IDENTIFICATION

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

PRODUCT NAME: STATIC LINE CARD TESTS

DATE RELEASED: 21-APRIL-1976

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).

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

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 read SWR (177570); SWR may be modified at Loc:176 or by hitting Control "G" <^G> on console terminal.

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

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4.1.2 SWITCH REGISTER RESTRICTIONS

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

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

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

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

4.1.3 SWITCH REGISTER PRIORITYS

ERROR SWITCHES

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

SCOPE SWITCHES

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

4.2 STARTING ADDRESS

starting address is at 000200 there are no other starting addresses for the DV11 diagnostics previously mentioned except for 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 DZDVB-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. Bits 07-00 must be all zeros for testing Async line cards.

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

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

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

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

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

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

BIT 15 Set: Line card *NOT installed (AND WONT BE TESTED)
BIT 14 Set: 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 175400 is reached. If a 'SLAVE SYNC RESPONSE' was issued by the DV11 (or any other device) (no nxm trap)(and it (SEL0) was=0) ; pointer plus 12 (SEL12) is tested to contain 177777 (MUST BE EXACTLY 177777); if a trap is encountered or if SEL12 does not contain 177777 the above updating is performed. If SEL12 was equal to 177777 the pointer is stored away and the routine continues as above;
NOTE: If the program does not find your DV11; something is wrong and AUTO SIZING should not be done.

8.5.2 FINDING THE VECTOR

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

8.5.3 PARAMETER ASSUMPTIONS.

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

1) ALL LINE CARDS(4) ARE ASSUMED TO BE INSTALLED.
   Set Bit15 of status map of any (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 cards.
5) SYNC "A"=226 AND SYNC "B"=062

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

DOCUMENT
****
DZDVBB LST
****

```
2       MAINDEC-11-DZDVB-B/<377>/STATIC LINE CARD TESTS
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        ------------------------------------------------------------------

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)


1212    ********************** TEST 1 ******************************
        TEST THAT "TRANSMITTER FLAG WAITING"
        IS TRUE AND THAT "RECV FLAG WAITING" IS
        FALSE  AFTER AN INIT.
        THIS TEST WILL BE DONE FOR BOTH ASYNC AND SYNC LINE CARDS.

1278    ********************** TEST 2 ******************************
        TEST THAT "MATCH DETECT" IS
        FALSE AFTER AN INIT.
        THIS TEST WILL BE DONE FOR BOTH ASYNC AND SYNC LINE CARDS.

1326    ********************** TEST 3 ******************************
        TEST THAT MAINT BIT WINDOW IS CLEARED
         AFTER AN INIT.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

1376    ********************** TEST 4 ******************************
        TEST THAT THE BIT WINDOW WILL
        STAY CLEARED WHEN MAINT INTERNAL

1379    MODE IS SELECTED BUT COND. STROBE IS
        NOT ASSERETED.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

1429    ********************** TEST 5 ******************************
        TEST THAT THE BIT WINDOW WILL
        SET WHEN MAINT INTERNAL MODE IS SELECTED
        AND COND. STOBE IS ASSERTED.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

1483    ********************** TEST 6 ******************************
        TEST THAT THE BIT WINDOW WILL BE CLEARED
        WHEN MAINT INTERNAL MODE IS SELECTED AND TX DSABLE
        IS ASSERTED.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

1537    ********************** TEST 7 ******************************
        TEST THAT "MAINT DATA" WILL SHOW
        UP IN "MAINT BIT WINDOW".
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
```

```
1604    ********************** TEST 10 ******************************
        TEST TO XMIT A BINARY COUNT PATTERN
        THUR THE USE OF THE BIT WINDOW,
        ONLY ONE LINE AT A TIME WILL BE EXERCISED,
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY,

1718    VERIFY THAT SETTING TMARK BIT PUTS LINE AT MARK,


1739    ********************** TEST 11 ******************************
        TEST TO CHECK THE IDLE CHARACTER
        FOR EACH LINE OF THE TRANSMITTER,
        THIS TEST USES "SYNCA",
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY,

1841    ********************** TEST 12 ******************************
        TEST TO CHECK THE IDLE CHARACTER
        FOR EACH LINE OF THE TRANSMITTER,
        THIS TEST USES "SYNCB",
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY,

1947    ********************** TEST 13 ******************************
        THIS TEST CHECKS "RECEIVE CHAR SILO" TO BE
        ALL ZERO'S WHEN "DATA ENABLE" IS NOT SET,
        EXPECTED DATA SHOULD BE LINE NUMBER ONLY
        DATA 0'S AND ERROR FLAGS 0,
        THIS TEST WILL BE DONE FOR BOTH ASYNC AND SYNC LINE CARDS,

2019    ********************** TEST 14 ******************************
        THIS TEST CHECKS "RECEIVER CHAR SILO"
        WHEN "DATA ENABLE IS SET" EXPECTED DATA S/B
        ALL 1'S FOR RX DATA, LINE NUMBER CORRECT,
        AND ERROR FLAGS =0,
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY,

2096    ********************** TEST 15 ******************************
        TEST THAT EACH RECEIVER WILL SET
        "MATCH DETECT" WHEN THE FIRST SYNC
        CHARACTER IS PUMPED INTO IT,
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY,

2159    ********************** TEST 16 ******************************
        TEST TO VERIFY THAT IF THE DV11 RECEIVER
        IS SET FOR ONE SYNC CHAR;
        "MATCH DET" *AND* "CHAR FLAG" ARE

2163    SET AFTER ONE SYNC IS PUSHED INTO THE RECEIVER
                    HOWEVER,..
        IF THE DV11 RECEIVER IS SET FOR
        TWO SYNC CHARS,...
        VERIFY THAT "MATCH DET" SETS ON THE FIRST SYNC
        AND VERIFY THAT "MATCH DET" *AND* "CHAR FLAG"
        ARE SET ON THE SECOND SYNC,
        THIS TEST USES "SYNC A",
```

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

2260    ********************** TEST 17 ******************************
        TEST TO VERIFY THAT IF THE DV11 RECEIVER
        IS SET FOR ONE SYNC CHAR;
        "MATCH DET" *AND* "CHAR FLAG" ARE
        SET AFTER ONE SYNC IS PUSHED INTO THE RECEIVER
                  HOWEVER...
        IF THE DV11 RECEIVER IS SET FOR
        TWO SYNC CHARS....
        VERIFY THAT "MATCH DET" SETS ON THE FIRST SYNC
        AND VERIFY THAT "MATCH DET" *AND* "CHAR FLAG"
        ARE SET ON THE SECOND SYNC.
        THIS TEST USES "SYNC B".
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

2365    ********************** TEST 20 ******************************
        TEST TO FORCE RECEIVER OVERRUN.
        THIS TEST WILL PUSH INTO THE RECEIVER
        TWO FULL CHARS (SYNCS) AND ONE MORE CHAR MINUS
        ONE BIT. THE PROGRAM WILL VERIFY NO OVERRUN EXISTS
        THEN THE LAST BITS WILL BE PUSHED IN VERIFING
        THAT THE OVERRUN WAS GENEPATED.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

2484    ********************** TEST 21 ******************************
        TEST OF RECEIVER DATA .
        THIS TEST RUNS A BINARY COUNT PATTERN THROUGH
        THE RECEIVER OF EACH LINE
        THROUGH THE USE OF MAINT. DATA BIT.
        THE TX IS NEVER ENABLED.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

2596    ********************** TEST 22 ******************************
        TEST OF RECEIVER DATA .
        THIS TEST RUNS A SET PATTERN TRHOUGH
        THE RECEIVER OF EACH LINE
        THROUGH THE USE OF THE TRANSMITTER.
        THIS TEST EXERCISES ALL LINES IN GROUPS OF 4.
        NOTE; SHOULD A DATA COMPARE ERROR OCCUR; THE PROGRAM
                REPORTS THE ERROR AS A RECEIVER DATA ERROR BASED
                ON THE TRANSMITTER HAS PREVIOUSLY BEEN CHECKED AND ASSUMED GOOD.
        THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.

2750    ********************** TEST 23 ******************************
        TEST OF RECEIVER "RE-SYNC"
        THIS TEST WILL SEND (BY BIT WINDOW) TWO SYNC CHARS AND
        THEN VERIFY THAT RX CHAR FLAG IS TRUE.
        THEN A "RE-SYNC" WILL BE ISSUED AND
        TWO NON-SYNC CHARS WIIL BE SENT INTO THE RX
        VERIFYING THAT THERE IS NO RX CHAR FLAG.
        NEXT TWO SYNC CHARS ARE AGAIN MOVED INTO THE RX
        VERIFING CHAR FLAG AND THE THE RX SOULD INDEED
                 RE SYNC!
```

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

2862    ********************** TEST 24 ******************************
        TEST TO VERIFY THAT SETTING RECEIVER ENABLE
        WILL SET RX FLAG AND MATCH DETECT.
        TEST WILL ALSO VERIFY THAT CLEARING RECEIVER
        ENABLE WILL CLEAR RX FLAG AND MATCH DETECT.
        THIS TEST WILL BE DONE FOR ASYNC LINE CARDS ONLY.

2950    ********************** TEST 25 ******************************
        TEST TO SET RECEIVER ENABLE.
        SET "RX DATA ENABLE".
        CLR "RX DATA ENABLE".
        AND EXPECT BOTH RX FLAG AND MATCH DETECT TO BE FALSE.
        THIS TEST WILL BE DONE FOR ASYNC LINE CARDS ONLY.

3021    ********************** TEST 26 ******************************
        TEST TO SET RECEIVER ENABLE.
        ISSUE A RESYNC  SIGNAL.
        AND EXPECT BOTH RX FLAG AND MATCH DETECT TO BE FALSE.
        THIS TEST WILL BE DONE FOR ASYNC LINE CARDS ONLY.
```

```
                                ;*MAINDEC-11-DZDVB-B/<377>/STATIC LINE CARD TESTS
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                                ;*************************************************************

                                        ;STARTING PROCEDURE
                                        ;LOAD PROGRAM
                                        ;LOAD ADDRESS 000200
                                        ;PRESS START
                                        ;PROGRAM WILL TYPE "MAINDEC-11-DZDVB-B/<377>/STATIC LINE CARD TESTS "
                                        ;PROGRAM WILL TYPE "R" TO INDICATE THAT TESTING HAS STARTED
                                        ;AT THE END OF A PASS, PROGRAM WILL TYPE PASS COMPLETE MESSAGE
                                        ;AND THEN RESUME TESTING


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

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



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

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

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

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

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

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

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

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

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

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


            001000              .=1000
 001000  005377  040515  047111 MTITLE: .ASCIZ  <377><12>/MAINDEC-11-DZDVB-B/<377>/STATIC LINE CARD TESTS /<377>
(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 ITEREATIONS COMPLETED
 001226  000000             TSTNO:  0                       ;NUMBER OF TEST IN PROGRESS
 001230  000000             PASCNT: 0                       ;NUMBER OF PASSES COMPLETED
 001232  000000             ERRCNT: 0                       ;TOTAL NUMBER OF ERRORS
 001234  000000             LSTERR: 0                       ;PC OF LAST ERROR CALL

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

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

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

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

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

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

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



```
                                        ;DV11 VECTOR AND REGISTER INDIRECT POINTERS

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

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

001406      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$:    CLR     LSTERR          ;CLEAR LAST ERROR PC.
002672  010016                          MOV     R0,(SP)         ;SAVE R0 ON THE STACK
002674  032777  040000  176300          BIT     #BIT14,@SWR     ;"LOOP ON THIS TEST"?
002702  001407                  TTST:   BEQ     1$              ;BR IF NO.  (IF LOCK SW01=1; THIS LOC =240)
002704  000437                          BR      3$              ;GOTO 3$    (IF LOCK SW01=1; THIS LOC =240)
002706  105777  176272                  TSTB    @TKCSR          ;KEYBOAD DONE?
002712  100034                          BPL     3$              ;BR IF NO. (LOCK: HIT KEY TO GOTO NEXT TEST)
002714  017700  176266                  MOV     @TKDBR,R0       ;CLEAR DONE BIT
002720  000415                          BR      2$              ;CONTINUE
002722  032777  004000  176252  1$:     BIT     #SW11,@SWR      ;DELETE ITERATION?  (QUICK PASS)
002730  001011                          BNE     2$              ;BR IF YES
002732  105737  001313                  TSTB    QV.FLG          ;HAVE PASSES BEECOMPLETED?
002736  001406                          BEQ     2$              ;BR IF QUICK PASS.
002740  005237  001224                  INC     LPCNT           ;UPDATE ITERATION COUNTER
002744  023737  001224  001222          CMP     LPCNT,ICOUNT    ;ARE ALL ITERATIONS DONE??
002752  001014                          BNE     3$              ;BR IF NOT YET
002754  105037  001311          2$:     CLRB    ERRFLG          ;PREPARE FOR NEW TEST
002760  005037  001224                  CLR     LPCNT           ;START ICOUNTER AT 0
002764  005037  001220                  CLR     LOCK
002770  012737  000020  001222          MOV     #20,ICOUNT      ;RESET ITERATIONS
002776  013737  001216  001214          MOV     NEXT,RETURN     ;GET NEXT TEST
003004  011600                  3$:     MOV     (SP),R0         ;POP R0 OFF OF THE STACK
003006  022626                          POP2SP                  ;FAKE AN "RTI"
003010  000177  176200                  JMP     @RETURN         ;GO DO THE TEST
003014  001407                  BRW:    1407
003016  000437                  BRX:    437

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

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

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

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

```
003116  000002                          RTI                     ;GO HOME
                                        ;-----------------------
                                .INSTR: MOV     R3,-(SP)        ;SAVE R3 ON STACK
003122  010446                          MOV     R4,-(SP)        ;SAVE R4 ON STACK
003124  017637  000004  003142          MOV     @4(SP),.MSG
003132  062766  000002  000004          ADD     #2,4(SP)
003140  104402                  .INST1: TYPE
003142  000000                  .MSG:   0
003144  012704  005520                  MOV     #INBUF,R4
003150  012703  000007                  MOV     #7,R3
003154  105777  176024          1$:     TSTB    @TKCSR
003160  100375                          BPL     1$
003162  117714  176020                  MOVB    @TKDBR,(R4)
003166  142714  000200                  BICB    #200,(R4)
003172  122427  000015                  CMPB    (R4)+,#15
003176  001417                          BEQ     INSTR2
003200  105777  176004          2$:     TSTB    @TPCSR
003204  100375                          BPL     2$
003206  017777  175774  175776          MOV     @TKDBR,@TPDBR
003214  005303                          DEC     R3
003216  001356                          BNE     1$
003220  012604                          MOV     (SP)+,R4
003222  012603                          MOV     (SP)+,R3
003224  104402  005100          .INSTE: TYPE    ,MQM
003230  010346                          MOV     R3,-(SP)
003232  010446                          MOV     R4,-(SP)
003234  000741                          BR      .INST1
003236  012604                  INSTR2: MOV     (SP)+,R4        ;RESTORE R4
003240  012603                          MOV     (SP)+,R3        ;RESTORE R3
003242  000002                          RTI

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

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



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

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

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

                                        ;STORE NUMBER AT SPECIFIED ADDRESS

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

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

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

                                        ;SAVE R0-R5

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

                                        ;RESTORE R0-R5

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

```
003534  000002                          RTI                     ;LEAVE

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



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

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

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

004002                        .HLT:
004002  022737  177570  001202        CMP     #177570,SWR     ;IS THERE A REAL SWR?
004010  001411                        BEQ     64$             ;BR IF YES
004012  017746  175170                MOV     @TKDBR,-(SP)    ;SAVE KEYBOARD CHAR
004016  042716  000200                BIC     #BIT7,(SP)      ;CLEAR PARITY BIT
004022  122726  000007                CMPB    #7,(SP)+        ;WAS IT CNTRL 'G' ?
004026  001002                        BNE     .+6             ;BR IF NO,
004030  004737  004640                JSR     PC,SERV.G       ;SERVICE "CNTRL 'G'",
004034  032777  010000  175140  64$:  BIT     #SW12,@SWR      ;BELL ON ERROR?
004042  001406                        BEQ     XBX             ;BR IF NO BELL
004044  105777  175140                TSTB    @TPCSR          ;TTY READY,
004050  100003                        BPL     XBX             ;DON'T WAIT IF TTY NOT READY,
004052  112777  000207  175132        MOVB    #207,@TPDBR     ;PUSH A BELL AT THE TTY,
004060  032777  020000  175114  XBX:  BIT     #SW13,@SWR      ;DELETE ERROR PRINT OUT?
004066  001105                        BNE     HALTS           ;BR IF NO PRINT OUT WANTED,
004070  021637  001234                CMP     (SP),LSTERR     ;WAS THIS ERROR FOUND LAST TIME?
004074  001404                        BEQ     1$              ;BR IF YES
004076  011637  001234                MOV     (SP),LSTERR     ;RECORD BEING HERE
004102  105037  001311                CLRB    ERRFLG          ;PREPARE HEADER
004106  104406        1$:     SAV05                   ;SAVE ALL PROC REGISTERS
004110  011605                        MOV     (SP),R5         ;GET THE PC OF ERROR
004112  162705  000002                SUB     #2,R5           ;GET ADDRESS OF TRAP CALL
004116  011504                        MOV     (R5),R4         ;GET HLT INSTRUCTION
004120  006304                        ASL     R4              ;MULT BY TWO
004122  061504                        ADD     (R5),R4         ;DOUBLE IT
004124  006304                        ASL     R4              ;MULT AGAIN
004126  042704  177001                BIC     #177001,R4      ;CLEAR JUNK
004132  062704  023056                ADD     #.ERRTAB,R4     ;GET POINTER
004136  012437  004252                MOV     (R4)+,ERRMSG    ;GET ERROR MESSAGE
004142  012437  004264                MOV     (R4)+,DATAHD    ;GET DATA HEADRER
004146  011437  004276                MOV     (R4),DATABP     ;GET DATA TABLE
004152  105737  001311                TSTB    ERRFLG          ;TYPE HEADREER
004156  001403                        BEQ     TYPMSG          ;BR IF YES
004160  005737  004276                TST     DATABP          ;DOES DATA TABLE EXIST?
004164  001040                        BNE     TYPDAT          ;BR IF YES,
004166  104402  005104        TYPMSG: TYPE    ,MCRLF
004172  104402  005104                TYPE    ,MCRLF
004176  005737  001220                TST     LOCK
```

```
                                        BEQ     1$
004202  001402
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          HALT5:  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
```



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

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

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

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

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

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

    005052  020377  051450  051127  89$:    .ASCIZ  <377>? (SWR)=/?
    005060  036451  000057
                                    .EVEN
    005064  000001                  88$:    1
    005066     006     000                  .BYTE   6,0
    005070  005072                          90$
    005072  000000                  90$:    .WORD   0
    005074  036457  000057          91$:    .ASCIZ  ?/=/?
                                    .EVEN
    005100  020040  000077          MQM:    .ASCIZ  /  ?/
(2) 005104  005015     000          MCRLF:  .ASCIZ   <15><12>
(2) 005107     377  053520  020122  MPFAIL: .ASCIZ  <377>/PWR FAILED, RESTART AT TEST /
(2) 005145     377  047105  020104  MEPASS: .ASCIZ  <377>/END PASS DZDVB-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                  XSTATQ: 2
    005510     006     003                  .BYTE   6,3
    005512  001246                          TEMP1
    005514     006     002                  .BYTE   6,2
    005516  001250                          TEMP2
                                    .EVEN

                                            ;BUFFERS FOR INPUT-OUTPUT

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

```
                                        ;
                                        ;ROUTINE USED TO "CYCLE" THROUGH UP TO EIGHT DV11'S
                                        ;THIS ROUTINE SETS UP THE CONTROL ADDRESS FOR THE DIAGNOSTIC
                                        ;AND RUNS THE SPECIFIED DV11'S.  THIS ROUTINE *MUST*
                                        ;BE RUN FIRST BEFORE ENTERING THE DIAGNOSTIC FOR THE
                                        ;SETUP NECESSARY.
                                        ;
005666  105737  001300          CYCLE:  TSTB    DVACTV          ;ARE ANY DV11'S TO BE TESTED?
005672  001004                          BNE     1$              ;BR IF OK,
005674  104402  005174                  TYPE    ,MERR2          ;NO DV11'S SELECTED!!
005700  000000                          HALT                    ;STOP THE SHOW,
005702  000776                          BR      .-2             ;DISQUALIFY CONT. SW,
005704  133737  001304  001300  1$:     BITB    RUN,DVACTV      ;IS THIS ONE "ACTIVE"
005712  001020                          BNE     2$              ;BR IF GOOD ONE FOUND,
005714  000241                          CLC                     ;CLEAR PROC. CARRY BIT,
005716  106137  001304                  ROLB    RUN             ;UPDATE POINTER
005722  105537  001304                  ADCB    RUN             ;CATCH CARRY FROM RUN
005726  062737  000024  001306          ADD     #24,CREAM       ;UPDATE ADDRESS POINTER,
005734  022737  001740  001306          CMP     #DV.END,CREAM
005742  001360                          BNE     1$              ;KEEP GOING; NOT ALL TESTED FOR,
005744  012737  001500  001306          MOV     #DV.MAP,CREAM   ;RESET ADDRESS POINTER,
005752  000754                          BR      1$              ;KEEP LOOKING FOR ACTIVE DV11
005754  000241                  2$:     CLC                     ;CLEAR PROC. CARRY,
005756  106137  001304                  ROLB    RUN             ;UPDATE POINTER,
005762  105537  001304                  ADCB    RUN             ;CATCH CARRY,
005766  013700  001306                  MOV     CREAM,R0        ;GET ADDRESS POINTER,
005772  062737  000024  001306          ADD     #24,CREAM       ;UPDATE,
006000  022737  001740  001306          CMP     #DV.END,CREAM
                                                                ;ALL DONE?
006006  001003                          BNE     3$              ;BR IF NO,
006010  012737  001500  001306          MOV     #DV.MAP,CREAM   ;RESTORE POINTER,
006016  012037  001362          3$:     MOV     (R0)+,DVSCR     ;LOAD SYSTEM CTRL. REG
006022  012037  001352                  MOV     (R0)+,DVRVEC    ;LOAD VECTOR
006026  012037  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  007256                  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  000112                          BR      8$
1087  006466  005720                  6$:     TST     (R0)+
1088  006470  020027  021754                  CMP     R0,#TLAST+10
1089  006474  001354                          BNE     5$
1090  006476  104402  005100                  TYPE    ,MQM
1091  006502  000733                          BR      4$
1092  006504  012737  007256  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,$AVNUM       ;SAVE NUMBER OF DEVICES
1166  007024  000241          4$:     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,$AVACT   ;SAVE ACTIVE REGISTER
1173  007056  000137  007102                  JMP     VECMAP          ;GO FIND THE VECTOR NOW.
1174  007062  104402  005174          5$:     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,@(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"
```



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

                                ;  TEST 1
                                ;---------------
007256  012737  000001  001226  TST1:   MOV     #1,TSTNO
007264  012737  007540  001216          MOV     #TST2,NEXT
007272  012700  000000                  MOV     #0.,R0                  ;PLACE LINE NUMBER INTO R0
007276  013737  001416  001236          MOV     L00.03,STAT             ;LOAD LINE CARD STATUS INTO STAT
007304  100402                          BMI     100$                    ;BR IF LINE CARD NOT TO BE TESTED
007306  004737  007374                  JSR     PC,105$                 ;GO DO THE TEST FOR LINE CARD 1
007312  012700  000004          100$:   MOV     #4.,R0                  ;PLACE LINE NUMBER INTO R0
007316  013737  001420  001236          MOV     L04.07,STAT             ;LOAD LINE CARD STATUS INTO STAT
007324  100402                          BMI     101$                    ;BR IF LINE CARD NOT TO BE TESTED
007326  004737  007374                  JSR     PC,105$                 ;GO DO THE TEST FOR LINE CARD 2
007332  012700  000010          101$:   MOV     #8.,R0                  ;LOAD LINE NUMBER
007336  013737  001422  001236          MOV     L08.11,STAT             ;LOAD LINE CARD STATUS INTO STAT
007344  100402                          BMI     102$                    ;BR IF LINE CARD NOT TO BE TESTED
007346  004737  007374                  JSR     PC,105$                 ;DO THE TEST FOR LINE CARD 3
007352  012700  000014          102$:   MOV     #12.,R0                 ;LOAD LINE NO.
007356  013737  001424  001236          MOV     L12.15,STAT             ;LOAD LINE CARD STATUS
007364  100402                          BMI     103$                    ;BR IF LINE CARD NOT TO BE TESTED
007366  004737  007374                  JSR     PC,105$                 ;DO THE TESTS FOR LINE CARD 4
007372  104400                  103$:   SCOPE                           ;SCOPE THIS TEST.
007374                          105$:                                   ;TEST ENTRANCE.
007374  104413                          RAMCLR                          ;CLEAR ALL DV11 SEC. REGS.
007376  010037  007410                  MOV     R0,65$                  ;STORE LINE NO. POINTER.
007402  005001                          CLR     R1                      ;ZERO MSCANNER POINTER
007404  004537  022470          1$:     PERFORM ,SETSCAN                ;POSITION SCANNER TO LINE NUMBER.
007410  000001                  65$:    .BLKW 1                         ;INITAL LINE NUMBER HERE.
007412  012703  000004          2$:     MOV     #4,R3                   ;SET TO DO 4 LINES AT A TIME
007416  012705  000003          3$:     MOV     #BIT1+BIT0,R5           ;SET EXPECTED RESULTS IN R5
007422  012702  002000                  MOV     #BIT10,R2               ;BR=A "RX FLAG WAITING"?
007426  010277  171746                  MOV     R2,@DVSFR               ;LOAD DV11 INSTRUCTION
007432  017704  171732                  MOV     @DVLCR,R4               ;READ BR TEST POINTS
007436  020504                          CMP     R5,R4                   ;TEST POINTS OK?
007440  001401                          BEQ     4$                      ;BR IF YES
007442  104001                          HLT     1                       ;EXPECT DVLCR BIT1+BIT0=1
007444  012777  050102  171726  4$:     MOV     #S.C+BIT6+BIT1,@DVSFR
007452  104415                          ROMCLK                          ;S/C "ADVANCE SCANNER"
007454  005201                          INC     R1                      ;UPDATE MSCAN POINTER
007456  010100                          MOV     R1,R0                   ;PREPARE TO SET LINE POINTER
007460  000241                          CLC                             ;TO CORRECT POSITION
007462  006000                          ROR     R0                      ;
007464  012702  001000                  MOV     #BIT9,R2                ;BR=A "TX FLAG WAITING"?
007470  010277  171704                  MOV     R2,@DVSFR               ;LOAD DV11 INSTRUCTION
007474  017704  171670                  MOV     @DVLCR,R4               ;READ BR TEST POINT
007500  012705  000002                  MOV     #BIT1,R5                ;SET EXPECTED RESULTS
007504  020504                          CMP     R5,R4                   ;TX FLAG WAITING TRUE?
007506  001401                          BEQ     5$                      ;BR IF LCR BIT1=1 AND BIT0=0
007510  104001                          HLT     1                       ;ERROR.
```

```
007512  012777  050102  171660  5$:     MOV     #S.C+BIT6+BIT1,@DVSFR
007520  104415                          ROMCLK                  ;S/C "ADVANCE SCANNER"
007522  005201                          INC     R1              ;UPDATE MSCAN POINTER
007524  010100                          MOV     R1,R0           ;UPDATE LINE POINTER
007526  000241                          CLC                     ;
007530  006000                          ROR     R0              ;
007532  005303                          DEC     R3              ;ARE ALL 4 LINES TESTED?
007534  001330                          BNE     3$              ;BR IF NO!
007536  000207                          RTS     PC              ;CHECK NEXT SET OF LINES.


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

                                ;  TEST 2
                                ;--------------
007540  012737  000002  001226  TST2:   MOV     #2,TSTNO
007546  012737  007742  001216          MOV     #TST3,NEXT
007554  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
007560  013737  001416  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
007566  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
007570  004737  007656                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
007574  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
007600  013737  001420  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
007606  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
007610  004737  007656                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
007614  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
007620  013737  001422  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
007626  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
007630  004737  007656                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
007634  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
007640  013737  001424  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
007646  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
007650  004737  007656                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
007654  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
007656                          105$:                           ;TEST ENTRANCE.
007656  010037  007672                  MOV     R0,65$          ;SET LINE POINTER
007662  104412                          MSTCLR                  ;RESET THE DV11
007664  005001                          CLR     R1              ;ZERO MSCANNER POINTER
007666  004537  022470          1$:     PERFORM ,SETSCAN        ;SET MSCAN TO CORRECT LINE
007672  000001                  65$:    .BLKW 1                 ;INITAL LINE POINTER PLACED HERE.
007674  012703  000004          2$:     MOV     #4,R3           ;SET FOR A FOUR LINE GROUP.
007700  012705  000003          3$:     MOV     #BIT1+BIT0,R5   ;SET EXPECTED RESULTS.
007704  012702  076400          4$:     MOV     #BRB+BIT11+BIT10+BIT8,R2
007710  010277  171464                  MOV     R2,@DVSFR       ;BR=B "MATCH DET"?
007714  017704  171450                  MOV     @DVLCR,R4       ;READ DVLCR INTO R4
007720  020504                          CMP     R5,R4           ;MATCH DET FALSE??
007722  001401                          BEQ     5$              ;BR IF YES
007724  104001                          HLT     1               ;LCR BIT1=1+BIT0=1 EXPECTED.
007726  004537  022470          5$:     PERFORM ,SETSCAN        ;UPDATE MSCAN POINTER TO NEXT LINE.
007732  000001                          1                       ;1 LINE
007734  005303                          DEC     R3              ;ALL FOUR LINES DONE YET?
007736  001362                          BNE     4$              ;BR IF NO
```



```
007740  000207                          RTS     PC              ;CHECK NEXT SET OF LINES


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


                                ;  TEST 3
                                ;--------------
007742  012737  000003  001226  TST3:   MOV     #3,TSTNO
007750  012737  010150  001216          MOV     #TST4,NEXT
007756  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
007762  013737  001416  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
007770  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
007772  004737  010060                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
007776  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
010002  013737  001420  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
010010  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
010012  004737  010060                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
010016  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
010022  013737  001422  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
010030  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
010032  004737  010060                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
010036  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
010042  013737  001424  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
010050  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
010052  004737  010060                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
010056  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
010060                          105$:                           ;TEST ENTRANCE.
010060  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
010066  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
010070  000207                          RTS     PC              ;EXIT TEST
010072  104412                          MSTCLR                  ;RESET DV11
010074  005002                          CLR     R2              ;ZERO SFR IMAGE
010076  017705  171266                  MOV     @DVLCR,R5       ;READ THE DVLCR INTO R5
010102  042705  000200                  BIC     #BIT7,R5        ;CLEAR MAINT BIT WINDOW EXPECTED
010106  012703  000004                  MOV     #4,R3           ;SET TO DO 4 LINES.
010112  010077  171254          1$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
010116  017704  171246                  MOV     @DVLCR,R4       ;READ DVLCR RESULTS INTO R4
010122  042705  000060                  BIC     #BIT5+BIT4,R5   ;CLEAR EXTENDED ADDRESS BITS
010126  042704  000060                  BIC     #BIT5+BIT4,R4   ;""
010132  020504                          CMP     R5,R4           ;OK?
010134  001401                          BEQ     2$              ;
010136  104001                          HLT     1               ;BIT7 INCORRECT
010140  005200                  2$:     INC     R0              ;UPDATE LINE POINTER
010142  005303                          DEC     R3              ;ALL LINES DONE?
010144  001362                          BNE     1$              ;BR IF NO
010146  000207                          RTS     PC              ;RETURN FOR NEXT SET OF LINES.


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


                                ;  TEST 4
                                ;--------------
010150  012737  000004  001226  TST4:   MOV     #4,TSTNO
010156  012737  010364  001216          MOV     #TST5,NEXT
010164  012700  000000                  MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
010170  013737  001416  001236          MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
010176  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
010200  004737  010266                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
010204  012700  000004          100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
010210  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
010216  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
010220  004737  010266                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
010224  012700  000010          101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
010230  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
010236  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
010240  004737  010266                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
010244  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
010250  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
010256  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
010260  004737  010266                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
010264  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
010266                          105$:                           ;TEST ENTRANCE.
010266  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
010274  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
010276  000207                          RTS     PC              ;EXIT TEST
010300  104412                          MSTCLR                  ;RESET DV11
010302  005002                          CLR     R2              ;ZERO SFR IMAGE
010304  012777  004000  171056          MOV     #BIT11,@DVLCR   ;SET INTERNAL MAINT MODE
010312  017705  171052                  MOV     @DVLCR,R5       ;READ THE DVLCR INTO R5
010316  042705  000200                  BIC     #BIT7,R5        ;CLEAR MAINT BIT WINDOW EXPECTED
010322  012703  000004                  MOV     #4,R3           ;SET TO DO 4 LINES.
010326  010077  171040          1$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
010332  017704  171032                  MOV     @DVLCR,R4       ;READ DVLCR RESULTS INTO R4
010336  042705  000060                  BIC     #BIT5+BIT4,R5   ;CLEAR EXTENDED ADDRESS BITS
010342  042704  000060                  BIC     #BIT5+BIT4,R4   ;""
010346  020504                          CMP     R5,R4           ;OK?
010350  001401                          BEQ     2$              ;
010352  104001                          HLT     1               ;BIT7 INCORRECT
010354  005200                  2$:     INC     R0              ;UPDATE LINE POINTER
010356  005303                          DEC     R3              ;ALL LINES DONE?
010360  001362                          BNE     1$              ;BR IF NO
010362  000207                          RTS     PC              ;RETURN FOR NEXT SET OF LINES.


                                        ;********************** TEST 5 ****************************
                                        ;*TEST THAT THE BIT WINDOW WILL
                                        ;*SET WHEN MAINT INTERNAL MODE IS SELECTED
                                        ;*AND COND. STOBE IS ASSERTED.
                                        ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                        ;!*****************************************************************
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                                ;  TEST 5
                                ;--------------
010364  012737  000005  001226  TST5:   MOV     #5,TSTNO
010372  012737  010412  001216          MOV     #TST6,NEXT
010400  012700  000000                  MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
010404  013737  001416  001236          MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
010412  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
010414  004737  010502                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
010420  012700  000004          100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
010424  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
010432  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
010434  004737  010502                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
010440  012700  000010          101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
010444  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
010452  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
010454  004737  010502                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
010460  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
010464  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
010472  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
010474  004737  010502                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
010500  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
010502                          105$:                           ;TEST ENTRANCE.
010502  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
010510  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
010512  000207                          RTS     PC              ;EXIT TEST
010514  104412                          MSTCLR                  ;RESET DV11
010516  005002                          CLR     R2              ;ZERO SFR IMAGE
010520  012777  004000  170642          MOV     #BIT11,@DVLCR   ;SET INTERNAL MAINT MODE
010526  017705  170636                  MOV     @DVLCR,R5       ;READ THE DVLCR INTO R5
010532  052705  000200                  BIS     #BIT7,R5        ;SET MAINT BIT WINDOW EXP RESULTS
010536  012703  000004                  MOV     #4,R3           ;SET TO DO 4 LINES.
010542  010077  170624          1$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
010546  052777  100000  170614          BIS     #BIT15,@DVLCR   ;SET STROBE
010554  004737  022406                  JSR     PC,CKBIT15      ;GO WAIT FOR BIT15 TO =0
010560  017704  170604                  MOV     @DVLCR,R4       ;READ DVLCR RESULTS INTO R4
010564  042705  000060                  BIC     #BIT5+BIT4,R5   ;CLEAR EXTENDED ADDRESS BITS
010570  042704  000060                  BIC     #BIT5+BIT4,R4   ;""
010574  020504                          CMP     R5,R4           ;OK?
010576  001401                          BEQ     2$              ;
010600  104001                          HLT     1               ;BIT7 INCORRECT
010602  005200                  2$:     INC     R0              ;UPDATE LINE POINTER
010604  005303                          DEC     R3              ;ALL LINES DONE?
010606  001355                          BNE     1$              ;BR IF NO
010610  000207                          RTS     PC              ;RETURN FOR NEXT SET OF LINES.


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


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1491                                    ;  TEST 6
1492                                    ;--------------
1493  010612  012737  000006  001226    TST6:   MOV     #6,TSTNO
1494  010620  012737  011040  001216            MOV     #TST7,NEXT
1495  010626  012700  000000                    MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
1496  010632  013737  001416  001236            MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
1497  010640  100402                            BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
1498  010642  004737  010730                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
1499  010646  012700  000004            100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
1500  010652  013737  001420  001236            MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
1501  010660  100402                            BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
1502  010662  004737  010730                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
1503  010666  012700  000010            101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
1504  010672  013737  001422  001236            MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
1505  010700  100402                            BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
1506  010702  004737  010730                    JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
1507  010706  012700  000014            102$:   MOV     #12.,R0         ;LOAD LINE NO.
1508  010712  013737  001424  001236            MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
1509  010720  100402                            BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
1510  010722  004737  010730                    JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
1511  010726  104400                    103$:   SCOPE                   ;SCOPE THIS TEST.
1512  010730                            105$:                           ;TEST ENTRANCE.
1513  010730  032737  004000  001236            BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
1514  010736  001401                            BEQ     .+4             ;BR IF SYNC LINE CARD.
1515  010740  000207                            RTS     PC              ;EXIT TEST
1516  010742  104412                            MSTCLR                  ;RESET DV11
1517  010744  005002                            CLR     R2              ;ZERO SFR IMAGE
1518  010746  012777  005000  170414            MOV     #BIT11+BIT9,@DVLCR      ;SET INTER MAINT MODE FOR SYSTEM TESTING
1519  010754  017705  170410                    MOV     @DVLCR,R5       ;READ THE DVLCR INTO R5
1520  010760  042705  000200                    BIC     #BIT7,R5        ;CLEAR MAINT BIT WINDOW EXPECTED
1521  010764  012703  000004                    MOV     #4,R3           ;SET TO DO 4 LINES.
1522  010770  010077  170376            1$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
1523  010774  052777  100000  170366            BIS     #BIT15,@DVLCR   ;SET STROBE
1524  011002  004737  022406                    JSR     PC,CKBIT15      ;GO WAIT FOR BIT15 TO =0
1525  011006  017704  170356                    MOV     @DVLCR,R4       ;READ DVLCR RESULTS INTO R4
1526  011012  042705  000060                    BIC     #BIT5+BIT4,R5   ;CLEAR EXTENDED ADDRESS BITS
1527  011016  042704  000060                    BIC     #BIT5+BIT4,R4   ;""
1528  011022  020504                            CMP     R5,R4           ;OK?
1529  011024  001401                            BEQ     2$              ;
1530  011026  104001                            HLT     1               ;BIT7 INCORRECT
1531  011030  005200                    2$:     INC     R0              ;UPDATE LINE POINTER
1532  011032  005303                            DEC     R3              ;ALL LINES DONE?
1533  011034  001355                            BNE     1$              ;BR IF NO
1534  011036  000207                            RTS     PC              ;RETURN FOR NEXT SET OF LINES.
1535
1536
1537                                    ;********************** TEST 7 ****************************
1538                                    ;*TEST THAT "MAINT DATA" WILL SHOW
1539                                    ;*UP IN "MAINT BIT WINDOW".
1540                                    ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
1541                                    ;*************************************************************
1542
1543                                    ;  TEST 7
1544                                    ;--------------
1545  011040  012737  000007  001226    TST7:   MOV     #7,TSTNO
1546  011046  012737  011344  001216            MOV     #TST10,NEXT
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1547  011054  012700  000000                    MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
1548  011060  013737  001416  001236            MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
1549  011066  100402                            BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
1550  011070  004737  011156                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
1551  011074  012700  000004            100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
1552  011100  013737  001420  001236            MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
1553  011106  100402                            BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
1554  011110  004737  011156                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
1555  011114  012700  000010            101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
1556  011120  013737  001422  001236            MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
1557  011126  100402                            BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
1558  011130  004737  011156                    JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
1559  011134  012700  000014            102$:   MOV     #12.,R0         ;LOAD LINE NO.
1560  011140  013737  001424  001236            MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
1561  011146  100402                            BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
1562  011150  004737  011156                    JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
1563  011154  104400                    103$:   SCOPE                   ;SCOPE THIS TEST.
1564  011156                            105$:                           ;TEST ENTRANCE.
1565  011156  032737  004000  001236            BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
1566  011164  001401                            BEQ     .+4             ;BR IF SYNC LINE CARD.
1567  011166  000207                            RTS     PC              ;EXIT TEST
1568  011170  104412                            MSTCLR                  ;RESET DV11
1569  011172  005002                            CLR     R2              ;CLEAR DVSFR IMAGE
1570  011174  012703  000004                    MOV     #4,R3           ;SET TO DO 4 LINES
1571  011200  010077  170166            1$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
1572  011204  004537  022266                    PERFORM ,LOAD,MODE      ;LOAD THE MODE
1573  011210  005000                            BIT11+BIT9              ;INT MAIT MODE AND TX DSABLE
1574  011212  017705  170152                    MOV     @DVLCR,R5       ;READ LSR
1575  011216  010504                            MOV     R5,R4           ;
1576  011220  042705  000200                    BIC     #BIT7,R5        ;CLEAR MAIT BIT WINDOW RESULT
1577  011224  020504                            CMP     R5,R4           ;WAS BIT WINDOW =TO 0
1578  011226  001401                            BEQ     .+4             ;BR IF YES
1579  011230  104001                            HLT     1               ;BIT7 OF LCR S/B=0
1580  011232  012737  000012  001250            MOV     #10.,TEMP2      ;SET FOR 10 BITS
1581  011240  052705  040200            2$:     BIS     #BIT14+BIT7,R5  ;SET MAINT DATA AND MAINT BIT WINDOW
1582  011244  052777  140000  170116            BIS     #BIT15+BIT14,@DVLCR
1583  011252  004737  022406                    JSR     PC,CKBIT15      ;STROBE MAINT DATA, WAIT BIT15=0
1584  011256  017704  170106                    MOV     @DVLCR,R4       ;READ THE LCR
1585  011262  020504                            CMP     R5,R4           ;BIT14+BIT7=1?
1586  011264  001401                            BEQ     3$              ;YES
1587  011266  104001                            HLT     1               ;MAINT DATA DID NOT SHOW UP IN WINDOW
1588  011270  042705  040200            3$:     BIC     #BIT14+BIT7,R5  ;CLEAR DATA AND WINDOW
1589  011274  042777  040000  170066            BIC     #BIT14,@DVLCR   ;CLEAR MAIT DATA
1590  011302  052777  100000  170060            BIS     #BIT15,@DVLCR   ;SET STROBE ON DV11
1591  011310  004737  022406                    JSR     PC,CKBIT15      ;WAIT 15=0
1592  011314  017704  170050                    MOV     @DVLCR,R4       ;READ DVLCR
1593  011320  020504                            CMP     R5,R4           ;WINDOW =0?
1594  011322  001401                            BEQ     4$              ;BR IF YES
1595  011324  104001                            HLT     1               ;BIT7 S/B=0
1596  011326  005337  001250            4$:     DEC     TEMP2           ;10 BITS DONE?
1597  011332  001342                            BNE     2$              ;BR IF NO
1598  011334  005200                            INC     R0              ;UPDATE LINE POINTER
1599  011336  005303                            DEC     R3              ;4 LINE GROUP DONE?
1600  011340  001317                            BNE     1$              ;BR IF NO
1601  011342  000207                            RTS     PC              ;RETURN FOR NEXT GROUP
1602
```

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

                                ;  TEST 10
                                ;--------------
011344  012737  000010  001226 TST10:  MOV     #10,TSTNO
011352  012737  012224  001216         MOV     #TST11,NEXT
011360  012700  000000                 MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
011364  113737  001412  001242         MOVB    CLK,A,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
011372  113737  001406  001244         MOVB    MASK,A,MASKX    ;PLACE "MASK"FOR CHARS INTO MASKX
011400  013737  001416  001236         MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
011406  100402                         BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
011410  004737  011542                 JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
011414  012700  000004         100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
011420  113737  001413  001242         MOVB    CLK,B,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
011426  113737  001407  001244         MOVB    MASK,B,MASKX    ;GET MASK
011434  013737  001420  001236         MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
011442  100402                         BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
011444  004737  011542                 JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
011450  012700  000010         101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
011454  113737  001414  001242         MOVB    CLK,C,CLKX      ;GET SHIFTS PER CHAR
011462  113737  001410  001244         MOVB    MASK,C,MASKX    ;GET MASK
011470  013737  001422  001236         MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
011476  100402                         BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
011500  004737  011542                 JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
011504  012700  000014         102$:   MOV     #12,,R0         ;LOAD LINE NO.
011510  113737  001415  001242         MOVB    CLK,D,CLKX      ;GET SHIFTS
011516  113737  001411  001244         MOVB    MASK,D,MASKX    ;GET MASKK
011524  013737  001424  001236         MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
011532  100402                         BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
011534  004737  011542                 JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
011540  104400                 103$:   SCOPE                   ;SCOPE THIS TEST.
011542                         105$:   ;TEST ENTRANCE.
011542  032737  004000  001236         BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
011550  001401                         BEQ     .+4             ;BR IF SYNC LINE CARD.
011552  000207                         RTS     PC              ;EXIT TEST
011554  010037  011570                 MOV     R0,65$          ;SET LINE NO. POINTER
011560  104412                         MSTCLR                  ;CLEAR DV11
011562  005001                         CLR     R1              ;ZERO MSCANNER POINTER
011564  004537  022470         1$:     PERFORM ,SETSCAN        ;ADJUST SCANNER FOR PROPER LINE
011570  000001                 65$:    .BLKW 1                 ;LINE NUMBER POINTER.
011572  012703  000004         2$:     MOV     #4,R3           ;SET FOR 4 LINES EXERCISED
011576  005005                 3$:     CLR     R5              ;SET DATA POINTER TO 0
011600  012777  050102  167572         MOV     #S,C+BIT6+BIT1,@DVSFR
011606  104415                         ROMCLK                  ;CLOCK SCANNER BY ONE
011610  005201                         INC     R1              ;ADD +1 TO SCANNER POINTER
011612  010077  167554                 MOV     R0,@DVSRS       ;LOAD LINE NUMBER
011616  004537  022266                 PERFORM ,LOAD,MODE      ;LOAD MODE
011622  004000                         BIT11
011624  004537  022560         7$:     PERFORM ,CLR,TMARK      ;CLEAR TMARK BIT.
011630  012777  001000  167542         MOV     #BIT9,@DVSFR    ;DO A BR "A" TEST FOR TX FLAG
```



```
011636  005005                         CLR     R5              ;SET EXPECTED DATA TO 0
011640  032777  000001  167522         BIT     #BIT0,@DVLCR    ;IF FLAG TRUE?
011646  001401                         BEQ     .+4             ;BR IF YES
011650  104000                         HLT                     ;TX FLAG NO TRUE(LOW(LPR0=0))
011652  005077  167514                 CLR     @DVSRS          ;ZERO LINE TO LINE 0
011656  010577  167514                 MOV     R5,@DVSRA       ;LOAD DATA INTO DVSRA
011662  012777  020000  167510         MOV     #BIT13,@DVSFR   ;EXECUTE A "ROM READ" INTSTR
011670  104415                         ROMCLK                  ;CLOCK.
011672  012777  030260  167500         MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
011700  104415                         ROMCLK                  ;DO A DATA XFER FROM RAM OUTPUT TO TX BUFFER
011702  104416                         DATACLK                 ;ISSUE A MAINT CLK.
011704  012777  001000  167466         MOV     #BIT9,@DVSFR    ;DO A "BR A" TEST FOR TX FLAG
011712  032777  000001  167450         BIT     #BIT0,@DVLCR    ;IS FLAG FALSE?
011720  001001                         BNE     .+4             ;BR IF YES
011722  104000                         HLT                     ;TX FLAG NOT FALSE(HIGH(LPR0=1))
011724  012737  011732  001220         MOV     #4$,LOCK        ;SET IF SW09=1 GOTO 4$
011732  113702  001242         4$:     MOVB    CLKX,R2         ;SET REQUIRED SHIFTS
011736  005037  022622                 CLR     DATA            ;CLEAR STUFFER LOCATION
011742  010077  167424                 MOV     R0,@DVSRS       ;LOAD LINE NUMBER
011746  104416                 5$:     DATACLK                 ;ISSUE MAINT CLK
011750  004537  022246                 PERFORM ,TXSHIFT        ;WORK THE TRANSMITTER
011754  005302                         DEC     R2              ;ALL SHIFTS DONE?
011756  022702  000001                 CMP     #1,R2           ;IS THE BUFFER ALMOST EMPTY?
011762  001030                         BNE     6$              ;BR IF NO
011764  005077  167402                 CLR     @DVSRS          ;ZERO LINE NUMBER
011770  032777  001000  167204         BIT     #BIT9,@SWR      ;LOCK ON DATA?
011776  001001                         BNE     .+4             ;BR IF YES!!
012000  005205                         INC     R5              ;UPDATE DATA.
012002  010577  167370                 MOV     R5,@DVSRA       ;LOAD DATA INTO DVSRA
012006  012777  020000  167364         MOV     #BIT13,@DVSFR   ;DO A ROM READ
012014  104415                         ROMCLK                  ;CLK
012016  012777  030260  167354         MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
012024  104415                         ROMCLK                  ;DO A  DATA XFER TO TX BUFF
012026  010077  167340                 MOV     R0,@DVSRS       ;RESELECT LINE NUMBER
012032  032777  001000  167142         BIT     #BIT9,@SWR      ;LOCK ON DATA?
012040  001001                         BNE     .+4             ;BR IF YES!!
012042  005305                         DEC     R5              ;READJUST DATA CHAR.
012044  005702                 6$:     TST     R2              ;ALL SHIFTS DONE?
012046  001337                         BNE     5$              ;BR IF NO
012050  022737  000010  001242         CMP     #8.,CLKX        ;IS LINE CARD SET TO 8 BITS?
012056  001414                         BEQ     15$             ;BR IF YES
012060  013737  001242  001246         MOV     CLKX,TEMP1      ;SAVE NUMBER OF SHIFTS DONE.
012066  000241                 16$:    CLC                     ;CLEAR CARRY
012070  006037  022622                 ROR     DATA            ;RIGHT JUSTIFY TX RESULTS.
012074  005237  001246                 INC     TEMP1   ;ALL DONE?
012100  022737  000010  001246         CMP     #8.,TEMP1       ;?
012106  001367                         BNE     16$             ;BR IF NO
012110                         15$:
012110  013704  022622                 MOV     DATA,R4         ;READ IMAGE CHAR FROM TX
012114  143704  001244                 BICB    MASKX,R4        ;STRIP PARITY IF IT EXISTS.
012120  020504                         CMP     R5,R4           ;ARE DATA CHARS THE SAME?
012122  001401                         BEQ     .+4             ;BR IF GOOD DATA FROM TX
012124  104003                         HLT     3               ;TX DATA COMPARE ERROR
012126  104401                         SCOP1                   ;LOCK ON DATA?
012130  105205                         INCB    R5              ;UPDATE DATA CHAR.
012132  001403                         BEQ     6$              ;BR IF 8BIT CODE DONE.
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1715  012134  133705  001244                  BITB    MASKX,R5        ;IF <8BIT SEE IF ALL DONE.
1716  012140  001674                          BEQ     4$              ;BR IF NOT ALL DONE
1717  012142  004537  022546          6$:     PERFORM ,SET,TMARK      ;SET TMARK BIT
1718                                          ;*VERIFY THAT SETTING TMARK BIT PUTS LINE AT MARK.
1719                                          ;*
1720  012146  113702  001242                  MOVB    CLKX,R2         ;SET COUNTER
1721  012152  010077  167214                  MOV     R0,@DVSRS       ;SET LINE
1722  012156  104416                  9$:     DATACLK                 ;CLOCK
1723  012160  005302                          DEC     R2              ;FLUSH LAST CHARACTER.
1724  012162  001375                          BNE     9$              ;CHAR FLUSHED?
1725  012164  012702  000024                  MOV     #20.,R2         ;LOOK AT 20. BITS.
1726  012170  104416                  10$:    DATACLK                 ;MAINT CLK
1727  012172  032777  000200  167170          BIT     #BIT7,@DVLCR    ;BIT WINDOW
1728  012200  001001                          BNE     11$             ;SET (MARK)
1729  012202  104000                          HLT     0               ;TX BIT WINDOW NOT SET (MARK)
1730  012204  005302                  11$:    DEC     R2              ;ALL BITS LOOKED AT?
1731  012206  001370                          BNE     10$             ;BR IF NO
1732  012210  004537  022470                  PERFORM ,SETSCAN        ;ADVANCE SCANNER TO NEXT LINE
1733  012214  000001                          1                       ;ONE LINE ADVANCE
1734  012216  005303                          DEC     R3              ;ALL LINES(4) DONE?
1735  012220  001201                          BNE     7$              ;BR IF NO
1736  012222  000207                          RTS     PC              ;GET NEXT GROUP OF 4 LINES.
1737
1738
1739                                          ;********************** TEST 11 ****************************
1740                                          ;*TEST TO CHECK THE IDLE CHARACTER
1741                                          ;*FOR EACH LINE OF THE TRANSMITTER.
1742                                          ;*THIS TEST USES "SYNCA".
1743                                          ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
1744                                          ;;*************************************************************
1745
1746                                  ;  TEST 11
1747                                  ;--------------
1748  012224  012737  000011  001226  TST11:  MOV     #11,TSTNO
1749  012232  012737  012740  001216          MOV     #TST12,NEXT
1750  012240  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
1751  012244  113737  001412  001242          MOVB    CLK,A,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
1752  012252  113737  001406  001244          MOVB    MASK,A,MASKX    ;PLACE "MASK"FOR CHARS INTO MASKX
1753  012260  013737  001416  001236          MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
1754  012266  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
1755  012270  004737  012422                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
1756  012274  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
1757  012300  113737  001413  001242          MOVB    CLK,B,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
1758  012306  113737  001407  001244          MOVB    MASK,B,MASKX    ;GET MASK
1759  012314  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
1760  012322  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
1761  012324  004737  012422                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
1762  012330  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
1763  012334  113737  001414  001242          MOVB    CLK,C,CLKX      ;GET SHIFTS PER CHAR
1764  012342  113737  001410  001244          MOVB    MASK,C,MASKX    ;GET MASK
1765  012350  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
1766  012356  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
1767  012360  004737  012422                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
1768  012364  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
1769  012370  113737  001415  001242          MOVB    CLK,D,CLKX      ;GET SHIFTS
1770  012376  113737  001411  001244          MOVB    MASK,D,MASKX    ;GET MASKK
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1771  012404  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
1772  012412  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
1773  012414  004737  012422                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
1774  012420  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
1775  012422                          105$:                           ;TEST ENTRANCE.
1776  012422  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
1777  012430  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
1778  012432  000207                          RTS     PC              ;EXIT TEST
1779  012434  010037  012450                  MOV     R0,65$          ;LOAD LINE NO. POINTER
1780  012440  104412                          MSTCLR                  ;RESET THE DV11
1781  012442  005001                          CLR     R1              ;ZERO MSCANNER POINTER
1782  012444  004537  022470          1$:     PERFORM ,SETSCAN        ;SET MSCANNER TO LINES TESTED
1783  012450  000001                  65$:    .BLKW 1                 ;INITAL LINE VALUE
1784  012452  012703  000004          2$:     MOV     #4,R3           ;SET TO DO 4 LINE GROUP
1785  012456  005005                  3$:     CLR     R5              ;ZERO
1786  012460  012777  050102  166712          MOV     #S,C+BIT6+BIT1,@DVSFR
1787  012466  104415                          ROMCLK                  ;SET/CLEAR "ADVANCE MSCANNER"
1788  012470  005201                          INC     R1              ;UPDATE MSCANNER POINTER
1789  012472  010077  166674          6$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER INTO DV11
1790  012476  004537  022560                  PERFORM ,CLR,TMARK      ;CLR TMARK BIT.
1791  012502  004537  022266                  PERFORM ,LOAD,MODE      ;LOAD THE MODE
1792  012506  004000                          BIT11                   ;INT MAINT MODE
1793  012510  005077  166662                  CLR     @DVSRA          ;ZERO DATA FOR XFR
1794  012514  012777  020000  166656          MOV     #BIT13,@DVSFR   ;DO A RAM READ INSTR.
1795  012522  104415                          ROMCLK                  ;
1796  012524  012777  030260  166646          MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
1797  012532  104415                          ROMCLK                  ;DATA XFR  TXBUFFER_RAM OUTPUT
1798  012534  104416                          DATACLK                 ;ISSUE MAIT CLOCK PULSE
1799  012536  012737  012570  001220          MOV     #4$,LOCK        ;SET FOR SCOP1
1800  012544  113702  001242                  MOVB    CLKX,R2         ;NUMBER OF CLOCK PULSES NEEDED
1801  012550  104416                          DATACLK                 ;MAINT CLOCK PULSE
1802  012552  005302                          DEC     R2              ;ALL CLOCKS DONE?
1803  012554  001375                          BNE     .-4             ;NO , DO MORE
1804  012556  113705  001236                  MOVB    STAT,R5         ;GET SYNC (IDLE) CHAR.
1805  012562  012737  000005  001250          MOV     #5,TEMP2        ;SET FOR 5 CHARS
1806  012570  113702  001242          4$:     MOVB    CLKX,R2         ;GET CLOCKS NEEDED
1807  012574  005037  022622                  CLR     DATA            ;ZERO STORAGE AREA
1808  012600  010077  166566                  MOV     R0,@DVSRS       ;LOAD LINE NUMBER
1809  012604  104416                  5$:     DATACLK                 ;ISSUE MAINT CLK PULSE
1810  012606  004537  022246                  PERFORM ,TXSHIFT        ;CLOCK THE TRANSMITTER
1811  012612  005302                          DEC     R2              ;MORE SHIFTS REQUIRED?
1812  012614  001373                          BNE     5$              ;BR IF YES
1813  012616  022737  000010  001242          CMP     #8.,CLKX        ;IS LINE CARD SET TO 8 BITS?
1814  012624  001414                          BEQ     15$             ;BR IF YES
1815  012626  013737  001242  001246          MOV     CLKX,TEMP1      ;SAVE NUMBER OF SHIFTS DONE.
1816  012634  000241                  16$:    CLC                     ;CLEAR CARRY
1817  012636  006037  022622                  ROR     DATA            ;RIGHT JUSTIFY TX RESULTS.
1818  012642  005237  001246                  INC     TEMP1   ;ALL DONE?
1819  012646  022737  000010  001246          CMP     #8.,TEMP1       ;?
1820  012654  001367                          BNE     16$             ;BR IF NO
1821  012656                          15$:
1822  012656  013704  022622                  MOV     DATA,R4         ;SAVE DATA SHIFTED OUT OF TX.
1823  012662  143704  001244                  BICB    MASKX,R4        ;CLEAR UNWANTED BITS.
1824  012666  042705  177400                  BIC     #^C<377>,R5     ;CLEAR SIGN EXTEND.
1825  012672  143705  001244                  BICB    MASKX,R5        ;CLEAR UNUSED BITS
1826  012676  042704  177400                  BIC     #^C<377>,R4     ;CLEAR SIGN EXTEND.
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1827  012702  020504                        CMP     R5,R4           ;EXPECTED = FOUND ??
1828  012704  001401                        BEQ     .+4             ;BR IF OK
1829  012706  104003                        HLT     3               ;IDLE CHAR NOT WHAT EXPECTED.
1830  012710  005337  001250                DEC     TEMP2           ;ALL IDLE CHARS DONE?
1831  012714  001325                        BNE     4$              ;BR IF NO
1832  012716  104401                        SCOP1                   ;LOCK (SW09=1)?
1833  012720  004537  022546                PERFORM ,SET,TMARK      ;SET TMARK BIT
1834  012724  004537  022470                PERFORM ,SETSCAN        ;UPDATE SCANNER TO NEXT LINE
1835  012730  000001                        1                       ;
1836  012732  005303                        DEC     R3              ;ALL LINES DONE
1837  012734  001256                        BNE     6$              ;BR IF NO
1838  012736  000207                        RTS     PC              ;EXIT FOR NEXT GROUP OF LINES.
1839
1840
1841                                        ;********************** TEST 12 ****************************
1842                                        ;*TEST TO CHECK THE IDLE CHARACTER
1843                                        ;*FOR EACH LINE OF THE TRANSMITTER.
1844                                        ;*THIS TEST USES "SYNCB".
1845                                        ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
1846                                        ;;************************************************************
1847
1848                                ;  TEST 12
1849                                ;--------------
1850  012740  012737  000012  001226 TST12:  MOV     #12,TSTNO
1851  012746  012737  013504  001216         MOV     #TST13,NEXT
1852  012754  012700  000000                MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
1853  012760  113737  001412  001242        MOVB    CLK,A,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
1854  012766  113737  001406  001244        MOVB    MASK,A,MASKX    ;PLACE "MASK"FOR CHARS INTO MASKX
1855  012774  013737  001426  001240        MOV     SYNC2A,SYNCX    ;
1856  013002  013737  001416  001236        MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
1857  013010  100402                        BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
1858  013012  004737  013166                JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
1859  013016  012700  000004         100$:  MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
1860  013022  113737  001413  001242        MOVB    CLK,B,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
1861  013030  113737  001407  001244        MOVB    MASK,B,MASKX    ;GET MASK
1862  013036  013737  001430  001240        MOV     SYNC2B,SYNCX    ;
1863  013044  013737  001420  001236        MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
1864  013052  100402                        BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
1865  013054  004737  013166                JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
1866  013060  012700  000010         101$:  MOV     #8,,R0          ;LOAD LINE NUMBER
1867  013064  113737  001414  001242        MOVB    CLK,C,CLKX      ;GET SHIFTS PER CHAR
1868  013072  113737  001410  001244        MOVB    MASK,C,MASKX    ;GET MASK
1869  013100  013737  001432  001240        MOV     SYNC2C,SYNCX    ;
1870  013106  013737  001422  001236        MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
1871  013114  100402                        BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
1872  013116  004737  013166                JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
1873  013122  012700  000014         102$:  MOV     #12,,R0         ;LOAD LINE NO.
1874  013126  113737  001415  001242        MOVB    CLK,D,CLKX      ;GET SHIFTS
1875  013134  113737  001411  001244        MOVB    MASK,D,MASKX    ;GET MASKK
1876  013142  013737  001434  001240        MOV     SYNC2D,SYNCX    ;
1877  013150  013737  001424  001236        MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
1878  013156  100402                        BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
1879  013160  004737  013166                JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
1880  013164  104400                 103$:  SCOPE                   ;SCOPE THIS TEST.
1881  013166                          105$:                          ;TEST ENTRANCE.
1882  013166  032737  004000  001236        BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
```



```
1883  013174  001401                        BEQ     .+4             ;BR IF SYNC LINE CARD.
1884  013176  000207                        RTS     PC              ;EXIT TEST
1885  013200  010037  013214                MOV     R0,65$          ;LOAD LINE NO. POINTER
1886  013204  104412                        MSTCLR                  ;RESET THE DV11
1887  013206  005001                        CLR     R1              ;ZERO MSCANNER POINTER
1888  013210  004537  022470          1$:   PERFORM ,SETSCAN        ;SET MSCANNER TO LINES TESTED
1889  013214  000001                  65$:  ,BLKW 1                 ;INITAL LINE VALUE
1890  013216  012703  000004          2$:   MOV     #4,R3           ;SET TO DO 4 LINE GROUP
1891  013222  005005                  3$:   CLR     R5              ;ZERO
1892  013224  012777  050102  166146        MOV     #S,C+BIT6+BIT1,@DVSFR
1893  013232  104415                        ROMCLK                  ;SET/CLEAR "ADVANCE MSCANNER"
1894  013234  005201                        INC     R1              ;UPDATE MSCANNER POINTER
1895  013236  010077  166130          6$:   MOV     R0,@DVSRS       ;LOAD LINE NUMBER INTO DV11
1896  013242  004537  022560                PERFORM ,CLR,TMARK      ;CLR TMARK BIT.
1897  013246  004537  022266                PERFORM ,LOAD,MODE      ;LOAD THE MODE
1898  013252  006000                        BIT11+BIT10             ;INT MAINT MODE AND SECOND SYNC
1899  013254  005077  166116                CLR     @DVSRA          ;ZERO DATA FOR XFR
1900  013260  012777  020000  166112        MOV     #BIT13,@DVSFR   ;DO A RAM READ INSTR.
1901  013266  104415                        ROMCLK                  ;
1902  013270  012777  030260  166102        MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
1903  013276  104415                        ROMCLK                  ;DATA XFR  TXBUFFER_RAM OUTPUT
1904  013300  104416                        DATACLK                 ;ISSUE MAIT CLOCK PULSE
1905  013302  012737  013334  001220        MOV     #4$,LOCK        ;SET FOR SCOP1
1906  013310  113702  001242                MOVB    CLKX,R2         ;NUMBER OF CLOCK PULSES NEEDED
1907  013314  104416                        DATACLK                 ;MAINT CLOCK PULSE
1908  013316  005302                        DEC     R2              ;ALL CLOCKS DONE?
1909  013320  001375                        BNE     .-4             ;NO , DO MORE
1910  013322  113705  001240                MOVB    SYNCX,R5        ;GET SYNC (IDLE CHAR).
1911  013326  012737  000005  001250        MOV     #5,TEMP2        ;SET FOR 5 CHARS
1912  013334  113702  001242          4$:   MOVB    CLKX,R2         ;GET CLOCKS NEEDED
1913  013340  005037  022622                CLR     DATA            ;ZERO STORAGE AREA
1914  013344  010077  166022                MOV     R0,@DVSRS       ;LOAD LINE NUMBER
1915  013350  104416                  5$:   DATACLK                 ;ISSUE MAINT CLK PULSE
1916  013352  004537  022246                PERFORM ,TXSHIFT        ;CLOCK THE TRANSMITTER
1917  013356  005302                        DEC     R2              ;MORE SHIFTS REQUIRED?
1918  013360  001373                        BNE     5$              ;BR IF YES
1919  013362  022737  000010  001242        CMP     #8,,CLKX        ;IS LINE CARD SET TO 8 BITS?
1920  013370  001414                        BEQ     15$             ;BR IF YES
1921  013372  013737  001242  001246        MOV     CLKX,TEMP1      ;SAVE NUMBER OF SHIFTS DONE.
1922  013400  000241                  16$:  CLC                     ;CLEAR CARRY
1923  013402  006037  022622                ROR     DATA            ;RIGHT JUSTIFY TX RESULTS.
1924  013406  005237  001246                INC     TEMP1   ;ALL DONE?
1925  013412  022737  000010  001246        CMP     #8,,TEMP1       ;?
1926  013420  001367                        BNE     16$             ;BR IF NO
1927  013422                           15$:
1928  013422  013704  022622                MOV     DATA,R4         ;SAVE DATA SHIFTED OUT OF TX.
1929  013426  143704  001244                BICB    MASKX,R4        ;CLEAR UNWANTED BITS.
1930  013432  042705  177400                BIC     #^C<377>,R5     ;CLEAR SIGN EXTEND.
1931  013436  143705  001244                BICB    MASKX,R5        ;CLEAR UNUSED BITS
1932  013442  042704  177400                BIC     #^C<377>,R4     ;CLEAR SIGN EXTEND.
1933  013446  020504                        CMP     R5,R4           ;EXPECTED = FOUND ??
1934  013450  001401                        BEQ     .+4             ;BR IF OK
1935  013452  104003                        HLT     3               ;IDLE CHAR NOT WHAT EXPECTED.
1936  013454  005337  001250                DEC     TEMP2           ;ALL IDLE CHARS DONE?
1937  013460  001325                        BNE     4$              ;BR IF NO
1938  013462  104401                        SCOP1                   ;LOCK (SW09=1)?
```

```
1939  013464  004537  022546                  PERFORM ,SET,TMARK      ;SET TMARK BIT
1940  013470  004537  022470                  PERFORM ,SETSCAN        ;UPDATE SCANNER TO NEXT LINE
1941  013474  000001                          1                       ;
1942  013476  005303                          DEC     R3              ;ALL LINES DONE
1943  013500  001256                          BNE     6$              ;BR IF NO
1944  013502  000207                          RTS     PC              ;EXIT FOR NEXT GROUP OF LINES.
1945
1946
1947                                          ;********************** TEST 13 ****************************
1948                                          ;*THIS TEST CHECKS "RECEIVE CHAR SILO" TO BE
1949                                          ;*ALL ZERO'S WHEN "DATA ENABLE" IS NOT SET.
1950                                          ;*EXPECTED DATA SHOULD BE LINE NUMBER ONLY
1951                                          ;*DATA 0'S AND ERROR FLAGS 0.
1952                                          ;*THIS TEST WILL BE DONE FOR BOTH ASYNC AND SYNC LINE CARDS.
1953                                          ;!************************************************************
1954
1955                                  ;  TEST 13
1956                                  ;--------------
1957  013504  012737  000013  001226  TST13:  MOV     #13,TSTNO
1958  013512  012737  014012  001216          MOV     #TST14,NEXT
1959  013520  012700  000000                  MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
1960  013524  013737  001416  001236          MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
1961  013532  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
1962  013534  004737  013622                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
1963  013540  012700  000004          100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
1964  013544  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
1965  013552  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
1966  013554  004737  013622                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
1967  013560  012700  000010          101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
1968  013564  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
1969  013572  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
1970  013574  004737  013622                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
1971  013600  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
1972  013604  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
1973  013612  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
1974  013614  004737  013622                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
1975  013620  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
1976  013622                          105$:                           ;TEST ENTRANCE.
1977  013622  010037  013642                  MOV     R0,65$          ;STORE LINE NO. POINTER
1978  013626  012703  000004                  MOV     #4,R3           ;SET FOR 4 LINE GROUP
1979  013632  104412                  1$:     MSTCLR                  ;RESET DV11
1980  013634  005001                          CLR     R1              ;ZERO MSCANNER POINTER
1981  013636  004537  022470                  PERFORM ,SETSCAN        ;ADJUST SCANNER
1982  013642  000001                  65$:    ,BLKW 1                 ;TO CORRECT LINE NO.
1983  013644  010005                          MOV     R0,R5           ;PLACE LINE NUMBER INTO R5
1984  013646  000305                          SWAB    R5              ;PLACE LINE NO. IN HIGH BYTE
1985  013650  105005                          CLRB    R5              ;CLEAR LOW BYTE OF EXPECTED
1986  013652                          3$:
1987  013652  012777  050021  165520          MOV     #S,C+BIT4+BIT0,@DVSFR
1988  013660  104415                          ROMCLK                  ;SET/CLEAR SILO IN
1989  013662  005002                          CLR     R2              ;
1990  013664  012777  001400  165506          MOV     #BIT9+BIT8,@DVSFR
1991  013672  032777  000001  165470  4$:     BIT     #BIT0,@DVLCR    ;"RECV CHAR WAITING TRUE"
1992  013700  001403                          BEQ     5$              ;BR IF YES
1993  013702  005202                          INC     R2              ;DELAY IF NOT READY
1994  013704  001372                          BNE     4$              ;END OF DELAY?
```



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1995  013706  104000                          HLT     0               ;"RECV CHAR WAITING" NOT TRUE
1996  013710  012777  030306  165462  5$:     MOV     #XFR+BIT7+BIT6+BIT2+BIT1,@DVSFR
1997  013716  017702  165456                  MOV     @DVSFR,R2       ;XFR RICR_SILO OUT
1998  013722  104415                          ROMCLK                  ;DATA/XFER  RICR_SILO OUT
1999  013724  017704  165436                  MOV     @DVRIC,R4       ;READ RIC
2000  013730  020504                          CMP     R5,R4           ;EXPECTED OK?
2001  013732  001401                          BEQ     .+4             ;
2002  013734  104001                          HLT     1               ;
2003  013736  062705  000400                  ADD     #400,R5         ;UPDATE LINE NO. (POINTER)
2004  013742  005002                          CLR     R2              ;SFR IMAGE
2005  013744  012777  050020  165426          MOV     #S,C+BIT4,@DVSFR
2006  013752  104415                          ROMCLK                  ;S/C "SET SILO OUT"
2007  013754  012777  001400  165416          MOV     #BIT9+BIT8,@DVSFR
2008  013762  032777  000001  165400  6$:     BIT     #BIT0,@DVLCR    ;"RECV CHAR WAITING"
2009  013770  001003                          BNE     7$              ;FALSE?
2010  013772  005202                          INC     R2              ;DELAY WAITING....
2011  013774  001372                          BNE     6$              ;DELAY DONE?
2012  013776  104000                          HLT     0               ;
2013  014000  005237  013642          7$:     INC     65$             ;UPDATE MSCANNER POINTER(LINE)
2014  014004  005303                          DEC     R3              ;GROUP OF 4 LINES DONE.
2015  014006  001311                          BNE     1$              ;BR IF YES
2016  014010  000207                          RTS     PC              ;EXIT FOR NEXT GROUP OF LINES
2017
2018
2019                                          ;********************** TEST 14 ****************************
2020                                          ;*THIS TEST CHECKS "RECEIVER CHAR SILO"
2021                                          ;*WHEN "DATA ENABLE IS SET" EXPECTED DATA S/B
2022                                          ;*ALL 1'S FOR RX DATA, LINE NUMBER CORRECT,
2023                                          ;*AND ERROR FLAGS =0.
2024                                          ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
2025                                          ;!************************************************************
2026
2027                                  ;  TEST 14
2028                                  ;--------------
2029  014012  012737  000014  001226  TST14:  MOV     #14,TSTNO
2030  014020  012737  014344  001216          MOV     #TST15,NEXT
2031  014026  012700  000000                  MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
2032  014032  013737  001416  001236          MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
2033  014040  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
2034  014042  004737  014130                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
2035  014046  012700  000004          100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
2036  014052  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
2037  014060  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
2038  014062  004737  014130                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
2039  014066  012700  000010          101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
2040  014072  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
2041  014100  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
2042  014102  004737  014130                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
2043  014106  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
2044  014112  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
2045  014120  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
2046  014122  004737  014130                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
2047  014126  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
2048  014130                          105$:                           ;TEST ENTRANCE.
2049  014130  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
2050  014136  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
```

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014140  000207                          RTS     PC                  ;EXIT TEST
014142  010037  014162                  MOV     R0,65$              ;STORE LINE NO. POINTER
014146  012703  000004                  MOV     #4,R3               ;SET FOR 4 LINE GROUP
014152  104412                  1$:     MSTCLR                      ;RESET DV11
014154  005001                          CLR     R1                  ;ZERO MSCANNER POINTER
014156  004537  022470                  PERFORM ,SETSCAN            ;ADJUST SCANNER
014162  000001                  65$:    .BLKW 1                     ;TO CORRECT LINE NO.
014164  010005                          MOV     R0,R5               ;PLACE LINE NUMBER INTO R5
014166  000305                          SWAB    R5                  ;PLACE LINE NO. IN HIGH BYTE
014170  052705  000377                  BIS     #377,R5             ;SET LOW BYTE TO ALL 1'S
014174                          3$:
014174  012777  050023  165176          MOV     #S.C+BIT4+BIT1+BIT0,@DVSFR
014202  104415                          ROMCLK                      ;S/C "SET RECV DATA ENABLE"
014204  012777  050021  165166          MOV     #S.C+BIT4+BIT0,@DVSFR
014212  104415                          ROMCLK                      ;SET/CLEAR SILO IN
014214  005002                          CLR     R2                  ;
014216  012777  001400  165154          MOV     #BIT9+BIT8,@DVSFR
014224  032777  000001  165136  4$:     BIT     #BIT0,@DVLCR        ;"RECV CHAR WAITING TRUE"
014232  001403                          BEQ     5$                  ;BR IF YES
014234  005202                          INC     R2                  ;DELAY IF NOT READY
014236  001372                          BNE     4$                  ;END OF DELAY?
014240  104000                          HLT     0                   ;"RECV CHAR WAITING" NOT TRUE
014242  012777  030306  165130  5$:     MOV     #XFR+BIT7+BIT6+BIT2+BIT1,@DVSFR
014250  017702  165124                  MOV     @DVSFR,R2           ;XFR RICR_SILO OUT
014254  104415                          ROMCLK                      ;DATA/XFER  RICR_SILO OUT
014256  017704  165104                  MOV     @DVRIC,R4           ;READ RIC
014262  020504                          CMP     R5,R4               ;EXPECTED OK?
014264  001401                          BEQ     .+4                 ;
014266  104001                          HLT     1                   ;
014270  062705  000400                  ADD     #400,R5             ;UPDATE LINE NO. (POINTER)
014274  005002                          CLR     R2                  ;SFR IMAGE
014276  012777  050020  165074          MOV     #S.C+BIT4,@DVSFR
014304  104415                          ROMCLK                      ;S/C "SET SILO OUT"
014306  012777  001400  165064          MOV     #BIT9+BIT8,@DVSFR
014314  032777  000001  165046  6$:     BIT     #BIT0,@DVLCR        ;"RECV CHAR WAITING"
014322  001003                          BNE     7$                  ;FALSE?
014324  005202                          INC     R2                  ;DELAY WAITING....
014326  001372                          BNE     6$                  ;DELAY DONE?
014330  104000                          HLT     0                   ;
014332  005237  014162          7$:     INC     65$                 ;UPDATE MSCANNER POINTER(LINE)
014336  005303                          DEC     R3                  ;GROUP OF 4 LINES DONE.
014340  001304                          BNE     1$                  ;BR IF YES
014342  000207                          RTS     PC                  ;EXIT FOR NEXT GROUP OF LINES


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

                                ;  TEST 15
                                ;--------------
014344  012737  000015  001226  TST15:  MOV     #15,TSTNO
014352  012737  014642  001216          MOV     #TST16,NEXT
```



```
014360  012700  000000                  MOV     #0.,R0              ;PLACE LINE NUMBER INTO R0
014364  113737  001412  001242          MOVB    CLK.A,CLKX          ;PLACE "SHIFTS/PER/CHAR" IN CLKX
014372  013737  001416  001236          MOV     L00.03,STAT         ;LOAD LINE CARD STATUS INTO STAT
014400  100402                          BMI     100$                ;BR IF LINE CARD NOT TO BE TESTED
014402  004737  014512                  JSR     PC,105$             ;GO DO THE TEST FOR LINE CARD 1
014406  012700  000004          100$:   MOV     #4.,R0              ;PLACE LINE NUMBER INTO R0
014412  113737  001413  001242          MOVB    CLK.B,CLKX          ;PLACE "SHIFTS/PER/CHAR" IN CLKX
014420  013737  001420  001236          MOV     L04.07,STAT         ;LOAD LINE CARD STATUS INTO STAT
014426  100402                          BMI     101$                ;BR IF LINE CARD NOT TO BE TESTED
014430  004737  014512                  JSR     PC,105$             ;GO DO THE TEST FOR LINE CARD 2
014434  012700  000010          101$:   MOV     #8.,R0              ;LOAD LINE NUMBER
014440  113737  001414  001242          MOVB    CLK.C,CLKX          ;GET SHIFTS PER CHAR
014446  013737  001422  001236          MOV     L08.11,STAT         ;LOAD LINE CARD STATUS INTO STAT
014454  100402                          BMI     102$                ;BR IF LINE CARD NOT TO BE TESTED
014456  004737  014512                  JSR     PC,105$             ;DO THE TEST FOR LINE CARD 3
014462  012700  000014          102$:   MOV     #12.,R0             ;LOAD LINE NO.
014466  113737  001415  001242          MOVB    CLK.D,CLKX          ;GET SHIFTS
014474  013737  001424  001236          MOV     L12.15,STAT         ;LOAD LINE CARD STATUS
014502  100402                          BMI     103$                ;BR IF LINE CARD NOT TO BE TESTED
014504  004737  014512                  JSR     PC,105$             ;DO THE TESTS FOR LINE CARD 4
014510  104400                  103$:   SCOPE                       ;SCOPE THIS TEST.
014512                          105$:                               ;TEST ENTRANCE.
014512  032737  004000  001236          BIT     #ASYNC,STAT         ;IS THIS A SYNC LINE CARD?
014520  001401                          BEQ     .+4                 ;BR IF SYNC LINE CARD.
014522  000207                          RTS     PC                  ;EXIT TEST
014524  012703  000004                  MOV     #4,R3
014530  010037  014544                  MOV     R0,65$              ;SET LINE NO. POINTER
014534  104412                  1$:     MSTCLR                      ;RESET DV11
014536  005001                          CLR     R1                  ;ZERO MSCANNER POINTER
014540  004537  022470                  PERFORM ,SETSCAN
014544  000001                  65$:    .BLKW 1                     ;SET MSCANNER TO CORRECT LINE.
014546  010077  164620          3$:     MOV     R0,@DVSRS           ;LOAD LINE NO.
014552  004537  022266                  PERFORM ,LOAD.MODE          ;LOAD THE MODE
014556  025000                          BIT13+BIT11+BIT9            ;RECV ENABLE,INT MAINT,TX DSABLE
014560  113737  001236  022622          MOVB    STAT,DATA           ;GET "SYNC" CHAR.
014566  104416                          DATACLK                     ;PRIME DV11
014570  004537  022326                  PERFORM ,RXSHIFT            ;SHIFT DATA INTO RECEIVER
014574  001242                          CLKX                        ;NO. OF SHIFTS GIVEN
014576  012777  076400  164574          MOV     #BRB+BIT11+BIT10+BIT8,@DVSFR
014604  017704  164560                  MOV     @DVLCR,R4           ;BRB "MATCH DET"
014610  010405                          MOV     R4,R5               ;
014612  052705  000001                  BIS     #BIT0,R5            ;
014616  042705  000002                  BIC     #BIT1,R5            ;
014622  020504                          CMP     R5,R4               ;MATCH DET TRUE??
014624  001401                          BEQ     4$                  ;BR IF YES
014626  104001                          HLT     1                   ;
014630  005237  014544          4$:     INC     65$                 ;UPDATE TO NEXT LINE.
014634  005303                          DEC     R3                  ;4 LINE GROUP DONE?
014636  001336                          BNE     1$                  ;BR IF NO
014640  000207                          RTS     PC                  ;OBTAIN NEXT 4 LINE GROUP


                                        ;*********************** TEST 16 ******************************
                                        ;*TEST TO VERIFY THAT IF THE DV11 RECEIVER
                                        ;*IS SET FOR ONE SYNC CHAR;
                                        ;*"MATCH DET" *AND* "CHAR FLAG" ARE
```

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

                                ; TEST 16
                                ;--------------
014642  012737  000016  001226  TST16:  MOV     #16,TSTNO
014650  012737  015276  001216          MOV     #TST17,NEXT
014656  012700  000000                  MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
014662  113737  001412  001242          MOVB    CLK.A,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
014670  013737  001416  001236          MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
014676  100402                          BMI     10$             ;BR IF LINE CARD NOT TO BE TESTED
014700  004737  015010                  JSR     PC,10$          ;GO DO THE TEST FOR LINE CARD 1
014704  012700  000004          10$:    MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
014710  113737  001413  001242          MOVB    CLK,B,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
014716  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
014724  100402                          BMI     10$             ;BR IF LINE CARD NOT TO BE TESTED
014726  004737  015010                  JSR     PC,10$          ;GO DO THE TEST FOR LINE CARD 2
014732  012700  000010          10$:    MOV     #8,,R0          ;LOAD LINE NUMBER
014736  113737  001414  001242          MOVB    CLK,C,CLKX      ;GET SHIFTS PER CHAR
014744  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
014752  100402                          BMI     10$             ;BR IF LINE CARD NOT TO BE TESTED
014754  004737  015010                  JSR     PC,10$          ;DO THE TEST FOR LINE CARD 3
014760  012700  000014          10$:    MOV     #12.,R0         ;LOAD LINE NO.
014764  113737  001415  001242          MOVB    CLK,D,CLKX      ;GET SHIFTS
014772  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
015000  100402                          BMI     10$             ;BR IF LINE CARD NOT TO BE TESTED
015002  004737  015010                  JSR     PC,10$          ;DO THE TESTS FOR LINE CARD 4
015006  104400                  10$:    SCOPE                   ;SCOPE THIS TEST.
015010                          10$:                            ;TEST ENTRANCE.
015010  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
015016  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
015020  000207                          RTS     PC              ;EXIT TEST
015022  012703  000004                  MOV     #4,R3           ;SET FOR 4 LINES
015026  010037  015042                  MOV     R0,65$          ;PLACE LINE NO. POINTER
015032  104412                  1$:     MSTCLR                  ;INIT DV11
015034  005001                          CLR     R1              ;ZERO MSCANNER POINTER
015036  004537  022470                  PERFORM ,SETSCAN         ;SET SCANNER TO LINE DESIRED
015042  000001                  65$:    ,BLKW 1                 ;INITIAL LINE NUMBER.
015044  010077  164322          3$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
015050  004537  022266                  PERFORM ,LOAD,MODE       ;LOAD
015054  025000                          BIT13+BIT11+BIT9        ;MODE AND RX ENABLEAND TX DSABLE
015056  113737  001236  022622          MOVB    STAT,DATA       ;PLACE SYNC CHAR IN DATA
015064  104416                          DATACLK                 ;INIT DATA CLOCK.
015066  004537  022326                  PERFORM ,RXSHIFT         ;SHIFT DATA INTO RX
015072  001242                          CLKX                    ;NUMBER OF SHIFTS NEEDED
015074  012777  076400  164276          MOV     #BRB+BIT11+BIT10+BIT8,@DVSFR
                                                                ;SET BR "B" AND MATCH DET.
015102  017704  164262                  MOV     @DVLCR,R4       ;SAVE LPR IN R4
```



```
015106  010405                          MOV     R4,R5           ;SET FOR COMPARE
015110  052705  000001                  BIS     #BIT0,R5        ;BR "A" FALSE
015114  042705  000002                  BIC     #BIT1,R5        ;BR "B" TRUE
015120  020504                          CMP     R5,R4
015122  001401                          BEQ     .+4             ;BR IF LPR OK.
015124  104001                          HLT     1               ;EXPECT B TRUE; A FALSE
015126  012777  002000  164244          MOV     #BIT10,@DVSFR   ;SET BR "A" AND RX CHAR FLAG.
015134  017704  164230                  MOV     @DVLCR,R4       ;SAVE LPR IN R4
015140  010405                          MOV     R4,R5           ;SET FOR COMPARE
015142  032737  010000  001236          BIT     #TWOSYN,STAT    ;SET FOR ONE SYNC OR TWO?
015150  001036                          BNE     4$              ;BR IF SET FOR ONE SYNC
015152  052705  000003                  BIS     #BIT1+BIT0,R5
015156  020504                          CMP     R5,R4
015160  001401                          BEQ     .+4
015162  104001                          HLT     1
015164  113737  001236  022622          MOVB    STAT,DATA
015172  004537  022326                  PERFORM ,RXSHIFT
015176  001242                          CLKX
015200  012777  076400  164172          MOV     #BRB+BIT11+BIT10+BIT8,@DVSFR
                                                                ;SET BR "B" AND MATCH DET.
015206  017704  164156                  MOV     @DVLCR,R4       ;SAVE LPR IN R4
015212  010405                          MOV     R4,R5           ;SET FOR COMPARE
015214  052705  000001                  BIS     #BIT0,R5        ;BR "A" FALSE
015220  042705  000002                  BIC     #BIT1,R5        ;BR "B" TRUE
015224  020504                          CMP     R5,R4
015226  001401                          BEQ     .+4             ;BR IF LPR OK.
015230  104001                          HLT     1               ;EXPECT B TRUE; A FALSE
015232  012777  002000  164140          MOV     #BIT10,@DVSFR   ;SET BR "A" AND RX CHAR FLAG.
015240  017704  164124                  MOV     @DVLCR,R4       ;SAVE LPR IN R4
015244  010405                          MOV     R4,R5           ;SET FOR COMPARE
015246  052705  000002          4$:     BIS     #BIT1,R5
015252  042705  000001                  BIC     #BIT0,R5
015256  020504                          CMP     R5,R4
015260  001401                          BEQ     .+4
015262  104001                          HLT     1
015264  005237  015042                  INC     65$             ;UPDATE LINE NUMBER
015270  005303                          DEC     R3
015272  001257                          BNE     1$
015274  000207                          RTS     PC

                                        ;********************** TEST 17 ****************************
                                        ;*TEST TO VERIFY THAT IF THE DV11 RECEIVER
                                        ;*IS SET FOR ONE SYNC CHAR;
                                        ;*"MATCH DET" *AND* "CHAR FLAG" ARE
                                        ;*SET AFTER ONE SYNC IS PUSHED INTO THE RECEIVER
                                        ;*           HOWEVER,..
                                        ;*IF THE DV11 RECEIVER IS SET FOR
                                        ;*TWO SYNC CHARS....
                                        ;*VERIFY THAT "MATCH DET" SETS ON THE FIRST SYNC
                                        ;*AND VERIFY THAT "MATCH DET" *AND* "CHAR FLAG"
                                        ;*ARE SET ON THE SECOND SYNC.
                                        ;*THIS TEST USES "SYNC B".
                                        ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
                                        ;!*****************************************************************
```

```
                                                ;  TEST 17
                                                ;--------------
015276  012737  000017  001226  TST17:  MOV     #17,TSTNO
015304  012737  015762  001216          MOV     #TST20,NEXT
015312  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
015316  113737  001412  001242          MOVB    CLK.A,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
015324  013737  001426  001240          MOV     SYNC2A,SYNCX    ;
015332  013737  001416  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
015340  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
015342  004737  015474                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
015346  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
015352  113737  001413  001242          MOVB    CLK.B,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
015360  013737  001430  001240          MOV     SYNC2B,SYNCX    ;
015366  013737  001420  001236          MOV     L04.07,STAT     ;LOAD LINE CARD STATUS INTO STAT
015374  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
015376  004737  015474                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
015402  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
015406  113737  001414  001242          MOVB    CLK.C,CLKX      ;GET SHIFTS PER CHAR
015414  013737  001432  001240          MOV     SYNC2C,SYNCX    ;
015422  013737  001422  001236          MOV     L08.11,STAT     ;LOAD LINE CARD STATUS INTO STAT
015430  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
015432  004737  015474                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
015436  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
015442  113737  001415  001242          MOVB    CLK.D,CLKX      ;GET SHIFTS
015450  013737  001434  001240          MOV     SYNC2D,SYNCX    ;
015456  013737  001424  001236          MOV     L12.15,STAT     ;LOAD LINE CARD STATUS
015464  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
015466  004737  015474                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
015472  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
015474                          105$:                           ;TEST ENTRANCE.
015474  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
015502  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
015504  000207                          RTS     PC              ;EXIT TEST
015506  012703  000004                  MOV     #4,R3           ;SET FOR 4 LINES
015512  010037  015526                  MOV     R0,65$          ;PLACE LINE NO. POINTER
015516  104412                  1$:     MSTCLR                  ;INIT DV11
015520  005001                          CLR     R1              ;ZERO MSCANNER POINTER
015522  004537  022470                  PERFORM ,SETSCAN        ;SET SCANNER TO LINE DESIRED
015526  000001                  65$:    .BLKW 1                 ;INITIAL LINE NUMBER.
015530  010077  163636          3$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
015534  004537  022266                  PERFORM ,LOAD.MODE      ;LOAD
015540  027000                          BIT13+BIT11+BIT10+BIT9  ;MODE, RX ENABL, TX DSABL, SYNC2
015542  013737  001240  022622          MOV     SYNCX,DATA      ;PLACE SYNC 2 IN  DATA
015550  104416                          DATACLK                 ;INIT DATA CLOCK.
015552  004537  022326                  PERFORM ,RXSHIFT        ;SHIFT DATA INTO RX
015556  001242                          CLKX                    ;NUMBER OF SHIFTS NEEDED
015560  012777  076400  163612          MOV     #BRB+BIT11+BIT10+BIT8,@DVSFR
                                                                ;SET BR "B" AND MATCH DET.
015566  017704  163576                  MOV     @DVLCR,R4       ;SAVE LPR IN R4
015572  010405                          MOV     R4,R5           ;SET FOR COMPARE
015574  052705  000001                  BIS     #BIT0,R5        ;BR "A" FALSE
015600  042705  000002                  BIC     #BIT1,R5        ;BR "B" TRUE
015604  020504                          CMP     R5,R4
015606  001401                          BEQ     .+4             ;BR IF LPR OK.
015610  104001                          HLT     1               ;EXPECT B TRUE; A FALSE
015612  012777  002000  163560          MOV     #BIT10,@DVSFR   ;SET BR "A" AND RX CHAR FLAG.
```



```
015620  017704  163544                  MOV     @DVLCR,R4       ;SAVE LPR IN R4
015624  010405                          MOV     R4,R5           ;SET FOR COMPARE
015626  032737  010000  001236          BIT     #TWOSYN,STAT    ;SET FOR ONE SYNC OR TWO?
015634  001036                          BNE     4$              ;BR IF SET FOR ONE SYNC
015636  052705  000003                  BIS     #BIT1+BIT0,R5
015642  020504                          CMP     R5,R4
015644  001401                          BEQ     .+4
015646  104001                          HLT     1
015650  013737  001240  022622          MOV     SYNCX,DATA
015656  004537  022326                  PERFORM ,RXSHIFT
015662  001242                          CLKX
015664  012777  076400  163506          MOV     #BRB+BIT11+BIT10+BIT8,@DVSFR
                                                                ;SET BR "B" AND MATCH DET.
015672  017704  163472                  MOV     @DVLCR,R4       ;SAVE LPR IN R4
015676  010405                          MOV     R4,R5           ;SET FOR COMPARE
015700  052705  000001                  BIS     #BIT0,R5        ;BR "A" FALSE
015704  042705  000002                  BIC     #BIT1,R5        ;BR "B" TRUE
015710  020504                          CMP     R5,R4
015712  001401                          BEQ     .+4             ;BR IF LPR OK.
015714  104001                          HLT     1               ;EXPECT B TRUE; A FALSE
015716  012777  002000  163454          MOV     #BIT10,@DVSFR   ;SET BR "A" AND RX CHAR FLAG.
015724  017704  163440                  MOV     @DVLCR,R4       ;SAVE LPR IN R4
015730  010405                          MOV     R4,R5           ;SET FOR COMPARE
015732  052705  000002          4$:     BIS     #BIT1,R5
015736  042705  000001                  BIC     #BIT0,R5
015742  020504                          CMP     R5,R4
015744  001401                          BEQ     .+4
015746  104001                          HLT     1
015750  005237  015526                  INC     65$             ;UPDATE LINE NUMBER
015754  005303                          DEC     R3
015756  001257                          BNE     1$
015760  000207                          RTS     PC


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

                                                ;  TEST 20
                                                ;--------------
015762  012737  000020  001226  TST20:  MOV     #20,TSTNO
015770  012737  016600  001216          MOV     #TST21,NEXT
015776  012700  000000                  MOV     #0.,R0          ;PLACE LINE NUMBER INTO R0
016002  113737  001412  001242          MOVB    CLK.A,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
016010  113737  001406  001244          MOVB    MASK.A,MASKX    ;PLACE "MASK"FOR CHARS INTO MASKX
016016  013737  001416  001236          MOV     L00.03,STAT     ;LOAD LINE CARD STATUS INTO STAT
016024  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
016026  004737  016160                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
016032  012700  000004          100$:   MOV     #4.,R0          ;PLACE LINE NUMBER INTO R0
016036  113737  001413  001242          MOVB    CLK.B,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
```

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2387  016044  113737  001407  001244          MOVB    MASK.B,MASKX    ;GET MASK
2388  016052  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
2389  016060  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
2390  016062  004737  016160                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
2391  016066  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
2392  016072  113737  001414  001242          MOVB    CLK,C,CLKX      ;GET SHIFTS PER CHAR
2393  016100  113737  001410  001244          MOVB    MASK,C,MASKX    ;GET MASK
2394  016106  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
2395  016114  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
2396  016116  004737  016160                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
2397  016122  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
2398  016126  113737  001415  001242          MOVB    CLK,D,CLKX      ;GET SHIFTS
2399  016134  113737  001411  001244          MOVB    MASK,D,MASKX    ;GET MASKK
2400  016142  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
2401  016150  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
2402  016152  004737  016160                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
2403  016156  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
2404  016160                          105$:                           ;TEST ENTRANCE.
2405  016160  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
2406  016166  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
2407  016170  000207                          RTS     PC              ;EXIT TEST
2408  016172  012703  000004                  MOV     #4,R3           ;SET FOR 4 LINE GROUP
2409  016176  010037  016212                  MOV     R0,65$          ;SET LINE POINTER
2410  016202  104412                  1$:     MSTCLR                  ;RESET DV11
2411  016204  005001                          CLR     R1              ;ZERO MSCANNER POINTER
2412  016206  004537  022470                  PERFORM ,SETSCAN         ;ADJUST MSCANNER
2413  016212  000001                  65$:    .BLKW 1                 ;LINE POINTER
2414  016214  010077  163152          3$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
2415  016220  012777  125000  163142          MOV     #BIT15+BIT13+BIT11+BIT9,@DVLCR
2416  016226  004737  022406                  JSR     PC,CKBIT15
2417  016232  113737  001236  022622          MOVB    STAT,DATA       ;GET SYNC CHAR
2418  016240  104416                          DATACLK                 ;INIT DV11 BY ONE CLOCK
2419  016242  113737  001242  016576          MOVB    CLKX,10$        ;GET NUMBER OF SHIFTS PER CHAR.
2420  016250  004537  022326                  PERFORM ,RXSHIFT        ;CLOCK RX
2421  016254  016576                          10$                     ;NUMBER OF SHIFTS
2422  016256  113737  001236  022622          MOVB    STAT,DATA       ;GET ANOTHER SYNC
2423  016264  004537  022326                  PERFORM ,RXSHIFT        ;SHIFT RX
2424  016270  016576                          10$                     ;NUMBER OF SHIFTS
2425  016272  113737  001236  022622          MOVB    STAT,DATA       ;SYNC CHAR
2426  016300  162737  000001  016576          SUB     #1,10$          ;SET NUMBER OF SHIFTS -1
2427  016306  004537  022326                  PERFORM ,RXSHIFT        ;SHIFT RX
2428  016312  016576                          10$                     ;SHIFTS
2429  016314  012777  050023  163056          MOV     #S,C+BIT4+BIT1+BIT0,@DVSFR
2430  016322  104415                          ROMCLK                  ;S/C "SET RECV DATA ENABLE"
2431  016324  012777  050021  163046          MOV     #S,C+BIT4+BIT0,@DVSFR
2432  016332  104415                          ROMCLK                  ;SET/CLEAR SILO IN
2433  016334  012777  001400  163036          MOV     #BIT9+BIT8,@DVSFR
2434  016342  032777  000001  163020  4$:     BIT     #BIT0,@DVLCR    ;RCV CHAR WAITING??
2435  016350  001374                          BNE     4$              ;BR IF YES
2436  016352  012702  030306                  MOV     #XFR+BIT7+BIT6+BIT2+BIT1,R2
2437  016356  010277  163016                  MOV     R2,@DVSFR       ;XFR RIC_SILO OUT
2438  016362  104415                          ROMCLK                  ;DATA/XFER  RICR_SILO OUT
2439  016364  017704  162776                  MOV     @DVRIC,R4       ;READ DVRIC REG
2440  016370  010405                          MOV     R4,R5           ;
2441  016372  042705  020000                  BIC     #BIT13,R5       ;
2442  016376  020504                          CMP     R5,R4           ;OVERRUN??
```



```
2443  016400  001401                          BEQ     .+4             ;BR IF NO
2444  016402  104001                          HLT     1               ;OVERRUN OCCURED TO SOON.
2445  016404  004537  022456                  PERFORM ,SILO,OUT       ;SILO OUT
2446  016410  113737  001236  022622          MOVB    STAT,DATA
2447  016416  113704  001242                  MOVB    CLKX,R4
2448  016422  005304                          DEC     R4
2449  016424  000241                  66$:    CLC
2450  016426  106037  022622                  RORB    DATA
2451  016432  105304                          DECB    R4
2452  016434  001373                          BNE     66$
2453  016436  012737  000001  016576          MOV     #1,10$
2454  016444  004537  022326                  PERFORM ,RXSHIFT
2455  016450  016576                          10$
2456  016452  012777  050021  162720          MOV     #S,C+BIT4+BIT0,@DVSFR
2457  016460  104415                          ROMCLK                  ;SET/CLEAR SILO IN
2458  016462  012777  001400  162710          MOV     #BIT9+BIT8,@DVSFR
2459  016470  032777  000001  162672  5$:     BIT     #BIT0,@DVLCR    ;RECV CHAR WAITING
2460  016476  001374                          BNE     5$              ;
2461  016500  010005                          MOV     R0,R5           ;GET LINE NUMBER
2462  016502  000305                          SWAB    R5              ;PUT LINE NUMBER INTO HIGH BYTE
2463  016504  153705  001236                  BISB    STAT,R5         ;PLACE SYNC INTO EXPECTED
2464  016510  143705  001244                  BICB    MASKX,R5        ;CLEAR UNUSED BITS.
2465  016514  052705  020000                  BIS     #BIT13,R5       ;SET OVERRUN
2466  016520  012702  030306                  MOV     #XFR+BIT7+BIT6+BIT2+BIT1,R2
2467  016524  010277  162650                  MOV     R2,@DVSFR
2468  016530  104415                          ROMCLK                  ;DATA/XFER  RICR_SILO OUT
2469  016532  017704  162630                  MOV     @DVRIC,R4       ;READ DVRIC
2470  016536  032737  040000  001236          BIT     #PARBIT,STAT    ;PARITY?
2471  016544  001402                          BEQ     6$              ;BR IF NO
2472  016546  042704  010000                  BIC     #BIT12,R4       ;CLEAR PARITY ERROR IF IT EXISTS
2473  016552  020504                  6$:     CMP     R5,R4           ;OVERRUN SET?
2474  016554  001401                          BEQ     .+4             ;BR IF YES
2475  016556  104001                          HLT     1               ;LINE,CHAR,AND OVERRUN EXPECTED.
2476  016560  004537  022456                  PERFORM ,SILO,OUT       ;SILO OUT
2477  016564  005237  016212                  INC     65$             ;UPDATE LINE POINTER
2478  016570  005303                          DEC     R3              ;4 LINE GROUP DONE?
2479  016572  001203                          BNE     1$              ;BR IF NO
2480  016574  000207                          RTS     PC              ;RETURN FOR NEXT 4 LINE GROUP
2481  016576  000001                  10$:    .BLKW 1
2482
2483
2484                                          ;********************** TEST 21 ****************************
2485                                          ;*TEST OF RECEIVER DATA .
2486                                          ;*THIS TEST RUNS A BINARY COUNT PATTERN THROUGH
2487                                          ;*THE RECEIVER OF EACH LINE
2488                                          ;*THROUGH THE USE OF MAINT. DATA BIT.
2489                                          ;*THE TX IS NEVER ENABLED.
2490                                          ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
2491                                          ;************************************************************
2492
2493                                  ;  TEST 21
2494                                  ;--------------
2495  016600  012737  000021  001226  TST21:  MOV     #21,TSTNO
2496  016606  012737  017346  001216          MOV     #TST22,NEXT
2497  016614  012700  000000                  MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
2498  016620  113737  001412  001242          MOVB    CLK,A,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
```

```
2499  016626  113737  001406  001244          MOVB    MASK,A,MASKX    ;PLACE "MASK"FOR CHARS INTO MASKX
2500  016634  013737  001416  001236          MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
2501  016642  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
2502  016644  004737  016776                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
2503  016650  012700  000004          100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
2504  016654  113737  001413  001242          MOVB    CLK,B,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
2505  016662  113737  001407  001244          MOVB    MASK,B,MASKX    ;GET MASK
2506  016670  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
2507  016676  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
2508  016700  004737  016776                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
2509  016704  012700  000010          101$:   MOV     #8.,R0          ;LOAD LINE NUMBER
2510  016710  113737  001414  001242          MOVB    CLK,C,CLKX      ;GET SHIFTS PER CHAR
2511  016716  113737  001410  001244          MOVB    MASK,C,MASKX    ;GET MASK
2512  016724  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
2513  016732  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
2514  016734  004737  016776                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
2515  016740  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
2516  016744  113737  001415  001242          MOVB    CLK,D,CLKX      ;GET SHIFTS
2517  016752  113737  001411  001244          MOVB    MASK,D,MASKX    ;GET MASKK
2518  016760  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
2519  016766  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
2520  016770  004737  016776                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
2521  016774  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
2522  016776                          105$:                           ;TEST ENTRANCE.
2523  016776  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
2524  017004  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
2525  017006  000207                          RTS     PC              ;EXIT TEST
2526  017010  012703  000004                  MOV     #4,R3           ;SET FOR 4 LINE GROUP.
2527  017014  010037  017030                  MOV     R0,65$          ;PLACE LINE POINTER
2528  017020  104412                  1$:     MSTCLR                  ;CLEAR THE DV11
2529  017022  005001                          CLR     R1              ;ZERO MSCANNER POINTER
2530  017024  004537  022470                  PERFORM ,SETSCAN         ;SET SCANNER
2531  017030  000001                  65$:    .BLKW 1                 ;POSITION MSCAN TO LINE NO.
2532  017032  010077  162334          3$:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
2533  017036  012777  125000  162324          MOV     #BIT15+BIT13+BIT11+BIT9,@DVLCR
2534  017044  004737  022406                  JSR     PC,CKBIT15      ;GO WAIT FOR BIT15 TO=0
2535  017050  113737  001236  022622          MOVB    STAT,DATA       ;LOAD SYNC CHAR
2536  017056  104416                          DATACLK                 ;GIVE AN INITIAL CLOCK
2537  017060  004537  022326                  PERFORM ,RXSHIFT         ;STROBE CHAR INTO RX.
2538  017064  001242                          CLKX                    ;PICK UP NO. OF CLOCKS.
2539  017066  032737  010000  001236          BIT     #TWOSYN,STAT    ;TWO SYNCS REQUIRED??
2540  017074  001006                          BNE     4$              ;BR IF ONLY ONE SYNC..
2541  017076  113737  001236  022622          MOVB    STAT,DATA       ;GIVE ANOTHER SYNC TO THE RX
2542  017104  004537  022326                  PERFORM ,RXSHIFT         ;STROBE IT IN
2543  017110  001242                          CLKX                    ;SHIFTS REQUIRED
2544  017112  010005                  4$:     MOV     R0,R5           ;LOAD LINE NUMBER INTO "EXPECTED"
2545  017114  000305                          SWAB    R5              ;PLACE IT INTO HIGH BYTE
2546  017116  105005                          CLRB    R5              ;ZERO LOW BYTE
2547  017120  012737  017174  001220          MOV     #5$,LOCK        ;SET IF SW09=1; GOTO 5$
2548  017126  012777  050023  162244          MOV     #S.C+BIT4+BIT1+BIT0,@DVSFR
2549  017134  104415                          ROMCLK                  ;CLOCK "DATA ENABLE"
2550  017136  004537  022434                  PERFORM ,SILO.IN         ;READ RX BUFFER INTO SILO
2551  017142  005002                          CLR     R2              ;SET FOR DELAY
2552  017144  012777  001400  162226          MOV     #BIT9+BIT8,@DVSFR
2553  017152  032777  000001  162210  10$:    BIT     #BIT0,@DVLCR    ;IS "RX CHAR WAITING" TRUE?
2554  017160  001403                          BEQ     9$              ;BR IF TRUE..
```



```
2555  017162  005202                          INC     R2              ;DELAY.......
2556  017164  001372                          BNE     10$             ;BR IF DELAY NOTDONE
2557  017166  104000                          HLT     0               ;RX CHAR WAITING NOT TRUE!
2558  017170  004537  022456          9$:     PERFORM ,SILO,OUT        ;REMOVE CHAR FROM SILO
2559  017174  010537  022622          5$:     MOV     R5,DATA         ;PLACE CHAR INTO SOFTWARE LOC.
2560  017200  105037  022623                  CLRB    DATA+1          ;ZERO LINE NUMBER.
2561  017204  004537  022326                  PERFORM ,RXSHIFT         ;PLACE CHAR INTO RX BUFFER.
2562  017210  001242                          CLKX                    ;CLOCKS.
2563  017212  012777  050023  162160          MOV     #S.C+BIT4+BIT1+BIT0,@DVSFR
2564  017220  104415                          ROMCLK                  ;SET RX DATA ENABLE
2565  017222  004537  022434                  PERFORM ,SILO.IN         ;READ FROM RX BUFFER INTO SILO
2566  017226  005002                          CLR     R2              ;SET DELAY
2567  017230  012777  001400  162142          MOV     #BIT9+BIT8,@DVSFR
2568  017236  032777  000001  162124  6$:     BIT     #BIT0,@DVLCR    ;WAIT FOR RX CHAR WAITING
2569  017244  001403                          BEQ     7$              ;BR IF TRUE
2570  017246  005202                          INC     R2              ;UPDATE DELAY
2571  017250  001372                          BNE     6$              ;GOBACK
2572  017252  104000                          HLT     0               ;RX CHAR WAITING NOT TRUE
2573  017254  012702  030306          7$:     MOV     #XFR+BIT7+BIT6+BIT2+BIT1,R2
2574  017260  010277  162114                  MOV     R2,@DVSFR       ;DO DATA XFER FROM SILO TO DVRIC
2575  017264  104415                          ROMCLK                  ;CLOCK
2576  017266  017704  162074                  MOV     @DVRIC,R4       ;LOAD DVRIC TO "FOUND" LOC.
2577  017272  032737  040000  001236          BIT     #PARBIT,STAT    ;PARITY ON??
2578  017300  001402                          BEQ     16$             ;BR IF PARITY NOT ON.
2579  017302  042704  010000                  BIC     #BIT12,R4       ;CLEAR PARITY ERROR (DON'T WORRY ABOUT PARITY NOW!)
2580  017306                          16$:
2581  017306  020504                          CMP     R5,R4           ;RX DATA AND LINE NUMBER OK??
2582  017310  001401                          BEQ     .+4             ;BR IF EXPECTED =FOUND.
2583  017312  104002                          HLT     2               ;RX DATA ERROR
2584  017314  004537  022456                  PERFORM ,SILO,OUT        ;REMOVE RX DATA FROM SILO
2585  017320  104401                          SCOP1                   ;SW09=1?
2586  017322  105205                          INCB    R5              ;UPDATE DATA
2587  017324  001403                          BEQ     8$              ;BR IF ALL DATA DONE
2588  017326  133705  001244                  BITB    MASKX,R5        ;IF <8BITS CHECK END OF DATA.
2589  017332  001720                          BEQ     5$              ;BR IF MORE TO GO
2590  017334  005237  017030          8$:     INC     65$             ;UPDATE TO NEXT LINE.
2591  017340  005303                          DEC     R3              ;ALL 4 LINES DONE?
2592  017342  001226                          BNE     1$              ;BR IF NOT ALL DONE
2593  017344  000207                          RTS     PC              ;SCOPE THIS TEST
2594
2595
2596                                          ;************************ TEST 22 *****************************
2597                                          ;*TEST OF RECEIVER DATA .
2598                                          ;*THIS TEST RUNS A SET PATTERN TRHOUGH
2599                                          ;*THE RECEIVER OF EACH LINE
2600                                          ;*THROUGH THE USE OF THE TRANSMITTER.
2601                                          ;*THIS TEST EXERCISES ALL LINES IN GROUPS OF 4.
2602                                          ;*NOTE: SHOULD A DATA COMPARE ERROR OCCUR; THE PROGRAM
2603                                          ;*      REPORTS THE ERROR AS A RECEIVER DATA ERROR BASED
2604                                          ;*      ON THE TRANSMITTER HAS PREVIOUSLY BEEN CHECKED AND ASSUMED GOOD.
2605                                          ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
2606                                          ;!************************************************************
2607
2608                                  ;  TEST 22
2609                                  ;--------------
2610  017346  012737  000022  001226  TST22:  MOV     #22,TSTNO
```

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 2611  017354  012737  020336  001216          MOV     #TST23,NEXT
 2612  017362  012700  000000                  MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
 2613  017366  113737  001412  001242          MOVB    CLK,A,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
 2614  017374  113737  001406  001244          MOVB    MASK,A,MASKX    ;PLACE "MASK"FOR CHARS INTO MASKX
 2615  017402  013737  001416  001236          MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2616  017410  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
 2617  017412  004737  017544                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
 2618  017416  012700  000004          100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
 2619  017422  113737  001413  001242          MOVB    CLK,B,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
 2620  017430  113737  001407  001244          MOVB    MASK,B,MASKX    ;GET MASK
 2621  017436  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2622  017444  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
 2623  017446  004737  017544                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
 2624  017452  012700  000010          101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
 2625  017456  113737  001414  001242          MOVB    CLK,C,CLKX      ;GET SHIFTS PER CHAR
 2626  017464  113737  001410  001244          MOVB    MASK,C,MASKX    ;GET MASK
 2627  017472  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2628  017500  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
 2629  017502  004737  017544                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
 2630  017506  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
 2631  017512  113737  001415  001242          MOVB    CLK,D,CLKX      ;GET SHIFTS
 2632  017520  113737  001411  001244          MOVB    MASK,D,MASKX    ;GET MASKK
 2633  017526  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
 2634  017534  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
 2635  017536  004737  017544                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
 2636  017542  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
 2637  017544                          105$:                           ;TEST ENTRANCE.
 2638  017544  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
 2639  017552  001401                          BEQ     .+4             ;BR IF SYNC LINE CARD.
 2640  017554  000207                          RTS     PC              ;EXIT TEST
 2641  017556  010037  017654                  MOV     R0,65$          ;PLACE LINE NO.
 2642  017562  005037  001250                  CLR     TEMP2
 2643  017566  113704  001244                  MOVB    MASKX,R4
 2644  017572  005037  001252                  CLR     TEMP3
 2645  017576  110437  001252                  MOVB    R4,TEMP3
 2646  017602  000241                          CLC
 2647  017604  006104                          ROL     R4
 2648  017606  050437  001252                  BIS     R4,TEMP3
 2649  017612  000241                          CLC
 2650  017614  006104                          ROL     R4
 2651  017616  050437  001252                  BIS     R4,TEMP3
 2652  017622  013737  001236  022572          MOV     STAT,SYNC
 2653  017630  113737  001236  022573          MOVB    STAT,SYNC+1
 2654  017636  012737  000004  001246          MOV     #4,TEMP1        ;SET FOR 4 LINES
 2655  017644  104412                  18:     MSTCLR                  ;RESET DV11
 2656  017646  005001                          CLR     R1              ;ZERO MSCANNER POINTER
 2657  017650  004537  022470                  PERFORM ,SETSCAN         ;ADJUST SCANNER FOR PROPER LINE
 2658  017654  000001                  65$:    ,BLKW 1                 ;
 2659  017656                          38:
 2660                                                                  ;SET SOURCE SELECT
 2661  017656  010077  161510          78:     MOV     R0,@DVSRS       ;LOAD LINE NUMBER
 2662  017662  004537  022560                  PERFORM ,CLR,TMARK       ;CLEAR TMARK BIT.
 2663  017666  004537  022266                  PERFORM ,LOAD,MODE       ;LOAD
 2664  017672  024000                          BIT13+BIT11             ;MODE AND RX ENABLE
 2665  017674  032737  010000  001236          BIT     #TWOSYN,STAT
 2666  017702  001003                          BNE     9$
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 2667  017704  012703  022572                  MOV     #SYNC,R3
 2668  017710  000402                          BR      10$
 2669  017712  012703  022573          98:     MOV     #SYNC+1,R3
 2670  017716  111337  001250          108:    MOVB    (R3),TEMP2
 2671  017722  043737  001252  001250          BIC     TEMP3,TEMP2
 2672  017730  005077  161436                  CLR     @DVSRS          ;ZERO LINE TO LINE 0
 2673  017734  013777  001250  161434          MOV     TEMP2,@DVSRA    ;LOAD DATA INTO DVSRA
 2674  017742  012777  020000  161430          MOV     #BIT13,@DVSFR   ;EXECUTE A "ROM READ" INTSTR
 2675  017750  104415                          ROMCLK                  ;CLOCK.
 2676  017752  012777  030260  161420          MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
 2677  017760  104415                          ROMCLK                  ;DO A DATA XFER FROM RAM OUTPUT TO TX BUFFER
 2678  017762  104416                          DATACLK                 ;ISSUE A MAINT CLK.
 2679  017764  012737  017776  001220          MOV     #48,LOCK        ;SET IF SW09=1 GOTO 48
 2680  017772  010005                          MOV     R0,R5
 2681  017774  000305                          SWAB    R5
 2682  017776  113702  001242          48:     MOVB    CLKX,R2         ;SET REQUIRED SHIFTS
 2683  020002  010077  161364                  MOV     R0,@DVSRS       ;LOAD LINE NUMBER
 2684  020006  111337  001250                  MOVB    (R3),TEMP2
 2685  020012  043737  001252  001250          BIC     TEMP3,TEMP2
 2686  020020  105005                          CLRB    R5
 2687  020022  053705  001250                  BIS     TEMP2,R5
 2688  020026  104416                  58:     DATACLK                 ;ISSUE MAINT CLK
 2689  020030  005302                          DEC     R2              ;ALL SHIFTS DONE?
 2690  020032  022702  000001                  CMP     #1,R2           ;IS THE BUFFER ALMOST EMPTY?
 2691  020036  001033                          BNE     68              ;BR IF NO
 2692  020040  005077  161326                  CLR     @DVSRS          ;ZERO LINE NUMBER
 2693  020044  032777  001000  161130          BIT     #BIT9,@SWR      ;LOCK ON DATA?
 2694  020052  001001                          BNE     .+4             ;BR IF YES!!
 2695  020054  005203                          INC     R3              ;UPDATE DATA POINTER.
 2696  020056  111337  001250                  MOVB    (R3),TEMP2      ;STORE DATA
 2697  020062  013777  001250  161306          MOV     TEMP2,@DVSRA    ;LOAD DATA INTO DVSRA
 2698  020070  012777  020000  161302          MOV     #BIT13,@DVSFR   ;DO A ROM READ
 2699  020076  104415                          ROMCLK                  ;CLK
 2700  020100  012777  030260  161272          MOV     #XFR+BIT7+BIT5+BIT4,@DVSFR
 2701  020106  104415                          ROMCLK                  ;DO A  DATA XFER TO TX BUFF
 2702  020110  010077  161256                  MOV     R0,@DVSRS       ;RESELECT LINE NUMBER
 2703  020114  032777  001000  161060          BIT     #BIT9,@SWR      ;LOCK ON DATA?
 2704  020122  001001                          BNE     .+4             ;BR IF YES!!
 2705  020124  005303                          DEC     R3              ;READJUST DATA CHAR POINTER.
 2706  020126  005702                  88:     TST     R2              ;ALL SHIFTS DONE?
 2707  020130  001336                          BNE     58              ;BR IF NO
 2708  020132  022703  022572                  CMP     #SYNC,R3
 2709  020136  001465                          BEQ     508
 2710  020140  022703  022573                  CMP     #SYNC+1,R3
 2711  020144  001462                          BEQ     508
 2712  020146  012777  050023  161224          MOV     #S,C+BIT4+BIT1+BIT0,@DVSFR
 2713  020154  104415                          ROMCLK                  ;SET RX DATA ENABLE
 2714  020156  004537  022434                  PERFORM ,SILO,IN         ;READ FROM RX BUFFER INTO SILO
 2715  020162  005002                          CLR     R2              ;SET DELAY
 2716  020164  012777  001400  161206          MOV     #BIT9+BIT8,@DVSFR
 2717  020172  032777  000001  161170  268:    BIT     #BIT0,@DVLCR    ;WAIT FOR RX CHAR WAITING
 2718  020200  001403                          BEQ     278             ;BR IF TRUE
 2719  020202  005202                          INC     R2              ;UPDATE DELAY
 2720  020204  001372                          BNE     268             ;GOBACK
 2721  020206  104000                          HLT     0               ;RX CHAR WAITING NOT TRUE
 2722  020210  012702  030306          278:    MOV     #XFR+BIT7+BIT6+BIT2+BIT1,R2
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2723  020214  010277  161160                    MOV     R2,@DVSFR       ;DO DATA XFER FROM SILO TO DVRIC
2724  020220  104415                            ROMCLK                  ;CLOCK
2725  020222  017704  161140                    MOV     @DVRIC,R4       ;LOAD DVRIC TO "FOUND" LOC.
2726  020226  032737  040000  001236            BIT     #PARBIT,STAT    ;PARITY ON??
2727  020234  001402                            BEQ     36$             ;BR IF PARITY NOT ON.
2728  020236  042704  010000                    BIC     #BIT12,R4       ;CLEAR PARITY ERROR (DON'T WORRY ABOUT PARITY NOW!)
2729  020242  020504                    36$:    CMP     R5,R4           ;RX DATA AND LINE NUMBER OK??
2730  020244  001401                            BEQ     .+4             ;BR IF EXPECTED =FOUND.
2731  020246  104002                            HLT     2               ;RX DATA ERROR
2732  020250  004537  022456                    PERFORM ,SILO,OUT       ;REMOVE RX DATA FROM SILO
2733  020254  104401                            SCOP1                   ;LOCK ON DATA?
2734  020256  005203                    11$:    INC     R3
2735  020260  020327  022620                    CMP     R3,#ENDPAT
2736  020264  001244                            BNE     4$
2737  020266  004537  022546            6$:     PERFORM ,SET,TMARK      ;SET TMARK BIT.
2738  020272  005237  017654                    INC     65$             ;UPDATE LINE NO.
2739  020276  005337  001246                    DEC     TEMP1           ;ALL LINES(4) DONE?
2740  020302  001402                            BEQ     46$
2741  020304  000137  017644                    JMP     1$
2742  020310  000207                    46$:    RTS     PC                      ;SCOPE THESE 4 LINES!
2743  020312  012777  050023  161060    50$:    MOV     #S,C+BIT4+BIT1+BIT0,@DVSFR
2744  020320  104415                            ROMCLK
2745  020322  012777  050022  161050            MOV     #S,C+BIT4+BIT1,@DVSFR
2746  020330  104415                            ROMCLK
2747  020332  000137  020256                    JMP     11$
2748
2749
2750                                            ;************************ TEST 23 *****************************
2751                                            ;*TEST OF RECEIVER "RE-SYNC"
2752                                            ;*THIS TEST WILL SEND (BY BIT WINDOW) TWO SYNC CHARS AND
2753                                            ;*THEN VERIFY THAT RX CHAR FLAG IS TRUE,
2754                                            ;*THEN A "RE-SYNC" WILL BE ISSUED AND
2755                                            ;*TWO NON-SYNC CHARS WIIL BE SENT INTO THE RX
2756                                            ;*VERIFYING THAT THERE IS NO RX CHAR FLAG,
2757                                            ;*NEXT TWO SYNC CHARS ARE AGAIN MOVED INTO THE RX
2758                                            ;*VERIFING CHAR FLAG AND THE THE RX SOULD INDEED
2759                                            ;*       RE SYNC!
2760                                            ;*THIS TEST WILL BE DONE FOR SYNC LINE CARDS ONLY.
2761                                            ;!*************************************************************
2762
2763                                    ; TEST 23
2764                                    ;-------------
2765  020336  012737  000023  001226    TST23:  MOV     #23,TSTNO
2766  020344  012737  021042  001216            MOV     #TST24,NEXT
2767  020352  012700  000000                    MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
2768  020356  113737  001412  001242            MOVB    CLK,A,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
2769  020364  013737  001416  001236            MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
2770  020372  100402                            BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
2771  020374  004737  020504                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
2772  020400  012700  000004            100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
2773  020404  113737  001413  001242            MOVB    CLK,B,CLKX      ;PLACE "SHIFTS/PER/CHAR" IN CLKX
2774  020412  013737  001420  001236            MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
2775  020420  100402                            BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
2776  020422  004737  020504                    JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
2777  020426  012700  000010            101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
2778  020432  113737  001414  001242            MOVB    CLK,C,CLKX      ;GET SHIFTS PER CHAR
```



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2779  020440  013737  001422  001236            MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
2780  020446  100402                            BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
2781  020450  004737  020504                    JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
2782  020454  012700  000014            102$:   MOV     #12,,R0         ;LOAD LINE NO.
2783  020460  113737  001415  001242            MOVB    CLK,D,CLKX      ;GET SHIFTS
2784  020466  013737  001424  001236            MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
2785  020474  100402                            BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
2786  020476  004737  020504                    JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
2787  020502  104400                    103$:   SCOPE                   ;SCOPE THIS TEST.
2788  020504                            105$:   ;TEST ENTRANCE.
2789  020504  032737  004000  001236            BIT     #ASYNC,STAT     ;IS THIS A SYNC LINE CARD?
2790  020512  001401                            BEQ     .+4             ;BR IF SYNC LINE CARD.
2791  020514  000207                            RTS     PC              ;EXIT TEST
2792  020516  012703  000004                    MOV     #4,R3           ;SET FOR 4 LINE GROUP
2793  020522  010037  020536                    MOV     R0,68$          ;SAVE LINE NO
2794  020526  104412                    1$:     MSTCLR                  ;RESET
2795  020530  005001                            CLR     R1              ;ZERO MSCANNER POINTER
2796  020532  004537  022470                    PERFORM ,SETSCAN        ;SET SCANNER
2797  020536  000001                    68$:    .BLKW 1                 ;TO RIGHT LINE
2798  020540  012737  020546  001220            MOV     #3$,LOCK        ;SET IF SW09=1
2799  020546  010077  160620            3$:     MOV     R0,@DVSR8       ;LOAD LINE
2800  020552  004537  022266                    PERFORM ,LOAD,MODE      ;LOAD
2801  020556  025000                            BIT13+BIT11+BIT9        ;MODE
2802  020560  012702  000002                    MOV     #2,R2           ;SET COUNT
2803  020564  104416                            DATACLK                 ;INIT DV11 SAT/SAR
2804  020566  013737  001236  022622    4$:     MOV     STAT,DATA       ;GET SYNC
2805  020574  004537  022326                    PERFORM ,RXSHIFT        ;SHIFT INTO RX
2806  020600  001242                            CLKX                    ;CLOCKS
2807  020602  005302                            DEC     R2              ;TWO CHARS YET
2808  020604  001370                            BNE     4$              ;
2809  020606  012702  002000                    MOV     #BIT10,R2       ;BRA TEST
2810  020612  010277  160562                    MOV     R2,@DVSFR       ;
2811  020616  017704  160546                    MOV     @DVLCR,R4       ;
2812  020622  010405                            MOV     R4,R5           ;
2813  020624  042705  000001                    BIC     #BIT0,R5        ;
2814  020630  020504                            CMP     R5,R4           ;BRANCH TEST POINT BAD
2815  020632  001401                            BEQ     64$             ;
2816  020634  104001                            HLT     1               ;
2817  020636  012777  050106  160534    64$:    MOV     #S,C+BIT6+BIT2+BIT1,@DVSFR
2818  020644  104415                            ROMCLK                  ;S/C "RESYNC PULSE"
2819  020646  010277  160526                    MOV     R2,@DVSFR       ;
2820  020652  017704  160512                    MOV     @DVLCR,R4       ;
2821  020656  010405                            MOV     R4,R5           ;
2822  020660  052705  000001                    BIS     #BIT0,R5        ;
2823  020664  020504                            CMP     R5,R4           ;
2824  020666  001401                            BEQ     65$             ;
2825  020670  104001                            HLT     1               ;RESYNC FAILED.
2826  020672  012702  000002            65$:    MOV     #2,R2           ;
2827  020676  013737  001236  022622    5$:     MOV     STAT,DATA       ;GET SYNC
2828  020704  005437  022622                    NEG     DATA            ;MAKE IT A NON-SYNC
2829  020710  004537  022326                    PERFORM ,RXSHIFT        ;SHIFT
2830  020714  001242                            CLKX                    ;INTO RX
2831  020716  005302                            DEC     R2              ;TWO DONE?
2832  020720  001366                            BNE     5$              ;
2833  020722  012702  002000                    MOV     #BIT10,R2       ;
2834  020726  010277  160446                    MOV     R2,@DVSFR       ;
```

```
021732  017704  160432                  MOV     @DVLCR,R4       ;
021736  010405                          MOV     R4,P5           ;
021740  052705  000001                  BIS     #BIT0,R5        ;
021744  020504                          CMP     R5,R4           ;
021746  001401                          BEQ     66$             ;
021750  104001                          HLT     1               ;
021752  012702  000002          66$:    MOV     #2,R2           ;
021756  013737  001236  022622  6$:     MOV     STAT,DATA       ;
021764  004537  022326                  PERFORM ,RXSHIFT        ;
021770  001242                          CLKX                    ;
021772  005302                          DEC     R2              ;
021774  001370                          BNE     6$              ;
021776  012702  002000                  MOV     #BIT10,R2       ;
022002  010277  160372                  MOV     R2,@DVSFR       ;
022006  017704  160356                  MOV     @DVLCR,R4       ;
022012  010405                          MOV     R4,R5   ;
022014  042705  000001                  BIC     #BIT0,R5        ;
022020  020504                          CMP     R5,R4           ;
022022  001401                          BEQ     67$             ;
022024  104001                          HLT     1               ;
022026  104401                  67$:    SCOP1                   ;
022030  005237  020536                  INC     68$             ;
022034  005303                          DEC     R3              ;
022036  001233                          BNE     1$              ;
022040  000207                          RTS     PC              ;EXIT
```

```
                                        ;********************** TEST 24 ****************************
                                        ;*TEST TO VERIFY THAT SETTING RECEIVER ENABLE
                                        ;*WILL SET RX FLAG AND MATCH DETECT.
                                        ;*TEST WILL ALSO VERIFY THAT CLEARING RECEIVER
                                        ;*ENABLE WILL CLEAR RX FLAG AND MATCH DETECT.
                                        ;*THIS TEST WILL BE DONE FOR ASYNC LINE CARDS ONLY.
                                        ;;*************************************************************
                                ;  TEST 24
                                ;--------------
021042  012737  000024  001226  TST24:  MOV     #24,TSTNO
021050  012737  021432  001216          MOV     #TST25,NEXT
021056  012700  000000                  MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
021062  013737  001416  001236          MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
021070  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
021072  004737  021160                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
021076  012700  000004          100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
021102  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
021110  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
021112  004737  021160                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
021116  012700  000010          101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
021122  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
021130  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
021132  004737  021160                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
021136  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO.
021142  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
021150  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
021152  004737  021160                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
```



```
021156  104400                  103$:   SCOPE                   ;SCOPE THIS TEST.
021160                          105$:                           ;TEST ENTRANCE.
021160  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS AN ASYNC LINE CAR?
021166  001001                          BNE     .+4             ;BR IF ASYNC.
021170  000207                          RTS     PC              ;EXIT TEST
021172  012703  000004                  MOV     #4,R3           ;SET TO TEST 4 LINES.
021176  104412                  1$:     MSTCLR                  ;INIT DV11
021200  005001                          CLR     R1              ;INIT SCANNER POINTER.
021202  012777  000010  160152          MOV     #BIT3,@DVSCR    ;SET SOURCE ENABLE
021210  010037  021220                  MOV     R0,65$          ;PREPARE MASTER SCANNER.
021214  004537  022470                  PERFORM ,SETSCAN        ;SET SCANNER
021220  000001                  65$:    ,BLKW   1               ;POSITION OF SCANNER.
021222  010077  160144                  MOV     R0,@DVSBS       ;LOAD LINE NO.
021226  004537  022266                  PERFORM ,LOAD,MODE      ;SET RX ENABLE.
021232  020000                          BIT13                   ;
021234  012702  076400                  MOV     #BRB+BIT11+BIT10+BIT8,R2
021240  010277  160134                  MOV     R2,@DVSFR       ;BRB MATCH DETECT.
021244  017704  160120                  MOV     @DVLCR,R4       ;READ BR POINTS.
021250  010405                          MOV     R4,R5           ;
021252  052705  000001                  BIS     #BIT0,R5        ;BR A FALSE.
021256  042705  000002                  BIC     #BIT1,R5        ;BR B TRUE.
021262  020504                          CMP     R5,R4           ;MATCH DETECT TRUE?
021264  001401                          BEQ     2$              ;BR IF YES
021266  104001                          HLT     1               ;RX FLAG NOT TRUE.
021270  012702  002000          2$:     MOV     #BIT10,R2       ;BRA RX FLAG.
021274  010277  160100                  MOV     R2,@DVSFR       ;LOAD INSTRUCTION.
021300  017704  160064                  MOV     @DVLCR,R4       ;READ BR POINTS.
021304  010405                          MOV     R4,R5           ;
021306  052705  000002                  BIS     #BIT1,R5        ;BR B FALSE
021312  042705  000001                  BIC     #BIT0,R5        ;BR A TRUE.
021316  020504                          CMP     R5,R4           ;RX FLAG TRUE?
021320  001401                          BEQ     3$              ;BR IF YES
021322  104001                          HLT     1               ;RX FLAG NOT TRUE.
021324  004537  022266          3$:     PERFORM ,LOAD,MODE      ;CLEAR RX ENABLE.
021330  000000                          0                       ;
021332  012702  076400                  MOV     #BRB+BIT11+BIT10+BIT8,R2
021336  010277  160036                  MOV     R2,@DVSFR       ;BRB MATCH DETECT.
021342  017704  160022                  MOV     @DVLCR,R4       ;READ BR POINTS.
021346  010405                          MOV     R4,R5           ;
021350  052705  000001                  BIS     #BIT0,R5        ;BR A FALSE.
021354  052705  000002                  BIS     #BIT1,R5        ;BR B FALSE.
021360  020504                          CMP     R5,R4           ;MATCH DETECT FALSE?
021362  001401                          BEQ     4$              ;BR IF YES
021364  104001                          HLT     1               ;RX FLAG NOT FALSE.
021366  012702  002000          4$:     MOV     #BIT10,R2       ;BRA RX FLAG.
021372  010277  160002                  MOV     R2,@DVSFR       ;LOAD INSTRUCTION.
021376  017704  157766                  MOV     @DVLCR,R4       ;READ BR POINTS.
021402  010405                          MOV     R4,R5           ;
021404  052705  000002                  BIS     #BIT1,R5        ;BR B FALSE
021410  052705  000001                  BIS     #BIT0,R5        ;BR A FALSE.
021414  020504                          CMP     R5,R4           ;RX FLAG FALSE?
021416  001401                          BEQ     5$              ;BR IF YES
021420  104001                          HLT     1               ;RX FLAG NOT FALSE.
021422  005200                  5$:     INC     R0              ;UPDATE LINE NO.
021424  005303                          DEC     R3              ;4 LINES DONE?
021426  001263                          BNE     1$              ;BR IF NO.
```

```
 2947  021430  000207                          RTS     PC              ;EXIT TEST.
 2948
 2949
 2950                                          ;********************** TEST 25 ****************************
 2951                                          ;*TEST TO SET RECEIVER ENABLE,
 2952                                          ;*SET "RX DATA ENABLE",
 2953                                          ;*CLR "RX DATA ENABLE",
 2954                                          ;*AND EXPECT BOTH RX FLAG AND MATCH DETECT TO BE FALSE,
 2955                                          ;*THIS TEST WILL BE DONE FOR ASYNC LINE CARDS ONLY,
 2956                                          ;!*************************************************************
 2957
 2958                                  ;  TEST 25
 2959                                  ;--------------
 2960  021432  012737  000025  001226  TST25: MOV     #25,TSTNO
 2961  021440  012737  021744  001216          MOV     #TST26,NEXT
 2962  021446  012700  000000                  MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
 2963  021452  013737  001416  001236          MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2964  021460  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
 2965  021462  004737  021550                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
 2966  021466  012700  000004          100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
 2967  021472  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2968  021500  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
 2969  021502  004737  021550                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
 2970  021506  012700  000010          101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
 2971  021512  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
 2972  021520  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
 2973  021522  004737  021550                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
 2974  021526  012700  000014          102$:   MOV     #12.,R0         ;LOAD LINE NO,
 2975  021532  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
 2976  021540  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
 2977  021542  004737  021550                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
 2978  021546  104400                  103$:   SCOPE                   ;SCOPE THIS TEST,
 2979  021550                          105$:                           ;TEST ENTRANCE,
 2980  021550  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS AN ASYNC LINE CAR?
 2981  021556  001001                          BNE     .+4             ;BR IF ASYNC,
 2982  021560  000207                          RTS     PC              ;EXIT TEST
 2983  021562  012703  000004                  MOV     #4,R3           ;SET TO TEST 4 LINES,
 2984  021566  104412                  1$:     MSTCLR                  ;INIT DV11
 2985  021570  005001                          CLR     R1              ;INIT SCANNER POINTER,
 2986  021572  012777  000010  157562          MOV     #BIT3,@DVSCR    ;SET SOURCE ENABLE
 2987  021600  010037  021610                  MOV     R0,65$          ;PREPARE MASTER SCANNER,
 2988  021604  004537  022470                  PERFORM ,SETSCAN         ;SET SCANNER
 2989  021610  000001                  65$:    ,BLKW   1               ;POSITION OF SCANNER,
 2990  021612  010077  157554                  MOV     R0,@DVSRS       ;LOAD LINE NO,
 2991  021616  004537  022266                  PERFORM ,LOAD,MODE       ;SET RX ENABLE,
 2992  021622  020000                          BIT13                   ;
 2993  021624  012777  050023  157546          MOV     #S,C+BIT4+BIT1+BIT0,@DVSFR
 2994  021632  104415                          ROMCLK                  ;SET RX DATA ENABLE,
 2995  021634  012777  050022  157536          MOV     #S,C+BIT4+BIT1,@DVSFR
 2996  021642  104415                          ROMCLK                  ;CLEAR RX DATA ENABLE,
 2997  021644  012702  076400                  MOV     #BRB+BIT11+BIT10+BIT8,R2
 2998  021650  010277  157524                  MOV     R2,@DVSFR       ;BRB MATCH DETECT,
 2999  021654  017704  157510                  MOV     @DVLCR,R4       ;READ BR POINTS,
 3000  021660  010405                          MOV     R4,R5           ;
 3001  021662  052705  000001                  BIS     #BIT0,R5        ;BR A FALSE,
 3002  021666  052705  000002                  BIS     #BIT1,R5        ;BR B FALSE,
```



```
 3003  021672  020504                          CMP     R5,R4           ;MATCH DETECT FALSE?
 3004  021674  001401                          BEQ     4$              ;BR IF YES
 3005  021676  104001                          HLT     1               ;RX FLAG NOT FALSE,
 3006  021700  012702  002000          4$:     MOV     #BIT10,R2       ;BRA RX FLAG,
 3007  021704  010277  157470                  MOV     R2,@DVSFR       ;LOAD INSTRUCTION,
 3008  021710  017704  157454                  MOV     @DVLCR,R4       ;READ BR POINTS,
 3009  021714  010405                          MOV     R4,R5           ;
 3010  021716  052705  000002                  BIS     #BIT1,R5        ;BR B FALSE
 3011  021722  052705  000001                  BIS     #BIT0,R5        ;BR A FALSE,
 3012  021726  020504                          CMP     R5,R4           ;RX FLAG FALSE?
 3013  021730  001401                          BEQ     5$              ;BR IF YES
 3014  021732  104001                          HLT     1               ;RX FLAG NOT FALSE,
 3015  021734  005200                  5$:     INC     R0              ;UPDATE LINE NO,
 3016  021736  005303                          DEC     R3              ;4 LINES DONE?
 3017  021740  001312                          BNE     1$              ;BR IF NO,
 3018  021742  000207                          RTS     PC              ;EXIT TEST,
 3019
 3020
 3021                                          ;********************** TEST 26 ****************************
 3022                                          ;*TEST TO SET RECEIVER ENABLE,
 3023                                          ;*ISSUE A RESYNC  SIGNAL,
 3024                                          ;*AND EXPECT BOTH RX FLAG AND MATCH DETECT TO BE FALSE,
 3025                                          ;*THIS TEST WILL BE DONE FOR ASYNC LINE CARDS ONLY,
 3026                                          ;!*************************************************************
 3027
 3028                                  ;  TEST 26
 3029                                  ;--------------
 3030  021744  012737  000026  001226  TST26: MOV     #26,TSTNO
 3031  021752  012737  002436  001216          MOV     #,EOP,NEXT
 3032  021760  012700  000000                  MOV     #0,,R0          ;PLACE LINE NUMBER INTO R0
 3033  021764  013737  001416  001236          MOV     L00,03,STAT     ;LOAD LINE CARD STATUS INTO STAT
 3034  021772  100402                          BMI     100$            ;BR IF LINE CARD NOT TO BE TESTED
 3035  021774  004737  022062                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 1
 3036  022000  012700  000004          100$:   MOV     #4,,R0          ;PLACE LINE NUMBER INTO R0
 3037  022004  013737  001420  001236          MOV     L04,07,STAT     ;LOAD LINE CARD STATUS INTO STAT
 3038  022012  100402                          BMI     101$            ;BR IF LINE CARD NOT TO BE TESTED
 3039  022014  004737  022062                  JSR     PC,105$         ;GO DO THE TEST FOR LINE CARD 2
 3040  022020  012700  000010          101$:   MOV     #8,,R0          ;LOAD LINE NUMBER
 3041  022024  013737  001422  001236          MOV     L08,11,STAT     ;LOAD LINE CARD STATUS INTO STAT
 3042  022032  100402                          BMI     102$            ;BR IF LINE CARD NOT TO BE TESTED
 3043  022034  004737  022062                  JSR     PC,105$         ;DO THE TEST FOR LINE CARD 3
 3044  022040  012700  000014          102$:   MOV     #12,,R0         ;LOAD LINE NO,
 3045  022044  013737  001424  001236          MOV     L12,15,STAT     ;LOAD LINE CARD STATUS
 3046  022052  100402                          BMI     103$            ;BR IF LINE CARD NOT TO BE TESTED
 3047  022054  004737  022062                  JSR     PC,105$         ;DO THE TESTS FOR LINE CARD 4
 3048  022060  104400                  103$:   SCOPE                   ;SCOPE THIS TEST,
 3049  022062                          105$:                           ;TEST ENTRANCE,
 3050  022062  032737  004000  001236          BIT     #ASYNC,STAT     ;IS THIS AN ASYNC LINE CAR?
 3051  022070  001001                          BNE     .+4             ;BR IF ASYNC,
 3052  022072  000207                          RTS     PC              ;EXIT TEST
 3053  022074  012703  000004                  MOV     #4,R3           ;SET TO TEST 4 LINES,
 3054  022100  104412                  1$:     MSTCLR                  ;INIT DV11
 3055  022102  005001                          CLR     R1              ;INIT SCANNER POINTER,
 3056  022104  012777  000010  157250          MOV     #BIT3,@DVSCR    ;SET SOURCE ENABLE
 3057  022112  010037  022122                  MOV     R0,65$          ;PREPARE MASTER SCANNER,
 3058  022116  004537  022470                  PERFORM ,SETSCAN         ;SET SCANNER
```

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3059  022122  000001                    65$:    .BLKW   1               ;POSITION OF SCANNER.
3060  022124  010077  157242                    MOV     R0,@DVSRS       ;LOAD LINE NO.
3061  022130  004537  022266                    PERFORM ,LOAD,MODE      ;SET RX ENABLE.
3062  022134  020000                            BIT13                   ;
3063  022136  012777  050106  157234            MOV     #S,C+BIT6+BIT2+BIT1,@DVSFR
3064  022144  104415                            ROMCLK                  ;ISSUE RESYNC.
3065  022146  012702  076400                    MOV     #BRB+BIT11+BIT10+BIT8,R2
3066  022152  010277  157222                    MOV     R2,@DVSFR       ;BRB MATCH DETECT.
3067  022156  017704  157206                    MOV     @DVLCR,R4       ;READ BR POINTS.
3068  022162  010405                            MOV     R4,R5           ;
3069  022164  052705  000001                    BIS     #BIT0,R5        ;BR A FALSE.
3070  022170  052705  000002                    BIS     #BIT1,R5        ;BR B FALSE.
3071  022174  020504                            CMP     R5,R4           ;MATCH DETECT FALSE?
3072  022176  001401                            BEQ     4$              ;BR IF YES
3073  022200  104001                            HLT     1               ;RX FLAG NOT FALSE.
3074  022202  012702  002000            4$:     MOV     #BIT10,R2       ;BRA RX FLAG.
3075  022206  010277  157166                    MOV     R2,@DVSFR       ;LOAD INSTRUCTION.
3076  022212  017704  157152                    MOV     @DVLCR,R4       ;READ BR POINTS.
3077  022216  010405                            MOV     R4,R5           ;
3078  022220  052705  000002                    BIS     #BIT1,R5        ;BR B FALSE
3079  022224  052705  000001                    BIS     #BIT0,R5        ;BR A FALSE.
3080  022230  020504                            CMP     R5,R4           ;RX FLAG FALSE?
3081  022232  001401                            BEQ     5$              ;BR IF YES
3082  022234  104001                            HLT     1               ;RX FLAG NOT FALSE.
3083  022236  005200                    5$:     INC     R0              ;UPDATE LINE NO.
3084  022240  005303                            DEC     R3              ;4 LINES DONE?
3085  022242  001316                            BNE     1$              ;BR IF NO.
3086  022244  000207                            RTS     PC              ;EXIT TEST.
3087
3088  022246                            TXSHIFT:
3089  022246  010046                            MOV     R0,-(SP)
3090  022250  017700  157114                    MOV     @DVLCR,R0
3091  022254  106100                            ROLB    R0
3092  022256  106037  022622                    RORB    DATA
3093  022262  012600                            MOV     (SP)+,R0
3094  022264  000205                            EXIT
3095  022266                            LOAD,MODE:
3096  022266  012577  157076                    MOV     (R5)+,@DVLCR
3097  022272  052777  100000  157070            BIS     #BIT15,@DVLCR
3098  022300  010046                            MOV     R0,-(SP)
3099  022302  005000                            CLR     R0
3100  022304  005777  157060            1$:     TST     @DVLCR
3101  022310  100004                            BPL     2$
3102  022312  104414                            DELAY
3103  022314  005200                            INC     R0
3104  022316  001372                            BNE     1$
3105  022320  104000                            HLT     0               ;BIT 15 FAILED TO CLEAR
3106  022322  012600                    2$:     MOV     (SP)+,R0
3107  022324  000205                            EXIT
3108  022326                            RXSHIFT:
3109  022326  010046                            MOV     R0,-(SP)
3110  022330  010246                            MOV     R2,-(SP)
3111  022332  113502                            MOVB    @(R5)+,R2
3112  022334  042777  040000  157026    1$:     BIC     #BIT14,@DVLCR
3113  022342  005000                            CLR     R0
3114  022344  000241                            CLC
```



```
3115  022346  006037  022622                    ROR     DATA
3116  022352  006000                            ROR     R0
3117  022354  006000                            ROR     R0
3118  022356  052700  100000                    BIS     #BIT15,R0
3119  022362  050077  157002                    BIS     R0,@DVLCR
3120  022366  004737  022406                    JSR     PC,CKBIT15
3121  022372  104416                            DATACLK
3122  022374  105302                            DECB    R2
3123  022376  001356                            BNE     1$
3124  022400  012602                            MOV     (SP)+,R2
3125  022402  012600                            MOV     (SP)+,R0
3126  022404  000205                            EXIT
3127
3128  022406                            CKBIT15:
3129  022406  010046                            MOV     R0,-(SP)
3130  022410  005000                            CLR     R0
3131  022412  005777  156752            64$:    TST     @DVLCR
3132  022416  100004                            BPL     65$
3133  022420  104414                            DELAY
3134  022422  005200                            INC     R0
3135  022424  001372                            BNE     64$
3136  022426  104000                            HLT     0               ;BIT 15 FAILED TO CLEAR
3137  022430  012600                    65$:    MOV     (SP)+,R0
3138  022432  000207                            RTS     PC
3139  022434                            SILO,IN:
3140  022434  012777  050021  156736            MOV     #BIT14+BIT12+BIT4+BIT0,@DVSFR
3141  022442  104415                            ROMCLK
3142  022444  012777  050022  156726            MOV     #BIT14+BIT12+BIT4+BIT1,@DVSFR
3143  022452  104415                            ROMCLK
3144  022454  000205                            EXIT
3145
3146  022456                            SILO,OUT:
3147  022456  012777  050020  156714            MOV     #BIT14+BIT12+BIT4,@DVSFR
3148  022464  104415                            ROMCLK
3149  022466  000205                            EXIT
3150
3151
3152  022470                            SETSCAN:
3153  022470  010346                            MOV     R3,-(SP)
3154  022472  052777  000010  156662            BIS     #BIT3,@DVSCR
3155  022500  012503                            MOV     (R5)+,R3
3156  022502  001414                            BEQ     2$
3157  022504  012777  050102  156666    1$:     MOV     #BIT14+BIT12+BIT6+BIT1,@DVSFR
3158  022512  104415                            ROMCLK
3159  022514  005201                            INC     R1
3160  022516  012777  050102  156654            MOV     #BIT14+BIT12+BIT6+BIT1,@DVSFR
3161  022524  104415                            ROMCLK
3162  022526  005201                            INC     R1
3163  022530  005303                            DEC     R3
3164  022532  001364                            BNE     1$
3165  022534  012603                    2$:     MOV     (SP)+,R3
3166  022536  010100                            MOV     R1,R0
3167  022540  000241                            CLC
3168  022542  006000                            ROR     R0
3169  022544  000205                            EXIT
3170  022546                            SET,TMARK:
```

```
3171  022546  012777  050105  156624          MOV     #BIT14+BIT12+BIT6+BIT2+BIT0,@DVSFR
3172  022554  104415                          ROMCLK                  ;SET/CLEAR "SET TMARK"
3173  022556  000205                          EXIT
3174  022560                          CLR.TMARK:
3175  022560  012777  050101  156612          MOV     #BIT14+BIT12+BIT6+BIT0,@DVSFR
3176  022566  104415                          ROMCLK          ;SET/CLEAR "CLEAR TMARK"
3177  022570  000205                          EXIT
3178
3179  022572  000001                  SYNC:   .BLKW 1
3180  022574     300                  DATPAT: .BYTE   ^B<00000000>    ;ALL ZERO'S
3181  022575     377                          .BYTE   ^B<11111111>    ;ALL ONE'S
3182  022576     125                          .BYTE   ^B<01010101>    ;ALTERNATE ONE'S
3183  022577     252                          .BYTE   ^B<10101010>    ;ALTERNATE ZERO'S
3184  022600     001                          .BYTE   ^B<00000001>    ;F
3185  022601     002                          .BYTE   ^B<00000010>    ; L
3186  022602     004                          .BYTE   ^B<00000100>    ;  O
3187  022603     010                          .BYTE   ^B<00001000>    ;   A
3188  022604     020                          .BYTE   ^B<00010000>    ;    T
3189  022605     040                          .BYTE   ^B<00100000>    ;     I
3190  022606     100                          .BYTE   ^B<01000000>    ;      N
3191  022607     200                          .BYTE   ^B<10000000>    ;       G  ONE!
3192  022610     177                          .BYTE   ^B<01111111>    ;F
3193  022611     277                          .BYTE   ^B<10111111>    ; L
3194  022612     337                          .BYTE   ^B<11011111>    ;  O
3195  022613     357                          .BYTE   ^B<11101111>    ;   A
3196  022614     367                          .BYTE   ^B<11110111>    ;    T
3197  022615     373                          .BYTE   ^B<11111011>    ;     I
3198  022616     375                          .BYTE   ^B<11111101>    ;      N
3199  022617     376                          .BYTE   ^B<11111110>    ;       G  ZERO!
3200  022620                          ENDPAT:
3201  022620  000000                  NPRLOC: 0
3202  022622  000000                  DATA:   0
3203  022624  046377  047111  020105  EM1:    .ASCIZ  <377>/LINE CARD STATIC TEST/
      022653     377  042522  042503  EM2:    .ASCIZ  <377>/RECEIVER DATA COMAPRISON ERROR/
      022713     377  051124  047101  EM3:    .ASCIZ  <377>/TRANSMITTER DATA COMPARISON ERROR/
      022756  046777  052123  041523  DH1:    .ASCIZ  <377>/MSTSCAN  DVSFR  EXPECTED  FOUND  LINE(8)/
                                      .EVEN
              000000                  $KIP=000000
3204  023030  000005                  DT6:    5
3205  023032     006     003                  .BYTE   6,3
3206  023034  001262                          $AVR1
3207  023036     006     001                  .BYTE   6,1
3208  023040  001264                          $AVR2
3209  023042     006     004                  .BYTE   6,4
3210  023044  001272                          $AVR5
3211  023046     006     001                  .BYTE   6,1
3212  023050  001270                          $AVR4
3213  023052     002     001                  .BYTE   2,1
3214  023054  001260                          $AVR0
3215
3216  023056                          .ERRTAB:
3217  023056  000000                          0
3218  023060  000000                          0
3219  023062  000000                          0
3220  023064  022624                          EM1
3221  023066  022756                          DH1     ;HALT 1
```



```
3222  023070  023030                          DT6
3223  023072  022653                          EM2
3224  023074  022756                          DH1     ;HALT 2
3225  023076  023030                          DT6
3226  023100  022713                          EM3
3227  023102  022756                          DH1     ;HALT 3
3228  023104  023030                          DT6
3229  023106                          CORMAX:
3230          000001                  .END
```

```
ADRCNT= 003443   617*   653*   662#
ALU   = 010000    73#
ASYNC = 004000    81#  1355  1407  1459  1513  1565  1641  1776  1882  2049  2129  2200  2305
                2405  2523  2638  2789  2893  2980  3050
AUTO.S  006622  1127#
BCC   = 060000    78#
BINWRD  003746   703*   704   741#
BIT0  = 000001    71#   884  1247  1312  1660  1671  1987  1991  2008  2062  2064  2068  2085
                2148  2220  2230  2241  2250  2325  2335  2346  2355  2429  2431  2434  2456
                2459  2548  2553  2563  2568  2712  2717  2743  2813  2822  2837  2851  2910
                2920  2930  2940  2993  3001  3011  3069  3079  3140  3171  3175
BIT1  = 000002    70#   884   895  1247  1254  1263  1267  1312  1651  1786  1892  1996  2062
                2073  2149  2221  2230  2242  2249  2326  2335  2347  2354  2429  2436  2466
                2548  2563  2573  2712  2722  2743  2745  2817  2911  2919  2931  2939  2993
                2995  3002  3010  3063  3070  3078  3142  3157  3160
BIT10 = 002000    61#   884  1248  1313  1898  2145  2216  2225  2237  2246  2316  2321  2330
                2342  2351  2809  2833  2847  2906  2915  2926  2935  2997  3006  3065  3074
BIT11 = 004000    60#   884  1313  1412  1464  1518  1573  1656  1792  1898  2140  2145  2211
                2216  2237  2316  2321  2342  2415  2533  2664  2801  2906  2926  2997  3065
BIT12 = 010000    59#    73    75    77    79  2472  2579  2728  3140  3142  3147  3157  3160
                3171  3175
BIT13 = 020000    58#    74    75    78    79  1665  1688  1794  1900  2140  2211  2316  2415
                2441  2465  2533  2664  2674  2698  2801  2905  2992  3062
BIT14 = 040000    57#    76    77    78    79   524  1581  1582  1588  1589  3112  3140  3142
                3147  3157  3160  3171  3175
BIT15 = 100000    56#  1469  1523  1582  1590  2415  2533  3097  3118
BIT2  = 000004    69#   451   884  1996  2073  2436  2466  2573  2722  2817  3063  3171
BIT3  = 000010    68#   884  2899  2986  3056  3154
BIT4  = 000020    67#  1365  1366  1418  1419  1472  1473  1526  1527  1667  1690  1796  1902
                1987  2005  2062  2064  2082  2429  2431  2456  2548  2563  2676  2700  2712
                2743  2745  2993  2995  3140  3142  3147
BIT5  = 000040    66#  1365  1366  1418  1419  1472  1473  1526  1527  1667  1690  1796  1902
                2676  2700
BIT6  = 000100    65#  1195  1254  1267  1651  1786  1892  1996  2073  2436  2466  2573  2722
                2817  3063  3157  3160  3171  3175
BIT7  = 000200    64#   518   765   922   943  1195  1361  1414  1466  1520  1576  1581  1588
                1667  1690  1727  1796  1902  1996  2073  2436  2466  2573  2676  2700  2722
BIT8  = 000400    63#   884   901  1313  1990  2007  2067  2084  2145  2216  2237  2321  2342
                2433  2458  2552  2567  2716  2906  2926  2997  3065
BIT9  = 001000    62#   884  1195  1200  1260  1518  1573  1658  1670  1684  1693  1990  2007
                2067  2084  2140  2211  2316  2415  2433  2458  2533  2552  2567  2693  2703
                2716  2801
BRB   = 070000    79#  1313  2145  2216  2237  2321  2342  2906  2926  2997  3065
BRW     003014   457   546#
BRX     003016   458   547#
CHRCNT  003744   701*   705   721*   739#   740
CKBIT1  022406  1470  1524  1583  1591  2416  2534  3120  3128#
CLKX    001242   150#  1616*  1622*  1628*  1634*  1675  1698  1700  1720  1751*  1757*  1763*  1769*
                1800  1806  1813  1815  1853*  1860*  1867*  1874*  1906  1912  1919  1921  2108*
                2113*  2118*  2123*  2144  2179*  2184*  2189*  2194*  2215  2236  2280*  2286*  2292*
                2298*  2320  2341  2380*  2386*  2392*  2398*  2419  2447  2498*  2504*  2510*  2516*
                2538  2543  2562  2613*  2619*  2625*  2631*  2682  2768*  2773*  2778*  2783*  2806
                2830  2844
CLK.A   001412   250#  1045  1616  1751  1853  2108  2179  2280  2380  2498  2613  2768
CLK.B   001413   251#  1050  1622  1757  1860  2113  2184  2286  2386  2504  2619  2773
CLK.C   001414   252#  1055  1628  1763  1867  2118  2189  2292  2392  2510  2625  2778
```



```
CLK.D   001415   253#  1060  1634  1769  1874  2123  2194  2298  2398  2516  2631  2783
CLR.TM  022560  1657  1790  1896  2662  3174#
CNVRT = 104411   209#   476   478   480   482   802   804   860   917
CONVRT= 104410   207#   416   818
CORMAX  023106  3229#  3230
CREAM   001306   171#   385*   992*   993   995*  1000  1001*  1002  1005*
CSRMAP  006624   410  1129#
CYCLE   005666   460   496   497   982#
DATA    022622  1676*  1702*  1707  1807*  1817*  1822  1913*  1923*  1928  2141*  2212*  2234*  2317*
                2339*  2417*  2422*  2425*  2446*  2450*  2535*  2541*  2559*  2560*  2804*  2827*  2828*
                2842*  3092*  3115*  3202#
DATABP  004276   791*   794   816   819#
DATACL= 104416   219#  1669  1678  1722  1726  1798  1801  1809  1904  1907  1915  2142  2213
                2318  2418  2536  2678  2688  2803  3121
DATAHD  004264   790*   812   815#
DATPAT  022574  3180#
DELAY = 104414   215#  3102  3133
DEVADR  003440   615*   650   660#
DH1     022756  3203#  3221  3224  3227
DT6     023030  3204#  3222  3225  3228
DVACTV  001300   165#   432*   433   982   987  1161*  1167*  1168*  1172  1191
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  1250  1262  1315  1360  1364  1412*  1413
                1417  1464*  1465  1469*  1471  1518*  1519  1523*  1525  1574  1582*  1584  1589*
                1590*  1592  1660  1671  1727  1991  2008  2068  2085  2146  2218  2226  2239
                2247  2323  2331  2344  2352  2415*  2434  2459  2533*  2553  2568  2717  2811
                2820  2835  2849  2908  2917  2928  2937  2999  3008  3067  3076  3090  3096*
                3097*  3100  3112*  3119*  3131
DVNSR   001402   238#  1031*  1032*  1033
DVNUM   001301   166#   381   486  1133*  1154*  1155  1162  1164
DVRIC   001366   232#  1019*  1020*  1021  1999  2076  2439  2469  2576  2725
DVRLVL  001354   227#  1036*  1037*  1038
DVRVEC  001352   226#   503  1007*  1036
DVSCR   001362   230#   500   878*   891*   895*  1006*  1017  2899*  2986*  3056*  3154*
DVSCRH  001364   231#  1017*  1018*  1019
DVSFR   001400   237#  1029*  1030*  1031  1249*  1254*  1261*  1267*  1314*  1651*  1658*  1665*  1667*
                1670*  1688*  1690*  1786*  1794*  1796*  1892*  1900*  1902*  1987*  1990*  1996*  1997
                2005*  2007*  2062*  2064*  2067*  2073*  2074  2082*  2084*  2145*  2216*  2225*  2237*
                2246*  2321*  2330*  2342*  2351*  2429*  2431*  2433*  2437*  2456*  2458*  2467*  2548*
                2552*  2563*  2567*  2574*  2674*  2676*  2698*  2700*  2712*  2716*  2723*  2743*  2745*
                2810*  2817*  2819*  2834*  2848*  2907*  2916*  2927*  2936*  2993*  2995*  2998*  3007*
                3063*  3066*  3075*  3140*  3142*  3147*  3157*  3160*  3171*  3175*
DVSRA   001376   236#   882  1027*  1028*  1029  1664*  1687*  1793*  1899*  2673*  2697*
DVSRS   001372   234#   881  1023*  1024*  1025  1363*  1416*  1468*  1522*  1571*  1654*  1663*  1677*
                1683*  1692*  1721*  1789*  1808*  1895*  1914*  2138*  2209*  2314*  2414*  2532*  2661*
                2672*  2683*  2692*  2702*  2799*  2903*  2990*  3060*
DVSRSH  001374   235#  1025*  1026*  1027
DVTLVL  001360   229#  1040*  1041*
DVTR00  001502   282#
```

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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
DV.MAP  001500  171  280#  385  412  995  1005  1129  1134  1183
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#
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     022624  3203#  3220
EM2     022653  3203#  3223
EM3     022713  3203#  3226
ENDPAT  022620  2735  3200#
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#
EXIT  = 000205  81#  3094  3107  3126  3144  3149  3169  3173  3177
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
INSTR2  003236  591  603#
LIGHT   000174  110#  402
LIGHTS  001200  121#  402*  473*
LIMITS  003364  630  641#
LOAD.M  022266  1572  1655  1791  1897  2139  2210  2315  2663  2800  2904  2924  2991  3061
                3095#
LOBITS  003442  616*  645  661#  662
LOCK    001220  137#  548*  554  556  798  1674*  1799*  1905*  2547*  2679*  2798*
LOGICA  002560  107  490#
LOKFLG  001312  178#
LOLIM   003434  613*  643  658#
LPCNT   001224  139#  535*  536  539*
LSTERR  001234  143#  388*  470*  522*  776  778*  862*
L00.03  001416  255#  1008*  1043  1224  1289  1338  1390  1442  1496  1548  1618  1753  1856
                1960  2032  2109  2180  2282  2382  2500  2615  2769  2876  2963  3033
L04.07  001420  256#  1010*  1048  1228  1293  1342  1394  1446  1500  1552  1624  1759  1863
                1964  2036  2114  2185  2288  2388  2506  2621  2774  2880  2967  3037
L08.11  001422  257#  1012*  1053  1232  1297  1346  1398  1450  1504  1556  1630  1765  1870
                1968  2040  2119  2190  2294  2394  2512  2627  2779  2884  2971  3041
L12.15  001424  258#  1014*  1058  1236  1301  1350  1402  1454  1508  1560  1636  1771  1877
                1972  2044  2124  2195  2300  2400  2518  2633  2784  2888  2975  3045
MASKX   001244  151#  1617*  1623*  1629*  1635*  1708  1715  1752*  1758*  1764*  1770*  1823  1825
                1854*  1861*  1868*  1875*  1929  1931  2381*  2387*  2393*  2399*  2464  2499*  2505*
                2511*  2517*  2588  2614*  2620*  2626*  2632*  2643
MASK.A  001406  245#  1044  1617  1752  1854  2381  2499  2614
MASK.B  001407  246#  1049  1623  1758  1861  2387  2505  2620
MASK.C  001410  247#  1054  1629  1764  1868  2393  2511  2626
MASK.D  001411  248#  1059  1635  1770  1875  2399  2517  2632
MASTEK  005400  800  958#
MCRLF   005104  569  692  796  797  805  946  958#  1067  1085
MCSRX   005330  475  958#
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#
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
MSTCLR= 104412  211#  863  1307  1358  1410  1462  1516  1568  1645  1780  1886  1979  2054
                2134  2205  2310  2410  2528  2655  2794  2897  2984  3054
MTITLE  001000  119#  406
MTSTN   005366  801  958#  1069
MTSTPC  005267  958#
MVECX   005336  477  958#
NEXT    001216  136#  542  832  1222*  1287*  1336*  1388*  1440*  1494*  1546*  1614*  1749*  1851*
                1958*  2030*  2106*  2177*  2278*  2378*  2496*  2611*  2766*  2874*  2961*  3031*
```

```
NOLIST= ****** U          1
NPR    = 040000          76#
NPRLOC  022620         3201#
PARAM  = 104405          201#   1070
PARAM1  003304           619#    636
PARBIT= 040000            81#   1114   2470   2577   2726
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*  1226*  1230*  1234*  1238*  1275*  1291*  1295*  1299*  1303*  1323*  1340*  1344*
                        1348*  1352*  1357*  1373*  1392*  1396*  1400*  1404*  1409*  1426*  1444*  1448*  1452*
                        1456*  1461*  1470*  1480*  1498*  1502*  1506*  1510*  1515*  1524*  1534*  1550*  1554*
                        1558*  1562*  1567*  1583*  1591*  1601*  1620*  1626*  1632*  1638*  1643*  1736*  1755*
                        1761*  1767*  1773*  1778*  1838*  1858*  1865*  1872*  1879*  1884*  1944*  1962*  1966*
                        1970*  1974*  2016*  2034*  2038*  2042*  2046*  2051*  2093*  2111*  2116*  2121*  2126*
                        2131*  2156*  2182*  2187*  2192*  2197*  2202*  2257*  2284*  2290*  2296*  2302*  2307*
                        2362*  2384*  2390*  2396*  2402*  2407*  2416*  2480*  2502*  2508*  2514*  2520*  2525*
                        2534*  2593*  2617*  2623*  2629*  2635*  2640*  2742*  2771*  2776*  2781*  2786*  2791*
                        2859*  2878*  2882*  2886*  2890*  2895*  2947*  2965*  2969*  2973*  2977*  2982*  3018*
                        3035*  3039*  3043*  3047*  3052*  3086*  3120*  3138*
PERFOR= 004537            81#   1244   1309   1319   1572   1647   1655   1657   1679   1717   1732   1782   1790
                        1791   1810   1833   1834   1888   1896   1897   1916   1939   1940   1981   2056   2136
                        2139   2143   2207   2210   2214   2235   2312   2315   2319   2340   2412   2420   2423
                        2427   2445   2454   2476   2530   2537   2542   2550   2558   2561   2565   2584   2657
                        2662   2663   2714   2732   2737   2796   2800   2805   2829   2843   2901   2904   2924
                        2988   2991   3058   3061
PFTAB   004470           860    866#
POPR0  = 012600           55#    826
POP1&P= 005726            55#
POP2&P= 022626            55#    544
PS     = 177776           53#    378*   447*   1194*
PUSHR0= 010046            55#    823
PUSH1&= 005746            55#
PUSH2S= 024646            55#
QV,FLG  001313           179#    384*   485*   533
RAM    = 020000           74#
RAMCLR= 104413           213#    864    1241
RESREG  004300           817     820#
RESTAR  004414           847     853#
RESTRT  002572           484     488    496#
RESV16  001404           239#   1033*  1034#
RES05  = 104407           205#    820
RETURN  001214           135#    390*   460*   462    496*   542*   545    832*   834    865    1084*  1092*  1093
ROMCLK= 104415           217#   1255   1268   1652   1666   1668   1689   1691   1787   1795   1797   1893   1901
                        1903   1988   1998   2006   2063   2065   2075   2083   2430   2432   2438   2457   2468
                        2549   2564   2575   2675   2677   2699   2701   2713   2724   2744   2746   2818   2994
                        2996   3064   3141   3143   3148   3158   3161   3172   3176
RUN     001304           169#    386*   987    990*   991*   998*   999*
RXSHIF  022326          2143   2214   2235   2319   2340   2420   2423   2427   2454   2537   2542   2561   2805
                        2829   2843   3108#
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*  1223*  1227*  1231*  1235*  1242   1257*  1259*  1270*  1272*  1288*  1292*  1296*
```



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                        1300*  1306   1337*  1341*  1345*  1349*  1363   1370*  1389*  1393*  1397*  1401*  1416
                        1423*  1441*  1445*  1449*  1453*  1468   1477*  1495*  1499*  1503*  1507*  1522   1531*
                        1547*  1551*  1555*  1559*  1571   1598*  1615*  1621*  1627*  1633*  1644   1654   1677
                        1692   1721   1750*  1756*  1762*  1768*  1779   1789   1808   1852*  1859*  1866*  1873*
                        1885   1895   1914   1959*  1963*  1967*  1971*  1977   1983   2031*  2035*  2039*  2043*
                        2052   2058   2107*  2112*  2117*  2122*  2133   2138   2178*  2183*  2188*  2193*  2204
                        2209   2279*  2285*  2291*  2297*  2309   2314   2379*  2385*  2391*  2397*  2409   2414
                        2461   2497*  2503*  2509*  2515*  2527   2532   2544   2612*  2618*  2624*  2630*  2641
                        2661   2680   2683   2702   2767*  2772*  2777*  2782*  2793   2799   2875*  2879*  2883*
                        2887*  2900   2903   2944*  2962*  2966*  2970*  2974*  2987   2990   3015*  3032*  3036*
                        3040*  3044*  3057   3060   3083*  3089   3090*  3091*  3093*  3098   3099*  3103*  3106*
                        3109   3113*  3116*  3117*  3118*  3119   3125*  3129   3130*  3134*  3137*  3166*  3168*
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   1243*  1256*  1257   1269*  1270   1308*  1646*  1653*  1781*
                        1788*  1887*  1894*  1980*  2055*  2135*  2206*  2311*  2411*  2529*  2656*  2795*  2898*
                        2985*  3055*  3159*  3162*  3166
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*  1248*  1249   1260*  1261
                        1313*  1314   1359*  1411*  1463*  1517*  1569*  1675*  1680*  1681   1696   1720*  1723*
                        1725*  1730*  1800*  1802*  1806*  1811*  1906*  1908*  1912*  1917*  1989*  1993*  1997*
                        2004*  2010*  2066*  2070*  2074*  2081*  2087*  2436*  2437   2466*  2467   2551*  2555*
                        2566*  2570*  2573*  2574   2682*  2689*  2690   2706   2715*  2719*  2722*  2723   2802*
                        2807*  2809*  2810   2819   2826*  2831*  2833*  2834   2841*  2845*  2847*  2848   2906*
                        2907   2915*  2916   2926*  2927   2935*  2936   2997*  2998   3006*  3007   3065*  3066
                        3074*  3075   3110   3111*  3122*  3124*
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   1246*  1273*
                        1311*  1321*  1362*  1371*  1415*  1424*  1467*  1478*  1521*  1532*  1570*  1599*  1649*
                        1734*  1784*  1836*  1890*  1942*  1978*  2014*  2053*  2091*  2132*  2154*  2203*  2255*
                        2308*  2360*  2408*  2478*  2526*  2591*  2667*  2669*  2670   2684   2695*  2696   2705*
                        2708   2710   2734*  2735   2792*  2857*  2896*  2945*  2983*  3016*  3053*  3084*  3153
                        3155*  3163*  3165*
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*  1250*  1251   1262*  1264   1315*  1316   1364*  1366*  1367   1417*
                        1419*  1420   1471*  1473*  1474   1525*  1527*  1528   1575*  1577   1584*  1585   1592*
                        1593   1707*  1708*  1709   1822*  1823*  1826*  1827   1928*  1929*  1932*  1933   1999*
                        2000   2076*  2077   2146*  2147   2150   2218*  2219   2222   2226*  2227   2231   2239*
                        2240   2243   2247*  2248   2251   2323*  2324   2327   2331*  2332   2336   2344*  2345
                        2348   2352*  2353   2356   2439*  2440   2442   2447*  2448*  2451*  2469*  2472*  2473
                        2576*  2579*  2581   2643*  2645   2647*  2648   2650*  2651   2725*  2728*  2729   2811*
                        2812   2814   2820*  2821   2823   2835*  2836   2838   2849*  2850   2852   2908*  2909
                        2912   2917*  2918   2921   2928*  2929   2932   2937*  2938   2941   2999*  3000   3003
                        3008*  3009   3012   3067*  3068   3071   3076*  3077   3080
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   1247*  1251   1263*  1264
                        1312*  1316   1360*  1361*  1365*  1367   1413*  1414*  1418*  1420   1465*  1466*  1472*
                        1474   1519*  1520*  1526*  1528   1574*  1575   1576*  1577   1581*  1585   1588*  1593
                        1650*  1659*  1664   1686*  1687   1695*  1709   1713*  1715   1785*  1804*  1824*  1825*
                        1827   1891*  1910*  1930*  1931*  1933   1983*  1984*  1985*  2000   2003*  2058*  2059*
                        2060*  2077   2080*  2147*  2148*  2149*  2150   2219*  2220*  2221*  2222   2227*  2230*
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                    2231    2240*   2241*   2242*   2243    2248*   2249*   2250*   2251    2324*   2325*   2326*   2327
                    2332*   2335*   2336    2345*   2346*   2347*   2348    2353*   2354*   2355*   2356    2440*   2441*
                    2442    2461*   2462*   2463*   2464*   2465*   2473    2544*   2545*   2546*   2559    2581    2586*
                    2588    2680*   2681*   2686*   2687*   2729    2812*   2813*   2814    2821*   2822*   2823    2836*
                    2837*   2838    2850*   2851*   2852    2909*   2910*   2911*   2912    2918*   2919*   2920*   2921
                    2929*   2930*   2931*   2932    2938*   2939*   2940*   2941    3000*   3001*   3002*   3003    3009*
                    3010*   3011*   3012    3068*   3069*   3070*   3071    3077*   3078*   3079*   3080    3096    3111
                    3155
SAVACT  001302       167#    427     1172*
SAVNUM  001303       168#    381*    483*    486*    1165*
SAVPC   001276       164#    667*    838
SAVR0   001260       157#    676*    681     3214
SAVR1   001262       158#    675*    682     3206
SAVR2   001264       159#    674*    683     3208
SAVR3   001266       160#    673*    684
SAVR4   001270       161#    672*    685     3212
SAVR5   001272       162#    671*    686     3210
SAVSP   001274       163#
SAV05 = 104406       203#    780
SCOPE = 104400       191#    1239    1304    1353    1405    1457    1511    1563    1639    1774    1880    1975    2047
                    2127    2198    2303    2403    2521    2636    2787    2891    2978    3048
SCOP1 = 104401       193#    1712    1832    1938    2585    2733    2855
SERV,G  004640       521     768     912#    913
SETSCA  022470      1244    1309    1319    1647    1732    1782    1834    1888    1940    1981    2056    2136    2207
                    2312    2412    2530    2657    2796    2901    2988    3058    3152#
SET,TM  022546      1717    1833    1939    2737    3170#
SILO,I  022434      2550    2565    2714    3139#
SILO,O  022456      2445    2476    2558    2584    2732    3146#
SKIP  = 000000      3203#
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*   3089*   3093    3098*   3106
                    3109*   3110*   3124    3125    3129*   3137    3153*   3165
SPACNT= 003745       702*    723     726*    740#
SSWR    000176       112#    403
STACK = 001200        54#    379     448     833     855
STAT    001236       148#    1224*   1228*   1232*   1236*   1289*   1293*   1297*   1301*   1338*   1342*   1346*   1350*
                    1355    1390*   1394*   1398*   1402*   1407    1442*   1446*   1450*   1454*   1459    1496*   1500*
                    1504*   1508*   1513    1548*   1552*   1556*   1560*   1565    1618*   1624*   1630*   1636*   1641
                    1753*   1759*   1765*   1771*   1776    1804    1856*   1863*   1870*   1877*   1882    1960*   1964*
                    1968*   1972*   2032*   2036*   2040*   2044*   2049    2109*   2114*   2119*   2124*   2129    2141
                    2180*   2185*   2190*   2195*   2200    2212    2228    2234    2282*   2288*   2294*   2300*   2305
                    2333    2382*   2388*   2394*   2400*   2405    2417    2422    2425    2446    2463    2470    2500*
                    2506*   2512*   2518*   2523    2535    2539    2541    2577    2615*   2621*   2627*   2633*   2638
                    2652    2653    2665    2726    2769*   2774*   2779*   2784*   2789    2804    2827    2842    2876*
                    2880*   2884*   2888*   2893    2963*   2967*   2971*   2975*   2980    3033*   3037*   3041*   3045*
                    3050
SV05    003452       671#
SWR     001202       123#    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    1684    1693    2693    2703
SW00  = 000001        34#    422
```



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SW01  = 000002        33#    1062
SW02  = 000004        32#
SW03  = 000010        31#
SW04  = 000020        30#
SW05  = 000040        29#
SW06  = 000100        28#
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    022572      2652*   2653*   2667    2669    2708    2710    3179#
SYNCX   001240       149#    1855*   1862*   1869*   1876*   1910    2281*   2287*   2293*   2299*   2317    2339
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*   1855    2281
SYNC2B  001430       261#    1011*   1862    2287
SYNC2C  001432       262#    1013*   1869    2293
SYNC2D  001434       263#    1015*   1876    2299
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#    1254    1267    1651    1786    1892    1987    2005    2062    2064    2082    2429    2431
                    2456    2548    2563    2712    2743    2745    2817    2993    2995    3063
TEMP    005562       706     856*    857*    969#
```

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TEMP1   001246          152#   412*   413    418*   960    1191#  1192*  1700*  1703*  1704   1815*  1818*  1819
                       1921*  1924*  1925   2654*  2739*
TEMP2   001250          153#   413*   414    962    1580*  1596*  1805*  1830*  1911*  1936*  2642*  2670*  2671*
                       2673   2684*  2685*  2687   2696*  2697
TEMP3   001252          154#   2644*  2645*  2648*  2681*  2671   2685
TEMP4   001254          155#
TEMP5   001256          156#
TKCSR   001204          127#   527    586    912    919    940
TKDBR   001206          128#   517    529    588    594    764    921    942
TLAST = 021744         1088   3203#
TPCSR   001210          129#   570    592    771    926
TPDBR   001212          130#   572*   594*   773*   928*
TRPOK   003762          752#
TSTNO   001226          140#   389*   841    868    1073   1080   1082   1221*  1286*  1335*  1387*  1439*  1493*
                       1545*  1613*  1748*  1850*  1957*  2029*  2105*  2176*  2277*  2377*  2495*  2610*  2765*
                       2873*  2960*  3030*
TST1    007256         1076   1092   1221#
TST10   011344         1546   1613#
TST11   012224         1614   1748#
TST12   012740         1749   1850#
TST13   013504         1851   1957#
TST14   014012         1958   2029#
TST15   014344         2030   2105#
TST16   014642         2106   2176#
TST17   015276         2177   2277#
TST2    007540         1222   1286#
TST20   015762         2278   2377#
TST21   016600         2378   2495#
TST22   017346         2496   2610#
TST23   020336         2611   2765#
TST24   021042         2766   2873#
TST25   021432         2874   2960#
TST26   021744         2961   3030#  3203
TST27 = ****** U       3031
TST3    007742         1287   1335#
TST4    010150         1336   1387#
TST5    010364         1388   1439#
TST6    010612         1440   1493#
TST7    011040         1494   1545#
TTST    002702          454*   455*   457*   458#   525#
TWOSYN= 010000           81#  2228   2333   2539   2665
TXSHIF  022246         1679   1810   1916   3088#
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
TYPMSG  004166          793    796#
VECMAP  007102         1173   1181#
WRDCNT  003742          700*   730*   738#
WRKO,F  004254          808    811#
XBX     004060          770    772    774#
XCSR    002604          476    498#
XERR    002626          482    507#
XFR   = 030000           75#  1667   1690   1796   1902   1996   2073   2436   2466   2573   2676   2700   2722
XHEAD   005461          411    958#
XPASS   002620          480    504#
```



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XSTATQ  005506          417    958#
XTSTN   004374          802    839#
XVEC    002612          478    501#
$CRAP = 177777            1#  1212#  1217#  1278#  1282#  1326#  1330#  1376#  1382#  1429#  1434#  1483#  1488#
                       1537#  1541#  1604#  1609#  1739#  1744#  1841#  1846#  1947#  1953#  2019#  2025#  2096#
                       2101#  2159#  2172#  2260#  2273#  2365#  2373#  2484#  2491#  2596#  2606#  2750#  2761#
                       2862#  2869#  2950#  2956#  3021#  3026#
$E    = 000030          1#  1222   1223#  1287   1288#  1336   1337#  1388   1389#  1440   1441#  1494   1495#
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DZDVBB.P11 CROSS REFERENCE TABLE -- PERMANENT SYMBOLS

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RUN-TIME RATIO:  293/78=3.7
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