IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZDVE-B-D

PRODUCT NAME: MODEM CONTROL AND CABLE TESTS PLUS MANUAL PARAMETER INPUT

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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 (DZDVE 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).

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

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. DZDVB [REV] Static line card tests.
3. DZDVC [REV] 'FREE RUNNING' Rom tests part 1.
4. DZDVD [REV] 'FREE RUNNING' Rom tests part 2.
5. DZDVE [REV] Modem control and cable tests plus manual parameter input. [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 real SWR (177570); SWR may be modified at Loc:176 or by hitting Control "G" <^G> on console terminal.

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

4.1.2 SWITCH REGISTER RESTRICTIONS

SW 00 RESELECT DV11'S DESIRED ACTIVE, please note that a message is typed out for setting the switch register equal to DV11's active, this means if the system has four DV11s; bits 00,01,02,03 will be set in loc 'DVACTV' from the switch register, Using this switch(SW00) alters that location;therefore if four DV11s are in the system ***DO NOT*** set switchs greater than SW 03 in the up position, this would be a fatal error, do not select more active DV11s than has been given information about in trial program.

METHOD: A: Load address 200
B: Start with SW 00=1
C: Program will type message
D: Set the binary number of DV11s desired active EXAMPLE: 1=1 DV11; 3=2 DV11; 7=3 DV11; 17=4 DV11 37=5 DV11 etc, PRESS CONTINUE.
E: Number (IF VALID) will be in data lights (excluding 11/05)
F: Set with any other switch settings desired, PRESS CONTINUE.

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

SW 09 LOOP ON CURRENT DATA; this switch will only work if call 'SCOPI' 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.

.TCH 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 DZDVE which is: 000200 for the modem control and cable tests and 000210 for the manual parameter input program.

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

5. OPERATING PROCEDURE

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

and program will begin running the diagnostic

5.2 PROGRAM AND/OR OPERATOR ACTION

The typical approach should be

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

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

6. ERRORS

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

6.2 ERROR RECOVERY

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

7. RESTRICTIONS

7.1 STARTING RESTRICTIONS

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

7.2 OPERATING RESTRICTIONS

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

7.3 HARDWARE CONFIGURATION RESTRICTIONS (SYNC LINE CARDS ONLY)

1. Hardware must be set to FULL DUPLEX
2. Parity off.
3. 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 DZDVE-B 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: DZDVE (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: Reserved
BIT 13 Set: Reserved
BIT 12 Set: One sync, =0: two syncs.
BIT 11 Set: Async line card, =0 Sync line card.
BIT 10 Set: Reserved
BIT 09 Set: Bits per char. (used with bit8)
BIT 08 Set: Bits per char. (used with bit9)

BIT09	BIT08	BITS PER CHAR.
0	0	8
0	1	7
1	0	6
1	1	5

BIT 07-00 SYNC "A" for specified line card.

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

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

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

1500 175000 This is the system control register for the 1st DV11 in the system.

1502 000300 This is vector 'A' for the first DV11 in the system.

1504 000226 This represents 'SYNC A' and the software status for the 1st line card in the 1st DV11. The bits are as follows:

BIT 15 Set: Line card *NOT installed (AND WONT BE TESTED)
BIT 14 Set: Reserved
BIT 13 Set: Reserved
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 175200 is reached. If a 'SLAVE SYNC RESPONSE' was issued by the DV11 (or any other device) (no nxm trap) ; pointer plus 12 (SEL12) is tested to contain 177777 (MUST BE EXACTLY 177777); if a trap is encountered or if SEL12 does not contain 177777 the above updating is performed. If SEL12 was equal to 177777 the pointer is stored away and the routine continues as above:
NOTE: If the program does not find your DV11; something is wrong and AUTO SIZING should not be done.

8.5.2 FINDING THE VECTOR

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

8.5.3 PARAMETER ASSUMPTIONS.

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

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

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

DOCUMENT
****
DZDVEB LST
****

2 MAINDEC-11-DZDVE-A/<377>/MODEM CONTROL TESTS AND MANUAL PARAMETER INPUT

1119 ROUTINE USED TO "AUTO SIZE" THE DV11
CSR AND VECTOR.
NOTE: THE CSR MAY BE ANY WHERE IN THE FLOATING
ADDRESS RANGE (175000:175400)
AND THE VECTOR MAY BE ANY WHERE IN THE
FLOATING VECTOR RANGE (300:770)

TABLE OF LOOP AROUND FUNCTIONS (H325)

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

1265 **
THIS "TEST 1" IS NOT ACTUALLY A TEST.
IT IS USED TO GET USERS INPUTS FOR WHICH LINE(S) ARE TO BE
EXERCISED. THE PROGRAM WILL TYPE OUT:
(A) H325
(B) H861
TYPE "A" "OR "B"

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

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

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

1464    ********************** TEST 2 ******************************
        INITIALIZATION CHECK
        VERIFY THAT CONTROL STATUS REGISTER AND LINE STATUS
        REGISTER WERE CLEARED BY INITIALIZE

1501    ********************** TEST 3 ******************************
        VERIFY THAT "INTERUPT ENABLE" CAN BE
        SET AND CLEARED.

1528    ********************** TEST 4 ******************************
        VERIFY THAT "DONE" CAN BE
        SET AND CLEARED.

1555    ********************** TEST 5 ******************************
        VERIFY THAT "MAINTENANCE MODE" CAN BE
        SET AND CLEARED.

1582    ********************** TEST 6 ******************************
        VERIFY THAT "SCAN ENABLE" CAN BE
        SET AND CLEARED.

1608    ********************** TEST 7 ******************************
        VERIFY THAT "BUSY" IS SET WHEN "SCAN ENABLE" IS SET
        VERIFY THAT "BUSY" IS CLEARED WHEN "SCAN ENABLE" IS CLEARED
```

```
1636    ********** TEST 10 **********
        VERIFY THAT SETTING "DONE" DOES NOT CAUSE AN
        INTERRUPT IF "INTERRUPT ENABLE" IS CLEARED.

1657    ********** TEST 11 **********
        VERIFY THAT NO INTERRUPT OCCURS WITH "INTERRUPT ENABLE"
        SET AND "DONE" CLEARED.

1678    ********** TEST 12 **********
        VERIFY THAT SETTING "DONE" CAUSES AN INTERRUPT
        WITH "INTERRUPT ENABLE" SET

1701    ********** TEST 13 **********
        VERIFY THAT NO INTERRUPT OCCURS WITH
        "INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 7.

1722    ********** TEST 14 **********
        VERIFY THAT NO INTERRUPT OCCURS WITH
        "INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 6.

1743    ********** TEST 15 **********
        VERIFY THAT NO INTERRUPT OCCURS WITH
        "INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 5.

1764    ********** TEST 16 **********
        VERIFY THAT NO INTERRUPT OCCURS WITH
        "INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 4.

1785    ********** TEST 17 **********
        VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
        ENABLE" SET AND "DONE" SET AT PRIORITY 0.

1806    ********** TEST 20 **********
        VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
        ENABLE" SET AND "DONE" SET AT PRIORITY 1.

1827    ********** TEST 21 **********
        VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
        ENABLE" SET AND "DONE" SET AT PRIORITY 2.

1848    ********** TEST 22 **********
        VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
        ENABLE" SET AND "DONE" SET AT PRIORITY 3.

1868    ********** TEST 23 **********
        VERIFY THAT ALL LINE NUMBERS CAN BE WRITTEN INTO AND
        READ BACK FROM LINE COUNTER

1894    ********** TEST 24 **********
        USING "STEP" MODE, VERIFY THAT THE
        LINE COUNTER CAN BE STEPPED THRU ALL STATES.
```

```
1921    ********************** TEST 25 ******************************
        WRITE 1'S INTO ALL SCANNER MEMORY LOCATIONS,
        VERIFY THAT ALL LOCATIONS HAVE BEEN WRITTEN
        TO 1'S,
        VERIFY THAT "CLEAR SCAN" CLEARS ALL SCANNER
        MEMORY LOCATIONS,

1973    ********************** TEST 26 ******************************
        WRITE 1'S INTO SELECTED SCANNER MEMORY LOCATION,
        VERIFY THAT ONLY SELECTED LOCATION WAS WRITTEN INTO,

2016    ********************** TEST 27 ******************************
        WITH ALL SCANNER MEMORY LOCATIONS SET TO 1'S,
        WRITE 0'S INTO SELECTED LOCATION
        VERIFY THAT ONLY SELECTED LOCATION WAS CLEARED,

2060    ********************** TEST 30 ******************************
        VERIFY THAT "CLEAR MULTIPLXER" CLEARS ALL MULTIPLEXER
        FUNCTION FLIP-FLOPS

2101    ********************** TEST 31 ******************************
        WRITE 1'S INTO ALL SCANNER MEMORY LOCATIONS
        SET "LINE ENABLE FOR ALL LINES
        VERIFY THAT AN INTERRUPT OCCURS FOR EACH LINE

2155    ********************** TEST 32 ******************************
        WRITE 1'S INTO ALL MULTIPLEXER FUNCTION FLIP-FLOPS
        CLEAR SCANNER MEMORY
        VERIFY THAT AN INTERRUPT OCCURS FOR EACH LINE
        THIS TEST IS DONE IF THE H861 TURN AROUND IS USED,

2233    ********************** TEST 33 ******************************
        VERIFY THAT LINE ENABLE FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2280    ********************** TEST 34 ******************************
        VERIFY THAT TERMINAL READY FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2327    ********************** TEST 35 ******************************
        VERIFY THAT REQUEST TO SEND FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2374    ********************** TEST 36 ******************************
        VERIFY THAT NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
```

```
2422    ********************** TEST 37 ******************************
        VERIFY THAT RING IS SET IF "LINE ENABLE"
        AND TERMINAL ARE SET FOR SELECTED LINE.
        THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2469    ********************** TEST 40 ******************************
        VERIFY THAT CLEAR TO SEND AND CARRIER ARE SET IF "LINE ENABLE"
        AND REQUEST TO SEND ARE SET FOR SELECTED LINE.
        THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2516    ********************** TEST 41 ******************************
        VERIFY THAT DATA SET READY(SECRX IF ASYNC LC) IS SET IF "LINE ENABLE"
        AND NEW SYNC (SECTX IF ASYNC LC) ARE SET FOR SELECTED LINE.
        THIS TEST IS DONE IF THE H325 TURN AROUND IS USED

2562    ********************** TEST 42 ******************************
        VERIFY THAT LINE ENABLE FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2616    ********************** TEST 43 ******************************
        VERIFY THAT TERMINAL READY FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2670    ********************** TEST 44 ******************************
        VERIFY THAT REQUEST TO SEND FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2724    ********************** TEST 45 ******************************
        VERIFY THAT SECONDARY TRANSMIT FUNCTION FLIP-FLOP CAN
        BE SET AND CLEARED FOR SELECTED LINE
        THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2779    ********************** TEST 46 ******************************
        VERIFY THAT CLEAR TO SEND AND CARRIER ARE SET IF "LINE ENABLE"
        AND TERMINAL ARE SET FOR SELECTED LINE.
        THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2833    ********************** TEST 47 ******************************
        VERIFY THAT RING IS SET IF "LINE ENABLE"
        AND REQUEST TO SEND ARE SET FOR SELECTED LINE.
        THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.

2887    ********************** TEST 50 ******************************
        VERIFY THAT SECONDARY RECEIVE IS SET IF "LINE ENABLE"
        AND SECONDARY TRANSMIT ARE SET FOR SELECTED LINE.
        THIS TEST IS DONE IF THE H861 TURN AROUND IS USED.
```

```
2940    ********************** TEST 51 ******************************
        DV11 SINGLE LINE CABLE TEST.
        TEST TO RUN A 5 BIT BLOCK (000-037)
        OF DATA FROM THE DV11 TRANSMITTER INTO THE
        DV11 RECEIVER THROUGH THE CABLE.
        SETUP:
        MODE:           EXTERNAL LOOP BACK
        TXBA:           SYNC
        TXWC:           -42(8)-BIT15
        RXBA            RXBA
        RXWC:           -40(8)-BIT15
        LINE PROTOCOL TXDDCMP,RXDDCMP,LRC8,STRIP SYNC,IDLE MARK
        LINE STATE      EXPECT BCC,TX GO
        LINE PROGRESS   SEND BCC
        NOTE: FOR TEST OF ASYNC LINE CARD;
         "SYNC 'A'" MUST BE SET TO ALL ZEROS
         IN SOFTWARE STATUS MAP.
```

```
                        ;*MAINDEC-11-DZDVE-A/<377>/MODEM CONTROL TESTS AND MANUAL PARAMETER INPUT
                        ;*COPYRIGHT 1972, DIGITAL EQUIPMENT CORP., MAYNARD, MASS. 01754
                        ;*************************************************************

                                ;STARTING PROCEDURE
                                ;LOAD PROGRAM
                                ;LOAD ADDRESS 000200
                                ;PRESS START
                                ;PROGRAM WILL TYPE "MAINDEC-11-DZDVE-A/<377>/MODEM CONTROL TESTS AND MANUAL PARA
                                ;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
                                ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
                                ;AND THEN RESUME TESTING


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

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



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

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

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

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

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

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

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

          000024                .=24
 000024   004402                        .PFAIL                  ;POWER FAIL HANDLER
 000026   000340                        340                     ;SERVICE AT LEVEL 7
 000030   004402                        .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  040515  047111  MTITLE: .ASCIZ  <377><12>/MAINDEC-11-DZDVE-A/<377>/MODEM CONTROL TESTS AND MANUAL PARAME
(2)
          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 ITERATIONS COMPLETED
 001226   000000                TSTNO:  0                       ;NUMBER OF TEST IN PROGRESS
 001230   000000                PASCNT: 0                       ;NUMBER OF PASSES COMPLETED
 001232   000000                ERRCNT: 0                       ;TOTAL NUMBER OF ERRORS
 001234   000000                LSTERR: 0                       ;PC OF LAST ERROR CALL


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

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

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

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

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

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

                                        ;-----------------------------------------------------------------
                                        ;!*****************************************************************
```



```
                                        ;DV11 VECTOR AND REGISTER INDIRECT POINTERS

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


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

001406  000             MASK,A: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 00-03
001407  000             MASK,B: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 04-07
001410  000             MASK,C: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 08-11
001411  000             MASK,D: .BYTE 000       ;LAST CHAR TO TEST AND PARITY MASK FOR LINES 12-15

001412  010             CLK,A:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 00-03
001413  010             CLK,B:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 04-07
001414  010             CLK,C:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 08-11
001415  010             CLK,D:  .BYTE 8.        ;NUMBER OF CLOCKS NEEDED FOR ONE CHAR FOR LINES 12-15

001416  000000          L00,03: 000000          ;PARAMETERS FOR LINES 00-03
001420  000000          L04,07: 000000          ;PARAMETERS FOR LINES 04-07
001422  000000          L08,11: 000000          ;PARAMETERS FOR LINES 08-11
001424  000000          L12,15: 000000          ;PARAMETERS FOR LINES 12-15

001426  000000          SYNC2A: 000000          ;SYNC 2
001430  000000          SYNC2B: 000000          ;
001432  000000          SYNC2C: 000000          ;
001434  000000          SYNC2D: 000000          ;

                                ;SUMMARY
                                ;-------
                        ;       MASK,X          040     5 BITS PER CHAR,
                        ;                       100     6 BITS PER CHAR,
                        ;                       200     7 BITS PER CHAR,
                        ;                       000     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,
```

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

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

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

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

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

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



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

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

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

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

001740  000000                        DV.END: 000000
```

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

001742  012737  000340  177776  .START: MOV     #340,PS                 ;LOCK OUT INTERRUPTS
001750  012706  001200                  MOV     #STACK,SP               ;SET UP STACK
001754  012737  004402  000024          MOV     #.PFAIL,@#24            ;SET UP POWER FAIL VECTOR
001762  113737  001301  001303          MOVB    DVNUM,SAVNUM            ;SAVE NUMBER OF DEVICES IN SYSTEM.
001770  005037  001230                  CLR     PASCNT                  ;CLEAR PASS COUNT
001774  105037  001311                  CLRB    ERRFLG                  ;CLEAR ERROR FLAG
002000  105037  001313                  CLRB    QV.FLG                  ;ZERO QUICK VERIFY FLAG
002004  012737  001500  001306          MOV     #DV.MAP,CREAM           ;GET MAP POINTER,
002012  112737  000001  001304          MOVB    #1,RUN                  ;POINT POINTER TO FIRST DEVICE.
002020  005037  001232                  CLR     ERRCNT                  ;CLEAR ERROR COUNT
002024  005037  001234                  CLR     LSTERR                  ;CLEAR LAST ERROR POINTER
002030  012737  000001  001226          MOV     #1,TSTNO                ;SET UP FOR TEST 1
002036  012737  001742  001214          MOV     #.START,RETURN          ;SET UP FOR POWER FAIL BEFORE
                                                                        ;TESTING STARTS
002044  105737  001310                  TSTB    INIFLG                  ;HAS INITIALIZATION BEEN PERFORMED
002050  001063                          BNE     1$                      ;BR IF YES
002052  013746  000004                  MOV     4,-(SP)                 ;
002056  013746  000006                  MOV     6,-(SP)                 ;
002062  005037  000006                  CLR     6                       ;
002066  012737  002104  000004          MOV     #80$,4                  ;
002074  005777  177102                  TST     @SWR                    ;
002100  000240                          NOP                             ;
002102  000407                          BR      81$                     ;
002104  022626                  80$:    CMP     (SP)+,(SP)+             ;
002106  012737  000174  001200          MOV     #LIGHT,LIGHTS           ;
002114  012737  000176  001202          MOV     #SSWR,SWR               ;
002122  012637  000006          81$:    MOV     (SP)+,6                 ;
002126  012637  000004                  MOV     (SP)+,4                 ;
002132  104402  001000                  TYPE    ,MTITLE                 ;TYPE TITLE MESSAGE
002136  105137  001310                  COMB    INIFLG                  ;IF NOT SET FLAG AND DO
002142  105777  177034                  TSTB    @SWR                    ;BIT7=1??
002146  100402                          BMI     16$                     ;BR IF NO AUTO SIZE
002150  004737  006624                  JSR     PC,CSRMAP               ;GO DO THE AUTO SIZE
002154  104402  005461          16$:    TYPE    ,XHEAD          ;TYPE HEADER
002160  012737  001500  001246          MOV     #DV.MAP,TEMP1           ;SET POINTER
002166  017737  177054  001250  5$:     MOV     @TEMP1,TEMP2            ;SET DATA
002174  022737  177777  001250          CMP     #177777,TEMP2           ;ALL DONE?
002202  001406                          BEQ     1$                      ;BR IF YES
002204  104410                          CONVRT                          ;
002206  005506                          XSTATQ                          ;
002210  062737  000002  001246          ADD     #2,TEMP1                ;UPDATE POINTER
002216  000763                          BR      5$
002220  005737  000042          1$:     TST     @#42                    ;IS PROGRAM RUNNING UNDER MONITOR
002224  001030                          BNE     3$                      ;BR IF YES
002226  032777  000001  176746          BIT     #SW00,@SWR              ;SELECT SPECIFIC DEVICES??
002234  001424                          BEQ     3$                      ;BR IF NO.
002236  104402  005402                  TYPE    ,MNEW                   ;TYPE THE MESSAGE.
002242  005000                          CLR     R0                      ;ZERO DATA LIGHTS
```



```
002244  000000                          HALT                            ;WAIT FOR USER TO TELL WHAT DEVICES TO RUN
002246  127737  176730  001302          CMPB    @SWR,SAVACT             ;IS THE NUMBER VALID?
002254  101404                          BLOS    2$                      ;BR IF NUMBER IS OK.
002256  104402  005243                  TYPE    ,MERR3                  ;TELL USER OF INVALID NUMBER.
002262  000000                          HALT                            ;STOP EVERY THING.
002264  000776                          BR      .-2                     ;RESTART THE PROGRAM AGAIN.
002266  117737  176710  001300  2$:     MOVB    @SWR,DVACTV             ;GET NEW DEVICE PATTERN
002274  113700  001300                  MOVB    DVACTV,R0               ;SHOW THE USER WHAT HE SELECTED.
002300  042700  177400                  BIC     #^C<377>,R0             ;USE ONLY LOW BYTE.
002304  000000                          HALT                            ;CONTINUE DYNAMIC SWITCHES.
002306  012700  000300          3$:     MOV     #300,R0                 ;PREPARE TO CLEAR THE FLOATING
002312  012701  000302                  MOV     #302,R1                 ;VECTOR AREA, 300-776
002316  010120                  4$:     MOV     R1,(R0)+                ;START PUTTING "PC+2 - HALT"
002320  005021                          CLR     (R1)+                   ;IN VECTOR AREA.
002322  022021                          CMP     (R0)+,(R1)+             ;POP POINTERS
002324  022700  001000                  CMP     #1000,R0                ;ALL DONE??
002330  001372                          BNE     4$                      ;BR IF NO.

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

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

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

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

                                        ;SCOPE LOOP AND INTERATION HANDLER
                                        ;*********************************

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



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

                                        ;CHECK FOR FREEZE ON CURRENT DATA
                                        ;********************************

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

                                        ;TELETYPE OUTPUT ROUTINE
                                        ;************************

003044  010546                  .TYPE:  MOV     R5,-(SP)        ;SAVE R5 ON THE STACK,
003046  017605  000002                  MOV     @2(SP),R5       ;GET ADDRESS OF MESSAGE,
003052  062766  000002  000002          ADD     #2,2(SP)        ;POP OVER ADDRESS,
003060  032777  010000  176114  1$:     BIT     #SW12,@SWR      ;INHIBIT ALL PRINT OUT??
003066  001012                          BNE     3$              ;BR IF NO PRINT OUT WANTED (SW12=1)
003070  105715                          TSTB    (R5)            ;IS NUMBER MINUS? (MSB=1(BIT7))
003072  100002                          BPL     2$              ;BR IF NUMBER IS PLUS
003074  104402  005104                  TYPE    ,MCRLF          ;TYPE A CR/LF!
003100  105777  176104          2$:     TSTB    @TPCSR          ;TTY READY?
003104  100375                          BPL     2$              ;BR IF NO,
003106  112577  176100                  MOVB    (R5)+,@TPDBR    ;PRINT CURRENT CHAR,
003112  001362                          BNE     1$              ;IF NOT ZERO KEEP PRINTING!
003114  012605                  3$:     MOV     (SP)+,R5        ;END OF OUTPUT, RESTORE R5
```

```
                                        BEQ     1$
004204  104402  005400                  TYPE    ,MASTEK
004210  104402  005366          1$:     TYPE    ,MTSTN
004214  104411  004374                  CNVRT   ,XTSTN          ;SHOW IT
004220  104402  005454                  TYPE    ,MERRPC         ;TYPE PC,
004224  104411  004366                  CNVRT   ,ERTAB0         ;SHOW IT
004230  104402  005104                  TYPE    ,MCRLF          ;GIVE A CR/LF
004234  112737  177777  001311          MOVB    #-1,ERRFLG      ;NO MORE HEADER UNLESS NO DATA TABLE,
004242  005737  004252                  TST     ERRMSG          ;IS THERE AN ERROR MESSAGE?
004246  001402                          BEQ     WRKO,FM         ;BR IF NO,
004250  104402                          TYPE                    ;TYPE
004252  000000          ERRMSG: 0                               ;    ERROR MESSAGE
004254                  WRKO,FM:                                ;
004254  005737  004264                  TST     DATAHD          ;DATA HEADER?
004260  001402                          BEQ     TYPDAT          ;BR IF NO
004262  104402                          TYPE                    ;TYPE
004264  000000          DATAHD: 0                               ;    DATA HEADER
004266  005737  004276          TYPDAT: TST     DATABP          ;DATA TABLE?
004272  001402                          BEQ     RESREG          ;BR IF NO,
004274  104410                          CONVRT                  ;SHOW
004276  000000          DATABP: 0                               ;    DATA TABLE
004300  104407          RESREG: RES05                           ;RESTORE PROC REGISTERS
004302  005777  174674          HALTS:  TST     @SWR            ;HALT ON ERROR?
004306  100005                          BPL     EXITER          ;BR IF NO HALT ON ERROR
004310  010046                          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                          TSTNO
                                        ;ENTER HERE ON POWER FAILURE
                                        ;-------------------------


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

                                        ;PROCESSOR WILL TRAP HERE WHEN POWER IS RESTORED

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



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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                          CLR     (R4)            ;ZERO THE SECONDARY REGISTER,
004542  062711  170361          1$:     ADD     #^C<BIT11+BIT10+BIT9+BIT8+BIT3+BIT2+BIT1+BIT0>+BIT0,(R1)
004546  001374                          BNE     1$
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
```

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                911
004640  032777  004000  174336  SERV,G: BIT     #4000,@TKCSR    ;RX BUSY?
004646  001374                  BNE     SERV,G          ;BR IF YES
004650  017737  174326  005072  MOV     @SWR,90$        ;SAVE (SWR).
004656  013777  005072  174316  1$:     MOV     90$,@SWR        ;
004664  104402  005052          TYPE    ,89$            ;
004670  104411  005064          CNVRT   ,88$            ;
004674  104402  005074          TYPE    ,91$            ;
004700  105777  174300          TSTB    @TKCSR          ;WAIT FOR DONE.
004704  100375                  BPL     .-4             ;
004706  017746  174274          MOV     @TKDBR,-(SP)    ;
004712  042716  000200          BIC     #BIT7,(SP)      ;
004716  122726  000015          CMPB    #15,(SP)+       ;
004722  001450                  BEQ     5$              ;
004724  005077  174252          CLR     @SWR            ;
004730  105777  174254          2$:     TSTB    @TPCSR          ;
004734  100375                  BPL     .-4             ;
004736  016677  177776  174246  MOV     -2(SP),@TPDBR   ;
004744  000241                  CLC                     ;
004746  006177  174230          ROL     @SWR            ;
004752  006177  174224          ROL     @SWR            ;
004756  006177  174220          ROL     @SWR            ;
004762  103735                  BCS     1$              ;ERROR
004764  026627  177776  000060  CMP     -2(SP),#60      ;
004772  002731                  BLT     1$              ;
004774  026627  177776  000067  CMP     -2(SP),#67      ;
005002  003325                  BGT     1$              ;
005004  042766  177770  177776  BIC     #^C<7>,-2(SP)   ;
005012  056677  177776  174162  BIS     -2(SP),@SWR     ;
005020  105777  174160          TSTB    @TKCSR          ;
005024  100375                  BPL     .-4             ;
005026  017746  174154          MOV     @TKDBR,-(SP)
005032  042716  000200          BIC     #BIT7,(SP)
005036  122726  000015          CMPB    #15,(SP)+
005042  001332                  BNE     2$              ;
005044  104402  005104          5$:     TYPE    ,MCRLF          ;
005050  000207                  RTS     PC
                
005052  020377  051450  051127  89$:    ,ASCIZ  <377>? (SWR)=/?
005060  036451  000057
                                ,EVEN
005064  000001                  88$:    1
005066     006     000                  ,BYTE   6,0
005070  005072                  90$
005072  000000                  90$:    ,WORD   0
005074  036457  000057          91$:    ,ASCIZ  ?/=/?
                                ,EVEN
005100  020040  000077          MQM:    ,ASCIZ  /  ?/
(2) 005104  005015     000      MCRLF:  ,ASCIZ   <15><12>
(2) 005107     377  053520  020122  MPFAIL: ,ASCIZ  <377>/PWR FAILED, RESTART AT TEST /
(2) 005145     377  047105  020104  MEPASS: ,ASCIZ  <377>/END PASS DZDVE-B  /
(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                  X$TATO: 2
005510     006     003                  ,BYTE   6,3
005512  001246                  TEMP1
005514     006     002                  ,BYTE   6,2
005516  001250                  TEMP2
                                ,EVEN
                
                                ;BUFFERS FOR INPUT-OUTPUT
                
005520  000000                  INBUF:  0
                005562          .=.+40
005562  000000                  TEMP:   0
                005624          .=.+40
005624  000000                  MDATA:  0
                005666          .=.+40
```

```
                                        ;
                                        ;ROUTINE USED TO "CYCLE" THROUGH UP TO EIGHT DV11'S
                                        ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
                                        ;AND RUNS THE SPECIFIED DV11'S.   THIS ROUTINE *MUST*
                                        ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
                                        ;SETUP NECESSARY.
                                        ;
005666  105737  001300          CYCLE:  TSTB    DVACTV          ;ARE ANY DV11'S TO BE TESTED?
005672  001004                          BNE     1$              ;BR IF OK.
005674  104402  005174                  TYPE    ,MERR2          ;NO DV11'S SELECTED!!
005700  000000                          HALT                    ;STOP THE SHOW.
005702  000776                          BR      .-2             ;DISQUALIFY CONT. SW.
005704  133737  001304  001300  1$:     BITB    RUN,DVACTV      ;IS THIS ONE "ACTIVE"
005712  001020                          BNE     2$              ;BR IF GOOD ONE FOUND.
005714  000241                          CLC                     ;CLEAR PROC. CARRY BIT.
005716  106137  001304                  ROLB    RUN             ;UPDATE POINTER
005722  105537  001304                  ADCB    RUN             ;CATCH CARRY FROM RUN
005726  062737  000024  001306          ADD     #24,CREAM       ;UPDATE ADDRESS POINTER.
005734  022737  001740  001306          CMP     #DV.END,CREAM
005742  001360                          BNE     1$              ;KEEP GOING; NOT ALL TESTED FOR.
005744  012737  001500  001306          MOV     #DV.MAP,CREAM   ;RESET ADDRESS POINTER.
005752  000754                          BR      1$              ;KEEP LOOKING FOR ACTIVE DV11
005754  000241                  2$:     CLC                     ;CLEAR PROC. CARRY.
005756  106137  001304                  ROLB    RUN             ;UPDATE POINTER.
005762  105537  001304                  ADCB    RUN             ;CATCH CARRY.
005766  013700  001306                  MOV     CREAM,R0        ;GET ADDRESS POINTER.
005772  062737  000024  001306          ADD     #24,CREAM       ;UPDATE.
006000  022737  001740  001306          CMP     #DV.END,CREAM
                                                                ;ALL DONE?
006006  001003                          BNE     3$              ;BR IF NO.
006010  012737  001500  001306          MOV     #DV.MAP,CREAM   ;RESTORE POINTER.
006016  012037  001362          3$:     MOV     (R0)+,DVSCR     ;LOAD SYSTEM CTRL. REG
006022  012037  001352                  MOV     (R0)+,DVRVEC    ;LOAD VECTOR
006026  012037  001416                  MOV     (R0)+,L00,03    ;GET LINE PARAMETERS, 00-03
006032  012037  001426                  MOV     (R0)+,SYNC2A    ;
006036  012037  001420                  MOV     (R0)+,L04,07    ;                       04-07
006042  012037  001430                  MOV     (R0)+,SYNC2B    ;
006046  012037  001422                  MOV     (R0)+,L08,11    ;                       08-11
006052  012037  001432                  MOV     (R0)+,SYNC2C    ;
006056  012037  001424                  MOV     (R0)+,L12,15    ;                       12-15
006062  012037  001434                  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  001416                  MOV     #L00,03,R0      ;LOAD STAUS 00-03
006266  012701  001406                  MOV     #MASK,A,R1      ;PREPARE MASK.
006272  012702  001412                  MOV     #CLK,A,R2       ;PREPARE CLOCKS
006276  004737  006516                  JSR     PC,FIX,00       ;GO AND CALCULATE CONFIGURATION.

006302  012700  001420                  MOV     #L04,07,R0      ;LOAD STAUS 00-03
006306  012701  001407                  MOV     #MASK,B,R1      ;PREPARE MASK.
006312  012702  001413                  MOV     #CLK,B,R2       ;PREPARE CLOCKS
006316  004737  006516                  JSR     PC,FIX,00       ;GO AND CALCULATE CONFIGURATION.

006322  012700  001422                  MOV     #L08,11,R0      ;LOAD STAUS 00-03
006326  012701  001410                  MOV     #MASK,C,R1      ;PREPARE MASK.
006332  012702  001414                  MOV     #CLK,C,R2       ;PREPARE CLOCKS
006336  004737  006516                  JSR     PC,FIX,00       ;GO AND CALCULATE CONFIGURATION.

006342  012700  001424                  MOV     #L12,15,R0      ;LOAD STAUS 00-03
006346  012701  001411                  MOV     #MASK,D,R1      ;PREPARE MASK.
006352  012702  001415                  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  007306                  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
```

```
1085  006460  104402  005104                  TYPE    ,MCRLF
1086  006464  000412                          BR      8$
1087  006466  005720                  6$:     TST     (R0)+
1088  006470  020027  020456                  CMP     R0,#TLAST+10
1089  006474  001354                          BNE     5$
1090  006476  104402  005100                  TYPE    ,MQM
1091  006502  000733                          BR      4$
1092  006504  012737  007306  001214  7$:     MOV     #TST1,RETURN    ;PREPARE RETURN ADDRESS
1093  006512  000177  172476          8$:     JMP     @RETURN         ;GO START TESTING.
1094
1095  006516  011003                  FIX,00: MOV     (R0),R3         ;GET PARAMETERS.
1096  006520  042703  176377                  BIC     #^C<1400>,R3    ;CLEAR JUNK.
1097  006524  005703                          TST     R3              ;TEST FOR EIGHT BITS.
1098  006526  001004                          BNE     1$              ;BR IF NOT 8 BITS.
1099  006530  105011                          CLRB    (R1)            ;SET
1100  006532  112712  000010                  MOVB    #8.,(R2)        ;
1101  006536  000424                          BR      4$
1102  006540  022703  000400          1$:     CMP     #400,R3         ;CHECK FOR SEVEN BITS.
1103  006544  001005                          BNE     2$              ;BR IF NOT 7 BITS.
1104  006546  112711  000200                  MOVB    #200,(R1)       ;
1105  006552  112712  000007                  MOVB    #7,(R2)         ;
1106  006556  000414                          BR      4$
1107  006560  022703  001000          2$:     CMP     #1000,R3        ;CHECK FOR SIX BITS.
1108  006564  001005                          BNE     3$              ;BR IF NOT SIX BITS.
1109  006566  112711  000300                  MOVB    #300,(R1)       ;
1110  006572  112712  000006                  MOVB    #6,(R2)         ;
1111  006576  000404                          BR      4$
1112  006600  112711  000340          3$:     MOVB    #340,(R1)       ;IF NONE OF THE ABOVE; MUST BE 5 BITS.
1113  006604  112712  000005                  MOVB    #5,(R2)         ;
1114  006610  032710  040000          4$:     BIT     #PARBIT,(R0)    ;PARITY ENABLED?
1115  006614  001401                          BEQ     5$              ;IF =0; THEN NO PARITY.
1116  006616  105212                          INCB    (R2)            ;PLUS ONE TO THE CLOCK!
1117  006620  000207                  5$:     RTS     PC              ;
1118
1119                                          ;*ROUTINE USED TO "AUTO SIZE" THE DV11
1120                                          ;*CSR AND VECTOR.
1121                                          ;*NOTE: THE CSR MAY BE ANY WHERE IN THE FLOATING
1122                                          ;*      ADDRESS RANGE (175000:175400)
1123                                          ;*      AND THE VECTOR MAY BE ANY WHERE IN THE
1124                                          ;*      FLOATING VECTOR RANGE (300:770)
1125                                          ;*
1126
1127  006622                          AUTO.SIZE:
1128  006622  000005                          RESET                   ;INSURE A BUS INIT.
1129  006624  012702  001500          CSRMAP: MOV     #DV.MAP,R2      ;LOAD MAP POINTER.
1130  006630  005022                  1$:     CLR     (R2)+           ;ZERO ENTIRE MAP
1131  006632  022702  001740                  CMP     #DV.END,R2      ;ALL DONE?
1132  006636  001374                          BNE     1$              ;BR IF NO
1133  006640  105037  001301                  CLRB    DVNUM           ;SET OCTAL NUMBER OF DV11'S TO 0
1134  006644  012702  001500                  MOV     #DV.MAP,R2
1135  006650  012701  175000                  MOV     #175000,R1      ;SET FOR FIRST ADDRESS TO BE TESTED
1136  006654  012737  007074  000004          MOV     #6$,@#4         ;SET FOR NON-EXISTANT DEVICE TIME OUT
1137  006662  005711                  2$:     TST     (R1)            ;IF DV11 DVSCR S/B 0
1138  006664  001037                          BNE     3$              ;IF NO DEV ; TRAP TO 4, IF NO BIT 8 THEN NO DV11
1139  006666  022761  177777  000012          CMP     #177777,12(R1)  ;IF DV11 THEN DVSFR S/B ALL 1'S ON INIT!
1140  006674  001033                          BNE     3$              ;BR IF NOT DV11
```



```
1141  006676  005761  000016                  TST     16(R1)          ;IF DV11 THEN RESV16 S/B ALL 0'S
1142  006702  001030                          BNE     3$              ;BR IF NOT DV11
1143                                  ;AT THIS POINT IT IS ASSUMED THAT R1 HOLDS A DV11 CSR ADDRESS.
1144  006704  010122                          MOV     R1,(R2)+        ;STORE CSR IN CORE TABLE.
1145  006706  005722                          TST     (R2)+           ;POP OVER VECTOR STORE AREA
1146  006710  052722  000226                  BIS     #226,(R2)+      ;SET LINE CARD 1 STAT AND SYNC
1147  006714  052722  000062                  BIS     #62,(R2)+       ;
1148  006720  052722  000226                  BIS     #226,(R2)+      ;SET LINE CARD 2 STAT AND SYNC
1149  006724  052722  000062                  BIS     #62,(R2)+       ;
1150  006730  052722  000226                  BIS     #226,(R2)+      ;SET LINE CARD 3 STAT AND SYNC
1151  006734  052722  000062                  BIS     #62,(R2)+       ;
1152  006740  052722  000226                  BIS     #226,(R2)+      ;SET LINE CARD 4 STAT AND SYNC
1153  006744  052722  000062                  BIS     #62,(R2)+       ;
1154  006750  105237  001301                  INCB    DVNUM           ;UPDATE DEVICE COUNTER
1155  006754  122737  000010  001301          CMPB    #10,DVNUM       ;ARE MAX. NO. OF DEV FOUND?
1156  006762  001405                          BEQ     10$             ;YES DON'T LOOK FOR ANY MORE.
1157  006764  062701  000010          3$:     ADD     #10,R1          ;UPDATE CSR POINTER ADDRESS
1158  006770  022701  175400                  CMP     #175400,R1
1159  006774  001332                          BNE     2$              ;BR IF MORE ADDRESS TO CHECK.
1160  006776  012722  177777          10$:    MOV     #177777,(R2)+   ;TERMINATER.
1161  007002  105037  001300                  CLRB    DVACTV
1162  007006  105737  001301                  TSTB    DVNUM           ;WERE ANY DV11'S FOUND AT ALL?
1163  007012  001423                          BEQ     5$              ;ERROR AUTO SIZER FOUND NO DV11'S IN THIS SYS.
1164  007014  113701  001301                  MOVB    DVNUM,R1
1165  007020  110137  001303                  MOVB    R1,SAVNUM       ;SAVE NUMBER OF DEVICES
1166  007024  000241                  4$:     CLC
1167  007026  106137  001300                  ROLB    DVACTV          ;GENERATE ACTIVE REGISTER OF DEVICES.
1168  007032  105237  001300                  INCB    DVACTV          ;SET THE BIT
1169  007036  005301                          DEC     R1
1170  007040  001371                          BNE     4$              ;BR IF MORE TO GENERATE
1171  007042  012737  000006  000004          MOV     #6,@#4          ;RESTORE TRAP VECTOR
1172  007050  113737  001300  001302          MOVB    DVACTV,SAVACT   ;SAVE ACTIVE REGISTER
1173  007056  000137  007102                  JMP     VECMAP          ;GO FIND THE VECTOR NOW.
1174  007062  104402  005174          5$:     TYPE    ,MERR2          ;NOTIFY OPR THAT NO DV11'S FOUND.
1175  007066  005000                          CLR     R0              ;MAKE DATA LIGHTS ZERO .
1176  007070  000000                          HALT                    ;STOP THE SHOW
1177  007072  000776                          BR      .-2             ;DISABLE CONT. SW.
1178  007074  012716  006764          6$:     MOV     #3$,(SP)        ;ENTERED BY NON-EXISTANT TIME-OUT.
1179  007100  000002                          RTI                     ;RETURN TO MAINSTREAM
1180
1181  007102  012737  000340  000022  VECMAP: MOV     #340,@#22       ;SET IOT TRAP PRIO TO 7
1182  007110  012737  007232  000020          MOV     #4$,@#20        ;SET IOT TRAP VECTOR
1183  007116  012702  001500                  MOV     #DV.MAP,R2      ;SET SOFTWARE POINTER
1184  007122  012700  000300                  MOV     #300,R0         ;FLOATING VECTORS START HERE.
1185  007126  012701  000302                  MOV     #302,R1         ;PC OF IOT INSTR.
1186  007132  010120                  1$:     MOV     R1,(R0)+        ;START FILLING VECTOR AREA
1187  007134  012721  000004                  MOV     #4,(R1)+        ;WITH ,+2; IOT
1188  007140  022021                          CMP     (R0)+,(R1)+     ;ADD 2 TO R0 +R1
1189  007142  020127  001000                  CMP     R1,#1000
1190  007146  101771                          BLOS    1$              ;BR IF MORE TO FILL
1191  007150  113737  001300  001246          MOVB    DVACTV,TEMP1    ;STORE TEMPORALLY
1192  007156  006037  001246          2$:     ROR     TEMP1           ;BRING OUT A BIT
1193  007162  103034                          BCC     5$              ;BR IF ALL DONE
1194  007164  005037  177776                  CLR     PS              ;ZERO CPU PRIO
1195  007170  012772  001300  000000          MOV     #BIT9+BIT7+BIT6,0(R2)
1196  007176  005000                          CLR     R0              ;ATTEMPT TO FORCE AN INTERUPT
```

```
007200  005200                          INC     R0              ;STALL
007202  001376                          BNE     .-2             ;       FOR TIME TO INTERUPT
007204  052762  000300  000002          BIS     #300,2(R2)      ;NO INTERUPT ASSUME 300 AND FIX DV11 LATER
007212  042772  176777  000000  3$:     BIC     #^C<BIT9>,@(R2)
007220  005072  000000                  CLR     @(R2)
007224  062702  000024                  ADD     #24,R2          ;POP SOFTWARE POINTER
007230  000752                          BR      2$              ;KEEP GOING
007232  051662  000002          4$:     BIS     (SP),2(R2)      ;GET VECTOR ADDRESS
007236  042762  000007  000002          BIC     #7,2(R2)        ;CLEAR JUNK
007244  022626                          CMP     (SP)+,(SP)+     ;POP IOT JUNK OFF STACK
007246  012716  007212                  MOV     #3$,(SP)        ;SET FOR RETURN
007252  000002                          RTI
007254  000207                  5$:     RTS     PC              ;ALL DONE WITH "AUTO SIZING"
```



```
                                ;CONTROL STATUS REGISTER BIT FUNCTIONS

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

                                ;LINE REGISTER BIT FUNCTIONS

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

007256  000000                  TURFLG: 0
007260  000000                  LINE:   0
007262  000000                  POINTER:        0
007264  000000                  CHAR:   0
007266  000000                  COUNT:  0
007270  000000                  SELECT: 0
007272  000000                  EXERCISE:       0
007274  000000                  TOTAL:  0
007276  000001                  MC.CSR: .BLKW 1
007300  000001                  MC.LSR: .BLKW 1
007302  000300                  MC.VEC: 300             ;DEFAULT VECTOR!!
007304  000001                  MC.LVL: .BLKW 1

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

```
1265                                    ;*********************************************************************
1266                                    ;*      THIS "TEST 1" IS NOT ACTUALLY A TEST,
1267                                    ;*      IT IS USED TO GET USERS INPUTS FOR WHICH LINE(S) ARE TO BE
1268                                    ;*      EXERCISED, THE PROGRAM WILL TYPE OUT:
1269                                    ;*      (A) H325
1270                                    ;*      (B) H861
1271                                    ;*      TYPE "A" "OR "B"
1272                                    ;*
1273                                    ;*      THE H325 TURN AROUND IS USED FOR THE SINGLE LINE
1274                                    ;*      TURN AROUND AT THE DISTRIBUTION PANEL OR
1275                                    ;*      AT THE END OF THE MODEM CABLE,
1276                                    ;*      THE H861 TURN AROUND IS USED FOR THE 16 LINE TURN AROUND,
1277                                    ;*      IF THE H325 WAS SELECTED (A) THE FOLLOWING WILL BE TYPED
1278                                    ;*      IF SW06=0:
1279                                    ;*      SELECT LINE(S):  XXXXXXXXXXXXXXX
1280                                    ;*
1281                                    ;*      THE FIRST "X" REPRESENTS LINE 15 AND EACH "X" IS THE
1282                                    ;*      NEXT LOWER LINE TILL THE LAST "X" IS LINE 0. TYPE
1283                                    ;*      A "1" OR A "0" UNDER THE APPROIATE "X"(LINE)
1284                                    ;*      TO EITHER SELECT(1) OR NOT TEST(0) EACH LINE,
1285                                    ;*      AFTER ALL 1'S AND 0'S ARE TYPED; TYPE A <CR>,
1286                                    ;*      THE PROGRAM WILL TYPE OUT IN OCTAL THE LINES YOU
1287                                    ;*      HAVE SELECTED; AND THE PROGRAM WILL BEGIN RUNNING
1288                                    ;*      THE HIGHEST SELECTED LINE THROUGH *ALL* TESTS THEN
1289                                    ;*      UPDATING TO THE NEXT LOWEST LINE TILL ALL SELECTED
1290                                    ;*      LINES ARE DONE, THEN THE PROGRAM WILL TYPE AN
1291                                    ;*      "END" CHAR,  PLEASE READ  THE SECTION ON PASS COMPLETE
1292                                    ;*                      IN DOCUMENT,
1293                                    ;*      IF THE H325 IS SELECTED AND SW06=1 THE FOLLOWING WILL BE TYPED:
1294                                    ;*      SINGLE LINE:
1295                                    ;*      THE USER MUST THEN TYPE IN A SINGLE LINE HE DESIRES (00-17) -OCTAL-
1296                                    ;*      END PASS IS THE SAME,
1297                                    ;*      REGUARDLESS OF WHICH CONNECTOR WAS SELECTED; THE
1298                                    ;*      THE LAST QUESTION IS:
1299                                    ;*      MODEM VECTOR:
1300                                    ;*      (THIS WILL BE ASKED ONLY AT THE INIATL START OF PROGRAM
1301                                    ;*      OR WHEN A DIFFERENT DV11 IN THE SYSTEM IS UNDER TEST)
1302                                    ;*      TYPE IN THE VECTOR OF THE MODEM CONTROL(300:774),
1303                                    ;*      THE CSR(MC,CSR) IS ASSUMED TO BE =DVSCR+20,
1304                                    ;*      NOTE:   IF CABLE TESTS ARE TO BE DONE ON OTHER
1305                                    ;*      DV11'S IN SYSTEM; SELECT THEM BY USING SW00 AS DESCRIBED
1306                                    ;*      IN THE DOCUMENTATION,
1307                                    ;*      UNLESS LOCATION 42 IS NON-ZERO IN WHICH CASE THE PROGRAM
1308                                    ;*      ASSUMES ITS UNDER ACT-11 MONITOR,  THE PROGRAM WILL
1309                                    ;*      CYCLE THROUGH ALL DV11S AND MODEM CONTROL *HOWEVER*
1310                                    ;*      THE RESTRICTIONS ARE:
1311                                    ;*      ***ALL*** MODEM VECTORS MUST BE AT 300
1312                                    ;*      ***ALL*** TURN AROUNDS MUST BE H861,
1313                                    ;*      "LONG END PASS" WILL BE GIVEN AT END OF LARGE END TO
1314                                    ;*              INDICATE DEVICES TESTED, PASSES TYPED IN THIS
1315                                    ;*              MESSAGE DO NOT INDICATE PASSES BUT RATHER THE
1316                                    ;*              NUMBER OF FULL PASSES THROUGH MULTIPLE DEVICES,
1317                                    ;*                      !LARGE END AND TYPE OUT MAY BE INHIBITED BY SW12!
1318                                    ;*********************************************************************
```



```
1319                                    ;  TEST 1
1320                                    ;--------------
1321  007306  012737  000001  001226  TST1:  MOV     #1,TSTNO
1322  007314  012737  010766  001216         MOV     #TST2,NEXT
1323  007322  005037  177776                CLR     PS              ;CLEAR CPU STATUS
1324  007326  013737  001362  007276         MOV     DVSCR,MC,CSR    ;GET MODEM CSR
1325  007334  062737  000020  007276         ADD     #20,MC,CSR      ;IT HAS TO BE 20(8) MORE THAN DVSCR,
1326  007342  013737  007276  007300         MOV     MC,CSR,MC,LSR   ;GET MODEM LSR
1327  007350  062737  000002  007300         ADD     #2,MC,LSR       ;MUST BE 2 MORE THAN CSR
1328  007356  012737  010274  000060         MOV     #KBISR,@#60     ;SET KEYBOARD INTERUPT VEC
1329  007364  012737  000340  000062         MOV     #340,@#62       ;SET LEV TO 7
1330  007372  012777  000100  171604         MOV     #100,@TKCSR     ;SET INTERUPT ENABLE
1331  007400  012737  000340  177776         MOV     #340,PS         ;LOCK OUT TTY
1332  007406  005737  000042                TST     @#42
1333  007412  001020                        BNE     44$
1334  007414  104402  023247          1$:   TYPE    ,MTURN
1335  007420  004737  023334                JSR     PC,TKRDY
1336  007424  122737  000101  001272         CMPB    #101,SAVR5
1337  007432  001004                        BNE     70$
1338  007434  012737  000377  007256         MOV     #377,TURFLG
1339  007442  000412                        BR      71$
1340  007444  122737  000102  001272  70$:  CMPB    #102,SAVR5
1341  007452  001360                        BNE     1$
1342  007454  005037  007256          44$:  CLR     TURFLG
1343  007460  012737  000001  007270         MOV     #1,SELECT
1344  007466  000523                        BR      68$
1345  007470  032777  000100  171504  71$:  BIT     #SW06,@SWR
1346  007476  001421                        BEQ     72$
1347                  007500          MAR18=.
1348  007500  104403  022240                INSTR   ,MSING
1349  007504  104405                        PARAM
1350  007506  000000                        00
1351  007510  000017                        17
1352  007512  007260                        LINE
1353  007514     000     001                .BYTE   0,1
1354  007516  012737  000001  007270         MOV     #1,SELECT
1355  007524  005337  007260          74$:  DEC     LINE
1356  007530  100502                        BMI     68$
1357  007532  000241                        CLC
1358  007534  006137  007270                ROL     SELECT
1359  007540  000771                        BR      74$
1360  007542  104402  022125          72$:  TYPE    ,MSEL           ;ASK FOR LINES
1361  007546  013737  007270  001252         MOV     SELECT,TEMP3    ;GET PREVIOUS LINE SELECT
1362  007554  005037  007270                CLR     SELECT          ;MAKE IT 0
1363  007560  105777  171420          2$:   TSTB    @TKCSR          ;READY?
1364  007564  100375                        BPL     2$              ;BR IF NO
1365  007566  017700  171414                MOV     @TKDBR,R0       ;READ CHAR
1366  007572  010077  171414                MOV     R0,@TPDBR       ;ECHO CHAR
1367  007576  042700  177600                BIC     #^C<177>,R0     ;STRIP ALL BUT DATA
1368  007602  022700  000123                CMP     #123,R0         ;WAS IT "S(AME)"
1369  007606  001004                        BNE     .+12            ;BR IF NO
1370  007610  013737  001252  007270         MOV     TEMP3,SELECT    ;RESTORE PREVIOUS LINES SELECTED
1371  007616  000415                        BR      4$              ;GO ON
1372  007620  022700  000015                CMP     #15,R0          ;WAS IT "<CR>"
1373  007624  001412                        BEQ     4$              ;BR IF YES
1374  007626  022700  000060                CMP     #60,R0          ;WAS IT "0"
```

```
1375  007632  001403                          BEQ     3$              ;BR IF YES
1376  007634  022700  000061                  CMP     #61,R0          ;WAS IT "1"
1377  007640  001265                          BNE     1$              ;BR IF NO, RETYPE MSG
1378  007642  006000                  3$:     ROR     R0              ;SHIFT THE BITS
1379  007644  006137  007270                  ROL     SELECT          ;BRING CARRY INTO SELECT
1380  007650  000743                          BR      2$              ;CONT.
1381  007652  005737  007270          4$:     TST     SELECT          ;ARE ANY LINES SELECTED?
1382  007656  001656                          BEQ     1$              ;BR IF NO, AND TYPE MSG
1383  007660  005037  001266                  CLR     SAVR3           ;SET TYPE OUT
1384  007664  013705  007270                  MOV     SELECT,R5       ;SAVE
1385  007670  104402  022206                  TYPE    ,MLINE          ;ALERT USER TO WHAT
1386  007674  005037  177776          65$:    CLR     PS              ;HE SELECTED
1387  007700  006005                  5$:     ROR     R5              ;
1388  007702  103002                          BCC     6$              ;
1389  007704  104411  023420                  CNVRT   ,XXLIN          ;
1390  007710  005237  001266          6$:     INC     SAVR3           ;
1391  007714  022737  000020  001266          CMP     #16.,SAVR3      ;
1392  007722  001366                          BNE     5$              ;
1393  007724  104402  022235                  TYPE    ,M,CRLF         ;
1394  007730  022700  000123                  CMP     #123,R0         ;
1395  007734  001427                          BEQ     69$             ;
1396  007736  005737  000042          68$:    TST     @#42
1397  007742  001016                          BNE     98$
1398  007744  022737                          CMP     (PC)+,@(PC)+
1399  007746  000000                  80$:    .WORD   0
1400  007750  001362                          DVSCR
1401  007752  001412                          BEQ     98$
1402  007754  104403  023314                  INSTR   ,MVECZ          ;
1403  007760  104405                          PARAM
1404  007762  000300                          300
1405  007764  000774                          774
1406  007766  007302                          MC,VEC
1407  007770      003     001                 .BYTE   3,1
1408  007772  013737  001362  007746          MOV     DVSCR,80$
1409  010000  013737  007302  007304  98$:    MOV     MC,VEC,MC,LVL   ;GET PRIORITY LEVEL
1410  010006  062737  000002  007304          ADD     #2,MC,LVL       ;UP IT.
1411  010014  012737  010326  007262  69$:    MOV     #TABLE,POINTER  ;
1412  010022  117737  177234  007266          MOVB    @POINTER,COUNT  ;
1413  010030  005237  007262                  INC     POINTER         ;
1414  010034  117737  177222  007264          MOVB    @POINTER,CHAR   ;
1415  010042  005237  007262                  INC     POINTER         ;
1416  010046  013737  007270  007272          MOV     SELECT,EXERCISE ;
1417  010054  012737  000020  007260          MOV     #20,LINE        ;
1418  010062  005337  007260          TESTER: DEC     LINE            ;
1419  010066  006337  007272                  ASL     EXERCISE        ;
1420  010072  103451                          BCS     2$              ;
1421  010074  001372                          BNE     TESTER          ;
1422  010076  112737  000377  001313          MOVB    #377,OV.FLG     ;
1423  010104  104402  007264                  TYPE    ,CHAR           ;
1424  010110  005337  007266                  DEC     COUNT           ;
1425  010114  001031                          BNE     3$              ;
1426  010116  117737  177140  007266          MOVB    @POINTER,COUNT  ;
1427  010124  001016                          BNE     4$              ;
1428  010126  005737  000042                  TST     42
1429  010132  001405                          BEQ     .+14
1430  010134  012737  002436  001214          MOV     #.EOP,RETURN
```



```
1431  010142  000177  171046                  JMP     @RETURN
1432  010146  012737  010326  007262          MOV     #TABLE,POINTER  ;
1433  010154  117737  177102  007266          MOVB    @POINTER,COUNT  ;
1434  010162  005237  007262          4$:     INC     POINTER         ;
1435  010166  117737  177070  007264          MOVB    @POINTER,CHAR
1436  010174  005237  007262                  INC     POINTER         ;
1437  010200  013737  007270  007272  3$:     MOV     SELECT,EXERCISE ;
1438  010206  012737  000020  007260          MOV     #20,LINE        ;
1439  010214  000722                          BR      TESTER          ;
1440  010216  012737  010766  001214  2$:     MOV     #TST2,RETURN    ;
1441  010224  013737  001214  001216          MOV     RETURN,NEXT     ;
1442  010232  005046                          CLR     -(SP)           ;SET FOR FAKE INTR
1443  010234  012746  010270                  MOV     #5$,-(SP)       ;SET FAKE PC OF INTR
1444  010240  032777  004000  170736          BIT     #BIT11,@TKCSR   ;TTY ACTIVE?
1445  010246  001374                          BNE     .-6             ;YES WAIT TILL DONE.
1446  010250  017746  170732                  MOV     @TKDBR,-(SP)
1447  010254  042716  000200                  BIC     #BIT7,(SP)      ;CLEAR PARITY
1448  010260  122726  000001                  CMPB    #1,(SP)+        ;WAS ^A (CHANGE LINES) HIT?
1449  010264  001403                          BEQ     KBISR           ;BR IF YES
1450  010266  022626                          CMP     (SP)+,(SP)+     ;BR TO KBISR NOT TAKEN
1451                                                                  ;POP FAKE INTR OFF STACK
1452  010270  000177  170720          5$:     JMP     @RETURN         ;
1453
1454  010274  010046                  KBISR:  MOV     R0,-(SP)        ;
1455  010276  017700  170704                  MOV     @TKDBR,R0       ;SAVE CHAR IN R0
1456  010302  042700  177600                  BIC     #^C<177>,R0     ;CLEAR ALL BUT DATA
1457  010306  022700  000001                  CMP     #1,R0           ;WAS IT <^A> (CNTRL A)?
1458  010312  001003                          BNE     1$              ;BR IF NO
1459  010314  012766  007500  000002          MOV     #MAR18,2(SP)    ;SET RETURN
1460  010322  012600                  1$:     MOV     (SP)+,R0        ;RESTORE R0
1461  010324  000002                          RTI                     ;CONT.
1462
1463  010326      001     015     002  TABLE:  .BYTE 1,15,2,12
      010332      010     040     012         .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
      010352      001     015     001         .BYTE 1,15,1,12
      010356      010     040     012         .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
      010376      001     015     001         .BYTE 1,15,1,12
      010402      010     040     002         .BYTE 8.,40,2,105,12.,40,2,116,6,40,2,116,4,40,2,104,6,40,2,104
      010426      001     015     001         .BYTE 1,15,1,12
      010432      010     040     002         .BYTE 8.,40,2,105,12.,40,2,116,6,40,2,116,4,40,2,104,6,40,2,104
      010456      001     015     001         .BYTE 1,15,1,12
      010462      010     040     002         .BYTE 8.,40,2,105,12.,40,4,116,4,40,2,116,4,40,2,104,6,40,2,104
      010506      001     015     001         .BYTE 1,15,1,12
      010512      010     040     002         .BYTE 8.,40,2,105,12.,40,4,116,4,40,2,116,4,40,2,104,6,40,2,104
      010536      001     015     001         .BYTE 1,15,1,12
      010542      010     040     010         .BYTE 8.,40,8.,105,6,40,2,116,2,40,2,116,2,40,2,116,4,40,2,104,6,40,2,104
      010572      001     015     001         .BYTE 1,15,1,12
      010576      010     040     010         .BYTE 8.,40,8.,105,6,40,2,116,2,40,2,116,2,40,2,116,4,40,2,104,6,40,2,104
      010626      001     015     001         .BYTE 1,15,1,12
      010632      010     040     002         .BYTE 8.,40,2,105,12.,40,2,116,4,40,4,116,4,40,2,104,6,40,2,104
      010656      001     015     001         .BYTE 1,15,1,12
      010662      010     040     002         .BYTE 8.,40,2,105,12.,40,2,116,4,40,4,116,4,40,2,104,6,40,2,104
      010706      001     015     001         .BYTE 1,15,1,12
      010712      010     040     012         .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
      010732      001     015     001         .BYTE 1,15,1,12
      010736      010     040     012         .BYTE 8.,40,10.,105,4,40,2,116,6,40,2,116,4,40,8.,104
```

```
010756      001     015     001         .BYTE 1,15,1,12
010762      000     000     000         .BYTE 0,0,0
          010766                        .EVEN
```

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

                                ;  TEST 2
                                ;--------------
010766  012737  000002  001226  TST2:  MOV     #2,TSTNO
010774  012737  011124  001216         MOV     #TST3,NEXT
011002  105777  170202                 TSTB    @TPCSR                  ;WAIT FOR TTY READY
011006  100375                         BPL     .-4                     ;BR IF NOT READY
011010  000005                         RESET                           ;INIT
011012  005005                         CLR     R5
011014  052777  000100  170162         BIS     #100,@TKCSR             ;SET TTY INTERUPT ENABLE
011022  012737  011112  000004         MOV     #1$,@#4                 ;SET FOR NON-EX DEVICE.
011030  012702  000010                 MOV     #8.,R2                  ;SET COUNTER
011034  027777  170144  170142  65$:   CMP     @TKCSR,@TKCSR           ;WASTE TIME
011042  027777  170136  170134         CMP     @TKCSR,@TKCSR           ;WASTE TIME
011050  005302                         DEC     R2                      ;DELAY DONE?
011052  001370                         BNE     65$                     ;BR IF NO
011054  005200                         INC     R0                      ;FLASH LIGHTS
011056  013703  007276                 MOV     MC.CSR,R3               ;SET MC.CSR POINTER
011062  011304                         MOV     (R3),R4                 ;READ REGISTER
011064  001401                         BEQ     .+4
011066  104002                         HLT     2                       ;CONTROL STATUS NOT CLEARED, ERROR
011070  013703  007300                 MOV     MC.LSR,R3               ;SET POINTER
011074  011304                         MOV     (R3),R4                 ;READ MC.LSR
011076  001401                         BEQ     .+4
011100  104002                         HLT     2                       ;LINE STATUS NOT CLEARED, ERROR
011102  012737  000006  000004         MOV     #6,@#4                  ;RESET TRAP CATCHER
011110  104400                         SCOPE                           ;CHECK FOR LOOP
011112  104005                 18:     HLT     5                       ;SHOULD NOT TRAP.
011114  012706  001200                 MOV     #STACK,SP               ;
011120  000177  170070                 JMP     @RETURN


                                        ;********************** TEST 3 ****************************
                                        ;*VERIFY THAT "INTERUPT ENABLE" CAN BE
                                        ;*SET AND CLEARED.
                                        ;!*************************************************************

                                ;  TEST 3
                                ;--------------
011124  012737  000003  001226  TST3:  MOV     #3,TSTNO
011132  012737  011216  001216         MOV     #TST4,NEXT
011140  013703  007276                 MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
011144  012713  000100                 MOV     #INTENA,(R3)            ;LOAD FUNCTION
011150  011304                         MOV     (R3),R4                 ;READ RESULTS
011152  042704  177677                 BIC     #^C<INTENA>,R4          ;MASK OFF ALL OTHER BITS,
011156  012705  000100                 MOV     #INTENA,R5                      ;MAKE R5=GOOD
011162  020504                         CMP     R5,R4                   ;RESULTS OK?
011164  001401                         BEQ     .+4                     ;BR IF YES
011166  104002                         HLT     2                       ;ERROR, R5=GOOD,R4=BAD,R3=REGISTER
011170  042705  000100                 BIC     #INTENA,R5
011174  042713  000100                 BIC     #INTENA,(R3)            ;CLEAR BIT
```



```
011200  011304                         MOV     (R3),R4                 ;READ REGISTER
011202  042704  177677                 BIC     #^C<INTENA>,R4          ;MASK OFF ALL OTHER BITS,
011206  020504                         CMP     R5,R4                   ;REGISTER OK?
011210  001401                         BEQ     .+4                     ;BR IF YES
011212  104002                         HLT     2                       ;BIT FAILED TO CLEAR
011214  104400                         SCOPE                           ;SCOPE TEST.


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

                                ;  TEST 4
                                ;--------------
011216  012737  000004  001226  TST4:  MOV     #4,TSTNO
011224  012737  011310  001216         MOV     #TST5,NEXT
011232  013703  007276                 MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
011236  012713  000200                 MOV     #DONE,(R3)              ;LOAD FUNCTION
011242  011304                         MOV     (R3),R4                 ;READ RESULTS
011244  042704  177577                 BIC     #^C<DONE>,R4            ;MASK OFF ALL OTHER BITS,
011250  012705  000200                 MOV     #DONE,R5                        ;MAKE R5=GOOD
011254  020504                         CMP     R5,R4                   ;RESULTS OK?
011256  001401                         BEQ     .+4                     ;BR IF YES
011260  104002                         HLT     2                       ;ERROR, R5=GOOD,R4=BAD,R3=REGISTER
011262  042705  000200                 BIC     #DONE,R5
011266  042713  000200                 BIC     #DONE,(R3)              ;CLEAR BIT
011272  011304                         MOV     (R3),R4                 ;READ REGISTER
011274  042704  177577                 BIC     #^C<DONE>,R4            ;MASK OFF ALL OTHER BITS,
011300  020504                         CMP     R5,R4                   ;REGISTER OK?
011302  001401                         BEQ     .+4                     ;BR IF YES
011304  104002                         HLT     2                       ;BIT FAILED TO CLEAR
011306  104400                         SCOPE                           ;SCOPE TEST.


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

                                ;  TEST 5
                                ;--------------
011310  012737  000005  001226  TST5:  MOV     #5,TSTNO
011316  012737  011402  001216         MOV     #TST6,NEXT
011324  013703  007276                 MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
011330  012713  001000                 MOV     #MAINT,(R3)             ;LOAD FUNCTION
011334  011304                         MOV     (R3),R4                 ;READ RESULTS
011336  042704  176777                 BIC     #^C<MAINT>,R4           ;MASK OFF ALL OTHER BITS,
011342  012705  001000                 MOV     #MAINT,R5                       ;MAKE R5=GOOD
011346  020504                         CMP     R5,R4                   ;RESULTS OK?
011350  001401                         BEQ     .+4                     ;BR IF YES
011352  104002                         HLT     2                       ;ERROR, R5=GOOD,R4=BAD,R3=REGISTER
011354  042705  001000                 BIC     #MAINT,R5
011360  042713  001000                 BIC     #MAINT,(R3)             ;CLEAR BIT
011364  011304                         MOV     (R3),R4                 ;READ REGISTER
011366  042704  176777                 BIC     #^C<MAINT>,R4           ;MASK OFF ALL OTHER BITS,
```

```
1576  011372  020504                        CMP     R5,R4                   ;REGISTER OK?
1577  011374  001401                        BEQ     .+4                     ;BR IF YES
1578  011376  104002                        HLT     2                       ;BIT FAILED TO CLEAR
1579  011400  104400                        SCOPE                           ;SCOPE TEST.
1580
1581
1582                                        ;********************** TEST 6 ****************************
1583                                        ;*VERIFY THAT "SCAN ENABLE" CAN BE
1584                                        ;*SET AND CLEARED.
1585                                        ;!**********************************************************
1586
1587                                ;  TEST 6
1588                                ;--------------
1589  011402  012737  000006  001226 TST6:  MOV     #6,TSTNO
1590  011410  012737  011474  001216        MOV     #TST7,NEXT
1591  011416  013703  007276                MOV     MC.CSR,R3               ;SET POINTER TO MC.CSR
1592  011422  012713  000040                MOV     #SCNENA,(R3)            ;LOAD FUNCTION
1593  011426  011304                        MOV     (R3),R4                 ;READ RESULTS
1594  011430  042704  177737                BIC     #^C<SCNENA>,R4          ;MASK OFF ALL OTHER BITS.
1595  011434  012705  000040                MOV     #SCNENA,R5                      ;MAKE R5=GOOD
1596  011440  020504                        CMP     R5,R4                   ;RESULTS OK?
1597  011442  001401                        BEQ     .+4                     ;BR IF YES
1598  011444  104002                        HLT     2                       ;ERROR, R5=GOOD,R4=BAD,R3=REGISTER
1599  011446  042705  000040                BIC     #SCNENA,R5
1600  011452  042713  000040                BIC     #SCNENA,(R3)            ;CLEAR BIT
1601  011456  011304                        MOV     (R3),R4                 ;READ REGISTER
1602  011460  042704  177737                BIC     #^C<SCNENA>,R4          ;MASK OFF ALL OTHER BITS.
1603  011464  020504                        CMP     R5,R4                   ;REGISTER OK?
1604  011466  001401                        BEQ     .+4                     ;BR IF YES
1605  011470  104002                        HLT     2                       ;BIT FAILED TO CLEAR
1606  011472  104400                        SCOPE                           ;SCOPE TEST.
1607
```



```
1608
1609                                        ;********************** TEST 7 ****************************
1610                                        ;*VERIFY THAT "BUSY" IS SET WHEN "SCAN ENABLE" IS SET
1611                                        ;*VERIFY THAT "BUSY" IS CLEARED WHEN "SCAN ENABLE" IS CLEARED
1612                                        ;!**********************************************************
1613
1614                                ;  TEST 7
1615                                ;--------------
1616  011474  012737  000007  001226 TST7:  MOV     #7,TSTNO
1617  011502  012737  011576  001216        MOV     #TST10,NEXT
1618  011510  013703  007276                MOV     MC.CSR,R3               ;SET REGISTER POINTER
1619  011514  012713  000040                MOV     #SCNENA,(R3)            ;SET SCAN ENABLE
1620  011520  011304                        MOV     (R3),R4                 ;READ REGISTER
1621  011522  010405                        MOV     R4,R5                   ;GET IMAGE
1622  011524  052705  000020                BIS     #BUSY,R5                ;SET BUSY BIT IN GOOD.
1623  011530  020504                        CMP     R5,R4                   ;REGISTER OK?
1624  011532  001401                        BEQ     .+4
1625  011534  104002                        HLT     2                       ;BUSY NOT SET, ERROR
1626  011536  042713  000040                BIC     #SCNENA,(R3)            ;CLEAR SCAN ENABLE
1627  011542  023737  000000  000000        CMP     0,0                     ;GIVE BUSY A CHANCE TO CLEAR
1628  011550  023737  000000  000000        CMP     0,0                     ;WHEN ON A HOT ROD MACHINE (11/70)!
1629  011556  011304                        MOV     (R3),R4                 ;READ MC.CSR
1630  011560  010405                        MOV     R4,R5                   ;GET IMAGE
1631  011562  042705  000020                BIC     #BUSY,R5                ;CLEAR BUSY IN GOOD.
1632  011566  020504                        CMP     R5,R4                   ;BUSY CLEARED?
1633  011570  001401                        BEQ     .+4
1634  011572  104002                        HLT     2                       ;BUSY NOT CLEARED, ERROR
1635  011574  104400                        SCOPE                           ;CHECK FOR LOOP, ITERATIONS
1636
1637                                        ;********************** TEST 10 ***************************
1638                                        ;*VERIFY THAT SETTING "DONE" DOES NOT CAUSE AN
1639                                        ;*INTERRUPT IF "INTERRUPT ENABLE" IS CLEARED.
1640                                        ;!**********************************************************
1641
1642                                ;  TEST 10
1643                                ;--------------
1644  011576  012737  000010  001226 TST10:  MOV     #10,TSTNO
1645  011604  012737  011664  001216        MOV     #TST11,NEXT
1646  011612  012737  000340  177776        MOV     #340,PS                 ;LOCK OUT INTERRUPTS
1647  011620  005077  175452                CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
1648  011624  012777  011656  175450        MOV     #18,@MC.VEC             ;SET UP INTERRUPT SERVICE ADDRESS
1649  011632  012777  000340  175444        MOV     #340,@MC.LVL            ;SET UP INTERRUPT PRIORITY
1650  011640  052777  000200  175430        BIS     #DONE,@MC.CSR           ;SET DONE
1651  011646  005037  177776                CLR     PS                      ;ALLOW INTERRUPTS
1652  011652  000240                        NOP                             ;DELAY FOR INTERRUPT
1653  011654  000402                        BR      2$                      ;NO INTERRUPT, CONTINUE
1654  011656  022626                1$:     POP2SP                          ;RESTORE STACK, INTERRUPT
1655  011660  104003                        HLT     3                       ;OCCURED, ERROR
1656  011662  104400                2$:     SCOPE                           ;CHECK FOR LOOP, ITERATIONS
```

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

                                ;  TEST 11
                                ;--------------
011664  012737  000011  001226 TST11:  MOV     #11,TSTNO
011672  012737  011752  001216         MOV     #TST12,NEXT
011700  012737  000340  177776         MOV     #340,PS                 ;LOCK OUT INTERRUPTS
011706  005077  175364                 CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
011712  012777  011744  175362         MOV     #1$,@MC,VEC             ;SET UP INTERRUPT SERVICE ADDRESS
011720  012777  000340  175356         MOV     #340,@MC,LVL            ;SET UP INTERRUPT SERVICE LEVEL
011726  052777  000100  175342         BIS     #INTENA,@MC,CSR         ;SET INTERRUPT ENABLE
011734  005037  177776                 CLR     PS                      ;ALLOW INTERRUPTS
011740  000240                         NOP                             ;DELAY FOR INTERRUPTS
011742  000402                         BR      2$                      ;NO INTERRUPT, CONTINUE
011744  022626                 1$:     POP2SP                          ;RESTORE STACK
011746  104003                         HLT     3                       ;INTERRUPT OCCURED, ERROR
011750  104400                 2$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP

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

                                ;  TEST 12
                                ;--------------
011752  012737  000012  001226 TST12:  MOV     #12,TSTNO
011760  012737  012046  001216         MOV     #TST13,NEXT
011766  012737  000340  177776         MOV     #340,PS                 ;LOCK OUT INTERRUPTS
011774  005077  175276                 CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
012000  012777  012042  175274         MOV     #1$,@MC,VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012006  012777  000100  175262         MOV     #INTENA,@MC,CSR         ;SET "INTERRUPT ENABLE"
012014  012777  000340  175262         MOV     #340,@MC,LVL            ;SET "INTERRUPT LEVEL"
012022  005037  177776                 CLR     PS                      ;ALLOW INTERRUPTS
012026  052777  000200  175242         BIS     #DONE,@MC,CSR           ;SET "DONE"
012034  000240                         NOP                             ;DELAY FOR INTERRUPT
012036  104004                         HLT     4                       ;INTERRUPT OCCURED, ERROR
012040  000401                         BR      2$                      ;CONTINUE
012042  022626                 1$:     POP2SP                          ;INTERRUPT OCCURED, RESTOR STACK
012044  104400                 2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP
```



```
                                        ;************************ TEST 13 *****************************
                                        ;*VERIFY THAT NO INTERRUPT OCCURS WITH
                                        ;*"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 7.
                                        ;!*************************************************************

                                ;  TEST 13
                                ;--------------
012046  012737  000013  001226 TST13:  MOV     #13,TSTNO
012054  012737  012136  001216         MOV     #TST14,NEXT
012062  005077  175210                 CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
012066  012737  000340  177776         MOV     #340,PS                 ;TO LEVEL 7.
012074  012777  012130  175200         MOV     #1$,@MC,VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012102  012777  000340  175174         MOV     #340,@MC,LVL            ;SET UP INTERRUPT SERVICE LEVEL
012110  012777  000100  175160         MOV     #INTENA,@MC,CSR         ;SET INTERRUPT ENABLE
012116  052777  000200  175152         BIS     #DONE,@MC,CSR           ;GENERATE INTERRUPT
012124  000240                         NOP                             ;DELAY FOR INTERRUPT
012126  000402                         BR      2$                      ;NO INTERRUPT, CONTINUE
012130  022626                 1$:     POP2SP                          ;RESTORE STACK
012132  104003                         HLT     3                       ;INTERRUPT OCCURED, ERROR
012134  104400                 2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP

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

                                ;  TEST 14
                                ;--------------
012136  012737  000014  001226 TST14:  MOV     #14,TSTNO
012144  012737  012226  001216         MOV     #TST15,NEXT
012152  005077  175120                 CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
012156  012737  000300  177776         MOV     #300,PS                 ;TO LEVEL 6.
012164  012777  012220  175110         MOV     #1$,@MC,VEC             ;SET UP INTERRUPT SERVICE ADDRESS
012172  012777  000300  175104         MOV     #300,@MC,LVL            ;SET UP INTERRUPT SERVICE LEVEL
012200  012777  000100  175070         MOV     #INTENA,@MC,CSR         ;SET INTERRUPT ENABLE
012206  052777  000200  175062         BIS     #DONE,@MC,CSR           ;GENERATE INTERRUPT
012214  000240                         NOP                             ;DELAY FOR INTERRUPT
012216  000402                         BR      2$                      ;NO INTERRUPT, CONTINUE
012220  022626                 1$:     POP2SP                          ;RESTORE STACK
012222  104003                         HLT     3                       ;INTERRUPT OCCURED, ERROR
012224  104400                 2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP
```

```
1742
1743                                        ;************************ TEST 15 ******************************
1744                                        ;*VERIFY THAT NO INTERRUPT OCCURS WITH
1745                                        ;*"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 5.
1746                                        ;!***********************************************************************
1747
1748                                    ;  TEST 15
1749                                    ;--------------
1750  012226  012737  000015  001226  TST15:  MOV     #15,TSTNO
1751  012234  012737  012316  001216          MOV     #TST16,NEXT
1752  012242  005077  175030                  CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
1753  012246  012737  000240  177776          MOV     #240,PS                 ;TO LEVEL 5.
1754  012254  012777  012310  175020          MOV     #1$,@MC,VEC             ;SET UP INTERRUPT SERVICE ADDRESS
1755  012262  012777  000240  175014          MOV     #240,@MC,LVL            ;SET UP INTERRUPT SERVICE LEVEL
1756  012270  012777  000100  175000          MOV     #INTENA,@MC,CSR         ;SET INTERRUPT ENABLE
1757  012276  052777  000200  174772          BIS     #DONE,@MC,CSR           ;GENERATE INTERRUPT
1758  012304  000240                          NOP                             ;DELAY FOR INTERRUPT
1759  012306  000402                          BR      2$                      ;NO INTERRUPT, CONTINUE
1760  012310  022626                  1$:     POP2SP                          ;RESTORE STACK
1761  012312  104003                          HLT     3                       ;INTERRUPT OCCURED, ERROR
1762  012314  104400                  2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP
1763
1764                                        ;************************ TEST 16 ******************************
1765                                        ;*VERIFY THAT NO INTERRUPT OCCURS WITH
1766                                        ;*"INTERRUPT ENABLE" SET AND "DONE" SET AT PRIORITY 4.
1767                                        ;!***********************************************************************
1768
1769                                    ;  TEST 16
1770                                    ;--------------
1771  012316  012737  000016  001226  TST16:  MOV     #16,TSTNO
1772  012324  012737  012406  001216          MOV     #TST17,NEXT
1773  012332  005077  174740                  CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
1774  012336  012737  000200  177776          MOV     #200,PS                 ;TO LEVEL 4.
1775  012344  012777  012400  174730          MOV     #1$,@MC,VEC             ;SET UP INTERRUPT SERVICE ADDRESS
1776  012352  012777  000200  174724          MOV     #200,@MC,LVL            ;SET UP INTERRUPT SERVICE LEVEL
1777  012360  012777  000100  174710          MOV     #INTENA,@MC,CSR         ;SET INTERRUPT ENABLE
1778  012366  052777  000200  174702          BIS     #DONE,@MC,CSR           ;GENERATE INTERRUPT
1779  012374  000240                          NOP                             ;DELAY FOR INTERRUPT
1780  012376  000402                          BR      2$                      ;NO INTERRUPT, CONTINUE
1781  012400  022626                  1$:     POP2SP                          ;RESTORE STACK
1782  012402  104003                          HLT     3                       ;INTERRUPT OCCURED, ERROR
1783  012404  104400                  2$:     SCOPE                           ;CHECK FOR ITERATION, LOOP
```



```
1784
1785                                        ;************************ TEST 17 ******************************
1786                                        ;*VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
1787                                        ;*ENABLE" SET AND "DONE" SET AT PRIORITY 0.
1788                                        ;!***********************************************************************
1789
1790                                    ;  TEST 17
1791                                    ;--------------
1792  012406  012737  000017  001226  TST17:  MOV     #17,TSTNO
1793  012414  012737  012474  001216          MOV     #TST20,NEXT
1794  012422  005077  174650                  CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
1795  012426  012777  012470  174646          MOV     #1$,@MC,VEC             ;SET UP INTERRUPT SERVICE ADDRESS
1796  012434  005077  174644                  CLR     @MC,LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
1797  012440  012737  000000  177776          MOV     #0,PS                   ;SET PROCESSOR PRIORITY TO LEVEL 0.
1798  012446  012777  000100  174622          MOV     #INTENA,@MC,CSR         ;SET INTERRUPT ENABLE
1799  012454  052777  000200  174614          BIS     #DONE,@MC,CSR           ;GENERATE INTERRUPT
1800  012462  000240                          NOP                             ;WAIT FOR INTERRUPT
1801  012464  104004                          HLT     4                       ;NO INTERRUPT, ERROR.
1802  012466  000401                          BR      2$                      ;CONTINUE
1803  012470  022626                  1$:     POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
1804  012472  104400                  2$:     SCOPE                           ;CHECK FOR INTERATIONS, LOOP.
1805
1806                                        ;************************ TEST 20 ******************************
1807                                        ;*VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
1808                                        ;*ENABLE" SET AND "DONE" SET AT PRIORITY 1.
1809                                        ;!***********************************************************************
1810
1811                                    ;  TEST 20
1812                                    ;--------------
1813  012474  012737  000020  001226  TST20:  MOV     #20,TSTNO
1814  012502  012737  012562  001216          MOV     #TST21,NEXT
1815  012510  005077  174562                  CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
1816  012514  012777  012556  174560          MOV     #1$,@MC,VEC             ;SET UP INTERRUPT SERVICE ADDRESS
1817  012522  005077  174556                  CLR     @MC,LVL                 ;SET UP INTERRUPT SERVICE PRIORITY
1818  012526  012737  000040  177776          MOV     #40,PS                  ;SET PROCESSOR PRIORITY TO LEVEL 1.
1819  012534  012777  000100  174534          MOV     #INTENA,@MC,CSR         ;SET INTERRUPT ENABLE
1820  012542  052777  000200  174526          BIS     #DONE,@MC,CSR           ;GENERATE INTERRUPT
1821  012550  000240                          NOP                             ;WAIT FOR INTERRUPT
1822  012552  104004                          HLT     4                       ;NO INTERRUPT, ERROR.
1823  012554  000401                          BR      2$                      ;CONTINUE
1824  012556  022626                  1$:     POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
1825  012560  104400                  2$:     SCOPE                           ;CHECK FOR INTERATIONS, LOOP.
```

```
                                        ;************************ TEST 21 *****************************
                                        ;*VERIFY THAT AN INTERRUPT OCCURS WITH "INTERRUPT
                                        ;*ENABLE" SET AND "DONE" SET AT PRIORITY 2.
                                        ;!*************************************************************

                                    ; TEST 21
                                    ;--------------
012562  012737  000021  001226 TST21: MOV     #21,TSTNO
012570  012737  012650  001216        MOV     #TST22,NEXT
012576  005077  174474               CLR     @MC,CSR             ;CLEAR CONTROL REGISTER
012602  012777  012644  174472        MOV     #1$,@MC,VEC         ;SET UP INTERRUPT SERVICE ADDRESS
012610  005077  174470               CLR     @MC,LVL             ;SET UP INTERRUPT SERVICE PRIORITY
012614  012737  000100  177776        MOV     #100,PS             ;SET PROCESSOR PRIORITY TO LEVEL 2.
012622  012777  000100  174446        MOV     #INTENA,@MC,CSR     ;SET INTERRUPT ENABLE
012630  052777  000200  174440        BIS     #DONE,@MC,CSR       ;GENERATE INTERRUPT
012636  000240                       NOP                         ;WAIT FOR INTERRUPT
012640  104004                       HLT     4                   ;NO INTERRUPT, ERROR.
012642  000401                       BR      2$                  ;CONTINUE
012644  022626                1$:    POP2SP                      ;INTERRUPT OCCURED, RESTORE STACK
012646  104400                2$:    SCOPE                       ;CHECK FOR INTERATIONS, LOOP.

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

                                    ; TEST 22
                                    ;--------------
012650  012737  000022  001226 TST22: MOV     #22,TSTNO
012656  012737  012736  001216        MOV     #TST23,NEXT
012664  005077  174406               CLR     @MC,CSR             ;CLEAR CONTROL REGISTER
012670  012777  012732  174404        MOV     #1$,@MC,VEC         ;SET UP INTERRUPT SERVICE ADDRESS
012676  005077  174402               CLR     @MC,LVL             ;SET UP INTERRUPT SERVICE PRIORITY
012702  012737  000140  177776        MOV     #140,PS             ;SET PROCESSOR PRIORITY TO LEVEL 3.
012710  012777  000100  174360        MOV     #INTENA,@MC,CSR     ;SET INTERRUPT ENABLE
012716  052777  000200  174352        BIS     #DONE,@MC,CSR       ;GENERATE INTERRUPT
012724  000240                       NOP                         ;WAIT FOR INTERRUPT
012726  104004                       HLT     4                   ;NO INTERRUPT, ERROR.
012730  000401                       BR      2$                  ;CONTINUE
012732  022626                1$:    POP2SP                      ;INTERRUPT OCCURED, RESTORE STACK
012734  104400                2$:    SCOPE                       ;CHECK FOR INTERATIONS, LOOP.
```



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

                                    ; TEST 23
                                    ;--------------
012736  012737  000023  001226 TST23: MOV     #23,TSTNO
012744  012737  013024  001216        MOV     #TST24,NEXT
012752  012737  013000  001220        MOV     #1$,LOCK
012760  013703  007276               MOV     MC,CSR,R3           ;SET POINTER
012764  005013                       CLR     (R3)                ;CLEAR CONTROL STATUS REGISTER
012766  005037  177776               CLR     PS                  ;ENABLE INTERRUPTS
012772  005005                       CLR     R5                  ;CLEAR EXPECTED LINE NUMBER
012774  012700  000020               MOV     #16.,R0             ;SET UP TO TEST 16 LINE NUMBERS
013000  010513                1$:    MOV     R5,(R3)             ;SET LINE NUMBER
013002  011304                       MOV     (R3),R4             ;READ BACK LINE NUMBER
013004  020504                       CMP     R5,R4               ;ARE EXPECTED AND RECEIVED
013006  001401                       BEQ     2$                  ;LINE NUBMERS THE SAME
013010  104002                       HLT     2                   ;LINE NUMBERS DIFFERENT, ERROR
013012  104401                2$:    SCOP1                       ;CHECK FOR DATA FREEZE
013014  005205                       INC     R5                  ;UPDATE LINE COUNT
013016  005300                       DEC     R0                  ;UPDATE LINE NUMBER
013020  001367                       BNE     1$                  ;CONTINUE
013022  104400                       SCOPE                       ;CHECK FOR ITERATION, LOOP

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

                                    ; TEST 24
                                    ;--------------
013024  012737  000024  001226 TST24: MOV     #24,TSTNO
013032  012737  013122  001216        MOV     #TST25,NEXT
013040  012737  013052  001220        MOV     #1$,LOCK
013046  013703  007276               MOV     MC,CSR,R3           ;SET POINTER
013052  005037  177776         1$:   CLR     PS                  ;ENABLE INTERRUPTS
013056  005013                       CLR     (R3)                ;CLEAR CONTROL STATUS REGISTER
013060  005005                       CLR     R5                  ;CLEAR EXPECTED LINE COUNT
013062  012700  000020               MOV     #16.,R0             ;SET UP TO TEST 16 VALUES
013066  012713  000017               MOV     #17,(R3)            ;FIRST VALUE =0
013072  052713  000400         2$:   BIS     #STEP,(R3)          ;STEP LINE COUNTER
013076  104414                       DELAY
013100  011304                       MOV     (R3),R4             ;READ LINE COUNTER
013102  020504                       CMP     R5,R4               ;COMPARE EXPECTED AND
013104  001401                       BEQ     3$                  ;RECEIVED LINE NUMBERS
013106  104002                       HLT     2                   ;LINE COUNTER ERROR
013110  104401                3$:    SCOP1                       ;CHECK FOR DATA FREEZE
013112  005205                       INC     R5                  ;UPDATE EXPECTED LINE NUMBER
013114  005300                       DEC     R0
013116  001365                       BNE     2$
013120  104400                       SCOPE                       ;CHECK FOR ITERATIONS, LOOP
```

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

                                ;  TEST 25
                                ;--------------
013122  012737  000025  001226  TST25: MOV     #25,TSTNO
013130  012737  013324  001216         MOV     #TST26,NEXT
013136  012737  013150  001220         MOV     #1$,LOCK
013144  013703  007276                 MOV     MC,CSR,R3               ;SET POINTER
013150  012713  002000          1$:    MOV     #CLRMUX,(R3)            ;CLEAR CONTROL STATUS REGISTER
013154  005037  177776                 CLR     PS                      ;ENABLE INTERRUPTS
013160  012700  000020                 MOV     #16.,R0                 ;SET UP TO TEST 16 LOCATIONS
013164  052713  001017                 BIS     #MAINT+17,(R3)          ;SET MAINTEANCE MODE
013170  052713  000400          2$:    BIS     #STEP,(R3)              ;SET LINE COUNTER THRU ALL
013174  005300                 DEC     R0                      ;STATES, WRITING 1'S INTO
013176  001374                 BNE     2$                      ;ALL MEMORY WORDS
013200  012700  000020                 MOV     #16.,R0                 ;SET UP TO TEST 16 WORDS
013204  012705  070000                 MOV     #70000,R5               ;SET UP EXPECTED STATUS REGISTER
013210  012713  000017                 MOV     #17,(R3)                ;START WITH LINE 0
013214  052713  000400          3$:    BIS     #STEP,(R3)              ;ACCESS SCANNER MEMORY
013220  104414                 DELAY
013222  011304                 MOV     (R3),R4                 ;READ DATA
013224  020504                 CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
013226  001401                 BEQ     4$                      ;DATA
013230  104002                 HLT     2                       ;CONTROL STATUS OR MEMORY ERROR
013232  104401                 SCOP1                           ;CHECK FOR DATA FREEZE
013234  005205          4$:    INC     R5                      ;UPDATE EXPECTED STATUS
013236  005300                 DEC     R0                      ;UPDATE LINE COUNT
013240  001365                 BNE     3$                      ;CONTINUE
013242  012737  013250  001220         MOV     #5$,LOCK                ;SET RETURN
013250  012713  004000          5$:    MOV     #CLRSCN,(R3)            ;SET "CLEAR SCAN"
013254  032713  000020                 BIT     #BUSY,(R3)              ;WAIT FOR "CLEAR CYCLES"
013260  001375                 BNE     .-4
013262  012700  000020                 MOV     #16.,R0                 ;SET UP TO TEST 16 MEMORY
013266  005005                 CLR     R5                      ;LOCATIONS
013270  012713  000017                 MOV     #17,(R3)                ;FIRST TO BE TESTED=0
013274  052713  000400          6$:    BIS     #STEP,(R3)              ;ACCESS SCANNER MEMORY
013300  104414                 DELAY
013302  011304                 MOV     (R3),R4                 ;READ DATA
013304  020504                 CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
013306  001402                 BEQ     7$                      ;DATA
013310  104002                 HLT     2                       ;CONTROL  STATUS OF MEMORY ERROR
013312  104401                 SCOP1                           ;CHECK FOR DATA FREEZE
013314  005205          7$:    INC     R5                      ;UPDATE EXPECTED DATA
013316  005300                 DEC     R0                      ;UPDATE LINE COUNT
013320  001365                 BNE     6$                      ;CONTTINUE
013322  104400                 SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```



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

                                ;  TEST 26
                                ;--------------
013324  012737  000026  001226  TST26: MOV     #26,TSTNO
013332  012737  013506  001216         MOV     #TST27,NEXT
013340  012737  013352  001220         MOV     #1$,LOCK
013346  013703  007276                 MOV     MC,CSR,R3               ;SET POINTER
013352  005013          1$:    CLR     (R3)                    ;CLEAR CONTROL STATUS REGISTER
013354  005037  177776                 CLR     PS                      ;ENABLE INTERRUPTS
013360  012700  000020                 MOV     #16.,R0                 ;SET UP TO TEST 16 ADDRESSES
013364  012702  000017                 MOV     #17,R2                  ;FIRST ADDRESS TO BE TESTED=0
013370  012713  004000          2$:    MOV     #CLRSCN,(R3)            ;CLEAR SCANNER MEMORY
013374  032713  000020                 BIT     #BUSY,(R3)              ;WAIT FOR CLEAR CYCLE
013400  001375                 BNE     .-4
013402  012713  001000                 MOV     #MAINT,(R3)             ;SET "MAINTENANCE MODE"
013406  050213                 BIS     R2,(R3)                 ;SET LINE COUNTER TO TEST ADDRESS=1
013410  052713  000400                 BIS     #STEP,(R3)              ;WRITE 1'S INTO TEST ADDRESS
013414  042713  001000                 BIC     #MAINT,(R3)             ;CLEAR "MAINTENANCE MODE"
013420  012737  000020  001252         MOV     #16.,TEMP3              ;SET UP TO TEST ALL 16
013426  012713  000017                 MOV     #17,(R3)                ;SCANNER MEMORY LOCATIONS
013432  005202                 INC     R2
013434  005001                 CLR     R1
013436  052713  000400          3$:    BIS     #STEP,(R3)              ;ACCESS SCANNER MEMORY
013442  104414                 DELAY
013444  111304                 MOVB    (R3),R4                 ;READ CONPENTS OF MEMORY
013446  010105                 MOV     R1,R5                   ;SET UP EXPECTED CONTENTS
013450  120402                 CMPB    R4,R2                   ;OF SCANNER MEMORY
013452  001002                 BNE     4$
013454  052705  070000                 BIS     #70000,R5
013460  020405          4$:    CMP     R4,R5                   ;COMPARE EXPECTED AND RECEIVED
013462  001402                 BEQ     5$                      ;VALUES
013464  104002                 HLT     2                       ;SCANNER MEMORY ERROR
013466  104401                 SCOP1                           ;CHECK FOR DATA FREEZE
013470  005201          5$:    INC     R1
013472  005337  001252                 DEC     TEMP3                   ;TEST NEXT SCANNER LOCATION
013476  001357                 BNE     3$
013500  005300                 DEC     R0                      ;UPDATE LINE COUNT
013502  001332                 BNE     2$
013504  104400                 SCOPE                           ;CHECK FOR ITERATION, LOOP
```

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

                                ;  TEST 27
                                ;--------------
013506  012737  000027  001226  TST27:  MOV     #27,TSTNO
013514  012737  013672  001216          MOV     #TST30,NEXT
013522  012737  013552  001220          MOV     #2$,LOCK
013530  013703  007276                  MOV     MC,CSR,R3               ;SET POINTER
013534  005013                  1$:     CLR     (R3)                    ;CLEAR CONTROL STATUS REGISTER
013536  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
013542  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 ADDRESSES
013546  012702  000017                  MOV     #17,R2                  ;FIRST ADDRESS TO BE TESTED=0
013552  012737  000020  001252  2$:     MOV     #16.,TEMP3              ;WRITE 1'S INTO ALL SCANNER
013560  012713  001017                  MOV     #MAINT+17,(R3)  ;MEMORY LOCATIONS
013564  052713  000400          3$:     BIS     #STEP,(R3)
013570  005337  001252                  DEC     TEMP3
013574  001373                          BNE     3$
013576  010213                          MOV     R2,(R3)                 ;SET LINE COUNTER TO TEST ADDRESS=1
013600  052713  000400                  BIS     #STEP,(R3)              ;WRITE 0'S INTO TEST ADDRESS
013604  012737  000020  001252          MOV     #16.,TEMP3              ;SET UP TO TEST ALL 16
013612  012713  000017                  MOV     #17,(R3)                ;SCANNER MEMORY LOCATIONS
013616  005202                          INC     R2
013620  005001                          CLR     R1
013622  052713  000400          4$:     BIS     #STEP,(R3)              ;ACESS SCANNER MEMORY
013626  104414                          DELAY
013630  111304                          MOVB    (R3),R4                 ;READ CONTENTS OF MEMORY
013632  010105                          MOV     R1,R5                   ;SET UP EXPECTED CONTENTS
013634  120402                          CMPB    R4,R2                   ;OF SCANNER MEIORY
013636  001002                          BNE     5$
013640  052705  070000                  BIS     #70000,R5
013644  020405          5$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
013646  001402                          BEQ     6$                      ;RECEIVED VALUES
013650  104002                          HLT     2                       ;SCANNER MEMORY ERROR
013652  104401                          SCOP1                           ;CHECK FOR DATA FREEZE
013654  005201          6$:     INC     R1
013656  005337  001252                  DEC     TEMP3                   ;TEST NEXT SCANNER LOCATION
013662  001357                          BNE     4$
013664  005300                          DEC     R0                      ;UPDATE ADDRESS COUNT
013666  001331                          BNE     2$
013670  104400                          SCOPE                           ;CHECK FOR ITERATION, LOOP
```



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

                                ;  TEST 30
                                ;--------------
013672  012737  000030  001226  TST30:  MOV     #30,TSTNO
013700  012737  014050  001216          MOV     #TST31,NEXT
013706  012737  013760  001220          MOV     #3$,LOCK
013714  013703  007276                  MOV     MC,CSR,R3               ;SET POINTER
013720  005013                  1$:     CLR     (R3)                    ;CLEAR CONTROL REGISTER
013722  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
013726  012700  000020                  MOV     #16.,R0                 ;SET UP TO TEST 16 LINES
013732  012777  000017  173340  2$:     MOV     #17,@MC,LSR             ;WRITE 1S INTO  ALL MULTIPLEXER
013740  052713  000400                  BIS     #STEP,(R3)              ;FUNCTION FLIPFLOPS
013744  005300                          DEC     R0
013746  001371                          BNE     2$
013750  005037  001252                  CLR     TEMP3                   ;SET UP FOR 16 LINES
013754  012700  000020                  MOV     #16.,R0
013760  012713  002000          3$:     MOV     #CLRMUX,(R3)            ;CLEAR MULTIPLEXER
013764  013713  001252          4$:     MOV     TEMP3,(R3)                      ;SELECT LINE
013770  017704  173304                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
013774  005005                          CLR     R5                      ;EXPECT 0S
013776  005704                          TST     R4                      ;WAS LINE STATUS REGISTER CLEARED
014000  001402                          BEQ     5$
014002  104002                          HLT     2                       ;LINE STATUS ERROR
014004  104401                          SCOP1                           ;CHECK FOR LOOP ON SAME DATA
014006  005205          5$:     INC     R5                      ;EXPECT LINE ENABLE
014010  052777  000001  173262          BIS     #LINENA,@MC,LSR         ;SET LINE ENABLE ON SELECTED LINE
014016  017704  173256                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
014022  020504                          CMP     R5,R4                   ;IS ANYTHING BUT LINE ENABLE SET
014024  001402                          BEQ     6$
014026  104002                          HLT     2                       ;LINE STATUS ERROR
014030  104401                          SCOP1                           ;CHECK FOR LOOP ON SAME DATA
014032  005237  001252          6$:     INC     TEMP3                   ;UPDATE LINE NUMBER
014036  005077  173236                  CLR     @MC,LSR                 ;CLEAR CURRENT LINE
014042  005300                          DEC     R0                      ;CONTINUE IF ALL LINES NOT
014044  001347                          BNE     4$                      ;TESTED
014046  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

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

                                                ;  TEST 31
                                                ;--------------
014050  012737  000031  001226  TST31:  MOV     #31,TSTNO
014056  012737  014302  001216          MOV     #TST32,NEXT
014064  012737  014076  001220          MOV     #1$,LOCK
014072  013703  007276                  MOV     MC.CSR,R3               ;SET POINTER
014076  012713  002000          1$:     MOV     #CLRMUX,(R3)            ;CLEAR ALL MULTIPLEXER FLIPFLOPS
014102  005013                          CLR     (R3)                    ;CLEAR CONTROL REGISTER
014104  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
014110  012700  000020                  MOV     #16.,R0                 ;SET UP TO WRITE 1'S INTO
014114  012713  001017                  MOV     #MAINT+17,(R3)          ;ALL SCANNER MEMORY LOCATION
014120  052713  000400          2$:     BIS     #STEP,(R3)              ;WRITE A LOCATION
014124  012777  000001  173146          MOV     #LINENA,@MC.LSR         ;LET "LINE ENABLE"
014132  005300                          DEC     R0
014134  001371                          BNE     2$
014136  012705  070340                  MOV     #70340,R5               ;EXPECT "DONE"+"SCNENA"+"COF"+"CSF"+"SECRXF"
014142  012777  014252  173132          MOV     #4$,@MC.VEC             ;SET UP LOCAL INTERRUPT SERVICE
014150  013777  177776  173126          MOV     PS,@MC.LVL              ;SERVICE AT LEVEL 7
014156  012700  000020                  MOV     #16.,R0
014162  012713  000117                  MOV     #INTENA+17,(R3)         ;SET INTERRUPT ENABLE
014166  012737  000340  177776  3$:     MOV     #340,PS                 ;LOCK OUT INTERRUPTS
014174  052713  000040                  BIS     #SCNENA,(R3)            ;START SCANNER
014200  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
014204  005037  001270                  CLR     SAVR4
014210  105713                          TSTB    (R3)                    ;WAIT FOR DONE
014212  100410                          BMI     .+22
014214  104414                          DELAY
014216  000240                          NOP
014220  000240                          NOP
014222  062737  000001  001270          ADD     #1,SAVR4
014230  001367                          BNE     .-20
014232  104006                          HLT     6
014234  012737  000340  177776          MOV     #340,PS                 ;INTERRUPT DID NOT OCCUR
014242  011304                          MOV     (R3),R4                 ;ERROR
014244  104004                          HLT     4                       ;CONTROL STATUS ERROR
014246  104401                          SCOP1                           ;CHECK FOR LOOP ON SAME DATA
014250  000406                          BR      5$
014252  022626                  4$:     POP2SP                          ;INTERRUPT OCCURED, REPOSITION STACK
014254  011304                          MOV     (R3),R4                 ;READ CONTROL STATUS
014256  020504                          CMP     R5,R4                   ;ARE EXPECTED AND RECEIVED
014260  001402                          BEQ     5$                      ;REGISTERS THE SAME
014262  104002                          HLT     2                       ;NO, LINE STATUS ERROR
014264  104401                          SCOP1                           ;CHECK FOR LOOP WITH CURRENT DATA
014266  042713  000240          5$:     BIC     #SCNENA+DONE,(R3)       ;CLEAR SCAN ENABLE AND DONE
014272  005205                          INC     R5                      ;UPDATE EXPECTED RESULT
014274  005300                          DEC     R0                      ;CONTINUE IF NOT DONE
014276  001333                          BNE     3$
014300  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```



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

                                                ;  TEST 32
                                                ;--------------
014302  012737  000032  001226  TST32:  MOV     #32,TSTNO
014310  012737  014646  001216          MOV     #TST33,NEXT
014316  012737  014434  001220          MOV     #1$,LOCK
014324  005000                          CLR     R0
014326  005737  001416                  TST     L00.03
014332  100402                          BMI     68$
014334  062700  000004                  ADD     #4,R0
014340  005737  001420          68$:    TST     L04.07
014344  100402                          BMI     69$
014346  062700  000004                  ADD     #4,R0
014352  005737  001422          69$:    TST     L08.11
014356  100402                          BMI     70$
014360  062700  000004                  ADD     #4,R0
014364  005737  001424          70$:    TST     L12.15
014370  100402                          BMI     71$
014372  062700  000004                  ADD     #4,R0
014376  005700                  71$:    TST     R0
014400  001001                          BNE     .+4
014402  000000                          HALT                    ;TEST CAN NOT RUN WITH NO LINE CARDS!!
014404  010037  007274                  MOV     R0,TOTAL
014410  005737  007256                  TST     TURFLG
014414  001405                          BEQ     65$
014416  013737  001216  001214          MOV     NEXT,RETURN
014424  000177  164564                  JMP     @RETURN
014430  013703  007276          65$:    MOV     MC.CSR,R3               ;SET POINTER
014434  012700  000020          1$:     MOV     #16.,R0                 ;WRITE 1S INTO ALL
014440  012713  002000                  MOV     #CLRMUX,(R3)            ;CLEAR MULTIPLEXER
014444  005013                          CLR     (R3)                    ;MULTIPLEXER FUNCTION
014446  005037  177776                  CLR     PS                      ;ENABLE TELETYPE INTERRUPTS
014452  012777  000017  172620  2$:     MOV     #17,@MC.LSR             ;FLIPFLOPS
014460  052713  000400                  BIS     #STEP,(R3)
014464  005300                          DEC     R0
014466  001371                          BNE     2$
014470  012713  004000                  MOV     #CLRSCN,(R3)            ;CLEAR SCANNER MEMORY
014474  032713  000020                  BIT     #BUSY,(R3)              ;WAIT FOR CLEAR CYCLE TO COMPLETE
014500  001375                          BNE     .-4
014502  013700  007274                  MOV     TOTAL,R0
014506  012705  170340                  MOV     #170340,R5              ;FIRST EXPECTED RESULT
014512  012777  014616  172562          MOV     #4$,@MC.VEC             ;SET UP LOCAL INTERRUPT RETURN
014520  013777  177776  172556          MOV     PS,@MC.LVL
014526  012713  000117                  MOV     #INTENA+17,(R3)         ;SET INTERRUPT ENABLE
014532  012737  000340  177776  3$:     MOV     #340,PS                 ;LOCK OUT INTERRUPTS
014540  052713  000040                  BIS     #SCNENA,(R3)            ;START SCANNER
014544  005037  177776                  CLR     PS                      ;ENABLE INTERRUPTS
014550  005037  001270                  CLR     SAVR4
014554  105713                          TSTB    (R3)                    ;WAIT FOR DONE
014556  100410                          BMI     .+22
```

```
2211  014560  104414                          DELAY
2212  014562  000240                          NOP
2213  014564  000240                          NOP
2214  014566  062737  000001  001270          ADD     #1,SAVR4
2215  014574  001367                          BNE     .-20
2216  014576  104006                          HLT     6
2217  014600  012737  000340  177776          MOV     #340,PS                 ;LOCK OUT INTERRUPTS
2218  014606  011304                          MOV     (R3),R4                 ;READ CONTROL STATUS
2219  014610  104004                          HLT     4                       ;INTERRUPT DID NOT OCCUR
2220  014612  104401                          SCOP1                           ;CHECK FOR LOOP ON CURRENT DATA
2221  014614  000406                          BR      5$                      ;CONTINUE
2222  014616  022626                  4$:     POP2SP                          ;INTERRUPT OCCURED, RESTORE STACK
2223  014620  011304                          MOV     (R3),R4                 ;READ CONTROL STATUS REGISTER
2224  014622  020504                          CMP     R5,R4                   ;COMPARE TO EXPECTED RESULT
2225  014624  001402                          BEQ     5$
2226  014626  104002                          HLT     2                       ;CONTROL STATUS ERROR
2227  014630  104401                          SCOP1                           ;CHECK FOR LOOP ON CURRENT DATA
2228  014632  042713  000240          5$:     BIC     #SCNENA+DONE,(R3)       ;CLEAR SCAN ENABLE AND DONE
2229  014636  005205                          INC     R5                      ;UPDATE EXPECTED RESULT
2230  014640  005300                          DEC     R0                      ;CONTINUE IF ALL
2231  014642  001333                          BNE     3$                      ;LINES NOT TESTED
2232  014644  104400                          SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```



```
2233                                          ;************************ TEST 33 ****************************
2234                                          ;*VERIFY THAT LINE ENABLE FUNCTION FLIP=FLOP CAN
2235                                          ;*BE SET AND CLEARED FOR SELECTED LINE
2236                                          ;*THIS TEST IS DONE IF THE H325 TURN AROUND IS USED
2237                                          ; MODEM CONTROL LINES *MUST* BE CONTIGUOUS FROM LINE 00.
2238                                          ;!*************************************************************
2239
2240                                  ;  TEST 33
2241                                  ;--------------
2242  014646  012737  000033  001226  TST33:  MOV     #33,TSTNO
2243  014654  012737  015046  001216          MOV     #TST34,NEXT
2244  014662  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
2245  014666  001005                          BNE     1$                      ;BR IF H325
2246  014670  013737  001216  001214          MOV     NEXT,RETURN
2247  014676  000177  164312                  JMP     @RETURN
2248  014702  005077  172370          1$:     CLR     @MC,CSR                 ;CLEAR CONTROL STATUS REGISTER
2249  014706  005037  177776                  CLR     PS                      ;ZERO PSW.
2250  014712  013701  007260                  MOV     LINE,R1                 ;SET LINE IMAGE
2251  014716  012777  002000  172352  2$:     MOV     #CLRMUX,@MC,CSR         ;CLEAR MUX
2252  014724  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
2253  014730  010177  172342                  MOV     R1,@MC,CSR              ;SELECT LINE TO BE TESTED
2254  014734  012777  000001  172336          MOV     #LINENA,@MC,LSR         ;SET LINE ENABLE FUNCTION FLIP-FLOP
2255  014742  005077  172330                  CLR     @MC,CSR                 ;ZERO CSR
2256  014746  005005                  3$:     CLR     R5                      ;SET EXPECTED
2257  014750  017704  172324                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
2258  014754  117703  172316                  MOVB    @MC,CSR,R3              ;READ CONTROL STATUS REGISTER
2259  014760  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
2260  014764  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
2261  014766  001002                          BNE     4$                      ;EXCEPT LINE ENABLE FUNCTION FLIP FLOP
2262  014770  012705  000001                  MOV     #LINENA,R5              ;SET "GOOD"
2263                                                                          ;TO BE SET
2264  014774  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
2265  014776  001401                          BEQ     5$                      ;RESULTS
2266  015000  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
2267  015002  052777  000400  172266  5$:     BIS     #STEP,@MC,CSR           ;EXAMINE NEXT LINE
2268  015010  005302                          DEC     R2                      ;ALL LINES DONE?
2269  015012  001355                          BNE     3$                      ;BR IF NO
2270  015014  005005                          CLR     R5                      ;CLEAR "GOOD"
2271  015016  010177  172254          6$:     MOV     R1,@MC,CSR              ;LOAD LINE
2272  015022  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
2273  015024  005077  172250                  CLR     @MC,LSR                 ;CLEAR LINE ENABLE FLIP FLOP
2274  015030  104414                          DELAY                           ;DELAY FOR CABLE
2275  015032  017704  172242                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
2276  015036  005704                          TST     R4                      ;WAS LINE ENABLE FUNCTION FLIP FLOP
2277  015040  001401                          BEQ     .+4                     ;CLEARED
2278  015042  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
2279  015044  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

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

                                ; TEST 34
                                ;--------------
015046  012737  000034  001226  TST34: MOV     #34,TSTNO
015054  012737  015246  001216          MOV     #TST35,NEXT
015062  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
015066  001005                          BNE     1$                      ;BR IF H325
015070  013737  001216  001214          MOV     NEXT,RETURN
015076  000177  164112                  JMP     @RETURN
015102  005077  172170          1$:     CLR     @MC,CSR                 ;CLEAR CONTROL STATUS REGISTER
015106  005037  177776                  CLR     PS                      ;ZERO PSW.
015112  013701  007260                  MOV     LINE,R1                 ;SET LINE IMAGE
015116  012777  002000  172152  2$:     MOV     #CLRMUX,@MC,CSR         ;CLEAR MUX
015124  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
015130  010177  172142                  MOV     R1,@MC,CSR              ;SELECT LINE TO BE TESTED
015134  012777  000002  172136          MOV     #TRMRDY,@MC,LSR         ;SET TERMINAL READY FUNCTION FLIP-FLOP
015142  005077  172130                  CLR     @MC,CSR                 ;ZERO CSR
015146  005005                  3$:     CLR     R5                      ;SET EXPECTED
015150  017704  172124                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
015154  117703  172116                  MOVB    @MC,CSR,R3              ;READ CONTROL STATUS REGISTER
015160  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
015164  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
015166  001002                          BNE     4$                      ;EXCEPT TERMINAL READY FUNCTION FLIP FLOP
015170  012705  000002                  MOV     #TRMRDY,R5              ;SET "GOOD"
                                                                        ;TO BE SET
015174  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
015176  001401                          BEQ     5$                      ;RESULTS
015200  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015202  052777  000400  172066  5$:     BIS     #STEP,@MC,CSR           ;EXAMINE NEXT LINE
015210  005302                          DEC     R2                      ;ALL LINES DONE?
015212  001355                          BNE     3$                      ;BR IF NO
015214  005005                          CLR     R5                      ;CLEAR "GOOD"
015216  010177  172054          6$:     MOV     R1,@MC,CSR              ;LOAD LINE
015222  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
015224  005077  172050                  CLR     @MC,LSR                 ;CLEAR TERMINAL READY FLIP FLOP
015230  104414                          DELAY                           ;DELAY FOR CABLE
015232  017704  172042                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
015236  005704                          TST     R4                      ;WAS TERMINAL READY FUNCTION FLIP FLOP
015240  001401                          BEQ     .+4                     ;CLEARED
015242  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015244  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```



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

                                ; TEST 35
                                ;--------------
015246  012737  000035  001226  TST35: MOV     #35,TSTNO
015254  012737  015446  001216          MOV     #TST36,NEXT
015262  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
015266  001005                          BNE     1$                      ;BR IF H325
015270  013737  001216  001214          MOV     NEXT,RETURN
015276  000177  163712                  JMP     @RETURN
015302  005077  171770          1$:     CLR     @MC,CSR                 ;CLEAR CONTROL STATUS REGISTER
015306  005037  177776                  CLR     PS                      ;ZERO PSW.
015312  013701  007260                  MOV     LINE,R1                 ;SET LINE IMAGE
015316  012777  002000  171752  2$:     MOV     #CLRMUX,@MC,CSR         ;CLEAR MUX
015324  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
015330  010177  171742                  MOV     R1,@MC,CSR              ;SELECT LINE TO BE TESTED
015334  012777  000004  171736          MOV     #RS,@MC,LSR             ;SET REQUEST TO SEND FUNCTION FLIP-FLOP
015342  005077  171730                  CLR     @MC,CSR                 ;ZERO CSR
015346  005005                  3$:     CLR     R5                      ;SET EXPECTED
015350  017704  171724                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
015354  117703  171716                  MOVB    @MC,CSR,R3              ;READ CONTROL STATUS REGISTER
015360  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
015364  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
015366  001002                          BNE     4$                      ;EXCEPT REQUEST TO SEND FUNCTION FLIP FLOP
015370  012705  000004                  MOV     #RS,R5          ;SET "GOOD"
                                                                        ;TO BE SET
015374  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
015376  001401                          BEQ     5$                      ;RESULTS
015400  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015402  052777  000400  171666  5$:     BIS     #STEP,@MC,CSR           ;EXAMINE NEXT LINE
015410  005302                          DEC     R2                      ;ALL LINES DONE?
015412  001355                          BNE     3$                      ;BR IF NO
015414  005005                          CLR     R5                      ;CLEAR "GOOD"
015416  010177  171654          6$:     MOV     R1,@MC,CSR              ;LOAD LINE
015422  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
015424  005077  171650                  CLR     @MC,LSR                 ;CLEAR REQUEST TO SEND FLIP FLOP
015430  104414                          DELAY                           ;DELAY FOR CABLE
015432  017704  171642                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
015436  005704                          TST     R4                      ;WAS REQUEST TO SEND FUNCTION FLIP FLOP
015440  001401                          BEQ     .+4                     ;CLEARED
015442  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015444  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

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

                                ;  TEST 36
                                ;-------------
015446  012737  000036  001226  TST36:  MOV     #36,TSTNO
015454  012737  015646  001216          MOV     #TST37,NEXT
015462  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
015466  001005                          BNE     1$                      ;BR IF H325
015470  013737  001216  001214          MOV     NEXT,RETURN
015476  000177  163512                  JMP     @RETURN
015502  005077  171570          1$:     CLR     @MC,CSR                 ;CLEAR CONTROL STATUS REGISTER
015506  005037  177776                  CLR     PS                      ;ZERO PSW.
015512  013701  007260                  MOV     LINE,R1                 ;SET LINE IMAGE
015516  012777  002000  171552  2$:     MOV     #CLRMUX,@MC,CSR         ;CLEAR MUX
015524  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
015530  010177  171542                  MOV     R1,@MC,CSR              ;SELECT LINE TO BE TESTED
015534  012777  000010  171536          MOV     #NS,@MC,LSR             ;SET NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP-
015542  005077  171530                  CLR     @MC,CSR                 ;ZERO CSR
015546  005005                  3$:     CLR     R5                      ;SET EXPECTED
015550  017704  171524                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
015554  117703  171516                  MOVB    @MC,CSR,R3              ;READ CONTROL STATUS REGISTER
015560  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
015564  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
015566  001002                          BNE     4$                      ;EXCEPT NEW SYNC (SECTX IF ASYNC LC) FUNCTION FL
015570  012705  000010                  MOV     #NS,R5          ;SET "GOOD"
                                                                        ;TO BE SET
015574  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
015576  001401                          BEQ     5$                      ;RESULTS
015600  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015602  052777  000400  171466  5$:     BIS     #STEP,@MC,CSR           ;EXAMINE NEXT LINE
015610  005302                          DEC     R2                      ;ALL LINES DONE?
015612  001355                          BNE     3$                      ;BR IF NO
015614  005005                          CLR     R5                      ;CLEAR "GOOD"
015616  010177  171454          6$:     MOV     R1,@MC,CSR              ;LOAD LINE
015622  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
015624  005077  171450                  CLR     @MC,LSR                 ;CLEAR NEW SYNC (SECTX IF ASYNC LC) FLIP FLOP
015630  104414                          DELAY                           ;DELAY FOR CABLE
015632  017704  171442                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
015636  005704                          TST     R4                      ;WAS NEW SYNC (SECTX IF ASYNC LC) FUNCTION FLIP
015640  001401                          BEQ     .+4                     ;CLEARED
015642  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015644  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```



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

                                ;  TEST 37
                                ;-------------
015646  012737  000037  001226  TST37:  MOV     #37,TSTNO
015654  012737  016044  001216          MOV     #TST40,NEXT
015662  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
015666  001005                          BNE     1$                      ;BR IF H325
015670  013737  001216  001214          MOV     NEXT,RETURN
015676  000177  163312                  JMP     @RETURN
015702  005077  171370          1$:     CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
015706  005037  177776                  CLR     PS                      ;ZERO PSW
015712  013701  007260                  MOV     LINE,R1                 ;LINE NUMBER
015716  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
015722  010177  171350                  MOV     R1,@MC,CSR              ;SELECT A LINE
015726  012777  000003  171344          MOV     #LINENA+TRMRDY,@MC,LSR  ;SET LINE ENABLE +TRMRDY
015734  005077  171336                  CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
015740  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
015742  017704  171332                  MOV     @MC,LSR,R4              ;READ LINE STATUS
015746  117703  171324                  MOVB    @MC,CSR,R3              ;READ LINE NUMBER
015752  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
015756  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
015760  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
015762  012705  000203                  MOV     #LINENA+TRMRDY+RING,R5
                                                                        ;RING IS SET
015766  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
015770  001401                          BEQ     5$                      ;RECEIVED RESULTS
015772  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
015774  052777  000400  171274  5$:     BIS     #STEP,@MC,CSR           ;UPDATE LINE COUNTER
016002  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
016004  001355                          BNE     3$                      ;ARE NOT DONE FOR THIS LINE
016006  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
016012  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
016014  010177  171256                  MOV     R1,@MC,CSR              ;SELECT LINE
016020  042777  000002  171252          BIC     #TRMRDY,@MC,LSR         ;CLEAR TERMINAL
016026  104414                          DELAY                           ;DELAY FOR CABLE
016030  017704  171244                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
016034  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
016036  001401                          BEQ     .+4                     ;SET ON THIS LINE
016040  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016042  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

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

                                        ;  TEST 40
                                        ;--------------
016044  012737  000040  001226  TST40:  MOV     #40,TSTNO
016052  012737  016242  001216          MOV     #TST41,NEXT
016060  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
016064  001005                          BNE     1$                      ;BR IF H325
016066  013737  001216  001214          MOV     NEXT,RETURN
016074  000177  163114                  JMP     @RETURN
016100  005077  171172          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
016104  005037  177776                  CLR     PS                      ;ZERO PSW
016110  013701  007260                  MOV     LINE,R1                 ;LINE NUMBER
016114  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
016120  010177  171152                  MOV     R1,@MC.CSR              ;SELECT A LINE
016124  012777  000005  171146          MOV     #LINENA+RS,@MC.LSR      ;SET LINE ENABLE +RS
016132  005077  171140                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
016136  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
016140  017704  171134                  MOV     @MC.LSR,R4              ;READ LINE STATUS
016144  117703  171126                  MOVB    @MC.CSR,R3              ;READ LINE NUMBER
016150  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
016154  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
016156  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
016160  012705  000145                  MOV     #LINENA+RS+CO+CS,R5
                                                                        ;CLEAR TO SEND AND CARRIER ARE SET
016164  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
016166  001401                          BEQ     5$                      ;RECEIVED RESULTS
016170  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016172  052777  000400  171076  5$:     BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
016200  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
016202  001355                          BNE     3$                      ;ARE NOT DONE FOR THIS LINE
016204  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
016210  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
016212  010177  171060                  MOV     R1,@MC.CSR              ;SELECT LINE
016216  042777  000004  171054          BIC     #RS,@MC.LSR             ;CLEAR REQUEST TO SEND
016224  104414                          DELAY                           ;DELAY FOR CABLE
016226  017704  171046                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016232  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
016234  001401                          BEQ     .+4                     ;SET ON THIS LINE
016236  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016240  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```



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

                                        ;  TEST 41
                                        ;--------------
016242  012737  000041  001226  TST41:  MOV     #41,TSTNO
016250  012737  016440  001216          MOV     #TST42,NEXT
016256  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
016262  001005                          BNE     1$                      ;BR IF H325
016264  013737  001216  001214          MOV     NEXT,RETURN
016272  000177  162716                  JMP     @RETURN
016276  005077  170774          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
016302  005037  177776                  CLR     PS                      ;ZERO PSW
016306  013701  007260                  MOV     LINE,R1                 ;LINE NUMBER
016312  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
016316  010177  170754                  MOV     R1,@MC.CSR              ;SELECT A LINE
016322  012777  000011  170750          MOV     #LINENA+NS,@MC.LSR      ;SET LINE ENABLE +NS
016330  005077  170742                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
016334  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
016336  017704  170736                  MOV     @MC.LSR,R4              ;READ LINE STATUS
016342  117703  170730                  MOVB    @MC.CSR,R3              ;READ LINE NUMBER
016346  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
016352  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
016354  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
016356  012705  000031                  MOV     #LINENA+NS+DSR,R5
                                                                        ;DATA SET READY(SECRX IF ASYNC LC) IS SET
016362  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
016364  001401                          BEQ     5$                      ;RECEIVED RESULTS
016366  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016370  052777  000400  170700  5$:     BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
016376  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
016400  001355                          BNE     3$                      ;ARE NOT DONE FOR THIS LINE
016402  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
016406  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
016410  010177  170662                  MOV     R1,@MC.CSR              ;SELECT LINE
016414  042777  000010  170656          BIC     #NS,@MC.LSR             ;CLEAR NEW SYNC (SECTX IF ASYNC LC)
016422  104414                          DELAY                           ;DELAY FOR CABLE
016424  017704  170650                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
016430  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
016432  001401                          BEQ     .+4                     ;SET ON THIS LINE
016434  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016436  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

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

                                ; TEST 42
                                ;--------------
016440  012737  000042  001226  TST42: MOV     #42,TSTNO
016446  012737  016664  001216          MOV     #TST43,NEXT
016454  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
016460  001405                          BEQ     1$                      ;BR IF H861
016462  013737  001216  001214          MOV     NEXT,RETURN
016470  000177  162520                  JMP     @RETURN
016474  005077  170576          1$:     CLR     @MC,CSR                 ;CLEAR CONTROL STATUS REGISTER
016500  005037  177776                  CLR     PS                      ;ZERO PSW.
016504  013700  007274                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
016510  005001                          CLR     R1
016512  012737  016520  001220          MOV     #2$,LOCK
016520  012777  002000  170550  2$:     MOV     #CLRMUX,@MC,CSR         ;CLEAR MUX
016526  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
016532  010177  170540                  MOV     R1,@MC,CSR              ;SELECT LINE TO BE TESTED
016536  010137  007260                  MOV     R1,LINE                 ;SET IMAGE
016542  012777  000001  170530          MOV     #LINENA,@MC,LSR         ;SET LINE ENABLE FUNCTION FLIP-FLOP
016550  005077  170522                  CLR     @MC,CSR                 ;ZERO CSR
016554  005005                  3$:     CLR     R5                      ;SET EXPECTED
016556  017704  170516                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
016562  117703  170510                  MOVB    @MC,CSR,R3              ;READ CONTROL STATUS REGISTER
016566  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
016572  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
016574  001002                          BNE     4$                      ;EXCEPT LINE ENABLE FUNCTION FLIP FLOP
016576  012705  000001                  MOV     #LINENA,R5              ;SET "GOOD"
                                                                        ;TO BE SET
016602  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
016604  001401                          BEQ     5$                      ;RESULTS
016606  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016610  052777  000400  170460  5$:     BIS     #STEP,@MC,CSR           ;EXAMINE NEXT LINE
016616  005302                          DEC     R2                      ;ALL LINES DONE?
016620  001355                          BNE     3$                      ;BR IF NO
016622  005005                          CLR     R5                      ;CLEAR "GOOD"
016624  010177  170446          6$:     MOV     R1,@MC,CSR              ;LOAD LINE
016630  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
016632  005077  170442                  CLR     @MC,LSR                 ;CLEAR LINE ENABLE FLIP FLOP
016636  104414                          DELAY                           ;DELAY FOR CABLE
016640  017704  170434                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
016644  005704                          TST     R4                      ;WAS LINE ENABLE FUNCTION FLIP FLOP
016646  001401                          BEQ     .+4                     ;CLEARED
016650  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
016652  104401                          SCOP1
016654  005201                          INC     R1
016656  005300                          DEC     R0
016660  001317                          BNE     2$
016662  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```



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

                                ; TEST 43
                                ;--------------
016664  012737  000043  001226  TST43: MOV     #43,TSTNO
016672  012737  017110  001216          MOV     #TST44,NEXT
016700  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
016704  001405                          BEQ     1$                      ;BR IF H861
016706  013737  001216  001214          MOV     NEXT,RETURN
016714  000177  162274                  JMP     @RETURN
016720  005077  170352          1$:     CLR     @MC,CSR                 ;CLEAR CONTROL STATUS REGISTER
016724  005037  177776                  CLR     PS                      ;ZERO PSW.
016730  013700  007274                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
016734  005001                          CLR     R1
016736  012737  016744  001220          MOV     #2$,LOCK
016744  012777  002000  170324  2$:     MOV     #CLRMUX,@MC,CSR         ;CLEAR MUX
016752  012702  000020                  MOV     #16.,R2                 ;SET FOR 16 LINES
016756  010177  170314                  MOV     R1,@MC,CSR              ;SELECT LINE TO BE TESTED
016762  010137  007260                  MOV     R1,LINE                 ;SET IMAGE
016766  012777  000002  170304          MOV     #TRMRDY,@MC,LSR         ;SET TERMINAL READY FUNCTION FLIP-FLOP
016774  005077  170276                  CLR     @MC,CSR                 ;ZERO CSR
017000  005005                  3$:     CLR     R5                      ;SET EXPECTED
017002  017704  170272                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
017006  117703  170264                  MOVB    @MC,CSR,R3              ;READ CONTROL STATUS REGISTER
017012  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
017016  020103                          CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
017020  001002                          BNE     4$                      ;EXCEPT TERMINAL READY FUNCTION FLIP FLOP
017022  012705  000002                  MOV     #TRMRDY,R5              ;SET "GOOD"
                                                                        ;TO BE SET
017026  020504                  4$:     CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
017030  001401                          BEQ     5$                      ;RESULTS
017032  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
017034  052777  000400  170234  5$:     BIS     #STEP,@MC,CSR           ;EXAMINE NEXT LINE
017042  005302                          DEC     R2                      ;ALL LINES DONE?
017044  001355                          BNE     3$                      ;BR IF NO
017046  005005                          CLR     R5                      ;CLEAR "GOOD"
017050  010177  170222          6$:     MOV     R1,@MC,CSR              ;LOAD LINE
017054  010103                          MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
017056  005077  170216                  CLR     @MC,LSR                 ;CLEAR TERMINAL READY FLIP FLOP
017062  104414                          DELAY                           ;DELAY FOR CABLE
017064  017704  170210                  MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
017070  005704                          TST     R4                      ;WAS TERMINAL READY FUNCTION FLIP FLOP
017072  001401                          BEQ     .+4                     ;CLEARED
017074  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
017076  104401                          SCOP1
017100  005201                          INC     R1
017102  005300                          DEC     R0
017104  001317                          BNE     2$
017106  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

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

                                ;  TEST 44
                                ;--------------
017110  012737  000044  001226  TST44: MOV     #44,TSTNO
017116  012737  017334  001216         MOV     #TST45,NEXT
017124  005737  007256                 TST     TURFLG                  ;TURN AROUND H861 OR H325?
017130  001405                        BEQ     1$                      ;BR IF H861
017132  013737  001216  001214         MOV     NEXT,RETURN
017140  000177  162050                 JMP     @RETURN
017144  005077  170126          1$:    CLR     @MC,CSR                 ;CLEAR CONTROL STATUS REGISTER
017150  005037  177776                 CLR     PS                      ;ZERO PSW,
017154  013700  007274                 MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
017160  005001                        CLR     R1
017162  012737  017170  001220         MOV     #2$,LOCK
017170  012777  002000  170100  2$:    MOV     #CLRMUX,@MC,CSR         ;CLEAR MUX
017176  012702  000020                 MOV     #16.,R2                 ;SET FOR 16 LINES
017202  010177  170070                 MOV     R1,@MC,CSR              ;SELECT LINE TO BE TESTED
017206  010137  007260                 MOV     R1,LINE                 ;SET IMAGE
017212  012777  000004  170060         MOV     #RS,@MC,LSR             ;SET REQUEST TO SEND FUNCTION FLIP-FLOP
017220  005077  170052                 CLR     @MC,CSR                 ;ZERO CSR
017224  005005                 3$:    CLR     R5                      ;SET EXPECTED
017226  017704  170046                 MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
017232  117703  170040                 MOVB    @MC,CSR,R3              ;READ CONTROL STATUS REGISTER
017236  042703  177760                 BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
017242  020103                        CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
017244  001002                        BNE     4$                      ;EXCEPT REQUEST TO SEND FUNCTION FLIP FLOP
017246  012705  000004                 MOV     #RS,R5          ;SET "GOOD"
                                                                       ;TO BE SET
017252  020504                 4$:    CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
017254  001401                        BEQ     5$                      ;RESULTS
017256  104001                        HLT     1                       ;R5=EXPECTED R4=FOUND
017260  052777  000400  170010  5$:    BIS     #STEP,@MC,CSR           ;EXAMINE NEXT LINE
017266  005302                        DEC     R2                      ;ALL LINES DONE?
017270  001355                        BNE     3$                      ;BR IF NO
017272  005005                        CLR     R5                      ;CLEAR "GOOD"
017274  010177  167776          6$:    MOV     R1,@MC,CSR              ;LOAD LINE
017300  010103                        MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
017302  005077  167772                 CLR     @MC,LSR                 ;CLEAR REQUEST TO SEND FLIP FLOP
017306  104414                        DELAY                           ;DELAY FOR CABLE
017310  017704  167764                 MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
017314  005704                        TST     R4                      ;WAS REQUEST TO SEND FUNCTION FLIP FLOP
017316  001401                        BEQ     .+4                     ;CLEARED
017320  104001                        HLT     1                       ;R5=EXPECTED R4=FOUND
017322  104401                        SCOP1
017324  005201                        INC     R1
017326  005300                        DEC     R0
017330  001317                        BNE     2$
017332  104400                  7$:   SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```



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

                                ;  TEST 45
                                ;--------------
017334  012737  000045  001226  TST45: MOV     #45,TSTNO
017342  012737  017560  001216         MOV     #TST46,NEXT
017350  005737  007256                 TST     TURFLG                  ;TURN AROUND H861 OR H325?
017354  001405                        BEQ     1$                      ;BR IF H861
017356  013737  001216  001214         MOV     NEXT,RETURN
017364  000177  161624                 JMP     @RETURN
017370  005077  167702          1$:    CLR     @MC,CSR                 ;CLEAR CONTROL STATUS REGISTER
017374  005037  177776                 CLR     PS                      ;ZERO PSW,
017400  013700  007274                 MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
017404  005001                        CLR     R1
017406  012737  017414  001220         MOV     #2$,LOCK
017414  012777  002000  167654  2$:    MOV     #CLRMUX,@MC,CSR         ;CLEAR MUX
017422  012702  000020                 MOV     #16.,R2                 ;SET FOR 16 LINES
017426  010177  167644                 MOV     R1,@MC,CSR              ;SELECT LINE TO BE TESTED
017432  010137  007260                 MOV     R1,LINE                 ;SET IMAGE
017436  012777  000010  167634         MOV     #SECTX,@MC,LSR          ;SET SECONDARY TRANSMIT FUNCTION FLIP-FLOP
017444  005077  167626                 CLR     @MC,CSR                 ;ZERO CSR
017450  005005                 3$:    CLR     R5                      ;SET EXPECTED
017452  017704  167622                 MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
017456  117703  167614                 MOVB    @MC,CSR,R3              ;READ CONTROL STATUS REGISTER
017462  042703  177760                 BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
017466  020103                        CMP     R1,R3                   ;IF LINE NUMBER=SELECTED LINE NUMBER,
017470  001002                        BNE     4$                      ;EXCEPT SECONDARY TRANSMIT FUNCTION FLIP FLOP
017472  012705  000010                 MOV     #SECTX,R5               ;SET "GOOD"
                                                                       ;TO BE SET
017476  020504                 4$:    CMP     R5,R4                   ;COMPARE EXPECTED AND RECEIVED
017500  001401                        BEQ     5$                      ;RESULTS
017502  104001                        HLT     1                       ;R5=EXPECTED R4=FOUND
017504  052777  000400  167564  5$:    BIS     #STEP,@MC,CSR           ;EXAMINE NEXT LINE
017512  005302                        DEC     R2                      ;ALL LINES DONE?
017514  001355                        BNE     3$                      ;BR IF NO
017516  005005                        CLR     R5                      ;CLEAR "GOOD"
017520  010177  167552          6$:    MOV     R1,@MC,CSR              ;LOAD LINE
017524  010103                        MOV     R1,R3                   ;SET LINE COUNTER TO SELECTED LINE
017526  005077  167546                 CLR     @MC,LSR                 ;CLEAR SECONDARY TRANSMIT FLIP FLOP
017532  104414                        DELAY                           ;DELAY FOR CABLE
017534  017704  167540                 MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
017540  005704                        TST     R4                      ;WAS SECONDARY TRANSMIT FUNCTION FLIP FLOP
017542  001401                        BEQ     .+4                     ;CLEARED
017544  104001                        HLT     1                       ;R5=EXPECTED R4=FOUND
017546  104401                        SCOP1
017550  005201                        INC     R1
017552  005300                        DEC     R0
017554  001317                        BNE     2$
017556  104400                  7$:   SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

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

                                ; TEST 46
                                ;--------------
017560  012737  000046  001226 TST46:  MOV     #46,TSTNO
017566  012737  020002  001216         MOV     #TST47,NEXT
017574  005737  007256                 TST     TURFLG                  ;TURN AROUND H861 OR H325?
017600  001405                         BEQ     1$                      ;BR IF H861
017602  013737  001216  001214         MOV     NEXT,RETURN
017610  000177  161400                 JMP     @RETURN
017614  005077  167456          1$:    CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
017620  005037  177776                 CLR     PS                      ;ZERO PSW
017624  013700  007274                 MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
017630  005001                         CLR     R1
017632  012737  017640  001220         MOV     #2$,LOCK
017640  012702  000020          2$:    MOV     #16.,R2                 ;16 LINES
017644  010177  167426                 MOV     R1,@MC,CSR              ;SELECT A LINE
017650  012777  000003  167422         MOV     #LINENA+TRMRDY,@MC,LSR  ;SET LINE ENABLE +TRMRDY
017656  005077  167414                 CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
017662  005005                  3$:    CLR     R5                      ;CLEAR EXPECTED RESULT
017664  017704  167410                 MOV     @MC,LSR,R4              ;READ LINE STATUS
017670  117703  167402                 MOVB    @MC,CSR,R3              ;READ LINE NUMBER
017674  042703  177760                 BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
017700  020103                         CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
017702  001002                         BNE     4$                      ;EXPECT LINE ENABLE AND
017704  012705  000143                 MOV     #LINENA+TRMRDY+CO+CS,R5
                                                                       ;CLEAR TO SEND AND CARRIER ARE SET
017710  020405                  4$:    CMP     R4,R5                   ;COMPARE EXPECTED AND
017712  001401                         BEQ     5$                      ;RECEIVED RESULTS
017714  104001                         HLT     1                       ;R5=EXPECTED R4=FOUND
017716  052777  000400  167352  5$:    BIS     #STEP,@MC,CSR           ;UPDATE LINE COUNTER
017724  005302                         DEC     R2                      ;CONTINUE IF ALL CHECKS
017726  001355                         BNE     3$                      ;ARE NOT DONE FOR THIS LINE
017730  012705  000001                 MOV     #LINENA,R5              ;EXPECT LINE ENABLE
017734  010103                  6$:    MOV     R1,R3                   ;ON SELECTED LINE
017736  010177  167334                 MOV     R1,@MC,CSR              ;SELECT LINE
017742  042777  000002  167330         BIC     #TRMRDY,@MC,LSR         ;CLEAR TERMINAL
017750  104414                         DELAY                           ;DELAY FOR CABLE
017752  017704  167322                 MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
017756  020504                         CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
017760  001401                         BEQ     .+4                     ;SET ON THIS LINE
017762  104001                         HLT     1                       ;R5=EXPECTED R4=FOUND
017764  104401                         SCOP1
017766  005201                         INC     R1
017770  005077  167304                 CLR     @MC,LSR
017774  005300                         DEC     R0
017776  001320                         BNE     2$
020000  104400                  7$:    SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```



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

                                ; TEST 47
                                ;--------------
020002  012737  000047  001226 TST47:  MOV     #47,TSTNO
020010  012737  020224  001216         MOV     #TST50,NEXT
020016  005737  007256                 TST     TURFLG                  ;TURN AROUND H861 OR H325?
020022  001405                         BEQ     1$                      ;BR IF H861
020024  013737  001216  001214         MOV     NEXT,RETURN
020032  000177  161156                 JMP     @RETURN
020036  005077  167234          1$:    CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
020042  005037  177776                 CLR     PS                      ;ZERO PSW
020046  013700  007274                 MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
020052  005001                         CLR     R1
020054  012737  020062  001220         MOV     #2$,LOCK
020062  012702  000020          2$:    MOV     #16.,R2                 ;16 LINES
020066  010177  167204                 MOV     R1,@MC,CSR              ;SELECT A LINE
020072  012777  000005  167200         MOV     #LINENA+RS,@MC,LSR      ;SET LINE ENABLE +RS
020100  005077  167172                 CLR     @MC,CSR                 ;CLEAR CONTROL REGISTER
020104  005005                  3$:    CLR     R5                      ;CLEAR EXPECTED RESULT
020106  017704  167166                 MOV     @MC,LSR,R4              ;READ LINE STATUS
020112  117703  167160                 MOVB    @MC,CSR,R3              ;READ LINE NUMBER
020116  042703  177760                 BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
020122  020103                         CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
020124  001002                         BNE     4$                      ;EXPECT LINE ENABLE AND
020126  012705  000205                 MOV     #LINENA+RS+RING,R5
                                                                       ;RING IS SET
020132  020405                  4$:    CMP     R4,R5                   ;COMPARE EXPECTED AND
020134  001401                         BEQ     5$                      ;RECEIVED RESULTS
020136  104001                         HLT     1                       ;R5=EXPECTED R4=FOUND
020140  052777  000400  167130  5$:    BIS     #STEP,@MC,CSR           ;UPDATE LINE COUNTER
020146  005302                         DEC     R2                      ;CONTINUE IF ALL CHECKS
020150  001355                         BNE     3$                      ;ARE NOT DONE FOR THIS LINE
020152  012705  000001                 MOV     #LINENA,R5              ;EXPECT LINE ENABLE
020156  010103                  6$:    MOV     R1,R3                   ;ON SELECTED LINE
020160  010177  167112                 MOV     R1,@MC,CSR              ;SELECT LINE
020164  042777  000004  167106         BIC     #RS,@MC,LSR             ;CLEAR REQUEST TO SEND
020172  104414                         DELAY                           ;DELAY FOR CABLE
020174  017704  167100                 MOV     @MC,LSR,R4              ;READ LINE STATUS REGISTER
020200  020504                         CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
020202  001401                         BEQ     .+4                     ;SET ON THIS LINE
020204  104001                         HLT     1                       ;R5=EXPECTED R4=FOUND
020206  104401                         SCOP1
020210  005201                         INC     R1
020212  005077  167062                 CLR     @MC,LSR
020216  005300                         DEC     R0
020220  001320                         BNE     2$
020222  104400                  7$:    SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```

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

                                         ; TEST 50
                                         ;--------------
020224  012737  000050  001226  TST50:  MOV     #50,TSTNO
020232  012737  020446  001216          MOV     #TST51,NEXT
020240  005737  007256                  TST     TURFLG                  ;TURN AROUND H861 OR H325?
020244  001405                          BEQ     1$                      ;BR IF H861
020246  013737  001216  001214          MOV     NEXT,RETURN
020254  000177  160734                  JMP     @RETURN
020260  005077  167012          1$:     CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
020264  005037  177776                  CLR     PS                      ;ZERO PSW
020270  013700  007274                  MOV     TOTAL,R0                ;SET THE TOTAL NUMBER OF LINES TO BE TESTED IN R
020274  005001                          CLR     R1
020276  012737  020304  001220          MOV     #2$,LOCK
020304  012702  000020          2$:     MOV     #16.,R2                 ;16 LINES
020310  010177  166762                  MOV     R1,@MC.CSR              ;SELECT A LINE
020314  012777  000011  166756          MOV     #LINENA+SECTX,@MC.LSR   ;SET LINE ENABLE +SECTX
020322  005077  166750                  CLR     @MC.CSR                 ;CLEAR CONTROL REGISTER
020326  005005                  3$:     CLR     R5                      ;CLEAR EXPECTED RESULT
020330  017704  166744                  MOV     @MC.LSR,R4              ;READ LINE STATUS
020334  117703  166736                  MOVB    @MC.CSR,R3              ;READ LINE NUMBER
020340  042703  177760                  BIC     #^C<17>,R3              ;CLEAR UNWANTED BITS
020344  020103                          CMP     R1,R3                   ;IF RECEIVED LINE=SELECTED LINE
020346  001002                          BNE     4$                      ;EXPECT LINE ENABLE AND
020350  012705  000031                  MOV     #LINENA+SECTX+SECRX,R5
                                                                        ;SECONDARY RECEIVE IS SET
020354  020405                  4$:     CMP     R4,R5                   ;COMPARE EXPECTED AND
020356  001401                          BEQ     5$                      ;RECEIVED RESULTS
020360  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
020362  052777  000400  166706  5$:     BIS     #STEP,@MC.CSR           ;UPDATE LINE COUNTER
020370  005302                          DEC     R2                      ;CONTINUE IF ALL CHECKS
020372  001355                          BNE     3$                      ;ARE NOT DONE FOR THIS LINE
020374  012705  000001                  MOV     #LINENA,R5              ;EXPECT LINE ENABLE
020400  010103                  6$:     MOV     R1,R3                   ;ON SELECTED LINE
020402  010177  166670                  MOV     R1,@MC.CSR              ;SELECT LINE
020406  042777  000010  166664          BIC     #SECTX,@MC.LSR          ;CLEAR SECONDARY TRANSMIT
020414  104414                          DELAY                           ;DELAY FOR CABLE
020416  017704  166656                  MOV     @MC.LSR,R4              ;READ LINE STATUS REGISTER
020422  020504                          CMP     R5,R4                   ;ONLY LINE ENABLE SHOULD BE
020424  001401                          BEQ     .+4                     ;SET ON THIS LINE
020426  104001                          HLT     1                       ;R5=EXPECTED R4=FOUND
020430  104401                          SCOP1
020432  005201                          INC     R1
020434  005077  166640                  CLR     @MC.LSR
020440  005300                          DEC     R0
020442  001320                          BNE     2$
020444  104400                  7$:     SCOPE                           ;CHECK FOR ITERATIONS, LOOP
```



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

                                         ; TEST 51
                                         ;--------------
020446  012737  000051  001226  TST51:  MOV     #51,TSTNO
020454  012737  010062  001216          MOV     #TESTER,NEXT
020462  005737  007256                  TST     TURFLG
020466  001005                          BNE     88$
020470  013737  001216  001214          MOV     NEXT,RETURN
020476  000177  160512                  JMP     @RETURN
020502  104413                  88$:    RAMCLR                  ;CLEAR DV11
020504  032737  000010  007260          BIT #BIT3,LINE          ;DETERMINE LINE NO.
020512  001414                          BEQ     91$             ;
020514  032737  000004  007260          BIT     #BIT2,LINE      ;
020522  001404                          BEQ     89$             ;
020524  113737  001424  023560          MOVB    L12.15,SYNC     ;SET SYNC FOR 12-15
020532  000417                          BR      100$            ;
020534  113737  001422  023560  89$:    MOVB    L08.11,SYNC     ;SET SYNC FOR 08-11
020542  000413                          BR      100$            ;
020544  032737  000004  007260  91$:    BIT     #BIT2,LINE      ;
020552  001404                          BEQ     90$             ;
020554  113737  001420  023560          MOVB    L04.07,SYNC     ;SET SYNC FOR 04-07
020562  000403                          BR      100$            ;
020564  113737  001416  023560  90$:    MOVB    L00.03,SYNC     ;SET SYNC FOR 00-03
020572  113737  023560  023561  100$:   MOVB    SYNC,SYNC+1     ;MAKE SECOND SYNC
020600  012705  024162                  MOV     #TXTAB,R5       ;GET TABLE POINTER
020604  005004                          CLR     R4
020606  112725  000010          101$:   MOVB    #BIT3,(R5)+     ;"INC/BCC" AND "MODE 0"
020612  105204                          INCB    R4              ;ALL DONE?
020614  001374                          BNE     101$            ;BR IF NO
020616  012705  024162                  MOV     #TXTAB,R5       ;SET POINTER
020622  005004                          CLR     R4              ;
020624  113704  023560                  MOVB    SYNC,R4         ;SET SYNC CNTRL BYTE
020630  001405                          BEQ     102$            ;BR IF ASYNC LINE CARD!
020632  042704  177400                  BIC     #^C<377>,R4     ;
020636  060405                          ADD     R4,R5           ;
020640  112715  000040                  MOVB    #BIT5,(R5)      ;"MODE 1"
020644  012705  023562          102$:   MOV     #TXBAP,R5       ;
```

```
2996
2997  020650  005004                          CLR     R4              ;
2998  020652  110425                  1$:     MOVB    R4,(R5)+        ;LOAD DATA
2999  020654  105204                          INCB    R4              ;ALL DONE?
3000  020656  022704  000040                  CMP     #40,R4          ;
3001  020662  001373                          BNE     1$              ;
3002  020664  013777  007260  160500          MOV     LINE,@DVSRS     ;LOAD LINE NO
3003  020672  105737  023560                  TSTB    SYNC            ;IS THIS AN ASYNC CARD?
3004  020676  001006                          BNE     65$             ;BR IF NO
3005  020700  004537  023454                  PERFORM ,SETREG         ;
3006  020704     000     001                  ,BYTE   000,001         ;TXBAP, BYTE CNT
3007  020706  023562                          TXBAP                   ;
3008  020710  077740                          <-40>-BIT15             ;
3009  020712  000405                          BR      66$             ;
3010  020714  004537  023454          65$:    PERFORM ,SETREG         ;
3011  020720     000     001                  ,BYTE   000,001         ;TX BA, TX BC
3012  020722  023560                          SYNC                    ;SYNC
3013  020724  077736                          <-42>-BIT15             ;MARKED BYTE COUNT
3014  020726  004537  023454          66$:    PERFORM ,SETREG         ;
3015  020732     004     005                  ,BYTE   004,005         ;RX BA,BC
3016  020734  024562                          RXBA                    ;
3017  020736  077740                          <-40>-BIT15             ;
3018  020740  004537  023454                  PERFORM ,SETREG         ;
3019  020744     012     013                  ,BYTE   012,013         ;
3020  020746  000143                          BIT6+BIT5+BIT1+BIT0     ;
3021  020750  002004                          BIT10+BIT2              ;
3022  020752  004537  023454                  PERFORM ,SETREG         ;
3023  020756     016     014                  ,BYTE   016,014         ;
3024  020760  002000                          BIT10                   ;
3025  020762  000001                          001                     ;IF SYNC LINE CARD, START IN MODE 1
3026  020764  105737  023560                  TSTB    SYNC            ;IF ASYNC LINE CARD,
3027  020770  001002                          BNE     .+6             ;SET TX TO MODE 0
3028  020772  005077  160400                  CLR     @DVSRA          ;WHICH IS TRUE DDCMP MODE!
3029  020776  004537  023454                  PERFORM ,SETREG         ;
3030  021002     010     010                  ,BYTE   010,010         ;
3031  021004  023562                          TXTAB=400               ;
3032  021006  023562                          TXTAB=400               ;
3033  021010  105737  023560                  TSTB    SYNC            ;ASYNC LINE CARD?
3034  021014  001012                          BNE     67$             ;BR IF NOT ASYNC
3035  021016  004537  023520                  PERFORM ,LOAD,MODE      ;
3036  021022  015000                          <BIT12+BIT11>+BIT9      ;8 BITS/PER/CHAR,
3037  021024  004537  023520                  PERFORM ,LOAD,MODE      ;
3038  021030  020000                          BIT13                   ;RX ENABLE
3039  021032  004537  023520                  PERFORM ,LOAD,MODE      ;
3040  021036  072000                          <BIT14+BIT13+BIT12>+BIT10 ;9600 BAUD,
3041  021040  000403                          BR      68$             ;
3042  021042  004537  023520          67$:    PERFORM ,LOAD,MODE      ;MODE FOR CABLE TESTING
3043  021046  030000                          BIT13+BIT12             ;
3044  021050  005277  160306          68$:    INC     @DVSCR          ;SET GO
3045  021054  005005                          CLR     R5              ;
3046  021056  105777  160300          2$:     TSTB    @DVSCR          ;RX BIT7=1?
3047  021062  100404                          BMI     3$              ;YES
3048  021064  104414                          DELAY                   ;WASTE TIME
3049  021066  005205                          INC     R5              ;DELAY
3050  021070  001372                          BNE     2$              ;
3051  021072  104000                          HLT                     ;NO SCR BIT7=1
```



```
3052  021074  013705  007260          3$:     MOV     LINE,R5         ;GET LINE NUMBER
3053  021100  000305                          SWAB    R5              ;PUT IN HIGH BYTE
3054  021102  052705  050000                  BIS     #BIT14+BIT12,R5 ;
3055  021106  017704  160254                  MOV     @DVRIC,R4       ;READ RIC
3056  021112  020504                          CMP     R5,R4           ;OK?
3057  021114  001401                          BEQ     4$              ;YES
3058  021116  104000                          HLT                     ;
3059  021120  005005                  4$:     CLR     R5              ;
3060  021122  005004                          CLR     R4              ;
3061  021124  012701  023562                  MOV     #TXBAP,R1       ;CHECK DATA!!
3062  021130  012700  024562                  MOV     #RXBA,R0        ;
3063  021134  012702  000040                  MOV     #40,R2          ;
3064  021140  112004                  5$:     MOVB    (R0)+,R4        ;GET RX DATA
3065  021142  042704  177740                  BIC     #^C<37>,R4      ;
3066  021146  112105                          MOVB    (R1)+,R5        ;GET TX DATA
3067  021150  020504                          CMP     R5,R4           ;OK?
3068  021152  001401                          BEQ     6$              ;
3069  021154  104000                          HLT                     ;RX DATA BAD!!
3070  021156  005302                  6$:     DEC     R2              ;DONE?
3071  021160  001367                          BNE     5$              ;
3072  021162  104412                          MSTCLR                  ;INIT DV11
3073  021164  104400                          SCOPE                   ;SCOPE TEST,
3074
3075
3076
```

```
3077            021166                          LOVE=.
3078            000210                          .=210
3079  000210    000137  021166                  JMP     MANUAL
3080            021166                          .=LOVE
3081  021166    012706  001200          MANUAL: MOV     #STACK,SP
3082  021172    012700  001500                  MOV     #DV.MAP,R0
3083  021176    005020                  1$:     CLR     (R0)+
3084  021200    022700  001740                  CMP     #DV.END,R0
3085  021204    001374                          BNE     1$
3086  021206    104402  022257                  TYPE    ,MXTITLE
3087  021212    004737  023334                  JSR     PC,TKRDY
3088  021216    113737  001272  001301          MOVB    SAVR5,DVNUM
3089  021224    142737  177760  001301          BICB    #^C<17>,DVNUM
3090  021232    112737  000001  001303          MOVB    #1,SAVNUM
3091  021240    012700  001500                  MOV     #DV.MAP,R0
3092  021244    012705  000001          2$:     MOV     #1,R5
3093  021250    104402  022440                  TYPE    ,MXGIVE
3094  021254    113737  001303  001266          MOVB    SAVNUM,$AVR3
3095  021262    104411  023420                  CNVRT   ,XXLIN
3096  021266    104403  022477                  INSTR   ,MXSCR
3097  021272    104405                          PARAM
3098  021274    175000                          175000
3099  021276    175400                          175400
3100  021300    001256                          TEMP5
3101  021302       007     001                  .BYTE   7,1
3102  021304    013720  001256                  MOV     TEMP5,(R0)+
3103  021310    104403  022630                  INSTR   ,MXVEC
3104  021314    104405                          PARAM
3105  021316    000300                          300
3106  021320    000770                          770
3107  021322    001256                          TEMP5
3108  021324       007     001                  .BYTE   7,1
3109  021326    013720  001256                  MOV     TEMP5,(R0)+
3110  021332    113746  001303          65$:    MOVB    SAVNUM,-(SP)
3111  021336    110537  001303                  MOVB    R5,SAVNUM
3112  021342    104402  023000                  TYPE    ,MXQV
3113  021346    113737  001303  001266          MOVB    SAVNUM,$AVR3
3114  021354    104411  023420                  CNVRT   ,XXLIN
3115  021360    112637  001303                  MOVB    (SP)+,SAVNUM
3116  021364    104402  023050                  TYPE    ,MXINST
3117  021370    004737  023334                  JSR     PC,TKRDY
3118  021374    042737  000040  001272          BIC     #40,$AVR5
3119  021402    022737  000131  001272          CMP     #131,$AVR5
3120  021410    001402                          BEQ     .+6
3121  021412    052710  100000                  BIS     #BIT15,(R0)
3122  021416    112710  000226                  MOVB    #226,(R0)
3123  021422    112760  000062  000002          MOVB    #62,2(R0)
3124  021430    005710                          TST     (R0)
3125  021432    100515                          BMI     70$
3126  021434    104402  023117                  TYPE    ,MASYNC
3127  021440    004737  023334                  JSR     PC,TKRDY
3128  021444    042737  000040  001272          BIC     #40,$AVR5
3129  021452    022737  000116  001272          CMP     #116,$AVR5
3130  021460    001405                          BEQ     66$
3131  021462    012710  004000                  MOV     #ASYNC,(R0)
3132  021466    005060  000002                  CLR     2(R0)
```



```
3133  021472    000475                          BR      70$
3134  021474    104403  022566          66$:    INSTR   ,MXSY1A
3135  021500    104405                          PARAM
3136  021502    000001                          001
3137  021504    000376                          376
3138  021506    001256                          TEMP5
3139  021510       000     001                  .BYTE   0,1
3140  021512    113710  001256                  MOVB    TEMP5,(R0)
3141  021516    104403  022667                  INSTR   ,MXSY1B
3142  021522    104405                          PARAM
3143  021524    000001                          001
3144  021526    000376                          376
3145  021530    001256                          TEMP5
3146  021532       000     001                  .BYTE   0,1
3147  021534    113760  001256  000002          MOVB    TEMP5,2(R0)
3148  021542    104402  022731                  TYPE    ,MXBITS
3149  021546    004737  023334                  JSR     PC,TKRDY
3150  021552    042737  177770  001272          BIC     #^C<7>,$AVR5
3151  021560    032737  000007  001272  3$:     BIT     #7,$AVR5
3152  021566    001422                          BEQ     4$
3153  021570    062710  000400                  ADD     #400,(R0)
3154  021574    005237  001272                  INC     $AVR5
3155  021600    000767                          BR      3$
3156  021602    104402  023050                  TYPE    ,MXINST
3157  021606    004737  023334                  JSR     PC,TKRDY
3158  021612    042737  000040  001272          BIC     #40,$AVR5
3159  021620    022737  000131  001272          CMP     #131,$AVR5
3160  021626    001402                          BEQ     .+6
3161  021630    052710  100000                  BIS     #BIT15,(R0)
3162  021634    104402  023174          4$:     TYPE    ,MXSYN
3163  021640    004737  023334                  JSR     PC,TKRDY
3164  021644    042737  000040  001272          BIC     #40,$AVR5
3165  021652    022737  000131  001272          CMP     #131,$AVR5
3166  021660    001402                          BEQ     .+6
3167  021662    052710  010000                  BIS     #BIT12,(R0)
3168  021666    022020                  70$:    CMP     (R0)+,(R0)+
3169  021670    005205                          INC     R5
3170  021672    022705  000005                  CMP     #5,R5
3171  021676    001215                          BNE     65$
3172  021700    105237  001303                  INCB    SAVNUM
3173  021704    123737  001303  001301          CMPB    SAVNUM,DVNUM
3174  021712    101002                          BHI     .+6
3175  021714    000137  021244                  JMP     2$
3176  021720    105037  001300                  CLRB    DVACTV
3177  021724    113737  001301  001303          MOVB    DVNUM,SAVNUM
3178  021732    113701  001301                  MOVB    DVNUM,R1
3179  021736    000241                          CLC
3180  021740    106137  001300                  ROLB    DVACTV
3181  021744    105237  001300                  INCB    DVACTV
3182  021750    105301                          DECB    R1
3183  021752    001371                          BNE     .-14
3184  021754    113737  001300  001302          MOVB    DVACTV,$AVACT
3185  021762    012710  177777                  MOV     #177777,(R0)
3186  021766    104402  021774                  TYPE    ,MXFIN
3187  021772    000000                          HALT
3188  021774                            MXFIN:
```

```
 3189  021774  177777  044124  047101          ,ASCII  <377><377>/THANKS FOR THE INFORMATION,/
       022031     377  042522  042515          ,ASCII  <377>/REMEMBER TO START DIAGNOSTIS WITH SW07=1!/
       022103     377  042522  040507          ,ASCIZ  <377>/REGARDS,  JOHN,/<212>
       022125     377  042523  042514  MSEL:   ,ASCII  <377>/SELECT LINE(S) XXXXXXXXXXXXXXX/
       022165     377  020040  020040          ,ASCIZ  <377>/                 /
       022206  046377  047111  051505  MLINE:  ,ASCIZ  <377>/LINES SELECTED(8):  /<377>
       022235     056  000377          M.CRLF: ,ASCIZ  /./<377>
       022240  051777  047111  046107  MSING:  ,ASCIZ  <377>/SINGLE LINE: /
       022257                          MXTITLE:
       022257     212  053104  030461          ,ASCII  <212>/DV11 MANUAL PARAMETER INPUT PROGRAM,/
       022324  050377  042514  051501          ,ASCII  <377>/PLEASE ANSWER ALL QUESTIONS,/
       022361     377  054524  042520          ,ASCIZ  <377>/TYPE IN NUMBER OF DV11'S IN SYSTEM (1 TO 8): /
       022440  043612  053111  020105  MXGIVE: ,ASCIZ  <212>/GIVE INFORMATION ON DV11 NO, /
       022477     377  054524  042520  MXSCR:  ,ASCIZ  <377>/TYPE IN THE ADDRESS OF DV11 SYSTEM CONTROL REGISTER: /
       022566  052377  050131  020105  MXSY1A: ,ASCIZ  <377>/TYPE IN SYNC "A" FOR LINE CARD: /
       022630  052377  050131  020105  MXVEC:  ,ASCIZ  <377>/TYPE IN VECTOR "A" FOR DV11: /
       022667     377  054524  042520  MXSY1B: ,ASCIZ  <377>/TYPE IN SYNC "B" FOR LINE CARD: /
       022731     377  054524  042520  MXBITS: ,ASCIZ  <377>/TYPE IN BITS-PER-CHAR FOR LINE CARD: /
       023000  043612  053111  020105  MXGV:   ,ASCIZ  <212>/GIVE INFORMATION FOR LINE CARD NUMBER /
       023050  044777  020123  044124  MXINST: ,ASCIZ  <377>/IS THIS LINE CARD INSTALLED?(Y OR N) /
       023117     377  051511  052040  MASYNC: ,ASCIZ  <377>/IS THIS AN ASYNCHRONOUS LINE CARD?(Y OR N) /
       023174  040777  042522  054440  MXSYN:  ,ASCIZ  <377>/ARE YOU JUMPERED FOR TWO SYNCS? (Y OR N) /
       023247     377  040450  020051  MTURN:  ,ASCIZ  <377>/(A) H325/<377>/(B) H861/<377>/TYPE "A" OR "B": /
       023314  046777  042117  046505  MVECZ:  ,ASCIZ  <377>/MODEM VECTOR: /
                                       ,EVEN
       023334  105777  155644          TKRDY:  TSTB    @TKCSR
       023340  100375                          BPL     .-4
       023342  017746  155640                  MOV     @TKDBR,-(SP)
       023346  042716  000200                  BIC     #BIT7,(SP)
       023352  032716  000100                  BIT     #BIT6,(SP)      ;CHAR OR NUMBER
       023356  001402                          BEQ     .+6             ;BR IF NUMBER
       023360  042716  000040                  BIC     #BIT5,(SP)      ;MAKE UPPER CASE
       023364  022716  000015                  CMP     #15,(SP)
       023370  001411                          BEQ     1$
       023372  011637  001272                  MOV     (SP),SAVR5
       023376  105777  155606                  TSTB    @TPCSR
       023402  100375                          BPL     .-4
       023404  011677  155602                  MOV     (SP),@TPDBR
       023410  005726                          TST     (SP)+
       023412  000750                          BR      TKRDY
       023414  005726                  1$:     TST     (SP)+
       023416  000207                          RTS     PC
       023420  000001                  XXLIN:  1
 3190  023422     002     001                  .BYTE   2,1
 3191  023424  001266                          SAVR3
 3192
 3193  023426                          CKBIT15:
 3194  023426  010046                          MOV     R0,-(SP)
 3195  023430  005000                          CLR     R0
 3196  023432  005777  155732          64$:    TST     @DVLCR
 3197  023436  100004                          BPL     65$
 3198  023440  104414                          DELAY
 3199  023442  005200                          INC     R0
 3200  023444  001372                          BNE     64$
 3201  023446  104000                          HLT     0               ;BIT 15 FAILED TO CLEAR
 3202  023450  012600                  65$:    MOV     (SP)+,R0
```



```
 3203  023452  000207                          RTS     PC
 3204  023454  010046                  SETREG: MOV     R0,-(SP)
 3205  023456  010146                          MOV     R1,-(SP)
 3206  023460  112500                          MOVB    (R5)+,R0
 3207  023462  112501                          MOVB    (R5)+,R1
 3208  023464  110077  155704                  MOVB    R0,@DVSRSH
 3209  023470  012577  155702                  MOV     (R5)+,@DVSRA
 3210  023474  042777  000060  155660          BIC     #BIT5+BIT4,@DVSCR
 3211  023502  110177  155666                  MOVB    R1,@DVSRSH
 3212  023506  012577  155664                  MOV     (R5)+,@DVSRA
 3213  023512  012601                          MOV     (SP)+,R1
 3214  023514  012600                          MOV     (SP)+,R0
 3215  023516  000205                          EXIT
 3216
 3217  023520                          LOAD.MODE:
 3218  023520  012577  155644                  MOV     (R5)+,@DVLCR
 3219  023524  052777  100000  155636          BIS     #BIT15,@DVLCR
 3220  023532  010046                          MOV     R0,-(SP)
 3221  023534  005000                          CLR     R0
 3222  023536  005777  155626          1$:     TST     @DVLCR
 3223  023542  100004                          BPL     2$
 3224  023544  104414                          DELAY
 3225  023546  005200                          INC     R0
 3226  023550  001372                          BNE     1$
 3227  023552  104000                          HLT     0               ;BIT 15 FAILED TO CLEAR
 3228  023554  012600                  2$:     MOV     (SP)+,R0
 3229  023556  000205                          EXIT
 3230  023560  000001                  SYNC:   ,BLKW 1
 3231  023562  000400                  TXBAP:  ,BLKB   400
 3232  024162  000400                  TXTAB:  ,BLKB   400
 3233  024562  000400                  RXBA:   ,BLKB   400
 3234  025162  051777  047111  046107  EM1:    ,ASCIZ  <377>/SINGLE LINE CABLE TESTS(DV11 ERROR)/
       025227     377  040503  046102  EM2:    ,ASCIZ  <377>/CABLE TURN AROUND TESTS (MODEM CONTROL ERROR)/
       025306  046777  042117  046505  EM3:    ,ASCIZ  <377>/MODEM CONTROL ERROR/
       025333     377  054105  042520  DH4:    ,ASCIZ  <377>/EXPECTED  FOUND  REGISTER/
       025366  052777  042516  050130  EM4:    ,ASCIZ  <377>/UNEXPECTED MODEM CONTROL INTERUPT,/
       025432  046777  042117  046505  EM5:    ,ASCIZ  <377>/MODEM CONTROL FAILED TO INTERUPT/
       025474  051377  040505  044504  EM6:    ,ASCIZ  <377>/READING MODEM CONTROL CAUSED AT TRAP TO 4,/
       025550  042777  050130  041505  DH1:    ,ASCIZ  <377>/EXPECTED  FOUND  LINE  DVSCR  MC.CSR/
                                       ,EVEN
       025616  000005                  DT1:    5
 3235  025620     006     004                  ,BYTE 6,4
 3236  025622  001272                          SAVR5
 3237  025624     006     001                  ,BYTE   6,1
 3238  025626  001270                          SAVR4
 3239  025630     002     004                  ,BYTE   2,4
 3240  025632  007260                          LINE
 3241  025634     006     001                  ,BYTE   6,1
 3242  025636  001362                          DVSCR
 3243  025640     006     001                  ,BYTE 6,1
 3244  025642  007276                          MC,CSR
 3245  025644  000003                  DT2:    3
 3246  025646     006     004                  ,BYTE   6,4
 3247  025650  001272                          SAVR5
 3248  025652     006     001                  ,BYTE   6,1
 3249  025654  001270                          SAVR4
```

```
3250  025656     006      001              .BYTE    6,1
3251  025660   001266                      $AVR3
3252  025662                       .ERRTAB:
3253  025662   025162                      EM1
3254  025664   025550                      DH1
3255  025666   025616                      DT1
3256  025670   025227                      EM2
3257  025672   025550                      DH1
3258  025674   025616                      DT1
3259  025676   025306                      EM3
3260  025700   025333                      DH4
3261  025702   025644                      DT2
3262  025704   025366                      EM4
3263  025706   000000                      0
3264  025710   000000                      0
3265  025712   025432                      EM5
3266  025714   000000                      0
3267  025716   000000                      0
3268  025720   025474                      EM6
3269  025722   000000                      0
3270  025724   000000                      0
3271  025726   000000                      0
3272  025730   000000                      0
3273  025732   000000                      0
3274           000001              .END
```



```
ADRCNT= 003443       617*   653*   662#
ALU    = 010000       73#
ASYNC  = 004000       81#   3131
AUTO.S   006622     1127#
BCC    = 060000       78#
BINWRD   003746      703*   704    741#
BIT0   = 000001       71#   884   1228   3020
BIT1   = 000002       70#   884    895   1231   3020
BIT10  = 002000       61#   884   3021   3024   3040
BIT11  = 004000       60#   884   1444   3036
BIT12  = 010000       59#    73     75     77     79   3036   3040   3043   3054   3167
BIT13  = 020000       58#    74     75     78     79   3038   3040   3043
BIT14  = 040000       57#    76     77     78     79    524   3040   3054
BIT15  = 100000       56#  3008   3013   3017   3121   3161   3219
BIT2   = 000004       69#   451    884   1232   2971   2977   3021
BIT3   = 000010       68#   884   1233   2969   2985
BIT4   = 000020       67#  1234   3210
BIT5   = 000040       66#  1235   2994   3020   3189   3210
BIT6   = 000100       65#  1195   1236   3020   3189
BIT7   = 000200       64#   518    765    922    943   1195   1237   1447   3189
BIT8   = 000400       63#   884    901
BIT9   = 001000       62#   884   1195   1200   3036
BRB    = 070000       79#
BRW      003014      457    546#
BRX      003016      458    547#
BUSY   = 000020     1213#  1621   1630   1957   1989   2198
CHAR     007264     1242#  1414*  1423   1435*
CHRCNT   003744      701*   705    721*   739#   740
CKBIT1   023426     3193#
CLKX     001242      150#
CLK.A    001412      250#  1045
CLK.B    001413      251#  1050
CLK.C    001414      252#  1055
CLK.D    001415      253#  1060
CLRMUX= 002000      1219#  1935   2080   2113   2190   2251   2298   2345   2392   2582   2636   2690   2744
CLRSCN= 004000      1220#  1956   1988   2197
CNVRT  = 104411      209#   476    478    480    482    802    804    860    917   1309   3095   3114
CO     = 000100     1236#  2497   2809
COF    = 040000     1223#
CONVRT= 104410       207#   416    818
COUNT    007266     1243#  1412*  1424*  1426*  1433*
CREAM    001306      171#   385*   992*   993    995*  1000   1001*  1002   1005*
CS     = 000040     1235#  2497   2809
CSF    = 020000     1222#
CSRMAP   006624      410   1129#
CYCLE    005666      460    496    497    982#
DATABP   004276      791*   794    816    819#
DATACL= 104416       219#
DATAHD   004264      790*   812    815#
DELAY  = 104414      215#  1911   1946   1963   2000   2044   2133   2211   2274   2321   2368   2415   2462
                    2509   2556   2606   2660   2714   2768   2821   2875   2929   3048   3198   3224
DEVADR   003440      615*   650    660#
DH1      025550     3234#  3254   3257
DH4      025333     3234#  3260
DONE   = 000200     1216#  1538   1540   1541   1545   1546   1548   1649   1693   1715   1736   1757   1778
                    1799   1820   1841   1862   2150   2228
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DSR    = 000020          1234#   2544
DT1      025616          3234#   3255    3258
DT2      025644          3245#   3261
DVACTV   001300           165#    432*    433     982     987    1161*   1167*   1168*   1172    1191    3176*   3180*   3181*
                         3184
DVCR00   001500           281#
DVCR01   001524           292#
DVCR02   001550           303#
DVCR03   001574           314#
DVCR04   001620           325#
DVCR05   001644           336#
DVCR06   001670           347#
DVCR07   001714           358#
DVLCR    001370           233#    901*    902    1021*   1022*   1023    3196    3218*   3219*   3222
DVNSR    001402           238#   1031*   1032*   1033
DVNUM    001301           166#    381     486    1133*   1154*   1155    1162    1164    3088*   3089*   3173    3177    3178
DVRIC    001366           232#   1019*   1020*   1021    3055
DVRLVL   001354           227#   1036*   1037*   1038
DVRVEC   001352           226#    503    1007*   1036
DVSCR    001362           230#    500     878*    891*    895*   1006*   1017    1324    1400    1408    3044*   3046    3210*
                         3242
DVSCRH   001364           231#   1017*   1018*   1019
DVSFR    001400           237#   1029*   1030*   1031
DVSRA    001376           236#    882    1027*   1028*   1029    3028*   3209*   3212*
DVSRS    001372           234#    881    1023*   1024*   1025    3002*
DVSRSH   001374           235#   1025*   1026*   1027    3208*   3211*
DVTLVL   001360           229#   1040*   1041*
DVTR00   001502           282#
DVTR01   001526           293#
DVTR02   001552           304#
DVTR03   001576           315#
DVTR04   001622           326#
DVTR05   001646           337#
DVTR06   001672           348#
DVTR07   001716           359#
DVTVEC   001356           228#   1038*   1039*   1040
DV,END   001740           369#    993    1002    1131    3084
DV,MAP   001500           171     280#    385     412     995    1005    1129    1134    1183    3082    3091
DV00,A   001504           283#
DV00,B   001510           285#
DV00,C   001514           287#
DV00,D   001520           289#
DV01,A   001530           294#
DV01,B   001534           296#
DV01,C   001540           298#
DV01,D   001544           300#
DV02,A   001554           305#
DV02,B   001560           307#
DV02,C   001564           309#
DV02,D   001570           311#
DV03,A   001600           316#
DV03,B   001604           318#
DV03,C   001610           320#
DV03,D   001614           322#
DV04,A   001624           327#
DV04,B   001630           329#
```



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DV04,C   001634           331#
DV04,D   001640           333#
DV05,A   001650           338#
DV05,B   001654           340#
DV05,C   001660           342#
DV05,D   001664           344#
DV06,A   001674           349#
DV06,B   001700           351#
DV06,C   001704           353#
DV06,D   001710           355#
DV07,A   001720           360#
DV07,B   001724           362#
DV07,C   001730           364#
DV07,D   001734           366#
EM1      025162          3234#   3253
EM2      025227          3234#   3256
EM3      025306          3234#   3259
EM4      025366          3234#   3262
EM5      025432          3234#   3265
EM6      025474          3234#   3268
ERRCNT   001232           142#    387*    509     827*
ERRFLG   001311           177#    383*    471*    538*    779*    792     806*    861*
ERRMSG   004252           789*    807     810#
ERTAB0   004366           804     836#
EXERCI   007272          1245#   1416*   1419*   1437*
EXIT   = 000205            81#   3215    3229
EXITER   004322           822     827#
FIX,00   006516          1046    1051    1056    1061    1095*
HALTS    004302           775     821#
HILIM    003436           614*    641     659#
ICOUNT   001222           138#    536     541*
INBUF    005520           584     620     967#
INIFLG   001310           176#    392     407*
INSTER=  104404           199#    635
INSTR  = 104403           197#   1068    1348    1402    3096    3103    3134    3141
INSTR2   003236           591     603#
INTENA=  000100          1215#   1511    1513    1514    1518    1519    1521    1670    1690    1714    1735    1756    1777
                         1798    1819    1840    1861    2126    2204
KBISR    010274          1328    1449    1454#
LIGHT    000174           110#    402
LIGHTS   001200           121#    402*    473*
LIMITS   003364           630     641#
LINE     007260          1240#   1352    1355*   1417*   1418*   1438*   2250    2297    2344    2391    2439    2486    2533
                         2585*   2639*   2693*   2747*   2969    2971    2977    3002    3052    3240
LINENA=  000001          1228#   2089    2119    2254    2262    2442    2450    2458    2489    2497    2505    2536    2544
                         2552    2586    2594    2801    2809    2817    2855    2863    2871    2909    2917    2925
LOAD,M   023520          3035    3037    3039    3042    3217#
LOBITS   003442           616*    645     661#    662
LOCK     001220           137#    540*    554     556     798    1877*   1903*   1933*   1955*   1982*   2026*   2069*   2111*
                         2166*   2581*   2635*   2689*   2743*   2798*   2852*   2906*
LOGICA   002560           107     490#
LOKFLG   001312           178#
LOLIM    003434           613*    643     658#
LOVE   = 021166          3077#   3080
LPCNT    001224           139#    535*    536     539#
LSTERR   001234           143#    388*    470*    522*    776     778*    862*
```

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L00,03  001416          255#   1008*   1043    2160    2981
L04,07  001420          256#   1010*   1048    2171    2979
L08,11  001422          257#   1012*   1053    2174    2975
L12,15  001424          258#   1014*   1058    2177    2973
MAINT = 001000         1218#   1565    1567    1568    1572    1573    1575    1938    1991    1994    2033    2117
MANUAL  021166         3079    3081#
MAR18 = 007500         1347#   1459
MASKX   001244          151#
MASK,A  001406          245#   1044
MASK,B  001407          246#   1049
MASK,C  001410          247#   1054
MASK,D  001411          248#   1059
MASTEK  005400          800     958#
MASYNC  023117         3126    3189#
MCRLF   005104          569     692     796     797     805     946     958#    1067    1085
MCSRX   005330          475     958#
MC,CSR  007276         1247#   1324*   1325*   1326    1486    1510    1537    1564    1591    1617    1646*   1649*   1667*
                       1670*   1688*   1690*   1693*   1710*   1714*   1715*   1731*   1735*   1736*   1752*   1756*   1757*
                       1773*   1777*   1778*   1794*   1798*   1799*   1815*   1819*   1820*   1836*   1840*   1841*   1857*
                       1861*   1862*   1878    1904    1934    1983    2027    2070    2112    2188    2248*   2251*   2253*
                       2255*   2258    2267*   2271*   2295*   2298*   2300*   2302*   2305    2314*   2318*   2342*   2345*
                       2347*   2349*   2352    2361*   2365*   2389*   2392*   2394*   2396*   2399    2408*   2412*   2437*
                       2441*   2443*   2446    2455*   2460*   2484*   2488*   2490*   2493    2502*   2507*   2531*   2535*
                       2537*   2540    2549*   2554*   2577*   2582*   2584*   2587*   2590    2599*   2603*   2631*   2636*
                       2638*   2641*   2644    2653*   2657*   2685*   2690*   2692*   2695*   2698    2707*   2711*   2739*
                       2744*   2746*   2749*   2752    2761*   2765*   2794*   2800*   2802*   2805    2814*   2819*   2848*
                       2854*   2856*   2859    2868*   2873*   2902*   2908*   2910*   2913    2932*   2927*   3244
MC,LSR  007300         1248#   1326*   1327*   1490    2074*   2082    2089*   2090    2096*   2119*   2193*   2254*   2257
                       2273*   2275    2301*   2304    2320*   2322    2348*   2351    2367*   2369    2395*   2398    2414*
                       2416    2442*   2445    2461*   2463    2489*   2492    2508*   2510    2536*   2539    2555*   2557
                       2586*   2589    2605*   2607    2640*   2643    2659*   2661    2694*   2697    2713*   2715    2748*
                       2751    2767*   2769    2801*   2804    2820*   2822    2828*   2855*   2858    2874*   2876    2882*
                       2909*   2912    2928*   2930    2936*
MC,LVL  007304         1250#   1409*   1410*   1648*   1669*   1691*   1713*   1734*   1755*   1776*   1796*   1817*   1838*
                       1859*   2124*   2203*
MC,VEC  007302         1249#   1406    1409    1647*   1668*   1689*   1712*   1733*   1754*   1775*   1795*   1816*   1837*
                       1858*   2123*   2202*
MDATA   005624          719     729     971#
MEPASS  005145          474     958#
MERRPC  005454          803     958#
MERRX   005355          481     958#
MERR2   005174          958#    984     1174
MERR3   005243          429     958#
MLINE   022206         1385    3189#
MLOCK   005301          453     958#
MNEW    005402          424     958#
MPASSX  005344          479     958#
MPFAIL  005107          859     958#
MQM     005100          599     958#    1090
MR      005171          461     958#
MRESET= 004000           81#     878     891
MSEL    022125         1360    3189#
MSING   022240         1348    3189#
MSTCLR= 104412          211#    863     3072
MTITLE  001000          119#    406
MTSTN   005366          801     958#    1069
```



```
MTSTPC  005267          958#
MTURN   023247         1334    3189#
MVECX   005336          477     958#
MVECZ   023314         1402    3189#
MXBITS  022731         3148    3189#
MXFIN   021774         3186    3188#
MXGIVE  022440         3093    3189#
MXGV    023000         3112    3189#
MXINST  023050         3116    3156    3189#
MXSCR   022477         3096    3189#
MXSYN   023174         3162    3189#
MXSY1A  022566         3134    3189#
MXSY1B  022667         3141    3189#
MXTITL  022257         3086    3189#
MXVEC   022630         3103    3189#
M,CRLF  022235         1393    3189#
NEXT    001216          136#    542     832     1322*   1441*   1473*   1509*   1536*   1563*   1590*   1616*   1644*   1665*
                       1686*   1709*   1730*   1751*   1772*   1793*   1814*   1835*   1856*   1876*   1902*   1932*   1981*
                       2025*   2068*   2110*   2165*   2186    2243*   2246    2290*   2293    2337*   2340    2384*   2387
                       2432*   2435    2479*   2482    2526*   2529    2572*   2575    2626*   2629    2680*   2683    2734*
                       2737    2789*   2792    2843*   2846    2897*   2900    2963*   2966
NPR   = 040000           76#
NS    = 000010         1233#   2395    2403    2536    2544    2555
PARAM = 104405          201#   1070    1349    1403    3097    3104    3135    3142
PARAM1  003304          619#    636
PARBIT= 040000           81#   1114
PARERR  003360          622     624     626     635#    642     644     646
PASCNT  001230          141#    382*    472*    473     506
PC    =%000007           48#    410*    491*    521*    768*    947*   1046*   1051*   1056*   1061*   1077    1078*   1117*
                       1209*   1335*   1398    3087*   3117*   3127*   3149*   3157*   3163*   3189*   3203*
PERFOR= 004537           81#   3005    3010    3014    3018    3022    3029    3035    3037    3039    3042
PFTAB   004470          860     866#
POINTE  007262         1241#   1411*   1412    1413*   1414    1415*   1426    1432*   1433    1434*   1435    1436*
PORR0 = 012600           55#    826
POP1SP= 005726           55#
POP2SP= 022626           55#    544     1653    1674    1697    1718    1739    1760    1781    1803    1824    1845    1866
                       2144   2222
PS    = 177776           53#    378*    447*    1194*   1323*   1331*   1386*   1645*   1650*   1666*   1671*   1687*   1692*
                       1711*   1732*   1753*   1774*   1797*   1818*   1839*   1860*   1880*   1905*   1936*   1985*   2029*
                       2072*   2115*   2124    2127*   2129*   2139*   2192*   2203    2205*   2207*   2217*   2249*   2296*
                       2343*   2390*   2438*   2485*   2532*   2578*   2632*   2686*   2740*   2795*   2849*   2903*
PUSHR0= 010046           55#    823
PUSH1S= 005746           55#
PUSH2S= 024646           55#
QV,FLG  001313          179#    384*    485*    533     1422*
RAM   = 020000           74#
RAMCLR= 104413          213#    864     2968
RESREG  004300          817     820#
RESTAR  004414          847     853#
RESTRT  002572          484     488     496#
RESV16  001404         239#   1033*   1034*
REB05 = 104407          205#    820
RETURN  001214          135#    390*    460*    462     496*    542*    545     832*    834     865     1084*   1092*   1093
                       1430*   1431    1440*   1441    1452    1498    2186*   2187    2246*   2247    2293*   2294    2340*
                       2341    2387*   2388    2435*   2436    2482*   2483    2529*   2530    2575*   2576    2629*   2630
                       2683*   2684    2737*   2738    2792*   2793    2846*   2847    2900*   2901    2966*   2967
```

```
RING   = 000200   1237#  2450   2863
RINGF  = 100000   1224#
ROMCLK= 104415    217#
RS     = 000004   1232#  2348   2356   2489   2497   2508   2694   2702   2855   2863   2874
RUN      001304    169#   386*   987    990*   991*   998*   999*
RXBA     024562   3016   3062   3233#
R0     =%000000     41#   425*   433*   434*   436*   438*   440    441    523    529*   543*   676    681*
                   693    706*   710*   720    736*   824*   869    870*   871*   873*   899    900*   905*
                   908*  1000*  1006   1007   1008   1009   1010   1011   1012   1013   1014   1015   1016*
                  1022   1024   1030   1032   1034   1037   1039   1041   1043*  1048*  1053*  1058*  1076*
                  1077   1080   1082   1084   1087   1088   1095   1114   1175*  1184*  1186*  1188   1196*
                  1197*  1365*  1366   1367*  1368   1372   1374   1376   1378*  1394   1454   1455*  1456*
                  1457   1460*  1485*  1882*  1890*  1908*  1918*  1937*  1940*  1942*  1953*  1959*  1970*
                  1986*  2013*  2030*  2057*  2073*  2076*  2079*  2097*  2116*  2120*  2125*  2152*  2167*
                  2170*  2173*  2176*  2179*  2180   2183   2189*  2195*  2200*  2230*  2579*  2613*  2633*
                  2667*  2687*  2721*  2741*  2775*  2796*  2829*  2850*  2883*  2904*  2937*  3062*  3064
                  3082*  3083*  3084   3091*  3102*  3109*  3121*  3122*  3123*  3124   3131*  3132*  3140*
                  3147*  3153*  3161*  3167*  3168   3185*  3194   3195*  3199*  3202*  3204   3206*  3208
                  3214*  3220   3221*  3225*  3228*
R1     =%000001     42#   437*   438    439*   440    487*   491    675    682*   694    698*   700    701
                   702    703    735*   879    881*   884*   887*  1044*  1049*  1054*  1059*  1099*  1104*
                  1109*  1112*  1135*  1137   1139   1141   1144   1157*  1158   1164*  1165   1169*  1185*
                  1186   1187*  1188   1189   1998*  2002   2010*  2042*  2046   2054*  2250*  2253   2260
                  2271   2272   2297*  2300   2307   2318   2319   2344*  2347   2354   2365   2366   2391*
                  2394   2401   2412   2413   2439*  2441   2448   2459   2460   2486*  2488   2495   2506
                  2507   2533*  2535   2542   2553   2554   2580*  2584   2585   2592   2603   2604   2612*
                  2634*  2638   2639   2646   2657   2658   2666*  2688*  2692   2693   2700   2711   2712
                  2720*  2742*  2746   2747   2754   2765   2766   2774*  2797*  2800   2807   2818   2819
                  2827*  2851*  2854   2861   2872   2873   2881*  2905*  2908   2915   2926   2927   2935*
                  3061*  3066   3178*  3182*  3205   3207*  3211   3213*
R2     =%000002     43#   674    683*   1045*  1050*  1055*  1060*  1100*  1105*  1110*  1113*  1116*  1129*
                  1130*  1131   1134*  1144*  1145   1146*  1147*  1148*  1149*  1150*  1151*  1152*  1153*
                  1160*  1183*  1195*  1199*  1200*  1201*  1202*  1204*  1205*  1480*  1483*  1987*  1992
                  1997*  2003   2031*  2037   2041*  2047   2252*  2268*  2299*  2315*  2346*  2362*  2393*
                  2409*  2440*  2456*  2487*  2503*  2534*  2550*  2583*  2600*  2637*  2654*  2691*  2708*
                  2745*  2762*  2799*  2815*  2853*  2869*  2907*  2923*  3063*  3070*
R3     =%000003     44#   578    585*   595*   598*   600    604*   673    684*   695    707*   708*   709*
                   710    719*   720*   725*   728*   734*  1095*  1096*  1097   1102   1107   1486*  1487
                  1490*  1491   1510*  1511*  1512   1519*  1520   1537*  1538*  1539   1546*  1547   1564*
                  1565*  1566   1573*  1574   1591*  1592*  1593   1600*  1601   1617*  1618*  1619   1625*
                  1628   1878*  1879*  1883*  1884   1904*  1906*  1909*  1910*  1912   1934*  1935*  1938*
                  1939*  1944*  1945*  1947   1956*  1957   1961*  1962*  1964   1983*  1984*  1988*  1989
                  1991*  1992*  1993*  1994*  1996*  1999*  2001   2027*  2028*  2033*  2034*  2037*  2038*
                  2040*  2043*  2045   2070*  2071*  2075*  2080*  2081*  2112*  2113*  2114*  2117*  2118*
                  2126*  2128*  2131   2140   2145   2150*  2188*  2190*  2191*  2194*  2197*  2198   2204*
                  2206*  2209   2218   2223   2228*  2258*  2259*  2260   2272*  2305*  2306*  2307   2319*
                  2352*  2353*  2354   2366*  2399*  2400*  2401   2413*  2446*  2447*  2448   2459*  2493*
                  2494*  2495   2506*  2540*  2541*  2542   2553*  2590*  2591*  2592   2604*  2644*  2645*
                  2646   2658*  2698*  2699*  2700   2712*  2752*  2753*  2754   2766*  2805*  2806*  2807
                  2818*  2859*  2860*  2861   2872*  2913*  2914*  2915   2926*
R4     =%000004     45#   579    584*   588*   589*   590    597*   601    603*   611    620*   621    623
                   625    627*   628    629    650*   651*   655*   672    685*   696    704*   707    712*
                   714*   716*   733*   783*   784*   785*   786*   787*   788*   789    790    791    880
                   882*   883*   886*  1487*  1491*  1512*  1513*  1515   1520*  1521*  1522   1539*  1540*
                  1542   1547*  1548*  1549   1566*  1567*  1569   1574*  1575*  1576   1593*  1594*  1596
                  1601*  1602*  1603   1619*  1620   1622   1628*  1629   1631   1884*  1885   1912*  1913
```



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                  1947*  1948   1964*  1965   2001*  2003   2006   2045*  2047   2050   2082*  2084   2090*
                  2091   2140*  2145*  2146   2218*  2223*  2224   2257*  2264   2275*  2276   2304*  2311
                  2322*  2323   2351*  2358   2369*  2370   2398*  2405   2416*  2417   2445*  2452   2463*
                  2464   2492*  2499   2510*  2511   2539*  2546   2557*  2558   2589*  2596   2607*  2608
                  2643*  2650   2661*  2662   2697*  2704   2715*  2716   2751*  2758   2769*  2770   2804*
                  2811   2822*  2823   2858*  2865   2876*  2877   2912*  2919   2930*  2931   2984*  2986*
                  2989*  2990*  2992*  2993   2997*  2998   2999*  3000   3055*  3056   3060*  3064*  3065*
                  3067
R5     =%000005     46#   562    563*   567    572    574*   610    612*   613    614    615    616    617
                   618   619*   628*   631*   632*   633*   641    643    645    651    652*   656*   671
                   686*  697    705*   717*   732*   781*   782*   783    785   1384*  1387*  1477*  1514*
                  1515   1518*  1522   1541*  1542   1545*  1549   1568*  1569   1572*  1576   1595*  1596
                  1599*  1603   1620*  1621*  1622   1629*  1630*  1631   1881*  1883   1885   1889*  1907*
                  1913   1917*  1943*  1948   1952*  1960*  1965   1969*  2002*  2005*  2006   2046*  2049*
                  2050   2083*  2088*  2091   2122*  2146   2151*  2201*  2224   2229*  2256*  2262*  2264
                  2270*  2303*  2309*  2311   2317*  2350*  2356*  2358   2364*  2397*  2403*  2405   2411*
                  2444*  2450*  2452   2458*  2464   2491*  2497*  2499   2505*  2511   2538*  2544*  2546
                  2552*  2558   2588*  2594*  2596   2602*  2642*  2648*  2650   2656*  2696*  2702*  2704
                  2710*  2750*  2756*  2758   2764*  2803*  2809*  2811   2817*  2823   2857*  2863*  2865
                  2871*  2877   2911*  2917*  2919   2925*  2931   2983*  2985*  2988*  2993*  2994*  2995*
                  2998*  3045*  3049*  3052*  3053*  3054*  3056   3059*  3066*  3067   3092*  3111   3169*
                  3170   3206   3207   3209   3212   3218
SAVACT   001302    167#   427    1172*  3184*
SAVNUM   001303    168#   381*   483*   486*   1165*  3090*  3094   3110   3111*  3113   3115*  3172*  3173
                  3177*
SAVPC    001276    164#   667*   830
SAVR0    001260    157#   676*   681
SAVR1    001262    158#   675*   682
SAVR2    001264    159#   674*   683
SAVR3    001266    160#   673*   684   1383*  1390*  1391   3094*  3113*  3191   3251
SAVR4    001270    161#   672*   685   2130*  2136*  2208*  2214*  3238   3249
SAVR5    001272    162#   671*   686   1336   1340   3088   3118*  3119   3128*  3129   3150*  3151   3154*
                  3158*  3159   3164*  3165   3189*  3236   3247
SAVSP    001274    163#
SAV05  = 104406    203#   780
SCNENA= 000040    1214#  1592   1594   1595   1599   1600   1602   1618   1625   2128   2150   2206   2228
SCOPE  = 104400     191#  1495   1525   1552   1579   1606   1634   1655   1676   1698   1720   1741   1762
                  1783   1804   1825   1846   1867   1892   1920   1972   2015   2059   2099   2154   2232
                  2279   2326   2373   2420   2467   2514   2561   2615   2669   2723   2777   2831   2885
                  2939   3073
SCOP1  = 104401     193#  1888   1916   1951   1968   2009   2053   2087   2094   2142   2149   2220   2227
                  2611   2665   2719   2773   2826   2880   2934
SECRX  = 000020    1230#  2917
SECRXF= 010000    1221#
SECTX  = 000010    1229#  2748   2756   2909   2917   2928
SELECT   007270    1244#  1343*  1354*  1358*  1361   1362*  1370*  1379*  1381   1384   1416   1437
SERV.G   004640     521    768    912#   913
SETREG   023454    3005   3010   3014   3018   3022   3029   3204#
SP     =%000006     47#   379*   394*   395*   401    404    405    448*   517*   518*   519    523*   543
                   556*  562*   563    564*   574    578*   579*   580    581*   597    598    600*   601*
                   603   604    610*   611*   612    618*   655    656    667    693*   694*   695*   696*
                   697*  698    699*   732    733    734    735    736    749*   750*   751*   752*   753*
                   754*  755*   756    764*   765*   766    776    778    781    824    833*   855*   869*
                   873   879*   880*   886    887    899*   908    921*   922*   923    928    934    936
                   938*  939    942*   943*   944   1178*  1204   1206   1207*  1442*  1443*  1446*  1447*
                  1448   1450   1454*  1459*  1460   1497*  3081*  3110*  3115   3189*  3194*  3202   3204*
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                    3205*  3213   3214   3220*  3228
SPACNT= 003745       702*   723    726*   740#
SSWR    000176       112#   403
STACK = 001200        54#   379    448    833    855   1497   3081
STAT    001236       148#
STEP  = 000400      1217#  1910   1939   1945   1962   1993   1998   2034   2038   2043   2075   2118   2194
                    2267   2314   2361   2408   2455   2502   2549   2599   2653   2707   2761   2814   2868
                    2922
SV05    003452       671#
SWR     001202      1238#   398    403*   408    422    427    432    451    515    524    531    552    565
                     762    769    774    821    828    830    914    915*   925*   930*   931*   932*   939*
                    1062   1345
SW00  = 000001        34#   422
SW01  = 000002        33#  1062
SW02  = 000004        32#
SW03  = 000010        31#
SW04  = 000020        30#
SW05  = 000040        29#
SW06  = 000100        28#  1345
SW07  = 000200        27#
SW08  = 000400        26#   828
SW09  = 001000        25#   552
SW10  = 002000        24#   830
SW11  = 004000        23#   531
SW12  = 010000        22#   565    769
SW13  = 020000        21#   774
SW14  = 040000        20#
SW15  = 100000        19#
SYNA00  001506       284#
SYNA01  001532       295#
SYNA02  001556       306#
SYNA03  001602       317#
SYNA04  001626       328#
SYNA05  001652       339#
SYNA06  001676       350#
SYNA07  001722       361#
SYNB00  001512       286#
SYNB01  001536       297#
SYNB02  001562       308#
SYNB03  001606       319#
SYNB04  001632       330#
SYNB05  001656       341#
SYNB06  001702       352#
SYNB07  001726       363#
SYNC    023560      2973*  2975*  2979*  2981*  2982*  2990   3003   3012   3026   3033   3230#
SYNCX   001240       149#
SYNC00  001516       288#
SYNC01  001542       299#
SYNC02  001566       310#
SYNC03  001612       321#
SYNC04  001636       332#
SYNC05  001662       343#
SYNC06  001706       354#
SYNC07  001732       365#
SYNC2A  001426       260#  1009*
SYNC2B  001430       261#  1011*
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SYNC2C  001432       262#  1013*
SYNC2D  001434       263#  1015*
SYND00  001522       290#
SYND01  001546       301#
SYND02  001572       312#
SYND03  001616       323#
SYND04  001642       334#
SYND05  001666       345#
SYND06  001712       356#
SYND07  001736       367#
S,C   = 050000        77#
TABLE   010326      1411   1432   1463#
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TEMP1   001246       152#   412*   413    418*   960   1191*  1192*
TEMP2   001250       153#   413*   414    962
TEMP3   001252       154#  1361*  1370   1995*  2011*  2032*  2035*  2039*  2855*  2878*  2081   2095*
TEMP4   001254       155#
TEMP5   001256       156#  3100   3102   3107   3109   3138   3140   3145   3147
TESTER  010062      1418#  1421   1439   2963
TKCSR   001204       127#   527    586    912    919    940   1330*  1363   1444   1478*  1481   1482   3189
TKDBR   001206       128#   517    529    588    594    764    921    942   1365   1446   1455   3189
TKRDY   023334      1335   3087   3117   3127   3149   3157   3163   3189#
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TPCSR   001210       129#   570    592    771    926   1474   3189
TPDBR   001212       130#   572*   594*   773*   928*  1366*  3189*
TRMRDY= 000002      1231#  2301   2309   2442   2450   2461   2640   2648   2801   2809   2820
TRPOK   003762       752#
TSTNO   001226       140#   389*   841    868   1073   1080   1082   1321*  1472*  1508*  1535*  1562*  1589*
                    1615*  1643*  1664*  1685*  1708*  1729*  1750*  1771*  1792*  1813*  1834*  1855*  1875*
                    1901#  1931*  1980#  2024*  2067*  2109*  2164*  2242*  2289*  2336*  2383*  2431*  2478*
                    2525#  2571*  2625*  2679*  2733*  2788*  2842*  2896*  2962*
TST1    007306      1076   1092   1321#
TST10   011576      1616   1643#
TST11   011664      1644   1664#
TST12   011752      1665   1685#
TST13   012046      1686   1708#
TST14   012136      1709   1729#
TST15   012226      1730   1750#
TST16   012316      1751   1771#
TST17   012406      1772   1792#
TST2    010766      1322   1440   1472#
TST20   012474      1793   1813#
TST21   012562      1814   1834#
TST22   012650      1835   1855#
TST23   012736      1856   1875#
TST24   013024      1876   1901#
TST25   013122      1902   1931#
TST26   013324      1932   1980#
TST27   013506      1981   2024#
TST3    011124      1473   1508#
TST30   013672      2025   2067#
TST31   014050      2068   2109#
TST32   014302      2110   2164#
TST33   014646      2165   2242#
TST34   015046      2243   2289#
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TST36   015446          2337    2383#
TST37   015646          2384    2431#
TST4    011216          1509    1535#
TST40   016044          2432    2478#
TST41   016242          2479    2525#
TST42   016440          2526    2571#
TST43   016664          2572    2625#
TST44   017110          2626    2679#
TST45   017334          2680    2733#
TST46   017560          2734    2788#
TST47   020002          2789    2842#
TST5    011310          1536    1562#
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TST51   020446          2897    2962#   3259
TST6    011402          1563    1589#
TST7    011474          1590    1615#
TTST    002702           454*    455*    457*    458*    525#
TURFLG  007256          1239*   1338*   1342*   2184    2244    2291    2338    2385    2433    2480    2527    2573    2627
                        2681    2735    2790    2844    2898    2964
TWOSYN= 010000            81#
TXBAP   023562          2995    3007    3061    3231#
TXTAB   024162          2983    2988    3031    3032    3232#
TYPDAT  004266           795     813     816#
TYPE  = 104402           195#    406     411     424     429     453     461     474     475     477     479     481     569
                         582     599     692     729     796     797     800     801     803     805     809     814     859
                         916     918     946     984    1067    1085    1090    1174    1334    1360    1385    1393    1423
                        3086    3093    3112    3116    3126    3140    3156    3162    3186
TYPMSG  004166           793     796#
VECMAP  007102          1173    1181#
WRDCNT  003742           700*    730*    738#
WRKO,F  004254           808     811#
XBX     004060           770     772     774#
XCSP    002604           476     498#
XERR    002626           482     507#
XFR   = 030000            75#
XHEAD   005461           411     958#
XPASS   002620           480     504#
XSTATQ  005506           417     958#
XTSTN   004374           802     839#
XVEC    002612           478     501#
XXLIN   023420          1389    3095    3114    3189#
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                        1636#   1639#   1657#   1660#   1678#   1681#   1701#   1704#   1722#   1725#   1743#   1746#   1764#
                        1767#   1785#   1788#   1806#   1809#   1827#   1830#   1848#   1851#   1868#   1871#   1894#   1897#
                        1921#   1927#   1973#   1976#   2016#   2020#   2060#   2063#   2101#   2105#   2155#   2160#   2233#
                        2238#   2280#   2285#   2327#   2332#   2374#   2379#   2422#   2427#   2469#   2474#   2516#   2521#
                        2562#   2567#   2616#   2621#   2670#   2675#   2724#   2729#   2779#   2784#   2833#   2838#   2887#
                        2892#   2940#   2958#
$E    = 000053             1#    1322    1323#   1473    1474#   1509    1510#   1536    1537#   1563    1564#   1590    1591#
                        1616    1617#   1644    1645#   1665    1666#   1686    1687#   1709    1710#   1730    1731#   1751
                        1752#   1772    1773#   1793    1794#   1814    1815#   1835    1836#   1856    1857#   1876    1878#
                        1902    1904#   1932    1934#   1981    1983#   2025    2027#   2068    2070#   2110    2112#   2165
                        2167#   2243    2244#   2290    2291#   2337    2338#   2384    2385#   2432    2433#   2479    2480#
                        2526    2527#   2572    2573#   2626    2627#   2680    2681#   2734    2735#   2789    2790#   2843
                        2844#   2897    2898#   2964#
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                        1666#   1678    1683    1687#   1701    1706    1710#   1722    1727    1731#   1743    1748    1752#
                        1764    1769    1773#   1785    1790    1794#   1806    1811    1815#   1827    1832    1836#   1848
                        1853    1857#   1868    1873    1878#   1894    1899    1904#   1921    1929    1934#   1973    1978
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                        2429    2433#   2469    2476    2480#   2516    2523    2527#   2562    2569    2573#   2616    2623
                        2627#   2670    2677    2681#   2724    2731    2735#   2779    2786    2790#   2833    2840    2844#
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                         213#   215#    217#    219#    221#
.     = 025734            92#     93     96#    103#    104#    105#    106#    109#    111#    114#    118#    120#    165#
                        166#    167#    168#    169#    170#    279#    281#    282#    283#    284#    285#    286#    287#
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                        303#    304#    305#    306#    307#    308#    309#    310#    311#    312#    314#    315#    316#
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                        331#    332#    333#    334#    336#    337#    338#    339#    340#    341#    342#    343#    344#
                        345#    347#    348#    349#    350#    351#    352#    353#    354#    355#    356#    358#    359#
                        360#    361#    362#    363#    364#    365#    366#    367#    431     520     767     849     858
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.CONVR  003536           208     692#
.DATAC  004576           220     898#
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.SCOPE  002634           192     514#
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.TRPTA  001314           190#    754
.TYPE   003044           196     562#
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          2008   2052   2086   2093   2138   2141   2148   2216   2219   2226   2266   2278   2313   2325   2360
          2372   2407   2419   2454   2466   2501   2513   2548   2560   2598   2610   2652   2664   2706   2718
          2760   2772   2813   2825   2867   2879   2921   2933   3051   3058   3069   3201   3227
INTS       1463#  1784   1805   1826   1847
MUXS1       1#    2233   2280   2327   2374   2562   2616   2670   2724
MUXS2       1#    2421   2468   2515   2778   2832   2886
NOINT      1464#  1700   1721   1742   1763
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$CK15       1#
$CK150      1#    3193
$CLR,T      1#
$CYCLE      1#     973
$EGOLF     1500#  1527   1554   1581
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$GETFL      1#
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$SET,T      1#
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$SIMBC      1#
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          1809   1827   1830   1848   1851   1868   1871   1894   1897   1921   1927   1973   1976   2016   2020
          2060   2063   2101   2105   2155   2160   2233   2238   2280   2285   2327   2332   2374   2379   2422
          2427   2469   2474   2516   2521   2562   2567   2616   2621   2670   2675   2724   2729   2779   2784
          2833   2838   2887   2892   2940   2958
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ADCB       991    999
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          2214   2993   3153
ASL        631    632    633    752    784    786   1419
BCC        904   1193   1388
BCS        933    -20
BEQ        415    423    452    488    516    525    534    553    555    591    622    630    724    763    770
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          1382   1395   1401   1429   1449   1488   1492   1516   1523   1543   1550   1570   1577   1597   1604
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BGT        626    937
BHI        642   3174
BIC        434    518    708    753    765    787    922    938    943   1096   1200   1205   1367   1447   1456
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          1602   1625   1630   1994   2150   2228   2259   2306   2353   2400   2447   2461   2494   2508   2541
          2555   2591   2645   2699   2753   2806   2820   2860   2874   2914   2928   2992   3065   3118   3128
          3150   3158   3164   3189   3210
BICB       589    627   3089
BIS        895    901    939   1146   1147   1148   1149   1150   1151   1152   1153   1199   1204   1478   1621
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          1962   1992   1993   1999   2005   2034   2038   2043   2049   2075   2089   2118   2128   2194   2206
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          1957   1989   2198   2969   2971   2977   3151   3189
BITB       645    987
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BLT        624    935
BMI        409   1356   2132   2169   2172   2175   2178   2210   3047   3125
BNE        393    421    442    450    484    520    532    537    566    573    596    646    654    718    722
           727    731    767    775    795    829    858    872    885    906    913    945    983    988    994
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BPL        528    568    571    587    593    772    822    920    927    941   1364   1475   3189   3197   3223
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CLR        382    387    388    396    425    439    470    522    539    540    619    856    862    883    900
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          1859   1879   1880   1881   1905   1906   1907   1936   1960   1984   1985   1998   2028   2029   2042
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            2750  2764  2767  2794  2795  2797  2802  2803  2828  2848  2849  2851  2856  2857  2882
            2902  2903  2905  2910  2911  2936  2984  2989  2997  3028  3045  3059  3060  3083  3132
            3195  3221
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COMB         407
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EMT           55
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