DV11

DV11 STAT LN CD TSTS

CZDVBC0

AH-8733C-MC

FICHE 1 OF 1

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digital

MADE IN USA

IDENTIFICATION

PRODUCT CODE:	AC-8732C-MC
PRODUCT NAME:	CZDVBC0 DV11 STAT LN CD TSTS
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).

CZDVB exercises all existing line cards in a static state (micro processor is NEVER TURNED ON). Transmitter and receiver flags,transmitter and receiver data,receiver syncing and char silo are tested. Most tests exercise a ''group'' of 4 lines at a time (00-03,04-07,08-11,12-15). For ease of trobleshooting; only one line card may be installed and by alerting the diagnostic as to which line cards are PHYSICALLY REMOVED (see section 8.4A) program will run any combination of line cards.

NOTE: Czdvbc0 has been enhanced to enable checking of parity logic, by enabling parity(odd/even) in any of the character lengths (5-8 bit). caution should be exercised in selecting sync characters however. ie. if parity selected is odd, make sure sync character selected contains odd number of bits. likewise when even parity selected be sure sync character contains even number of bits.

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. DZDVF [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 read 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:	Reserved
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 deoends on the test) to give the operator an idea as to the source o' 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 or 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 HAPDWARE 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 CZDVBCO 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      tested.      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.  Bits  07-00
                                must be all zeros for testing Async line cards.
```

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.

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 175400 is reached. If a 'SLAVE SYNC RESPONSE' was issued by the DV11 (or any other device) (no nxm trap)(and it (SEL0) was=0) ; 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 cards.

5) SYNC 'A'=226 AND SYNC 'B'=062

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

DOCUMENT
****
CZDVBC 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)


1214    ************************ TEST 1 *******************************
        TEST THAT ''TRANSMITTER FLAG WAITING''
        IS TRUE AND THAT 'RECV FLAG WAITING'' IS
        FALSE  AFTER AN INIT.
        THIS TEST WILL BE DONE FOR BOTH ASYNC AND SYNC LINE CARDS.

1280    ************************ TEST 2 *******************************
        TEST THAT 'MATCH DETECT'' IS
        FALSE AFTER AN INIT.
        THIS TEST WILL BE DONE FOR BOTH ASYNC AND SYNC LINE CARDS.

1328    ************************ TEST 3 *******************************
        TEST THAT MAINT BIT WINDOW IS CLEARED
         AFTER AN INIT.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

1378    ************************ TEST 4 *******************************
        TEST THAT THE BIT WINDOW WILL
        STAY CLEARED WHEN MAINT INTERNAL

1381    MODE IS SELECTED BUT COND. STROBE IS
        NOT ASSERETED.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

1431    ************************ TEST 5 *******************************
        TEST THAT THE BIT WINDOW WILL
        SET WHEN MAINT INTERNAL MODE IS SELECTED
        AND COND. STOBE IS ASSERTED.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

1485    ************************ TEST 6 *******************************
        TEST THAT THE BIT WINDOW WILL BE CLEARED
        WHEN MAINT INTERNAL MODE IS SELECTED AND TX DSABLE
        IS ASSERTED.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

1539    ************************ TEST 7 *******************************
        TEST THAT 'MAINT DATA'' WILL SHOW
        UP IN 'MAINT BIT WINDOW''.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
```

```
1606     *********************** TEST 10 *******************************
         TEST TO XMIT A BINARY COUNT PATTERN
         THRU THE USE OF THE BIT WINDOW.
         ONLY ONE LINE AT A TIME WILL BE EXERCISED.
         THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

1724     VERIFY THAT SETTING TMARK BIT PUTS LINE AT MARK.


1746     *********************** TEST 11 *******************************
         TEST TO CHECK THE IDLE CHARACTER
         FOR EACH LINE OF THE TRANSMITTER.
         THIS TEST USES ''SYNCA''.
         THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

1852     *********************** TEST 12 *******************************
         TEST TO CHECK THE IDLE CHARACTER
         FOR EACH LINE OF THE TRANSMITTER.
         THIS TEST USES ''SYNCB''.
         THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

1962     *********************** TEST 13 *******************************
         THIS TEST CHECKS ''RECEIVE CHAR SILO'' TO BE
         ALL ZERO'S WHEN ''DATA ENABLE'' IS NOT SET.
         EXPECTED DATA SHOULD BE LINE NUMBER ONLY
         DATA 0'S AND ERROR FLAGS 0.
         THIS TEST WILL BE DONE FOR BOTH ASYNC AND SYNC LINE CARDS.

2034     *********************** TEST 14 *******************************
         THIS TEST CHECKS ''RECEIVER CHAR SILO''
         WHEN ''DATA ENABLE IS SET'' EXPECTED DATA S/B
         ALL 1'S FOR RX DATA, LINE NUMBER CORRECT,
         AND ERROR FLAGS  0.
         THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

2111     *********************** TEST 15 *******************************
         TEST THAT EACH RECEIVER WILL SET
         ''MATCH DETECT'' WHEN THE FIRST SYNC
         CHARACTER IS PUMPED INTO IT.
         THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

2174     *********************** TEST 16 *******************************
         TEST TO VERIFY THAT IF THE DV11 RECEIVER
         IS SET FOR ONE SYNC CHAR;
         ''MATCH DET'' *AND* ''CHAR FLAG'' ARE
         SET AFTER ONE SYNC IS PUSHED INTO THE RECEIVER
                       HOWEVER...
         IF THE DV11 RECEIVER IS SET FOR
         TWO SYNC CHARS....
         VERIFY THAT ''MATCH DET'' SETS ON THE FIRST SYNC
         AND VERIFY THAT ''MATCH DET'' *AND* ''CHAR FLAG''
         ARE SET ON THE SECOND SYNC.
         THIS TEST USES ''SYNC A''.
         THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
```

```
2275    ************************ TEST 17 ********************************
        TEST TO VERIFY THAT IF THE DV11 RECEIVER

2277    IS SET FOR ONE SYNC CHAR;
        'MATCH DET'' *AND* ''CHAR FLAG'' ARE
        SET AFTER ONE SYNC IS PUSHED INTO THE RECEIVER
                      HOWEVER...
        IF THE DV11 RECEIVER IS SET FOR
        TWO SYNC CHARS....
        VERIFY THAT 'MATCH DET'' SETS ON THE FIRST SYNC
        AND VERIFY THAT 'MATCH DET'' *AND* ''CHAR FLAG''
        ARE SET ON THE SECOND SYNC.
        THIS TEST USES ''SYNC B''.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

2380    ************************ TEST 20 ********************************
        TEST TO FORCE RECEIVER OVERRUN.
        THIS TEST WILL PUSH INTO THE RECEIVER
        TWO FULL CHARS (SYNCS) AND ONE MORE CHAR MINUS
        ONE BIT. THE PROGRAM WILL VERIFY NO OVERRUN EXISTS
        THEN THE LAST BITS WILL BE PUSHED IN VERIFING
        THAT THE OVERRUN WAS GENERATED.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

2508    ************************ TEST 21 ********************************
        TEST OF RECEIVER DATA .
        THIS TEST RUNS A BINARY COUNT PATTERN THROUGH
        THE RECEIVER OF EACH LINE
        THROUGH THE USE OF MAINT. DATA BIT.
        THE TX IS NEVER ENABLED.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

2623    ************************ TEST 22 ********************************
        TEST OF RECEIVER PARITY LOGIC.
        THIS TEST RUNS PREDETERMINED DATA PATTERNS
        THROUGH THE RECEIVER OF EACH LINE, BY
        MEANS OF THE MAINTENACE DATA BIT. IF ODD
        PARITY IS SELECTED, AN EVEN DATA PATTERN
        IS GENERATED THROUGH THE RECEIVER WITH
        THE PARITY BIT CLEAR. THIS SHOULD CAUSE A
        RECEIVER PARITY ERROR. IF NOT, THEN WE CAN
        ASSUME THE PARITY CHECKING LOGIC IN THE
        RECEIVER IS DEFECTIVE. DATA IS STILL
        CHECKED TO INSURE INTEGERITY. EVEN PARITY
        WILL LIKEWISE BE TESTED BY GENERATING
        AN ODD DATA PATTERN. ALL CHARACTER LENGTHS
        MAY BE TESTED. THE TX IS NEVER ENABLED.
        THIS TEST WILL DE DONE FOR SYNC LINE CARDS ONLY.
```

```
2778     ************************ TEST 23 ******************************
         TEST OF RECEIVER DATA .
         THIS TEST RUNS A SET PATTERN THROUGH

2781     THE RECEIVER OF EACH LINE
         THROUGH THE USE OF THE TRANSMITTER.
         THIS TEST EXERCISES ALL LINES IN GROUPS OF 4.
         NOTE: SHOULD A DATA COMPARE ERROR OCCUR; THE PROGRAM
                 REPORTS THE ERROR AS A RECEIVER DATA ERROR BASED
                 ON THE TRANSMITTER HAS PREVIOUSLY BEEN CHECKED AND ASSUMED GOOD.
         THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

2940     ************************ TEST 24 ******************************
         TEST OF RECEIVER 'RE-SYNC''
         THIS TEST WILL SEND (BY BIT WINDOW) TWO SYNC CHARS AND
         THEN VERIFY THAT RX CHAR FLAG IS TRUE.
         THEN A 'RE-SYNC'' WILL BE ISSUED AND
         TWO NON-SYNC CHARS WIIL BE SENT INTO THE RX
         VERIFYING THAT THERE IS NO RX CHAR FLAG.
         NEXT TWO SYNC CHARS ARE AGAIN MOVED INTO THE RX
         VERIFING CHAR FLAG AND THE THE RX SOULD INDEED

2949              RE SYNC!
         THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

3052     ************************ TEST 25 ******************************
         TEST TO VERIFY THAT SETTING RECEIVER ENABLE
         WILL SET RX FLAG AND MATCH DETECT.
         TEST WILL ALSO VERIFY THAT CLEARING RECEIVER
         ENABLE WILL CLEAR RX FLAG AND MATCH DETECT.
         THIS TEST WILL BE DONE FOR ASYNC LINE CARDS ONLY.

3140     ************************ TEST 26 ******************************
         TEST TO SET RECEIVER ENABLE.
         SET 'RX DATA ENABLE''.
         CLR 'RX DATA ENABLE''.
         AND EXPECT BOTH RX FLAG AND MATCH DETECT TO BE FALSE.
         THIS TEST WILL BE DONE FOR ASYNC LINE CARDS ONLY.

3211     ************************ TEST 27 ******************************
         TEST TO SET RECEIVER ENABLE.
         ISSUE A PESYNC  SIGNAL.
         AND EXPECT BOTH RX FLAG AND MATCH DETECT TO BE FALSE.
         THIS TEST WILL BE DONE FOR ASYNC LINE CARDS ONLY.
```

```

                        ;*AC-8732C-MC/<377>/CZDVBCO DV11 STAT LN CD TSTS
                        ;*COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
                        ;*-----------------------------------------------------------------------

                                ;STARTING PROCEDURE
                                ;LOAD PROGRAM
                                ;LOAD ADDRESS 000200
                                ;PRESS START
                                ;PROGRAM WILL TYPE ''A  5732C-MC/<377>/CZDVBCO DV11 STAT LN CD TSTS ''
                                ;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


                                ;RFGISTER DEFINITIONS
                                ;--------------------

        000000                  R0=%0           ;GENERAL REGISTER
        000001                  R1=%1           ;GENFRAL 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-8732C-MC/<377>/CZDVBCO DV11 STAT LN CD TSTS /<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 VECTCR 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 LINFS 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
  1706  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                      ;ZERU 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$:     MOV     BRW,TTST                ;PREPARE NORMAL SCOPE ROUTINE
002412  013737  003016  002704          MOV     BRX,TTST+2              ;LOCK NOT SELECTED, SET UP FOR NORMAL SCOPE LOOF
002420                          2$:
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'''.
002656  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$:       CLRB    ERRFLG          ;PREPARE FOR NEW TEST
002760  005037  001224                    CLR     LPCNT           ;START ICOUNTER AT 0
002764  005037  001220                    CLR     LOCK
002770  012737  000020  001222            MOV     #20,ICOUNT      ;RESET ITERATIONS
002776  013737  001216  001214            MOV     NEXT,RETURN     ;GET NEXT TEST
003004  011600                  3$:       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  001362                            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  024230                         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     WRK0.FM         ;BR IF NO.
004250  104402                                     TYPE                    ;TYPE
004252  000000                           ERRMSG:   0                       ;    ERROR MESSAGE
004254                                   WRK0.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                                     PUSHR0                  ;SAVE R0
004312  016600  000002                             MOV     2(SP),R0        ;SHOW ERROR PC IN DATA LIGHTS
004316  000000                                     HALT                    ;HALT
004320  012600                                     POPR0                   ;GET R0
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                                     TSTN0
                                                   ;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
```

```
 913
 914  004640  032777  004000  174336  SERV.G: BIT     #4000,@TKCSR       ;RX BUSY?
 915  004646  001374                          BNE     SERV.G             ;BR IF YES
 916  004650  017737  174326  005072          MOV     @SWR,90$           ;SAVE (SWR).
 917  004656  013777  005072  174316  1$:     MOV     90$,@SWR           ;
 918  004664  104402  005052                  TYPE    ,89$               ;
 919  004670  104411  005064                  CNVRT   ,88$               ;
 920  004674  104402  005074                  TYPE    ,91$               ;
 921  004700  105777  174300                  TSTB    @TKCSR             ;WAIT FOR DONE.
 922  004704  100375                          BPL     .-4
 923  004706  017746  174274                  MOV     @TKDBR,-(SP)       ;
 924  004712  042716  000200                  BIC     #BIT7,(SP)         ;
 925  004716  122726  000015                  CMPB    #15,(SP)+          ;
 926  004722  001450                          BEQ     5$                 ;
 927  004724  005077  174252                  CLR     @SWR               ;
 928  004730  105777  174254          2$:     TSTB    @TPCSR             ;
 929  004734  100375                          BPL     .-4
 930  004736  016677  177776  174246          MOV     -2(SP),@TPDBR      ;
 931  004744  000241                          CLC                        ;
 932  004746  006177  174230                  ROL     @SWR               ;
 933  004752  006177  174224                  ROL     @SWR               ;
 934  004756  006177  174220                  ROL     @SWR               ;
 935  004762  103735                          BCS     1$                 ;ERROR
 936  004764  026627  177776  000060          CMP     -2(SP),#60         ;
 937  004772  002731                          BLT     1$                 ;
 938  004774  026627  177776  000067          CMP     -2(SP),#67         ;
 939  005002  003325                          BGT     1$                 ;
 940  005004  042766  177770  177776          BIC     #^C<7>,-2(SP)      ;
 941  005012  056677  177776  174162          BIS     -2(SP),@SWR        ;
 942  005020  105777  174160                  TSTB    @TKCSR             ;
 943  005024  100375                          BPL     .-4                ;
 944  005026  017746  174154                  MOV     @TKDBR,-(SP)
 945  005032  042716  000200                  BIC     #BIT7,(SP)
 946  005036  122726  000015                  CMPB    #15,(SP)+
 947  005042  001332                          BNE     2$                 ;
 948  005044  104402  005104          5$:     TYPE    ,MCRLF             ;
 949  005050  000207                          RTS     PC
 950
 951  005052  020377  051450  051127  89$:    .ASCIZ  <377>? (SWR)=/?
 952  005060  036451  000057
 953                                  .EVEN
 954  005064  000001                  88$:    1
 955  005066     006     000                  .BYTE   6,0
 956  005070  005072                          90$
 957  005072  000000                  90$:    .WORD   0
 958  005074  036457  000057          91$:    .ASCIZ  ?/=/?
 959                                  .EVEN
 960  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 CZDVBC0  /
 (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
  961  005510     006     003                  .BYTE   6,3
  962  005512  001246                          TEMP1
  963  005514     006     002                  .BYTE   6,2
  964  005516  001250                          TEMP2
  965                                  .EVEN
  966
  967                                          ;BUFFERS FOR INPUT-OUTPUT
  968
  969  005520  000000                  INBUF:  0
  970          005562                  .-.+40
  971  005562  000000                  TEMP:   0
  972          005624                  .-.+40
  973  005624  000000                  MDATA:  0
  974          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    PUN             ;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 POINTEP.
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  007260                        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$:     TST     (R0)+
006470  020027  022760                          CMP     R0,#TLAST+10
006474  001354                                  BNE     5$
006476  104402  005100                          TYPE    ,MGM
006502  000733                                  BR      4$
006504  012737  007260  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
```

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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''
```

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                                        ;************************ TEST 1 ******************************
                                        ;*TEST THAT ''TRANSMITTER FLAG WAITING''
                                        ;*IS TRUE AND THAT ''RECV FLAG WAITING'' IS
                                        ;*FALSE  AFTER AN INIT.
                                        ;*THIS TEST WILL BE DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
                                        ;;**************************************************************

                                ;  TEST 1
                                ;---------------
007260  012737  000001  001226  TST1:   MOV      #1,TSTNO
007266  012737  007542  001216          MOV      #TST2,NEXT
007274  012700  000000                  MOV      #0.,R0           ;PLACE LINE NUMBER INTO R0
007300  013737  001422  001236          MOV      L00.03,STAT      ;LOAD LINE CARD STATUS INTO STAT
007306  100402                          BMI      100$             ;BR IF LINE CARD NOT TO BE TESTED
007310  004737  007376                  JSR      PC,105$          ;GO DO THE TEST FOR LINE CARD 1
007314  012700  000004          100$:   MOV      #4.,R0           ;PLACE LINE NUMBER INTO R0
007320  013737  001424  001236          MOV      L04.07,STAT      ;LOAD LINE CARD STATUS INTO STAT
007326  100402                          BMI      101$             ;BR IF LINE CARD NOT TO BE TESTED
007330  004737  007376                  JSR      PC,105$          ;GO DO THE TEST FOR LINE CARD 2
007334  012700  000010          101$:   MOV      #8.,R0           ;LOAD LINE NUMBER
007340  013737  001426  001236          MOV      L08.11,STAT      ;LOAD LINE CARD STATUS INTO STAT
007346  100402                          BMI      102$             ;BR IF LINE CARD NOT TO BE TESTED
007350  004737  007376                  JSR      PC,105$          ;DO THE TEST FOR LINE CARD 3
007354  012700  000014          102$:   MOV      #12.,R0          ;LOAD LINE NO.
007360  013737  001430  001236          MOV      L12.15,STAT      ;LOAD LINE CARD STATUS
007366  100402                          BMI      103$             ;BR IF LINE CARD NOT TO BE TESTED
007370  004737  007376                  JSR      PC,105$          ;DO THE TESTS FOR LINE CARD 4
007374  104400                  103$:   SCOPE                     ;SCOPE THIS TEST.
007376                          105$:                             ;TEST ENTRANCE.
007376  104413                          RAMCLR                    ;CLEAR ALL DV11 SEC. REGS.
007400  010037  007412                  MOV      R0,65$           ;STORE LINE NO. POINTER.
007404  005001                          CLR      R1               ;ZERO MSCANNER POINTER
007406  004537  023544          1$:     PERFORM  ,SETSCAN         ;POSITION SCANNER TO LINE NUMBER.
007412  000001                  65$:    .BLKW 1                   ;INITAL LINE NUMBER HERE.
007414  012703  000004          2$:     MOV      #4,R3            ;SET TO DO 4 LINES AT A TIME
007420  012705  000003          3$:     MOV      #BIT1+BIT0,R5    ;SET EXPECTED RESULTS IN R5
007424  012702  002000                  MOV      #BIT10,R2        ;BR-A ''RX FLAG WAITING''?
007430  010277  171744                  MOV      R2,@DVSFR        ;LOAD DV11 INSTRUCTION
007434  017704  171730                  MOV      @DVLCR,R4        ;READ BR TEST POINTS
007440  020504                          CMP      R5,R4            ;TEST POINTS OK?
007442  001401                          BEQ      4$               ;BR IF YES
007444  104001                          HLT      1                ;EXPECT DVLCR BIT1+BIT0=1
007446  012777  050102  171724  4$:     MOV      #S.C+BIT6+BIT1,@DVSFR
007454  104415                          ROMCLK                    ;S/C ''ADVANCE SCANNER''
007456  005201                          INC      R1               ;UPDATE MSCAN POINTER
007460  010100                          MOV      R1,R0            ;PREPARE TO SET LINE POINTER
007462  000241                          CLC                       ;TO CORRECT POSITION
007464  006000                          ROR      R0               ;
007466  012702  001000                  MOV      #BIT9,R2         ;BR-A ''TX FLAG WAITING''?
007472  010277  171702                  MOV      R2,@DVSFR        ;LOAD DV11 INSTRUCTION
007476  017704  171666                  MOV      @DVLCR,R4        ;READ BR TEST POINT
007502  012705  000002                  MOV      #BIT1,R5         ;SET EXPECTED RESULTS
007506  020504                          CMP      R5,R4            ;TX FLAG WAITING TRUE?
007510  001401                          BEQ      5$               ;BR IF LCR BIT1=1 AND BIT0=0
007512  104001                          HLT      1                ;ERROR.
```

```
007514  012777  050102  171656  5$:     MOV     #S.C+BIT6+BIT1,@DVSFR
007522  104415                          ROMCLK                  ;S/C ''ADVANCE SCANNER''
007524  005201                          INC     R1              ;UPDATE MSCAN POINTER
007526  010100                          MOV     R1,R0           ;UPDATE LINE POINTER
007530  000241                          CLC                     ;
007532  006000                          ROR     R0              ;
007534  005303                          DEC     R3              ;ARE ALL 4 LINES TESTED?
007536  001330                          BNE     3$              ;BR IF NO!
007540  000207                          RTS     PC              ;CHECK NEXT SET OF LINES.


                                        ;*********************** TEST 2 ******************************
                                        ;*TEST THAT 'MATCH DETECT'' IS
                                        ;*FALSE AFTER AN INIT.
                                        ;*THIS TEST WILL BE DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
                                        ;:**************************************************************

                                ;  TEST 2
                                ;--------------
007542  012737  000002  001226  TST2:   MOV     #2,TSTNO
007550  012737  007744  001216          MOV     #TST3,NEXT
007556  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
007562  013737  001422  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
007570  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
007572  004737  007660                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
007576  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
007602  013737  001424  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
007610  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
007612  004737  007660                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
007616  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
007622  013737  001426  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
007630  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
007632  004737  007660                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
007636  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
007642  013737  001430  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
007650  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
007652  004737  007660                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
007656  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
007660                          105$:                           ;TEST ENTRANCE.
007660  010037  007674                  MOV     R0,65$          ;SET LINE POINTER
007664  104412                          MSTCLR                  ;RESET THE DV11
007666  005001                          CLR     R1              ;ZERO MSCANNER POINTER
007670  004537  023544          1$:     PERFORM ,SETSCAN        ;SET MSCAN TO CORRECT LINE
007674  000001                  65$:    .BLKW 1                 ;INITAL LINE POINTER PLACED HERE.
007676  012703  000004          2$:     MOV     #4,R3           ;SET FOR A FOUR LINE GROUP.
007702  012705  000003          3$:     MOV     #BIT1+BIT0,R5   ;SET EXPECTED RESULTS.
007706  012702  076400          4$:     MOV     #BRB+BIT11+BIT10+BIT8,R2
007712  010277  171462                  MOV     R2,@DVSFR       ;BR-B 'MATCH DET'?
007716  017704  171446                  MOV     @DVLCR,R4       ;READ DVLCR INTO R4
007722  020504                          CMP     R5,R4           ;MATCH DET FALSE??
007724  001401                          BEQ     5$              ;BR IF YES
007726  104001                          HLT     1               ;LCR BIT1=1+BIT0=1 EXPECTED.
007730  004537  023544          5$:     PERFORM ,SETSCAN        ;UPDATE MSCAN POINTER TO NEXT LINE.
007734  000001                          1                       ;1 LINE
007736  005303                          DEC     R3              ;ALL FOUR LINES DONE YET?
007740  001362                          BNE     4$              ;BR IF NO
```

```
007742  000207                                    RTS     PC              ;CHECK NEXT SET OF LINES


                                                  ;************************ TEST 3 ******************************
                                                  ;*TEST THAT MAINT BIT WINDOW IS CLEARED
                                                  ;* AFTER AN INIT.
                                                  ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                                  ;;***********************************************************************


                                          ;  TEST 3
                                          ;--------------
007744  012737  000003  001226            TST3:   MOV     #3,TSTNO
007752  012737  010152  001216                    MOV     #TST4,NEXT
007760  012700  000000                            MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
007764  013737  001422  001236                    MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
007772  100402                                    BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
007774  004737  010062                            JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
010000  012700  000004                    100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
010004  013737  001424  001236                    MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
010012  100402                                    BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
010014  004737  010062                            JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
010020  012700  000010                    101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
010024  013/37  001426  001236                    MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
010032  100402                                    BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
010034  004737  010062                            JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
010040  012700  000014                    102$:   MOV     #12.,R0         ;LOAD LINE NO.
010044  013737  001430  001236                    MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
010052  100402                                    BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
010054  004737  010062                            JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
010060  104400                            103$:   SCOPE                   ;SCOPE THIS TEST.
010062                                    105$:                           ;TEST ENTRANCE.
010062  032737  004000  001236                    BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
010070  001401                                    BEQ     .+4             ;BR IF SYNC LINE CARD.
010072  000207                                    RTS     PC              ;EXIT TEST
010074  104412                                    MSTCLR                  ;RESET DV11
010076  005002                                    CLR     R2              ;ZERO SFR IMAGE
010100  017705  171264                            MOV     @DVLCR,R5       ;READ THE DVLCR INTO R5
010104  042705  000200                            BIC     #BIT7,R5        ;CLEAR MAINT BIT WINDOW EXPECTED
010110  012703  000004                            MOV     #4,R3           ;SET TO DO 4 LINES.
010114  010077  171252                    1$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
010120  017704  171244                            MOV     @DVLCR,R4       ;READ DVLCR RESULTS INTO R4
010124  042705  000060                            BIC     #BIT5+BIT4,R5   ;CLEAR EXTENDED ADDRESS BITS
010130  042704  000060                            BIC     #BIT5+BIT4,R4   ;""
010134  020504                                    CMP     R5,R4           ;OK?
010136  001401                                    BEQ     2$              ;
010140  104001                                    HLT     1               ;BIT7 INCORRECT
010142  005200                            2$:     INC     R0              ;UPDATE LINE POINTER
010144  005303                                    DEC     R3              ;ALL LINES DONE?
010146  001362                                    BNE     1$              ;BR IF NO
010150  000207                                    RTS     PC              ;RETURN FOR NEXT SET OF LINES.


                                                  ;************************ TEST 4 ******************************
                                                  ;*TEST THAT THE BIT WINDOW WILL
                                                  ;*STAY CLEARED WHEN MAINT INTERNAL
                                                  ;*MODE IS SELECTED BUT COND. STROBE IS
                                                  ;*NOT ASSERETED.
                                                  ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                                  ;;***********************************************************************


                                         ;  TEST 4
                                         ;---------------
010152  012737  000004  001226           TST4:    MOV     #4,TSTNO
010160  012737  010366  001216                    MOV     #TST5,NEXT
010166  012700  000000                            MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
010172  013737  001422  001236                    MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
010200  100402                                    BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
010202  004737  010270                            JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
010206  012700  000004                   100$:    MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
010212  013737  001424  001236                    MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
010220  100402                                    BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
010222  004737  010270                            JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
010226  012700  000010                   101$:    MOV     #8.,R0          ;LOAD LINE NUMBER
010232  013737  001426  001236                    MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
010240  100402                                    BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
010242  004737  010270                            JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
010246  012700  000014                   102$:    MOV     #12.,R0         ;LOAD LINE NO.
010252  013737  001430  001236                    MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
010260  100402                                    BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
010262  004737  010270                            JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
010266  104400                           103$:    SCOPE                   ;SCOPE THIS TEST.
010270                                   105$:                            ;TEST ENTRANCE.
010270  032737  004000  001236                    BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
010276  001401                                    BEQ     .+4             ;BR IF SYNC LINE CARD.
010300  000207                                    RTS     PC              ;EXIT TEST
010302  104412                                    MSTCLR                  ;RESET DV11
010304  005002                                    CLR     R2              ;ZERO SFR IMAGE
010306  012777  004000  171054                    MOV     #BIT11,@DVLCR   ;SET INTERNAL MAINT MODE
010314  017705  171050                            MOV     @DVLCR,R5       ;READ THE DVLCR INTO R5
010320  042705  000200                            BIC     #BIT7,R5        ;CLEAR MAINT BIT WINDOW EXPECTED
010324  012703  000004                            MOV     #4,R3           ;SET TO DO 4 LINES.
010330  010077  171036                   1$:      MOV     R0,@DVSRS       ;LOAD LINE NUMBER
010334  017704  171030                            MOV     @DVLCR,R4       ;READ DVLCR RESULTS INTO R4
010340  042705  000060                            BIC     #BIT5+BIT4,R5   ;CLEAR EXTENDED ADDRESS BITS
010344  042704  000060                            BIC     #BIT5+BIT4,R4   ;**
010350  020504                                    CMP     R5,R4           ;OK?
010352  001401                                    BEQ     2$              ;
010354  104001                                    HLT     1               ;BIT7 INCORRECT
010356  005200                           2$:      INC     R0              ;UPDATE LINE POINTER
010360  005303                                    DEC     R3              ;ALL LINES DONE?
010362  001362                                    BNE     1$              ;BR IF NO
010364  000207                                    RTS     PC              ;RETURN FOR NEXT SET OF LINES.


                                                  ;************************ TEST 5 ******************************
                                                  ;*TEST THAT THE BIT WINDOW WILL
                                                  ;*SET WHEN MAINT INTERNAL MODE IS SELECTED
                                                  ;*AND COND. STOBE IS ASSERTED.
                                                  ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                                  ;;***********************************************************************
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                                          ;  TEST 5
                                          ;--------------
010366  012737  000005  001226   TST5:    MOV     #5,TSTNO
010374  012737  010614  001216            MOV     #TST6,NEXT
010402  012700  000000                    MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
010406  013737  001422  001236            MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
010414  100402                            BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
010416  004737  010504                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
010422  012700  000004           100$:    MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
010426  013737  001424  001236            MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
010434  100402                            BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
010436  004737  010504                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
010442  012700  000010           101$:    MOV     #8.,R0          ;LOAD LINE NUMBER
010446  013737  001426  001236            MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
010454  100402                            BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
010456  004737  010504                    JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
010462  012700  000014           102$:    MOV     #12.,R0         ;LOAD LINE NO.
010466  013737  001430  001236            MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
010474  100402                            BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
010476  004737  010504                    JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
010502  104400                   103$:    SCOPE                   ;SCOPE THIS TEST.
010504                           105$:                            ;TEST ENTRANCE.
010504  032737  004000  001236            BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
010512  001401                            BEQ     .+4             ;BR IF SYNC LINE CARD.
010514  000207                            RTS     PC              ;EXIT TEST
010516  104412                            MSTCLR                  ;RESET DV11
010520  005002                            CLR     R2              ;ZERO SFR IMAGE
010522  012777  004000  170640            MOV     #BIT11,@DVLCR   ;SET INTERNAL MAINT MODE
010530  017705  170634                    MOV     @DVLCR,R5       ;READ THE DVLCR INTO R5
010534  052705  000200                    BIS     #BIT7,R5        ;SET MAINT BIT WINDOW EXP RESULTS
010540  012703  000004                    MOV     #4,R3           ;SET TO DO 4 LINES.
010544  010077  170622           1$:      MOV     R0,@DVSRS       ;LOAD LINE NUMBER
010550  052777  100000  170612            BIS     #BIT15,@DVLCR   ;SET STROBE
010556  004737  023462                    JSR     PC,CKBIT15      ;GO WAIT FOR BIT15 TO =0
010562  017704  170602                    MOV     @DVLCR,R4       ;READ DVLCR RESULTS INTO R4
010566  042705  000060                    BIC     #BIT5+BIT4,R5   ;CLEAR EXTENDED ADDRESS BITS
010572  042704  000060                    BIC     #BIT5+BIT4,R4   ;""
010576  020504                            CMP     R5,R4           ;OK?
010600  001401                            BEQ     2$              ;
010602  104001                            HLT     1               ;BIT7 INCORRECT
010604  005200                   2$:      INC     R0              ;UPDATE LINE POINTER
010606  005303                            DEC     R3              ;ALL LINES DONE?
010610  001355                            BNE     1$              ;BR IF NO
010612  000207                            RTS     PC              ;RETURN FOR NEXT SET OF LINES.


                                          ;************************ TEST 6 ******************************
                                          ;*TEST THAT THE BIT WINDOW WILL BE CLEARED
                                          ;*WHEN MAINT INTERNAL MODE IS SELECTED AND TX DSABLE
                                          ;*IS ASSERTED.
                                          ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                          ;:*************************************************************


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                                        ;  TEST 6
                                        ;--------------
010614  012737  000006  001226  TST6:   MOV     #6,TSTNO
010622  012737  011042  001216          MOV     #TST7,NEXT
010630  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
010634  013737  001422  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
010642  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
010644  004737  010732                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
010650  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
010654  013737  001424  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
010662  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
010664  004737  010732                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
010670  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
010674  013737  001426  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
010702  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
010704  004737  010732                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
010710  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
010714  013737  001430  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
010722  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
010724  004737  010732                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
010730  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
010732                          105$:                           ;TEST ENTRANCE.
010732  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
010740  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
010742  000207                          RTS     PC              ;EXIT TEST
010744  104412                          MSTCLR                  ;RESET DV11
010746  005002                          CLR     R2              ;ZERO SFR IMAGE
010750  012777  005000  170412          MOV     #BIT11+BIT9,@DVLCR      ;SET INTER MAINT MODE FOR SYSTEM TESTING
010756  017705  170406                  MOV     @DVLCR,R5       ;READ THE DVLCR INTO R5
010762  042705  000200                  BIC     #BIT7,R5        ;CLEAR MAINT BIT WINDOW EXPECTED
010766  012703  000004                  MOV     #4,R3           ;SET TO DO 4 LINES.
010772  010077  170374          1$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
010776  052777  100000  170364          BIS     #BIT15,@DVLCR   ;SET STROBE
011004  004737  023462                  JSR     PC,CKBIT15      ;GO WAIT FOR BIT15 TO =0
011010  017704  170354                  MOV     @DVLCR,R4       ;READ DVLCR RESULTS INTO R4
011014  042705  000060                  BIC     #BIT5+BIT4,R5   ;CLEAR EXTENDED ADDRESS BITS
011020  042704  000060                  BIC     #BIT5+BIT4,R4   ;""
011024  020504                          CMP     R5,R4           ;OK?
011026  001401                          BEQ     2$              ;
011030  104001                          HLT     1               ;BIT7 INCORRECT
011032  005200                  2$:     INC     R0              ;UPDATE LINE POINTER
011034  005303                          DEC     R3              ;ALL LINES DONE?
011036  001355                          BNE     1$              ;BR IF NO
011040  000207                          RTS     PC              ;RETURN FOR NEXT SET OF LINFS.


                                                ;************************ TEST 7 ******************************
                                                ;*TEST THAT 'MAINT DATA'' WILL SHOW
                                                ;*UP IN 'MAINT BIT WINDOW''.
                                                ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                                ;;*****************************************************************

                                        ;  TEST 7
                                        ;--------------
011042  012737  000007  001226  TST7:   MOV     #7,TSTNO
011050  012737  011346  001216          MOV     #TST10,NEXT
```

```
011056  012700  000000                   MOV     #0.,R0             ;PLACE LINE NUMBER INTO R0
011062  013737  001422  001236           MOV     L00.03,STAT        ;LOAD LINE CARD STATUS INTO STAT
011070  100402                           BMI     100$               ;BR IF LINE CARD NOT TO BE TESTED
011072  004737  011160                   JSR     PC,105$            ;GO DO THE TEST FOR LINE CARD 1
011076  012700  000004          100$:    MOV     #4.,R0             ;PLACE LINE NUMBER INTO R0
011102  013737  001424  001236           MOV     L04.07,STAT        ;LOAD LINE CARD STATUS INTO STAT
011110  100402                           BMI     101$               ;BR IF LINE CARD NOT TO BE TESTED
011112  004737  011160                   JSR     PC,105$            ;GO DO THE TEST FOR LINE CARD 2
011116  012700  000010          101$:    MOV     #8.,R0             ;LOAD LINE NUMBER
011122  013737  001426  001236           MOV     L08.11,STAT        ;LOAD LINE CARD STATUS INTO STAT
011130  100402                           BMI     102$               ;BR IF LINE CARD NOT TO BE TESTED
011132  004737  011160                   JSR     PC,105$            ;DO THE TEST FOR LINE CARD 3
011136  012700  000014          102$:    MOV     #12.,R0            ;LOAD LINE NO.
011142  013737  001430  001236           MOV     L12.15,STAT        ;LOAD LINE CARD STATUS
011150  100402                           BMI     103$               ;BR IF LINE CARD NOT TO BE TESTED
011152  004737  011160                   JSR     PC,105$            ;DO THE TESTS FOR LINE CARD 4
011156  104400                  103$:    SCOPE                      ;SCOPE THIS TEST.
011160                          105$:                               ;TEST ENTRANCE.
011160  032737  004000  001236           BIT     #ASYNC,STAT        ;IS THIS A SYNC LINE CARD?
011166  001401                           BEQ     .+4                ;BR IF SYNC LINE CARD.
011170  000207                           RTS     PC                 ;EXIT TEST
011172  104412                           MSTCLR                     ;RESET DV11
011174  005002                           CLR     R2                 ;CLEAR DVSFR IMAGE
011176  012703  000004                   MOV     #4,R3              ;SET TO DO 4 LINES
011202  010077  170164          1$:      MOV     R0,@DVSRS          ;LOAD LINE NUMBER
011206  004537  023342                   PERFORM .LOAD.MODE         ;LOAD THE MODE
011212  005000                           BIT11+BIT9                 ;INT MAIT MODE AND TX DSABLE
011214  017705  170150                   MOV     @DVLCR,R5          ;READ LSR
011220  010504                           MOV     R5,R4              ;
011222  042705  000200                   BIC     #BIT7,R5           ;CLEAR MAIT BIT WINDOW RESULT
011226  020504                           CMP     R5,R4              ;WAS BIT WINDOW =TO 0
011230  001401                           BEQ     .+4                ;BR IF YES
011232  104001                           HLT     1                  ;BIT7 OF LCR S/B=0
011234  012737  000012  001250           MOV     #10.,TEMP2         ;SET FOR 10 BITS
011242  052705  040200          2$:      BIS     #BIT14+BIT7,R5     ;SET MAINT DATA AND MAINT BIT WINDOW
011246  052777  140000  170114           BIS     #BIT15+BIT14,@DVLCR
011254  004737  023462                   JSR     PC,CKBIT15         ;STROBE MAINT DATA. WAIT BIT15=0
011260  017704  170104                   MOV     @DVLCR,R4          ;READ THE LCR
011264  020504                           CMP     R5,R4              ;BIT14+BIT7=1?
011266  001401                           BEQ     3$                 ;YES
011270  104001                           HLT     1                  ;MAINT DATA DID NOT SHOW UP IN WINDOW
011272  042705  040200          3$:      BIC     #BIT14+BIT7,R5     ;CLEAR DATA AND WINDOW
011276  042777  040000  170064           BIC     #BIT14,@DVLCR      ;CLEAR MAIT DATA
011304  052777  100000  170056           BIS     #BIT15,@DVLCR      ;SET STROBE ON DV11
011312  004737  023462                   JSR     PC,CKBIT15         ;WAIT 15=0
011316  017704  170046                   MOV     @DVLCR,R4          ;READ DVLCR
011322  020504                           CMP     R5,R4              ;WINDOW =0?
011324  001401                           BEQ     4$                 ;BR IF YES
011326  104001                           HLT     1                  ;BIT7 S/B=0
011330  005337  001250          4$:      DEC     TEMP2              ;10 BITS DONE?
011334  001342                           BNE     2$                 ;BR IF NO
011336  005200                           INC     R0                 ;UPDATE LINE POINTER
011340  005303                           DEC     R3                 ;4 LINE GROUP DONE?
011342  001317                           BNE     1$                 ;BR IF NO
011344  000207                           RTS     PC                 ;RETURN FOR NEXT GROUP
```

```

                                                   ;************************ TEST 10 ******************************
                                                   ;*TEST TO XMIT A BINARY COUNT PATTERN
                                                   ;*THRU THE USE OF THE BIT WINDOW.
                                                   ;*ONLY ONE LINE AT A TIME WILL BE EXERCISED.
                                                   ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                                   ;;**************************************************************

                                          ;  TEST 10
                                          ;--------------
011346  012737  000010  001226  TST10:  MOV     #10,TSTNO
011354  012737  012242  001216          MOV     #TST11,NEXT
011362  012700  000000                  MOV     #0.,R0              ;PLACE LINE NUMBER INTO R0
011366  113737  001416  001242          MOVB    CLK.A,CLKX          ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
011374  013737  001406  001244          MOV     MASK.A,MASKX        ;PLACE 'MASK'FOR CHARS INTO MASKX
011402  013737  001422  001236          MOV     L00.03,STAT         ;LOAD LINE CARD STATUS INTO STAT
011410  100402                          BMI     100$                ;BR IF LINE CARD NOT TO BE TESTED
011412  004737  011544                  JSR     PC,105$             ;GO DO THE TEST FOR LINE CARD 1
011416  012700  000004          100$:   MOV     #4.,R0              ;PLACE LINE NUMBER INTO R0
011422  113737  001417  001242          MOVB    CLK.B,CLKX          ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
011430  013737  001410  001244          MOV     MASK.B,MASKX        ;GET MASK
011436  013737  001424  001236          MOV     L04.07,STAT         ;LOAD LINE CARD STATUS INTO STAT
011444  100402                          BMI     101$                ;BR IF LINE CARD NOT TO BE TESTED
011446  004737  011544                  JSR     PC,105$             ;GO DO THE TEST FOR LINE CARD 2
011452  012700  000010          101$:   MOV     #8.,R0              ;LOAD LINE NUMBER
011456  113737  001420  001242          MOVB    CLK.C,CLKX          ;GET SHIFTS PER CHAR
011464  013737  001412  001244          MOV     MASK.C,MASKX        ;GET MASK
011472  013737  001426  001236          MOV     L08.11,STAT         ;LOAD LINE CARD STATUS INTO STAT
011500  100402                          BMI     102$                ;BR IF LINE CARD NOT TO BE TESTED
011502  004737  011544                  JSR     PC,105$             ;DO THE TEST FOR LINE CARD 3
011506  012700  000014          102$:   MOV     #12.,R0             ;LOAD LINE NO.
011512  113737  001421  001242          MOVB    CLK.D,CLKX          ;GET SHIFTS
011520  013737  001414  001244          MOV     MASK.D,MASKX        ;GET MASK
011526  013737  001430  001236          MOV     L12.15,STAT         ;LOAD LINE CARD STATUS
011534  100402                          BMI     103$                ;BR IF LINE CARD NOT TO BE TESTED
011536  004737  011544                  JSR     PC,105$             ;DO THE TESTS FOR LINE CARD 4
011542  104400                  103$:   SCOPE                       ;SCOPE THIS TEST.
011544                          105$:                               ;TEST ENTRANCE.
011544  032737  004000  001236          BIT     #ASYNC,STAT         ;IS THIS A SYNC LINE CARD?
011552  001401                          BEQ     .+4                 ;BR IF SYNC LINE CARD.
011554  000207                          RTS     PC                  ;EXIT TEST
011556  010037  011572                  MOV     R0,65$              ;SET LINE NO. POINTER
011562  104412                          MSTCLR                      ;CLEAR DV11
011564  005001                          CLR     R1                  ;ZERO MSCANNER POINTER
011566  004537  023544          1$:     PERFORM ,SETSCAN            ;ADJUST SCANNER FOR PROPER LINE
011572  000001                  65$:    .BLKW 1                     ;LINE NUMBER POINTER.
011574  012703  000004          2$:     MOV     #4,R3               ;SET FOR 4 LINES EXERCISED
011600  005005                  3$:     CLR     R5                  ;SET DATA POINTER TO 0
011602  012777  050102  167570          MOV     #S.C+BIT6+BIT1,@DVSFR
011610  104415                          ROMCLK                      ;CLOCK SCANNER BY ONE
011612  005201                          INC     R1                  ;ADD +1 TO SCANNER POINTER
011614  010077  167552                  MOV     R0,@DVSRS           ;LOAD LINE NUMBER
011620  004537  023342                  PERFORM ,LOAD.MODE          ;LOAD MODE
011624  004000                          BIT11
011626  004537  023634          7$:     PERFORM ,CLR.TMARK          ;CLEAR TMARK BIT.
011632  012777  001000  167540          MOV     #BIT9,@DVSFR        ;DO A BR ''A'' TEST FOR TX FLAG
```

```
011640  005005                          CLR     R5                  ;SET EXPECTED DATA TO 0
011642  032777  000001  167520          BIT     #BIT0,@DVLCR        ;IF FLAG TRUE?
011650  001401                          BEQ     .+4                 ;BR IF YES
011652  104000                          HLT                         ;TX FLAG NO TRUE(LOW(LPRO-0))
011654  005077  167512                  CLR     @DVSRS              ;ZERO LINE TO LINE 0
011660  010577  167512                  MOV     R5,@DVSRA           ;LOAD DATA INTO DVSRA
011664  012777  020000  167506          MOV     #BIT13,@DVSFR       ;EXECUTE A 'ROM READ'' INTSTR
011672  104415                          ROMCLK                      ;CLOCK.
011674  012777  030260  167476          MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
011702  104415                          ROMCLK                      ;DO A DATA XFER FROM RAM OUTPUT TO TX BUFFER
011704  104416                          DATACLK                     ;ISSUE A MAINT CLK.
011706  012777  001000  167464          MOV     #BIT9,@DVSFR        ;DO A 'BR A'' TEST FOR TX FLAG
011714  032777  000001  167446          BIT     #BIT0,@DVLCR        ;IS FLAG FALSE?
011722  001001                          BNE     .+4                 ;BR IF YES
011724  104000                          HLT                         ;TX FLAG NOT FALSE(HIGH(LPRO=1))
011726  012737  011734  001220          MOV     #4$,LOCK            ;SET IF SW09=1 GOTO 4$
011734  113702  001242          4$:     MOVB    CLKX,R2             ;SET REQUIRED SHIFTS
011740  005037  023676                  CLR     DATA                ;CLEAR STUFFER LOCATION
011744  010077  167422                  MOV     R0,@DVSRS           ;LOAD LINE NUMBER
011750  104416                  5$:     DATACLK                     ;ISSUE MAINT CLK
011752  004537  023252                  PERFORM ,TXSHIFT            ;WORK THE TRANSMITTER
011756  005302                          DEC     R2                  ;ALL SHIFTS DONE?
011760  022702  000001                  CMP     #1,R2               ;IS THE BUFFER ALMOST EMPTY?
011764  001030                          BNE     8$                  ;BR IF NO
011766  005077  167400                  CLR     @DVSRS              ;ZERO LINE NUMBER
011772  032777  001000  167202          BIT     #BIT9,@SWR          ;LOCK ON DATA?
012000  001001                          BNE     .+4                 ;BR IF YES!!
012002  005205                          INC     R5                  ;UPDATE DATA.
012004  010577  167366                  MOV     R5,@DVSRA           ;LOAD DATA INTO DVSRA
012010  012777  020000  167362          MOV     #BIT13,@DVSFR       ;DO A ROM READ
012016  104415                          ROMCLK                      ;CLK
012020  012777  030260  167352          MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
012026  104415                          ROMCLK                      ;DO A  DATA XFER TO TX BUFF
012030  010077  167336                  MOV     R0,@DVSRS           ;RESELECT LINE NUMBER
012034  032777  001000  167140          BIT     #BIT9,@SWR          ;LOCK ON DATA?
012042  001001                          BNE     .+4                 ;BR IF YES!!
012044  005305                          DEC     R5                  ;READJUST DATA CHAR.
012046  005702                  8$:     TST     R2                  ;ALL SHIFTS DONE?
012050  001337                          BNE     5$                  ;BR IF NO
012052  022737  000010  001242          CMP     #8.,CLKX            ;IS LINE CARD SET TO 8 BITS?
012060  001420                          BEQ     15$                 ;BR IF YES
                                ;;****************************************************************
012062  022737  000011  001242          CMP     #9.,CLKX            ;8 BITS WITH PARITY ENABLED?           ;;++C
012070  001414                          BEQ     15$                 ;IF YES, BR
                                ;;****************************************************************
012072  013737  001242  001246          MOV     CLKX,TEMP1          ;SAVE NUMBER OF SHIFTS DONE.
012100  000241                  16$:    CLC                         ;CLEAR CARRY
012102  006037  023676                  ROR     DATA                ;RIGHT JUSTIFY TX RESULTS.
012106  005237  001246                  INC     TEMP1               ;ALL DONE?
012112  022737  000010  001246          CMP     #8.,TEMP1           ;?
012120  001367                          BNE     16$                 ;BR IF NO
012122                          15$:
012122  013704  023676                  MOV     DATA,R4             ;READ IMAGE CHAR FROM TX
012126  043704  001244                  BIC     MASKX,R4            ;STRIP PARITY IF IT EXISTS.
012132  020504                          CMP     R5,R4               ;ARE DATA CHARS THE SAME?
012134  001401                          BEQ     .+4                 ;BR IF GOOD DATA FROM TX
```

```
012136  104003                          HLT     3               ;TX DATA COMPARE ERROR
012140  104401                          SCOP1                   ;LOCK ON DATA?
012142  105205                          INCB    R5              ;UPDATE DATA CHAR.
012144  001403                          BEQ     6$              ;BR IF 8BIT CODE DONE.
012146  133705  001244                  BITB    MASKX,R5        ;IF <8BIT SEE IF ALL DONE.
012152  001670                          BEQ     4$              ;BR IF NOT ALL DONE
012154  004537  023622          6$:     PERFORM ,SET.TMARK      ;SET TMARK BIT
                                        ;*VERIFY THAT SETTING TMARK BIT PUTS LINE AT MARK.
                                        ;*
012160  113702  001242                  MOVB    CLKX,R2         ;SET COUNTER
012164  010077  167202                  MOV     R0,@DVSRS       ;SET LINE
012170  104416                  9$:     DATACLK                 ;CLOCK
012172  005302                          DEC     R2              ;FLUSH LAST CHARACTER.
012174  001375                          BNE     9$              ;CHAR FLUSHED?
012176  012702  000024                  MOV     #20.,R2         ;LOOK AT 20. BITS.
012202  104416                  10$:    DATACLK                 ;MAINT CLK
012204  032777  000200  167156          BIT     #BIT7,@DVLCR    ;BIT WINDOW
012212  001001                          BNE     11$             ;SET (MARK)
012214  104000                          HLT     0               ;TX BIT WINDOW NOT SET (MARK)
012216  005302                  11$:    DEC     R2              ;ALL BITS LOOKED AT?
012220  001370                          BNE     10$             ;BP IF NO
012222  004537  023544                  PERFORM ,SETSCAN        ;ADVANCE SCANNER TO NEXT LINE
012226  000001                          1                       ;ONE LINE ADVANCE
012230  005303                          DEC     R3              ;ALL LINES(4) DONE?
012232  001402                          BEQ     12$             ;BR IF YES
012234  000137  011626                  JMP     7$              ;IF NO CONTINUE
012240  000207                  12$:    RTS     PC              ;GET NEXT GROUP OF 4 LINES.


                                        ;************************ TEST 11 ******************************
                                        ;*TEST TO CHECK THE IDLE CHARACTER
                                        ;*FOR EACH LINE OF THE TRANSMITTER.
                                        ;*THIS TEST USES ''SYNCA''.
                                        ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                        ;:**************************************************************

                                ;  TEST 11
                                ;--------------
012242  012737  000011  001226  TST11:  MOV     #11,TSTNO
012250  012737  012766  001216          MOV     #TST12,NEXT
012256  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
012262  113737  001416  001242          MOVB    CLK.A,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
012270  013737  001406  001244          MOV     MASK.A,MASKX    ;PLACE 'MASK'FOR CHARS INTO MASKX
012276  013737  001422  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
012304  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
012306  004737  012440                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
012312  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
012316  113737  001417  001242          MOVB    CLK.B,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
012324  013737  001410  001244          MOV     MASK.B,MASKX    ;GET MASK
012332  013737  001424  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
012340  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
012342  004737  012440                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
012346  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
012352  113737  001420  001242          MOVB    CLK.C,CLKX      ;GET SHIFTS PER CHAR
012360  013737  001412  001244          MOV     MASK.C,MASKX    ;GET MASK
012366  013737  001426  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
```

```
012374  100402                           BMI     102$              ;BR IF LINE CARD NOT TO BE TESTED
012376  004737  012440                   JSR     PC,105$           ;DO THE TEST FOR LINE CARD 3
012402  012700  000014          102$:    MOV     #12.,R0           ;LOAD LINE NO.
012406  113737  001421  001242           MOVB    CLK.D,CLKX        ;GET SHIFTS
012414  013737  001414  001244           MOV     MASK.D,MASKX      ;GET MASK
012422  013737  001430  001236           MOV     L12.15,STAT       ;LOAD LINE CARD STATUS
012430  100402                           BMI     103$              ;BR IF LINE CARD NOT TO BE TESTED
012432  004737  012440                   JSR     PC,105$           ;DO THE TESTS FOR LINE CARD 4
012436  104400                  103$:    SCOPE                     ;SCOPE THIS TEST.
012440                          105$:                              ;TEST ENTRANCE.
012440  032737  004000  001236           BIT     #ASYNC,STAT       ;IS THIS A SYNC LINE CARD?
012446  001401                           BEQ     .+4               ;BR IF SYNC LINE CARD.
012450  000207                           RTS     PC                ;EXIT TEST
012452  010037  012466                   MOV     R0,65$            ;LOAD LINE NO. POINTER
012456  104412                           MSTCLR                    ;RESET THE DV11
012460  005001                           CLR     R1                ;ZERO MSCANNER POINTER
012462  004537  023544          1$:      PERFORM .SETSCAN          ;SET MSCANNER TO LINES TESTED
012466  000001                  65$:     .BLKW 1                   ;INITAL LINE VALUE
012470  012703  000004          2$:      MOV     #4,R3             ;SET TO DO 4 LINE GROUP
012474  005005                  3$:      CLR     R5                ;ZERO
012476  012777  050102  166674           MOV     #S.C+BIT6+BIT1,@DVSFR
012504  104415                           ROMCLK                    ;SET/CLEAR ''ADVANCE MSCANNER''
012506  005201                           INC     R1                ;UPDATE MSCANNER POINTER
012510  010077  166656          6$:      MOV     R0,@DVSRS         ;LOAD LINE NUMBER INTO DV11
012514  004537  023634                   PERFORM .CLR.TMARK        ;CLR TMARK BIT.
012520  004537  023342                   PERFORM .LOAD.MODE        ;LOAD THE MODE
012524  004000                           BIT11                     ;INT MAINT MODE
012526  005077  166644                   CLR     @DVSRA            ;ZERO DATA FOR XFR
012532  012777  020000  166640           MOV     #BIT13,@DVSFR     ;DO A RAM READ INSTR.
012540  104415                           ROMCLK                    ;
012542  012777  030260  166630           MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
012550  104415                           ROMCLK                    ;DATA XFR  TXBUFFER RAM OUTPUT
012552  104416                           DATACLK                   ;ISSUE MAIT CLOCK PULSE
012554  012737  012606  001220           MOV     #4$,LOCK          ;SET FOR SCOP1
012562  113702  001242                   MOVB    CLKX,R2           ;NUMBER OF CLOCK PULSES NEEDED
012566  104416                           DATACLK                   ;MAINT CLOCK PULSE
012570  005302                           DEC     R2                ;ALL CLOCKS DONE?
012572  001375                           BNE     .-4               ;NO , DO MORE
012574  113705  001236                   MOVB    STAT,R5           ;GET SYNC (IDLE) CHAR.
012600  012737  000005  001250           MOV     #5,TEMP2          ;SET FOR 5 CHARS
012606  113702  001242          4$:      MOVB    CLKX,R2           ;GET CLOCKS NEEDED
012612  005037  023676                   CLR     DATA              ;ZERO STORAGE AREA
012616  010077  166550                   MOV     R0,@DVSRS         ;LOAD LINE NUMBER
012622  104416                  5$:      DATACLK                   ;ISSUE MAINT CLK PULSE
012624  004537  023252                   PERFORM .TXSHIFT          ;CLOCK THE TRANSMITTER
012630  005302                           DEC     R2                ;MORE SHIFTS REQUIRED?
012632  001373                           BNE     5$                ;BR IF YES
012634  022737  000010  001242           CMP     #8.,CLKX          ;IS LINE CARD SET TO 8 BITS?
012642  001420                           BEQ     15$               ;BR IF YES
                                ;;****************************************************************
012644  022737  000011  001242           CMP     #9.,CLKX          ;8 BITS WITH PARITY ENABLED?          ;;++C
012652  001414                           BEQ     15$               ;IF YES BR
                                ;;********************************************************************
012654  013737  001242  001246           MOV     CLKX,TEMP1        ;SAVE NUMBER OF SHIFTS DONE.
012662  000241                  16$:     CLC                       ;CLEAR CARRY
012664  006037  023676                   ROR     DATA              ;RIGHT JUSTIFY TX RESULTS.
```

```
012670 005237 001246                 INC     TEMP1            ;ALL DONE?
012674 022737 000010 001246          CMP     #8.,TEMP1        ;?
012702 001367                        BNE     16$              ;BR IF NO
012704                       15$:
012704 013704 023676                 MOV     DATA,R4          ;SAVE DATA SHIFTED OUT OF TX.
012710 143704 001244                 BICB    MASKX,R4         ;CLEAR UNWANTED BITS.
012714 042705 177400                 BIC     #^C<377>,R5      ;CLEAR SIGN EXTEND.
012720 143705 001244                 BICB    MASKX,R5         ;CLEAR UNUSED BITS
012724 042704 177400                 BIC     #^C<377>,R4      ;CLEAR SIGN EXTEND.
012730 020504                        CMP     R5,R4            ;EXPECTED = FOUND ??
012732 001401                        BEQ     .+4              ;BR IF OK
012734 104003                        HLT     3                ;IDLE CHAR NOT WHAT EXPECTED.
012736 005337 001250                 DEC     TEMP2            ;ALL IDLE CHARS DONE?
012742 001321                        BNE     4$               ;BR IF NO
012744 104401                        SCOP1                    ;LOCK (SW09=1)?
012746 004537 023622                 PERFORM .SET.TMARK       ;SET TMARK BIT
012752 004537 023544                 PERFORM .SETSCAN         ;UPDATE SCANNER TO NEXT LINE
012756 000001                        1                        ;
012760 005303                        DEC     R3               ;ALL LINES DONE
012762 001252                        BNE     6$               ;BR IF NO
012764 000207                        RTS     PC               ;EXIT FOR NEXT GROUP OF LINES.



                                     ;************************* TEST 12 ********************************
                                     ;*TEST TO CHECK THE IDLE CHARACTER
                                     ;*FOR EACH LINE OF THE TRANSMITTER.
                                     ;*THIS TEST USES ''SYNCB''.
                                     ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                     ;;*****************************************************************

                             ;  TEST 12
                             ;--------------
012766 012737 000012 001226  TST12:  MOV     #12,TSTNO
012774 012737 013542 001216          MOV     #TST13,NEXT
013002 012700 000000                 MOV     #0.,R0           ;PLACE LINE NUMBER INTO R0
013006 113737 001416 001242          MOVB    CLK.A,CLKX       ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
013014 013737 001406 001244          MOV     MASK.A,MASKX     ;PLACE 'MASK'FOR CHARS INTO MASKX
013022 013737 001432 001240          MOV     SYNC2A,SYNCX     ;
013030 013737 001422 001236          MOV     L00.03,STAT      ;LOAD LINE CARD STATUS INTO STAT
013036 100402                        BMI     100$             ;BR IF LINE CARD NOT TO BE TESTED
013040 004737 013214                 JSR     PC,105$          ;GO DO THE TEST FOR LINE CARD 1
013044 012700 000004         100$:   MOV     #4.,R0           ;PLACE LINE NUMBER INTO R0
013050 113737 001417 001242          MOVB    CLK.B,CLKX       ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
013056 013737 001410 001244          MOV     MASK.B,MASKX     ;GET MASK
013064 013737 001434 001240          MOV     SYNC2B,SYNCX     ;
013072 013737 001424 001236          MOV     L04.07,STAT      ;LOAD LINE CARD STATUS INTO STAT
013100 100402                        BMI     101$             ;BR IF LINE CARD NOT TO BE TESTED
013102 004737 013214                 JSR     PC,105$          ;GO DO THE TEST FOR LINE CARD 2
013106 012700 000010         101$:   MOV     #8.,R0           ;LOAD LINE NUMBER
013112 113737 001420 001242          MOVB    CLK.C,CLKX       ;GET SHIFTS PER CHAR
013120 013737 001412 001244          MOV     MASK.C,MASKX     ;GET MASK
013126 013737 001436 001240          MOV     SYNC2C,SYNCX     ;
013134 013737 001426 001236          MOV     L08.11,STAT      ;LOAD LINE CARD STATUS INTO STAT
013142 100402                        BMI     102$             ;BR IF LINE CARD NOT TO BE TESTED
013144 004737 013214                 JSR     PC,105$          ;DO THE TEST FOR LINE CARD 3
013150 012700 000014         102$:   MOV     #12.,R0          ;LOAD LINE NO.
```

```
013154  113737  001421  001242              MOVB    CLK.D,CLKX          ;GET SHIFTS
013162  013737  001414  001244              MOV     MASK.D,MASKX        ;GET MASK
013170  013737  001440  001240              MOV     SYNC2D,SYNCX        ;
013176  013737  001430  001236              MOV     L12.15,STAT         ;LOAD LINE CARD STATUS
013204  100402                              BMI     103$                ;BR IF LINE CARD NOT TO BE TESTED
013206  004737  013214                      JSR     PC,105$             ;DO THE TESTS FOR LINE CARD 4
013212  104400                      103$:   SCOPE                       ;SCOPE THIS TEST.
013214                              105$:                               ;TEST ENTRANCE.
013214  032737  004000  001236              BIT     #ASYNC,STAT         ;IS THIS A SYNC LINE CARD?
013222  001401                              BEQ     .+4                 ;BR IF SYNC LINE CARD.
013224  000207                              RTS     PC                  ;EXIT TEST
013226  010037  013242                      MOV     R0,65$              ;LOAD LINE NO. POINTER
013232  104412                              MSTCLR                      ;RESET THE DV11
013234  005001                              CLR     R1                  ;ZERO MSCANNER POINTER
013236  004537  023544              1$:     PERFORM ,SETSCAN            ;SET MSCANNER TO LINES TESTED
013242  000001                      65$:    .BLKW 1                     ;INITAL LINE VALUE
013244  012703  000004              2$:     MOV     #4,R3               ;SET TO DO 4 LINE GROUP
013250  005005                      3$:     CLR     R5                  ;ZERO
013252  012777  050102  166120              MOV     #S.C+BIT6+BIT1,@DVSFR
013260  104415                              ROMCLK                      ;SET/CLEAR ''ADVANCE MSCANNER''
013262  005201                              INC     R1                  ;UPDATE MSCANNER POINTER
013264  010077  166102              6$:     MOV     R0,@DVSRS           ;LOAD LINE NUMBER INTO DV11
013270  004537  023634                      PERFORM ,CLR.TMARK          ;CLR TMARK BIT.
013274  004537  023342                      PERFORM ,LOAD.MODE          ;LOAD THE MODE
013300  006000                              BIT11+BIT10                 ;INT MAINT MODE AND SECOND SYNC
013302  005077  166070                      CLR     @DVSRA              ;ZERO DATA FOR XFR
013306  012777  020000  166064              MOV     #BIT13,@DVSFR       ;DO A RAM READ INSTR.
013314  104415                              ROMCLK                      ;
013316  012777  030260  166054              MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
013324  104415                              ROMCLK                      ;DATA XFR  TXBUFFER RAM OUTPUT
013326  104416                              DATACLK                     ;ISSUE MAIT CLOCK PULSE
013330  012737  013362  001220              MOV     #4$,LOCK            ;SET FOR SCOP1
013336  113702  001242                      MOVB    CLKX,R2             ;NUMBER OF CLOLK PULSES NEEDED
013342  104416                              DATACLK                     ;MAINT CLOCK PULSE
013344  005302                              DEC     R2                  ;ALL CLOCKS DONE?
013346  001375                              BNE     .-4                 ;NO , DO MORE
013350  113705  001240                      MOVB    SYNCX,R5            ;GET SYNC (IDLE CHAR).
013354  012737  000005  001250              MOV     #5,TEMP2            ;SET FOR 5 CHARS
013362  113702  001242              4$:     MOVB    CLKX,R2             ;GET CLOCKS NEEDED
013366  005037  023676                      CLR     DATA                ;ZERO STORAGE AREA
013372  010077  165774                      MOV     R0,@DVSRS           ;LOAD LINE NUMBER
013376  104416                      5$:     DATACLK                     ;ISSUE MAINT CLK PULSE
013400  004537  023252                      PERFORM ,TXSHIFT            ;CLOCK THE TRANSMITTER
013404  005302                              DEC     R2                  ;MORE SHIFTS REQUIRED?
013406  001373                              BNE     5$                  ;BR IF YES
013410  022737  000010  001242              CMP     #8.,CLKX            ;IS LINE CARD SET TO 8 BITS?
013416  001420                              BEQ     15$                 ;BR IF YES
                                    ;;*******************************************************************
013420  022737  000011  001242              CMP     #9.,CLKX            ;8 BITS WITH PARITY ENABLED?            ;;++C
013426  001414                              BEQ     15$                 ;IF YES BR
                                    ;;*******************************************************************
013430  013737  001242  001246              MOV     CLKX,TEMP1          ;SAVE NUMBER OF SHIFTS DONE.
013436  000241                      16$:    CLC                         ;CLEAR CARRY
013440  006037  023676                      ROR     DATA                ;RIGHT JUSTIFY TX RESULTS.
013444  005237  001246                      INC     TEMP1               ;ALL DONE?
013450  022737  000010  001246              CMP     #8.,TEMP1           ;?
```

```
013456  001367                                  BNE     16$             ;BR IF NO
013460                                  15$:
013460  013704  023676                          MOV     DATA,R4         ;SAVE DATA SHIFTED OUT OF TX.
013464  143704  001244                          BICB    MASKX,R4        ;CLEAR UNWANTED BITS.
013470  042705  177400                          BIC     #^C<377>,R5     ;CLEAR SIGN EXTEND.
013474  143705  001244                          BICB    MASKX,R5        ;CLEAR UNUSED BITS
013500  042704  177400                          BIC     #^C<377>,R4     ;CLEAR SIGN EXTEND.
013504  020504                                  CMP     R5,R4           ;EXPECTED = FOUND ??
013506  001401                                  BEQ     .+4             ;BR IF OK
013510  104003                                  HLT     3               ;IDLE CHAR NOT WHAT EXPECTED.
013512  005337  001250                          DEC     TEMP2           ;ALL IDLE CHARS DONE?
013516  001321                                  BNE     4$              ;BR IF NO
013520  104401                                  SCOP1                   ;LOCK (SW09=1)?
013522  004537  023622                          PERFORM .SET.TMARK      ;SET TMARK BIT
013526  004537  023544                          PERFORM .SETSCAN        ;UPDATE SCANNER TO NEXT LINE
013532  000001                                  1                       ;
013534  005303                                  DEC     R3              ;ALL LINES DONE
013536  001252                                  BNE     6$              ;BR IF NO
013540  000207                                  RTS     PC              ;EXIT FOR NEXT GROUP OF LINES.


                                                ;************************ TEST 13 ******************************
                                                ;*THIS TEST CHECKS 'RECEIVE CHAR SILO'' TO BE
                                                ;*ALL ZERO'S WHEN 'DATA ENABLE'' IS NOT SET.
                                                ;*EXPECTED DATA SHOULD BE LINE NUMBER ONLY
                                                ;*DATA 0'S AND ERROR FLAGS 0.
                                                ;*THIS TEST WILL BE DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
                                                ;;**************************************************************

                                        ;  TEST 13
                                        ;--------------
013542  012737  000013  001226          TST13:  MOV     #13,TSTNO
013550  012737  014050  001216                  MOV     #TST14,NEXT
013556  012700  000000                          MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
013562  013737  001422  001236                  MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
013570  100402                                  BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
013572  004737  013660                          JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
013576  012700  000004                  100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
013602  013737  001424  001236                  MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
013610  100402                                  BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
013612  004737  013660                          JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
013616  012700  000010                  101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
013622  013737  001426  001236                  MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
013630  100402                                  BMI     102$            ;BR IF LINC CARD NOT TO BE TESTED
013632  004737  013660                          JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
013636  012700  000014                  102$:   MOV     #12.,R0         ;LOAD LINE NO.
013642  013737  001430  001236                  MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
013650  100402                                  BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
013652  004737  013660                          JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
013656  104400                          103$:   SCOPE                   ;SCOPE THIS TEST.
013660                                  105$:                           ;TEST ENTRANCE.
013660  010037  013700                          MOV     R0,65$          ;STORE LINE NO. POINTER
013664  012703  000004                          MOV     #4,R3           ;SET FOR 4 LINE GROUP
013670  104412                          1$·     MSTCLR                  ;RESET DV11
013672  005001                                  CLR     R1              ;ZERO MSCANNER POINTER
013674  004537  023544                          PERFORM .SETSCAN        ;ADJUST SCANNER
```

```
013700  000001                          65$:    .BLKW   1                       ;TO CORRECT LINE NO.
013702  010005                                  MOV     R0,R5                   ;PLACE LINE NUMBER INTO R5
013704  000305                                  SWAB    R5                      ;PLACE LINE NO. IN HIGH BYTE
013706  105005                                  CLRB    R5                      ;CLEAR LOW BYTE OF EXPECTED
013710                                  3$:
013710  012777  050021  165462                  MOV     #S.C+BIT4+BIT0,@DVSFR
013716  104415                                  ROMCLK                          ;SET/CLEAR SILO IN
013720  005002                                  CLR     R2                      ;
013722  012777  001400  165450                  MOV     #BIT9+BIT8,@DVSFR
013730  032777  000001  165432          4$:     BIT     #BIT0,@DVLCR            ;'RECV CHAR WAITING TRUE''
013736  001403                                  BEQ     5$                      ;BR IF YES
013740  005202                                  INC     R2                      ;DELAY IF NOT READY
013742  001372                                  BNE     4$                      ;END OF DELAY?
013744  104000                                  HLT     0                       ;'RECV CHAR WAITING'' NOT TRUE
013746  012777  030306  165424          5$:     MOV     #XFR+BIT7+BIT6+BIT2+BIT1,@DVSFR
013754  017702  165420                          MOV     @DVSFR,R2               ;XFR RICR_SILO OUT
013760  104415                                  ROMCLK                          ;DATA/XFER  RICR_SILO OUT
013762  017704  165400                          MOV     @DVRIC,R4               ;READ RIC
013766  020504                                  CMP     R5,R4                   ;EXPECTED OK?
013770  001401                                  BEQ     .+4                     ;
013772  104001                                  HLT     1                       ;
013774  062705  000400                          ADD     #400,R5                 ;UPDATE LINE NO. (POINTER)
014000  005002                                  CLR     R2                      ;SFR IMAGE
014002  012777  050020  165370                  MOV     #S.C+BIT4,@DVSFR
014010  104415                                  ROMCLK                          ;S/C ''SET SILO OUT''
014012  012777  001400  165360                  MOV     #BIT9+BIT8,@DVSFR
014020  032777  000001  165342          6$:     BIT     #BIT0,@DVLCR            ;'RECV CHAR WAITING''
014026  001003                                  BNE     7$                      ;FALSE?
014030  005202                                  INC     R2                      ;DELAY WAITING....
014032  001372                                  BNE     6$                      ;DELAY DONE?
014034  104000                                  HLT     0                       ;
014036  005237  013700                  7$:     INC     65$                     ;UPDATE MSCANNER POINTER(LINE)
014042  005303                                  DEC     R3                      ;GROUP OF 4 LINES DONE.
014044  001311                                  BNE     1$                      ;BR IF YES
014046  000207                                  RTS     PC                      ;EXIT FOR NEXT GROUP OF LINES


                                                ;************************ TEST 14 ******************************
                                                ;*THIS TEST CHECKS 'RECEIVER CHAR SILO''
                                                ;*WHEN 'DATA ENABLE IS SET'' EXPECTED DATA S/B
                                                ;*ALL 1'S FOR RX DATA, LINE NUMBER CORRECT,
                                                ;*AND ERROR FLAGS =0.
                                                ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                                ;;***************************************************************

                                        ;  TEST 14
                                        ;---------------
014050  012737  000014  001226          TST14:  MOV     #14,TSTNO
014056  012737  014402  001216                  MOV     #TST15,NEXT
014064  012700  000000                          MOV     #0.,R0                  ;PLACE LINE NUMBER INTO R0
014070  013737  001422  001236                  MOV     L00.03,STAT             ;LOAD LINE CARD STATUS INTO STAT
014076  100402                                  BMI     100$                    ;BR IF LINE CARD NOT TO BE TESTED
014100  004737  014166                          JSR     PC,105$                 ;GO DO THE TEST FOR LINE CARD 1
014104  012700  000004                  100$:   MOV     #4.,R0                  ;PLACE LINE NUMBER INTO R0
014110  013737  001424  001236                  MOV     L04.07,STAT             ;LOAD LINE CARD STATUS INTO STAT
014116  100402                                  BMI     101$                    ;BR IF LINE CARD NOT TO BE TESTED
```

```
014120  004737  014166                    JSR     PC,105$          ;GO DO THE TEST FOR LINE CARD 2
014124  012700  000010           101$:    MOV     #8.,R0           ;LOAD LINE NUMBER
014130  013737  001426  001236            MOV     L08.11,STAT      ;LOAD LINE CARD STATUS INTO STAT
014136  100402                            BMI     102$             ;BR IF LINE CARD NOT TO BE TESTED
014140  004737  014166                    JSR     PC,105$          ;DO THE TEST FOR LINE CARD 3
014144  012700  000014           102$:    MOV     #12.,R0          ;LOAD LINE NO.
014150  013737  001430  001236            MOV     L12.15,STAT      ;LOAD LINE CARD STATUS
014156  100402                            BMI     103$             ;BR IF LINE CARD NOT TO BE TESTED
014160  004737  014166                    JSR     PC,105$          ;DO THE TESTS FOR LINE CARD 4
014164  104400                   103$:    SCOPE                    ;SCOPE THIS TEST.
014166                           105$:                             ;TEST ENTRANCE.
014166  032737  004000  001236            BIT     #ASYNC,STAT      ;IS THIS A SYNC LINE CARD?
014174  001401                            BEQ     .+4              ;BR IF SYNC LINE CARD.
014176  000207                            RTS     PC               ;EXIT TEST
014200  010037  014220                    MOV     R0,65$           ;STORE LINE NO. POINTER
014204  012703  000004                    MOV     #4,R3            ;SET FOR 4 LINE GROUP
014210  104412                   1$:      MSTCLR                   ;RESET DV11
014212  005001                            CLR     R1               ;ZERO MSCANNER POINTER
014214  004537  023544                    PERFORM .SETSCAN         ;ADJUST SCANNER
014220  000001                   65$:     .BLKW 1                  ;TO CORRECT LINE NO.
014222  010005                            MOV     R0,R5            ;PLACE LINE NUMBER INTO R5
014224  000305                            SWAB    R5               ;PLACE LINE NO. IN HIGH BYTE
014226  052705  000377                    BIS     #377,R5          ;SET LOW BYTE TO ALL 1'S
014232                           3$:
014232  012777  050023  165140            MOV     #S.C+BIT4+BIT1+BIT0,@DVSFR
014240  104415                            ROMCLK                   ;S/C ''SET RECV DATA ENABLE''
014242  012777  050021  165130            MOV     #S.C+BIT4+BIT0,@DVSFR
014250  104415                            ROMCLK                   ;SET/CLEAR SILO IN
014252  005002                            CLR     R2               ;
014254  012777  001400  165116            MOV     #BIT9+BIT8,@DVSFR
014262  032777  000001  165100   4$:      BIT     #BIT0,@DVLCR     ;''RECV CHAR WAITING TRUE''
014270  001403                            BEQ     5$               ;BR IF YES
014272  005202                            INC     R2               ;DELAY IF NOT READY
014274  001372                            BNE     4$               ;END OF DELAY?
014276  104000                            HLT     0                ;''RECV CHAR WAITING'' NOT TRUE
014300  012777  030306  165072   5$:      MOV     #XFR+BIT7+BIT6+BIT2+BIT1,@DVSFR
014306  017702  165066                    MOV     @DVSFR,R2        ;XFR RICR SILO OUT
014312  104415                            ROMCLK                   ;DATA/XFER  RICR_SILO OUT
014314  017704  165046                    MOV     @DVRIC,R4        ;READ RIC
014320  020504                            CMP     R5,R4            ;EXPECTED OK?
014322  001401                            BEQ     .+4              ;
014324  104001                            HLT     1                ;
014326  062705  000400                    ADD     #400,R5          ;UPDATE LINE NO. (POINTER)
014332  005002                            CLR     R2               ;SFR IMAGE
014334  012777  050020  165036            MOV     #S.C+BIT4,@DVSFR
014342  104415                            ROMCLK                   ;S/C ''SET SILO OUT''
014344  012777  001400  165026            MOV     #BIT9+BIT8,@DVSFR
014352  032777  000001  165010   6$:      BIT     #BIT0,@DVLCR     ;''RECV CHAR WAITING''
014360  001003                            BNE     7$               ;FALSE?
014362  005202                            INC     R2               ;DELAY WAITING....
014364  001372                            BNE     6$               ;DELAY DONE?
014366  104000                            HLT     0                ;
014370  005237  014220           7$:      INC     65$              ;UPDATE MSCANNER POINTER(LINE)
014374  005303                            DEC     R3               ;GROUP OF 4 LINES DONE.
014376  001304                            BNE     1$               ;BR IF YES
014400  000207                            RTS     PC               ;EXIT FOR NEXT GROUP OF LINES
```

```



                                                 ;************************ TEST 15 ***********************************
                                                 ;*TEST THAT EACH RECEIVER WILL SET
                                                 ;*"MATCH DETECT" WHEN THE FIRST SYNC
                                                 ;*CHARACTER IS PUMPED INTO IT.
                                                 ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                                 ;;*****************************************************************

                                         ;  TEST 15
                                         ;--------------
014402  012737  000015  001226   TST15:  MOV     #15,TSTNO
014410  012737  014700  001216           MOV     #TST16,NEXT
014416  012700  000000                   MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
014422  113737  001416  001242           MOVB    CLK.A,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
014430  013737  001422  001236           MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
014436  100402                           BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
014440  004737  014550                   JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
014444  012700  000004           100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
014450  113737  001417  001242           MOVB    CLK.B,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
014456  013737  001424  001236           MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
014464  100402                           BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
014466  004737  014550                   JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
014472  012700  000010           101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
014476  113737  001420  001242           MOVB    CLK.C,CLKX      ;GET SHIFTS PER CHAR
014504  013737  001426  001236           MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
014512  100402                           BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
014514  004737  014550                   JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
014520  012700  000014           102$:   MOV     #12.,R0         ;LOAD LINE NO.
014524  113737  001421  001242           MOVB    CLK.D,CLKX      ;GET SHIFTS
014532  013737  001430  001236           MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
014540  100402                           BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
014542  004737  014550                   JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
014546  104400                   103$:   SCOPE                   ;SCOPE THIS TEST.
014550                           105$:                           ;TEST ENTRANCE.
014550  032737  004000  001236           BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
014556  001401                           BEQ     .+4             ;BR IF SYNC LINE CARD.
014560  000207                           RTS     PC              ;EXIT TEST
014562  012703  000004                   MOV     #4,R3
014566  010037  014602                   MOV     R0,65$          ;SET LINE NO. POINTER
014572  104412                   1$:     MSTCLR                  ;RESET DV11
014574  005001                           CLR     R1              ;ZERO MSCANNER POINTER
014576  004537  023544                   PERFORM ,SETSCAN
014602  000001                   65$:    .BLKW 1                 ;SET MSCANNER TO CORRECT LINE.
014604  010077  164562           3$:     MOV     R0,@DVSRS       ;LOAD LINE NO.
014610  004537  023342                   PERFORM ,LOAD.MODE      ;LOAD THE MODE
014614  025000                           BIT13+BIT11+BIT9        ;RECV ENABLE,INT MAINT,TX DSABLE
014616  113737  001236  023676           MOVB    STAT,DATA       ;GET "SYNC" CHAR.
014624  104416                           DATACLK                 ;PRIME DV11
014626  004537  023402                   PERFORM ,RXSHIFT        ;SHIFT DATA INTO RECEIVER
014632  001242                           CLKX                    ;NO. OF SHIFTS GIVEN
014634  012777  076400  164536           MOV     #BRB+BIT11+BIT10+BIT8,@DVSFR
014642  017704  164522                   MOV     @DVLCR,R4       ;BRB "MATCH DET"
014646  010405                           MOV     R4,R5           ;
014650  052705  000001                   BIS     #BIT0,R5        ;
014654  042705  000002                   BIC     #BIT1,R5        ;
```

```
014660  020504                          CMP     R5,R4           ;MATCH DET TRUE??
014662  001401                          BEQ     4$              ;BR IF YES
014664  104001                          HLT     1               ;
014666  005237  014602          4$:     INC     65$             ;UPDATE TO NEXT LINE.
014672  005303                          DEC     R3              ;4 LINE GROUP DONE?
014674  001336                          BNE     1$              ;BR IF NO
014676  000207                          RTS     PC              ;OBTAIN NEXT 4 LINE GROUP


                                        ;************************ TEST 16 ******************************
                                        ;*TEST TO VERIFY THAT IF THE DV11 RECEIVER
                                        ;*IS SET FOR ONE SYNC CHAR;
                                        ;*'MATCH DET'' *AND* ''CHAR FLAG'' ARE
                                        ;*SET AFTER ONE SYNC IS PUSHED INTO THE RECEIVER
                                        ;*              HOWEVER...
                                        ;*IF THE DV11 RECEIVER IS SET FOR
                                        ;*TWO SYNC CHARS....
                                        ;*VERIFY THAT 'MATCH DET'' SETS ON THE FIRST SYNC
                                        ;*AND VERIFY THAT 'MATCH DET'' *AND* ''CHAR FLAG''
                                        ;*ARE SET ON THE SECOND SYNC.
                                        ;*THIS TEST USES ''SYNC A''.
                                        ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                        ;;**************************************************************

                                ;  TEST 16
                                ;--------------
014700  012737  000016  001226  TST16:  MOV     #16,TSTNO
014706  012737  015334  001216          MOV     #TST17,NEXT
014714  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
014720  113737  001416  001242          MOVB    CLK.A,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
014726  013737  001422  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
014734  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
014736  004737  015046                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
014742  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
014746  113737  001417  001242          MOVB    CLK.B,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
014754  013737  001424  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
014762  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
014764  004737  015046                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
014770  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
014774  113737  001420  001242          MOVB    CLK.C,CLKX      ;GET SHIFTS PER CHAR
015002  013737  001426  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
015010  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
015012  004737  015046                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
015016  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
015022  113737  001421  001242          MOVB    CLK.D,CLKX      ;GET SHIFTS
015030  013737  001430  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
015036  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
015040  004737  015046                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
015044  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
015046                          105$:                           ;TEST ENTRANCE.
015046  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
015054  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
015056  000207                          RTS     PC              ;EXIT TEST
015060  012703  000004                  MOV     #4,R3           ;SET FOR 4 LINES
015064  010037  015100                  MOV     R0,65$          ;PLACE LINE NO. POINTER
015070  104412                  1$:     MSTCLR                  ;INIT DV11
```

```
015072  005001                          CLR      R1                  ;ZERO MSCANNER POINTER
015074  004537  023544                  PERFORM  .SETSCAN            ;SET SCANNER TO LINE DESIRED
015100  000001                  65$:    .BLKW 1                      ;INITIAL LINE NUMBER.
015102  010077  164264          3$:     MOV      R0,@DVSRS           ;LOAD LINE NUMBER
015106  004537  023342                  PERFORM  .LOAD.MODE          ;LOAD
015112  025000                          BIT13+BIT11+BIT9             ;MODE AND RX ENABLEAND TX DSABLE
015114  113737  001236  023676          MOVB     STAT,DATA           ;PLACE SYNC CHAR IN DATA
015122  104416                          DATACLK                      ;INIT DATA CLOCK.
015124  004537  023402                  PERFORM  .RXSHIFT            ;SHIFT DATA INTO RX
015130  001242                          CLKX                         ;NUMBER OF SHIFTS NEEDED
015132  012777  076400  164240          MOV      #BRB+BIT11+BIT10+BIT8,@DVSFR
                                                                     ;SET BR ''B'' AND MATCH DET.
015140  017704  164224                  MOV      @DVLCR,R4           ;SAVE LPR IN R4
015144  010405                          MOV      R4,R5               ;SET FOR COMPARE
015146  052705  000001                  BIS      #BIT0,R5            ;BR ''A'' FALSE
015152  042705  000002                  BIC      #BIT1,R5            ;BR 'B'' TRUE
015156  020504                          CMP      R5,R4
015160  001401                          BEQ      .+4                 ;BR IF LPR OK.
015162  104001                          HLT      1                   ;EXPECT B TRUE; A FALSE
015164  012777  002000  164206          MOV      #BIT10,@DVSFR       ;SET BR ''A'' AND RX CHAR FLAG.
015172  017704  164172                  MOV      @DVLCR,R4           ;SAVE LPR IN R4
015176  010405                          MOV      R4,R5               ;SET FOR COMPARE
015200  032737  010000  001236          BIT      #TWOSYN,STAT        ;SET FOR ONE SYNC OR TWO?
015206  001036                          BNE      4$                  ;BR IF SET FOR ONE SYNC
015210  052705  000003                  BIS      #BIT1+BIT0,R5
015214  020504                          CMP      R5,R4
015216  001401                          BEQ      .+4
015220  104001                          HLT      1
015222  113737  001236  023676          MOVB     STAT,DATA
015230  004537  023402                  PERFORM  .RXSHIFT
015234  001242                          CLKX
015236  012777  076400  164134          MOV      #BRB+BIT11+BIT10+BIT8,@DVSFR
                                                                     ;SET BR 'B'' AND MATCH DET.
015244  017704  164120                  MOV      @DVLCR,R4           ;SAVE LPR IN R4
015250  010405                          MOV      R4,R5               ;SET FOR COMPARE
015252  052705  000001                  BIS      #BIT0,R5            ;BR ''A'' FALSE
015256  042705  000002                  BIC      #BIT1,R5            ;BR 'B'' TRUE
015262  020504                          CMP      R5,R4
015264  001401                          BEQ      .+4                 ;BR IF LPR OK.
015266  104001                          HLT      1                   ;EXPECT B TRUE; A FALSE
015270  012777  002000  164102          MOV      #BIT10,@DVSFR       ;SET BR ''A'' AND RX CHAR FLAG.
015276  017704  164066                  MOV      @DVLCR,R4           ;SAVE LPR IN R4
015302  010405                          MOV      R4,R5               ;SET FOR COMPARE
015304  052705  000002          4$:     BIS      #BIT1,R5
015310  042705  000001                  BIC      #BIT0,R5
015314  020504                          CMP      R5,R4
015316  001401                          BEQ      .+4
015320  104001                          HLT      1
015322  005237  015100                  INC      65$                 ;UPDATE LINE NUMBER
015326  005303                          DEC      R3
015330  001257                          BNE      1$
015332  000207                          RTS      PC


                                        ;************************ TEST 17 ********************************
                                        ;*TEST TO VERIFY THAT IF THE DV11 RECEIVER
```

```
                                                ;*IS SET FOR ONE SYNC CHAR;
                                                ;*'MATCH DET'' *AND* ''CHAR FLAG'' ARE
                                                ;*SET AFTER ONE SYNC IS PUSHED INTO THE RECEIVER
                                                ;*          HOWEVER...
                                                ;*IF THE DV11 RECEIVER IS SET FOR
                                                ;*TWO SYNC CHARS....
                                                ;*VERIFY THAT 'MATCH DET'' SETS ON THE FIRST SYNC
                                                ;*AND VERIFY THAT 'MATCH DET'' *AND* ''CHAR FLAG''
                                                ;*ARE SET ON THE SECOND SYNC.
                                                ;*THIS TEST USES ''SYNC B''.
                                                ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                                ;;****************************************************************

                                        ;  TEST 17
                                        ;--------------
015334  012737  000017  001226  TST17:  MOV     #17,TSTNO
015342  012737  016020  001216          MOV     #TST20,NEXT
015350  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
015354  113737  001416  001242          MOVB    CLK.A,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
015362  013737  001432  001240          MOV     SYNC2A,SYNCX    ;
015370  013737  001422  001236          MOV     L00.03,STAT     ;LOAD I INE CARD STATUS INTO STAT
015376  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
015400  004737  015532                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
015404  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
015410  113737  001417  001242          MOVB    CLK.B,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
015416  013737  001434  001240          MOV     SYNC2B,SYNCX    ;
015424  013737  001424  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
015432  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
015434  004737  015532                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
015440  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
015444  113737  001420  001242          MOVB    CLK.C,CLKX      ;GET SHIFTS PER CHAR
015452  013737  001436  001240          MOV     SYNC2C,SYNCX    ;
015460  013737  001426  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
015466  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
015470  004737  015532                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
015474  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
015500  113737  001421  001242          MOVB    CLK.D,CLKX      ;GET SHIFTS
015506  013737  001440  001240          MOV     SYNC2D,SYNCX    ;
015514  013737  001430  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
015522  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
015524  004737  015532                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
015530  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
015532                          105$:                           ;TEST ENTRANCE.
015532  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
015540  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
015542  000207                          RTS     PC              ;FXIT TEST
015544  012703  000004                  MOV     #4,R3           ;SET FOR 4 LINES
015550  010037  015564                  MOV     R0,65$          ;PLACE LINE NO. POINTER
015554  104412                  1$:     MSTCLR                  ;INIT DV11
015556  005001                          CLR     R1              ;ZERO MSCANNER POINTER
015560  004537  023544                  PERFORM ,SETSCAN        ;SET SCANNER TO LINE DESIRED
015564  000001                  65$:    .BLKW 1                 ;INITIAL LINE NUMBER.
015566  010077  163600          3$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
015572  004537  023342                  PERFORM ,LOAD.MODE      ;LOAD
015576  027000                          BIT13+BIT11+BIT10+BIT9  ;MODE, RX ENABL, TX DSABL, SYNC2
015600  013737  001240  023676          MOV     SYNCX,DATA      ;PLACE SYNC 2 IN  DATA
```

```
015606 104416                              DATACLK                         ;INIT DATA CLOCK.
015610 004537 023402                       PERFORM ,RXSHIFT                ;SHIFT DATA INTO RX
015614 001242                              CLKX                            ;NUMBER OF SHIFTS NEEDED
015616 012777 076400 163554                MOV      #BRB+BIT11+BIT10+BIT8,@DVSFR
                                                                           ;SET BR 'B'' AND MATCH DET.
015624 017704 163540                       MOV      @DVLCR,R4              ;SAVE LPR IN R4
015630 010405                              MOV      R4,R5                  ;SET FOR COMPARE
015632 052705 000001                       BIS      #BIT0,R5               ;BR ''A'' FALSE
015636 042705 000002                       BIC      #BIT1,R5               ;BR 'B'' TRUE
015642 020504                              CMP      R5,R4
015644 001401                              BEQ      .+4                    ;BR IF LPR OK.
015646 104001                              HLT      1                      ;EXPECT B TRUE; A FALSE
015650 012777 002000 163522                MOV      #BIT10,@DVSFR          ;SET BR ''A'' AND RX CHAR FLAG.
015656 017704 163506                       MOV      @DVLCR,R4              ;SAVE LPR IN R4
015662 010405                              MOV      R4,R5                  ;SET FOR COMPARE
015664 032737 010000 001236                BIT      #TWOSYN,STAT           ;SET FOR ONE SYNC OR TWO?
015672 001036                              BNE      4$                     ;BR IF SET FOR ONE SYNC
015674 052705 000003                       BIS      #BIT1+BIT0,R5
015700 020504                              CMP      R5,R4
015702 001401                              BEQ      .+4
015704 104001                              HLT      1
015706 013737 001240 023676                MOV      SYNCX,DATA
015714 004537 023402                       PERFORM ,RXSHIFT
015720 001242                              CLKX
015722 012777 076400 163450                MOV      #BRB+BIT11+BIT10+BIT8,@DVSFR
                                                                           ;SET BR 'B'' AND MATCH DET.
015730 017704 163434                       MOV      @DVLCR,R4              ;SAVE LPR IN R4
015734 010405                              MOV      R4,R5                  ;SET FOR COMPARE
015736 052705 000001                       BIS      #BIT0,R5               ;BR ''A'' FALSE
015742 042705 000002                       BIC      #BIT1,R5               ;BR 'B'' TRUE
015746 020504                              CMP      R5,R4
015750 001401                              BEQ      .+4                    ;BR IF LPR OK.
015752 104001                              HLT      1                      ;EXPECT B TRUE; A FALSE
015754 012777 002000 163416                MOV      #BIT10,@DVSFR          ;SET BR ''A'' AND RX CHAR FLAG.
015762 017704 163402                       MOV      @DVLCR,R4              ;SAVE LPR IN R4
015766 010405                              MOV      R4,R5                  ;SET FOR COMPARE
015770 052705 000002                4$:    BIS      #BIT1,R5
015774 042705 000001                       BIC      #BIT0,R5
016000 020504                              CMP      R5,R4
016002 001401                              BEQ      .+4
016004 104001                              HLT      1
016006 005237 015564                       INC      65$                    ;UPDATE LINE NUMBER
016012 005303                              DEC      R3
016014 001257                              BNE      1$
016016 000207                              RTS      PC


                                           ;************************* TEST 20 ********************************
                                           ;*TEST TO FORCE RECEIVER OVERRUN.
                                           ;*THIS TEST WILL PUSH INTO THE RECEIVER
                                           ;*TWO FULL CHARS (SYNCS) AND ONE MORE CHAR MINUS
                                           ;*ONE BIT. THE PROGRAM WILL VERIFY NO OVERRUN EXISTS
                                           ;*THEN THE LAST BITS WILL BE PUSHED IN VERIFING
                                           ;*THAT THE OVERRUN WAS GENERATED.
                                           ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                           ;;****************************************************************
```

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                                        ;  TEST 20
                                        ;--------------
016020  012737  000020  001226  TST20:  MOV     #20,TSTNO
016026  012737  016652  001216          MOV     #TST21,NEXT
016034  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
016040  113737  001416  001242          MOVB    CLK.A,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
016046  013737  001406  001244          MOV     MASK.A,MASKX    ;PLACE 'MASK'FOR CHARS INTO MASKX
016054  013737  001422  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
016062  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
016064  004737  016216                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
016070  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
016074  113737  001417  001242          MOVB    CLK.B,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
016102  013737  001410  001244          MOV     MASK.B,MASKX    ;GET MASK
016110  013737  001424  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
016116  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
016120  004737  016216                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
016124  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
016130  113737  001420  001242          MOVB    CLK.C,CLKX      ;GET SHIFTS PER CHAR
016136  013737  001412  001244          MOV     MASK.C,MASKX    ;GET MASK
016144  013737  001426  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
016152  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
016154  004737  016216                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
016160  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
016164  113737  001421  001242          MOVB    CLK.D,CLKX      ;GET SHIFTS
016172  013737  001414  001244          MOV     MASK.D,MASKX    ;GET MASK
016200  013737  001430  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
016206  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
016210  004737  016216                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
016214  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
016216                          105$:                           ;TEST ENTRANCE.
016216  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
016224  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
016226  000207                          RTS     PC              ;EXIT TEST
016230  012703  000004                  MOV     #4,R3           ;SET FOR 4 LINE GROUP
016234  010037  016250                  MOV     R0,65$          ;SET LINE POINTER
016240  104412                  1$:     MSTCLR                  ;RESET DV11
016242  005001                          CLR     R1              ;ZERO MSCANNER POINTER
016244  004537  023544                  PERFORM ,SETSCAN        ;ADJUST MSCANNER
016250  000001                  65$:    .BLKW 1                 ;LINE POINTER
016252  010077  163114          3$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
016256  012777  125000  163104          MOV     #BIT15+BIT13+BIT11+BIT9,@DVLCR
016264  004737  023462                  JSR     PC,CKBIT15
016270  113737  001236  023676          MOVB    STAT,DATA       ;GET SYNC CHAR
016276  104416                          DATACLK                 ;INIT DV11 BY ONE CLOCK
016300  113737  001242  016650          MOVB    CLKX,10$        ;GET NUMBER OF SHIFTS PER CHAR.
016306  004537  023402                  PERFORM ,RXSHIFT        ;CLOCK RX
016312  016650                          10$                     ;NUMBER OF SHIFTS
016314  113737  001236  023676          MOVB    STAT,DATA       ;GET ANOTHER SYNC
016322  004537  023402                  PERFORM ,RXSHIFT        ;SHIFT RX
016326  016650                          10$                     ;NUMBER OF SHIFTS
016330  113737  001236  023676          MOVB    STAT,DATA       ;SYNC CHAR
016336  162737  000001  016650          SUB     #1,10$          ;SET NUMBER OF SHIFTS -1
016344  004537  023402                  PERFORM ,RXSHIFT        ;SHIFT RX
016350  016650                          10$                     ;SHIFTS
016352  012777  050023  163020          MOV     #S.C+BIT4+BIT1+BIT0,@DVSFR
```

```
016360  104415                                ROMCLK                       ;S/C ''SET RECV DATA ENABLE''
016362  012777  050021  163010                MOV     #S.C+BIT4+BIT0,@DVSFR
016370  104415                                ROMCLK                       ;SET/CLEAR SILO IN
016372  012777  001400  163000                MOV     #BIT9+BIT8,@DVSFR
016400  032777  000001  162762        4$:     BIT     #BIT0,@DVLCR         ;RCV CHAR WAITING??
016406  001374                                BNE     4$                   ;BR IF YES
016410  012702  030306                        MOV     #XFR+BIT7+BIT6+BIT2+BIT1,R2
016414  010277  162760                        MOV     R2,@DVSFR            ;XFR RIC_SILO OUT
016420  104415                                ROMCLK                       ;DATA/XFER  RICR_SILO OUT
016422  017704  162740                        MOV     @DVRIC,R4            ;READ DVRIC REG
016426  010405                                MOV     R4,R5                ;
016430  042705  020000                        BIC     #BIT13,R5            ;
016434  020504                                CMP     R5,R4                ;OVERRUN??
016436  001401                                BEQ     .+4                  ;BR IF NO
016440  104001                                HLT     1                    ;OVFRRUN OCCURED TC SOON.
016442  004537  023532                        PERFORM ,SILO.OUT            ;SILO OUT
016446  113737  001236  023676                MOVB    STAT,DATA
016454  113704  001242                        MOVB    CLKX,R4
016460  005304                                DEC     R4
016462  000241                        66$:    CLC
016464  106037  023676                        RORB    DATA
016470  105304                                DECB    R4
016472  001373                                BNE     66$
016474  012737  000001  016650                MOV     #1,10$
016502  004537  023402                        PERFORM ,RXSHIFT
016506  016650                                10$
016510  012777  050021  162662                MOV     #S.C+BIT4+BIT0,@DVSFR
016516  104415                                ROMCLK                       ;SET/CLEAR SILO IN
016520  012777  001400  162652                MOV     #BIT9+BIT8,@DVSFR
016526  032777  000001  162634        5$:     BIT     #BIT0,@DVLCR         ;RECV CHAR WAITING
016534  001374                                BNE     5$                   ;
016536  010005                                MOV     R0,R5                ;GET LINE NUMBER
016540  000305                                SWAB    R5                   ;PUT LINE NUMBER INTO HIGH BYTE
016542  153705  001236                        BISB    STAT,R5              ;PLACE SYNC INTO EXPECTED

                                      ;;******************************************************************
016546  032737  020000  001236                BIT     #BIT13,STAT          ;IS PARITY EVEN ?             ;;++C
016554  001402                                BEQ     7$                   ;IF NO BR. DO NOT MASK PARITY BIT
                                                                           ;WHEN PARITY EVEN BECAUSE IT MASKS
                                                                           ;THE SYNC CHARACTER MAKING RECEIVED
                                                                           ;SYNC ODD, CAUSING DATA COMPARE
                                                                           ; ERRORS.

                                      ;;******************************************************************
016556  143705  001244                        BICB    MASKX,R5             ;CLEAR UNUSED BITS.
016562  052705  020000                7$:     BIS     #BIT13,R5            ;SET OVERRUN
016566  012702  030306                        MOV     #XFR+BIT7+BIT6+BIT2+BIT1,R2
016572  010277  162602                        MOV     R2,@DVSFR
016576  104415                                ROMCLK                       ;DATA/XFER  RICR_SILO OUT
016600  017704  162562                        MOV     @DVRIC,R4            ;READ DVRIC
016604  032737  040000  001236                BIT     #PARBIT,STAT         ;PARITY?
016612  001402                                BEQ     6$                   ;BR IF NO
016614  042704  010000                        BIC     #BIT12,R4            ;CLEAR PARITY ERROR IF IT EXISTS
016620  020504                        6$:     CMP     R5,R4                ;OVERRUN SET?
016622  001401                                BEQ     .+4                  ;BR IF YES
016624  104001                                HLT     1                    ;LINE,CHAR,AND OVERRUN EXPECTED.
016626  004537  023532                        PERFORM ,SILO.OUT            ;SILO OUT
016632  005237  016250                        INC     65$                  ;UPDATE LINE POINTER
```

```
016636  005303                            DEC     R3              ;4 LINE GROUP DONE?
016640  001402                            BEQ     11$             ;BR IF YES
016642  000137  016240                    JMP     1$              ;IN NOT CONTINUE
016646  000207                    11$:    RTS     PC              ;RETURN FOR NEXT 4 LINE GROUP
016650  000001                    10$:    .BLKW 1


                                          ;************************ TEST 21 ******************************
                                          ;*TEST OF RECEIVER DATA .
                                          ;*THIS TEST RUNS A BINARY COUNT PATTERN THROUGH
                                          ;*THE RECEIVER OF EACH LINE
                                          ;*THROUGH THE USE OF MAINT. DATA BIT.
                                          ;*THE TX IS NEVER ENABLED.
                                          ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                          ;;*************************************************************

                                  ;  TEST 21
                                  ;--------------
016652  012737  000021  001226    TST21:  MOV     #21,TSTNO
016660  012737  017424  001216            MOV     #TST22,NEXT
016666  012700  000000                    MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
016672  113737  001416  001242            MOVB    CLK.A,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
016700  013737  001406  001244            MOV     MASK.A,MASKX    ;PLACE 'MASK'FOR CHARS INTO MASKX
016706  013737  001422  001236            MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
016714  100402                            BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
016716  004737  017050                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
016722  012700  000004            100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
016726  113737  001417  001242            MOVB    CLK.B,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
016734  013737  001410  001244            MOV     MASK.B,MASKX    ;GET MASK
016742  013737  001424  001236            MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
016750  100402                            BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
016752  004737  017050                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
016756  012700  000010            101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
016762  113737  001420  001242            MOVB    CLK.C,CLKX      ;GET SHIFTS PER CHAR
016770  013737  001412  001244            MOV     MASK.C,MASKX    ;GET MASK
016776  013737  001426  001236            MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
017004  100402                            BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
017006  004737  017050                    JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
017012  012700  000014            102$:   MOV     #12.,R0         ;LOAD LINE NO.
017016  113737  001421  001242            MOVB    CLK.D,CLKX      ;GET SHIFTS
017024  013737  001414  001244            MOV     MASK.D,MASKX    ;GET MASK
017032  013737  001430  001236            MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
017040  100402                            BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
017042  004737  017050                    JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
017046  104400                    103$:   SCOPE                   ;SCOPE THIS TEST.
017050                            105$:                           ;TEST ENTRANCE.
017050  032737  004000  001236            BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
017056  001401                            BEQ     .+4             ;BR IF SYNC LINE CARD.
017060  000207                            RTS     PC              ;EXIT TEST
017062  012703  000004                    MOV     #4,R3           ;SET FOR 4 LINE GROUP.
017066  010037  017102                    MOV     R0,65$          ;PLACE LINE POINTER
017072  104412                    1$:     MSTCLR                  ;CLEAR THE DV11
017074  005001                            CLR     R1              ;ZERO MSCANNER POINTER
017076  004537  023544                    PERFORM .SETSCAN        ;SET SCANNER
017102  000001                    65$:    .BLKW 1                 ;POSITION MSCAN TO LINE NO.
017104  010077  162262            3$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
```

```
017110  012777  125000  162252          MOV     #BIT15+BIT13+BIT11+BIT9,@DVLCR
017116  004737  023462                  JSR     PC,CKBIT15          ;GO WAIT FOR BIT15 TO=0
017122  113737  001236  023676          MOVB    STAT,DATA           ;LOAD SYNC CHAR
017130  104416                          DATACLK                     ;GIVE AN INITIAL CLOCK
017132  004537  023402                  PERFORM .RXSHIFT            ;STROBE CHAR INTO RX.
017136  001242                          CLKX                        ;PICK UP NO. OF CLOCKS.
017140  032737  010000  001236          BIT     #TWOSYN,STAT        ;TWO SYNCS REQUIRED??
017146  001006                          BNE     4$                  ;BR IF ONLY ONE SYNC..
017150  113737  001236  023676          MOVB    STAT,DATA           ;GIVE ANOTHER SYNC TO THE RX
017156  004537  023402                  PERFORM .RXSHIFT            ;STROBE IT IN
017162  001242                          CLKX                        ;SHIFTS REQUIRED
017164  010005                  4$:     MOV     R0,R5               ;LOAD LINE NUMBER INTO ''EXPECTED''
017166  000305                          SWAB    R5                  ;PLACE IT INTO HIGH BYTE
017170  105005                          CLRB    R5                  ;ZERO LOW BYTE
017172  012737  017246  001220          MOV     #5$,LOCK            ;SET IF SW09=1; GOTO 5$
017200  012777  050023  162172          MO.     #S.C+BIT4+BIT1+BIT0,@DVSFR
017206  104415                          ROMCLK                      ;CLOCK ''DATA ENABLE''
017210  004537  023510                  PERFORM .SILO.IN            ;READ RX BUFFER INTO SILO
017214  005002                          CLR     R2                  ;SET FOR DELAY
017216  012777  001400  162154          MOV     #BIT9+BIT8,@DVSFR
017224  032777  000001  162136  10$:    BIT     #BIT0,@DVLCR        ;IS ''RX CHAR WAITING'' TRUE?
017232  001403                          BEQ     9$                  ;BR IF TRUE..
017234  005202                          INC     R2                  ;DELAY........
017236  001372                          BNE     10$                 ;BR IF DELAY NOTDONE
017240  104000                          HLT     0                   ;RX CHAR WAITING NOT TRUE!
017242  004537  023532          9$:     PERFORM .SILO.OUT           ;REMOVE CHAR FROM SILO
017246  010537  023676          5$:     MOV     R5,DATA             ;PLACE CHAR INTO SOFTWARE LOC.
017252  105037  023677                  CLRB    DATA+1              ;ZERO LINE NUMBER.
017256  004537  023402                  PERFORM .RXSHIFT            ;PLACE CHAR INTO RX BUFFER.
017262  001242                          CLKX                        ;CLOCKS.
017264  012777  050023  162106          MOV     #S.C+BIT4+BIT1+BIT0,@DVSFR
017272  104415                          ROMCLK                      ;SET RX DATA ENABLE
017274  004537  023510                  PERFORM .SILO.IN            ;READ FROM RX BUFFER INTO SILO
017300  005002                          CLR     R2                  ;SET DELAY
017302  012777  001400  162070          MOV     #BIT9+BIT8,@DVSFR
017310  032777  000001  162052  6$:     BIT     #BIT0,@DVLCR        ;WAIT FOR RX CHAR WAITING
017316  001403                          BEQ     7$                  ;BR IF TRUE
017320  005202                          INC     R2                  ;UPDATE DELAY
017322  001372                          BNE     6$                  ;GOBACK
017324  104000                          HLT     0                   ;RX CHAR WAITING NOT TRUE
017326  012702  030306          7$:     MOV     #XFR+BIT7+BIT6+BIT2+BIT1,R2
017332  010277  162042                  MOV     R2,@DVSFR           ;DO DATA XFER FROM SILO TO DVRIC
017336  104415                          ROMC_K                      ;CLOCK
017340  017704  162022                  MC      @DVRIC,R4           ;LOAD DVRIC TO ''FOUND'' LOC.
017344  032737  040000  001236          BIT     #PARBIT,STAT        ;PARITY ON??
017352  001402                          BEQ     16$                 ;BR IF PARITY NOT ON.
017354  042704  010000                  BIC     #BIT12,R4           ;CLEAR PARITY ERROR (DON'T WORRY ABOUT PARITY NOW.)
017360                          16$:
017360  020504                          CMP     R5,R4               ;RX DATA AND LINE NUMBER OK??
017362  001401                          BEQ     .+4                 ;BR IF EXPECTED =FOUND.
017364  104002                          HLT     2                   ;RX DATA ERROR
017366  004537  023532                  PERFORM .SILO.OUT           ;REMOVE RX DATA FROM SILO
017372  104401                          SCOP1                       ;SW09=1?
017374  105205                          INCB    R5                  ;UPDATE DATA
017376  001403                          BEQ     8$                  ;BR IF ALL DATA DONE
017400  133705  001244                  BITB    MASKX,R5            ;IF <8BITS CHECK END OF DATA.
```

```
017404  001720                          BEQ     5$              ;BR IF MORE TO GO
017406  005237  017102          8$:     INC     65$             ;UPDATE TO NEXT LINE.
017412  005303                          DEC     R3              ;ALL 4 LINES DONE?
017414  001402                          BEQ     22$
017416  000137  017072                  JMP     1$              ;BR IF NOT ALL DONE
017422  000207                  22$:    RTS     PC              ;SCOPE THIS TEST




                                        ;************************ TEST 22 *******************************
                                        ;*TEST OF RECEIVER PARITY LOGIC.
                                        ;*THIS TEST RUNS PREDETERMINED DATA PATTERNS
                                        ;*THROUGH THE RECEIVER OF EACH LINE, BY
                                        ;*MEANS OF THE MAINTENACE DATA BIT. IF ODD
                                        ;*PARITY IS SELECTED, AN EVEN DATA PATTERN
                                        ;*IS GENERATED THROUGH THE RECEIVER WITH
                                        ;*THE PARITY BIT CLEAR. THIS SHOULD CAUSE A
                                        ;*RECEIVER PARITY ERROR. IF NOT, THEN WE CAN
                                        ;*ASSUME THE PARITY CHECKING LOGIC IN THE
                                        ;*RECEIVER IS DEFECTIVE. DATA IS STILL
                                        ;*CHECKED TO INSURE INTEGERITY. EVEN PARITY
                                        ;*WILL LIKEWISE BE TESTED BY GENERATING
                                        ;*AN ODD DATA PATTERN. ALL CHARACTER LENGTHS
                                        ;*MAY BE TESTED. THE TX IS NEVER ENABLED.
                                        ;*THIS TEST WILL DE DONE FOR SYNC LINE CARDS ONLY.
                                        ;;**************************************************************

                                ;  TEST 22
                                ;--------------
017424  012737  000022  001226  TST22:  MOV     #22,TSTNO
017432  012737  020336  001216          MOV     #TST23,NEXT
017440  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
017444  113737  001416  001242          MOVB    CLK.A,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
017452  013737  001406  001244          MOV     MASK.A,MASKX    ;PLACE 'MASK'FOR CHARS INTO MASKX
017460  013737  001422  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
017466  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
017470  004737  017622                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
017474  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
017500  113737  001417  001242          MOVB    CLK.B,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
017506  013737  001410  001244          MOV     MASK.B,MASKX    ;GET MASK
017514  013737  001424  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
017522  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
017524  004737  017622                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
017530  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
017534  113737  001420  001242          MOVB    CLK.C,CLKX      ;GET SHIFTS PER CHAR
017542  013737  001412  001244          MOV     MASK.C,MASKX    ;GET MASK
017550  013737  001426  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
017556  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
017560  004737  017622                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
017564  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
017570  113737  001421  001242          MOVB    CLK.D,CLKX      ;GET SHIFTS
017576  013737  001414  001244          MOV     MASK.D,MASKX    ;GET MASK
017604  013737  001430  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
017612  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
017614  004737  017622                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
```

```
017620  104400                  103$:   SCOPE                     ;SCOPE THIS TEST.
017622                          105$:                             ;TEST ENTRANCE.
                                ;;****************************************************************
017622  032737  040000  001236          BIT     #PARBIT,STAT      ;IS PARITY ENABLED?           ;;++C
017630  001404                          BEQ     23$               ;IF NO BR
                                ;;****************************************************************
017632  032737  004000  001236          BIT     #ASYNC,STAT       ;IS THIS A SYNC LINE CARD?
017640  001401                          BEQ     .+4               ;BR IF SYNC LINE CARD.
017642                          23$:
017642  000207                          RTS     PC                ;EXIT TEST
017644  012703  000004                  MOV     #4,R3             ;SET FOR 4 LINE GROUP.
017650  010037  017664                  MOV     R0,65$            ;PLACE LINE POINTER
017654  104412                  1$:     MSTCLR                    ;CLEAR THE DV11
017656  005001                          CLR     R1                ;ZERO MSCANNER POINTER
017660  004537  023544                  PERFORM ,SETSCAN          ;SET SCANNER
017664  000001                  65$:    .BLKW 1                   ;POSITION MSCAN TO LINE NO.
017666  010077  161500          3$:     MOV     R0,@DVSRS         ;LOAD LINE NUMBER
017672  012777  125000  161470          MOV     #BIT15+BIT13+BIT11+BIT9,@DVLCR
017700  004737  023462                  JSR     PC,CKBIT15        ;GO WAIT FOR BIT15 TO=0
017704  113737  001236  023676          MOVB    STAT,DATA         ;LOAD SYNC CHAR
017712  104416                          DATACLK                   ;GIVE AN INITIAL CLOCK
017714  004537  023402                  PERFORM ,RXSHIFT          ;STROBE CHAR INTO RX.
017720  001242                          CLKX                      ;PICK UP NO. OF CLOCKS.
017722  032737  010000  001236          BIT     #TWOSYN,STAT      ;TWO SYNCS REQUIRED??
017730  001006                          BNE     4$                ;BR IF ONLY ONE SYNC..
017732  113737  001236  023676          MOVB    STAT,DATA         ;GIVE ANOTHER SYNC TO THE RX
017740  004537  023402                  PERFORM ,RXSHIFT          ;STROBE IT IN
017744  001242                          CLKX                      ;SHIFTS REQUIRED
017746  010005                  4$:     MOV     R0,R5             ;LOAD LINE NUMBER INTO 'EXPECTED''
017750  000305                          SWAB    R5                ;PLACE IT INTO HIGH BYTE
017752  105005                          CLRB    R5                ;ZERO LOW BYTE
017754  012737  020056  001220          MOV     #5$,LOCK          ;SET IF SW09=1; GOTO 5$
017762  012777  050023  161410          MOV     #S.C+BIT4+BIT1+BIT0,@DVSFR
017770  104415                          ROMCLK                    ;CLOCK 'DATA ENABLE''
017772  004537  023510                  PERFORM ,SILO.IN          ;READ RX BUFFER INTO SILO
017776  005002                          CLR     R2                ;SET FOR DELAY
020000  012777  001400  161372          MOV     #BIT9+BIT8,@DVSFR
020006  032777  000001  161354  10$:    BIT     #BIT0,@DVLCR      ;IS 'RX CHAR WAITING'' TRUE?
020014  001403                          BEQ     9$                ;BR IF TRUE..
020016  005202                          INC     R2                ;DELAY........
020020  001372                          BNE     10$               ;BR IF DELAY NOTDONE
020022  104000                          HLT     0                 ;RX CHAR WAITING NOT TRUE!
                                ;;****************************************************************
020024  032737  020000  001236  9$:     BIT     #BIT13,STAT       ;IS PARITY EVEN SET?          ;;++C
020032  001404                          BEQ     20$               ;IF NO,BR
020034  012737  020262  001254          MOV     #ODDCH,TEMP4      ;SINCE PARITY IS EVEN, LOAD ODD CHARACTER
                                                                  ;TABLE ADR IN R5 WITH PARITY BIT CLEAR
020042  000403                          BR      21$               ;GO LOAD DATA
020044  012737  020310  001254  20$:    MOV     #EVENCH,TEMP4     ;SINCE PARITY IS ODD, LOAD EVEN CHARACTER
                                                                  ;TABLE WITH PARITY BIT CLEAR
020052  004537  023532          21$:    PERFORM ,SILO.OUT         ;REMOVE CHAR FROM SILO
020056  017737  161172  023676  5$:     MOV     @TEMP4,DATA       ;LOAD DATA
020064  010537  001256                  MOV     R5,TEMP5          ;SAVE LINE #
020070  117737  161160  001256          MOVB    @TEMP4,TEMP5      ;SAVE DATA
020076  013705  001256                  MOV     TEMP5,R5          ;UPDATE EXPECTED DATA AND LINE #
                                ;;****************************************************************
```

```
020102  004537  023402                   PERFORM .RXSHIFT         ;PLACE CHAR INTO RX BUFFER.
020106  001242                           CLKX                     ;CLOCKS.
020110  012777  050023  161262           MOV     #S.C+BIT4+BIT1+BIT0,@DVSFR
020116  104415                           ROMCLK                   ;SET RX DATA ENABLE
020120  004537  023510                   PERFORM .SILO.IN         ;READ FROM RX BUFFER INTO SILO
020124  005002                           CLR     R2               ;SET DELAY
020126  012777  001400  161244           MOV     #BIT9+BIT8,@DVSFR
020134  032777  000001  161226  6$:      BIT     #BIT0,@DVLCR     ;WAIT FOR RX CHAR WAITING
020142  001403                           BEQ     7$               ;BR IF TRUE
020144  005202                           INC     R2               ;UPDATE DELAY
020146  001372                           BNE     6$               ;GOBACK
020150  104000                           HLT     0                ;RX CHAR WAITING NOT TRUE
020152  012702  030306          7$:      MOV     #XFR+BIT7+BIT6+BIT2+BIT1,R2
020156  010277  161216                   MOV     R2,@DVSFR        ;DO DATA XFER FROM SILO TO DVRIC
020162  104415                           ROMCLK                   ;CLOCK
020164  017704  161176                   MOV     @DVRIC,R4        ;LOAD DVRIC TO 'FOUND' LOC.
                                ;;**********************************************************************
020170  032704  010000                   BIT     #BIT12,R4        ;IS PARITY ERROR SET?                         ;;++C
020174  001002                           BNE     17$              ;IF YES BR.
020176  104004                           HLT     4                ;RECEIVER PARITY ERROR NOT DETECTED
020200  000402                           BR      16$
020202  042704  010000          17$:     BIC     #BIT12,R4        ;CLEAR PARITY ERROR INDICATOR
                                ;;**********************************************************************
020206                          16$:
020206  020504                           CMP     R5,R4            ;RX DATA AND LINE NUMBER OK??
020210  001401                           BEQ     .+4              ;BR IF EXPECTED =FOUND.
020212  104002                           HLT     2                ;RX DATA ERROR
020214  004537  023532                   PERFORM .SILO.OUT        ;REMOVE RX DATA FROM SILO
020220  104401                           SCOP1                    ;SW09=1?
                                ;;**********************************************************************
020222  062737  000002  001254           ADD     #2,TEMP4         ;UPDATE POINTER TO DATA              ;;++C
020230  005777  161020                   TST     @TEMP4           ;END OF DATA?
                                ;;**********************************************************************
020234  001403                           BEQ     8$               ;BR IF ALL DATA DONE
020236  133705  001244                   BITB    MASKX,R5         ;IF <8BITS CHECK END OF DATA.
020242  001705                           BEQ     5$               ;BR IF MORE TO GO
020244  005237  017664          8$:      INC     65$              ;UPDATE TO NEXT LINE.
020250  005303                           DEC     R3               ;ALL 4 LINES DONE?
020252  001402                           BEQ     22$
020254  000137  017654                   JMP     1$               ;BR IF NOT ALL DONE
020260  000207                  22$:     RTS     PC               ;SCOPE THIS TEST


020262  000001  000002  000004  ODDCH:   .WORD   1,2,4,10,13,16,20,31,32,34,0
020270  000010  000013  000016
020276  000020  000031  000032
020304  000034  000000
020310  000003  000006  000011  EVENCH:  .WORD   3,6,11,12,14,21,22,24,30,33,0
020316  000012  000014  000021
020324  000022  000024  000030
020332  000033  000000


                                         ;************************ TEST 23 *******************************
                                         ;*TEST OF RECEIVER DATA .
                                         ;*THIS TEST RUNS A SET PATTERN THROUGH
```

```
                                        ;*THE RECEIVER OF EACH LINE
                                        ;*THROUGH THE USE OF THE TRANSMITTER.
                                        ;*THIS TEST EXERCISES ALL LINES IN GROUPS OF 4.
                                        ;*NOTE: SHOULD A DATA COMPARE ERROR OCCUR; THE PROGRAM
                                        ;*      REPORTS THE ERROR AS A RECEIVER DATA ERROR BASED
                                        ;*      ON THE TRANSMITTER HAS PREVIOUSLY BEEN CHECKED AND ASSUMED GOOD.
                                        ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                        ;*******************************************************************

                                ;  TEST 23
                                ;---------------
020336  012737  000023  001226  TST23:  MOV     #23,TSTNO
020344  012737  021342  001216          MOV     #TST24,NEXT
020352  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
020356  113737  001416  001242          MOVB    CLK.A,CLKX      ;PLACE 'SHIFTS/PER/CHAR'' IN CLKX
020364  013737  001406  001244          MOV     MASK.A,MASKX    ;PLACE 'MASK'FOR CHARS INTO MASKX
020372  013737  001422  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
020400  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
020402  004737  020534                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
020406  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
020412  113737  001417  001242          MOVB    CLK.B,CLKX      ;PLACE 'SHIFTS/PER/CHAR'' IN CLKX
020420  013737  001410  001244          MOV     MASK.B,MASKX    ;GET MASK
020426  013737  001424  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
020434  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
020436  004737  020534                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
020442  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
020446  113737  001420  001242          MOVB    CLK.C,CLKX      ;GET SHIFTS PER CHAR
020454  013737  001412  001244          MOV     MASK.C,MASKX    ;GET MASK
020462  013737  001426  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
020470  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
020472  004737  020534                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
020476  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
020502  113737  001421  001242          MOVB    CLK.D,CLKX      ;GET SHIFTS
020510  013737  001414  001244          MOV     MASK.D,MASKX    ;GET MASK
020516  013737  001430  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
020524  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
020526  004737  020534                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
020532  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
020534                          105$:                           ;TEST ENTRANCE.
020534  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
020542  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
020544  000207                          RTS     PC              ;EXIT TEST
020546  010037  020644                  MOV     R0,65$          ;PLACE LINE NO.
020552  005037  001250                  CLR     TEMP2
020556  113704  001244                  MOVB    MASKX,R4
020562  005037  001252                  CLR     TEMP3
020566  110437  001252                  MOVB    R4,TEMP3
020572  000241                          CLC
020574  006104                          ROL     R4
020576  050437  001252                  BIS     R4,TEMP3
020602  000241                          CLC
020604  006104                          ROL     R4
020606  050437  001252                  BIS     R4,TEMP3
020612  013737  001236  023646          MOV     STAT,SYNC
020620  113737  001236  023647          MOVB    STAT,SYNC+1
020626  012737  000004  001246          MOV     #4,TEMP1        ;SET FOR 4 LINES
```

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020634  104412                   1$:     MSTCLR                        ,RESET DV11
020636  005001                           CLR     R1                    ;ZERO MSCANNER POINTER
020640  004537  023544                   PERFORM .SETSCAN              ;ADJUST SCANNER FOR PROPER LINE
020644  000001                   65$:    .BLKW 1                       ;
020646                           3$:
                                                                       ;SET SOURCE SELECT
020646  010077  160520           7$:     MOV     R0,@DVSRS             ;LOAD LINE NUMBER
020652  004537  023634                   PERFORM .CLR.TMARK            ;CLEAR TMARK BIT.
020656  004537  023342                   PERFORM .LOAD.MODE            ;LOAD
020662  024000                           BIT13+BIT11                   ;MODE AND RX ENABLE
020664  032737  010000  001236           BIT     #TWOSYN,STAT
020672  001003                           BNE     9$
020674  012703  023646                   MOV     #SYNC,R3
020700  000402                           BR      10$
020702  012703  023647           9$:     MOV     #SYNC+1,R3
020706  111337  001250           10$:    MOVB    (R3),TEMP2
020712  043737  001252  001250           BIC     TEMP3,TEMP2
020720  005077  160446                   CLR     @DVSRS                ;ZERO LINE TO LINE 0
020724  013777  001250  160444           MOV     TEMP2,@DVSRA          ;LOAD DATA INTO DVSRA
020732  012777  020000  160440           MOV     #BIT13,@DVSFR         ;EXECUTE A 'ROM READ'' INTSTR
020740  104415                           ROMCLK                        ;CLOCK.
020742  012777  030260  160430           MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
020750  104415                           ROMCLK                        ;DO A DATA XFER FROM RAM OUTPUT TO TX BUFFER
020752  104416                           DATACLK                       ;ISSUE A MAINT CLK.
020754  012737  020766  001220           MOV     #4$,LOCK              ;SET IF SW09-1 GOTO 4$
020762  010005                           MOV     R0,R5
020764  000305                           SWAB    R5
020766  113702  001242           4$:     MOVB    CLKX,R2               ;SET REQUIRED SHIFTS
020772  010077  160374                   MOV     R0,@DVSRS             ;LOAD LINE NUMBER
020776  111337  001250                   MOVB    (R3),TEMP2
021002  043737  001252  001250           BIC     TEMP3,TEMP2
021010  105005                           CLRB    R5
021012  053705  001250                   BIS     TEMP2,R5
021016  104416                   5$:     DATACLK                       ;ISSUE MAINT CLK
021020  005302                           DEC     R2                    ;ALL SHIFTS DONE?
021022  022702  000001                   CMP     #1,R2                 ;IS THE BUFFER ALMOST EMPTY?
021026  001033                           BNE     8$                    ;BR IF NO
021030  005077  160336                   CLR     @DVSRS                ;ZERO LINE NUMBER
021034  032777  001000  160140           BIT     #BIT9,@SWR            ;LOCK ON DATA?
021042  001001                           BNE     .+4                   ;BR IF YES.!
021044  005203                           INC     R3                    ;UPDATE DATA POINTER.
021046  111337  001250                   MOVB    (R3),TEMP2            ;STORE DATA
021052  013777  001250  160316           MOV     TEMP2,@DVSRA          ;LOAD DATA INTO DVSRA
021060  012777  020000  160312           MOV     #BIT13,@DVSFR         ;DO A ROM READ
021066  104415                           ROMCLK                        ;CLK
021070  012777  030260  160302           MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
021076  104415                           ROMCLK                        ;DO A  DATA XFER TO TX BUFF
021100  010077  160266                   MOV     R0,@DVSRS             ;RESELECT LINE NUMBER
021104  032777  001000  160070           BIT     #BIT9,@SWR            ;LOCK ON DATA?
021112  001001                           BNE     .+4                   ;BR IF YES!!
021114  005303                           DEC     R3                    ;READJUST DATA CHAR POINTER.
021116  005702                   8$:     TST     R2                    ;ALL SHIFTS DONE?
021120  001336                           BNE     5$                    ;BR IF NO
021122  022703  023646                   CMP     #SYNC,R3
021126  001473                           BEQ     50$
021130  022703  023647                   CMP     #SYNC+1,R3
```

```
021134  001470                          BEQ      50$
021136  012777  050023  160234          MOV      #S.C+BIT4+BIT1+BIT0,@DVSFR
021144  104415                          ROMCLK                    ;SET RX DATA ENABLE
021146  004537  023510                  PERFORM  .SILO.IN         ;READ FROM RX BUFFER INTO SILO
021152  005002                          CLR      R2               ;SET DELAY
021154  012777  001400  160216          MOV      #BIT9+BIT8,@DVSFR
021162  032777  000001  160200  26$:    BIT      #BIT0,@DVLCR     ;WAIT FOR RX CHAR WAITING
021170  001403                          BEQ      27$              ;BR IF TRUE
021172  005202                          INC      R2               ;UPDATE DELAY
021174  001372                          BNE      26$              ;GOBACK
021176  104000                          HLT      0                ;RX CHAR WAITING NOT TRUE
021200  012702  030306          27$:    MOV      #XFR+BIT7+BIT6+BIT2+BIT1,R2
021204  010277  160170                  MOV      R2,@DVSFR        ;DO DATA XFFR FROM SILO TO DVRIC
021210  104415                          ROMCLK                    ;CLOCK
021212  017704  160150                  MOV      @DVRIC,R4        ;LOAD DVRIC TO 'FOUND'' LOC.
021216  032737  040000  001236          BIT      #PARBIT,STAT     ;PARITY ON??
021224  001410                          BEQ      36$              ;BR IF PARITY DISABLED
                                ;;**************************************************************
021226  032704  010000                  BIT      #BIT12,R4        ;IS THERE A PARITY ERROR?                 ;;++C
021232  001403                          BEQ      12$              ;IF NO BR
021234  104005                          HLT      5                ;IF YES, THEN IT IS A A BAD TRANSMITTER
                                ;;**************************************************************
021236  042704  010000                  BIC      #BIT12,R4        ;CLEAR PARITY ERROR (DON'T WORRY ABOUT PARITY NOW!)
                                ;;**************************************************************
021242  143704  001244          12$:    BICB     MASKX,R4    .    ;ELSE CLEAR PARITY BIT                    ;;++C
                                ;;**************************************************************
021246  020504                  36$:    CMP      R5,R4            ;RX DATA AND LINE NUMBER OK??
021250  001401                          BEQ      .+4              ;BR IF EXPECTED =FOUND.
021252  104002                          HLT      2                ;RX DATA ERROR
021254  004537  023532                  PERFORM  .SILO.OUT        ;REMOVE RX DATA FROM SILO
021260  104401                          SCOP1                     ;LOCK ON DATA?
021262  005203                  11$:    INC      R3
021264  020327  023674                  CMP      R3,#ENDPAT
021270  001236                          BNE      4$
021272  004537  023622          6$:     PERFORM  .SET.TMARK       ;SET TMARK BIT.
021276  005237  020644                  INC      65$              ;UPDATE LINE NO.
021302  005337  001246                  DEC      TEMP1            ;ALL LINES(4) DONE?
021306  001402                          BEQ      46$
021310  000137  020634                  JMP      1$
021314  000207                  46$:    RTS      PC                             ;SCOPE THESE 4 LINES.
021316  012777  050023  160054  50$:    MOV      #S.C+BIT4+BIT1+BIT0,@DVSFR
021324  104415                          ROMCLK
021326  012777  050022  160044          MOV      #S.C+BIT4+BIT1,@DVSFR
021334  104415                          ROMCLK
021336  000137  021262                  JMP      11$



                                        ;************************* TEST 24 *******************************
                                        ;*TEST OF RECEIVER 'RE-SYNC''
                                        ;*THIS TEST WILL SEND (BY BIT WINDOW) TWO SYNC CHARS AND
                                        ;*THEN VERIFY THAT RX CHAR FLAG IS TRUE.
                                        ;*THEN A 'RE-SYNC'' WILL BE ISSUED AND
                                        ;*TWO NON-SYNC CHARS WIIL BE SENT INTO THE RX
                                        ;*VERIFYING THAT THERE IS NO RX CHAR FLAG.
                                        ;*NEXT TWO SYNC CHARS ARE AGAIN MOVED INTO THE RX
                                        ;*VERIFING CHAR FLAG AND THE THE RX SOULD INDEED
```

```
                                                ;*          RE SYNC.
                                                ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                                ;;**************************************************************

                                        ;  TEST 24
                                        ;-------------
021342  012737  000024  001226          TST24:  MOV     #24,TSTNO
021350  012737  022046  001216                  MOV     #TST25,NEXT
021356  012700  000000                          MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
021362  113737  001416  001242                  MOVB    CLK.A,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
021370  013737  001422  001236                  MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
021376  100402                                  BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
021400  004737  021510                          JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
021404  012700  000004                  100$:   MCV     #4.,R0          ;PLACE LINE NUMBER INTO R0
021410  113737  001417  001242                  MOVB    CLK.B,CLKX      ;PLACE ''SHIFTS/PER/CHAR'' IN CLKX
021416  013737  001424  001236                  MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
021424  100402                                  BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
021426  004737  021510                          JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
021432  012700  000010                  101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
021436  113737  001420  001242                  MOVB    CLK.C,CLKX      ;GET SHIFTS PER CHAR
021444  013737  001426  001236                  MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
021452  100402                                  BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
021454  004737  021510                          JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
021460  012700  000014                  102$:   MOV     #12.,R0         ;LOAD LINE NO.
021464  113737  001421  001242                  MOVB    CLK.D,CLKX      ;GET SHIFTS
021472  013737  001430  001236                  MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
021500  100402                                  BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
021502  004737  021510                          JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
021506  104400                          103$:   SCOPE                   ;SCOPE THIS TEST.
021510                                  105$:                           ;TEST ENTRANCE.
021510  032737  004000  001236                  BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
021516  001401                                  BEQ     .+4             ;BR IF SYNC LINE CARD.
021520  000207                                  RTS     FC              ;EXIT TEST
021522  012703  000004                          MOV     #4,R3           ;SET FOR 4 LINE GROUP
021526  010037  021542                          MOV     R0,68$          ;SAVE LINE NO
021532  104412                          1$:     MSTCLR                  ;RESET
021534  005001                                  CLR     R1              ;ZERO MSCANNEK POINTER
021536  004537  023544                          PERFORM ,SETSCAN        ;SET SCANNER
021542  000001                          68$:    .BLKW 1                 ;TO RIGHT LINE
021544  012737  021552  001220                  MOV     #3$,LOCK        ;SET IF SW09=1
021552  010077  157614                  3$:     MOV     R0,@DVSRS       ;LOAD LINE
021556  004537  023342                          PERFORM ,LOAD.MODE      ;LOAD
021562  025000                                  BIT13+BIT11+BIT9        ;MODE
021564  012702  000002                          MOV     #2,R2           ;SET COUNT
021570  104416                                  DATACLK                 ;INIT DV11 SAT/SAR
021572  013737  001236  023676          4$:     MOV     STAT,DATA       ;GET SYNC
021600  004537  023402                          PERFORM ,RXSHIFT        ;SHIFT INTO RX
021604  001242                                  CLKX                    ;CLOCKS
021606  005302                                  DEC     R2              ;TWO CHARS YET
021610  001370                                  BNE     4$              ;
021612  012702  002000                          MOV     #BIT10,R2       ;BRA TEST
021616  010277  157556                          MOV     R2,@DVSFR       ;
021622  017704  157542                          MOV     @DVLCR,R4       ;
021626  010405                                  MOV     R4,R5           ;
021630  042705  000001                          BIC     #BIT0,R5        ;
021634  020504                                  CMP     R5,R4           ;BRANCH TEST POINT BAD
```

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021636  001401                         BEQ      64$             ;
021640  104001                         HLT      1               ;
021642  012777  050106  157530  64$:   MOV      #S.C+BIT6+BIT2+BIT1,@DVSFR
021650  104415                         ROMCLK                   ;S/C 'RESYNC PULSE''
021652  010277  157522                 MOV      R2,@DVSFR       ;
021656  017704  157506                 MOV      @DVLCR,R4       ;
021662  010405                         MOV      R4,R5           ;
021664  052705  000001                 BIS      #BIT0,R5        ;
021670  020504                         CMP      R5,R4           ;
021672  001401                         BEQ      65$             ;
021674  104001                         HLT      1               ;RESYNC FAILED.
021676  012702  000002          65$:   MOV      #2,R2           ;
021702  013737  001236  023676  5$:    MOV      STAT,DATA       ;GET SYNC
021710  005437  023676                 NEG      DATA            ;MAKE IT A NON-SYNC
021714  004537  023402                 PERFORM  ,RXSHIFT        ;SHIFT
021720  001242                         CLKX                     ;INTO RX
021722  005302                         DEC      R2              ;TWO DONE?
021724  001366                         BNE      5$              ;
021726  012702  002000                 MOV      #BIT10,R2       ;
021732  010277  157442                 MOV      R2,@DVSFR       ;
021736  017704  157426                 MOV      @DVLCR,R4       ;
021742  010405                         MOV      R4,R5           ;
021744  052705  000001                 BIS      #BIT0,R5        ;
021750  020504                         CMP      R5,R4           ;
021752  001401                         BEQ      66$             ;
021754  104001                         HLT      1               ;
021756  012702  000002          66$:   MOV      #2,R2           ;
021762  013737  001236  023676  6$:    MOV      STAT,DATA       ;
021770  004537  023402                 PERFORM  ,RXSHIFT        ;
021774  001242                         CLKX                     ;
021776  005302                         DEC      R2              ;
022000  001370                         BNE      6$              ;
022002  012702  002000                 MOV      #BIT10,R2       ;
022006  010277  157366                 MOV      R2,@DVSFR       ;
022012  017704  157352                 MOV      @DVLCR,R4       ;
022016  010405                         MOV      R4,R5   ;
022020  042705  000001                 BIC      #BIT0,R5        ;
022024  020504                         CMP      R5,R4           ;
022026  001401                         BEQ      67$             ;
022030  104001                         HLT      1               ;
022032  104401                  67$:   SCOP1                    ;
022034  005237  021542                 INC      68$             ;
022040  005303                         DEC      R3              ;
022042  001233                         BNE      1$              ;
022044  000207                         RTS      PC              ;EXIT


                                       ;************************* TEST 25 ********************************
                                       ;*TEST TO VERIFY THAT SETTING RECEIVER ENABLE
                                       ;*WILL SET RX FLAG AND MATCH DETECT.
                                       ;*TEST WILL ALSO VERIFY THAT CLEARING RECEIVER
                                       ;*ENABLE WILL CLEAR RX FLAG AND MATCH DETECT.
                                       ;*THIS TEST WILL BE DONE FOR ASYNC LINE CARDS ONLY.

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

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                                ;  TEST 25
                                ;--------------
022046  012737  000025  001226  TST25:  MOV      #25,TSTNO
022054  012737  022436  001216          MOV      #TST26,NEXT
022062  012700  000000                  MOV      #0.,R0            ;PLACE LINE NUMBER INTO R0
022066  013737  001422  001236          MOV      L00.03,STAT       ;LOAD LINE CARD STATUS INTO STAT
022074  100402                          BMI      100$              ;BR IF LINE CARD NOT TO BE TESTED
022076  004737  022164                  JSR      PC,105$           ;GO DO THE TEST FOR LINE CARD 1
022102  012700  000004          100$:   MOV      #4.,R0            ;PLACE LINE NUMBER INTO R0
022106  013737  001424  001236          MOV      L04.07,STAT       ;LOAD LINE CARD STATUS INTO STAT
022114  100402                          BMI      101$              ;BR IF LINE CARD NOT TO BE TESTED
022116  004737  022164                  JSR      PC,105$           ;GO DO THE TEST FOR LINE CARD 2
022122  012700  000010          101$:   MOV      #8.,R0            ;LOAD LINE NUMBER
022126  013737  001426  001236          MOV      L08.11,STAT       ;LOAD LINE CARD STATUS INTO STAT
022134  100402                          BMI      102$              ;BR IF LINE CARD NOT TO BE TESTED
022136  004737  022164                  JSR      PC,105$           ;DO THE TEST FOR LINE CARD 3
022142  012700  000014          102$:   MOV      #12.,R0           ;LOAD LINE NO.
022146  013737  001430  001236          MOV      L12.15,STAT       ;LOAD LINE CARD STATUS
022154  100402                          BMI      103$              ;BR IF LINE CARD NOT TO BE TESTED
022156  004737  022164                  JSR      PC,105$           ;DO THE TESTS FOR LINE CARD 4
022162  104400                  103$:   SCOPE                      ;SCOPE THIS TEST.
022164                          105$:                              ;TEST ENTRANCE.
022164  032737  004000  001236          BIT      #ASYNC,STAT       ;IS THIS AN ASYNC LINE CAR?
022172  001001                          BNE      .+4               ;BR IF ASYNC.
022174  000207                          RTS      PC                ;EXIT TEST
022176  012703  000004                  MOV      #4,R3             ;SET TO TEST 4 LINES.
022202  104412                  1$:     MSTCLR                     ;INIT DV11
022204  005001                          CLR      R1                ;INIT SCANNER POINTER.
022206  012777  000010  157146          MOV      #BIT3,@DVSCR      ;SET SOURCE ENABLE
022214  010037  022224                  MOV      R0,65$            ;PREPARE MASTER SCANNER.
022220  004537  023544                  PERFORM  ,SETSCAN          ;SET SCANNER
022224  000001                  65$:    .BLKW    1                 ;POSITION OF SCANNER.
022226  010077  157140                  MOV      R0,@DVSRS         ;LOAD LINE NO.
022232  004537  023342                  PERFORM  ,LOAD.MODE        ;SET RX ENABLE.
022236  020000                          BIT13                      ;
022240  012702  076400                  MOV      #BPB+BIT11+BIT10+BIT8,R2
022244  010277  157130                  MOV      R2,@DVSFR         ;BRB MATCH DETECT.
022250  017704  157114                  MOV      @DVLCR,R4         ;READ BR POINTS.
022254  010405                          MOV      R4,R5             ;
022256  052705  000001                  BIS      #BIT0,R5          ;BR A FALSE.
022262  042705  000002                  BIC      #BIT1,R5          ;BR B TRUE.
022266  020504                          CMP      R5,R4             ;MATCH DETECT TRUE?
022270  001401                          BEQ      2$                ;BR IF YES
022272  104001                          HLT      1                 ;RX FLAG NOT TRUE.
022274  012702  002000          2$:     MOV      #BIT10,R2         ;BRA RX FLAG.
022300  010277  157074                  MOV      R2,@DVSFR         ;LOAD INSTRUCTION.
022304  017704  157060                  MOV      @DVLCR,R4         ;READ BR POINTS.
022310  010405                          MOV      R4,R5             ;
022312  052705  000002                  BIS      #BIT1,R5          ;BR B FALSE
022316  042705  000001                  BIC      #BIT0,R5          ;BR A TRUE.
022322  020504                          CMP      R5,R4             ;RX FLAG TRUE?
022324  001401                          BEQ      3$                ;BR IF YES
022326  104001                          HLT      1                 ;RX FLAG NOT TRUE.
022330  004537  023342          3$:     PERFORM  ,LOAD.MODE        ;CLEAR RX ENABLE.
022334  000000                          0                          ;
022336  012702  076400                  MOV      #BRB+BIT11+BIT10+BIT8,R2
```

```
022342  010277  157032                      MOV     R2,@DVSFR       ;BRB MATCH DETECT.
022346  017704  157016                      MOV     @DVLCR,R4       ;READ BR POINTS.
022352  010405                              MOV     R4,R5           ;
022354  052705  000001                      BIS     #BIT0,R5        ;BR A FALSE.
022360  052705  000002                      BIS     #BIT1,R5        ;BR B FALSE.
022364  020504                              CMP     R5,R4           ;MATCH DETECT FALSE?
022366  001401                              BEQ     4$              ;BR IF YES
022370  104001                              HLT     1               ;RX FLAG NOT FALSE.
022372  012702  002000              4$:     MOV     #BIT10,R2       ;BRA RX FLAG.
022376  010277  156776                      MOV     R2,@DVSFR       ;LOAD INSTRUCTION.
022402  017704  156762                      MOV     @DVLCR,R4       ;READ BR POINTS.
022406  010405                              MOV     R4,R5           ;
022410  052705  000002                      BIS     #BIT1,R5        ;BR B FALSE
022414  052705  000001                      BIS     #BIT0,R5        ;BR A FALSE.
022420  020504                              CMP     R5,R4           ;RX FLAG FALSE?
022422  001401                              BEQ     5$              ;BR IF YES
022424  104001                              HLT     1               ;RX FLAG NOT FALSE.
022426  005200                      5$:     INC     R0              ;UPDATE LINE NO.
022430  005303                              DEC     R3              ;4 LINES DONE?
022432  001263                              BNE     1$              ;BR IF NO.
022434  000207                              RTS     PC              ;EXIT TEST.


                                            ;************************ TEST 26 *****************************
                                            ;*TEST TO SET RECEIVER ENABLE.
                                            ;*SET 'RX DATA ENABLE'.
                                            ;*CLR 'RX DATA ENABLE'.
                                            ;*AND EXPECT BOTH RX FLAG AND MATCH DETECT TO BE FALSE.
                                            ;*THIS TEST WILL BE DONE FOR ASYNC LINE CARDS ONLY.
                                            ;;**************************************************************

                                    ;  TEST 26
                                    ;---------------
022436  012737  000026  001226      TST26:  MOV     #26,TSTNO
022444  012737  022750  001216              MOV     #TST27,NEXT
022452  012700  000000                      MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
022456  013737  001422  001236              MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
022464  100402                              BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
022466  004737  022554                      JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
022472  012700  000004              100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
022476  013737  001424  001236              MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
022504  100402                              BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
022506  004737  022554                      JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
022512  012700  000010              101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
022516  013737  001426  001236              MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
022524  100402                              BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
022526  004737  022554                      JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
022532  012700  000014              102$:   MOV     #12.,R0         ;LOAD LINE NO.
022536  013737  001430  001236              MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
022544  100402                              BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
022546  004737  022554                      JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
022552  104400                      103$:   SCOPE                   ;SCOPE THIS TEST.
022554                              105$:                           ;TEST ENTRANCE.
022554  032737  004000  001236              BIT     #ASYNC,STAT     ;IS THIS AN ASYNC LINE CARD?
022562  001001                              BNE     .+4             ;BR IF ASYNC.
022564  000207                              RTS     PC              ;EXIT TEST
```

```
022566 012703 000004                         MOV     #4,R3             ;SET TO TEST 4 LINES.
022572 104412                        1$:     MSTCLR                    ;INIT DV11
022574 005001                                CLR     R1                ;INIT SCANNER POINTER.
022576 012777 000010 156556                  MOV     #BIT3,@DVSCR      ;SET SOURCE ENABLE
022604 010037 022614                         MOV     R0,65$            ;PREPARE MASTER SCANNER.
022610 004537 023544                         PERFORM ,SETSCAN          ;SET SCANNER
022614 000001                        65$:    .BLKW   1                 ;POSITION OF SCANNER.
022616 010077 156550                         MOV     R0,@DVSRS         ;LOAD LINE NO.
022622 004537 023342                         PERFORM ,LOAD.MODE        ;SET RX ENABLE.
022626 020000                                BIT13                     ;
022630 012777 050023 156542                  MOV     #S.C+BIT4+BIT1+BIT0,@DVSFR
022636 104415                                ROMCLK                    ;SET RX DATA ENABLE.
022640 012777 050022 156532                  MOV     #S.C+BIT4+BIT1,@DVSFR
022646 104415                                ROMCLK                    ;CLEAR RX DATA ENABLE.
022650 012702 076400                         MOV     #BRB+BIT11+BIT10+BIT8,R2
022654 010277 156520                         MOV     R2,@DVSFR         ;BRB MATCH DETECT.
022660 017704 156504                         MOV     @DVLCR,R4         ;READ BR POINTS.
022664 010405                                MOV     R4,R5             ;
022666 052705 000001                         BIS     #BIT0,R5          ;BR A FALSE.
022672 052705 000002                         BIS     #BIT1,R5          ;BR B FALSE.
022676 020504                                CMP     R5,R4             ;MATCH DETECT FALSE?
022700 001401                                BEQ     4$                ;BR IF YES
022702 104001                                HLT     1                 ;RX FLAG NOT FALSE.
022704 012702 002000                 4$:     MOV     #BIT10,R2         ;BRA RX FLAG.
022710 010277 156464                         MOV     R2,@DVSFR         ;LOAD INSTRUCTION.
022714 017704 156450                         MOV     @DVLCR,R4         ;READ BR POINTS.
022720 010405                                MOV     R4,R5             ;
022722 052705 000002                         BIS     #BIT1,R5          ;BR B FALSE
022726 052705 000001                         BIS     #BIT0,R5          ;BR A FALSE.
022732 020504                                CMP     R5,R4             ;RX FLAG FALSE?
022734 001401                                BEQ     5$                ;BR IF YES
022736 104001                                HLT     1                 ;RX FLAG NOT FALSE.
022740 005200                        5$:     INC     R0                ;UPDATE LINE NO.
022742 005303                                DEC     R3                ;4 LINES DONE?
022744 001312                                BNE     1$                ;BR IF NO.
022746 000207                                RTS     PC                ;EXIT TEST.


                                             ;************************** TEST 27 *******************************
                                             ;*TEST TO SET RECEIVER ENABLE.
                                             ;*ISSUE A RESYNC  SIGNAL.
                                             ;*AND EXPECT BOTH RX FLAG AND MATCH DETECT TO BE FALSE.
                                             ;*THIS TEST WILL B     E FOR ASYNC LINE CARDS ONLY.
                                             ;:****************        ****************************************

                                     ;  TEST 27
                                     ;--------------
022750 012737 000027 001226          TST27:  MOV     #27,TSTNO
022756 012737 002436 001216                  MOV     #.EOP,NEXT
022764 012700 000000                         MOV     #0.,R0            ;PLACE LINE NUMBER INTO R0
022770 013737 001422 001236                  MOV     L00.03,STAT       ;LOAD LINE CARD STATUS INTO STAT
022776 100402                                BMI     100$              ;BR IF LINE CARD NOT TO BE TESTED
023000 004737 023066                         JSR     PC,105$           ;GO DO THE TEST FOR LINE CARD 1
023004 012700 000004                 100$:   MOV     #4.,R0            ;PLACE LINE NUMBER INTO R0
023010 013737 001424 001236                  MOV     L04.07,STAT       ;LOAD LINE CARD STATUS INTO STAT
023016 100402                                BMI     101$              ;BR IF LINE CARD NOT TO BE TESTED
```

```
023020  004737  023066                   JSR      PC,105$          ;GO DO THE TEST FOR LINE CARD 2
023024  012700  000010           101$:   MOV      #8.,R0           ;LOAD LINE NUMBER
023030  013737  001426  001236           MOV      L08.11,STAT      ;LOAD LINE CARD STATUS INTO STAT
023036  100402                           BMI      102$             ;BR IF LINE CARD NOT TO BE TESTED
023040  004737  023066                   JSR      PC,105$          ;DO THE TEST FOR LINE CARD 3
023044  012700  000014           102$:   MOV      #12.,R0          ;LOAD LINE NO.
023050  013737  001430  001236           MOV      L12.15,STAT      ;LOAD LINE CARD STATUS
023056  100402                           BMI      103$             ;BR IF LINE CARD NOT TO BE TESTED
023060  004737  023066                   JSR      PC,105$          ;DO THE TESTS FOR LINE CARD 4
023064  104400                   103$:   SCOPE                     ;SCOPE THIS TEST.
023066                           105$:                             ;TEST ENTRANCE.
023066  032737  004000  001236           BIT      #ASYNC,STAT      ;IS THIS AN ASYNC LINE CAR?
023074  001001                           BNE      .+4              ;BR IF ASYNC.
023076  000207                           RTS      PC               ;EXIT TEST
023100  012703  000004                   MOV      #4,R3            ;SET TO TEST 4 LINES.
023104  104412                   1$:     MSTCLR                    ;INIT DV11
023106  005001                           CLR      R1               ;INIT SCANNER POINTER.
023110  012777  000010  156244           MOV      #BIT3,@DVSCR     ;SET SOURCE ENABLE
023116  010037  023126                   MOV      R0,65$           ;PREPARE MASTER SCANNER.
023122  004537  023544                   PERFORM ,SETSCAN          ;SET SCANNER
023126  000001                   65$:    .BLKW    1                ;POSITION OF SCANNER.
023130  010077  156236                   MOV      R0,@DVSRS        ;LOAD LINE NO.
023134  004537  023342                   PERFORM ,LOAD.MODE        ;SET RX ENABLE.
023140  020000                           BIT13                     ;
023142  012777  050106  156230           MOV      #S.C+BIT6+BIT2+BIT1,@DVSFR
023150  104415                           ROMCLK                    ;ISSUE RESYNC.
023152  012702  076400                   MOV      #BRB+BIT11+BIT10+BIT8,R2
023156  010277  156216                   MOV      R2,@DVSFR        ;BRB MATCH DETECT.
023162  017704  156202                   MOV      @DVLCR,R4        ;READ BR POINTS.
023166  010405                           MOV      R4,R5            ;
023170  052705  000001                   BIS      #BIT0,R5         ;BR A FALSE.
023174  052705  000002                   BIS      #BIT1,R5         ;BR B FALSE.
023200  020504                           CMP      R5,R4            ;MATCH DETECT FALSE?
023202  001401                           BEQ      4$               ;BR IF YES
023204  104001                           HLT      1                ;RX FLAG NOT FALSE.
023206  012702  002000           4$:     MOV      #BIT10,R2        ;BRA RX FLAG.
023212  010277  156162                   MOV      R2,@DVSFR        ;LOAD INSTRUCTION.
023216  017704  156146                   MOV      @DVLCR,R4        ;READ BR POINTS.
023222  010405                           MOV      R4,R5            ;
023224  052705  000002                   BIS      #BIT1,R5         ;BR B FALSE
023230  052705  000001                   BIS      #BIT0,R5         ;BR A FALSE.
023234  020504                           CMP      R5,R4            ;RX FLAG FALSE?
023236  001401                           BEQ      5$               ;BR IF YES
023240  104001                           HLT      1                ;RX FLAG NOT FALSE.
023242  005200                   5$:     INC      R0               ;UPDATE LINE NO.
023244  005303                           DEC      R3               ;4 LINES DONE?
023246  001316                           BNE      1$               ;BR IF NO.
023250  000207                           RTS      PC               ;EXIT TEST.

023252                           TXSHIFT:
023252  010046                           MOV      R0,-(SP)
023254  017700  156110                   MOV      @DVLCR,R0
                                 ;;*********************************************************************
023260  022737  000010  001242           CMP      #8.,CLKX         ;SEE IF 8 BIT CHAR              ;;++C
                                                                   ;OR 7 BIT W/PARITY ENABLED
023266  001404                           BEQ      1$               ;IF YES,BR
```

```
023270  022737  000011  001242                  CMP     #9.,CLKX        ;SEE IF I BIT CHAR W/PARTIY ENABLED
023276  001404                                  BEQ     2$              ;IF YES BR
                                        ;;*****************************************************************
023300  106100                          1$:     ROLB    R0
023302  106037  023676                          RORB    DATA
                                        ;;*****************************************************************
023306  000413                                  BR      4$              ;CHAR IS 8 BIT WITHOUT PARITY ENABLED           ;;++C
                                                                        ;OR LESS THAN 8 BITS IN LENGTH WITH
                                                                        ;OR WITHOUT PARITY ENABLED
023310  042737  001000  023676          2$:     BIC     #BIT9,DATA      ;SINCE PARTIY IS ENABLED, ROOM
                                                                        ;MUST BE PROVIDED FOR INSERTION
                                                                        ;OF PARITY BIT ON THE END OF 8
                                                                        ;BIT CHARACTER
023316  106100                                  ROLB    R0              ;LOAD CARRY BIT WITH DATA
023320  103004                                  BCC     3$              ;IF CARRY IS CLEAR OR NO DATA BR
023322  000241                                  CLC                     ;IF CARRY SET , CLEAR IT SO DATA
                                                                        ;WON'T BE SHIFTED INTO HIGH BYTE
                                                                        ;(BIT15) OF DATA LOCATION WHEN
                                                                        ;SHIFTINF OF DATA TAKES PLACE.
023324  052737  001000  023676                  BIS     #BIT9,DATA      ;ELSE START BEGINNING OF DATA
                                                                        ;IN BIT POSITION 9.
023332  006037  023676                  3$:     ROR     DATA            ;SHIFT DATA
                                        ;;*****************************************************************
023336  012600                          4$:     MOV     (SP)+,R0
023340  000205                                  EXIT
023342                                  LOAD.MODE:
023342  012577  156022                          MOV     (R5)+,@DVLCR
023346  052777  100000  156014                  BIS     #BIT15,@DVLCR
023354  010046                                  MOV     R0,-(SP)
023356  005000                                  CLR     R0
023360  005777  156004                  1$:     TST     @DVLCR
023364  100004                                  BPL     2$
023366  104414                                  DELAY
023370  005200                                  INC     R0
023372  001372                                  BNE     1$
023374  104000                                  HLT     0               ;BIT 15 FAILED TO CLEAR
023376  012600                          2$:     MOV     (SP)+,R0
023400  000205                                  EXIT
023402                                  RXSHIFT:
023402  010046                                  MOV     R0,-(SP)
023404  010246                                  MOV     R2,-(SP)
023406  113502                                  MOVB    @(R5)+,R2
023410  042777  040000  155752          1$:     BIC     #BIT14,@DVLCR
023416  005000                                  CLR     R0
023420  000241                                  CLC
023422  006037  023676                          ROR     DATA
023426  006000                                  ROR     R0
023430  006000                                  ROR     R0
023432  052700  100000                          BIS     #BIT15,R0
023436  050077  155726                          BIS     R0,@DVLCR
023442  004737  023462                          JSR     PC,CKBIT15
023446  104416                                  DATACLK
023450  105302                                  DECB    R2
023452  001356                                  BNE     1$
023454  012602                                  MOV     (SP)+,R2
023456  012600                                  MOV     (SP)+,R0
```

```
023460  000205                              EXIT

023462                            CKBIT15:
023462  010046                              MOV     R0,-(SP)
023464  005000                              CLR     R0
023466  005777  155676            64$:      TST     @DVLCR
023472  100004                              BPL     65$
023474  104414                              DELAY
023476  005200                              INC     R0
023500  001372                              BNE     64$
023502  104000                              HLT     0               ;BIT 15 FAILED TO CLEAR
023504  012600                    65$:      MOV     (SP)+,R0
023506  000207                              RTS     PC
023510                            SILO.IN:
023510  012777  050021  155662              MOV     #BIT14+BIT12+BIT4+BIT0,@DVSFR
023516  104415                              ROMCLK
023520  012777  050022  155652              MOV     #BIT14+BIT12+BIT4+BIT1,@DVSFR
023526  104415                              ROMCLK
023530  000205                              EXIT

023532                            SILO.OUT:
023532  012777  050020  155640              MOV     #BIT14+BIT12+BIT4,@DVSFR
023540  104415                              ROMCLK
023542  000205                              EXIT


023544                            SETSCAN:
023544  010346                              MOV     R3,-(SP)
023546  052777  000010  155606              BIS     #BIT3,@DVSCR
023554  012503                              MOV     (R5)+,R3
023556  001414                              BEQ     2$
023560  012777  050102  155612    1$:       MOV     #BIT14+BIT12+BIT6+BIT1,@DVSFR
023566  104415                              ROMCLK
023570  005201                              INC     R1
023572  012777  050102  155600              MOV     #BIT14+BIT12+BIT6+BIT1,@DVSFR
023600  104415                              ROMCLK
023602  005201                              INC     R1
023604  005303                              DEC     R3
023606  001364                              BNE     1$
023610  012603                    2$:       MOV     (SP)+,R3
023612  0101C0                              MOV     R1,R0
023614  000241                              CLC
023616  006000                              ROR     R0
023620  000205                              EXIT
023622                            SET.TMARK:
023622  012777  050105  155550              MOV     #BIT14+BIT12+BIT6+BIT2+BIT0,@DVSFR
023630  104415                              ROMCLK                  ;SET/CLEAR ''SET TMARK''
023632  000205                              EXIT
023634                            C.R.TMARK:
023634  012777  05010   155536              MOV     #BIT14+BIT12+BIT6+BIT0,@DVSFR
023642  104415                              ROMCLK          ;SET/CLEAR ''CLEAR TMARK''
023644  000205                              EXIT

023646  000001                    SYNC:     .BLKW 1
023650     000                    DATPAT:   .BYTE   ^B<00000000>    ;ALL ZERO'S
023651     377                              .BYTE   ^B<11111111>    ;ALL ONE'S
```

```
3397  023652      125                      .BYTE    ^B<01010101>    ;ALTERNATE ONE'S
3398  023653      252                      .BYTE    ^B<10101010>    ;ALTERNATE ZERO'S
3399  023654      001                      .BYTE    ^B<00000001>    ;F
3400  023655      002                      .BYTE    ^B<00000010>    ; L
3401  023656      004                      .BYTE    ^B<00000100>    ;  O
3402  023657      010                      .BYTE    ^B<00001000>    ;   A
3403  023660      020                      .BYTE    ^B<00010000>    ;    T
3404  023661      040                      .BYTE    ^B<00100000>    ;     I
3405  023662      100                      .BYTE    ^B<01000000>    ;      N
3406  023663      200                      .BYTE    ^B<10000000>    ;       G  ONE!
3407  023664      177                      .BYTE    ^B<01111111>    ;F
3408  023665      277                      .BYTE    ^B<10111111>    ; L
3409  023666      337                      .BYTE    ^B<11011111>    ;  O
3410  023667      357                      .BYTE    ^B<11101111>    ;   A
3411  023670      367                      .BYTE    ^B<11110111>    ;    T
3412  023671      373                      .BYTE    ^B<11111011>    ;     I
3413  023672      375                      .BYTE    ^B<11111101>    ;      N
3414  023673      376                      .BYTE    ^B<11111110>    ;       G  ZERO!
3415  023674                       ENDPAT:
3416  023674  000000               NPRLOC: 0
3417  023676  000000               DATA:   0
3418  023700  046377  047111  020105  EM1:     .ASCIZ  <377>/LINE CARD STATIC TEST/
      023727     377  042522  042503  EM2:     .ASCIZ  <377>/RECEIVER DATA COMAPRISON ERROR/
      023767     377  051124  047101  EM3:     .ASCIZ  <377>/TRANSMITTER DATA COMPARISON ERROR/
      024032  051377  041505  044505  EM4:     .ASCIZ  <377>/RECEIVER PARITY ERROR NOT DETECTED/
      024076  052377  040522  051516  EM5:     .ASCIZ  <377>/TRANSMITTER PARITY ERROR/
      024130  046777  052123  041523  DH1:     .ASCIZ  <377>/MSTSCAN  DVSFR  EXPECTED  FOUND  LINE(8)/
                                      .EVEN
              000000                  SKIP=000000
3419  024202  000005                  DT6:     5
3420  024204     006     003                   .BYTE   6,3
3421  024206  001262                           SAVR1
3422  024210     006     001                   .BYTE   6,1
3423  024212  001264                           SAVR2
3424  024214     006     004                   .BYTE   6,4
3425  024216  001272                           SAVR5
3426  024220     006     001                   .BYTE   6,1
3427  024222  001270                           SAVR4
3428  024224     002     001                   .BYTE   2,1
3429  024226  001260                           SAVR0
3430
3431  024230                          .ERRTAB:
3432  024230  000000                           0
3433  024232  000000                           0
3434  024234  000000                           0
3435  024236  023700                           EM1
3436  024240  024130                           DH1     ;HALT 1
3437  024242  024202                           DT6
3438  024244  023727                           EM2
3439  024246  024130                           DH1     ;HALT 2
3440  024250  024202                           DT6
3441  024252  023767                           EM3
3442  024254  024130                           DH1     ;HALT 3
3443  024256  024202                           DT6
3444  024260  024032                           EM4
3445  024262  024130                           DH1     ;HALT 4
```

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 3446  024264  024202                  DT6
 3447  024266  024076                  EM5
 3448  024270  024130                  DH1       ;HALT 5
 3449  024272  024202                  DT6
 3450  024274                  CORMAX:
 3451          000001          .END
```

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                                                         F  7
                                                                                            CZDVB     MACY
CZDVBC.P11    19-FEB-79 13:11          CROSS REFERENCE TABLE -- USER SYMBOLS                   SEQ 0083

ADRCNT= 003443          619*     655*     664#
ALU    - 010000          73#
ASYNC  = 004000          81#    1357     1409     1461     1515     1567     1643     1783     1893     2064     2144     2215     2320
                       2420     2547     2675     2820     2979     3083     3170     3240
AUTO.S   006624        1129#
BCC    = 060000          78#
BINWRD   003746         705*     706      743#
BIT0   = 000001          71#     886     1249     1314     1662     1673     2002     2006     2023     2077     2079     2083     2100
                       2163     2235     2245     2256     2265     2340     2350     2361     2370     2444     2446     2449     2471
                       2474     2572     2577     2587     2592     2701     2706     2727     2732     2894     2899     2933     3003
                       3012     3027     3041     3100     3110     3120     3130     3183     3191     3201     3259     3269     3355
                       3386     3390
BIT1   = 000002          70#     886      897     1249     1256     1265     1269     1314     1653     1793     1903     2011     2077
                       2088     2164     2236     2245     2257     2264     2341     2350     2362     2369     2444     2451     2489
                       2572     2587     2597     2701     2727     2737     2894     2904     2933     2935     3007     3101     3109
                       3121     3129     3183     3185     3192     3200     3253     3260     3268     3357     3372     3375
BIT10  = 002000          61#     886     1250     1315     1909     2160     2231     2240     2252     2261     2331     2336     2345
                       2357     2366     2999     3023     3037     3096     3105     3116     3125     3187     3196     3255     3264
BIT11  = 004000          60#     886     1315     1414     1466     1520     1575     1658     1799     1909     2155     2160     2226
                       2231     2252     2331     2336     2357     2430     2557     2686     2846     2991     3096     3116     3187
                       3255
BIT12  = 010000          59#      73       75       77       79     2495     2603     2742     2746     2911     2915     3355     3357
                       3362     3372     3375     3386     3390
BIT13  = 020000          58#      74       75       78       79     1667     1690     1801     1911     2155     2226     2331     2430
                       2456     2480     2488     2557     2686     2712     2846     2856     2880     2991     3095     3182     3252
BIT14  = 040000          57#      76       77       78       79      526     1583     1584     1590     1591     3327     3355     3357
                       3362     3372     3375     3386     3390
BIT15  = 100000          56#    1471     1525     1584     1592     2430     2557     2686     3312     3333
BIT2   = 000004          69#     453      886     2011     2088     2451     2489     2597     2737     2904     3007     3253     3386
BIT3   = 000010          68#     886     3089     3176     3246     3369
BIT4   = 000020          67#    1367     1368     1420     1421     1474     1475     1528     1529     1669     1692     1803     1913
                       2002     2020     2077     2079     2097     2444     2446     2471     2572     2587     2701     2727     2858
                       2882     2894     2933     2935     3183     3185     3355     3357     3362
BIT5   = 000040          66#    1367     1368     1420     1421     1474     1475     1528     1529     1669     1692     1803     1913
                       2858     2882
BIT6   = 000100          65#    1197     1256     1269     1653     1793     1903     2011     2088     2451     2489     2597     2737
                       2904     3007     3253     3372     3375     3386     3390
BIT7   = 000200          64#     520      767      924      945     1197     1363     1416     1468     1522     1578     1583     1590
                       1669     1692     1733     1803     1913     2011     2088     2451     2489     2597     2737     2858     2882
                       2904
BIT8     000400          63#     886      903     1315     2005     2022     2082     2099     2160     2231     2252     2336     2357
                       2448     2473     2576     2591     2705     2731     2898     3096     3116     3187     3255
BIT9     001000          62#     886     1197     1202     1262     1520     1575     1660     1672     1686     1695     2005     2022
                       2082     2099     2155     2226     2331     2430     2448     2473     2557     2576     2591     2686     2705
                       2731     2875     2885     2898     2991     3294     3304
BRB    - 070000          79#    1315     2160     2231     2252     2336     2357     3096     3116     3187     3255
BRW      003014         459      548#
BRX      003016         460      549#
CHRCNT   003744         703*     707      723*     741#     742
CKBIT1   023462        1472     1526     1585     1593     2431     2558     2687     3335     3343#
CLKX     001242         150#    1618*    1624*    1630*    1636*    1677     1700     1703     1706     1726     1758*    1764*    1770*
                       1776*    1807     1813     1820     1823     1826     1864*    1871*    1878*    1885*    1917     1923     1930
                       1933     1936     2123*    2128*    2133*    2138*    2159     2194*    2199*    2204*    2209*    2230     2251
                       2295*    2301*    2307*    2313*    2335     2356     2395*    2401*    2407*    2413*    2434     2462     2522*
                       2528*    2534*    2540*    2562     2567     2586     2646*    2652*    2658*    2664*    2691     2696     2726
                       2795*    2801*    2807*    2813*    2864     2958*    2963*    2968*    2973*    2996     3020     3034     3282
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                         3285
CLK.A   001416            250#   1047    1618    1758    1864    2123    2194    2295    2395    2522    2646    2795    2958
CLK.B   001417            251#   1052    1624    1764    1871    2128    2199    2301    2401    2528    2652    2801    2963
CLK.C   001420            252#   1057    1630    1770    1878    2133    2204    2307    2407    2534    2658    2807    2968
CLK.D   001421            253#   1062    1636    1776    1885    2138    2209    2313    2413    2540    2664    2813    2973
CLR.TM  023634           1659    1797    1907    2844    3389#
CNVRT = 104411            209#    478     480     482     484     804     806     862     919
CONVRT= 104410            207#    418     820
CORMAX  024274           3450#   3451
CREAM   001306            171#    387*    994*    995     997*   1002    1003*   1004    1007*
CSRMAP  006626            412    1131#
CYCLE   005666            462     498     499     984#
DATA    023676           1678*   1708*   1713    1814*   1828*   1833    1924*   1938*   1943    2156*   2227*   2249*   2332*
                         2354*   2432*   2437*   2440*   2461*   2465*   2559*   2565*   2583*   2584*   2688*   2694*   2720*
                         2994*   3017*   3018*   3032*   3289*   3294*   3304*   3306*   3330*   3417#
DATABP  004276            793*    796     818     821#
DATACL= 104416            219#   1671    1680    1728    1732    1805    1808    1816    1915    1918    1926    2157    2228
                         2333    2433    2560    2689    2860    2870    2993    3336
DATAHD  004264            792*    814     817#
DATPAT  023650           3395#
DELAY = 104414            215#   3317    3348
DEVADR  003440            617*    652     662#
DH1     024130           3418#   3436    3439    3442    3445    3448
DT6     024202           3419#   3437    3440    3443    3446    3449
DVACTV  001300            165#    434*    435     984     989    1163*   1169*   1170*   1174    1193
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    1252    1264    1317    1362    1366    1414*   1415
                         1419    1466*   1467    1471*   1473    1520*   1521    1525*   1527    1576    1584*   1586    1591*
                         1592*   1594    1662    1673    1733    2006    2023    2083    2100    2161    2233    2241    2254
                         2262    2338    2346    2359    2367    2430*   2449    2474    2557*   2577    2592    2686*   2706
                         2732    2899    3001    3010    3025    3039    3098    3107    3118    3127    3189    3198    3257
                         3266    3280    3311*   3312*   3315    3327*   3334*   3346
DVNSR   001402            238#   1033*   1034*   1035
DVNUM   001301            166#    383     488    1135*   1156*   1157    1164    1166
DVRIC   001366            232#   1021*   1022*   1023    2014    2091    2454    2492    2600    2740    2907
DVRLVL  001354            227#   1038*   1039*   1040
DVRVEC  001352            226#    505    1009*   1038
DVSCR   001362            230#    502     880*    893*    897*   1008*   1019    3089*   3176*   3246*   3369*
DVSCRH  001364            231#   1019*   1020*   1021
DVSFR   001400            237#   1031*   1032*   1033    1251*   1256*   1263*   1269*   1316*   1653*   1660*   1667*   1669*
                         1672*   1690*   1692*   1793*   1801*   1803*   1903*   1911*   1913*   2002*   2005*   2011*   2012
                         2020*   2022*   2077*   2079*   2082*   2088*   2089    2097*   2099*   2160*   2231*   2240*   2252*
                         2261*   2336*   2345*   2357*   2366*   2444*   2446*   2448*   2452*   2471*   2473*   2490*   2572*
                         2576*   2587*   2591*   2598*   2701*   2705*   2727*   2731*   2738*   2856*   2858*   2880*   2882*
                         2894*   2898*   2905*   2933*   2935*   3000*   3007*   3009*   3024*   3038*   3097*   3106*   3117*
                         3126*   3183*   3185*   3188*   3197*   3253*   3256*   3265*   3355*   3357*   3362*   3372*   3375*
                         3386*   3390*
DVSRA   001376            236#    884    1029*   1030*   1031    1666*   1689*   1800*   1910*   2855*   2879*
DVSRS   001372            234#    883    1025*   1026*   1027    1365*   1418*   1470*   1524*   1573*   1656*   1665*   1679*
```

```
                       1685*     1694*     1727*     1796*     1815*     1906*     1925*     2153*     2224*     2329*     2429*     2556*     2685*
                       2843*     2854*     2865*     2874*     2884*     2989*     3093*     3180*     3250*
DVSRSH   001374         235#     1027*     1028*     1029
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
DV.MAP   001500         171       282#      387       414       997      1007      1131      1136      1185
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#
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      023700        3418#     3435
EM2      023727        3418#     3438
EM3      023767        3418#     3441
EM4      024032        3418#     3444
EM5      024076        3418#     3447
ENDPAT   023674        2925      3415#
ERRCNT   001232         142#      389*      511       829*
ERRFLG   001311         177#      385*      473*      540*      781*      794       808*      863*
ERRMSG   004252         791*      809       812#
```

```
ERTABO  004366        806      838#
EVENCH  020310       2717     2772#
EXIT  = 000205         81#    3309     3322     3341     3359     3364     3384     3388     3392
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
INSTR2  003236        593      605#
LIGHT   000174        110#     404
LIGHTS  001200        121#     404*     475*
LIMITS  003364        632      643#
LOAD.M  023342       1574     1657     1798     1908     2154     2225     2330     2845     2990     3094     3114     3181     3251
                     3310#
LOBITS  003442        618*     647      663#     664
LOCK    001220        137#     542*     556      558      800     1676*    1806*    1916*    2571*    2700*    2861*    2988*
LOGICA  002560        107      492#
LOKFLG  001312        178#
LOLIM   003434        615*     645      660#
LPCNT   001224        139#     537*     538      541*
LSTERR  001234        143#     390*     472*     524*     778      780*     864*
L00.03  001422        255#    1010*    1045     1226     1291     1340     1392     1444     1498     1550     1620     1760     1867
                     1975     2047     2124     2195     2297     2397     2524     2648     2797     2959     3066     3153     3223
L04.07  001424        256#    1012*    1050     1230     1295     1344     1396     1448     1502     1554     1626     1766     1874
                     1979     2051     2129     2200     2303     2403     2530     2654     2803     2964     3070     3157     3227
L08.11  001426        257#    1014*    1055     1234     1299     1348     1400     1452     1506     1558     1632     1772     1881
                     1983     2055     2134     2205     2309     2409     2536     2660     2809     2969     3074     3161     3231
L12.15  001430        258#    1016*    1060     1238     1303     1352     1404     1456     1510     1562     1638     1778     1888
                     1987     2059     2139     2210     2315     2415     2542     2666     2815     2974     3078     3165     3235
MASKX   001244        151#    1619*    1625*    1631*    1637*    1714     1721     1759*    1765*    1771*    1777*    1834     1836
                     1865*    1872*    1879*    1886*    1944     1946     2396*    2402*    2408*    2414*    2487     2523*    2529*
                     2535*    2541*    2612     2647*    2653*    2659*    2665*    2759     2796*    2802*    2808*    2814*    2825
                     2917
MASK.A  001406        245#    1046     1619     1759     1865     2396     2523     2647     2796
MASK.B  001410        246#    1051     1625     1765     1872     2402     2529     2653     2802
MASK.C  001412        247#    1056     1631     1771     1879     2408     2535     2659     2808
MASK.D  001414        248#    1061     1637     1777     1886     2414     2541     2665     2814
MASTEK  005400        802      960#
MCRLF   005104        571      694      798      799      807      948      960#    1069     1087
MCSRX   005330        477      960#
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#
MLOCK   005301        455      960#
MNEW    005402        426      960#
MPASSX  005344        481      960#
MPFAIL  005107        861      960#
MQM     005100        601      960#    1092
MR      005171        463      960#
```

```
MRESET= 004000              81#     880      893
MSTCLR= 104412             211#     865     1309     1360     1412     1464     1518     1570     1647     1787     1897     1994     2069
                          2149     2220     2325     2425     2552     2681     2837     2984     3087     3174     3244
MTITLE  001000             119#     408
MTSTN   005366             803      960#    1071
MTSTPC  005267             960#
MVECX   005336             479      960#
NEXT    001216             136#     544      834     1224*    1289*    1338*    1390*    1442*    1496*    1548*    1616*    1756*    1862*
                          1973*    2045*    2121*    2192*    2293*    2393*    2520*    2644*    2793*    2956*    3064*    3151*    3221*
NOLIST= ****** U             1
NPR   = 040000              76#
NPRLOC  023674            3416#
ODDCH   020262            2714     2768#
PARAM = 104405             201#    1072
PARAM1  003304             621#     638
PARBIT= 040000              81#    1116     2493     2601     2672     2908
PARERR  003360             624      626      628      637#     644      646      648
PASCNT  001230             141#     384*     474*     475      508
PERFOR= 004537              81#    1246     1311     1321     1574     1649     1657     1659     1681     1723     1738     1789     1797
                          1798     1817     1844     1845     1899     1907     1908     1927     1954     1955     1996     2071     2151
                          2154     2158     2222     2225     2229     2250     2327     2330     2334     2355     2427     2435     2438
                          2442     2460     2469     2499     2554     2561     2566     2574     2582     2585     2589     2608     2683
                          2690     2695     2703     2719     2725     2729     2752     2839     2844     2845     2896     2922     2927
                          2986     2990     2995     3019     3033     3091     3094     3114     3178     3181     3248     3251
PFTAB   004470             862      868#
POPRO = 012600              55#     828
POP1SP= 005726              55#
POP2SP= 022626              55#     546
PS    = 177776              53#     380*     449*    1196*
PUSHRO= 010046              55#     825
PUSH1S= 005746              55#
PUSH2S= 024646              55#
QV.FLG  001313             179#     386*     487*     535
RAM   = 020000              74#
RAMCLR= 104413             213#     866     1243
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
ROMCLK= 104415             217#    1257     1270     1654     1668     1670     1691     1693     1794     1802     1804     1904     1912
                          1914     2003     2013     2021     2078     2080     2090     2098     2445     2447     2453     2472     2491
                          2573     2588     2599     2702     2728     2739     2857     2859     2881     2883     2895     2906     2934
                          2936     3008     3184     3186     3254     3356     3358     3363     3373     3376     3387     3391
RUN     001304             169#     388*     989      992*     993*    1000*    1001*
RXSHIF  023402            2158     2229     2250     2334     2355     2435     2438     2442     2469     2561     2566     2585     2690
                          2695     2725     2995     3019     3033     3323#
SAVACT  001302             167#     429     1174*
SAVNUM  001303             168#     383*     485*     488*    1167*
SAVPC   001276             164#     669*     840
SAVRO   001260             157#     678*     683     3429
SAVR1   001262             158#     677*     684     3421
SAVR2   001264             159#     676*     685     3423
SAVR3   001266             160#     675*     686
SAVR4   001270             161#     674*     687     3427
```

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SAVR5   001272                  162#     673*     688     3425
SAVSP   001274                  163#
SAV05 = 104406                  203#     782
SCOPE = 104400                  191#    1241     1306     1355     1407     1459     1513     1565     1641     1781     1891     1990     2062
                               2142     2213     2318     2418     2545     2669     2818     2977     3081     3168     3238
SCOP1 = 104401                  193#    1718     1843     1953     2609     2753     2923     3045
SERV.G  004640                  523      770      914#     915
SETSCA  023544                 1246     1311     1321     1649     1738     1789     1845     1899     1955     1996     2071     2151     2222
                               2327     2427     2554     2683     2839     2986     3091     3178     3248     3367#
SET.TM  023622                 1723     1844     1954     2927     3385#
SILO.I  023510                 2574     2589     2703     2729     2896     3354#
SILO.O  023532                 2460     2499     2582     2608     2719     2752     2922     3361#
SKIP  = 000000                 3418#
SPACNT= 003745                  704*     725      728*     742#
SSWR    000176                  112#     405
STACK = 001200                   54#     381      450      835      857
STAT    001236                  148#    1226*    1230*    1234*    1238*    1291*    1295*    1299*    1303*    1340*    1344*    1348*    1352*
                               1357     1392*    1396*    1400*    1404*    1409     1444*    1448*    1452*    1456*    1461     1498*    1502*
                               1506*    1510*    1515     1550*    1554*    1558*    1562*    1567     1620*    1626*    1632*    1638*    1643
                               1760*    1766*    1772*    1778*    1783     1811     1867*    1874*    1881*    1888*    1893     1975*    1979*
                               1983*    1987*    2047*    2051*    2055*    2059*    2064     2124*    2129*    2134*    2139*    2144     2156
                               2195*    2200*    2205*    2210*    2215     2227     2243     2249     2297*    2303*    2309*    2315*    2320
                               2348     2397*    2403*    2409*    2415*    2420     2432     2437     2440     2461     2478     2480     2493
                               2524*    2530*    2536*    2542*    2547     2559     2563     2565     2601     2648*    2654*    2660*    2666*
                               2672     2675     2688     2692     2694     2712     2797*    2803*    2809*    2815*    2820     2834     2835
                               2847     2908     2959*    2964*    2969*    2974*    2979     2994     3017     3032     3066*    3070*    3074*
                               3078*    3083     3153*    3157*    3161*    3165*    3170     3223*    3227*    3231*    3235*    3240
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     1686     1695     2875     2885
SW00  = 000001                   34#     424
SW01  = 000002                   33#    1064
SW02  = 000004                   32#
SW03  = 000010                   31#
SW04  = 000020                   30#
SW05  = 000040                   29#
SW06  = 000100                   28#
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#
```

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SYNB01   001536       299#
SYNB02   001562       310#
SYNB03   001606       321#
SYNB04   001632       332#
SYNB05   001656       343#
SYNB06   001702       354#
SYNB07   001726       365#
SYNC     023646      2834*  2835*  2849   2851   2890   2892   3394#
SYNCX    001240       149#  1866*  1873*  1880*  1887*  1921   2296*  2302*  2308*  2314*  2332   2354
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*  1866   2296
SYNC2B   001434       261#  1013*  1873   2302
SYNC2C   001436       262#  1015*  1880   2308
SYNC2D   001440       263#  1017*  1887   2314
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#  1256   1269   1653   1793   1903   2002   2020   2077   2079   2097   2444   2446
                     2471   2572   2587   2701   2727   2894   2933   2935   3007   3183   3185   3253
TEMP     005562       708    858*   859*   971#
TEMP1    001246       152#   414*   415    420*   962   1193*  1194*  1706*  1709*  1710   1826*  1829*  1830
                     1936*  1939*  1940   2836*  2929*
TEMP2    001250       153#   415*   416    964   1582*  1598*  1812*  1841*  1922*  1951*  2824*  2852*  2853*
                     2855   2866*  2867*  2869   2878*  2879
TEMP3    001252       154#  2826*  2827*  2830*  2833*  2853   2867
TEMP4    001254       155#  2714*  2717*  2720   2722   2755*  2756
TEMP5    001256       156#  2721*  2722*  2723
TKCSR    001204       127#   529    588    914    921    942
TKDBR    001206       128#   519    531    590    596    766    923    944
TLAST  = 022750      1090   3418#
TPCSR    001210       129#   572    594    773    928
TPDBR    001212       130#   574*   596*   775*   930*
TRPOK    003762       754#
TSTNO    001226       140#   391*   843    870   1075   1082   1084   1223*  1288*  1337*  1389*  1441*  1495*
                     1547*  1615*  1755*  1861*  1972*  2044*  2120*  2191*  2292*  2392*  2519*  2643*  2792*
                     2955*  3063*  3150*  3220*
TST1     007260      1078   1094   1223#
TST10    011346      1548   1615#
TST11    012242      1616   1755#
TST12    012766      1756   1861#
TST13    013542      1862   1972#
TST14    014050      1973   2044#
TST15    014402      2045   2120#
TST16    014700      2121   2191#
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TST17   015334             2192     2292#
TST2    007542             1224     1288#
TST20   016020             2293     2392#
TST21   016652             2393     2519#
TST22   017424             2520     2643#
TST23   020336             2644     2792#
TST24   021342             2793     2955#
TST25   022046             2956     3063#
TST26   022436             3064     3150#
TST27   022750             3151     3220#    3418
TST3    007744             1289     1337#
TST30 = ****** U           3221
TST4    010152             1338     1389#
TST5    010366             1390     1441#
TST6    010614             1442     1495#
TST7    011042             1496     1547#
TTST    002702              456*     457*     459*     460*     527#
TWOSYN= 010000               81#    2243     2348     2563     2692     2847
TXSHIF  023252             1681     1817     1927     3278#
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
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#    1669     1692     1803     1913     2011     2088     2451     2489     2597     2737     2858     2882
                           2904
XHEAD   005461              413      960#
XPASS   002620              482      506#
XSTATQ  005506              419      960#
XTSTN   004374              804      841#
XVEC    002612              480      503#
$CRAP = 177777                1#    1214#    1219#    1280#    1284#    1328#    1332#    1378#    1384#    1431#    1436#    1485#    1490#
                           1539#    1543#    1606#    1611#    1746#    1751#    1852#    1857#    1962#    1968#    2034#    2040#    2111#
                           2116#    2174#    2187#    2275#    2288#    2380#    2388#    2508#    2515#    2623#    2639#    2778#    2788#
                           2940#    2951#    3052#    3059#    3140#    3146#    3211#    3216#
$E    = 000031                1#    1224     1225#    1289     1290#    1338     1339#    1390     1391#    1442     1443#    1496     1497#
                           1548     1549#    1616     1617#    1756     1757#    1862     1863#    1973     1974#    2045     2046#    2121
                           2122#    2192     2193#    2293     2294#    2393     2394#    2520     2521#    2644     2645#    2793     2794#
                           2956     2957#    3064     3065#    3151     3152#    3221     3222#
$N    = 000027                1#    1214     1221     1225#    1280     1286     1290#    1328     1335     1339#    1378     1387     1391#
                           1431     1439     1443#    1485     1493     1497#    1539     1545     1549#    1606     1613     1617#    1746
                           1753     1757#    1852     1859     1863#    1962     1970     1974#    2034     2042     2046#    2111     2118
                           2122#    2174     2189     2193#    2275     2290     2294#    2380     2390     2394#    2508     2517     2521#
                           2623     2641     2645#    2778     2790     2794#    2940     2953     2957#    3052     3061     3065#    3140
                           3148     3152#    321'     3218     3222#    3418#
$Y    - 000017                1#     182#     191      193#     195#     197#     199#     201#     203#     205#     207#     209#     211#
                            213#     215#     217#     219#     221#
.     = 024274               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#
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                              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    1247#   1312#
                              1358    1410    1462    1516    1568    1580    1644    1650#   1663    1674    1687    1696    1716
                              1784    1790#   1810    1839    1894    1900#   1920    1949    1997#   2016    2065    2072#   2093
                              2145    2152#   2216    2223#   2238    2247    2259    2267    2321    2328#   2343    2352    2364
                              2372    2421    2428#   2458    2497    2505#   2548    2555#   2606    2676    2684#   2750    2821
                              2840#   2876    2886    2920    2980    2987#   3084    3092#   3171    3179#   3241    3249#   3394#
.BEGIN  002332                449#
.CNVR1  003542                210     695#
.CONVR  003536                208     694#
.DATAC  004576                220     900#
.DELAY  004476                216     871#
.EOP    002436                471#    3221
.ERRTA  C24230                790     3431#
.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#
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DVEND         1#     465
DVFRNT        1#
HLT          55#     909    1255    1268    1320    1371    1424    1478    1532    1581    1589    1597    1664    1675    1717
           1735     1840    1950    2010    2017    2027    2087    2094    2104    2167    2239    2248    2260    2268    2344
           2353     2365    2373    2459    2498    2581    2596    2607    2710    2736    2744    2751    2903    2913    2921
           3006     3015    3030    3044    3104    3113    3124    3133    3195    3204    3263    3272    3320    3351
$BUFFE        1#     966
$CK15         1#    3335
$CK150        1#    3343
$CLR.T        1#    3389
$CYCLE        1#     975
$EOP          1#     465
$FINI         1#    3418
$GETFL        1#
$GETPA        1#    1070
$HEADE        1#
$LC01         1#    1213
$LC02         1#    1327    1377    1430    1484
$LC02A        1#    1538
$LC03         1#    1605
$LC03A        1#
$LC04         1#    1745    1851
$LC05         1#    1961    2033
$LC06         1#    2110
$LC06A        1#    2173    2274
$LC06B        1#    2379
$LC07         1#    2507    2622
$LC07A        1#    2777
$LC10         1#    2939
$LC11         1#    3051
$LC12         1#    3139
$LC13         1#    3210
$MSG          1#     960
$PFAIL        1#     844
$RAMCL        1#     871
$RXSHI        1#    3323
$SCOPE        1#     512
$SETLI        1#    1221    1286    1335    1387    1439    1493    1545    1613    1753    1859    1970    2042    2118    2189
           2290     2390    2517    2641    2790    2953    3061    3148    3218
$SETSC        1#    3366
$SETSY        1#
$SET.T        1#    3385
$SILOI        1#    3354
$SIMBC        1#
$TRPDE        1#     191     193     195     197     199     201     203     205     207     209     211     213     215     217
            219
$TSTN         1#    1221    1286    1335    1387    1439    1493    1545    1613    1753    1859    1970    2042    2118    2189
           2290     2390    2517    2641    2790    2953    3061    3148    3218
$TXSHI        1#    3278
$VARIA        1#     117
$XZ           1#    1214    1219    1280    1284    1328    1332    1378    1384    1431    1436    1485    1490    1539    1543
           1606     1611    1746    1751    1852    1857    1962    1968    2034    2040    2111    2116    2174    2187    2275
           2288     2380    2388    2508    2515    2623    2639    2778    2788    2940    2951    3052    3059    3140    3146
           3211     3216
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. ABS.  024274      000

 ERRORS DETECTED:  0

 CZDVBC,CZDVBC/SOL/CRF/DOC=CZDVBC.MAC,CZDVBC.P11
 RUN-TIME: 31 45 3 SECONDS
 RUN-TIM" RATIO: 279/81=3.4
 CORE USED:  27K  (53 PAGES)

 DOCUMENT PAGES:  77
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