IDENTIFICATION

PRODUCT CODE: MAINDEC-11-DZQAB-B-D
PRODUCT NAME: MAINDEC USER REFERENCE MANUAL
DATE CREATED: OCTOBER 1973
MAINTAINER: DIAGNOSTIC GROUP

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DIGITAL EQUIPMENT CORPORATION
Each option on the Unibus that has an address assigned to it has a test or a set of tests.

There is another level of testing that is directed at detecting faulty Unibus interaction between devices. These tests will be directed at market areas that create common configurations such as: DOS, FST, COMTEX and TYPESET.

For many of the systems we are now marketing there could be as many as forty (40) unique tests (diagnostic tapes).

In most cases it is not necessary to run all of these programs to determine if the system is operational. The test programs directed at testing Unibus interaction and market areas should be adequate as a confidence check once the system has been operational. When an error has been detected by these programs, the unique test for that device should be adequate to correct the malfunction.

For systems with DECTape there is a diagnostic package DDP2 that will allow more rapid testing of systems.

The General Test Program (GTP) MAINDEC or the Communication Test Program (CTP) MAINDEC should be the initial program(s) run to determine the status of the system. However, neither of these programs should be considered a total check of the system.

For CTP to operate correctly all floating vector devices must be at the correct vectors.

CTP will check to see that starting at 300, all DC11's were assigned, then any extra KL11's, then any DP11's, then any DM11A's, etc.

In GTP, it may be necessary to change the vector in the software to test option that have floating vectors.

The following pages contain:

1. INDEX OF MAINDECS, CPU TEST, MEMORY TEST, UNIBUS OPTION

2. SYSTEM CHECKLIST FOR PROBLEM ISOLATION

3. SEQUENTIAL LIST OF ABSTRACTS AND STARTING INSTRUCTION FOR ALL MAINDECS.

Programs are in same sequence as in the Index,
4. EIGHT TABLES OF SYSTEM CONFIGURATION INFORMATION.

Execution times for tests are a function memory speed, processor type, baud rate for communication device and should be used only as a guide.
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#### Memory Tests

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<td>Basic Patterns</td>
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<td>Moving 1's &amp; 0's</td>
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<td>One's Susceptability</td>
<td>DZMFF</td>
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<td>Worst Case Noise</td>
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Core Heating
Random Data
Mem, Exp. (NPR TYPE)
Ekt, Mem. (P to 124k) I/O
Mem, Par.
Galomp

EIS = KE11E OPTION
KJ = KJ11 OPTION

DZMMH  X  X  X  X  X
DZMM1  X  X  X  X  X
DZQMA  X  X  X  X  X
D2QMB  X  X  X  X  X
DCMSA  =  =  =  =  X
DCMSB  =  =  =  =  X
# INTERNAL PROCESSOR OPTIONS

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**(Memory Management) KT11C**

| LOAD 1                           | DCKTA  | =   =   =   X  |
| LOAD 2                           | DCKTB  | =   =   =   X  |
| Keys                             | DCKTC  | =   =   =   X  |
| MFBO/1                           | DCKTD  | =   =   =   X  |
| MFBO/2                           | DCKTE  | =   =   =   X  |
| Abort                            | DCKTF  | =   =   =   X  |
| KTEX                             | DCKTG  | =   =   =   X  |

**(Line Clock)**

| KW11                             | DZKWA  | X   X   X   X  |

**(KT11)**

| LOAD                             | DBKTA  | =   =   =   X  |
| Keys                             | DBKTB  | =   =   =   X  |
| MFPI/MFPI                       | DBKTC  | =   =   =   X  |
| States                           | DBKTD  | =   =   =   X  |
| KTEX                             | DBKTE  | =   =   =   X  |

**(KE11F)**

<p>| Baseline Inst                    | DBKEA  | =   =   =   X  |
| Extension                       | DBKEB  | =   =   =   X  |
| GTP Overlay                      | DBKEC  | =   =   =   X  |</p>
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T = Total Modules
A = User for Address
V = Used for Vectors
C = Used for Control
SYSTEM CHECKLIST FOR PROBLEM ISOLATION

WHEN CTP OR GTP FAILS

1. How close to one unibus option can you isolate the failure?
2. Can you determine if the problem is a device failure, or excessive noise on the bus, or a configuration problem if the system has been added to in the field?
3. Will the failure occur if only that device is selected?
4. If the CPU test is inhibited will the device fail?
5. Does the failure occur if memory expansion is inhibited?
6. Is the CPU doing the same or similar operation when the same failure occurs?
7. When a BR or NPR device is failing, replace the printout "halt" with a real "halt"; then check the bits in the error register which error bit is the real error?
8. Is the problem a NPR latency error? Is the position on the bus correct? Is no back timeout occurring?
9. Is the problem a BR latency error? Is the position on the bus correct?
10. Are the devices at the standard BR level? If not at the standard level, has the software been modified to test it at that level? It may be necessary to reconfigure to standard BR level before the software (DEC software) will operate.
11. If the program comes to a halt at location 6, where was the program when the timeout occurred? Who did not raise slave sync?
12. If the program comes to a halt at location 12, where was the program when the program trapped? This failure on a known good program is a memory failure or the improper execution of an instruction by the processor.
13. If the system hangs, who is bus master? What are the C lines? What BR and NPRs are up? What "grant" is up? Where is the CPU when the hang occurs? Is the hanging a function of a device or CPU operation?
14. If an NPR device error is "Non existent memory", what is the content of that device's BUS Address Register (all eighteen
blts); Is it a valid address, is the offset of the word count register equal indexed by the same amount? How long does that device wait before it times out?

15'. Are there more than 20 unit loads on the system?

16'. Is there more than 50 feet of unibus cable?

17'. Are the terminators at the end of the bus?

18'. If a power fail occurs, is any power supply over loaded? What is the line voltage?

19'. Do all the diagnostics run with no error? Use the least complex test that fails to fix problems.

20'. When an exerciser is the only test that fails, do you know what the exerciser does and does not test? Exerciser must give up some form of testing in order to achieve high data rates.

21'. If you physically make the system smaller, does it still fail? How small can you make it and still have it fail? Sometimes the device that fails is not bad, but only the exhibited symptom of a separate problem.

22'. Are there any bus buffers/switches between the failing device and the processor? If so do same errors occur when device is run on processor side of buffer?

23'. Does failure occur when only running to particular BR level? i.e., level 4 device only fails when running level 5 devices.

24'. Do failures only occur when system is heavily loaded?

25'. Do "DATA REQUEST LATE" errors occur with NPR devices? What is the worst case BG delay? Is that time plus processor worse case latency greater than device latency time?
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# SYSTEMS DIAGNOSTICS

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ABSTRACT

This is a group of 12 tests that incrementally test and isolate simple malfunctions of the PDP-11. The tests should be run in the indicated numerical sequence. The sequence is:

1. Branch
2. Conditional Branch
3. Unary
4. Unary and Binary
5. Rotate/Shift
6. Compare (Equality)
7. Compare (non equality)
8. Move
9. Bit Set, Clear and Test
10. Add
11. Subtract
12. Jump

REQUIREMENTS

PDP-11

STORAGE = Use all of 4K except 17500 - 17776 (Reserved for boot and absolute loader);

LOADING = Absolute Loader

EXECUTION TIME = 2±6 min, depending on test - Bell will ring

STARTING PROCEDURE = Start and Restart at 200

PRINTOUTS = No

SWITCH REGISTER OPTIONS = No
ABSTRACT

This is a test of the JSR, RTS and RTI instruction; it is also the first time the Register 6 has been "PUSHED and POPPED";

REQUIREMENTS

POP=11

STORAGE = 0 - 5000

LOADING = Absolute Loader

EXECUTION TIME = 2 min.; - Bell will Ring

STARTING PROCEDURE = Start and Restart at 20% 

PRINTOUTS = No

SWITCH REGISTER OPTIONS = No
MAINEC-11-DMP

T14 TRAPS

ABSTRACT

This is a test of all operation and instruction that cause traps. Also tested are trap overflow conditions, oddities of register 6, interrupts and the reset instructions.

REQUIREMENTS

PDP=11/23, 11/05, 11/10

STORAGE = 0 = 17500

LOADING = Absolute Loader

EXECUTION TIME = Function of core size = Bell will ring

STARTING PROCEDURE

Start and Restart at

200 for a 4K System
232 for an 8K System
274 for a 12K System
206 for a 16K System
210 for a 20K System
212 for a 24K System
214 for a 28K System

PRINTOUTS = No

SWITCH REGISTER OPTIONS = No

This program should not be used to test 11/40 and 11/45's.
T1S Instruction Exerciser

ABSTRACT

This program is designed to be a comprehensive check of all 11 family processor instructions. The program executed each instruction in all address codes and includes tests for traps and the teletype interrupt sequence. The program relocates the test code throughout memory 0-28K.

REQUIREMENTS

- PDP-11 family central processor
- Optional = KL11-L (line clock)

STORAGE - Program uses all the first 4K of memory (excluding that area of memory reserved for the loaders.)

LOADING - Absolute Loader

EXECUTION TIME - For 4K = 1 min., For 28K = 5 min.

STARTING PROCEDURE = 270

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15 = ... HALT ON ERROR
SW14 = ... LOOP SUBTEST
SW13 = ... INHIBIT ERROR PRINTOUT
SW12 = ... INHIBIT TRACE TRAPPING
SW11 = ... INHIBIT SUBTEST ITERATION
SW10 = ... RING BELL ON ERROR
SW 8 = ... LOAD PDP-11/45 MICRO BREAK REGISTER
SW 7-0 = ... WHEN SET LOADS THE MICRO BREAK REGISTER WITH THE VALUE SET INTO SW7-0 AT THE BEGINNING OF EACH SUBTEST, WITH THE VALUE SET INTO SW7-0 AT THE BEGINNING OF EACH SUBTEST.

NOTE

When all switches are down, no typeouts will occur at the end of a pass (errors will be typed), setting SW7 will cause end of pass message to be typed;
T14 Trap Test (11/40 only)

ABSTRACT: This is a test of all operations and instructions that cause traps, also tested are trap overflow conditions, oddities of register 6, interrupts and the reset instructions.

REQUIREMENTS:

PDP-11/40 Standard Computer

STORAGE: Program uses memory from 0000 to 17500.

LOADING:

EXECUTION TIME = 45 Seconds

STARTING PROCEDURE = 200

PRINTOUTS = No

SWITCH REGISTER OPTIONS = No switches are used.
ABSTRACT

This program is a core expandable interactive bus exerciser for a paper tape oriented PDP-11/20. It performs a test of instructions and concurrent operations of I/O equipment simultaneously. It may also perform the same operation independently. This program is not to be considered a total check of the system; if an error is detected in an I/O device, it will probably be necessary to correct the malfunction with the respective diagnostic for that device.

REQUIREMENTS

PDP-11

OPTIONAL HARDWARE

MM11 = Up to 25KW of Memory
RC,RF,RK,RP DISK
TC11 = Dectape-Transport Zero
KE11 = Extended Arith. Unit
KH11 = Line Clock
PC11 = High Speed Reader/Punch
KL11 = ASR33 or ASR 35 Teleprinter
LP11 = Line Printer

STORAGE = 4 - 17476

LOADING = Absolute Loader

EXECUTION TIME = 1 - 1.5 min. depending on test for a 4K system; execution time increase with memory size.

STARTING PROCEUERE = Start and Restart at 200
                            If Line Printer is used restart at 400

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT TRACE TRAP,
SW11 = INHIBIT ITERATION LOOP
SW10 = INHIBIT PROCESSOR TEST
SW09 = INHIBIT VARIABLE CORE EXPANSION
SW08 = RESTART ON ERROR
SW07 = LP11
SW06 = TC11
SW05 = RC, RF, Rx and RP
SW04 = KW11L
SW03 = PC READER
SW02 = PC PUNCH
SW01 = TTY IN
SW00 = TTY OUT
Power Fall

ABSTRACT

The PDP-11 Power Fall Diagnostic consists of two parts, one of which is an exerciser test which checks all facets of power fall. Part two is made up of several small tests which enable the user to troubleshoot the power fall module with small basic routines.

REQUIREMENTS

PDP-11

STORAGE = 7 = 3066

LOADING = Absolute Loader

EXECUTION TIME = Continuous running = Printout will occur

STARTING PROCEDURE = Power Fall Exerciser = Start and Restart at 200

Diagnostic Tests

- Power Fall Trap Capability = 204
- Power Fall Re-Start Capability (WAIT) = 210
- Power Fall Re-Start Capability (BR) = 214
- Power Fall Re-Start Capability (EMT) = 220
- 2 MIP/sec, Shut Down Cap./Power Fall = 224
- 2 MIP/sec, Up Time/Powef Fall = 230

PRINTOUTS = No

SWITCH REGISTER OPTIONS = No

There is a super set tests for the Power Fall of the 11/45 that test that processor.
ABSTRACT

This is the first 5 of 15 tests that incrementally test and isolate simple malfunctions in the PDP-11. The tests should be run in the indicated alphabetical sequence. There are additional tests for more complex malfunctions. All tests are executed in kernel mode only, except for test DCKBE (11/40 only):

1. SXT
2. S0B
3. YDR
4. MARK
5. RTT

REQUIREMENTS

PDP-11/40, 11/45

STORAGE - The programs use all of a 4KW memory with the exception of 17507 to 17776 (which is reserved for the boot and absolute loader).

LOADING - Absolute Loader

EXECUTION TIME - All tests take approximately 1 minute each on an 11 with core memory.

STARTING PROCEDURE - Load address 200. Press start. The program will loop, and ring bell on completion. Pass count may be monitored in the display register (11/45 only) and is stored in address 1006.

PRINTOUTS - No

SWITCH REGISTER OPTIONS - Yes

SW108) = 1 Load PDP-11/45 micro break register with value in SW(00=7); (At start of test only);
MAINDEC11

NEW NUMBER = DCKBF to DCKBD

ABSTRACT

This is the last 15 of 15 tests that incrementally test and isolate simple malfunctions in the PDP-11 option. The tests should be run in the indicated alphabetic sequence. There are additional tests for more complex malfunctions. All tests are executed in kernel mode only except for test DCKBD. All these tests are needed for the 11/45. For the 11/40 stack limits, if you have a KJ option, for ASH, ASHC, MUL, DIV, if you have the KE11F option.

REQUIREMENTS -

PDP-11/45, 11/40

STORAGE - The programs use all of a 4KW memory with the exception of 1750% to 17776 (which is reserved for the boot and absolute loader).

LOADING - Absolute loader.

EXECUTION TIME - All tests take approximately 1 minute each on an 11 with core memory

STARTING PROCEDURE - Load address 200, Press start. The program will loop, and ring bell on completion. Pass count may be monitored in the display register (11/45 only), and is stored in address 1207.

PRINTOUTS - No

SWITCH REGISTER OPTIONS - Yes

SW(28) = 1 Load PDP-11/45 micro break register with value in SW(15-07), (at start of test only)

SW(29) = 1 Use alternate register set (R12-R15) test DCKBI=DCKBL only, (PDP-11/45 only)
ABSTRACT

This program is made up of 16 subtests to check out the power fall on the 11/45. The 2 msec. power down and power up time is checked on each power fall. A constant has to be changed for use in bipolar or mos memories. Initially power falls are tried in all processor modes than error conditions like red zone, yellow zone, time out, and odd address in all the processor modes. Finally a power fall is done with memory management aborts occurring and a memory volatility test is run on all memory (up to 124K).

REQUIREMENTS

PDP-11/45 standard computer with up to 124K of memory.

STORAGE - The routines use memory = 4244

LOADING - Absolute loader.

EXECUTION TIME = N/A

STARTING PROCEDURE = Load address 200 and start

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW14 = 1 ;; SCOPE LOOP
SW10 = 1 ;; INHIBIT BEL1 ON PASS COMPLETE
PDP 11/45 CONSOLE SWITCH TEST

ABSTRACT -

This program is designed to test the PDP11/45 console switches. In order to run, memory management must be available. Due to the nature of the program, extensive operator intervention is required. The operator instructions are fully described in the listings. The second phase of this program allows the operator to test the micro-break register and the PDP11/45 maintenance card.

REQUIREMENTS -

PDP11/45 with memory management;

STORAGE - The program requires 4K of storage;

LOADING -

EXECUTION TIME -

STARTING PROCEDURE - The program should always be started at 200;

PRINTOUT -

SWITCH REGISTER OPTIONS - None;
NEW NUMBER = DCFPA DCFPB to DCFPL

ABSTRACT

These programs test the FP11 in all modes with fixed number patterns; the programs should be run in order for at least 2 passes with all switches down. The sequence of testing should be:

LDFPS,STFPS,SETI,SETL,SETF,SETD,CFCC
STT
LDF,LDD,STF,STD
ADDF,ADDI,SBDF,SBBD
CMDF,CMPD
MULF,MULD
DIVE,DIVD
CLR,F,CLRD,TSTF,TSTD,ABSF,ABSD,NEG,F,NEG
LDCF,LCCF,STCF,STCD
LDCFL,LDCLF,LDCLD,STCFI,STCFL,STCPI,STCDL
LDXP,STEXP
MODF,MODD

REQUIREMENTS

PDP-11/45, FP11

STORAGE = The routines use memory 0 = 17776.

LOADING = Absolute loader.

EXECUTION TIME = Less than 1 minute.

STARTING PROCEDURE = Always start at 200.

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 ; HALT ON ERROR
SW14 = 1 ; SCOPE LOOP
SW13 = 1 ; INHIBIT PRINTOUT
SW12 = 1 ; INHIBIT TRACING TRAPPING
SW11 = 1 ; INHIBIT ITERATIONS OF SUBTEST
SW10 = 1 ; BELL ON ERROR
0 ; BELL ON PASS COMPLETE
SW9 = 1 ; BELL ON ERROR
SW8 = 1 ; LOOP ON TEST IN SW(710)
0 ; LOAD SW(710) INTO UB REGISTER
ABSTRACT

The purpose of this program is three fold: First to test the maintenance features, second to trace MULD through its steps, third to trace DIVD.

REQUIREMENTS

PDP-11/45, FP11

STORAGE - The routines use memory 0 = 17776.

LOADING - Absolute loader.

EXECUTION TIME - A bell will ring within 15 seconds with all switches down.

STARTING PROCEDURE - Always start at 200.

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15 = 1 ; HALT ON ERROR
SW14 = 1 ; SCOPE LOOP
SW13 = 1 ; INHIBIT PRINTOUT
SW12 = 1 ; INHIBIT TRACE TRAPPING
SW11 = 1 ; INHIBIT ITERATIONS OF SUBTEST
SW10 = 1 ; BELL ON ERROR
0 ; BELL ON PASS COMPLETE
SW09 = 1 ; LOOP ON ERROR
SW08 = 1 ; LOOP ON TEST IN SW (710)
0 ; LOAD SW (710) INTO UB REGISTER
ABSTRACT

This program tests the FP11 in all modes with fixed number patterns. It runs with interrupts both enabled and disabled and causes error conditions. The program should be run for at least 2 passes with all switches down.

REQUIREMENTS

PDP-11/45 standard computer with FP11 option;

STORAGE - The routines use memory 0 = 17776.

LOADING - Use standard procedure for ABS tapes;

EXECUTION TIME - A bell will ring within 15 seconds with all switches down;

STARTING PROCEDURE - Always be started at 200;

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15 = 1 ... HALT ON ERROR
SW14 = 1 ... SCOPE LOOP
SW13 = 1 ... INHIBIT PRINTOUT
SW12 = 1 ... INHIBIT TRACE TRAPPING
SW11 = 1 ... INHIBIT ITERATIONS OF SUBTEST
SW10 = 1 ... BELL ON ERROR
0 ... BELL ON PASS COMPLETE
SW09 = 1 ... LOOP ON ERROR
SW08 = 1 ... LOOP ON TEST IN SW(710)
0 ... LOAD SW(710) INTO US REGISTER
ABSTRACT

This program is an exerciser of LDO/STD instructions. It uses random numbers, floating 1's, and floating 0's, and checks all memory with LDP/STF into an AC.

REQUIREMENTS

PDP=11/45, FP11

STORAGE - The routines use memory 0 = 17776

LOADING - Absolute Loader

EXECUTION TIME = 15 secs.

STARTING PROCEDURE - Program should always be started at 200.

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1:... HALT ON ERROR
SW14 = 1:... SCOPE LOOP
SW13 = 1:... INHIBIT PRINTOUT
SW12 = 1:... INHIBIT TRACE TRAPPING
SW11 = 1:... INHIBIT ITERATIONS OF SUBTEST
SW10 = 1:... BELL ON ERROR
       0:... BELL ON PASS COMPLETE
SW9 = 1:... LOOP ON ERROR
SW8 = 1:... LOOP ON TEST IN SW(710)
       0:... LOAD SW(710) INTO UB REGISTER
ABSTRACT

This program exercises the FP11 floating point add and subtract instructions (ADDf, ADDd, SUBf, SUBd) with random number patterns. The answers are checked against results obtained using the corresponding fortran software routines.

REQUIREMENTS

POP#11/45, FP11

STORAGE - The routines use memory locations 0 - 17500.

LOADING - Absolute Loader

EXECUTION TIME = 15 secs.

STARTING PROCEDURE - At 220

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15 = 1 ... HALT ON ERROR
SW14 = 1 ... SCOPE LOOP
SW13 = 1 ... INHIBIT PRINTOUT
SW12 = 1 ... INHIBIT TRACE TRAPPING
SW11 = 1 ... INHIBIT IERATIONS OF SUBTEST
SW10 = 1 ... BELL ON ERROR
0 ... BELL ON PASS COMPLETE
SW09 = 1 ... CORE IMAGE TYPE=OUT (16 BIT WORDS)
0 ... FLOATING POINT TYPE=OUT (SIGN, EXPONENT, MANTISSA)
SW08 = 1 ... LOOP ON TEST IN SW(710)
0 ... LOAD SW(710) INTO U8 REGISTER
NEW NUMBER = DCFPT

ABSTRACT

This program exercises the FP11 floating point multiply instructions (MULF and MULD) with random number patterns. The answers are checked against results obtained using the corresponding fortran software routines.

REQUIREMENTS

PDP11/45 standard computer with FP11 option

STORAGE - The routines use memory locations 0-17500. The map at the end of the listings shows the absolute locations of the fortran math routines which were assembled separately and linked to the main program via LNX11 on a DECsystem-10.

LOADING = Absolute Loader

EXEcUTION TIME = Bell will ring within 15 seconds with all switches down.

STARTING PROCEDURE = Always start at 200.

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

<table>
<thead>
<tr>
<th>SW</th>
<th>Option</th>
</tr>
</thead>
<tbody>
<tr>
<td>SW15</td>
<td>1 ... HALT ON ERROR</td>
</tr>
<tr>
<td>SW14</td>
<td>1 ... SCOPE LOOP</td>
</tr>
<tr>
<td>SW13</td>
<td>1 ... INHIBIT PRINTOUT</td>
</tr>
<tr>
<td>SW12</td>
<td>1 ... INHIBIT TRACE TRAPPING</td>
</tr>
<tr>
<td>SW11</td>
<td>1 ... INHIBIT ITERATIONS OF SUBTEST</td>
</tr>
<tr>
<td>SW10</td>
<td>1 ... BELL ON ERROR</td>
</tr>
<tr>
<td></td>
<td>0 ... BELL ON PASS COMPLETE</td>
</tr>
<tr>
<td>SW09</td>
<td>1 ... CORE IMAGE TYPEOUT (16 BIT WORDS)</td>
</tr>
<tr>
<td></td>
<td>0 ... FLOATING POINT TYPEOUT (SIGN, EXponent, MANTISSA)</td>
</tr>
<tr>
<td>SW08</td>
<td>1 ... LOOP ON TEST IN SW(710)</td>
</tr>
<tr>
<td></td>
<td>0 ... LOAD SW(710) INTO UR REGISTER</td>
</tr>
</tbody>
</table>
NEW NUMBER = DCFPU

ABSTRACT -

This program exercises the FP11 floating point divide instructions (DIVF and DIVD) with random number patterns, the answers are checked against results obtained using the corresponding fortran software routines.

REQUIREMENTS = PDP-11/45 standard computer with FP11 option.

STORAGE = The routines use memory locations 0 = 17500. The map at the end of the listings shows the absolute locations of the fortran math routines which were assembled separately and linked to the main program via LNKX11 on a DECSYSTEM-10.

LOADING = Absolute Loader

EXECUTION TIME = Bell will ring within 15 seconds with all switches down.

STARTING PROCEDURE = Always start at 200.

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 ... HALT ON ERROR
SW14 = 1 ... SCOPE LOOP
SW13 = 1 ... INHIBIT PRINTOUT
SW12 = 1 ... INHIBIT TRACE TRAPPING
SW11 = 1 ... INHIBIT ITERATIONS OF SUBTEST
SW10 = 1 ... BELL ON ERROR
    0 ... BELL ON PASS COMPLETE
SW9 = 1 ... CORE IMAGE TYPE-OUT (16 BIT WORDS)
    0 ... FLOATING POINT TYPE-OUT (SIGN, EXPONENT, MANTISSA)
SW8 = 1 ... LOOP ON TEST IN SW(710)
    0 ... LOAD SW(710) Into UB REGISTER
NEW NUMBER = DC00A

ABSTRACT = Floating point overlay for GTP.

This program is an overlay for GTP and tests the FP11 in all modes with fixed number patterns. It runs with Interrupts both enabled and disabled and causes error conditions.

REQUIREMENTS =

PDP-11/45 standard computer with FP11 option and a minimum of 17K of memory;

STORAGE = The routines use memory 40000 - 57776

LOADING = Absolute Loader (GTP) = First load GTP

EXECUTION TIME = See GTP

STARTING PROCEDURE = See GTP

PRINTOUTS = Same as GTP

SWITCH REGISTER OPTIONS = Yes

See GTP
ABSTRACT

This program and the next (DCKTB) incrementally test the basic logic functions of the KT11-C memory management option for the PDP-11/45. They fully test relocation direct and indirect addressing of the memory management registers, and correct operation of all the bits in the registers. The various aborts are tested, as is proper "locking" and "unlocking" of the error tracking logic.

REQUIREMENTS

PDP-11/45 with KT11-C option;

STORAGE = Program requires memory locations 0 to 17474;

LOADING = Absolute Loader;

EXECUTION TIME = Each pass takes approximately 1 minute with core memory;

STARTING PROCEDURE = Load address 200;

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 or up ; ; HALT ON ERROR
SW14 = 1 or up ; ; SCOPE LOOP
SW13 = 1 or up ; ; INHIBIT PRINTOUT
SW11 = 1 or up ; ; INHIBIT ITERATIONS
SW08 = 1 or up ; ; LOAD MICROBREAK REGISTER WITH VALUE IN
       SW 00-07;
NEW NUMBER = DCKTR

ABSTRACT:

This program and the previous one (DCKTA) incrementally tests the basic logical functions of the KT11-C memory management option for the PDP-11/45. They fully test relocation, direct and indirect addressing of the memory management registers and operation of all the bits in the registers. The various aborts are tested, as is proper "locking" and "unlocking" of the error tracking logic.

REQUIREMENTS:

PDP-11/45 with KT11-C option;

STORAGE = Program requires memory locations 9 to 17474;

LOADING = Absolute loader;

EXECUTION TIME = Each pass takes approximately 1 minute with core memory;

STARTING PROCEDURE = Load address 200;

PRINTOUTS = Yes;

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 or UP ; ; HALT OF ERROR
SW14 = 1 or UP ; ; SCOPE LOOP
SW13 = 1 or UP ; ; INHIBIT PRINTOUT
SW12 = 1 or UP ; ; INHIBIT ITERATIONS
SW26 = 1 or UP ; ; LOAD MICROBREAK REGISTER WITH VALUE IN SW 00#77,
NEW NUMBER = 6CKTC

ABSTRACT = Keys test.

This program checks the operation of each access key for each of the four Unibus cycles (or combination of cycles) which have reference in an address thru segmentation. These cycles are DATI, DATO (no DATIP), DATIF DATO, and DATIP DATOH. Each of these cases is tested with and without memory management enable set, thus eight cases are tested for each key, SR7, SR1, SR; the corresponding PDR's, and the proper execution or prevention of execution of the instruction are checked in each case.

REQUIREMENTS =

PDP-11/45 with KT14-C option;

STORAGE = Program requires 5K of memory, starting at location 0.

LOADING = Absolute Loader.

EXECUTION TIME = Each pass takes approximately 1 minute with core memory.

STARTING PROCEDURE = Load address 200.

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 or up . : HALT ON ERROR
SW14 = 1 or up . : SCOPE LOOP
SW13 = 1 or up . : INHIBIT PRINTOUT
SW11 = 1 or up . : INHIBIT I(ERATIONS
SW08 = 1 or up . : LOAD MICROBREAK REGISTER WITH
VALUE IN SW00-SW07 (AT START OF TEST ONLY);
NEW NUMBER = 5CKTD

ABSTRACT

Program 5CKTD tests the MTPD and MTPI instructions with memory management enabled. (See prog. DCKRO for tests of these instructions without memory management. These instructions are executed in all combinations of current modes and equal or lower hierarchy previous modes.

REQUIRED:

PDP-11/45 with XT11-C (memory management) option installed;

STORAGE - Routine uses memory 0-17777

LOADING - Absolute Loader

EXECUTION TIME = 1 min;

STARTING PROCEDURE = Load address 200;

PRINTOUTS = No

SWITCH REGISTER OPTIONS = Yes

SWA = 1 or up ....; Load PDP-11/45 micro break register
SW7 + SW2 ....; Value to be loaded
NEW NUMBER = DCKTE

ABSTRACT =

Program DCKTE tests the MFPD and MFPI Instructions with memory management enabled; (See prog DCKRO for tests of these instructions without MEM management) These instructions are executed in all combinations of current modes and equal or lower hierarchy previous modes.

REQUIREMENTS =

PDP-11/45 with KT11-C (MEM management) option installed;

STORAGE = Routine uses memory 0=17777;

LOADING = Absolute Loader;

EXECUTION TIME = 1 min;

STARTING PROCEDURE = Load address 200

PRINTOUTS = No

SWITCH REGISTER OPTIONS = Yes

SW 8 = 1 of up ... LOAD PDP-11/45 MICRO BREAK REGISTER
SW 7 = SW ... VALUE TO BE LOADED
NEW NUMBER = ÖCKTF

ABSTRACT = Abort Test

Program ÖCKTF tests the memory management abort logic. The program is written to cause a memory management abort at every PDP-11/45 micro state where a memory reference (must) is initiated. The program also tests memory management aborts using floating point instructions. Aborts are in all cases trapped to the kernel; however, the instructions causing the abort are executed in all modes (kernel, supervisor, and user).

REQUIREMENTS =

PDP-11/45 with KT11-C

STORAGE = Routine uses memory 0 = 17777

LOADING = Absolute Loader

EXECUTION TIME = 1 min

STARTING PROCEDURE = Load address 200

PRINTOUTS = No

SWITCH REGISTER OPTIONS = Yes

SW 8 = 1 or up ... LOAD PDP-11/45 MICRO BREAK REGISTER
SW 7 = SW 3 ... VALUE TO BE LOADED
KT11+C Exerciser

ABSTRACT

This program is an interactive exerciser for a PDP-11/45 equipped with the KT11-C option. It performs a test of instructions and concurrent operations of I/O equipment while relocating thru memory. It provides numerous modes of testing, from 4K execution with the KT11-C turned off and only one kernel mode in use, to 128K execution with each user page mapped sequentially to every 4K bank of memory, TC11 and RF11 buffer and code relocation thru all memory, and supervisor mapping of other I/O devices. This program is not to be considered a total check of the system. If an error is detected in an I/O device, it will probably be necessary to correct the malfunction with the respective diagnostic for that device.

REQUIREMENTS

PDP-11/45 Standard Computer
KT11+C Memory Management Option

STORAGE = 2 = 17760
LOADING = Absolute Loader
EXECUTION TIME = System Dependent
STARTING PROCEDURE = Start and Restart at 200
PRINTOUTS = Yes
SWITCH REGISTER OPTIONS = No
NEW NUMBER = DBKTA

ABSTRACT =

This program incrementally test the basic logic functions of the KT11=O memory management option for the PDP-11/40; it fully tests relocation direct and indirect addressing of the memory management registers, and correct operation of all the bits in the registers. The various aspects are tested, as is proper "locking" and "unlocking" of the error tracking logic.

REQUIREMENTS =

PDP-11/40 with KT11=O option

STORAGE = Program requires memory locations 2 to 17474;

LOADING = Absolute Loader.

EXECUTION TIME = Each pass takes approximately 3 minutes with core memory.

STARTING PROCEDURE = Load address 200,

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 or up ... HALT ON ERROR
SW14 = 1 or up ... SCOPE LOOP
SW13 = 1 or up ... INHIBIT PRINTOUT
SW11 = 1 or up ... INHIBIT ITERATIONS
SW12 = 1 or up ... HALT AT END OF CURRENT TEST WITH NEXT TEST NUMBER IN DATA LIGHTS,
NEW NUMBER = 0BKTB

ABSTRACT = Keys test.

This program checks the operation of each access key for each of the four Unibus cycles (or combinations of cycles) which may reference an address thru segmentation. These cycles are DATI, DATO (no DATIP), DATIP=DATO and DATIP, DATPB. Each of these cases is tested with and without memory management enable set, thus eight cases are tested for each key, SR1, SR2 and the corresponding PDR's, and the proper execution or prevention of execution of the instruction are checked in each case.

REQUIREMENTS =

PDP-11/40 with KT11-M option

STORAGE = Program requires 4K of memory, starting at location 0.

LOADING = Absolute Loader.

EXECUTION TIME = Each pass takes approximately 10 seconds with 400 memory.

STARTING PROCEDURE = Load address 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 or up ; ; ; HALT ON ERROR
SW14 = 1 or up ; ; ; SCOPE LOOP
SW13 = 1 or up ; ; ; INHIBIT PRINTOUT
SW12 = 1 or up ; ; ; INHIBIT ITERATIONS
SW10 = 1 or up ; ; ; HALT AT END OF CURRENT TEST WITH NEXT TEST NUMBER IN DATA LIGHTS,
NEW NUMBER = DBKTC

ABSTRACT =
Program DBKTC tests the HTPI and MFPI instructions with memory management enabled. These instructions are executed in all combinations of current modes and equal or lower hierarchy previous modes.

REQUIREMENTS =

PDP-11/40 with KT11-D (memory management) option installed.

STORAGE = Routine uses memory 0 - 17777

LOADING = Absolute Loader.

EXECUTION TIME = 3 seconds;

STARTING PROCEDURE = Load address 207

PRINTOUTS = No

SWITCH REGISTER OPTIONS = No
NEW NUMBER = 58KTD

ABSTRACT =

KT114D PROCESSOR STATES TEST

This is a test that utilizes the KT114D memory management option and tests that in two PDP-11/40 states (Kernel, User) instructions are executed properly. This test tests traps from one state to the other and uses the MPPI/MTPI instructions.

REQUIREMENTS =

PDP-11/40 with KT114D (Mem, Mgmt) installed.

STORAGE = utilizes 4K of memory.

LOADING =

EXECUTION TIME = One pass takes approximately 10 seconds.

STARTING PROCEDURE = 200.

PRINTOUTS =

SWITCH REGISTER OPTIONS = None
NEW NUMBER = DBKTF

ABSTRACT - Abort Test

Program DBKTF tests the memory management abort logic. The program is written to cause a memory management abort at every PDP-11/40 micro state where a memory reference is initiated. Aborts are in all cases trapped to the kernel, however, the instructions causing the abort are executed in both modes (kernel and user).

REQUIREMENTS

PDP-11/40 with KT11-D

STORAGE - Routine uses memory 0 = 17777

LOADING - Absolute Loader

EXECUTION TIME - 15 seconds

STARTING PROCEDURE - Load address 200

PRINTOUTS - No

SWITCH REGISTER OPTIONS - No
KT11=O Exerciser

ABSTRACT

This program is an interactive exerciser for a PDP-11/40 equipped with the KT11=O option. It performs a test of instructions and concurrent operations of I/O equipment while relocating thru memory. It provides numerous modes of testing, from 4K execution with the KT11=O turned off and only kernel mode in use, to 124K execution with each user page mapped sequentially to every 4K bank of memory. TC11 and RF11 buffer and code relocation thru all memory. This program is not to be considered a total check of the system. If an error is detected in an I/O device, it will probably be necessary to correct the malfunction with the respective diagnostic for that device.

REQUIREMENTS

PDP-11/40 Standard Computer
KT11=O Memory Management Option

STORAGE = 0 = 17760
LOADING = Absolute Loader
EXECUTION TIME = 4K about 3 min., 32K less than an hour
STARTING PROCEDURE = Start and restart at 200
PRINTOUTS = Yes
SWITCH REGISTER OPTIONS =

At startup, SW settings are:

SW 0 = 1 or up ... RUN WITHOUT KT11=O
SW 1 = 1 or up ... RUN ALL IN KERNEL MODE (INHIBITS RUNNING 4K AS 32K
SW 2 = 1 or up ... INHIBIT RUNNING 256 USER KT11=O FROM EVERY 4K
BANK (ALLOW NORMAL CORE EXPANSION)
SW 5 = 1 or up ... INHIBIT VARIABLE CORE EXPANSION

At halt, SW settings are:

SW 15 = 1 or up ... HALT ON ERROR
SW 14 = 1 or up ... SCOPE LOOP
SW 13 = 1 or up ... INHIBIT PRINT OUT
SW 12 = 1 or up ... INHIBIT TRACE TRAPPING
SW 11 = 1 or up ... INHIBIT SUB-PROGRAM ITERATION AND INHIBIT TESTS
WHICH USE ALL COMBINATIONS OF NUMBERS
SW 10 = 1 or up ... INHIBIT PROCESSOR TEST
Special delete switches - set respective switch to a 1 to inhibit initiation of device.

SW 0 = 1 ; INHIBIT TTY OUTPUT
SW 3 = 1 ; INHIBIT RK11 DISK
SW 4 = 1 ; INHIBIT LINE CLOCK
SW 5 = 1 ; INHIBIT RF11 DISK
SW 6 = 1 ; INHIBIT TC11 DECTAPE
SW 7 = 1 ; INHIBIT LINE PRINTER
MAINDEC-11-D1A*

Basic Address Test (UP)

ABSTRACT

The PDP-11 Basic Address Test is designed to provide elementary first level test capable of verifying the operational status of a PDP-11 MM11-E memory. The test writes the address of each location (within the test limits) into itself and reads verifies that the proper address has been stored.

REQUIREMENTS:

PDP-11

STORAGE = 200 - 240

LOADING = Loaded Manually or With Paper Tape

STARTING PROCEDURE = Start and Restart at 200 =

- Lower Limit Location at 017500
- Upper Limit Location at 000236

EXECUTION TIME = Less than one second per pass = no printout

PRINTOUT = No

SWITCH REGISTER OPTIONS = No
Basic Address Test (Down)

ABSTRACT

This test demonstrates that the selected memory test area is capable of basic read and write operation when address propagation is downward through memory. This test is a companion test to the basic address test.

REQUIREMENTS

POP=11

STORAGE = 17307 - 17412

LOADING = Absolute Loader

STARTING PROCEDURE = Start and Restart at 17300

EXECUTION TIME = Approximately 2 sec, per pass no printout

PRINTOUTS = No

SWITCH REGISTER OPTIONS = No
No Dual Address Test

ABSTRACT

The no dual address test checks the unique selection of each memory address tested; the address of each failure location and its contents are printed on the teletype. Scope loop options are provided to facilitate any additional diagnostic procedures that may be used in conjunction with this test.

REQUIREMENTS

PDP-11

STORAGE = 20M = 3562

LOADING = Absolute Loader

EXECUTION TIME = 6.5 min. for 4K of memory = Bell will ring

STARTING PROCEDURE = Start at 200 for automatic test limits up to 28K Start at 202 for selected test limits

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = HALT UPON COMPLETION OF A PASS
Basic Memory Patterns Test

ABSTRACT

The basic memory patterns test verifies that the selected memory test field is capable of writing and reading fixed data patterns. Some loop provisions are also available to facilitate further fault isolation procedures or identifying intermittent failure conditions.

REQUIREMENTS

PDP-11

STORAGE = 200 - 2362

LOADING = Absolute Loader

EXECUTION TIME = 1 min; Bell will ring

STARTING PROCEDURE = 200 for automatic test limits = up to 26K
- 202 to select test limits
- 204 to select special test patterns

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = HALT ON END OF PROGRAM
SW11 = PRINT PATTERN ON END OF PROGRAM
Memory Moving Ones and Zeroes Test

ABSTRACT

The moving ones and zeroes test verifies the following:

1. The selected test area is capable of writing and reading all configurations of a 0 bit moved sequentially through all bit positions of all test zone locations;

2. The selected test area is capable of writing and reading all configurations of a 1 bit moved sequentially through all bit positions of a test zone location,

3. The selected test area is free from regenerate noise disturbances for all of the forementioned moving 0 and 1 conditions. Scope loop options are provided to facilitate any additional diagnostic procedures that may be used in conjunction with this test.

REQUIREMENTS

PDP-11

STORAGE = 200 - 3154

LOADING = Absolute Loader

STARTING PROCEDURE = Start at 200 for automatic test limits
                     = up to 28K
                     = Start at 202 for selected test limits

EXECUTION TIME = 1 min; for part 1
                 = 4 min; for part 2
                 = Bell will ring

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = HALT ON END OF PROGRAM
SW11 = PART 2 SWITCH
MA!NDEC-11-D1F-

1/s Susceptibility Test

ABSTRACT

This test verifies that the cores of a Y axis address strings of the selected memory test zone are not sensitive to 0 read noise propagated along the address string. Scope loop options are provided to facilitate any additional diagnostic procedures that may be used in conjunction with this test.

REQUIREMENTS

PDP-11

STORAGE = 220 = 2656

LOADING = Absolute Loader

EXECUTION TIME = 1 min; Bell will ring

STARTING PROCEDURE = 200 with automatic test limits - up to 28K
 = 222 with selected test limits

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

5x15 = HALT ON ERROR
5x14 = SCOPE LOOP
5x13 = INHIBIT PRINTOUT
5x12 = HALT ON END OF PROGRAM
Worst Case Noise Test

ABSTRACT

This test generates the maximum amount of plane noise possible during the execution of memory reference instructions. The noise generated is distributed across the core plane as an algebraic supplement to the normal dynamic noise present on the sense lines during memory read-regenerate operations; Data modification as a result of noise amplitudes is flagged as an error, with the location and contents recorded on the teletype. Provisions have been added to include worst case patterns for Interleaved memories.

REQUIREMENTS

PDP-11

STORAGE = 200 - 2071

LOADING = Absolute Loader

EXECUTION TIME = 1 min; Bell will ring

STARTING PROCEDURE = 200 with automatic test limits
               = 232 with selected test limits

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW13 = INHIBIT PRINTOUT
SW12 = HALT ON END OF PROGRAM
Core Heating Test

ABSTRACT

The core heating test verifies the ability of memory cores within the test zone to withstand both internal and external heat without malfunctioning. Heating is limited to the amount of heat that can be produced by the process of executing memory reference instructions at the maximum rate. A test feature is provided in the fact that the heating interval can be set to any specified period to facilitate specialized heat tests. The test can be run independently of external devices and does not rely on external interrupts for operational continuity.

REQUIREMENTS

POP#11

STORAGE = 0 - 502

LOADING = Absolute Loader

EXECUTION TIME = 3.5 min. = Bell will ring

STARTING PROCEDURE = 270 with automatic test limits = up to 28k = 272 with selected test limits

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW12 = HALT ON END OF PROGRAM
ABSTRACT

This test combines a random number generator with a random (location) exerciser to demonstrate that the memory test zone is capable of storing random data. The random exerciser provides a read loop determined by the least significant octal bit of the data in the location under test to demonstrate compatibility between locations holding random data. Each report printout lists the error address, error contents, and correct random data.

REQUIREMENTS

PUP=11

STORAGE = 200 - 2541

LOADING = Absolute Loader

EXECUTION TIME = 1 min; Bell will ring

STARTING PROCEDURE = 270 for automatic test limits = up to 28K
                     = 202 for selected test limits

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW13 = INHIBIT PRINTOUT
SW12 = HALT ON END OF PROGRAM
PDP-11 MEMORY &K SPECIAL

ABSTRACT

The "8K special" program is designed to allow all PDP-11 memory diagnostics to reside in the first 4K bank of core. An executive routine controls execution of all diagnostics selected via the switch register.

REQUIREMENTS

PDP-11 with at least 8K of core storage,

STORAGE = The first 4K of core memory is used by the program,

LOADING = Absolute Loader,

EXECUTION TIME = Following is a list of approximate run times when testing 8K of memory under normal conditions. When testing other than 8K, the times expand linearly except for no dual addressing and core heating which expand exponentially,

- Bus up and down: 35 sec
- Bus memory patterns: 2 min
- Moving 1's and 0's: 2 min
- 1's susceptibility: 2 min
- Worst case noise: 3 min
- Core heating: 19 min
- Randat: 2 min
- No dual addressing: 40 min

STARTING PROCEDURE = Starting at address 200 and all switches down executes all tests.

PRINTOUTS = Yes,

SWITCH REGISTER OPTIONS = Yes

- SW15 = HALT ON ERROR
- SW14 = SCOPE LOOP
- SW13 = INHIBIT PRINTOUT
- SW12 = INHIBIT TEST HEADER
- SW11 = BELL ON ERROR
- SW10 = HALT AT END OF PASS
- SW9 =
- SW8 = SKIP TEST 08 (NO DUAL ADDRESSING)
- SW7 = SKIP TEST 07 (RANDAT)
- SW6 = SKIP TEST 06 (CORE HEATING)
- SW5 = SKIP TEST 05 (WORST CASE NOISE)
- SW4 = SKIP TEST 04 (1's SUSCEPTIBILITY)
SW03 = SKIP TEST 03 (MOVING 1's AND 0's)
SW02 = SKIP TEST 02 (BASIC MEM PAT/S)
SW01 = SKIP TEST 01 (BASIC UP AND DOWN)

SEE MAINDEC FOR FURTHER INFORMATION.
ABSTRACT

UPDOWN ADDRESS TEST

This test demonstrates that the selected memory test area is capable of basic read and write operations when address propagation is both upward and downward through memory.

REQUIREMENTS

PDP-11

STORAGE = Routine occupies memory from 100 to 560

LOADING =

EXECUTION TIME = The program will ring the teletype bell after four (4) passes through the program which is approximately once per minute with 4k of memory and test limits set under program control.

STARTING PROCEDURE = 220

PRINTOUTS = No

SWITCH REGISTER OPTIONS = YES

SW12 = 1 OR UP,,HALT AT END OF TEST
MAINDEC#11=Z2MA

MEMORY EXERCISER using input-output devices

ABSTRACT

This program checks bank selection, EA bits, and memory using any NPR
device with EA bits. It runs stand alone or with KT11C or KT11D to
access extended memory. Worst case noise patterns are used with the NPR
device to test the memory.

REQUIREMENTS

POPC#11 standard computer with a minimum of 8K of memory
KT11C/D for memory expansion (optional).

STORAGE - The routines use memory 0 = 17776

LOADING - Absolute Loader

EXECUTION TIME - The execution time is dependent on the amount of
memory and the device used. The bell should ring
within 20 minutes (using DM#1 at 110 BAUD in 124K).

STARTING PROCEDURE -

1. Start at 202
2. Type device (RF#11,RK#11,RP#11,RC#11,TC#11,TM#11,DM#11; or DR#11B)
   and RETURN.
3. Test will start (*G will return to step 2 and restore the
   loader),
   OR
1. Start at 202
2. Type a RETURN
3. Type a lower bank to be tested . . . 1=20000=37777 etc,
4. Type the upper bank to be tested
5. Type device (RF#11,RK#11,RP#11,RC#11,TC#11,TM#11,DM#11; or DR#11B)
   and RETURN
6. Test will start (*G will return to step 2 and restore the
   loader)

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

  SW#15 = HALT ON ERROR
  SW#14 = HANG ON CURRENT BANK
  SW#13 = INHIBIT PRINTOUT
  SW#12 = INHIBIT BELL ON PASS COMPLETE
  SW#09 = INHIBIT USE OF MEMORY EXPANSION DEVICE
SN78 - TRACE BANK UNDER TEST
MAINDEC-11-DZOMB

2=124K MEMORY EXERCISER

ABSTRACT

Program DZOMB tests contiguous memory addresses from 000000 to 757776.
It verifies that each address is unique (an address test) and that each memory location can be read/written reliably (worst case noise tests).

REQUIREMENTS

PDP-11 family processor
optional:
KT114C or KT11-D memory management option

STORAGE - The routine uses memory 0-17777

LOADING - Absolute Loader

EXECUTION TIME = 4K - 1 min, 128K - 32 min.

STARTING PROCEDURE = Start at 200

The program will loop and ring bell on completion

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 OR UP ..., HALT ON ERROR

NOTE

IF SW15=1 WHEN AN ERROR OCCURS THE PROGRAM WILL HALT; IF SW15 IS RAISED AFTER THE ERROR TYPEOUT BEGINS THE PROGRAM WILL HALT WHEN THE TYPEOUT COMPLETES.

SW19 = 1 OR UP ..., LOOP SUBTEST
SW13 = 1 OR UP ..., INHIBIT ERROR TYPEOUT
SW11 = 1 OR UP ..., INHIBIT SUBTEST ITERATION
SW10 = 1 OR UP ..., RING BELL ON ERROR
SW08 = 1 OR UP ..., LOAD PDP=11/45 MICRO BREAK REGISTER
SW07 = SW00 ..., VALUE TO BE LOADED
AA11 DAC Calibration

ABSTRACT

This program assists in the testing and calibration of the AA11 Digital to Analog Converter. Provisions are included for a PDP-11 System with up to 4 AA11 DAC's. The program is divided into four sections: DAC Test, RAMP, Square Wave, and Calibrate.

REQUIREMENTS

PDP-11
AA11 Digital to Analog Converter Subsystem with up to 4 Converter Modules

STORAGE = 0 - 1510

LOADING = Absolute Loader

EXECUTION TIME = Not applicable

STARTING PROCEDURE = 230 for DAC Test
                      = 234 for RAMP
                      = 212 for Square Wave
                      = 214 for Calibrate

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = No
AA11-A,B,C Scope Control Test

ABSTRACT

This program tests the AA11-A,B,C Scope Control, X and Y axis DAC's and each of the three available scopes (TEKTRONIX 611 Storage display unit, TEKTRONIX RM503 Oscilloscope, or VR12 Point Plot Display).

REQUIREMENTS

POP=11
AA11-D DAC control with an AA11-A,B or C scope control

STORAGE = 0 = 4222

LOADING = Absolute Loader

EXECUTION TIME = Bell will ring = Phosphor & Erase Test
= 2 Min. 15 sec
= CSR Test = 30 Sec.
= All other tests = Not applicable

STARTING PROCEDURE

Non Store Scopes

200 = Command & Status Register
204 = Display Horizontal Line
210 = Display Vertical Line
214 = Display Square
220 = Display X
224 = Display Low & High Intensity
230 = Display Alpha-Numeric Character

Storage Scopes

234 = Display Horizontal Line
240 = Display Vertical Line
244 = Display Square
252 = Display X
254 = Display Alpha-Numeric Character
260 = Phosphor & Erase (1st Quad.)
264 = Phosphor & Erase (3rd Quad.)

PRINTOUTS = No

SWITCH REGISTER OPTIONS = No
ABSTRACT

This test is to be used as an A/D Diagnostic for the PDP-11 with the
A081-D Converter. It tests all logic functions of the converter with
previsions for testing drift, calibration, differential linearity, and
repeatability as well.

REQUIREMENTS

PDP-11
A081-D A/D Converter
Calibrated DC Voltage Source

STORAGE = 7 - 16520

LOADING = Absolute Loader

EXECUTION TIME = when trace trapping, one pass takes about 90 sec,
when not trace trapping, one pass takes about 30 sec;
Bell rings at end of each pass.

STARTING PROCEDURE

200 = Normal (Worst Case) Test
210 = Restart Address (Normal)
220 = Display Conversion Loop
230 = External Conversion Loop
240 = Fast Ext. Conversion Loop
250 = Conversion Print Loop
260 = Single Test Loop
270 = Multiplexer Channel & Repeatability Test
300 = Statistical Repeatability Test

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT TRACE TRAPPING
SW11 = INHIBIT SUB-PROGRAM ITERATION
SW10 = INHIBIT AVERAGING
SW09 = INHIBIT + OR #1 LSB TESTING
SW08 = TEST SIGN OPTION


**AD02/AD11 Diagnostic Test**

**ABSTRACT**

This diagnostic tests and exercises the AD02/AD11. The program is self-starting and when loaded, will type out the program title and then request and A/D length. The program will accept a 10 to 13 bit unipolar or bipolar input; Examples: 10(CR)= would indicate a 10 bit unipolar A/D typing 11+(CR) would indicate an 11 bit bipolar A/D; A sentence is then typed giving the letter designators to be typed to run any one of the six (6) separate tests of which this program consists. The program then types a "CR" and then waits in a keyboard monitor mode for a letter to be typed. Although these tests may be run in any order, it is imperative that the "logic" test is run first and proved fully operational.

The program is set up to give the operator as much control over the program as possible via the teletype. Typing a "C" (obtained via typing the "CSI" and "C" keys simultaneously) while running any test will enable the program to return to the keyboard monitor and await a new letter designator to be typed. Typing a "A" while in monitor mode will enable the letter designators to be retyped.

**REQUIREMENTS**

PDP-11
AD02/AD11 Analog to Digital Converter

**STORAGE**

**LOADING** = Absolute Loader

**EXECUTION TIME** = 1 min

**STARTING PROCEDURE** = Start at 200, Restart at 174

**PRINTOUTS** = Yes

**SWITCH REGISTER OPTIONS** = No
AFC11 Diagnostic

ABSTRACT

This program is a diagnostic and exerciser for the AFC-11 low level analog multiplexer system. The program is composed of four sections:

1. AFC-11 Interface Logic Test
2. AFC-11 Data Repeatability Test
3. Calibration and Adjustment Routines
4. Data Collection Routines

REQUIREMENTS

- AFC-11 with ASR-33 Teletype (or equivalent)
- Adjustable precision voltage source, EDC MV100 M, or equivalent
- Oscilloscope, Tektronix 453 or equivalent with direct probes
- Digital test cable must be installed
- Triangle wave generator, WAVETEC VCG 111, or equivalent (optional - required to monotonicity test)

STORAGE - Requires 4K of memory and will use up to 8K if available

LOADING - Absolute Loader

STARTING PROCEDURE

Load Address 200
Clear Switches
Press Start Key

The program will respond by typing "AFC-11 DIAGNOSTIC XXXX CHANNELS CAN BE TESTED AT LENGTH!" The program will wait for the operator to enter the number of data bits (not including sign) of the A-D converter followed by altmode. When this has been done, the program will type "," to indicate that it has entered the keyboard monitor mode.

XXX = Maximum number of channels that can be tested sequentially by the data repeatability test,

Type Logic (ALTMOD)

Program will begin execution of logic test. Program types logic at end of pass.

EXECUTION TIME - Approximately 3 min. for 2 typeouts or logic
PRINTOUTS – Yes
SWITCH REGISTER OPTIONS – Yes
ABSTRACT

The M792 Diagnostic Programs are written to be used as an aid to hardware debugging and maintenance of the M792 ROM Diode Matrix Board. These programs may also be used as a data reliability test. The available tests are:

- PRG0 = Logic Tests
- PRG1 = ROM Data Dump
- PRG2 = Single ROM Address Read Data Loop

REQUIREMENTS

- POP=11
- M792

STORAGE - Z = 4440 (8)

LOADING = Absolute Loader

EXECUTION TIME = 4 sec. - Printout will occur

STARTING PROCEDURE = Start at 220

RESTART at 204

PRINTOUT - YES

SWITCH REGISTER OPTIONS - NO
M792-YA paper tape bootstrap loader

ABSTRACT

The M792-YA diagnostic programs are written to be used as an aid to hardware debugging and maintenance of the M792-YA (paper tape bootstrap loader). These programs may also be used as a data reliability test.

The available tests are:

PRG0 = Logic Tests
PRG1 = ROM DATA DUMP
PRG2 = Single ROM address read data loop

REQUIREMENTS

PUP-11
M792-YA

STORAGE = A = 4040

LOADING = Absolute Loader

EXECUTION TIME = 5 sec; - Printout will occur

STARTING PROCEDURE = START AT 200
RESTART AT 210

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT TRACE TRAPPING (NOT USED)
SW11 = INHIBIT ITERATION
M792-YP Diagnostic Programs are written to be used as an aid to hardware debugging and maintenance of the M792-YP (dectape and disk bootstrap loader). These programs may also be used as a data reliability test.

The available tests are:

- PHG0 - Logic Tests
- PHG1 - ROM DATA PUMP
- PHG2 - Single ROM Address Read Data Loop

REQUIREMENTS

- PCP-11
- M792-YP

STORAGE - 256K 4040

LOADING - Absolute Loader

EXECUTION TIME = 4 sec; Printout will occur;

STARTING PROCEDURE - Start at 20m
Restart at 21m

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

- SW15 = HALT ON ERROR
- SW14 = SCOPE LOOP
- SW13 = INHIBIT PRINTOUT
- SW12 = INHIBIT TRACE TRAPPING (Not Used)
- SW11 = INHIBIT ITERATION
BM792YC (CARD READER BOOTSTRAP LOADER)

ABSTRACT

The BM792YC diagnostic program is written to be used as an aid to hardware debugging and maintenance of the BM792YC module (card reader bootstrap loader). These programs may also be used as a data reliability test.

The available tests are

   PRG0 = Logic Tests
   PRG1 = ROM DATA DUMP
   PRG2 = Single ROM Address Read Data Loop

REQUIREMENTS

   PDP-11, M792YC

   STORAGE = Core 0-4042(8)

   LOADING = Absolute Loader

   EXECUTION TIME = 5 sec; = Printout will occur

   STARTING PROCEDURE = Start at 200
                      Restart at 210

   PRINTOUT = Yes

   SWITCH REGISTER OPTIONS = Yes

   SW15 = 1 OR UP    HALT ON ERROR
   SW14 = 1 OR UP    SCOPE LOOP
   SW13 = 1 OR UP    INHIBIT PRINTOUT
   SW12 = 1 OR UP    INHIBIT TRACE TRAPPING (NOT USED)
   SW11 = 1 OR UP    INHIBIT ITERATION
BM792YH CASSETTE BOOTSTRAP LOADER

ABSTRACT

The DZMBH diagnostic program is written to be used as an aid to hardware debugging and maintenance of the BM792YH CASSETTE BOOTSTRAP LOADER. This program may also be used as a data reliability test.

Available tests are:
- PRG1 - Logic Tests
- PRG1 - ROM DATA DUMP
- PRG2 - Single ROM Address Read Data Loop.

REQUIREMENTS

1. POP 11 FAMILY CENTRAL PROCESSOR
2. BM792YH MODULE

STORAGE - This program uses core 0=4100 (8)

LOADING -

EXECUTION TIME -

STARTING Procedure = 200

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15 1 OR UP = HALT ON ERROR
SW14 1 OR UP = SCOPE LOOP
SW13 1 OR UP = INHIBIT PRINTOUT
SW12 1 OR UP = INHIBIT TRACE TRAPPING (NOT USED)
SW11 1 OR UP = INHIBIT ITERATION
CBII Telemetry Monitor Diagnostic

ABSTRACT

This program tests the CBII system scan modules are explicitly tested via maintenance mode (which is therefore also explicitly tested). Distribute modules are explicitly tested in a direct read/write manner.

In addition, both scan and distribute boards may be implicitly tested whenever two distribute boards are jumped in such a way as to drive one scan board and when the program is called to run this type of testing.

REQUIREMENTS

1. Any CBII-11, a TTY, and a line clock KW11L or KW11P.
2. A CBII device.
3. The user inputs to scan and distribute modules must be disconnected ***

*** If item 3 is not strictly adhered to, the results to the program or to the hardware is unspecified. ***

STORAGE = 0-17776

LOADING = Absolute Loader

EXECUTION TIME = Function of Hardware

STARTING PROCEDURE = 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT TRACE TRAPPING
SW11 = INHIBIT ITERATION
SW06 = INHIBIT STATUS TYPEOUTS IN SCOPE LOOP
SW05 = RING BELL AND PASS COUNT AT END OF EACH PASS
SW04 = DYNAMIC STATUS TYPEOUT
SW03 = INHIBIT TTY QUERIES
SW02 = SHORTEN ALL TIME DELAYS BY 10%
SW01 = LENGTHEN ALL TIME DELAYS BY 10%
SW00 = PRINT ONLY PROGRAM COUNTER ON ERROR
CB11 GTP/CTP Overlay

ABSTRACT

This program runs as a background (non-interrupting) overlay, supported by CTP or GTP test program.

This program tests the CB11 system. Scan modules are explicitly tested via maintenance mode. Maintenance mode is also explicitly tested. Distribute modules are explicitly tested in a direct read/write manner.

REQUIREMENTS

POP-11 standard computer
12k of memory
Console TTY
CB11

STORAGE = 40000 to 57000

LOADING = Absolute Loader

EXECUTION TIME = a function of the PDP-11 processor used and the number of devices selected for testing

STARTING PROCEDURE = 270

PRINTOUTS = Same as GTP/CTP

SWITCH REGISTER OPTIONS = Same as GTP/CTP
DC11 CARD READER DIAGNOSTIC

ABSTRACT

This program is to be used as a card reader diagnostic for the PDP-11 with the DC11 card reader interface to the Documentation M 1000 punched card reader. It tests all logic functions of the card reader, and includes an exerciser for alphanumeric and binary test decks; A separate starting address allows the error sensing functions of the Documentation M 1000 reader to be checked. Another starting address tests special decks which have all columns and cards punched identically, to aid in diagnosing special problems.

REQUIREMENTS

PDP-11
DC11 Card Reader

STORAGE = Memory 0 to 15000

LOADING = Absolute Loader

EXECUTION TIME = 30 sec.

STARTING PROCEDURE = Load adr 200
Set dynamic switch settings
Start

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 OR UP HALT ON ERROR
SW14 = 1 OR UP SCOPE LOOP
SW13 = 1 OR UP INHIBIT PRINT OUT
SW12 = 1 OR UP INHIBIT TRACE TRAPPING
SW11 = 1 OR UP INHIBIT SUB-PROGRAM ITERATION
SW07 = 1 OR UP LOOP THRU THE INSTRUCTION TEST PORTION (NOTE THAT THE PROCESSOR MAY HANG LEGITIMATELY WHEN THE INPUT HOPPER GOES EMPTY IF SW7 IS SET)
SW06 = 1 OR UP RETURN TO THE BEGINNING OF THE INSTRUCTION TEST WHEN CONTINUING FROM ONE DECK TO ANOTHER
SW05 = 1 OR UP HALT BETWEEN TEST DECKS
SW04 = 1 OR UP RUN THE BINARY TEST DECK
SW03 = 1 OR UP RUN IN IMAGE MODE ONLY
SW02 = 1 OR UP RUN IN PACKING MODE ONLY
CMII Diagnostic Test

ABSTRACT

This test is to be used as a card reader diagnostic for the PDP-11 with the CMII Card Reader. It tests all logic functions of the card reader, and includes an exerciser for alphanumeric, binary, and checkerboard test decks. A separate starting address allows the error sensing functions of the reader to be checked. Another starting address tests special decks which have all columns and cards punched or marked identically, to aid in diagnosing special problems.

REQUIREMENTS

- PDP-11
- CMII Card Reader

STORAGE - Z = 15100

LOADING - Load with Absolute Loader

EXECUTION TIME - Depends on which test is being done. Easily monitored by watching the cards feed thru the reader. Bell will ring at end of pass.

STARTING PROCEDURE - Load one test deck in the card reader input hopper. Press motor start and read start. Set switch register to starting address. Load address. Set switches all down; Press start, When the input hopper is empty the program will hang waiting for an interrupt from the card reader. Load one or more test decks into the input hopper. Pressing "MOTOR START" and "READ START" on the card reader should cause program execution to resume. This entire sequence is necessary to run the full test on the card reader.

COMMENTS - Note that certain switch settings may cause errors to occur although the reader is functioning correctly. See the document section (4.1) before using any switch register settings other than all switches down.
CM11F Diagnostic Test with the documentation OM=200 Card Reader <80 column>

ABSTRACT

This test is to be used as a card reader diagnostic for the PDP-11 with the CM11F Card Reader. It tests all logic functions of the Card Reader, and includes an exerciser for punch alphanumeric, punch binary, and mark sense binary test decks. A separate starting address allows the error sensing functions of the reader to be checked. Another starting address tests special decks which have all columns and cards punched or marked identically, to aid in diagnostic special problems.

REQUIREMENTS

- PDP-11 STANDARD COMPUTER
- CM11F CARD CONTROLLER
- CM-11FAYFB CARD READER DOCUMENTATION MODEL OM=200 <80 COLUMN>

STORAGE - THE ROUTINE USES MEMORY 0 TO 16000,

LOADING -

EXECUTION TIME - Not Applicable

STARTING PROCEDURE

- 200 = INSTRUCTION AND DATA SET
- 210 = PICK FUNCTION TEST
- 220 = ERROR FUNCTION TEST
- 240 = SINGLE SUBTEST LOOP
- 250 = READ SINGLE DATA PATTERN TEST

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15=1 OR UP:...HALT
SW14=1 OR UP:...SCOPE LOOP
SW13=1 OR UP:...INHIBIT PRINT OUT
SW12=1 OR UP:...INHIBIT TRACE TRAPPING
SW11=1 OR UP:...INHIBIT SUB-PROGRAM ITERATION
(NOTE THAT IF SW11 IS SET, THE CARD COUNT WILL BE ALTERED, CAUSING FAILURES IN THE DATA TEST SECTION)

SW07=1 OR UP:...LOOP THRU THE INSTRUCTION TEST PORTION
(NOTE THAT THE PROGRAM MAY HANG LEGITIMATELY WHEN THE INPUT HOPPER GOES EMPTY IF SW7 IS SET)
SW06=1 OR UP...RETURN TO THE BEGINNING OF THE INSTRUCTION TEST
WHEN COUNTING FROM ONE DECK TO ANOTHER
SW5=1 OR UP...HALT BETWEEN TEST DECKS
(SEE 5.2.1 FOR EXPLANATION OF SW5=0)
SW5=1 OR UP...RUN THE PUNCHED BINARY TEST DECK (UNLESS
SW03 IS SET)
SW03=1 OR UP...RUN THE MARKSENSE BINARY TEST DECK
CRL1 diagnostic Test

ABSTRACT

This test is to be used as a card reader diagnostic for the PDP-11 with the CRL1 card reader. It tests all logic functions of the card reader and includes an exerciser for alphanumeric and binary test decks. A separate starting address allows the error sensing functions of the CORDIC or Documentation Reader to be checked. Another starting address tests special decks which have all columns and cards punched identically, to aid in diagnosing special problems.

REQUIREMENTS

PDP-11
CRL1 Card Reader

STORAGE = M = 15K32

LOADING = Absolute Loader

EXECUTION TIME - Depends on test being run. Easily monitored by watching the cards feed through the reader, a bell will ring.

STARTING PROCEDURE - Load one test deck in the card reader input hopper.
    Press motor start and read start.
    Set switch register to starting address.
    Load Address.
    Set switches all down.
    Press start.
    When the input hopper is empty the program will hang waiting for an interrupt from the card reader. Load one or more test decks into the input hopper. Pressing "MOTOR START" and "READ START" on the card reader should cause program execution to resume. This entire sequence is necessary to run the full test on the card reader.

PRINTOUTS - No

SWITCH REGISTER OPTIONS - Yes

SW15 = HALT ON ERROR
SW14 = STOP LOOP
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT TRACE TRAP
SW11 = INHIBIT SUBPROGRAM ITERATION

SW7 = LOOP THRU INST, TEST
SW6 = RETURN TO BEGINNING OF TEST
SW5 = HALT BETWEEN TEST DECKS
SW4 = RUN BINARY TEST DECK
COMMENTS - Note that certain switch register settings may cause errors to occur although the reader is functioning. See the document (Section 4.1) for description of these effects.
MAINDEC-11-D9A-

DC11 Off Line Tests

ABSTRACT

Two separate diagnostic programs are provided for the DC11 (Asynchronous Modem Interface), MAINDEC-11-D9A- (DC-11 Off Line Tests) and MAINDEC-11-D9B- (DC-11 On Line Tests); The Off Line Tests test all DC11 Tonic and may be used to individually test up to 16 DC-11S. The off line tests do not require the use of a modem; however, a special jumper connector is required. The on line tests are essentially data reliability tests requiring the use of modems and a suitable terminal device; available tests are:

PRG0 = Input/Output logic tests
PRG1 = Transmitter scope loop
PRG2 = Receiver scope loop
PRG3 = Single character maint, mode data test
PRG4 = Special binary countmant, mode data test

REQUIREMENTS

PDP-11
DC11
Special jumper connector (see DC11 Maintenance Manual for detailed description)

STORAGE = All of 4K except area reserved for the bootstrap and absolute loaders

LOADING = Absolute Loader

STARTING PROCEDURE = Start and Restart at 20B

EXECUTION TIME = 4 Min; (No Iterations)

PRINTOUTS = No

SWITCH REGISTER OPTIONS = Yes

SW0 = 6 = ROUTINE TO BE RUN
SW8 = DISABLE STALL MODE
SW9 = LOOP SELECTED ROUTINE
SW10 = HALT AT END OF PROGRAM
SW11 = INHIBIT ITERATION
SW13 = INHIBIT PRINTOUT
SW14 = SCOPE
SW15 = HALT ON ERROR
MAINDEC-11-D98

DC11 On Line Tests

ABSTRACT

Two separate diagnostic programs are provided for the DC-11 (Asynchronous Modem Interface), MAINDEC-11-D9A= (DC-11 Off Line Tests) and MAINDEC-11-D9B= (DC-11 On Line Tests). The Off Line Tests test all DC11 I/O and may be used to individually test up to 16 DC-11's. The Off Line Tests do not require the use of a modem, however, a special jumper connector is required. The On Line tests are essentially data reliability tests requiring the use of modems and a suitable terminal device.

REQUIREMENTS

PDP-11
DC11 (s)

STORAGE - This program uses all of 4K except that area reserved for the bootstrap and absolute loaders.

LOADING - Absolute Loader

EXECUTION TIME - Dependent on baud rate selected in tests (2 min, 110 Baud);

STARTING PROCEDURE - Start and Restart at 20%

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT TRACE TRAP
SW11 = INHIBIT ITERATION
DH11 Static Logic Test

ABSTRACT

The DH11 static logic test is designed to provide a means for testing the correct function of all read/write bits in the following DH11 registers:

- DH11 system control register
- DH11 line parameter register
- DH11 break control register
- DH11 silo status register

In addition, tests are provided to check the function of those bits that are read only in maintenance mode. Also provided are tests of register addressability and of the function of master clear.

The diagnostic has been written so that the testing of each function is contained in an individual test loop.

REQUIREMENTS

- PDP-11 family standard computer with 4KW of memory
- ASR-33 teletype or equivalent
- DH11 asynchronous multiplier
- DH11 maintenance card installed

STORAGE = Programs loaded into 4KW of memory

LOADING = Absolute Loader

EXECUTION TIME = 1 minute per device

STARTING PROCEDURE = start at 200

RESTART at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS:

- SW15 = HALT ON ERROR
- SW14 = LOOP ON CURRENT TEST
- SW13 = SUPPRESS ERROR TYPEOUT
- SW11 = INHIBIT ITERATIONS
- SW10 = ESCAPE TO NEXT TEST ON ERROR
- SW09 = FREEZE VARIABLE PARAMETER IN CURRENT TEST
- SW01 = START PROGRAM AT SELECTED TEST
- SW00 = CHANGE PARAMETERS AT PROGRAM RESTART
DH11 Memory Test

ABSTRACT

The DH11 memory test is a test of the BYTE count and bus address memories of the DH11. Each memory is tested for addressability and data read/write capability.

Requirements

- PDP-11 family standard computer with 4KW of memory
- ASR-33 teletype or equivalent
- DH11 asynchronous multiplexer
- DH11 maintenance card installed

STORAGE = program loads into 4KW of memory

LOADING = Absolute Loader

EXECUTION TIME = Less than 30 minutes

STARTING PROCEDURE = start at 200
                        restart at 2000

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = LOOP ON CURRENT TEST
SW13 = SUPPRESS ERROR TYPEOUT
SW11 = INHIBIT ITERATIONS
SW10 = ESCAPE TO NEXT TEST ON ERROR
SW09 = FREEZE VARIABLE PARAMETER IN CURRENT TEST
SW01 = START PROGRAM AT SELECTED TEST
SW00 = CHANGE PARAMETERS AT PROGRAM RESTART
ABSTRACT

The DH11 transmitter and receiver logic test checks the basic transmitter and receiver functions. Functions tested include interrupts, operation of transmitter NPR logic, and operation of receiver silicon logic.

REQUIREMENTS

- PDP-11 family standard computer with 4KW of memory
- ASR-33 teletype or equivalent
- DH11 asynchronous multiplexer
- DMH1 maintenance card installed

STORAGE = program loads into 4KW of memory

LOADING = Absolute Loader

EXECUTION TIME = 1 minute per device

STARTING PROCEDURE = start at 200
    restart at 2000

PRINTOUTS = yes

SWITCH REGISTER OPTIONS = yes

SW15 = HALT ON ERROR
SW14 = LOOP ON CURRENT TEST
SW13 = SUPPRESS ERROR TYPEOUT
SW11 = INHIBIT ITERATIONS
SW10 = ESCAPE TO NEXT TEST ON ERROR
SW09 = FREEZE VARIABLE PARAMETER IN CURRENT TEST
SW08 = START PROGRAM AT SELECTED TEST
SW00 = CHANGE PARAMETERS AT PROGRAM RESTART
DH11 Speed Selection Logic Test

ABSTRACT

The DH11 speed selection logic test verifies that the speed selection functions of the line parameter register operate properly for each transmitter and receiver line. Transmitter timing is checked first and then receiver timing is tested. The program uses a relative timing comparison to determine if line speed selection is correct.

NOTE:
The external clock functions (speed codes 16 and 17) are not tested.

REQUIREMENTS

- PDP-11 family standard computer with 4KW of memory
- ASR-33 teletype or equivalent
- DH11 asynchronous multiplexer
- CM11 maintenance card installed

STORAGE - program loads into 4KW of memory

LOADING - Absolute Loader

EXECUTION TIME - Less than 30 minutes per device

STARTING PROCEDURE - start at 20M
restart at 2000

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

- SW15 = HALT ON ERROR
- SW14 = LOOP ON CURRENT TEST
- SW13 = SUPPRESS ERROR TYPEOUT
- SW11 = INHIBIT ITERATIONS
- SW10 = ESCAPE TO NEXT TEST ON ERROR
- SW9 = FREEZE VARIABLE PARAMETER IN CURRENT TEST
- SW8 = START PROGRAM AT SELECTED TEST
- SW7 = CHANGE PARAMETERS AT PROGRAM RESTART
DH11 Character Length and Basic Data Test

ABSTRACT

The DH11 character length and basic data test verifies that character length can be selected correctly on each line and that the correct line number and character status are received on each line selected for transmission.

REQUIREMENTS

PDP-11 family standard computer with 4KW of memory
ASR-33 teletype or equivalent
DH11 asynchronous multiplexer
DH11 maintenance card installed

STORAGE - Program loads into 4KW of memory

LOADING - Absolute Loader

EXECUTION TIME -

STARTING PROCEDURE - starts at 200
                        restarts at 200

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15 = HALT ON ERROR
SW14 = LOOP ON CURRENT TEST
SW13 = SUPPRESS ERROR TYPEOUT
SW11 = INHIBIT ITERATIONS
SW10 = ESCAPE TO NEXT TEST ON ERROR
SW9 = FREEZE VARIABLE PARAMETER IN CURRENT TEST
SW8 = START PROGRAM AT SELECTED TEST
SW0 = CHANGE PARAMETERS AT PROGRAM RESTART
DH11 Single Line Data Test

The DH11 single line data test verifies that all characters (0-377) each line can transmit and receive at all speeds (8 bits per character) and all character lengths (at a speed of 9600 baud).

REQUIREMENTS

- PDP-11 family standard computer with 4KW of memory
- ASR33 teletype or equivalent
- DH11 asynchronous multiplexer
- DH11 maintenance card installed

STORAGE - program loads into 4KW of memory

LOADING - Absolute Loader

EXECUTION TIME = 54 minutes per device

STARTING PROCEDURE - start at 2000
     restart at 2000

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

- SW15 = HALT ON ERROR
- SW14 = LOOP ON CURRENT TEST
- SW13 = SUPPRESS ERROR TYPEOUT
- SW11 = INHIBIT ITERATIONS
- SW10 = ESCAPE TO NEXT TEST ON ERROR
- SW09 = FREEZE VARIABLE PARAMETER IN CURRENT TEST
- SW01 = START PROGRAM AT SELECTED TEST
- SW00 = CHANGE PARAMETERS AT PROGRAM RESTART
DH11 multiline Data Test

ABSTRACT
The DH11 multiline data test transmits binary count patterns on all 16 lines simultaneously.

REQUIREMENTS
- PDP-11 family standard computer with 4KW of memory
- ASR-33 teletype or equivalent
- DH11 asynchronous multiplexer
- DM11 maintenance card installed

STORAGE - Program loads into 4KW of memory

LOADING - Absolute Loader

EXECUTION TIME - 5 minutes per device

STARTING PROCEDURE - start at 200
                 restart at 2000

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

- SW15 = HALT ON ERROR
- SW14 = LOOP ON CURRENT TEST
- SW13 = SUPPRESS ERROR TYPEOUT
- SW11 = INHIBIT ITERATIONS
- SW10 = ESCAPE TO NEXT TEST ON ERROR
- SW09 = FREEZE VARIABLE PARAMETER IN CURRENT TEST
- SW01 = START PROGRAM AT SELECTED TEST
- SW00 = CHANGE PARAMETERS AT PROGRAM RESTART
DH11 Auto-echo Test

ABSTRACT

The DH11 auto-echo logic test verifies the functions of the auto-echo logic of the DH11 transmitter and receiver.

REQUIREMENTS

- PDP-11 family standard computer with 4KW of memory
- ASR-33 teletype or equivalent
- DH11 asynchronous multiplexer
- DH11 maintenance card installed

STORAGE = Program loads into 4KW of memory

LOADING = Absolute Loader

EXECUTION TIME = In response to user command

STARTING PROCEDURE = start at 200
                         restart at 2000

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

- SW15 = Halt on Error
- SW14 = Loop on Current Test
- SW13 = Suppress Error Typeout
- SW11 = Inhibit Iterations
- SW10 = Escape to Next Test on Error
- SW09 = Freeze Variable Parameter in Current Test
- SW01 = Start Program at Selected Test
- SW02 = Change Parameters at Program Restart
DHIII Break and Half-Duplex Test

ABSTRACT

Checks the break control logic of the DHIII and verifies that the uarts receive only one break character on a given line no matter how long break is asserted. The test also verifies that no characters are received on a line if the half duplex function for that line is selected.

REQUIREMENTS

PDP-11 family standard computer with 4KW of memory
ASR-33 teletype or equivalent
DH11 asynchronous multiplexer
DM11 maintenance card installed

STORAGE - program loads into 4KW of memory
LOADING - Absolute Loader
EXECUTION TIME -

STARTING PROCEDURE - start at 220
                       restart at 2000

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15 = HALT ON ERROR
SW14 = LOOP ON CURRENT TEST
SW13 = SUPPRESS ERROR TYPEOUT
SW11 = INHIBIT ITERATIONS
SW10 = ESCAPE TO NEXT TEST ON ERROR
SW09 = FREEZE VARIABLE PARAMETER IN CURRENT TEST
SW01 = START PROGRAM AT SELECTED TEST
SW00 = CHANGE PARAMETERS AT PROGRAM RESTART
DH11 GTP/CTP Overlay

Abstract

This program runs as a foreground (interrupting) overlay, supported by CTP or GTP test program. This program tests the DH11 communications option(s) in maintenance mode at 9,6 k Baud (burst mode). This program may be executed in monitor mode (test all devices on system) or as a stand alone module. Refer to stand alone execution annotation for operational procedures and actions.

REQUIREMENTS

PDP-11 STANDARD COMPUTER 12K OF MEMORY (MINIMUM) CONSOLE TTY
DH11(S)

STORAGE = 12K

LOADING

EXECUTION TIME = Under 0.3 minutes.

STARTING PROCEDURE = 202

PRINTOUTS = Same as GTP and CTP

SWITCH REGISTER OPTIONS = same as GTP and CTP
DEJ1 Logic Tests

This program tests the logic of the DEJ1 asynchronous multiplexer in maintenance mode. It checks that all the control registers function properly, that interrupts occur at the right level, and that data can be transmitted and received correctly. This program does not test that the input and output lead connections are functional; (See MAINDEC-11-DZDJA, programs 2 and 3 for on-line testing). The program should be run for at least 2 passes with all switches down.

REQUIREMENTS

PDP-11 standard computer with console teletype up to 8 DEJ1 asynchronous multiplexer.

STORAGE = \( Z = 17500 \)

LOADING = Absolute Loader

EXECUTION TIME = 15 seconds to 3 1/2 hours = Bell on pass complete

STARTING PROCEDURE = Start at 200
 Restart at 1000

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT TRACE TRAPPING
SW11 = INHIBIT ITERATIONS OF SUBTEST
SW10 = BELL ON ERROR
0 = BELL ON PASS COMPLETE
SW09 = LOOP ON ERROR
SW08 = LOOP ON TEST IN SW710
DJII Exerciser and Online Tests

ABSTRACT

This program consists of three sub-programs which exercise the DJII asynchronous multiplexer. Program 1 is an offline exerciser. Program 2 is an online exerciser which continuously transmits the test character received. Program 3 is an echo test.

REQUIREMENTS

PDP-11 standard computer with console teletype up to 8 DJII asynchronous multiplexers;

STORAGE = 2 - 17500

LOADING = Absolute Loader

EXECUTION TIME = 30 seconds per line

STARTING PROCEDURE = start at 200
                          restart at 1000

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 ... HALT ON ERROR
SW13 = 1 ... INHIBIT PRINTOUT
SW12 = 1 ... INHIBIT TRACE TRAPPING (prog. 1 only)
SW10 = 1 ... BELL ON ERROR
          0 ... BELL ON PASS COMPLETE (prog.1 only)
SW09 = 1 ... INHIBIT MAINTENANCE (prog. 1 online)
SW08 = 1 ... SELECT LINES FOR TEST

prog. 1 only

SW210 = 0 ... BINARY COUNT PATTERN
           1 ... "THE QUICK BROWN FOX"
           2 ... ALPHA-NUMERIC (40-127)
           3=7 ... NOT USED
DJII Master/Slave Exerciser

ABSTRACT

This program is designed to test the communications lines connected to a DJII asynchronous multiplexer. Each line of the DJII can be selected to act as either the "Master" line or the "Slave" line. A "Slave" line will simply echo every character it receives, regardless of the data. A "Master" line will transmit a fixed message and expects to receive the same message back. This allows for high throughout testing of a line which has this or a similar program controlling both ends. The two ends of a particular line can be:

1: on the same DJII
2: on two separate DJII's on the same processor
3: on DJII's on different processors or
4: on a DJII on one processor and another type asynchronous device on another processor with compatible software.

REQUIREMENTS

POP-11 standard computer with console teletype up to 8 DJII asynchronous multiplexers,

STORAGE = 0 = 17500

LOADING = Absolute Loader

EXECUTION TIME = 1/2 minute = Bell on pass complete

STARTING PROCEDURE = start at 200

RESTART AT 1000

PRINTOUTS = YES

SWITCH REGISTER OPTIONS = YES

SW15 ,.. HALT ON ERROR
SW13 ,.. INHIBIT PRINTOUT
SW12 ,.. INHIBIT TRACE TRAPPING
SW10 ,.. BELL ON ERROR

SW212 = 0 ;: BINARY COUNT PATTERN
1 ,.. "THE QUICK BROWN FOX;"
2 ,.. ALPHANUMERIC (40=177)
3=7 ,.. NOT USED
DJII overlay to GTP

ABSTRACT

This overlay allows the DJII to be tested with version of GTP that does not include the DJII. This program has been assembled with the DJII at address 760020 and vector 300. These locations are at the end of the program and/or operator action note.

REQUIREMENTS

PDP11 standard computer
12K of memory
DJII

STORAGE - uses memory from 40000 to 42000

LOADING - Absolute Loader

EXECUTION TIME - see GTP

STARTING PROCEDURE - Starting at 200 all switches should be down or zero. Will select only the DJII to select other devices refer to the GTP writeup.

PRINTOUTS - Same as GTP/CTP

SWITCH REGISTER OPTIONS - Same as GTP/CTP
ABSTRACT

Two separate diagnostic programs are provided for the DL11E (Asynchronous Modem Interface), MAINDEC-II-DZDLA-A (DL11E off line tests) and MAINDEC-II-DZDLA-A (DL11-E on line tests). The off line test tests all DL11-E logic. The off line tests do not require the use of a modem. However, a special jumper connector H315 is required. The on line tests are essentially data reliability tests requiring the use of modems and a suitable terminal device.

The DL11-C and DL11-D can also be tested with this off line test, these are both tested in maintenance mode and only those tests marked C,D in the test number are executed. In order to test C and D versions it is necessary to modify the table at location 1370 according to the instructions contained there.

Tests which are not executed for DL11-C,D can be performed by using the select switch option (SR9). Test 56 is a data test which can be used for cable testing DL11-D's. Warning: A failure in this test may occur due to a split baud rate of RCVTR/TXVTR.

This document describes the off line tests.

The available tests are:

Progs:  1  Input/output logic tests
       2  Transmitter scope loop
       3  Receiver scope loop
       4  Single character multi mode data test

REQUIREMENTS

PDP-11, DL11-E or DL11-C or DL11-D, Special Jumper connector H315 if DL11-E

STORAGE: Program uses all of core (4K) except that area reserved for the bootstrap and absolute loaders.

LOADING: Absolute Loader

EXECUTION TIME: Dependent on number of DL11's in system.

STARTING PROCEDURE: Load address at 00000000

PRINTOUTS: Yes

SWITCH REGISTER OPTIONS: Yes

SR 0 = 6 Routine to be run (if enabled by SR9)
SR 7 = disable stall mode
SR 9  LOOP SELECTED ROUTINE
SR10  HALT AT END OF CURRENT TEST
SR11  INHIBIT ITERATION
SR12  SELECT LINE NUMBER AND LOCK ON IT
SR13  INHIBIT PRINTOUT
SR14  SCOPE
SR15  HALT ON ERROR
NEW NUMBER = DJDLB

DL11E On Line Tests

ABSTRACT

Two separate diagnostic programs are provided for the DL11E (asynchronous line interface), MAINDEC=DL11E (DL11E Off Line Tests) and MAINDEC=DL11E (DL11E On Line Tests); The Off Line Tests test all DL11E I/O and may be used to individually test up to 31 DL11E's. The Off Line Tests do not require the use of a modem however, a special jumper connector is required. The On Line Tests are essentially data reliability tests requiring the use of modems and a suitable terminal device.

This document describes the On Line Tests; The available tests are:

PRG0 Single Character Line Mode Data Test
PRG1 Binary Count Line Mode Data Test
PRG2 Message Transmit Only W/W/O Parity
PRG4 Message Transmit (Serial) Only W/W/O Parity

REQUIREMENTS:

PDP=11 System
DL11E(s)
Modem type 103 or 202 or equivalent

STORAGE = All of core (4K)

LOADING = Absolute Loader

EXECUTION TIME

STARTING PROCEDURE

200 = Normal Start
204 = Remap devices present and Restart
218 = Modify device addresses if non standard Instructions to do this are typed out.

PRINTOUTS = No

SWITCH REGISTER OPTIONS = No
ABSTRACT

Two separate diagnostic programs are provided for testing the DM11 (asynchronous data multiplexer): MAINDEC-11DZDM (DM11 logic tests), and MAINDEC-11DZDM (DM11 multiple line data tests) the logic tests individually test each of the 16 DM11 lines and all common logic. The multiple line data tests run several lines concurrently and are used to test line interaction and data transmission/reception reliability. This document describes the multiple line data test.

The available tests are:

PRG0 = Data Tests
PRG1 = Data Test (all lines simultaneously)
PRG2 = Transmit to Terminals
PRG3 = Echo Received Data
PRG4 = Transmit Message

REQUIREMENTS

PDP-11
DM11
Jumers connecting 16 transmitters to their respective receivers
Terminals (if available)
DM11 Distribution Panel

STORAGE - Uses all of core (4K) except that area reserved for the loaders.

LOADING - Absolute Leader

EXECUTION TIME = 10 min. (110 Baud) Single Iteration

STARTING PROCEDURE = Start and restart at 200

PRINTOUTS = No

SWITCH REGISTER OPTIONS = Yes

SW0-6 = ROUTINE TO BE RUN (IF ENABLED BY SW-9)
SW9 = LOOP SELECTED ROUTINE
SW11 = INHIBIT ITERATION (DO EACH ROUTINE ONCE)
SW13 = INHIBIT PRINTOUT
SW14 = SCOPE (LOOP ROUTINE)
SW15 = WAIT ON ERROR
MAINDEC-11-D9F

DM11 Logic Tests

ABSTRACT

Two separate diagnostic programs are provided for testing the DM11 (Asynchronous Data Multiplexer), MAINDEC-11-D9F (DM11 Logic Tests), and MAINDEC-11-D9G (DM11 Multiple Line Data Tests). The logic tests individually test each of the 16 DM11 lines and all common logic. The multiple line data tests run several lines concurrently and are used to test line interaction and data transmission/reception reliability. This document describes the logic tests. The tests are:

PRG0 = Logic Test
PRG1 = Transmitter Scope Loop
PRG2 = Transmit/Receive Scope Loop

REQUIREMENTS

PDP-11
DM11
Jumpers connecting 16 transmitters to their respective receivers.

STORAGE = All of 4K except that area reserved for the loaders;

LOADING = Absolute Loader

EXECUTION TIME = 20 min. (110 Baud) Single Iteration;

STARTING PROCEDURE = Start and Restart at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW9 = ROUTINE TO BE RUN
SW8 = RING BELL ON ERROR
SW9 = LOOP SELECTED ROUTINE
SW11 = INHIBIT ITERATION
SW13 = INHIBIT PRINTOUT
SW14 = SCOPE
SW15 = HALT ON ERROR
MAINDEC-11-D9K

ABSTRACT

This program is a test of the DM11-BB Modem Control Multiplexer. The program is divided into functional test groups as follows:

Group 01: All Line Scanner and Line Multiplexer functions are tested using the 4861 Test Connector.
Group 11: A single line is tested using the modem cable and a DC11 Test Connector.
Group 21: Connect-01|scnnect Test for 103A Modems.
Group 31: Connect-01|scnnect Test for 2020 Modems.

REQUIREMENTS

PDP=11
DM11-BB

STORAGE - The routines use locations 0000-16600

LOADING - Absolute Loader

EXECUTION TIME - User dependent

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15 = 1 ; HALT ON ERROR
SW14 = 1 ; LOOP ON CURRENT TEST
SW13 = 1 ; SUPPRESS ERROR TYPEOUT
SW12 = 1 ; SUPPRESS TRACE TRAPPING
SW11 = 1 ; SUPPRESS ITERATIONS
SW10 = 1 ; ESCAPE TO NEXT TEST ON ERROR
MAINDEC-11-D9J

ABSTRACT

The DN11 Diagnostic consists of two parts: The first is a series of incremental tests which statically check out the DN11 using the maintenance mode. The second part is the on-line exerciser which allows the user to dial any given phone in his dialing range. Upon the completion of the call the program will terminate the call and try again.

REQUIREMENTS

PDP-11
DN11 (max. No. 4 used at one any time)

STORAGE = The routines use the first 3K of core.

LOADING = Absolute Loader

EXECUTION TIME = 15 sec.

STARTING PROCEDURE = at 220

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = No
**MAINDEC-11-DP11A**

**DP11A Synchronous Line Unit**

**ABSTRACT**

This MAINDEC consists of two programs. First, a DP11A exerciser which is run with a test connector (DB25S) in place of the modem. This test is run under a simulated (software) clock that runs at approximately 56KHz. Second, there is the principle diagnostic for the DP11. This program runs in the maintenance mode with the DC01R-25 cable removed from the system unit. This test provides complete diagnostics for all character modes of the DP11.

**REQUIREMENTS**

- PDP-11
- DB25S Test Connector (If cable test is to be run)
- DP11A/DP11DA

**STORAGE** - 4K of memory

**LOADING** - Absolute Loader

**EXECUTION TIME** - 4 min; Bell will ring

**STARTING PROCEDURE**

Start at 200 for maintenance mode diagnostics (Cable must be pulled from the system unit).
Start at 210 for DC01R-25 cable test (DB25S test connector must be plugged in).

**PRINTOUTS** - Yes

**SWITCH REGISTER OPTIONS** - Yes

- SW15 = Halt on Error
- SW14 = Scope Loop
- SW13 = Inhibit Printout
- SW12 = Inhibit Iteration
MAINDEC=11-ORE

DP11 Online Test - For In-House Use Only

ABSTRACT

This "Online Test" is primarily for confidence building in the DP11A as a product.

REQUIREMENTS

PDP=11
DP11A

STORAGE = 4K

LOADING = Absolute Loader

EXECUTION TIME = 5 min; Bell will ring

STARTING PROCEDURE - Start and Restart at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE (NOT USED)
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT ITERATION (NOT USED)
DR11A Device Register Test

ABSTRACT

This is a logic test of the DR11A. For this test to operate, a special maintenance module must be connected (M982). This test will check up to 32 sequential DR11A's.

REQUIREMENTS

POP=11
DR11A
M982 for each DR11A

STORAGE = N = 50%0

LOADING = Absolute Loader

EXECUTION TIME = About 2 min., for each DR11A = Bell will ring at end of pass,

STARTING PROCEDURE = Start at 200

- The low byte of the SR should contain the first DR11A vector address.

PRINTOUT = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = Halt on error
SW14 = Scope loop
SW13 = Inhibit printout
SW12 = Inhibit trace trapping
SW11 = Inhibit iteration loop

SW8 to 0 will be used as vector address if not zero, (DR11A has floating vectors)

The assigned sequence for floating vectors are:

1. Starting at 300 all DC11's will be assigned,
2. Then any KL11 called for (VT55, VT56, LC11)
3. Then any DP11 called for,
4. Then any DM11A called for,
5. Then any DM11 called for,
6. Then any DM11BR called for,
7. Then any DR11A called for,

The DR11A device address will be assigned in the user area of 767776 to 764270. The assignment of address will start at the high address limit and proceed downward; users and special systems should start
their assignment of special devices at the low address limit and work up:

<table>
<thead>
<tr>
<th>Address Range</th>
<th>DR11A #</th>
</tr>
</thead>
<tbody>
<tr>
<td>767776 to 767783</td>
<td>#0</td>
</tr>
<tr>
<td>767756 to 767760</td>
<td>#1</td>
</tr>
<tr>
<td>767736 to 767743</td>
<td>#7</td>
</tr>
<tr>
<td>767676 to 767683</td>
<td>#15</td>
</tr>
</tbody>
</table>
MAINDEC=11-DR1B

DR11B = DDP=11 General NPR Interface

ABSTRACT

This is a logic test of the "NPR General Interface" - DR11B. There is a special maintenance feature that allows testing of NPRS without a customers device attached.

REQUIREMENTS

    DDP=11
    DR11B

STORAGE = 0 = 15000

LOADING = Absolute Loader

EXECUTION TIME = 28 sec. = Bell will ring

STARTING PROCEDURE = Start at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

    SW15 = HALT ON ERROR
    SW14 = SCOPE LOOP
    SW13 = INHIBIT PRINTOUT
    SW12 = INHIBIT TRACE TRAP
    SW11 = INHIBIT ITERATIONS
ABSTRACT

This is a routine test of the DR11C. For this test to operate a special maintenance cable must be connected (BO8R). This test will check up to 32 sequential DR11C's.

REQUIREMENTS

PDP-11 standard computer
DR11C
BO8R for each DR11C

STORAGE - The routine uses memory from 0000 to 5700.

LOADING - Absolute Loader.

EXECUTION TIME - For each DR11C about 1 min.

STARTING PROCEDURE - Starting at SA 200 all switches should be down to zero, (If not zero, bit 0 to 8 will be starting vector)

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

\[ SW_{15} = 1 \text{ or up; } \text{HALT ON ERROR} \]
\[ SW_{14} = 1 \text{ or up; } \text{SCOPE LOOP} \]
\[ SW_{13} = 1 \text{ or up; } \text{INHIBIT PRINTOUT} \]
\[ SW_{12} = 1 \text{ or up; } \text{INHIBIT TRACE TRAPPING} \]
\[ SW_{11} = 1 \text{ or up; } \text{INHIBIT ITERATION LOOP} \]
\[ SW_{10} = 1 \text{ or up; } \text{INHIBIT ADVANCING TO NEXT DR11C} \]
\[ SW_{08} = 0 \text{ will be used as vector address if not zero;} \]
\[ (\text{DR11A has floating vectors}) \]

The assigned sequence for floating vectors are:

1. Starting at 300 all DC11/s will be assigned.
2. Then any KL11/CL11A called for (VT05, VT06, LC11)
3. Then any DR11 called for,
4. Then any DM11A called for;
5. Then any DM11 called for,
6. Then any DM11BB called for,
7. Then any DR11A called for;
8. Then any DR11C called for;

The DR11A device address will be assigned in the user area of 767776 to 7649%0. The assignment of address will start at the high address limit and proceed downward. Users and special systems should start their assignment of special devices at the low address limit and work
<table>
<thead>
<tr>
<th>DC11C #2</th>
<th>DR12C #1</th>
<th>DR12C #7</th>
<th>DR12C #15</th>
</tr>
</thead>
<tbody>
<tr>
<td>767796 to 767782</td>
<td>767742 to 767742</td>
<td>767786 to 767782</td>
<td>767696 to 767692</td>
</tr>
</tbody>
</table>
DT11 DIAGNOSTIC

ABSTRACT

This program is designed to test all the functions of the DT11-A and B bus switches which can be tested without assuming specific devices to be on the switched bus. A great deal of operator intervention is required due to the dual processor nature of the switch and the various modes of operation controlled by two two-position switches. A routine is also provided which allows the operator to scope the various shots for adjustment purposes.

REQUIREMENTS

- POP-11 = 6K of memory
- DT11-A or B bus switches
- STORAGE = The first 6K of memory
- LOADING = Absolute Loader
- EXECUTION TIME = Operator dependent. When done, the program prints out "end of pass".

STARTING PROCEDURE = Start at 220 for DT11-B
Start at 260 for DT11-A

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 OR UP ;; HALT ON ERROR
SW14 = 1 OR UP ;; SCOPE LOOP
SW13 = 1 OR UP ;; INHIBIT ERROR PRINTOUT IF SCOPE LOOP IS REQUESTED
SW12 = 1 OR UP ;; INHIBIT TRACE TRAPPING
SW11 = 1 OR UP ;; INHIBIT SUB-PROGRAM ITERATION
SW10 = 1 OR UP ;; INHIBIT POWER FAIL TESTING
SW09 = 1 OR UP ;; INHIBIT MOST SWITCHED BUS POWER FAIL TESTING
(ONLY CHECK TO SEE THAT AC LO sets)

SW08 = 1 OR UP ;; INHIBIT ALL SWITCHED BUS POWER FAIL TESTING
DX11B Diagnostic (maintenance clock 1)

ABSTRACT

The function of the DX11P diagnostics is to verify that the DX11B implements the functional flow diagrams illustrated in the DX11B print set. The DX11 diagnostic package consists of four tapes:

1. D2DXA-TRVY maintenance clock 1
2. D2DXF-TRVY maintenance clock 2
3. D2DXA-TRVY dx diagnostic exerciser
4. D2DXF-TRVY online-maintenance-clock exerciser

The diagnostics were divided into four tapes because of the 8K word memory limit required to support minimum systems and for functional safeguards. It was felt that safeguards should be taken to ensure that no one inadvertently ran the online-maintenance-cable exerciser while connected online to IBM. It was also felt that the functional separation of tests would facilitate adaption to ACTII and DNP testing. There are also two other MAINDEC's supported by diagnostics that run the DX11B:

1. Communication test program (CTP)
2. General test program (CTP) with DX overlay

Both of these tests operate in the maintenance mode and were designed to detect unknown device interaction problems; additionally, CTP was a "responder" mode so that interaction problems may be detected while running online.

REQUIREMENTS

PDP11 (minimum 8K words memory)
ASR33 (or equivalent)
DX11B
Maintenance cables (or equivalent)
If online-maintenance-cabled exerciser is to be run.

STORAGE - Programs load in 8K of memory

LOADING

EXECUTION TIME - In general they run 10 to 20 minutes

STARTING PROCEDURE - 270

PRINTOUTS

SWITCH REGISTER OPTIONS - Yes
SR 15...HALT ON ERROR
SR 14...SCOPE ON TEST OR ERROR
SR 13...INHIBIT PRINTING
SR 12...TYPE SHORT ERROR REPORT
SR 11...INHIBIT INTERACTIONS
SR 10...CONTROL MAINTENANCE CLOCK (MAINT, CLK; TEST ONLY)
SR  9...DDT TRAP ON ERROR
SR  8...MULTIPLEXER CHANNEL
SR  1...SET BUSY ENABLE
DX11 IBM END OVERLAY TO GTP

ABSTRACT

The principal reason for the existence of this overlay is to measure DX11 system's latency and interaction. The DX11 uses special maintenance logic to cause fast NPR's. This is the fast service-in, service-out and causes data to be transferred at rates up to the maximum allowable.

The transfer is implemented by loading an IBM channel simulator register with a write data pattern. Then the DX base address and byte count registers are initialized and the DX is to go, when the transfer is complete, the DX interrupts and checks for NPRTO and data errors.

REQUIREMENTS

1. TOP11 system (12K memory)
2. High Speed Reader
3. Console Terminal

STORAGE = Program loads in the 12th K bank

LOADING =

EXECUTION TIME = End of mass is determined by the host program GTP.

STARTING PROCEDURE = Ref. GTP documentation on overlays,

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

At location DXINIT the program halts and expects the DX11'S vector address to be in the switches when "continue" is pressed.
DX11B DIAGNOSTIC (MAINTENANCE CLOCK 2)

ABSTRACT

The function of the DX11B diagnostics is to verify that the DX11B implements the functional flow diagrams illustrated in the DX11B print set. The DX11 diagnostic package consists of four tapes:

1. ODXAX-[rev] maintenance clock 1
2. ODXAX-[rev] maintenance clock 2
3. ODXAX-[rev] DX diagnostic exerciser
4. ODXAX-[rev] online-maintenance-clock exerciser

The diagnostics were divided into four tapes because of the 8K word memory limit required to support minimum systems for functional safeguards. It was felt that safeguards should be taken to ensure that no one inadvertently ran the online-maintenance-cable exerciser while connected online to IBM. It was also felt that the functional separation of tests would facilitate adaption to ACT11 and DDP testing. There are also two other MAINDEC's supported by diagnostics that run the DX11B:

1. Communication Test Program (CTP)
2. General Test Program (CTP) with DX overlay

Both of these tests operate in the maintenance mode and were designed to detect unusual device interaction problems. Additionally CTP has a "responder" mode so that interaction problems may be detected while running online.

REQUIREMENTS

PUP11 (minimum 8K words memory)
ASR=33 (or equivalent)
DX11B
maintenance cables (or equivalent)
If online-maintenance-cabled exerciser is to be run.

STORAGE = 8K

LOADING =

EXECUTION TIME = In general they run 10 to 20 minutes

STARTING PROCEDURE = 200

SWITCH REGISTER OPTIONS = Yes

SR 15...HALT ON ERROR
SR 14...SCOPE ON TEST OR ERROR
SR 13...INHIBIT PRINTING
SR 12...TYPE SHORT ERROR REPORT
SR 11...INHIBIT INTERACTIONS
SR 10...CONTROL MAINTENANCE CLOCK (MAINT, CLK, TEST ONLY)
SR 9...DOT TRAP ON ERROR
SR 8...MULTIPLEXER CHANNEL
SR 7...SET BUSY ENABLE
DX11B DIAGNOSTIC (OFF LINE EXERCISER)

ABSTRACT

The function of the DX11B diagnostics is to verify that the DX11B implements the functional flow diagrams illustrated in the DX11B print set. The Dx11 diagnostic package consists of four tapes:

1. 82DXA-[rev] maintenance clock 1
2. 82DXF-[rev] maintenance clock 2
3. 82DXC-[rev] DX diagnostic exerciser
4. 82DXH-[rev] online-maintenance-clock exerciser

The diagnostics were divided into four tapes because of the 8K word memory limit required to support minimum systems and for functional safeguards. It was felt that safeguards should be taken to ensure that no one inadvertently ran the online-maintenance-cable exerciser while connected online to IBM. It was also felt that the functional separation of tests would facilitate adoption to ACTII and DOP testing. There are also two other MAINDEC's supported by diagnostics that run the DX11B:

1. Communication Test Program (CTP)
2. General Test Program (GTP) with DX overlay

Both of these tests operate in the maintenance mode and were designed to detect unibus device interaction problems. Additionally CTP has a "responder" mode so that interaction problems may be detected while running online.

REQUIREMENTS

- POP11 (minimum 8K word memory)
- ASPe33 (or equivalent)
- DX113 maintenance cables (or equivalent)
- If online-maintenance-cable exerciser is to be run:

STORAGE = 8K

LOADING =

EXECUTION TIME = In general they run 10 to 22 minutes

STARTING PROCEDURE = 200

PRINTOUTS =

SWITCH REGISTER OPTIONS = Yes
SR 15...HALT ON ERROR
SR 14...SCOPE ON TEST OR ERROR
SR 13...INHIBIT PRINTING
SR 12...TYPE SHORT ERROR REPORT
SR 11...INHIBIT INTERACTIONS
SR 10...CONTROL MAINTENANCE CLOCK (MAINT,CLK,TEST ONLY)
SR 9...DIT TRAP ON ERROR
SR 8...MULTIPLEXER CHANNEL
SR 7...SET BUSY ENABLE
DX11B DIAGNOSTIC (ON LINE EXERCISER)

ABSTRACT

The function of the DX11B diagnostics is to verify that the DX11B implements the functional flow diagrams illustrated in the DX11B print set. The DX11 diagnostic package consists of four tapes:

1. ox11a-[rev] maintenance clock 1
2. ox11f-[rev] maintenance clock 2
3. ox11g-[rev] DX diagnostic exerciser
4. ox11h-[rev] online-maintenance-clock exerciser

The diagnostics were divided into four tapes because of the 8K word memory limit required to support minimum systems and for functional safeguards. It was felt that safeguards should be taken to ensure that no one inadvertently ran the online-maintenance-cable exerciser while connected online to IBM. It was also felt that the functional separation of tests would facilitate adaptation to ACT11 and DMP testing. There are also two other MAINDEC's supported by diagnostics that run the DX11B:

1. Communication Test Program (CTP)
2. General Test Program (GTP) with DX overlay

Both of these tests operate in the maintenance mode and were designed to detect unibus device interaction problems. Additionally CTP has a "responder" mode so that interaction problems may be detected while running online.

REQUIREMENTS

- POP11 (minimum 8K words memory)
- ASP#33 (or equivalent)
- DX11B
- Maintenance cables (or equivalent)

If online-maintenance-cabled exerciser is to be run.

STORAGE = 8K

LOADING =

EXECUTION TIME = in general they run 10 to 20 minutes

STARTING PROCEDURE = 200

PRINTOUTS =

SWITCH REGISTER OPTIONS = yes
SR 15...HALT ON ERROR
SR 14...SCOPE ON TEST OR ERROR
SR 13...INHIBIT PRINTING
SR 12...TYPE SHORT ERROR REPORT
SR 11...INHIBIT INTERACTIONS
SR 10...CONTROL MAINTENANCE CLOCK (MAINT, CLK, TEST ONLY)
SR  9...DDT TRAP ON ERROR
SR  8...MULTIPLEXER CHANNEL
SR  7...SET BUSY ENABLE
GT40 Instruction Test 1

ABSTRACT

This is a two part logic test of the alphahraphic terminal for this test the two maintenance switches will be used. This test is designed to test all functional registers and interrupt vector in the alphahraphic display control. This program does not type-out or display any messages. The program will only halt on an error:

REQUIREMENTS

STORAGE - Program used memory locations #515000 less than 4K of memory

LOADING - Absolute Loader

EXECUTION TIME - Subtest 1 takes approx. 1 second
Subtest 2 takes approx. 30 seconds

STARTING PROCEDURE - 270

PRINTOUTS - No

SWITCH REGISTER OPTIONS - YES

SW14 = SCOPE LOOP
GT40 Instruction Test II

ABSTRACT

This is a two part logic test of the alphanumeric terminal; for this test the two maintenance switch will not be used. This test is designed to test all functional registers and interrupt vector in the alphanumeric display control. The program will only halt on an error.

REQUIREMENTS

GT40 system (11/05, display processor and VT14 scope)

STORAGE - program used memory locations 1-15200 less than 4K of memory

LOADING - Absolute Loader

EXECUTION TIME - Subtest 1 takes approx. 15 seconds
                      Subtest 2 takes approx. 127 seconds

STARTING PROCEDURE - 200

PRINTOUTS - No

SWITCH REGISTER OPTIONS - Yes
                           SW14 = SCOPE LOOP
GT40 Visual Display Test with VR14 Display

ABSTRACT

This program contains a series of patterns that are used as aids in the alignment and adjustment of the GT40 display. For this test the maintenance switches are not used in normal position.

REQUIREMENTS

GT40 system with VR14 display scope

STORAGE = program used memory location 0-15020 less than 4K of memory

LOADING = Absolute Loader

EXECUTION TIME = NA

STARTING PROCEDURE = Start at 202

PRINTOUTS = No

SWITCH REGISTER OPTIONS = Yes
GT40 ROM Verify Test

ABSTRACT

The GT40 diagnostic program is written to be used as an aid to hardware debugging and maintenance of the GT40 ROM bootstrap loader. These programs may also be used as a data reliability test.

The available tests are:

- **PRG0**: Logic Tests
- **PRG1**: ROM data dump to the console teletype
- **PRG2**: Single ROM address read data loop

**REQUIREMENTS**

- GT40 Display processor with ROM bootstrap

**STORAGE**: This program uses memory locations 0=7000(8).

**LOADING**: Absolute Loader

**EXECUTION TIME** = PRG0 takes approx. 5 seconds per pass
- **PRG1**: N/A
- **PRG2**: N/A

**STARTING PROCEDURE** = 0200 Program 0; ROM logic test
- 0204 Program 1; ROM data dump on console TTY
- 0210 Program 2, single ROM read

**PRINTOUTS** = Yes

**SWITCH REGISTER OPTIONS** = Yes

- SW15 = HALT ON ERROR
- SW14 = SCOPE LOOP
- SW13 = INHIBIT PRINTOUT
- SW12 = NOT USED
- SW11 = INHIBIT ITERATIONS

SAME AS ALL Y972
GT40 Quick Verify

ABSTRACT

This program is a quick go-no-go test of the GT40 system. The purpose of this test is to quickly identify any problem in the system. The program will start the display and then initiate the communication line.

Two background tasks are executed, the first is a GT40 ROM verify test, the second task is a worse case noise test thru memory.

REQUIREMENTS

GT40 system (11/05, display processor and VR14 Scope) Modem test connector which connects data out to data in.

STORAGE - This program used memory locations 0-7720 less than 2K of memory

LOADING - Absolute Loader

EXECUTION TIME = 10 seconds

STARTING PROCEDURE = Start at 200

PRINTOUTS = No

SWITCH REGISTER OPTIONS = None
GT40 OVERLAY FOR GTP-11

ABSTRACT
This program is a quick go-no-go test of the GT40 system under GTP. The purpose of this test is to quickly identify any problems in the system; the program will start the display and the operator must verify the display pattern.

REQUIREMENTS
- GT40 system (11/05, display processor and VR14 scope) 12K of memory,

STORAGE = this program used memory locations 40200-45000 (less than 2K of memory).

LOADING =

EXECUTION TIME = LIKE GTP
STARTING PROCEDURE = LIKE GTP
PRINTOUTS = LIKE GTP

SWITCH REGISTER OPTIONS
- SK 1#1 INHIBIT GT-40 DISPLAY,
MAINDEC=11-DPS

KELI LOGIC TEST

ABSTRACT

This test is to be used as an EAE logic test for the PDP-11 with the EAE option. It tests all the functions of the EAE with specific number combinations.

REQUIREMENTS

PDP-11, KEL1A

STORAGE = 0 = 17200

LOADING = Absolute Loader

EXECUTION TIME = 40 sec. with all switches down
BELL will ring

STARTING PROCEDURE = Start and Restart at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT TRACE TRAP

NEW NUMBER =

SW11 = INHIBIT ITERATION LOOP
SW10 = I OR UP ... BELL ON ERROR
SW09 = DWN ... BELL ON PASS
SW08 = COMP.

SW07 = INHIBIT MULTI/DIV TEST
SW06 = INHIBIT SHIFT/NORM TEST
MAINDEC-11-DET-
KE11 EXERCISER

ABSTRACT
This test is to be used as an EAE exerciser for the PDP-11 with the EAE option; it tests the divide and multiply with random numbers.

REQUIREMENTS

PDP-11, KE11A

STORAGE = M = 6070

LOADING = Absolute Loader

EXECUTION TIME = 65 sec., with all switches down

STARTING PROCEDURE = Start and Restart at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT TRACE LOOP
SW11 = BELL ON ERROR
SW10 = 1 or UP ..., INHIBIT ITERATION LOOP
0 or DOWN ..., BELL ON 1000 PASSES
ABSTRACT
This program tests the KE11F (PDP-11 floating instruction set (PADD, PMUL, and FDDV)) option with fixed number patterns, using each register at least once as the stack pointer. It also checks stack overflow and that the floating instructions can be interrupted (by the console teletype). The program should be run for at least 2 passes with all switches down.

REQUIREMENTS
PDP-11 (KD11A) standard computer with KE11F option

STORAGE - The routines use memory 0 - 17500
LOADING - Absolute Loader
EXECUTION TIME = 15 sec.
STARTING PROCEDURE - start at 200
PRINTOUTS = Yes
SWITCH REGISTER OPTIONS = Yes

SW15 = 1 ... HALT ON ERROR
SW14 = 1 ... SCOPE LOOP
SW13 = 1 ... INHIBIT PRINTOUT
SW12 = 1 ... INHIBIT TRACE TRAPPING
SW11 = 1 ... INHIBIT ITERATIONS OF SUBTEST
SW10 = 1 ... BELL ON ERROR
SW9 = 1 ... BELL ON PASS COMPLETE
SW8 = 1 ... LOOP ON ERROR
SW7 = 1 ... LOOP ON TEST IN SW(710)

CAUTION! (SW(710)) are also used for ROM word match with KM11 maintenance card.
ABSTRACT

This program exercises the KE11F floating point instructions (FADD, FSUB, FMUL, FDIV) with random number patterns. The answers are checked against results obtained using the corresponding FORTRAN software routines. About 200 passes should be run to establish credibility.

REQUIREMENTS

PDPM11 (MD11A) standard computer with KE11F option

STORAGE = The routines use memory location 0 = 17500

LOADING = Absolute Loader

EXECUTION TIME = 5 sec;

STARTING PROCEDURE = Always start at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 ... HALT ON ERROR
SW14 = 1 ... SCOPE LOOP
SW13 = 1 ... INHIBIT PRINTOUT
SW12 = 1 ... INHIBIT TRACE TRAPPING
SW11 = 1 ... INHIBIT ITERATIONS OF SUBTEST
SW10 = 1 ... BELL ON ERROR
0 ... BELL ON PASS COMPLETE
SW09 = 1 ... LOOP ON ERROR
SW08 = 1 ... LOOP ON TEST IN SW(610)
SW07 = 1 ... INPUT DATA FROM THE TELETYP
KE11F SYSTEM EXERCISER OVERLAY

ABSTRACT

This program is an overlay for GTP (MAINDEC=11=D2QGA) or CTP (MAINDEC=11=02QGA) which tests the KE11F (PDP=11 Floating Instruction Set <FADD, FMUL, and FDIV>) using all registers with fixed number patterns; overflow, underflow, and divide by zero are checked to insure that the error trap works.

REQUIREMENTS

PDP=11 (K11A) standard computer with KE11F option and a minimum of 12K of memory.

STORAGE = GTP or CTP = 0 to 37500
KE11F Overlay = 40000 to 57500

LOADING

EXECUTION TIME =

STARTING PROCEDURE = See GTP or CTP

PRINTOUTS

SWITCH REGISTER OPTIONS
ABSTRACT

This program tests the logic of the cycle redundancy check devices (KG11A).

REQUIREMENTS

A standard PDP-11 and a KG11A.

STORAGE = Loos: 0 thru 4502,

LOADING = Absolute Loader

EXECUTION TIME = 2 min;

STARTING PROCEDURE = Start at SA200 with SWR15 set, SWR14=0 reset.

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = SET, HALT ON ERROR
RST, BYPASS ERROR

SW14 = SET, SCOPE LOOP ON ERROR
RST, BYPASS ERROR

SW13 = SET, INHIBIT PRINTOUTS DURING SCOPE LOOP
RST, ALLOW PRINTOUTS DURING SCOPE LOOP

SW12 = SET, INHIBIT TRACE TRAPPING
RST, ALLOW TRACE TRAPPING

SW11 = SET, INHIBIT ITERATIONS
RST, ALLOW ITERATIONS

SW11 = SW6 and SW5 = SW0 are designed in the select test mode section on pa. 6 & 7.
KL11 or KL11 Teletype test

ABSTRACT

The KL11 Teletype Tests consists of a package of test programs designed to test the teletype input-output logic, the paper tape reader and punch, the printer, and the keyboard. All tests are included in one object tape. The available test programs are listed here in numerical order:

- PGR1 = Reader Test
- PGR2 = Printer Test
- PGR3 = Punch Test
- PGR4 = Keyboard Test
- PGR5 = Combined Reader-Punch Test
- PGR6 = Reader Exerciser
- PGR7 = Printer Exerciser
- PGR8 = Combined Input-output logic tests
- PGR9 = Special Binary Count Pattern Generator
- PGR10 = Punch Clock Adjustment Routine
- PGR11 = Reader Clock Adjustment Routine
- PGR12 = Maintenance Mode Single Character Data Test
- PGR13 = Maintenance Mode Special Character Binary Count Pattern Test
- PGR14 = Maintenance Mode Special Character Data Test

PRG2 through PRG5 are the actual Teletype tests,
PRG6 through PRG14 are utility and maintenance routines.

REQUIREMENTS

- POP=11
- ASR33, KSR33, ASR35, KSR35 Teletype

STORAGE = 207 = 1502k

LOADING = Absolute Loader

EXECUTION TIME = Depends on program begin run; PR60 = PR64 halt at end of mass at LOC 002026 if SW10 not set;

STARTING PROCEDURE = Start at 200

PRINTOUTS = No

SWITCH REGISTER OPTIONS = Yes

- SW15 = HALT
- SW14 = SCOPE
- SW13 = INHIBIT ITERATION COUNT
- SW12 = LOOP PROGRAM
- SW9 = SELECT ROUTINE
- SW8 = DISABLE STALL MODE
Line Frequency Clock Test

ABSTRACT

This program tests the KW11L line frequency clock. It validates proper operation under both interrupt and non-interrupt modes. It requires the operator to monitor its operation with a clock capable of measuring time in seconds.

REQUIREMENTS

PDP-11 with KW11L

STORAGE = 2 = 2000

LOADING = Absolute Loader

EXECUTION TIME = 1 min;

STARTING PROCEDURE = 200 = 60 Hz, Line Frequency
       = 202 = 50 Hz, Line Frequency

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = No
KW11P Real Time Clock

ABSTRACT

This program tests the KW11-P real time clock. It contains a series of incremental routines that test the control and status register, count set buffer, counter, and interrupt vector address using 122KHz, 12KHz, 60Hz, and external frequencies.

REQUIREMENTS

PDP-11
KW11

STORAGE - This program occupies memory from 0 to 4664

LOADING - Absolute Loader

EXECUTION TIME - Basic test requires 15 sec. per pass, timing test requires 4 min. per pass

STARTING PROCEDURE - 200 basic test
204 timing test

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15 = 1 OR UP ; HALT ON ERROR
SW14 = 1 OR UP ; SCOPE LOOP
SW13 = 1 OR UP ; INHIBIT PRINTOUT
SW12 = 1 OR UP ; INHIBIT SUB-TEST ITERATIONS
MAINDEC-11-06F

LAB11

ABSTRACT

This program tests the LAB-11 scope control, X and Y axis dace's and the VR20 (two color point plot display).

REQUIREMENTS

POP=11
LAB=11 = VR20

STORAGE: The program occupies memory from 0 to 5772

LOADING: Absolute Loader

EXECUTION TIME: Sequence test - the teletype bell will ring after every pass approx. 90 sec.

STARTING PROCEDURE: Load 200

PRINTOUT: Yes

SWITCH REGISTER OPTIONS: Yes

SW15 = HALT ON ERROR
SW14 = SCOPE
SW13 = INHIBIT ERROR PRINTOUTS
SW12 = INHIBIT TRACE TRAPPING/RACK GROUND TEST
SW11 = INHIBIT ITERATION
ABSTRACT

The LA30 terminal tests consists of a package of test programs designed to test the LC11 input-output logic, the LA30 printer and keyboard. All tests are included in one object tape. This test can test the LA30 when interfaced by either a single (KL) or double buffered (DL) controller communicating serial to 300 baud.

Under monitor load it will test the console device and all contiguous extra devices.

This test is compatible for all configurations of PDP-11. The available test programs are listed here in numerical order:

PRG0 = Combined input-output logic tests
PRG1 = Display test
PRG2 = Keyboard test
PRG3 = Printer Exerciser
PRG4 = Clock adjustment routine
PRG5 = Clock adjustment routine
PRG6 = Maintenance mode single character data test
PRG7 = Maintenance mode special binary count pattern test
PRG10 = Non-printing character test
PRG11 = Worst case noise
PRG12 = Last character visibility

REQUIREMENTS

PDP-11 System (4K core)
LC11 Interface/LA30 Terminal

STORAGE - The routines use memory locations 200 = 14554

LOADING - Absolute Loader

EXECUTION TIME = 4 min

STARTING PROCEDURE - at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT AT END OF ROUTINE
SW14 = ENTER SCOPE MODE AFTER ERROR
SW11 = INHIBIT ITERATION
SW10 = LOOP PROGRAM
SW09 = SELECT ROUTINE
SW16 = Number of routine to be selected.
ABSTRACT

The LA30 terminal tests consists of a package of test programs designed to test the LC11 input-output logic. The LA30 printer and keyboard. All tests are included in one object tape. The available test programs are listed here in numerical order:

- PRG 7 = Combined input-output logic tests
- PRG 1 = Display test
- PRG 2 = Keyboard test
- PRG 3 = Printer exerciser
- PRG 4 = Clock adjustment routine
- PRG 5 = Clock adjustment routine
- PRG 6 = Maintenance mode single character data test
- PRG 7 = Maintenance mode special binary count pattern test
- PRG 12 = Roll-up display test
- PRG 13 = Non-printing character test
- PRG 14 = Worst case noise
- PRG 15 = Last character visibility

REQUIREMENTS

- PDP-11
- LC11 parallel

STORAGE = 200 = 1500

LOADING = Absolute Loader

EXECUTION TIME = Depends on program being run.

STARTING PROCEDURE = Start at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

- SW15 = HALT AT END OF ROUTINE
- SW14 = SCOPE
- SW13 = INHIBIT ERROR PRINTOUTS
- SW12 = INHIBIT TRACE TRAPPING/BACKGROUND TEST
- SW11 = INHIBIT ITERATION
- SW10 = LOOP PROGRAM
- SW09 = SELECT ROUTINE
- SW06 = SW0M = NUMBER OF ROUTINE TO BE SELECTED,
LP11 Line Printer Test

ABSTRACT

The LP11 Line Printer Diagnostic Test Program is designed to provide a thorough check-out of the printer control electronics as well as the electronic and mechanical portions of the line printer mechanism itself. The program consists of a series of seven test and drive routines, each of which can be selected and operated independently of the others using special entry points. Internally detected error conditions are displayed on the teleprinter while detailed descriptions of each error and what was happening at the time the error occurred is presented in the listing. Print patterns used in these tests have been chosen for ease of visual verification.

The first test is composed of several tests designed to checkout the processor interface control electronics and intercommunication data paths. Tests 2, 3, and 4 use worst case patterns to test printer performance and endurance while tests 5 and 6 provide drive for printer hammer alignment and intensity adjustment procedures and a test of the paper slew and clutch operations. Test 7 consists of several sub-tests and maintenance aids among them a scope drive test for helping the technician to debug the hardware.

REQUIREMENTS

PDP=11
DATA Products, Model 2310, Line Printer
LP11 Line Printer Control Unit

STORAGE = 0 - 7230

LOADING = Absolute Loader

EXECUTION TIME = Continuous running - Printout will occur

STARTING PROCEDURE = Start at 200
                    Restart at 600

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = 132 COL. LINE PRINTER
SW13 = 96 CHARACTER LINE PRINTER
SW12 = LOOP ON ROUTINE
LPC11 INTERFACE DIAGNOSTIC TEST

ABSTRACT

This diagnostic will exercise all logic functions and data capabilities of the LPC11 Interface. The program should be started at location 2% and will type out the program name and request input of vector address, register address, and interface mode setting.

The program consists of four (4) test groups: logic tests, data tests, maintenance mode tests, and line count mode. The logic and data tests are performed sequentially; (except logic test 22 which is entered via switch ten). The maintenance mode and line count mode are entered through the console switches.

The program is designed to provide the operator with as much flexibility as possible through the use of the console switch register. Use of the switches provides for control of error print, stop on error, iteration of data patterns, repeat loop, error status bit testing, maintenance mode entry, maintenance mode interrupt recognition, and line count mode entry.

REQUIREMENTS

1. 5DP=11/45,15,22,45
2. Teletype
3. LPC11 Interface
4. 5DP=11/45 and KLI1-L line clock

STORAGE =

LOADING =

EXECUTION TIME =

STARTING PROCEDURE = 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW 15: 1=NO ERROR PRINTS
        0=PRINT ALL ERRORS

SW 14: 1=STOP ON ERROR
        0=CONTINUE ON ERROR

SW 17: 1=LOOP MODE
        0=SINGLE PASS
SW 12:  1=INHIBIT DATA ITERATIONS
        0=DO NOT INHIBIT ITERATIONS

SW 11:  1=GO TO MAINTENANCE MODE
        0=DO NOT ENTER MAINTENANCE MODE

SW 10:  1=DO ERROR BIT TEST
        0=DO NOT DO ERROR BIT TEST

SW 9:   1=USE TESTER INTERRUPT FOR MAINTENANCE MODE
        0=USE CONTROLLER INTERRUPT

SW 8:   1=ENTER LINE COUNT MODE (PDP-11/45 only)
        0=DO NOT ENTER LINE COUNT MODE
Laboratory Peripheral System Diagnostic Test I

ABSTRACT

This diagnostic tests and exercises the "LPS". The program is self-starting and when loaded will type out the program title; A sentence is then typed giving the letter designators to be typed to run any one of the seven (7) separate tests of which this program is composed, the program then types a "CR" and then waits in a keyboard monitor mode for a letter to be typed. Although these tests may be run in any order it is imperative that the logic tests are run first and proven fully operational. The program is set up to give the operator as much control over the program as possible via the teletype typing a "U" (obtained via typing the "CNTR" and "C" keys simultaneously), while running any test will enable the program to return to the keyboard monitor and await a new letter designator to be typed typing a "A" while in monitor mode will enable the letter designators to be retyped.

REQUIREMENTS

1. PnP-11
2. Teletype
3. LPS11 control box with
   LPSAD12 simple A to D control and
   LPSADVF DMA A to D control and/or
   LPSCH dual sample and hold control.

STORAGE - 0 = 17500

LOADING - Absolute Leader

EXECUTION TIME = 1 minute for Logic Test

STARTING PROCEDURE - Program is self-starting with a restart address of '174 re-initialization address of '200'

204 A = 0 Logic Test
210 DMA Logic Test
214 Dual sample logic
220 A = D Calibration test

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUTS
SW11 = INHIBIT ITERATION
Laboratory Peripheral System Diagnostic Test II

ABSTRACT

This diagnostic test and exercises the "LPS". The program is self-starting and when loaded will type out the program title: A sentence is then typed giving the letter designators to be typed to run any one of the seven (7) separate tests of which this program is comprised. The program then types a "CR", and then waits in a keyboard monitor mode for a letter to be typed. Although these tests may be run in any order it is imperative that the "logic" tests are run first and proved fully operational. The program is set up to give the operator as much control over the program as possible via the teletype typing a "C" (obtained via typing the "CNTR" and "C" keys simultaneously) while running any test will enable the program to return to the keyboard monitor and await a new letter designator to be typed. Typing a "A" while in monitor mode will enable the letter designator to be retyped.

REQUIREMENTS

1. PJP-11
2. Teletype
3. LPS11 option box with
   LPSKW real time clock control and/or
   LPSDR Digital input/output control and/or
   LPSVC point plot scope control

STORAGE = 2 1756K

LOADING = Absolute Loader

EXECUTION TIME = Not greater than 2 minutes per subtest

STARTING PROCEDURE = Program is self-starting with a restart address of '174' or re-initialized at address '200'

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT ERROR PRINTOUTS
SW12 = INHIBIT TRACE TRAPPING
SW11 = INHIBIT ITERATION
LPS-11 Overlay for GTP-11

ABSTRACT

This program is a quick go-no-go test of the LPS-11 system under GTP. The purpose of this test is to quickly identify any problem in the system. The program will start the display, if selected, and the operator must verify the display pattern.

REQUIREMENTS

STORAGE - This program used memory locations 40000 to 44000 less than 2K of memory.

LOADING - Absolute Loader - after loading GTP

EXECUTION TIME - Function of GTP

STARTING PROCEDURE - See switch register options

PRINTOUTS - Same as GTP

SWITCH REGISTER OPTIONS - Initialization

Sw15 = INHIBIT LPS-11 VC DISPLAY
Sw14 = INHIBIT LPS-11 CLOCK
Sw13 = INHIBIT LPS-11 DIGITAL I/O BACKGROUND
Sw12 = LPS-11 DR INPUT-OUTPUT CABLE NOT CONNECTED
Sw11 = INHIBIT LPS-11 A TO D CONVERTER
Sw10 = INHIBIT LPS-11 DMA A TO D OPTION

Refer to GTP for dynamic switch settings.
LSI1 CENTRONICS PRINTER TEST

ABSTRACT

This program is designed to test and exercise Centronics printers. The basic logic tests executed and exercises performed are as follows:

1. Manual intervention (optional) to check hardware alarms. For further details see Test 2 under PROGRAM DESCRIPTION.
2. Status and buffer register addressability.
3. More bit = clear and set} as well as mode and IE bits after RESET.
4. Interrupt enable bit = clear and set.
5. Interrupts with processor at levels 4 thru 7
6. Interrupt with processor at level 3.
7. Deselect interrupt
8. Format control characters
9. Bell
10. Relative timing technique for checking time to execute a certain line length (4 lengths in this program) and slowing rate, (see Section 8.4 to interpret relative time test results),
11. Data transfer lines
12. Character generation
13. Lower case letters forced to UPPER CASE
14. Switch register input (optional) to print lines of characters regular or elongated. For further details see Test 31 under PROGRAM DESCRIPTION.
15. Print time free pulse generator (optional), for further details see Test 31 under PROGRAM DESCRIPTION.
REQUIREMENTS

PDP-11 standard computer with console teletype, a
centronics printer and LS11 interface.

STORAGE = 4K

LOADING =

EXECUTION TIME = 11 minutes

STARTING PROCEDURE = 290

PRINTOUTS =

SWITCH REGISTER OPTIONS = YES

- SW<15>=1; HALT ON ERROR
- SW<14>=1; SCOPE LOOP
- SW<13>=1; INHIBIT ERROR PRINTOUT
- SW<12>=1; SELECT "PRINT TIME FREE" PULSE GENERATOR
- SW<11>=1; NOT USED
- SW<10>=1; ELONGATION ON SWR INPUT test
- SW<9>=1; SELECT MANUAL INTERVENTION
- SW<7 thru 8>; contains the test no., used
  with SW<9>
LV-11 PRINTER/PLOTTERT TEST

ABSTRACT

This is a dynamic test of the LV-11 printer plotter hardware and interface. This test is used to determine the ability of the hardware to execute both printed and graphic plotted data. The test is divided into two parts: The first is a manual intervention test where the operator must execute the operation typed on the console teletype; the second test the operator must visually inspect the printed pattern on the electrostatic paper from the printer.

REQUIREMENTS

PDP-11 computer
LV-11 Interface module
LV-11 printer plotter

STORAGE - Less than 4K of memory,

LOADING

EXECUTION TIME

Manual Intervention Test - N/A
Dynamic Logic and visual Test = 5 min.
Upon completion of one pass, the console bell will ring.

STARTING PROCEDURE = 200

PRINTOUTS

SWITCH REGISTER OPTIONS = YES

| SWITCH BIT 15 = 1, ... | HALT ON ERROR |
| SWITCH BIT 14 = 1, ... | LOOP ON CURRENT TEST |
| SWITCH BIT 13 = 1, ... | INHIBIT ERROR TYPEOUT |
| SWITCH BIT 12 = 1, ... | LOOP ON A LINE |
| SWITCH BIT 11 = 1, ... | SELECT FIRST TEST RUN BY SW 0=3 |
ABSTRACT

The DZMRA diagnostic program is written to be used as an aid to hardware debugging and maintenance of the MR11+DB (64 word bulk storage bootstrap loader). These programs may also be used as a data reliability test.

REQUIREMENTS

DPM-11
MR11+DB (64 word bulk storage bootstrap loader)

STORAGE - This program uses core 0-4100(8)

LOADING - Absolute Loader

EXECUTION TIME = 1 min;

STARTING PROCEDURE = Load address = 00200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = 1 or UP ; HALT ON ERROR
SW14 = 1 or UP ; SCOPE LOOP
SW13 = 1 or UP ; INHIBIT PRINTOUT
SW12 = 1 or UP ; INHIBIT TRACE TRAPING (not used)
SW11 = 1 or UP ; INHIBIT ITERATION
ABSTRACT

This program tests all memory parity (max. 28K) by exercising the register control logic then by writing a series of patterns. The program will map where memory parity is found and report this information on the teletype. The program will then proceed to test all of memory parity found.

REQUIREMENTS

POPE11/45 with Memory Parity

STORAGE - The routines use memory locations 0 to 7777.

LOADING - Absolute Loader

EXECUTION TIME - 22 sec.

STARTING PROCEDURE - at 200

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15#1 OR UP -- HALT ON ERROR
SW14#1 OR UP -- SCOPE LOOP
SW13#1 OR UP -- INHIBIT PRINTOUT
SW11#1 OR UP -- INHIBIT ITERATIONS
SW10#1 OR UP -- HALT AT END OF CURRENT TEST
SW 9#1 OR UP -- SELECT ROUTINE SPECIFIED BY SW7-SW0
SW 8#1 OR UP -- MANUAL INTERVENTION - PERFORM HALT ON ERROR TEST
SW 7 THRU SW0 -- NUMBER OF TEST ROUTINE TO BE SELECTED
ABSTRACT

This program tests MOS/Bipolar Memory with a galloping pattern. This test may be used on any memory, however, it is most effective on MOS/Bipolar. Memory may be tested by starting at ADDRESS 224 and inputting test limits or by starting at ADDRESS 220 and all available memory (28K max.) will be tested.

REQUIREMENTS

PDP-11/45 with Memory Parity

STORAGE - The routines use memory locations 2 to 7777

LOADING - Absolute Loader

EXECUTION TIME - 20 sec.

STARTING PROCEDURE - at 200

PRINTOUTS - No

SWITCH REGISTER OPTIONS - Yes

SW15 = 1 OR UP = HALT ON ERROR
SW14 = 1 OR UP = SCOPE LOOP
SW13 = 1 OR UP = INHIBIT PRINTOUT
MAINDEC=11-D2E

Typeset=11 Reader-Punch Tests

ABSTRACT

The Typeset=11 Reader and Punch Tests consists of a package of test programs designed to test the PA611 reader logic, reader, punch logic, punch, and the reader and punch in combination. All tests are included in one object tape. The available tests are listed numerically:

- PRG2 = Reader test
- PRG1 = Punch test
- PRG2 = Punch verify routine
- PRG3 = Combined reader-punch test
- PRG4 = Punch tape with 2 characters set in sr routine
- PRG5 = Read and check tape punched with 2 characters set in Sr
- PRG6 = Read x characters, then stall y msecs
- PRG7 = Special binary count pattern tape generator
- PRG11 = Reader speed print routine
- PRG11 = Punch speed print routine

Programs PRG1-PRG6 are the Reader and Punch Tests.
Programs PRG4-PRG11 are utility routines that produce test tapes and aid in making adjustments.

REQUIREMENTS

- PDP-11
- ASR33*35 Teletype
- PA611 Reader(s) and Punch(s)

STORAGE = 200 = 315600

LOADING = Absolute Loader

EXECUTION TIME = Depends on program being executed,
    Printout will occur

STARTING PROCEDURE = Start at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = Halt on Error
SW14 = Enter Scope Mode
SW13 = Inhibit Error Print
SW11 = Inhibit Iteration

SW10 = Halt at End of Current Routine
SW 9 = Select Specific Routine
SW 7 = SW0 = Number of Test Selected
PA611 MULTI READER PUNCH EXERCISER

ABSTRACT

The function of this test is to detect malfunctions caused by the interaction of multiple PA611 typesetting systems. The program types out a sequence of messages on the console that ask the operator to select his test configuration. The punches generate a tape with a special binary count pattern and the readers expect to read a tape with this pattern. Therefore any punch can serve any reader so long as they are the same code level (6 bits vs 8 bits).

REQUIREMENTS

1. DP611/20 system
2. High Speed Reader
3. 7 to 16 typesetting punches
4. 7 to 16 typesetting readers

STORAGE - 4K

LOADING

EXECUTION TIME - Program runs indefinitely. Execution time is determined by the tape length;

STARTING PROCEDURE - 220

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

The program will type the following sequence:

1. Message 1 = "Set SR to vector of reader 0"
   The program then halts at which point the operator must load the console switches with the vector address of the first reader and press continue.

2. Message 2 = "Set SR to readers test"
   The program then halts at which point the operator must select readers to test and press continue.
   EX: test reader 0
   SW1=1 test reader 1
   ETC,
3: **Message 3** = "set SR to code level\(^{-}\)=up\(^{=}\)=8 down\(^{=}\)=6

This message print and halt is executed only if one or more readers is selected for test. The operator is required to indicate the code level of each reader selected by using the console switches as follows and press continue,

\[
\begin{align*}
SW_{11}=5 & \quad \text{level code for reader 0} \\
SW_{12}=6 & \quad \text{level code for reader 1} \\
SW_{13}=8 & \quad \text{level code for reader 1} \\
\text{etc.} & 
\end{align*}
\]

4: **Message 4** = "set SR to punches to test"

The program then halts at which point the operator is requested to select the punches to test and press continue.

\[
\begin{align*}
SW_{11} & = \text{test punch 0} \\
\text{etc.} & 
\end{align*}
\]

5: **Message 5** = "set SR to code level\(^{-}\)=up\(^{=}\)=8 down\(^{=}\)=6"

The program then halts. The switch interpretation is the same as Item 3 above.

6: **Message 6** = "setup SR, normal SR=000007, Press continue",

The operator then resets the switch register options as follows:

\[
\begin{align*}
SR_{15} & = \text{halt on all errors} \\
SR_{14} & = \text{inhibit printing of error messages} \\
SR_{13} & = \text{inhibit stall} \\
\end{align*}
\]

At this time, depressing continue will start the exerciser.
GTP OVERLAY FOR PA611

ABSTRACT

The function of this test is to detect malfunctions caused by the interaction of multiple pa611 typesetting systems with GTP. The program types out a sequence of messages on the console TTY that ask the operator to select his test configuration. The punchers generate a tape with a special binary count pattern and the readers expect to read a tape with this pattern. Therefore any punch can service any reader so long as they are the same code level (6 bits vs 8 bits).

REQUIREMENTS

1. PDP-11/20 system
2. High Speed Reader
3. 2 to 16 typesetting punchers
4. 2 to 16 typesetting readers
5. GTP test program (MAINDLC 11=DZQGA)

STORAGE = Loads in 12K of core

LOADING

EXECUTION TIME = End of pass is controlled by the host program GTP; run time is determined by the quantity of tape punched.

STARTING PROCEDURE = Refer to GTP's documentation on overlays

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

The program will type the following sequence:

1. "Message 1 = "set SW to vector of reader 0"
   The program then halts at which point the operator must load the console switches with vector address of the first reader and press continue.

2. "Message 2 = "set SW to readers to test"
   The program then halts at which point the operator must select readers to test and press continue.
   SW=1 test reader 0
   SW=1 test reader 1
   ETC,
3. **Message 3** - "set SR to code level=up=8 down=6"

This message print and halt is executed only if one or more readers is selected for test. The operator is required to indicate the code level of each reader selected by using the console switches as follows and press continue,

- SW1=5 level code for reader 2
- SW1=6 level code for reader 3
- SW1=5 level code for reader 1
- ETC.

4. **Message 4** - "set SR to punches to test"

The program then halts at which point the operator is requested to select the punches to test and press continue,

- SW1= test punch 0
- ETC.

5. **Message 5** - "set SR to code level=up=8, down=6"

The program then halts. The switch interpretation is the same as item 3 above.

6. **Message 6** - "setup SR, normal SR=270000, press continue",

The operator then resets the switch register options as follows:

- SR15 = HALT ON ALL ERRORS
- SR14 = INHIBIT PRINTING OF ERROR MESSAGES
- SR13 = INHIBIT STALL

At this time, depressing continue will start the exerciser.
PC11 High Speed Reader and Punch Tests

ABSTRACT

The PC11 High Speed Reader and Punch Tests consist of a package of test programs designed to test the reader logic, reader, punch logic, punch, and the reader and punch in combination. All tests are included in one object tape. The tests are listed in numerical order:

- PRG0: Reader logic tests
- PRG1: Reader tests
- PRG2: Punch logic tests
- PRG3: Punch test
- PRG4: Punch verify routine
- PRG5: Combined reader-punch test
- PRG6: Punch tape with 2 characters set in sr routine
- PRG7: Send and check tape punched with 2 characters in sr
- PRG12: Send x characters, then stall y msec
- PRG11: Special binary count pattern tape generator
- PRG12: Reader speed print routine
- PRG13: Punch speed print routine

Programs PRG0 to PRG5 are the reader and punch tests; programs PRG6 to PRG13 are utility routines that produce test tapes and aid in making adjustments.

REQUIREMENTS

- POP-11
- ASR33 or 35 Teletype
- PC11 Reader or PC11 Reader and Punch

STORAGE = 20K = 32,768

LOADING = Absolute Loader

EXECUTION TIME = Depends on program being executed;

PRINTOUT WILL OCCUR;

STARTING PROCEDURE = Start at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

- SW15 = Halt on error
- SW14 = Enter scope mode
- SW13 = Inhibit error print
- SW12 = Inhibit iteration
- SW10 = Loop program
- SW9 = Select a specific routine
RC11 Disk Data/Part one Static Test

ABSTRACT

The RC11 Disk Data Test is a series of static, address and data reliability routines which verify to the user the disk control (RC11) and disk (RS64) are operating correctly. This test used in conjunction with the RC11 diskless and RC11 multi-disk assures the user of an error free system, when used in its entirety.

REQUIREMENTS

PDP-11
RC11 and RS64

STORAGE = 2 = 11250

LOADING = Absolute Loader

EXECUTION TIME = 22 sec. = Printout will occur

STARTING PROCEDURE = Start and Restart at 202

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = ENTER PROGRAM CONVERSATION
SW14 = DELETE TYPEOUTS
SW13 = HALT ON FLAG
SW12 = DELETE DATA COMPARISONS
SW11 = LOOP ON TEST
SW10 = HALT AFTER ERROR
SW 9 = WAIT FOR INTERRUPTS
SW 8 = LOOP ON DISK ADDRESS
SW 5 = SELECT TRACK FROM SW4 = SW0
ABSTRACT

Multi disk was designed to ensure the user that the disk system is capable of transferring data correctly while not destroying the user's program on the disk surface. The program first reads from the disk; the length of the transfer is determined by the size of memory. If an error occurs while reading, the program will make up to three attempts at reading the data. If the error still exists, the program will then halt. If the program successfully reads from the disk within the three attempts, it will then generate a random buffer, write it on the disk, and read it back and verify it. After comparing the data, the program then writes the original data back on the disk. Making up to three attempts to transfer if an error is encountered, before halting. If the data was successfully transferred, the program will go to the next buffer until the complete disk system is exercised.

REQUIREMENTS

- PDP-11
- Teletype
- RC11 and RS64 plus up to three additional RS64's
- STORAGE - The main body of the program occupies the first 5K. Three data buffers occupy the rest of existing memory.

LOADING - Absolute Loader

EXECUTION TIME = 11 sec. - Printout will occur

STARTING PROCEDURE - Start and Restart at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = No

SPECIAL INSTRUCTIONS

Type Control C to terminate and save old data.
RF11 Disk Data

ABSTRACT

The RF11 disk data test is a series of static, address and data reliability routines which verify to the user the disk control (RF11) and disk (RS11) are operating correctly. This test is useful in conjunction with the RF11 diskless and RF11 multi-disk assures the user of an error free system, when used in its entirety.

REQUIREMENTS

- PDP-11
- RF11 and RS11

STORAGE = 0 = 11134

LOADING = Absolute Loader

EXECUTION TIME = 1 hr. 15 min.; Printout will occur

STARTING PROCEDURE = Start and Restart at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

- SW15 = ENTER PROGRAM CONVERSATION
- SW14 = DELETE TYPEOUTS
- SW13 = HALT ON FLAG
- SW12 = DELETE DATA COMPARISONS
- SW11 = LOOP ON TEST
- SW10 = HALT AFTER ERROR
- SW 9 = WAIT FOR INTERRUPTS
- SW 8 = LOOP ON DISK ADDRESS
- SW 7 = SELECT TRANS FROM SR
MULTI DISK was designed to insure the user that the disk system is capable of transferring data correctly while not destroying the users programs on the disk surface. The program first reads from the disk; the length of the transfer is determined by the size of memory. If an error occurs while reading, the program will make up to three attempts at reading the data. If the error still exists, the program will then halt. If the program successfully reads from the disk within the three attempts, it will then generate a random buffer, write it on the disk, and read it back and verify it. After comparing the data, the program then writes the original data back on the disk, making up to three attempts to transfer if an error is encountered, before halting. If the data was successfully transferred, the program will go to the next disk buffer until the complete disk system is exercised.

REQUIREMENTS

PDP-11 - 4K to 28K of memory
Teletype
RF and RS11 plus up to seven additional RS11's

STORAGE - The main body of the program occupies the first 5K. Three data buffers occupy the rest of existing memory.

LOADING - Absolute Leader

EXECUTION TIME = 5 min; Printout will occur

STARTING PROCEDURE = Start and Restart at 20'

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = No
MULTI DISK TEST

ABSTRACT

MULTI disk is a high speed confidence test that assures the user that he can transfer data correctly, without destroying the data on the disk. MULTI disk uses all existing memory on the system as buffer areas.

REQUIREMENTS

1. PDP-11 4K to 28K of memory
2. Teletype
3. RF11 and RS11 plus up to seven additional RS11's

STORAGE = First 5K Octal (bytes) of memory

LOADING

EXECUTION TIME

STARTING PROCEDURE = 230,

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS
RK11 STATIC TEST

ABSTRACT

The RK11 disk data test is a series of address and data reliability routines which verify to the user the disk control (RK11) and disk (RK22 thru RK25) are operating correctly. This test used in conjunction with the RK11 data test and RK11 random drive exerciser assures the user of an error free system, when used in its entirety.

REQUIREMENTS

PDP-11
RK11 and (RK72 thru RK75)

STORAGE =

LOADING =

EXECUTION TIME =

STARTING PROCEDURE = 230

PRINTOUTS =

SWITCH REGISTER OPTIONS =
RKII Disk Data

ABSTRACT

The RKII Disk Data Test is a series of address and data reliability routines which verify to the user that disk control (RKII) and disk (RK02 through RK05) are operating correctly. This test used in conjunction with the RKII static test and RKII random drive exerciser assures the user of an error free system, when used in its entirety.

REQUIREMENTS

PDP-11 4K
RKII and (RK02 thru RK05)

STORAGE = All of memory
LOADING = Absolute Loader
EXECUTION TIME = 2 hrs - Printout will occur
STARTING PROCEDURE = Start and Restart at 200
PRINTOUTS = Yes
SWITCH REGISTER OPTIONS = Yes

SW15 = ENTER PROGRAM CONVERSATION
SW14 = DELETE TYPEOUTS
SW13 = HALT ON FLAG
SW12 = DELETE DATA COMPARISONS
SW11 = LOOP ON TEST
SW10 = HALT AFTER ERROR
SW 9 = WAIT FOR INTERRUPTS
SW 8 = LOOP ON DISK ADDRESS
SW 7 = 0 = SELECT CYLINDER FROM SR
RKII Random Exerciser

ABSTRACT

The RKII Random Exerciser is an attempt to simulate a user's environment of an RKII system. This test is not meant to be a diagnostic; if problems are encountered while running this program, it is suggested that the operator revert back to the RKII diagnostic (Disk Data Mal-dec D5HA).

REQUIREMENTS

PDP-11
Teletype
RKII Disk Control
RK (42, 73, 84, 85) Disk Drive (Max: 8)

STORAGE = All of memory of the lower limit of the absolute loader.

LOADING = Absolute Loader

EXECUTION TIME = 5 min; = Printout will occur

STARTING PROCEDURE = Start and Restart at 20

PRINTOUT = Yes

SWITCH REGISTER OPTIONS = No
PRODUCT NAME = RP11C Diskless Diagnostic

ABSTRACT

The RP11C Diskless Diagnostic exercises the RP11C in the maintenance mode. It consists of two segments; the first segment verifies the logic contained in the RP11C by utilizing the three maintenance registers which simulate the signals passing between the RP11C and the RP03. Segment two operates in the normal mode and is used to verify the switches contained on the RP11C and the RP03.

REQUIREMENTS

HARDWARE = Standard PDP-11 configuration RP11C Disk Controller, one or more RP03 Disk Drives (switch test only).

SOFTWARE

STORAGE = 4K
LOADING = Absolute Loader
EXECUTION TIME = 4 minutes
STARTING PROCEDURE = 200
PRINTOUTS = Yes
SWITCH REGISTER OPTIONS

SW15 = 1 ... HALT ON ERROR
SW14 = 1 ... LOOP ON ERROR
SW13 = 1 ... INHIBIT PRINTOUT
SW12 ... NOT USED
SW11 = 1 ... RING BELL ON ERROR
PRODUCT NAME = RP11C Reliability Diagnostic

ABSTRACT

This program tests both the addressing capability and the data reliability of the RP11C and the RP03. The program consists of seven tests any one of which is selectable by the operator. A conversation mode exists which allows the operator to define test parameters.

REQUIREMENTS

HARDWARE = PDP-11 standard family processor
RP11C disk pack controller with up to eight RP03 drives ASR33 or equivalent.

SOFTWARE

STORAGE = 8K

LOADING = Absolute Loader

EXECUTION TIME = 8 hours

STARTING PROCEDURE = 230

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = SW15 = 1, HALT ON ERROR

SW15 = 1 ... HALT ON ERROR
SW14 = 1 ... INHIBIT PRINTOUT
SW12 = 1 ... INHIBIT BACKGROUND TEST
SW11 = 1 ... RING BELL ON ERROR
SW10 = 1 ... LOOP ON TEST
SW09 = 1 ... INHIBIT DATA COMPARISON
PRODUCT NAME = RP11C MULTI DRIVE DIAGNOSTIC

ABSTRACT

This program will test up to eight RP02/RP03 drives on an RP11C disk controller. Basically, the program will seek to a random address and then write and read random data, while data is being transferred. Seek operations will be in progress on the other drives. The purpose of the test is to check for any interaction on the bus while trying to keep all the drives busy.

REQUIREMENTS

HARDWARE = PDP11 standard family processor
RP11C disk controller with up to eight RP02/RP03 disk drives.

SOFTWARE

STORAGE = 64K

LOADING = Absolute Loader

EXECUTION TIME = 1/2 hour

STARTING PROCEDURE = 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS

SW15 = 1 ... Halt on Error
SW14 = ... Not Used
SW13 = 1 ... Inhibit Printout
SW12 = ... Not Used
SW11 = ... Not Used
SW10 = 1 ... Bell on Error
SW07 thru SW00 = 1 ... Select Unit for Test
PRODUCT NAME = RP11C Disk Pack Formatter

ABSTRACT

The RP11C formatter consists of three parts: Part 1 formats an RP3 disk in the normal manner and checks all addresses for validity. Part 2 allows the operator to rewrite the header of any desired sector. Part 3 formats and verifies the disk with the sequence of sector addresses specified by the operator.

REQUIREMENTS

HARDWARE = Standard PDP-11 configuration
RP11C Disk Controller
One or more RP3 disk drives

SOFTWARE

STORAGE = 4K of storage

LOADING = Absolute Loader

EXECUTION TIME = 1/2 hour

STARTING PROCEDURE = 270

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS

SW15 = 1 . . . HALT ON ERROR
SW14 . . . NOT USED
SW13 = 1 . . . INHIBIT PRINTOUT
SW12 . . . NOT USED
SW11 . . . NOT USED
SW10 = 1 . . . BELL ON ERROR
PRODUCT NAME = RP11 Diskless Diagnostic

ABSTRACT

The RP11 Diskless Diagnostic exercises the RP11 in the maintenance mode. It verifies the logic contained in the RP11 by utilizing the three maintenance registers which simulate the signals passing between the RP11 and the RP02.

REQUIREMENTS

HARDWARE = Standard PDP-11 configuration and a RP11 Disk Controller.

SOFTWARE

STORAGE = 4K of storage,

LOADING = Absolute Loader

EXECUTION TIME = 5 minutes

STARTING PROCEDURE = 600

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS

SW15 = 1 . . . DELETE ERROR WALT
SW14 = 1 . . . DELETE PRINTOUT
SW13 = 1 . . . LOOP ON FAILING TEST
SW12 = 1 . . . LOOP ON TEST UNCONDITIONALLY
PRODUCT NAME = RP11 Disk Data and Address Test

ABSTRACT

This program tests both the addressing capability and the data reliability of the PR11 and the RP02. The program consists of seven tests any one of which is selectable by the operator. A conversion mode exists which allows the operator to define test parameters.

REQUIREMENTS

HARDWARE = PDP-11 standard family processor

RP11 Disk pack controller with up to eight RP02 drives

ASR33 or equivalent

SOFTWARE

STORAGE = 9K of storage

LOADING = Absolute Loader

EXECUTION TIME = 5 hours

STARTING PROCEDURE = The program must always be started at 200.

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS

SW15 = 1 ... HALT ON ERROR
SW14 = 1 ... LOOP ON ERROR
SW13 = 1 ... INHIBIT PRINTOUT
SW12 = 1 ... RING BELL ON ERROR
SW11 = 1 ... LOOP ON TEST
SW09 = 1 ... INHIBIT DATA COMPARISON
SW08 = 1 ... ENTER CONVERSATION MODE
SW07 = 1 ... USED TO CONTROL HOW MANY COMPARE ERRORS WILL BE TYPED OUT AS A RESULT OF A READ OPERATION IN THE DATA TEST;

SW05 = 1 ... CHECK FOR UP TO THREE COMPARE ERRORS WITHIN THE READ BUFFER AND TYPE ALL APPROPRIATE ERROR INFORMATION FOR EACH ERROR;

SW05 = 0 ... CHECK FOR ONLY ONE COMPARE ERROR WITHIN THE READ BUFFER;

SW04 ... USED TO CONTROL THE AMOUNT OF INFORMATION TYPED ON REREAD ATTEMPTS

SW04 = 1 ... TYPE ALL ERROR INFORMATION ON EACH REREAD ATTEMPT;

SW04 = 0 ... TYPE THE ERROR INFORMATION ON THE FIRST READ ERROR ONLY, AFTER THE ERROR GOES AWAY OR IS
UNRECOVERABLE, THE NUMBER OF REREADS IS THEN TYPED.

SW3 = 1 ... RUN TEST SELECTED BY SWITCH POSITIONS SW0 THRU SW2.

SW0 thru SW32 TEST SELECTED
0  ADDRESS TEST 0
1  ADDRESS TEST 1
2  ADDRESS TEST 2
3  TEST 3 = WRITE CHECK TEST
4  TEST 4 = MEMORY ADDRESS TEST
5  TEST 5 = DATA RELIABILITY
6  TEST 6 = RANDOM TEST
7  TEST 7 = POWER FAIL TEST

If it is desired to select an individual test, also set SW10
loop on test.
PRODUCT NAME = RP11 Multi Drive Diagnostic

ABSTRACT

This program will test up to eight RP02 drives on an RP11 Disk Controller. Basically, the program will seek to a random address and then write and read random data, while data is being transferred, seek operations will be in progress on the other drives. The purpose of the test is to check for any interaction on the bus while trying to keep all the drives busy.

REQUIREMENTS

HARDWARE = PDP-11 standard family processor
RP11 Disk Controller with up to eight RP02 disk drives

SOFTWARE

STORAGE = 4K of storage
LOADING = Absolute Loader

EXECUTION TIME = It is recommended that the program should run for half an hour

STARTING PROCEDURE = The program should always be started at 200,

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS

SW15 = 1 ... HALT ON ERROR
SW14 = NOT USED
SW13 = 1 ... INHIBIT PRINTOUT
SW12 = NOT USED
SW11 = NOT USED
SW10 = 1 ... BELL ON ERROR
SW9 thru SW00 = 1 ,... SELECT UNIT FOR TEST
SW09 corresponds to unit 0
SW07 corresponds to unit 7
PRODUCT NAME = RP11 Disk Pack Formatter

ABSTRACT

The RP11 formatter consists of three parts; Part I formats an RP02 disk in the normal manner and checks all addresses for validity. Part II allows the operator to rewrite the header of any desired sector. Part III formats and verifies the disk with the sequence of sector addresses specified by the operator.

REQUIREMENTS

HARDWARE = Standard PDP-11 configuration
    RP11 Disk Controller
    One or more RP02 disk drives

SOFTWARE

STORAGE = Program requires 4K of storage

LOADING = Absolute Loader

EXECUTION TIME = 1/2 hour

STARTING PROCEDURE = 600

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS

    SW15 = 1 ; ; ; DELETE ERROR HALT
    SW14 = 1 ; ; ; DELETE PRINTOUTS
RS64 TESTER MONITOR AND DISK EXERCISER

ABSTRACT

The RS64 tester monitor and exerciser is a time-sharing system which monitors and services multiple RS64 testers which exercise RS64 disks. The operator of each tester station has control over the monitoring of his station through the station's teletype. The operator has the ability to run an automatic acceptance program or any one of 20 tests for which he may choose the data and addressing parameters.

REQUIREMENTS

- PDP-11 standard processor
- 1MHz frequency clock
- RS64 testers (up to 16)
- LT33+DC teletypes (one per RS64 tester)

STORAGE = 8K

LOADING

EXECUTION TIME = Auto Accept takes 12+1/2 hours

STARTING PROCEDURE = 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

Program control is my means of an interactive monitor and console teletype.
TAIL LOGIC TEST (PART 1)

ABSTRACT

This program contains a series of basic logic tests that check the TAIL for proper operation.

REQUIREMENTS

POP-11 computer with console teletype, and a TAIL cassette.

STORAGE = Approx. 4K

LOADING

EXECUTION TIME = The first pass takes approximately 45 seconds. All subsequent passes take approximately 100 seconds.

STARTING PROCEDURE = 270

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW<15>=1; HALT ON ERROR
SW<14>=1; LOOP ON TEST
SW<13>=1; INHIBIT ERROR TYPEOUTS
SW<11>=1; INHIBIT ITERATIONS
SW<17>=1; RING BELL ON ERROR
SW<19>=0; RING BELL ON PASS COMPLETE
SW<09>=1; LOOP ON ERROR
SW<08>=1; LOOP ON TEST AS PER SW<27107>
SW<07>=1; LOCK ON CURRENT DRIVE (ONLY VALID FOR STARTING ADDRESSES 220 THRU 250).
TAII LOGIC TEST (PART 2)

ABSTRACT

This program contains a series of basic logic tests that check the TAII for proper operation.

REQUIREMENTS

POP-11 computer with console teletype, and a TAII cassette.

STORAGE = Approx. 4K

EXECUTION TIME = The first pass takes approximately 107 seconds. All subsequent passes take approximately 475 seconds.

STARTING PROCEDURE = 290

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW<15>=1'; HALT ON ERROR
SW<14>=1'; LOOP ON TEST
SW<13>=1'; INHIBIT ERROR TYPEOUTS
SW<11>=1'; INHIBIT ITERATIONS
SW<17>=1'; RING BELL ON ERROR
SW<17>=0'; RING BELL ON PASS COMPLETE
SW<07>=1'; LOOP ON ERROR
SW<09>=1'; LOOP ON TEST AS PER SW<2710>
SW<27>=1'; LOCK ON CURRENT DRIVE (ONLY VALID FOR STARTING ADDRESSES 220 THRU 250),
TAII MANUAL INTERVENTION TEST

ABSTRACT

This program contains a series of basic logic tests that check the TAII for proper operation.

REQUIREMENTS

- PDP-11 computer with console teletype,
- and a TAII cassette

STORAGE - Approx. 4K

EXECUTION TIME - 2 minutes

STARTING PROCEDURE - 200

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

- $\text{SW}<15>=1$: HALT ON ERROR
- $\text{SW}<14>=1$: LOOP ON TEST
- $\text{SW}<13>=1$: INHIBIT ERROR TYPEOUTS
- $\text{SW}<12>=1$: INHIBIT ITERATIONS
- $\text{SW}<11>=1$: RING BELL ON ERROR
- $\text{SW}<10>=1$: RING BELL ON PASS COMPLETE
- $\text{SW}<9>=1$: LOOP ON ERROR
- $\text{SW}<8>=1$: LOOP ON TEST AS PER $\text{SW}<07>$
- $\text{SW}<07>=1$: LOCK ON CURRENT DRIVE (ONLY VALID FOR STARTING ADDRESSES 220 THRU 250)
TAIl MOTION TEST

ABSTRACT

This program contains a series of tests that check the TU60 drive for proper operation.

REQUIREMENTS

PDP-11 computer with console teletype, and a TAII cassette

STORAGE = Approx. 4K

LOADING

EXECUTION TIME = The first pass takes approximately 4 minutes. All subsequent passes take approximately 8 minutes.

STARTING PROCEDURE = 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW<15>=1;..HALT ON ERROR
SW<14>=1;..LOOP ON TEST
SW<13>=1;..INHIBIT ERROR TYPEOUTS
SW<11>=1;..INHIBIT ITERATIONS
SW<17>=1;..RING BELL ON ERROR
SW<19>=0;..RING BELL ON PASS COMPLETE
SW<09>=1;..LOOP ON ERROR
SW<07>=1;..LOCK ON CURRENT DRIVE
SW<05>=1;..DELAY AT END OF EACH FUNCTION
SW<04>=1;..RUN WITHOUT INTERRUPTS
SW<03>=1;..IGNORE BLOCK CHECK ERRORS
SW<01>=1;..INHIBIT DATA COMPARE
TAII DATA RELIABILITY

ABSTRACT

This program collects statistical information pertaining to the data reliability of the TAII/TU60 when run for extended periods of time. It uses a number of different parameters controlling the data patterns, the number of bytes per block (record) and the number of blocks per file.

REQUIREMENTS

1. TAII computer with console teletype, and a TAII cassette.

STORAGE = Approx. 4K

LOADING

EXECUTION TIME - Testing the TAII/TU60 to specification takes approximately 2 hours, 30 minutes with each drive taking 75 minutes.

STARTING PROCEDURE = 230

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW<15>=1",HALT ON ERROR
SW<14>=1",LOOP ON TEST
SW<13>=1",INHIBIT ERROR TYPEOUTS
SW<17>=1",RING BELL ON ERROR
SW<29>=1",HALT AFTER NEXT "END=OF=TEST" TYPEOUT
SW<30>=1",AT NEXT "END=OF=TAPE" (EOT) GO TO "END=OF=TEST"
SW<07>=1",PERFORM PASS AS PER SWR<110>

SWR<110>=00=FORMAT
SWR<110>=01=READ ONLY
SWR<110>=10=WRITE ONLY
SWR<110>=11=READ ONLY
TA11 CASSETTE ABSOLUTE LOADER (TALDR)

ABSTRACT

TALDR is a loader program designed to load MAINDEC-11 diagnostic programs from TA11 cassettes.

The TALDR loader is the first file stored on a TA11 MAINDEC-11 cassette. It is labelled "TALDR, SYS", it is followed by one or more MAINDEC-11 diagnostic programs stored in abs loader format.

Each TA11 MAINDEC-11 cassette is provided with a directory that lists the TALDR loader, and all the programs stored in the cassette.

Each file name in the cassette is numbered with an octal sequence number; TALDR has the sequence number of 1. The file number is used to specify to the TALDR loader which program is to be loaded.

In order to prevent accidental erasure of cassettes, each cassette to be loaded from should be "write-locked". Write-locking of a cassette is accomplished by uncovering the small holes at the back of the cassette by folding the small plastic tabs out of the way.

Ability of the TALDR loader to successfully load a program depends on the size of the program to be loaded. TALDR can not load a program that requires or like can storage area.

REQUIREMENTS

Hardware

A PDP-11 processor
RM792+VH cassette bootstrap ROM (may be simulated by a TA11 bootstrap loader program)
TA11 tape cassette control unit
TA68 tape cassette transport
RK minimum storage

Software

MAINDEC-11 diagnostic tape cassettes
TA11 bootstrap loader program (if RM792+VH is not installed)
(tape program must be manually toggled in.)

STORAGE = 256

LOADING

EXECUTION TIME
STARTING PROCEDURE - Refer to DOC.

PRINTOUTS

SWITCH REGISTER OPTIONS  - Yes

Is set to file number of program to be loaded.
TA11 GTP OVERLAY

ABSTRACT

The function of this test is to detect interactive type of problems of the TA11 in a system environment.

The program exercises both drives simultaneously.

Program starts by rewinding both units, then the program writes one block, back space one block and reads a block on unit 7.

The same exercise is performed on unit 1.

When end leader is detected, the units are rewound and the write/back space/leader sequence are repeated all over again.

REQUIREMENTS

- DP-11 system with 12K of core, This overlay starts at 40070
- High Speed Reader
- TA11
  - GTP test program (MAINDEC-11=07QGA)

STORAGE - This overlay loads in 12K of core with GTP

LOADING

EXECUTION TIME - Same as GTP overlay

STARTING PROCEDURE - Load address 40070 and start.

PRINTOUTS - Same as GTP overlay

SWITCH REGISTER OPTIONS - Same as GTP overlay
TCI Test 1

ABSTRACT

TCI Test 1 is Part 1 of a five program package used to test the TC11 Dectape Control. TC1 is a bit checker program that checks that each of the control's registers can be referenced without causing bus error traps, that read/write bits can be set and clear, that read/write bits are cleared by reset instruction, and that read only bits are set to their power clear state by reset instruction.

A special routine (Test 0) is available in the program as a maintenance aid in adjusting the TC11 control delays.

REQUIREMENTS

PDP-11
ASR33/35 Teletype
TC11 Dectape Control and at least one TU56 Dual Transport

STORAGE = 2 = 16K

LOADING = Absolute Loader

EXECUTION TIME = 1; One normal pass = 1 minute
2; Single iteration pass = 13 seconds;
Printout will occur

STARTING PROCEDURE = Start at 200
                    Restart at 1000

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE
SW13 = INHIBIT ERROR PRINTOUT
SW11 = INHIBIT ITERATION
SW10 = HALT AT END OF CURRENT ROUTINE
SW 9 = SELECT ROUTINE
TC2 = TC11 Test 2

ABSTRACT

TC2 = TC11 Test 2 is part 2 of a five program package used to test the TC11 Dectape control. TC2 uses the maintenance bit feature of the TC11 control to check the TC11 control without depending on Dectape transport movement. Prior to actual use of the maintenance bit feature, correct operation of the interrupt circuits is checked, and the maintenance bit itself is checked.

REQUIREMENTS

PWP=11
ASR33=35 Teletype
TC11 Dectape Control and at least one TU56 Dual Transport

STORAGE = 0 = 17400

LOADING = Absolute Loader

EXECUTION TIME = 1'; Normal pass = 4 min,
2'; Single iteration pass = 5 sec.

Printout will occur

STARTING PROCEDURE = Start at 200
Restart at 1000

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = ENTER SCOPE MODE
SW13 = INHIBIT ERROR PRINTOUT
SW11 = INHIBIT ITERATION
SW10 = HALT AT END OF TEST
SW 9 = SELECT TEST SPECIFIED BY SW7 =SW0
SW 7 = SW2 = NUMBER OF TEST SELECTED
TC3 = TC11 Test 3

ABSTRACT

TC3 = TC11 Test 3 is part 3 of a five program package used to test the TC11 DECtape Control. TC3 tests and exercises the TC11 control and from one to eight selected transports. TC3 concentrates on testing for correct operation of the up to speed bit (UPS), ability to read block numbers and detect end zones, exercises RNUM command reading forward and reverse block number, exercises the WDATA (Write Data) and RDATA (Read Data) commands both forward and reverse, and with single, double, and 4 block transfers.

REQUIREMENTS

PDP-11
ASR37/35 Teletype
TC11 DECtape control and at least one Ty56 Dual Transport

STORAGE = 0 - 17500

LOADING = Absolute Loader

EXECUTION TIME = 1: Normal pass - about 43 min;
2: Single Iteration pass - about 15 min;
Printout will occur

STARTING PROCEDURE = Start at 200
Restart at 1000

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = ENTER SCOPE MODE
SW13 = INHIBIT ERROR PRINTOUT
SW11 = INHIBIT ITERATION
SW10 = HALT AT END OF TEST CURRENTLY EXECUTED
SW 9 = SELECT THE TEST SPECIFIED BY SR7 & SR8
SW 7 = SW2 = NUMBER OF TEST SPECIFIED
TC4 = TCI1 Test 4

ABSTRACT

TC4 = TCI1 Test 4 is part of a five program package used to test the TCI1 DECTape Control. TC4 tests and exercises the TCI1 Control and from one to eight selected transports. TC4 concentrates on testing for correct operation of the READ ALL and WRITE ALL commands, and checks for correct operation of the parity circuits.

REQUIREMENTS

PDP-11
ASR33-35 Teletype
TCI1 DECTape Control and at least one TY56 Dual Transport
At least one standard PDP-11 Format DECTape; the guard areas of the tape blocks must be zero. If necessary, reformat tape.

STORAGE = 8 = 17500

LOADING = Absolute Loader

EXECUTION TIME = 1, normal pass = about 30 min;
2, single iteration pass = 7 min.
Printout will occur

STARTING PROCEDURE = Start at 222
Restart at 1000

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = ENTER SCOPE MODE
SW13 = INHIBIT ERROR PRINTOUT
SW11 = INHIBIT ITERATION
SW10 = HALT AT END OF TEST
SW9 = SELECT THE SPECIFIED SW8 = SW0
SW7 = SW8 = NUMBER OF TEST SELECTED
TC5 = TC11 Test 5

ABSTRACT

TC5 = TC11 Test 5 is part 5 of a five program package used to test the TC11 DECTape control. TC5 exercises the TC11 control and from one to eight selected transports. All available core storage up to 28K is used in order to execute the maximum number of data transfers possible.

REQUIREMENTS

PDP-11
ASR33/35 Teletype
TC11 DECTape Control and at least one TU56 Dual Transport
One Standard PDP-11 Format DECTape for each transport to be tested. One of the tape blocks must be zero, if necessary reformat the tape.

STORAGE = 2 = 10214

LOADING = Absolute Loader

EXECUTION TIME = 1 normal pass = max. 1 hour
2 single iteration pass = 5 min.
Note: Actual time dependent on number of transports and available core.

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = ENTER SCOPE MODE
SW13 = INHIBIT ERROR PRINTOUT
SW11 = INHIBIT ITERATION
SW10 = HALT AT END OF TEST
SW 9 = SELECT THE TEST SPECIFIED BY SW7 = SW8
SW 7 = SW6 = NUMBER OF TEST TO BE SELECTED
TM11 Instruction Test

ABSTRACT

The TM11 Instruction test contains a series of basic tests that check TM11 registers for proper operation while not involving tape motion; all tape motion functions, data transfers extended memory, and manual intervention tests of the TU10 transport switches.

REQUIREMENTS

PUP=11 with TM11 Control Unit and 1 TU10 Tape Unit

STORAGE = 4K of memory

LOADING = Absolute Loader

EXECUTION TIME = 1 min; = Bell will ring

STARTING PROCEDURE = Start at 207

PRINTOUT = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT TEST SUB-TEST ITERATION
SW10 = INHIBIT MANUAL INTERVENTION TEST
SW 9 = TEST 7 CHANNEL TAPE UNIT
THII Data Reliability (9 Track)

ABSTRACT

The THII Data Reliability Program collects statistical information pertaining to the data reliability of the THII, TUI0 when run for extended periods of time. It uses a number of different parameters controlling data patterns, record lengths, writing and reading sequences and stopping modes (NONSTOP, START-STOP, RANDOM STALL DELAY);

REQUIREMENTS

- PUP with THII and 1 to 8 TUI0 Tape Units (9 Channel only)
- STORAGE = 4K of memory
- LOADING = Absolute Loader
- EXECUTION TIME = Depends on length of tape; Printout will occur
- STARTING PROCEDURE = 270 for automatic parameter selection
  = 234 to manually select parameters (with 4K)
  = 218 to manually select parameters (with 8K)

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = No
The TM11 Data Reliability Program collects statistical information pertaining to the data reliability of the TM11. When TM11 runs for extended periods of time, it uses a number of different parameters controlling data patterns, parity, density record lengths, writing and reading sequences and stopping modes (NONSTOP, START=STOP, RANDOM STALL DELAY).

**REQUIREMENTS**

- PDP-11 with TM11 and 1 to 8 TM10 Tape Units (7 Channel only)
- STORAGE = 4K of memory
- LOADING = Absolute Loader
- EXECUTION TIME = Depends on Length of Tape - Printout will occur
- STARTING PROCEDURE = 200 for automatic parameter selection
  - 204 to manually select parameters (with 4K)
  - 210 to manually select parameters (with 8K)

**PRINTOUTS = Yes**

**SWITCH REGISTER OPTIONS = No**
MAINDEC-11-D4D

TMII Drive Function Timer

ABSTRACT

The TMII Drive Function Timer assists in the testing of the TMII control unit and TU10 tape unit. Selected operations are executed, timed, and the times are then printed (in milliseconds). There is no limit of error testing facilities in the program. The decision on the validity of times measured must be made by the operator. Any configuration of up to 8 TU10 Tape Units (7 and 9 Channel) may be selected.

REQUIREMENTS

PDP-11 with TMII control unit and 1 to 8 TU10 Tape Units (any combination of 7 and 9 channel units)

STORAGE = 4K of memory

LOADING = Absolute Loader

EXECUTION TIME = Non-applicable

STARTING PROCEDURE = Start at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes
UDC11 Control Test

ABSTRACT

UDC11 Control Test tests virtually all of the control logic up to the UDC bus. Maintenance logic is used to generate UDC interrupts and to single step the scan register. Note: the UDC bus cable to the system units can be removed from the control while this test is run if errors result due to interrupt modules generating interrupts. If the modules generating interrupts are in the first four addresses (0 - 006), the modules must be removed since removing the bus cable will not disconnect these modules from the UDC bus.

A power fail test is included, starting address = 000204. This test will type a message that it is waiting for a power failure and will type which one of two types of failures occur (UDC DC power or PDP-11) when and if they happen.

REQUIREMENTS

PDP-11
ASR33/35 Teletype
UDC11 Control

STORAGE = 7 = 712500

LOADING = Absolute Loader

EXECUTION TIME = 1 min. = Bell will ring

STARTING PROCEDURE = 270 = Control Diagnostic
274 = Power Fail Test
Restart at 1000

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = YES

SW15 = HALT ON ERROR
SW14 = ENTER SCOPE MODE
SW13 = INHIBIT ERROR PRINTOUT
SW12 = INHIBIT ITERATION
SW10 = HALT AT END OF TEST CURRENTLY EXECUTING
SW 9 = SELECT THE TEST SPECIFIED BY SW7 = SW3
SW 7 = SW2 = NUMBER OF TEST TO BE SELECTED
UDC#11 System Function Exerciser

ABSTRACT

This program allows the user to checkout, debug, or demonstrate the universal digital controller. Through a set of parameters the program will input and/or output data on one or more I/O channels. The input data is generated by and the output data is detected by some external source such as switch or light panels. The parameters are entered via a set of directives from the teletype keyboard. At any time, any one or more of the parameters may be changed. The program contains 7 test routines; all of the test routines do not necessarily use all of the directives.

REQUIREMENTS

PDP-11
ASR33/35 Teletype
UDC#11 Control
I/O modules and some form of input generating device and output detecting device such as switch or light panels.

STORAGE = R = 11702

LOADING = Absolute Loader

EXECUTION TIME = Variable, depending on parameters and test selected.

STARTING PROCEDURE = Start at 200
                      = Restart at 1000

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW0 = INHIBIT TYPEOUT = Test 4
MAINDEC-11-DBA=L

Unibus Tester Factory use only

ABSTRACT

This program tests the Unibus tester which is used for In-house production line testing of the PDP-11 UNIBUS.

REQUIREMENTS

PDP-11 and a UNIBUS Tester

STORAGE = All of 4K of memory

LOADING = Absolute Loader

EXECUTION TIME = Not Applicable

STARTING PROCEDURE = Start at 200

PRINTOUTS = No

SWITCH REGISTER OPTIONS No
VT05

ABSTRACT

The VT05 display terminal tests consists of a package of test programs designed to test the VT05 input-output logic, the VT05 display, and the keyboard. All tests are included in one object tape. The available test programs are listed here in numerical order:

PRG 7 - Combined input-output logic tests
PRG 1 - Display test
PRG 2 - Keyboard test
PRG 3 - Printer exerciser
PRG 4 - Clock adjustment routine
PRG 5 - Clock adjustment routine
PRG 6 - Maintenance mode single character data test
PRG 7 - Maintenance mode special binary count pattern test
PRG 10 - Roll-up display test
PRG 11 - Cursor address test

REQUIREMENTS

PDP-11
VT05

STORAGE - This program uses location 00200 through 15160.

LOADING - Absolute loader

EXECUTION TIME - Depends on program selected and baud rate.

STARTING PROCEDURE -

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW15 = HALT ON ERROR
SW14 = SCOPE
SW13 = INHIBIT ERROR PRINTOUTS
SW12 = INHIBIT TRACE TRAPPING/BACK GROUND TEST
SW11 = INHIBIT ITERATION
VT06 Display Terminal Tests

ABSTRACT

The VT06 Display Terminal Tests consists of a package of test programs designed to test the VT06 input-output tools, the VT06 display, and the keyboard. All tests are included in one object tape. The available test programs are listed in numerical order:

- PRG0: Combined input-output logic tests
- PRG1: Display Test
- PRG2: Keyboard Test
- PRG3: Printer Exerciser
- PRG4: Clock Adjustment Routine
- PRG5: Clock Adjustment Routine
- PRG6: Maintenance Mode Single Character Data Test
- PRG7: Maintenance Mode Special Binary Count Pattern Test
- PRG10: Roll-Up Display Test

REQUIREMENTS

- PDP11
- VT06 Display Terminal
- High Speed Reader

STORAGE = 200 = 11672

LOADING = Absolute Loader

EXECUTION TIME = Depends on Program selected

STARTING PROCEDURE = Start and Restart at 200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

- SW15 = HALT AT END OF ROUTINE
- SW14 = ENTER SCOPE MODE AFTER ERROR
- SW13 = INHIBIT ITERATION
- SW10 = LOOP PROGRAM
- SW9 = SELECT ROUTINE
- SW6 = 0 = NUMBER OF ROUTINE TO BE SELECTED
VT20 DIAGNOSTIC TEST

ABSTRACT

This program tests, diagnoses and exercises the "VT20" system. The program is comprised of eighteen individual selectable tests to facilitate the checkout of the VT20 displays and keyboards. The program consists of two parts. Part I, the main diagnostic is to be loaded into the VT20. Part II is a DL11 data handling routine and is to be loaded into the VT20 host computer. The program is set up to operate "with" or "without" a teletype. If a teletype isn't available, program "halts" are used to report errors and collect needed information. The program responds functionally the same with or without the teletype. It is imperative that the display tests be run and proved fully operational before running the keyboard tests. This is necessary since the display is used in conjunction with the "KBD" (functional & ASCII keyboard) tests.

REQUIREMENTS

<table>
<thead>
<tr>
<th>VT20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host computer with console device.</td>
</tr>
</tbody>
</table>

STORAGE = 8K

LOADING

EXECUTION TIME =

<table>
<thead>
<tr>
<th>TEST</th>
<th>PASS TIME</th>
<th>NOTES</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>7.5 mins</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>4 mins</td>
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<tr>
<td>2</td>
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<tr>
<td>3</td>
<td>30 secs</td>
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<tr>
<td>4</td>
<td>25 secs</td>
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<tr>
<td>5</td>
<td>6 mins</td>
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<tr>
<td>6</td>
<td>6 mins</td>
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<td>9</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>6 mins</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>N/A</td>
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<tr>
<td>13</td>
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<tr>
<td>14</td>
<td>total of above + test 15</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>75 secs</td>
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<td>16</td>
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<td>20</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td>N/A</td>
<td></td>
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</tbody>
</table>
STARTING PROCEDURE - There are 2 starting addresses

1. With teletype, load and start program at address 200
2. Without teletype, load and start program at address 254

PRINTOUTS - Yes

SWITCH REGISTER OPTIONS - Yes

SW10=0...REQUEST KEYBOARD INPUT
SW10=1...INHIBIT KEYBOARD INPUT REQUEST

SW11=0...NORMAL RUN (100 PASSES/TEST)
SW11=1...SUPPRESS SUBTEST ITERATIONS

SW13=0...PRINT ERROR MESSAGES
SW13=1...SUPPRESS ERROR MESSAGES

SW14=0...NORMAL RUN
SW14=1...LOOP ON CURRENT SUBTEST

SW15=0...CONTINUE ON ERROR
SW15=1...HALT ON ERROR
Communication Test Program (CTP)

ABSTRACT

The function of this test is to detect malfunctions caused by the interaction of multiple communication devices. The test is designed to run 32 DC11 asynchronous line interfaces, 16 KL11 user teletype interfaces, 32 DPII synchronous line interfaces, 16 DM11 asynchronous multiplexers, 16 DON11 auto calling units (64 lines), one DX11 (IBM 360 or 370 Interface), 31 DL11C, D or E asynchronous interfaces, one LIPI line printer, one TC11 DECTape, one FF11 disk, one RF11 disk, one RP11 disk and one KL11 console teletype interface. All devices are fully interrupt driven. This allows a background program to monitor the system. Devices (DC/LS, KL/LS, DP/LS, DM/LS, DL/LS, CN/LS) and continuously check NPL data (RF, RK, RP, TC). On the first pass of this program the user must generate the hardware configuration to be tested. This is accomplished by leaving the start address in the console switches when pressing 'START'. A systems configuration of devices currently on the system will be output on the CTY. The program then halts, permitting the user to select the device to be tested; after the initial configuring has been accomplished the restart procedure is to "LOAD ADDRESS", zero switches, "START".

REQUIREMENTS = PDP-11 = 8K

STORAGE = Fixed core 0 = 026760
Variable core 026762 and up

LOADING = Absolute Loader

EXECUTION TIME = The run time is a function of system overhead, with no devices running it takes approximately 1 min. to complete the background. As the number of devices tested increases so does the background time; printout will occur.

STARTING PROCEDURE = Start at 200 (leave start ADDR in switches if first run or new test configuration);
Start at 1000 if LPT was tested

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

With start address in switches program halts with R0=I;
Program halts R0=3 thru R0=16 allocation of line activity for devices selected on halts below:

R0 = I SWITCH SELECTIONS
(SET) (TEST)
R0 = 2 SWITCH SELECTIONS
(SET) (TEST)
SW0 = 1, CTY (CONSOLE TTY)
SW1 = 1, LP11 (LINE PRINTER)
SW2 = 1, TC11 (DECTAPE)
SW3 = 1, RF11 (DISK)
SW4 = 1, RK11 (DISK)
SW5 = 1, RP11 (DISK)
SW6 =
SW7 =
SW8 = NOT USED
SW9 =

R0=177777 DYNAMIC SWITCH SELECTION
(SET) (FUNCTION)
SW 8=1, INHIBIT MEM, TEST WORST CASE NOISE
SW 9=1, INHIBIT MEM, TEST FAST READ WRITE
SW10=1, BELL ON ERROR
SW11=1, INHIBIT ITERATIONS
SW12= (NOT USED)
SW13=1, INHIBIT ERROR TYPEOUT
SW14=1, SCOPE LOOP
SW15=1, HALT ON ERROR
ABSTRACT

DP2 makes the PDP11 family diagnostic programs available in the DECTape medium. It provides an easy and convenient means of loading and running programs. It provides the means for updating and modifying the programs, and makes possible sequential execution of Diagnostic programs (chain mode).

The diagnostic programs are packaged in four DECTapes as follows:

1. DECTape 1 = Processor and memory tests; EAE tests
2. DECTape 2 = 11/45 and 11/40 processor options
3. DECTape 3 = I/O diagnostics
4. DECTape 4 = I/O diagnostics

The following documents are released with DP2 to facilitate its use:

1. MAINDEC-11-020AA PDP-11 MAINDEC Index
2. MAINDEC-11-020AB MAINDEC user reference manual

REQUIREMENTS

SOFTWARE = 1. standard PDP11 system
2. 5K minimum storage
3. TC11 DECTape control and one TU56 DECTape transport
4. BM792YB or MR11-DB bootstrap loader
5. Console TTY or equivalent

HARDWARE = DP2 uses the uppermost 1K of storage of the system (up to 28K), it either preserves or restores the bootstrap loader, programs to be loaded by DP2 must not load into DP2 space.

DRIVE = DP2 uses the uppermost 1K of storage of the system (up to 28K).

LOADING = Load via BM792YB bootstrap loader or by MR11-DB bootstrap loader.

EXECUTION TIME = Function of each individual program executed

WRITING PROCEDURE = Start at 200

INPUTS = Yes

'CH REGISTRATION = No

1: Faster loading
2: Seldom run programs more likely to be used.
3: Very useful in preventative maintenance; especially when used in chain mode.
4: The compact storage medium minimizes loss of programs.
5: By keeping programs updated to latest MCN levels, no need to patch a program each time it is loaded.
RKDP is a Diagnostic Package

ABSTRACT

RKDP makes the PDP-11 family diagnostic program available on the RKII disk. It provides an easy and convenient means of loading and running programs, provides the means for updating and modifying the programs and makes possible sequential execution of diagnostic programs (chain mode).

The following documents are released with RKDP to facilitate its use:

1. MAINDEC-11-DZQAA PDP-11 MAINDEC INDEX
2. MAINDEC-11-DZQAB MAINDEC USER REFERENCE MANUAL

REQUIREMENTS

HARDWARE - RKDP requires the following hardware environment:

1. Standard PDP-11 system
2. 8K minimum storage
3. RKII disk controller and one AKM5 disk
4. By792YB or MR11-OB bootstrap loader
5. Console TTY or equivalent

SOFTWARE - RKDP uses the uppermost 1K of storage of the system (up to 28K). It either preserves or restores the bootstrap loader programs to be loaded by RKDP must not load into RKDP space.

STORAGE - 8K minimum

LOADING - loaded via bulk storage bootstrap ROM

EXECUTION TIME = function of Individual Program

STARTING PROCEDURE = self start with ROM Bootstrap

PRINTOUTS = YES

SWITCH REGISTER OPTIONS = YES

SR 017001 = ABORT CHAIN MODE
SR 270002 = SKIP TO NEXT PROGRAM IN CHAIN MONITOR ITERATIONS

MONITOR MONITOR
ABSTRACT

This program is an interactive bus exerciser for a paper tape oriented PDP-11; it performs a test of instructions and concurrent operations of I/O equipment simultaneously. It may also perform the same operation independently. This program is not to be considered a total check of the system; if an error is detected in an I/O device, it will probably be necessary to correct the malfunction with the respective diagnostic for that device.

REQUIREMENTS = PDP-11 and 8K of memory.

OPTION HARDWARE THAT THE PROGRAM WILL EXERCISE OR INTERACT WITH:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
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<tr>
<td>AA11</td>
<td>DAC/W/SCOPE</td>
<td>KE11</td>
<td>EAE OPTION</td>
</tr>
<tr>
<td>AD01</td>
<td>AUD/UX</td>
<td>KG11</td>
<td>CRC OPTION</td>
</tr>
<tr>
<td>AFC11</td>
<td>AUD/UX</td>
<td>KL11</td>
<td>ASR33,35 (VT05, VT06, LC11)</td>
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<tr>
<td>BM792Y</td>
<td>PAPER TAPE BOOT</td>
<td>KW11-L</td>
<td>LINE CLOCK</td>
</tr>
<tr>
<td>BM792YB</td>
<td>MASS STORAGE BOOT</td>
<td>KW11-P</td>
<td>PROG CLOCK</td>
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<tr>
<td>CO11</td>
<td>CARD ROR (NPR)</td>
<td>LP11</td>
<td>LINE PRINTER</td>
</tr>
<tr>
<td>CH11</td>
<td>CARD ROR (BR)</td>
<td>MH11</td>
<td>UP TO 28KW MEMORY</td>
</tr>
<tr>
<td>CR11</td>
<td>CARD ROR (RB)</td>
<td>MR11</td>
<td>BULK STORAGE BOOT</td>
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<td>DC11</td>
<td>ASYNC LINE UNIT</td>
<td>PC11</td>
<td>HSP/HSR</td>
</tr>
<tr>
<td>DM11</td>
<td>ASYNC LINE MUX</td>
<td>RC11</td>
<td>FIXED HEAD DISK</td>
</tr>
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<td>DM118R</td>
<td>MUX MUX</td>
<td>RF11</td>
<td>FIXED HEAD DISK</td>
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<td>CN11</td>
<td>DIGITAL DIALER</td>
<td>RK11</td>
<td>CARTRIDGE DISK</td>
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<td>DP11</td>
<td>SYNC LINE UNIT</td>
<td>TF11</td>
<td>MAGNETIC TAPE</td>
</tr>
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<td>DR11A</td>
<td>DEV INTERFACE (BR)</td>
<td>TC11</td>
<td>DECTAPE</td>
</tr>
<tr>
<td>DR11B</td>
<td>DEV INTERFACE (NPR)</td>
<td>TM11</td>
<td>MAGNETIC TAPE</td>
</tr>
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<td>DR11C</td>
<td>DEV INTERFACE (BR)</td>
<td>UDC11</td>
<td>UNIVERSAL DIGITAL CONT</td>
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<tr>
<td>DT11</td>
<td>BUS SWITCH</td>
<td>VR20</td>
<td>2 COLOR SCOPE</td>
</tr>
</tbody>
</table>

STORAGE = 7 - 37476

LOADING = Absolute Loader

EXECUTION TIME = Varies with core size and number of devices. 

= Bell will ring = 8KW - about 5 min, for two bells.

STARTING PROCEDURE = Start at 207 (SW=0 runs processor test only - all of core).

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = Yes

SW15 = HALT ON ERROR
SW14 = SCOPE LOOP
SW13 = INHIBIT PRINTOUT
SW12 = INHIBIT TRACE TRAPPING
SW11 = INHIBIT ITERATION LOOP  
SW12 = INHIBIT PROCESSOR TEST  
SW 9 = INHIBIT MEMORY  
SW 8 = ISOLATION BY DROPOUT  
SW 7 = SWITCH ERROR MESSAGE TO HIGH SPEED PUNCH  
SW 6 = RESTART PROGRAM ON ERROR

**DEVICE INHIBIT SWITCHES - SW = 1, INHIBIT DEVICE**

<table>
<thead>
<tr>
<th>SWITCH</th>
<th>AFTER ADRS LOAD</th>
<th>AFTER 1ST HALT</th>
<th>AFTER 2ND HALT</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>OT11</td>
<td>DC11 #1</td>
<td>KG11</td>
</tr>
<tr>
<td>1</td>
<td>MULTIPROC</td>
<td>DC11 #2</td>
<td>CD11</td>
</tr>
<tr>
<td>2</td>
<td>PC11 HSP</td>
<td>AA11</td>
<td>DR11A,C</td>
</tr>
<tr>
<td>3</td>
<td>PC11 HSR</td>
<td>AFC11</td>
<td>DM11BB</td>
</tr>
<tr>
<td>4</td>
<td>KW11-L</td>
<td>RK11</td>
<td>VR2P</td>
</tr>
<tr>
<td>5</td>
<td>CR11,CH11</td>
<td>DR11-B</td>
<td>RESERVED</td>
</tr>
<tr>
<td>6</td>
<td>KW11-P</td>
<td>KE11</td>
<td>RESERVED</td>
</tr>
<tr>
<td>7</td>
<td>LP11 (RESTRT 600)</td>
<td>AD01</td>
<td>RESERVED</td>
</tr>
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<td>8</td>
<td>FACTORY USE ONLY</td>
<td>PP11</td>
<td>RESERVED</td>
</tr>
<tr>
<td>9</td>
<td>FACTORY USE ONLY</td>
<td>FACTORY USE ONLY</td>
<td>RESERVED</td>
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<tr>
<td>10</td>
<td>RF11</td>
<td>DN11</td>
<td>RESERVED</td>
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<tr>
<td>11</td>
<td>UD011</td>
<td>TM11</td>
<td>RESERVED</td>
</tr>
<tr>
<td>12'</td>
<td>RC11</td>
<td>M792YA</td>
<td>RESERVED</td>
</tr>
<tr>
<td>13</td>
<td>TC11</td>
<td>M792YB,MR11</td>
<td>RESERVED</td>
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<tr>
<td>14</td>
<td>KL11 IN</td>
<td>DP11</td>
<td>RESERVED</td>
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<tr>
<td>15</td>
<td>KL11 OUT</td>
<td>DM11</td>
<td>RESERVED</td>
</tr>
</tbody>
</table>
MAINEC-11-DY\$E=

Maintenance Loader

ABSTRACT

The purpose of this loader is to provide an alternate method of loading diagnostics which may function when the absolute loader fails to work due to a hardware failure. A description of the bootstrap loader loading the maintenance loader is also provided to aid in isolation of trouble should it be impossible to load even the maintenance loader. This loader is not intended to replace the absolute loader and should only be used for loading of diagnostic programs if the absolute loader will not function.

REQUIREMENTS

PDP-11

STORAGE = 17476 - 17742

LOADING = Normal Bootstrap

STARTING PROCEDURE = Start at 17500

PRINTOUTS = No

SWITCH REGISTER OPTIONS = No
SYSTEM SIZER

ABSTRACT
This program will detect and list on the TTY all devices that exist on the system running it.

REQUIREMENTS

Any PDP11 with 4K of memory and a TTY (or equiv.) will run this program.

STORAGE

LOADING

EXECUTION TIME = Depends on printouts

STARTING PROCEDURE = SA200

PRINTOUTS = Yes

SWITCH REGISTER OPTIONS = N/A
### Table 8

**Address Assignments**

**Standard DEC I/O Devices**

**Sheet 11 Address Field 770000 to 773776**

<table>
<thead>
<tr>
<th>27</th>
<th>13</th>
<th>27</th>
<th>30</th>
<th>47</th>
<th>50</th>
<th>60</th>
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</thead>
<tbody>
<tr>
<td>7700</td>
<td><strong>BUS TESTER AND LATENCY TESTER</strong></td>
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- **ADF 11**
- **UDC 11**
- **FUNCTIONAL MODULES**

**Sheet 12 Address Field 773776 to 777777**

<table>
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<th>50</th>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

- **R111=8**
- **TM11**
- **KW11-P XV11**
- **AFC 11**

- **M790 USER ROM #2**
- **M792 USER ROM #3**
- **M792 USER ROM #4**
- **M792 USER ROM #5**
- **M792 MAINTENANCE ROM**
### Table 8

**Address Assignments**

**Standard PEG 1/0 Devices**

Sheet 21: Address Field 774000 to 777776

<table>
<thead>
<tr>
<th>70</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
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<tbody>
<tr>
<td>7740</td>
<td>#1</td>
<td>#2</td>
<td>#3</td>
<td>#4</td>
<td>#5</td>
<td>#6</td>
<td>#7</td>
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<tr>
<td>7741</td>
<td>#9</td>
<td>#10</td>
<td>#11</td>
<td>#12</td>
<td>#13</td>
<td>#14</td>
<td>#15</td>
</tr>
<tr>
<td>7742</td>
<td>#16</td>
<td>#18</td>
<td>#19</td>
<td>20</td>
<td>#21</td>
<td>#22</td>
<td>#23</td>
</tr>
<tr>
<td>7743</td>
<td>#25</td>
<td>#26</td>
<td>#27</td>
<td>#28</td>
<td>#29</td>
<td>#30</td>
<td>#31</td>
</tr>
<tr>
<td>7744</td>
<td>#32</td>
<td>#31</td>
<td>#30</td>
<td>#29</td>
<td>#28</td>
<td>#27</td>
<td>#26</td>
</tr>
<tr>
<td>7745</td>
<td>#24</td>
<td>#23</td>
<td>#22</td>
<td>#21</td>
<td>#20</td>
<td>#19</td>
<td>#18</td>
</tr>
<tr>
<td>7746</td>
<td>#14</td>
<td>#15</td>
<td>#16</td>
<td>#17</td>
<td>#18</td>
<td>#19</td>
<td>#20</td>
</tr>
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<td>7747</td>
<td>#8</td>
<td>#7</td>
<td>#6</td>
<td>#5</td>
<td>#4</td>
<td>#3</td>
<td>#2</td>
</tr>
<tr>
<td>7748</td>
<td>#1</td>
<td>#2</td>
<td>#3</td>
<td>#4</td>
<td>#5</td>
<td>#6</td>
<td>#7</td>
</tr>
</tbody>
</table>

### Diagram

- **KM11**
- **DP11**
- **DM11**
- **DS11**
- **DX11**
- **CPU Register**

**Note:** Start at 167770 Down.
Table 1  
Timing Characteristics of Standard PDP-11 NPR Devices

<table>
<thead>
<tr>
<th>NPR Priority</th>
<th>Device</th>
<th>Latency (Worst Case) (usec)</th>
<th>Time Between Data Available (usec)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>RK11/RK03</td>
<td>8.5</td>
<td>11,1</td>
</tr>
<tr>
<td>2</td>
<td>RP11</td>
<td>11</td>
<td>14.8#</td>
</tr>
<tr>
<td>3</td>
<td>RC11</td>
<td>12</td>
<td>16</td>
</tr>
<tr>
<td>4</td>
<td>RF11</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>RK11/RK02</td>
<td>19</td>
<td>22,2</td>
</tr>
<tr>
<td>6</td>
<td>TH11</td>
<td>29</td>
<td>32 (at 800 baud)</td>
</tr>
<tr>
<td>7</td>
<td>TC11</td>
<td>67</td>
<td>200</td>
</tr>
<tr>
<td>8</td>
<td>DM11</td>
<td>100</td>
<td>119 (at 1200 baud)</td>
</tr>
<tr>
<td>9</td>
<td>CD11</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>DR11MB</td>
<td>*</td>
<td></td>
</tr>
</tbody>
</table>

# The RP11 transfers two words each 14.8 usec;  
• Depends on Customer Application.
### Table 2

**Priority of Devices Affected by BR Latency**

<table>
<thead>
<tr>
<th>Priority</th>
<th>BR7</th>
<th>BR6</th>
<th>BR5</th>
<th>BR4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AD1(1)</td>
<td>KW11-L</td>
<td>DP11 @ 9600 baud or higher</td>
<td>KL11</td>
</tr>
<tr>
<td>2</td>
<td>DT11=8</td>
<td>TC11</td>
<td>DC11 @ 1800 baud</td>
<td>UNCI1 (Def'd)</td>
</tr>
<tr>
<td>3</td>
<td>CR11</td>
<td>CM11</td>
<td>DP11 @ 4800 baud</td>
<td>AFC11(2)</td>
</tr>
<tr>
<td>4</td>
<td>CM11</td>
<td></td>
<td>DC11 @ 1200 baud</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>KW11-P(2)</td>
<td>UDC11 (Immediate)</td>
<td>DP11 @ 2400 baud</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>UDC11 (Immediate)</td>
<td></td>
<td>DC11 @ 600 BAUD</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>UDC11 (Immediate)</td>
<td></td>
<td>DP11 @ 2000 baud</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>UDC11 (Immediate)</td>
<td></td>
<td>DC11 @ 300 baud</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>UDC11 (Immediate)</td>
<td></td>
<td>DM11</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>DR11=A(2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>DR11=B</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Notes:**

1. For AD1 sampling at high rates, can be assigned to lower level for slow input applications.
2. Priority positions depend on customer application.
### Table 3

**Fixed Vector Interrupt Devices**

<table>
<thead>
<tr>
<th>UNIBUS OPTION NO.</th>
<th>DEVICE ADDRESS</th>
<th>INTERRUPT VECTOR</th>
<th>BR LEVEL</th>
<th>X=NPR</th>
<th>BUS LOAD</th>
<th>MOUNTING</th>
<th>AMPS @+5 Vdc</th>
<th>AMPS @115 Vac</th>
<th>POWER DISSIPATION (W)</th>
<th>PERIPHERAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA11</td>
<td>77675</td>
<td>140</td>
<td>4</td>
<td>1(3)</td>
<td>SU</td>
<td>Panel</td>
<td>2.9</td>
<td>1</td>
<td>15</td>
<td>VR81, VR14, VT81</td>
</tr>
<tr>
<td>AD11</td>
<td>77677</td>
<td>132</td>
<td>5,7</td>
<td>1</td>
<td>Panel</td>
<td>Cabinet</td>
<td>1.5</td>
<td>15</td>
<td>1700</td>
<td></td>
</tr>
<tr>
<td>AFC</td>
<td>77237</td>
<td>134</td>
<td>4</td>
<td>1</td>
<td>SPC</td>
<td>Module</td>
<td>0.8</td>
<td>3</td>
<td>350</td>
<td>GDI 100, M200, GDI 100M</td>
</tr>
<tr>
<td>CH11/CM11</td>
<td>77714</td>
<td>232</td>
<td>6</td>
<td>1</td>
<td>SPC</td>
<td>Module</td>
<td>1.0</td>
<td>3</td>
<td>250</td>
<td>Console Telex/Inter</td>
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<tr>
<td>CTY</td>
<td>77756</td>
<td>602, 264</td>
<td>4</td>
<td>1</td>
<td>SPC</td>
<td>Module</td>
<td>1.5</td>
<td>5</td>
<td>500</td>
<td>(2) Amounts In KA11 Or KC11</td>
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<tr>
<td>KW11-L</td>
<td>77754</td>
<td>100</td>
<td>6</td>
<td>1</td>
<td>SPC</td>
<td>Module</td>
<td>0.8</td>
<td>3</td>
<td>350</td>
<td></td>
</tr>
<tr>
<td>KW11-P</td>
<td>77254</td>
<td>134</td>
<td>6</td>
<td>1</td>
<td>SPC</td>
<td>Module</td>
<td>1.0</td>
<td>3</td>
<td>250</td>
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<tr>
<td>LPI1</td>
<td>77751</td>
<td>270</td>
<td>4</td>
<td>1</td>
<td>SPC</td>
<td>Module</td>
<td>1.5</td>
<td>5</td>
<td>500</td>
<td></td>
</tr>
<tr>
<td>PG11/PR11</td>
<td>77755</td>
<td>370, 174</td>
<td>4</td>
<td>1</td>
<td>Panel</td>
<td>Cabinet</td>
<td>2.2</td>
<td>11</td>
<td>1200</td>
<td>LA81</td>
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<td>RC11</td>
<td>77744</td>
<td>210</td>
<td>6,5</td>
<td>X</td>
<td>Panel</td>
<td>Cabinet</td>
<td>1.5</td>
<td>3</td>
<td>350</td>
<td>PC05</td>
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<td>RF11</td>
<td>77746</td>
<td>216</td>
<td>5,5</td>
<td>X</td>
<td>Panel</td>
<td>Cabinet</td>
<td>1.5</td>
<td>3</td>
<td>1200</td>
<td>RS11</td>
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<tr>
<td>RK11</td>
<td>77748</td>
<td>220</td>
<td>5,5</td>
<td>X</td>
<td>Panel</td>
<td>Cabinet</td>
<td>1.5</td>
<td>3</td>
<td>1200</td>
<td>RS11</td>
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<td>TP11</td>
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<td>254</td>
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<td>X</td>
<td>Panel</td>
<td>Cabinet</td>
<td>1.5</td>
<td>3</td>
<td>1200</td>
<td>RK02, RK03</td>
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<td>77734</td>
<td>214</td>
<td>6</td>
<td>X</td>
<td>Panel</td>
<td>Cabinet</td>
<td>1.5</td>
<td>3</td>
<td>1200</td>
<td>TK02</td>
</tr>
<tr>
<td>TM11</td>
<td>77252</td>
<td>224</td>
<td>6</td>
<td>X</td>
<td>Panel</td>
<td>Cabinet</td>
<td>1.5</td>
<td>3</td>
<td>1200</td>
<td>TK02</td>
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<tr>
<td>UDC11</td>
<td>77177</td>
<td>234</td>
<td>4,6</td>
<td>2</td>
<td>SPC</td>
<td>Module</td>
<td>2.2</td>
<td>11</td>
<td>1200</td>
<td>TU56</td>
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<tr>
<td>XY11</td>
<td>77255</td>
<td>122</td>
<td>5</td>
<td>1</td>
<td>SPC</td>
<td>Module</td>
<td>1.0</td>
<td>24</td>
<td>2700</td>
<td>(2) XY Plotter</td>
</tr>
</tbody>
</table>

1. Maximum AC operating current for controller and one peripheral when mounted in same cabinet.

2. Power dissipation is included in AA11 mounting box; see Equipment Power Requirements, Table 6.

3. AA11 presents two unit bus loads if it includes Scope Control.
Table 4

Floating Vector Interrupt Devices

<table>
<thead>
<tr>
<th>UNI BUS Option No.</th>
<th>Max. No. of Units</th>
<th>Address of First</th>
<th>Address of Second</th>
<th>Address of ..., Last Unit</th>
<th>Full(1) Duplex</th>
<th>BR Level</th>
<th>X NP</th>
<th>Bus Load</th>
<th>Mounting</th>
<th>Ams (6) @ ±5 Vdc</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCII</td>
<td>32</td>
<td>774000</td>
<td>774010</td>
<td>... 774373</td>
<td>X</td>
<td>5</td>
<td></td>
<td>1</td>
<td>SU</td>
<td>2.8</td>
</tr>
<tr>
<td>KLII</td>
<td>16</td>
<td>776500</td>
<td>776510</td>
<td>... 776670</td>
<td>X</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>SPC</td>
<td>1.5</td>
</tr>
<tr>
<td>DPII</td>
<td>32</td>
<td>774770</td>
<td>774780</td>
<td>... 774400</td>
<td>X</td>
<td>5</td>
<td></td>
<td>1</td>
<td>SU</td>
<td>2.5</td>
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<tr>
<td>DMII</td>
<td>16</td>
<td>775000</td>
<td>775010</td>
<td>... 775170</td>
<td>X</td>
<td>5</td>
<td>X</td>
<td>1</td>
<td>2xSU(8)</td>
<td>4.9</td>
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<td>DNII</td>
<td>16</td>
<td>775200</td>
<td>775212</td>
<td>... 775370</td>
<td>4</td>
<td></td>
<td>4</td>
<td>1</td>
<td>SU</td>
<td>4.5</td>
</tr>
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<td>DMII-BB</td>
<td>16</td>
<td>776500</td>
<td>776510</td>
<td>... 776670</td>
<td>4</td>
<td></td>
<td>4</td>
<td>1</td>
<td>Module(9)</td>
<td>2.5</td>
</tr>
<tr>
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<td>(2)</td>
<td>767770</td>
<td>767780</td>
<td>...</td>
<td>(2)</td>
<td></td>
<td></td>
<td></td>
<td>SPC</td>
<td>1.5</td>
</tr>
<tr>
<td>DTII</td>
<td>8</td>
<td>777420</td>
<td>777422</td>
<td>... 777436</td>
<td>(7)</td>
<td></td>
<td></td>
<td>(4)</td>
<td>Panel</td>
<td>(5)</td>
</tr>
<tr>
<td>DRII-B</td>
<td>4(3)</td>
<td>772410</td>
<td>772430</td>
<td>... 772472</td>
<td>5</td>
<td>X</td>
<td>1</td>
<td>1</td>
<td>SU</td>
<td>3.3</td>
</tr>
</tbody>
</table>

1. Full duplex devices require two consecutive vectors.

2. The maximum number of DRII-B's is limited only by available vector space; Addresses are assigned in User Address Space starting at 767770 and counting down.

3. Additional DRII-B's may be installed with addresses in User Address Space.

4. DTII presents three Unit Bus Loads to each processor bus and three loads to the switched bus.

5. DTII requires 1.2 amps at 115 VAC; power dissipation is 125 watts.

6. Power dissipation of SPC and SU devices is included in BAII Mounting Box - see Equipment Power Requirements, Table 6.

7. DRII-B requires only one vector, but it must be of the form XX4.

8. DMII also includes Distribution Panel and power supply.

9. DMII-BB module set mounts in DMII SU.
Table 7

I/O Device Vector Assignments


*User reserved

*Start floating vector assignments at location 300. Note that full duplex devices require two consecutive vectors; e.g., CU11 #1 at 300 and 304.