Release Notice
CONVEX I/O Diagnostics V1.1 (C200/C3200/C3400 Series)

Document No. 760-006730-001

June 1992

CONVEX Computer Corporation
RICHARDSON, TX USA

PRINTED IN THE UNITED STATES OF AMERICA

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Appendices

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Release Notice

1. Introduction

This document is intended to enhance and clarify the existing permanent documentation for this product with information that is up-to-the-minute, or was developed too late for inclusion in the permanent documentation. Always refer to this release notice before reporting questions or problems with CONVEX I/O Diagnostics. Your questions may be answered here. Fixes and workarounds are listed here that may save you time in rediscovering known problems.

The remaining sections in this document describe the contents of this release:

- Section 2 describes the contents of this distribution.
- Section 3 contains notes and warnings about the use of the software.
- Section 4 contains enhancements to the previous functionality.
- Section 5 describes fixes for previously reported problems.
- Section 6 describes known software problems.
- Section 7 contains ioconfig entry examples.
- Section 8 contains known documentation problems.
- Section 9 contains description of new documentation.
- Appendix A contains instructions for installing this release on a CONVEX C200/C3200/C3400 Series Service Processor Unit.
- Appendix B contains a list of the files contained on the release tape.

CONVEX I/O Diagnostics consists of various functional-level test programs and diagnostic utilities that execute under the CONVEX UNIX Version 7 operating system of the CONVEX Service Processor Unit (SPU). All programs MUST execute in the offline diagnostic environment of CONVEX SPU OS and are mutually exclusive with the operation of ConvexOS on the main processors. These programs are the property of CONVEX Computer Corporation and are intended for use only by CONVEX Field Service.

2. Contents of This Distribution

The distribution package for this release of CONVEX I/O Diagnostics consists of this document, distribution media for the software, and documentation. The specific contents of the software and documentation distribution are described in the following tables:

CONVEX I/O Diagnostics Media

ITEM	QTY	TYPE	PART NUMBER	DESCRIPTION	FORMAT
1.	1	QIC	760-004215-003	I/O Diagnostics, V1.1	Installsw

If you do not already have CONVEX I/O Diagnostics Documentation, you will receive the Release Package.

CONVEX I/O Diagnostics Documentation

Release Package

ITEM	QTY	ORDER NUMBER	DESCRIPTION
1.	1	DHW-082	C2 Diagnostics Utilities Manual
2.	1	DHW-082a	C2 Diagnostics Utilities Manual Addendum
3.	0/1	DHW-230	Mbus I/O Subsystem Diagnostics Manual
4.	0/1	DHW-231	Mbus SMD Disk Diagnostics Manual
5.	0/1	DHW-232	Mbus SMD Disk Formatter Diagnostics Manual
6.	0/1	DHW-233	Mbus STC Tape Unit Controller Diagnostics Manual
7.	0/1	DHW-234	Mbus Terminal Controller Diagnostics Manual
8.	0/1	DHW-235	Mbus Line Printer Diagnostics Manual
9.	0/1	DHW-236	Mbus Plotter Diagnostics Manual
10.	0/1	DHW-237	Mbus Ethernet Controller Diagnostics Manual
11.	0/1	DHW-238	Mbus HYPERchannel Controller Diagnostics Manual
12.	0/1	DHW-239	Mbus X.25 Controller Diagnostics Manual
13.	0/1	DHW-240	Mbus Emulator Controller Diagnostics Manual
14.	0/1	DHW-241	VME I/O Processor Diagnostics Manual
15.	0/1	DHW-242	VME SMD/ESDI Disk & Formatter Diagnostics Manual
16.	0/1	DHW-243	VME STC Tape Controller Diagnostics Manual
17.	0/1	DHW-244	VME Async Controller Diagnostics Manual
18.	0/1	DHW-245	VME Ethernet Controller Diagnostics Manual
19.	0/1	DHW-246	VME UltraNet Controller Diagnostics Manual
20.	0/1	DHW-247	VME DAT/3480 Tape Subsystem Diagnostics Manual
21.	0/1	DHW-248	VME HSP/HIA Subsystem Diagnostics Manual
22.	0/1	DHW-249	Tape Library Interface(TLI) Subsystem Diagnostics Manual
23.	0/1	DHW-276	Fiber Distributed Data Interface Diagnostic Manual
24.	0/1	DHW-280	High Performance Parallel Interface Diagnostic Manual
25.	0/1	DHW-285	Integrated Tape Channel Subsystem Diagnostic Manual
26.	0/1	DHW-286	Integrated Disk Channel Subsystem Diagnostic Manual

- C200 and C3200 series Release Packages will include items 1 and 2. Items 3 thru 26 are included, as pertinent, with respect to I/O configuration. For C3400 series Release Packages, items 14 thru 26 are included, as pertinent, with respect to I/O configuration.

Series Update Package

- Consists of items 3 thru 26, as pertinent, with respect to I/O configuration updates, and or, additions.

3. Notes and Warnings

This section contains generally useful information or words of caution about the product.

- This release supersedes all previous versions of Diagnostics.
- For C200 and C3200 systems, this release of CONVEX I/O Diagnostics requires the V5.0 (or later) release of CONVEX C3200 Series Processor Diagnostics (760-001015-220) and the V5.2 (or later) release of CONVEX SPU OS (760-001215-204). For C3400 systems, this release of CONVEX I/O Diagnostics requires the V1.1 (or later) release of CONVEX C3400 Series Processor Diagnostics (760-003515-007) and the V6.0 (or later)

release of CONVEX SPU OS (760-001215-206).

- Multibus is not supported on C3400 series systems.
- The following table lists the hardware configurators recommended to support this release of CONVEX I/O Diagnostics:

Logic Configurator Specification

Logic Configurator	PART NUMBER
CX Configurator	400-000100-979
C2XX Shipping Configurator	400-000100-981

- CONVEX SCSI I/O requires Revision J (or later) of the VIOP Channel Controller Unit (CCU).
- The Diagnostic Database files are now included as part of the CONVEX I/O Diagnostics release and are no longer a separately released product.
- This release should only be installed by a qualified CONVEX Field Service representative. Please see Appendix A for installation details.

4. Enhancements

Utilities

The following enhancements have been made to utility programs in this release:

- None

Test Programs

The following enhancements have been made to test programs in this release:

- The **dev5130** diagnostic will now support DKD-287, 1.5 GB ESDI drive, when used with an Interphase 4201 controller revision 06H and above. Some patterns used in pattern testing for 2-7 RLL and 1-7 RLL data encoding drives have been modified for optimal testing.
- The **io5000** Vme Bus I/O Processor test has been modified to include support for Real Time VIOP ccu board. The diagnostic automatically recognizes Real Time VIOP boards and invokes related subtests to check Real Time functions.
- The **dev_vscsit** diagnostic now includes support for the DAT tape drive with stacker. In addition, data compression modes are supported for both 3480 and DAT.
- The **tli4480** Tape Library Interface diagnostic has added enhancements to checkout the control store, channel to memory and memory to channel subsystems.
- The **dev5300** Vme bus Async Controller Test has an added subtest (115) to checkout the lower 32K of the internal ram. Subtests 209 and 210 are eliminated

from the diagnostic.

- The **dev_vfddi** CONVEX Fiber Distributed Data Vme Interface diagnostic is released for the first time. There are 6 classes of tests in this diagnostic. Class 1 and 3 tests only require the fddi controller to to be present to run the tests. Class 3 also requires presence of firmware file, fddi.x00 in /mnt/test on the spu disk for booting. Class 2 requires the availability of a loopback fiber cable or loopback connector assembly. Class 4 requires the controller to be connected to a fiber ring with at least one other active node. Class 5 subtests require 2 fddi controller boards, with different csr addresses in the same vme chassis and a pair of fddi loopback fiber cable. Class 6 requires an optical bypass switch connected to the fddi controller to run the test.

- The **itc4000** CONVEX Integrated Tape Channel Subsystem diagnostic is released for the first time. There are 5 classes of tests in this diagnostic. Class 0 and 1 do not require additional equipment other than the itc ccu board to be present. Class 2 tests requires the use of a special loopback cable and connector. There is no Class 3 test. Class 4 and 5 require the connection of a E-MASS data storage system. Please refer to the diagnostic manual for further information of this diagnostic.

- The **idc4010** Integrated Disk Channel Subsystem diagnostic is released for the first time. There are 3 classes of tests in this diagnostic. Class 0 and 1 do not require additional equipment other than the idc ccu board to be present. Class 2 tests require the use of a special loopback cable and connector. The **idc4000** diagnostic is obsoleted by the **idc4010** diagnostic. Please refer to the diagnostic manual for further information of this diagnostic.

- Some of our diagnostics have diagnostic functions incorporated in the ConvexOS drivers. The **dev_vscsit, tli4480, dev_vfddi, idc4010** and **itc4000** diagnostics have local copies of **ConvexOS** drivers released with **ConvexOS 10.1.** The names of the driver files are vscsit.x00, tli4480.x00, fddi.viop, idc4010.x00 and itc4000.x00 respectively. These files reside in /mnt/test on the spu disk.

5. Fixes

Utilities

- None

Test Programs

- None

6. Known Software Problems

At the time this release notice was prepared, this section contains the known problems with this release of CONVEX I/O Diagnostics software. Please refer to this list prior to reporting a problem in order to ensure that it has not been previously reported. Serious problems

include workarounds if they are known.

Utilities

- None

Test Programs

- None

7. Ioconfig example

- Ioconfig entries for dev5130, dev_vfddi, dev_vscsit

```
viop 1
 vme 0
#
#    1.5GB esdi disk drive
#
   ctlr DKC-203 csr 0x800 int 1
     unit 0 type DKD-287

#
#          fddi
#
   ctlr LAN-208 csr 0x6000 int 2
     unit 0 type fd
   ctlr LAN-208 csr 0x6200 int 3
     unit 0 type fd

#
#         dev_vscsit
#

# 3480 (207), 3480 with data compression (227)
   ctlr MTC-202 csr 0xee00 int 4
     unit 0 subunit 0 type MTD-207
     unit 0 subunit 1 type MTD 227

# 3480 stacker (217), 3480 with data compression and stacker (237)
   cltr MTC-202 csr 0xec00 int 5
     unit 0 subunit 0 type MTD-217
     unit 0 subunit 1 type MTD 237

# DAT (208), DAT with data compression and stacker (238)
   ctlr MTC-202 csr 0xea00 int 6
     unit 0 subunit 0 type MTD-208
     unit 1 subunit 0 type MTD-238
```

8. Known Documentation Problems

There are no known documentation problems for this release.

9. New Documentation

There is no new documentation for this release.

A

Installing CONVEX C200/C3200/C3400 Series I/O Diagnostics V1.1

Warnings

This section contains generally useful information or words of caution about the product.

- This release supersedes all previous versions of Diagnostics.
- For C200 and C3200 systems, this release of CONVEX I/O Diagnostics requires the V5.0 (or later) release of CONVEX C3200 Series Processor Diagnostics (760-001015-220) and the V5.2 (or later) release of CONVEX SPU OS (760-001215-204). For C3400 systems, this release of CONVEX I/O Diagnostics requires the V1.1 (or later) release of CONVEX C3400 Series Processor Diagnostics (760-003515-007) and the V6.0 (or later) release of CONVEX SPU OS (760-001215-206).
- Multibus is not supported on C3400 series systems.
- The following table lists the hardware configurators recommended to support this release of CONVEX I/O Diagnostics:

Logic Configurator Specification

Logic Configurator	PART NUMBER
CX Configurator	400-000100-979
C2XX Shipping Configurator	400-000100-981

- CONVEX SCSI I/O requires Revision J (or later) of the VIOP Channel Controller Unit (CCU).
- The Diagnostic Database files are now included as part of the CONVEX I/O Diagnostics release and are no longer a separately released product.
- This release should only be installed by a qualified CONVEX Field Service representative.

Installation Procedure

1. If CONVEX SPU OS is already booted, go to step 5.
2. Place the front panel key switch in the *local* position and depress the system reset button to boot CONVEX SPU OS.

3. The soft front panel menu will be displayed. Change the mode to diagnostics and continue the boot process by entering the following commands at the **(fp)>** prompt:

   (fp)> set mode=diagnostic (or sm=d)
   (fp)> boot (or b)

4. The CONVEX SPU OS bootstrap routine will prompt with:

   SPU OS boot
   :

   You should enter a carriage return <CR> in response to the prompt. CONVEX SPU OS will now boot and prompt with **(spu)>** when boot is complete.

   NOTE: A file system check is performed during the boot procedure. If errors are detected in the file system, they will be corrected if possible. If it is not possible to automatically correct the errors, then you will be requested to execute */etc/fsck* manually to correct these errors before proceeding.

5. Verify that the required version of CONVEX SPU OS is installed :

   (spu)> more /UNIX_REV

   If the file */UNIX_REV* is not present, then install CONVEX SPU OS V5.2 (or later) for CONVEX C200/C3200 Series systems. For CONVEX C3400 Series systems, install CONVEX SPU OS V6.0 (or later).

6. Verify that the required version of CONVEX Processor Diagnostics is installed :

   (spu)> more /mnt/PROCDIAG_REV

   For CONVEX C200/C3200 Series systems, if the file */mnt/PROCDIAG_REV* indicates that version V5.0 (or later) of the CONVEX Processor Diagnostics is installed, proceed to the next step. If the file is not present or the version number displayed for CONVEX Processor Diagnostics is not V5.0 or later, then install CONVEX C3200 Series Processor Diagnostics/Database V5.0 (760-001015-220) in accordance with the CONVEX C3200 Series Processor Diagnostics/Database Release Notice (760-001130-007). For CONVEX C3400 Series systems, if the file */mnt/PROCDIAG_REV* indicates that version V1.1 (or later) of the CONVEX Processor Diagnostics is installed, proceed to the next step. If the file is not present or the version number displayed for CONVEX Processor Diagnostics is not V1.1 or later, then install CONVEX C3400 Series Processor Diagnostics V1.1 (760-003515-007) in accordance with the CONVEX C3400 Series Processor Diagnostics Release Notice (760-005030-007).

7. Place the CONVEX C200/C3200/C3400 Series I/O Diagnostics V1.1 tape (760-004215-003) in the cartridge tape unit and enter the following command:

   (spu)> /etc/installsw -i

   The installation of this release requires about 8 minutes.

8. A log of all tar operations is saved in */tmp/installsw.tar* and should be removed as follows:

   (spu)> rm /tmp/installsw.tar

9. After installation is complete, remove the tape from the cartridge tape unit.

10. If the desired mode of operation is diagnostic mode, then this step may be skipped. Otherwise, return to the soft front panel via the */etc/reboot* command:

    (spu)> /etc/reboot

    Change the mode of operation setting to the *desired-mode.* Use the soft front panel *help* command if you need assistance.

    (fp)> set mode=*desired-mode*

    Place the front panel key switch in the *local* position and enter the *boot* command to reboot the system:

    (fp)> boot (or b)

11. This completes the installation of CONVEX C200/C3200/C3400 Series I/O Diagnostics.

B

Files list

The following is the *installsw* output from making the V1.1 I/O Diagnostics tape.

```
==========================================================================

** Installsw Header File Copy **
Product:        CONVEX C200/C3200/C3400 I/O Diagnostics  V1.1
Release date:   June 24th 1992
Directories:        /mnt/bin, /mnt/bin/lib, /mnt/test, /mnt/test/script,
                /mnt/usr, /mnt/usr/lib, /mnt/usr/scn, /mnt/man
==========================================================================
SPU tape device is /dev/rmt1
a /tmp/install1 1 blocks
a /tmp/install2 3 blocks
a bin/get_defects 320 blocks
a bin/ioputil 46 blocks
a bin/lib/get_defects.x00 115 blocks
a bin/lib/ioputil.x00 42 blocks
a bin/lib/dev4100.causes 6 blocks
a bin/lib/dev4100.help 8 blocks
a bin/lib/dev4110.help 7 blocks
a bin/lib/dev4200.help 5 blocks
a bin/lib/dev4300.help 4 blocks
a bin/lib/dev4400.help 3 blocks
a bin/lib/dev4410.help 10 blocks
a bin/lib/dev4500.help 3 blocks
a bin/lib/dev4510.causes 4 blocks
a bin/lib/dev4510.help 5 blocks
a bin/lib/dev4540.help 14 blocks
a bin/lib/dev4600.help 5 blocks
a test/dev4100.t 605 blocks
a test/dev4110.t 605 blocks
a test/dev4200.t 365 blocks
a test/dev4300.t 520 blocks
a test/dev4400.t 360 blocks
a test/dev4410.t 334 blocks
a test/dev4500.t 385 blocks
a test/dev4510.t 366 blocks
a test/dev4540.t 295 blocks
a test/dev4540x.t link to test/dev4540.t
a test/dev4600.t 298 blocks
a test/io4000.t 443 blocks
a test/dev4100.x00 126 blocks
a test/dev4200.x00 84 blocks
a test/dev4300.x00 78 blocks
a test/dev4400.x00 67 blocks
a test/dev4410.x00 73 blocks
a test/dev4500.x00 69 blocks
```

a test/dev4510.x00 90 blocks
a test/dev4540.x00 69 blocks
a test/dev4540.xx0 19 blocks
a test/dev4600.x00 74 blocks
a test/io4000.x00 31 blocks
a usr/scn/iop_rev1 18 blocks
a man/cat1/get_defects.1d 5 blocks
a man/cat1/ioputil.1d 14 blocks
a bin/boot_hsp 264 blocks
a bin/boot_iop 277 blocks
a bin/hsputil 188 blocks
a bin/idcfmt 467 blocks
a bin/io_hard_logger 233 blocks
a bin/io_margin 239 blocks
a bin/io_sysreset 238 blocks
a bin/vioputil 35 blocks
a bin/lib/hsputil.x00 74 blocks
a bin/lib/vioputil.x00 45 blocks
a bin/lib/controllers 4 blocks
a bin/lib/DB_diskfmt 6 blocks
a bin/lib/DBtapefmt 11 blocks
a bin/lib/dev5130.causes 3 blocks
a bin/lib/dev5130.help 9 blocks
a bin/lib/dev5210.dhelp 20 blocks
a bin/lib/dev5210.help 41 blocks
a bin/lib/dev5300.dhelp 24 blocks
a bin/lib/dev5300.help 14 blocks
a bin/lib/dev5510.dhelp 18 blocks
a bin/lib/dev5510.help 16 blocks
a bin/lib/dev_ultra.help 11 blocks
a bin/lib/dev_vscsit.dhelp 38 blocks
a bin/lib/dev_vscsit.help 12 blocks
a bin/lib/dev_vfddi.dhelp 26 blocks
a bin/lib/dev_vfddi.help 12 blocks
a bin/lib/tli.help 145 blocks
a bin/lib/tli4480.edb 38 blocks
a bin/lib/idcfmt.help 35 blocks
a bin/lib/hpi4000.help 14 blocks
a bin/lib/idc4010.edb 38 blocks
a bin/lib/idc4010.help 44 blocks
a bin/lib/itc.help 75 blocks
a bin/lib/itc4000.edb 38 blocks
a test/dev5130.t 568 blocks
a test/dev5130.x00 121 blocks
a test/dev5210.t 555 blocks
a test/dev5210x.t link to test/dev5210.t
a test/dev5210.x00 117 blocks
a test/dev5300.t 316 blocks
a test/dev5300x.t link to test/dev5300.t
a test/dev5300.x00 120 blocks
a test/dev5300.xx0 30 blocks
a test/dev5300.000 65 blocks
a test/dev5500.t 265 blocks
a test/dev5500.x00 72 blocks
a test/dev5510.t 314 blocks
a test/dev5510x.t link to test/dev5510.t
a test/dev5510.x00 88 blocks
a test/dev_ultra.t 292 blocks
a test/dev_ultrax.t link to test/dev_ultra.t

a test/dev_ultra.x00 374 blocks
a test/dev_vscsit.t 500 blocks
a test/dev_vscsitx.t link to test/dev_vscsit.t
a test/vscsit.x00 371 blocks
a test/dev_vfddi.t 432 blocks
a test/dev_vfddix.t link to test/dev_vfddi.t
a test/fddi.viop 450 blocks
a test/fddi.x00 413 blocks
a test/io4120.t 551 blocks
a test/io4120.x00 156 blocks
a test/io5000.t 549 blocks
a test/io5000.x00 72 blocks
a test/tli4480.t 804 blocks
a test/tli4480x.t link to test/tli4480.t
a test/tli4480.000 3 blocks
a test/tli4480.x00 268 blocks
a test/itc4000.t 832 blocks
a test/itc4000.x00 247 blocks
a test/idc4010.t 682 blocks
a test/idc4010.x00 248 blocks
a test/hpi4000.t 593 blocks
a test/hpi4000x.t link to test/hpi4000.t
a test/hpi4000.x00 424 blocks
a test/hpi4000.piga 2 blocks
a test/script/tli_test.pat 1 blocks
a test/script/tli4480.scr 7 blocks
a test/script/tli4480b.scr 2 blocks
a test/script/tli4480d.scr 2 blocks
a test/script/tli4480f.scr 2 blocks
a test/script/tli4480i.scr 1 blocks
a test/script/tli_config.scr 1 blocks
a test/script/tli_scr5 2 blocks
a usr/lib/DB_idc 7 blocks
a usr/lib/RLL_1_7 1 blocks
a usr/lib/RLL_1_7.2hp 1 blocks
a usr/lib/RLL_2_7 1 blocks
a usr/lib/RLL_2_7.2hp 1 blocks
a usr/lib/DB_cop_io 1 blocks
a usr/scn/fse_rev1 14 blocks
a usr/scn/hsp_rev1 8 blocks
a usr/scn/idc_rev1 296 blocks
a usr/scn/tli_rev1 164 blocks
a usr/scn/viop_rev1 18 blocks
a usr/scn/hpi_rev1 60 blocks
a man/cat1/boot_iop.1d 2 blocks
a man/cat1/hsputil.1d 16 blocks
a man/cat1/idcfmt.1d 98 blocks
a man/cat1/vioputil.1d 14 blocks
a man/cat1/security_clear.1d 11 blocks

Release Notice/Installation Procedure
CONVEX I/O Diagnostics
Real-Time VIOP Diagnostic V1.1

Document No. 760-004530-500

May 1992

CONVEX Computer Corporation
Richardson, Texas USA

Release Notice and Installation Procedure
CONVEX I/O Diagnostics RTIOP V1.1

Printed in the United States of America

1

Introduction

This document describes the initial release of the CONVEX I/O Diagnostics Real-Time IOP V1.1 . Always refer to this release notice before reporting questions or problems with the CONVEX I/O Diagnostics RTIOP; your questions may be answered here.

1.1 Contents of this document

The remaining chapters and sections of this document describe:

- Information about this release (Chapter 2)
- Installation on a Convex system (Chapter 3)
- Part numbers and contents of this distribution (Appendix A)
- List of the files contained on the release tape (Appendix B)

CONVEX I/O Diagnostics consists of various functional-level test programs and diagnostic utilities. All programs MUST execute in the offline diagnostic environment of CONVEX SPU OS and are mutually exclusive with the operation of ConvexOS on the main processors. These programs are the property of CONVEX Computer Corporation and are intended for use only by CONVEX Field Service.

1.2 Notes and Warnings

- This release supersedes all previous versions of CONVEX RTIOP Diagnostic.
- This release should only be installed by a qualified CONVEX Field Service representative. Please see Chapter 3 for installation details.

1.3 Enhancements

The following enhancements have been made to *io5000* in this release:

- The *io5000* diagnostic now supports VIOP and RTIOP CCU boards with either RTVBC or VBCU. The diagnostic displays the configuration of the CCU board(s) immediately after the first time it boots the diagnostic driver. The following is an example of the configuration display.

```
CCU#  CCU_board_type  VME0_board_type  VME1_board_type
3     VIOP            NO_BOARD_FOUND   VBCU
5     RTIOP           VBCU             RTVBC
6     RTIOP           RTVBC            RTVBC
8     RTIOP           RTVBC            NO_BOARD_FOUND
```

- A set of new subtests has been added that test the real-time functionalities. Subtest 240 tests the microsecond real-time clock on the RTIOP. Class 7 subtests - 700, 701, 702, 703, and 710 - test the real-time interrupts and real-time VMEbus interrupts. The *io5000* diagnostic has the intelligence to know which set of subtests to run depending on the configuration of the ccu board(s) selected. The configuration and list of subtests executed are as follows:

CCU BOARD	VME0 BOARD	VME1 BOARD	REAL-TIME SUBTESTS EXECUTED
VIOP	NO_BOARD_FOUND RTVBC or VBCU	NO_BOARD_FOUND RTVBC or VBCU	None
RTIOP	NO_BOARD_FOUND or RTVBC	NO_BOARD_FOUND or RTVBC	240 and class 7 subtests
RTIOP	VBCU	NO_BOARD_FOUND or RTVBC	subtest 240 only
RTIOP	NO_BOARD_FOUND or RTVBC	VBCU	subtest 240 only

- The following test parameter prompt has been added:

```
Enter PBUS clock margin level (0=none 1=lower 2=upper) [0-2]     (0) ->
```

This prompt asks whether the PBUS clock has been margined. If the response to this prompt is 0 or <return>, subtest 240 will be run if it is requested. Subtest 240 will not be executed if the PBUS clock is margined.

2

Release Information

2.1 Real-time subtests added to io5000 diagnostic

CONVEX I/O Diagnostics RTIOP V1.1 consists of six new subtests to verify the RTIOP's real-time functionalities.

- **Subtest 240 - Real-Time Microsecond Clock Test** (00:55)

  This subtest verifies the operation of the RTIOP's real time microsecond clock by comparing the elapsed microsecond clock value with the line clock. Therefore, passing subtest 230 is a prerequisite for running this test. This subtest also verifies the alarm function, the microsecond clock interrupt, and the alarm reset circuit.

- **Subtest 700 - Real-Time PBUS Interrupt Test** (00:10)

  During non-real-time operation, the RTIOP group 3 PBUS interrupts are asserted at level 5 with a vector of 0xBC. When the board's real-time PBUS interrupt functionality is enabled, however, these interrupts are asserted at level 7 with several different vectors.

  This subtest is similar to subtest 400.

  This subtest verifies that the RTIOP group 3 PBUS interrupts generate the correct interrupt level and interrupt vectors when real-time PBUS interrupts are enabled. It consists of four steps, as follows:

  - Step 1: Interrupt Receive Test

    The RTIOP verifies that it can set and clear the PIB RTINT bit in its MCR (memory control register). It then sets this bit to enable real-time PBUS interrupt functionality. The SPU then sends 248 PBUS interrupts to the RTIOP, one at a time, using PBUS interrupts 0x08 through 0xff. After each interrupt, the RTIOP verifies that only one interrupt was received and that the interrupt was received with the proper group, level, and vector. The group used for each interrupt is the modulo 4 residue of the PBUS interrupt number, e.g. group 3 is used for interrupt 3, group 0 for interrupt 4, group 1 for interrupt 5, etc.

  - Step 2: Group 3 Interrupt Vector Test

    This step is the same as step 1, except that group 3 is used for all 248 PBUS interrupts. This step verifies that the RTIOP generates the proper interrupt vectors for group 3 PBUS interrupts when real-time PBUS interrupts are enabled. These vectors should be in the range 0x80-0x9f. The lower 5 bits of the vector number are inverted internally, i.e. vector 0x89 is internally represented as 0x96.

- Step 3: Interrupt Transmit Test

  The RTIOP sends PBUS interrupts 8, 9, 10, and 11 to the SPU, one at a time. After each interrupt, the RTIOP verifies that it received a PBUS interrupt-acknowledge interrupt, and the service processor verifies that it received an interrupt from the RTIOP.

- Step 4: Interrupt Loopback Test

  The RTIOP sends and receives 248 PBUS interrupts in each of the four possible groups (using PBUS interrupts 0x08 through 0xff). The RTIOP verifies that it received each interrupt with the proper group, level, and vector (as in step 1) and that it received a PBUS interrupt-acknowledge interrupt for each interrupt. This step also verifies that the RTIOP does not acknowledge a PBUS interrupt if there is a pending PBUS interrupt at the same group which has not been acknowledged by the 68020 processor.

- **Subtest 701 - Real-Time VMEbus Interrupt Test** (00:05)

  During non-real-time operation, the RTVBC's high and low priority interrupts are asserted at levels 3 and 1, respectively. When the board's real-time VMEbus interrupt functionality is enabled, however, these interrupts are asserted at levels 7 and 6, respectively.

  This subtest verifies that the RTVBC's high- and low-priority interrupts generate the correct interrupt levels and vectors when real-time VMEbus interrupts are enabled. It begins by verifying that the RTIOP can set and clear the VME RTINT bit in its MCR. The RTIOP then sets this bit to enable real-time VMEbus interrupt functionality. Next, the board uses the RTVBC's FIR (force interrupt register) to test the ability of the RTVBC to interrupt the RTIOP's microprocessor at the proper level and with the proper vector. All eight available interrupts are generated at both of the possible interrupt levels (6 and 7).

  This subtest is similiar to subtest 501.

- **Subtest 702 - Real-Time Level 4 Interrupt Test** (00:05)

  During normal operation, the RTIOP's line clock, PBUS error, cache error, and VMEbus error interrupts are asserted at level 6. When the board's real-time VMEbus interrupt functionality is enabled, however, these interrupts are asserted at level 4.

  This subtest verifies that the RTIOP's level 6 interrupts are asserted at level 4 when real-time VMEbus interrupts are enabled. It also verifies that the RTIOP can set and clear the LEVEL4 RTINT bit in its MCR.

- **Subtest 703 - Real-Time Interrupt Priority Test** (00:20)

  This subtest verifies the operation of the RTIOP's interrupt-prioritizing logic by generating various combinations of interrupts with all combinations of the three real-time MCR bits and verifying that interrupts occur in the proper order. It also verifies interrupt levels and vectors.

- **Subtest 710 - Real-Time VMEbus Arbitration Test** (00:05)

  During normal operation, the RTVBC uses a round-robin method of determining the next VMEbus master. When the board's real-time VMEbus arbitration functionality is enabled, however, it uses a fixed priority method of VMEbus master arbitration.

This subtest verifies that the RTIOP can set and clear the arbiter mode select bit in the RTVBC's control register.