Sun™ Ultra™ 5/10 Product Notes

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Sun Ultra 5/10 Product Notes

This Sun Ultra 5/10 product notes contain information about the hardware and hardware diagnostics for the Sun™ Ultra™ 5/10 system.

This product note contains the following:

Elite3D m3 Lite UPA Graphics Card Patch Information

If you are installing Solaris™ 2.5.1 HW:11/97 on a Sun™ Workstation™ that has an Elite3D UPA graphics card installed, you may only install this operating environment through the console.

■ Following the installation of the Elite3D UPA graphics card software, it is recommended that you install patch 105791-05 or later. This patch is available through SunService.

■ Patch 105789-01 is applied as part of the Elite3D UPA graphics card software installation process.

If you are installing Solaris 2.6 HW:3/98 on a Sun Workstation that has an Elite3D UPA graphics card installed, you may only install this operating environment through the console.

■ Following the installation of the Elite3D UPA graphics card software, it is recommended that you install patch 105363-06 or later. This patch is available through SunService.

PCI Card Remove and Replace (From the Ultra 5 PCI Card Slot 2)

This section of the product note contains changes to Section 10.3.1 and 10.3.2 that were made after release of the *Sun Ultra 5/10 Service Manual.*

To remove and replace a PCI card from card slot 2 of the Ultra 5, proceed as follows.

Removing a PCI Card

1. **Power off the system unit:**

   a. **Back up system files as necessary.**

   See *Solaris Handbook for SMCC Peripherals*, part number 802-7675.

Caution – Pressing the standby switch or pressing the Sun Type-5 keyboard standby key does not remove all power from the system unit; a trickle voltage remains in the power supply. To remove all power from the system unit, set the power on/off switch to the off position.

b. Press the system unit standby switch (FIGURE 1**) or press the Sun Type-5 keyboard standby key (**FIGURE 2**).**

Note – For the system unit to gracefully shut down by the standby switch or the Sun Type-5 keyboard standby key, UNIX must be operating. If the system unit is in POST, the standby switch or the standby key are inoperative.
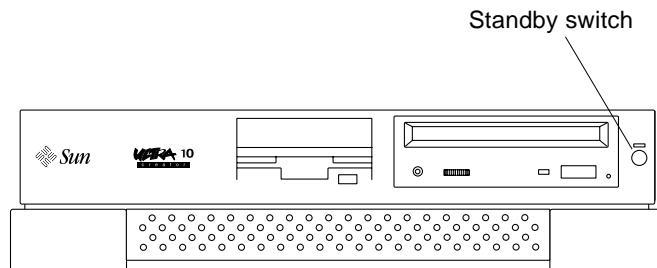
FIGURE 1   System Unit Standby Switch (Ultra 5)
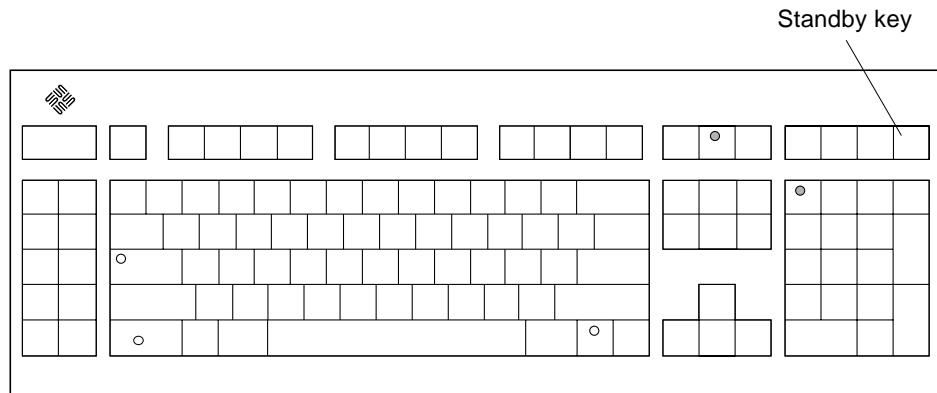
FIGURE 2   Sun Type-5 Keyboard

c. Set the system unit power on/off switch to the off position (FIGURE 3**).**

d. Verify the following:

- The front panel LED is off.
- The system fans are not spinning.

Power on/off switch

Voltage selector switch
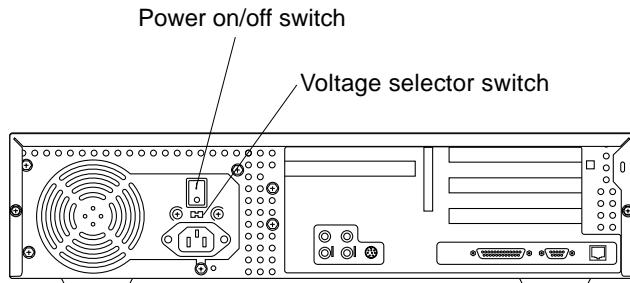
FIGURE 3   System Unit Power On/Off Switch (Ultra 5)

   e. Turn off the power to the monitor and any peripheral equipment.

   f. Disconnect cables to any peripheral equipment.

   g. Disconnect all cables from the PCI card.

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

2. **Remove the top cover (**FIGURE 4**):**

   a. Using a number 2 Phillips screwdriver, remove the two screws securing the top cover to the chassis.

   b. Grasp the center front edge of the top cover. Slide the top cover toward the rear of the system unit until the top cover tabs release.

   c. Lift the top cover straight up. Set it aside in a safe place.
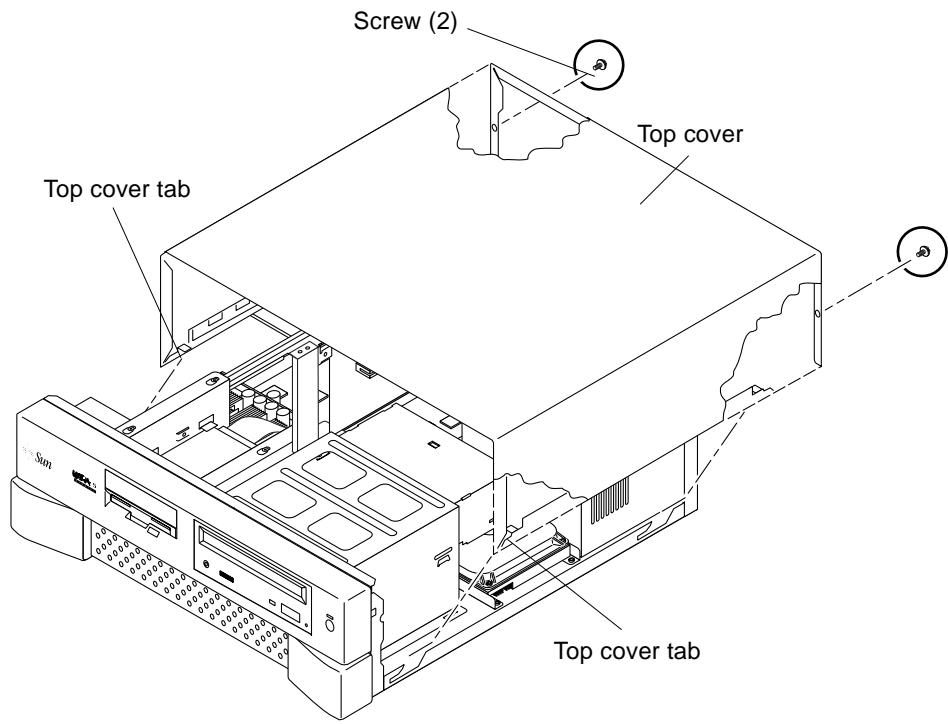
FIGURE 4   Removing and Replacing the Top Cover (Ultra 5)

⚠️ **Caution –** Wear an antistatic wrist strap and use an ESD-protected mat when handling components. When servicing or removing system unit components, attach an ESD strap to your wrist, then to a metal area on the chassis, and then disconnect the power cord from the system unit and the wall receptacle. Following this caution equalizes all electrical potentials with the system unit.

3. Attach the wrist strap:

    a. Unwrap the first two folds of the wrist strap; wrap the adhesive side firmly against the wrist.

    b. Peel the liner from the copper foil at the opposite end of the wrist strap.

    c. Attach the copper end of the wrist strap to the chassis (FIGURE 5**).**

    d. Disconnect the AC power cord from the system unit.

Copper end
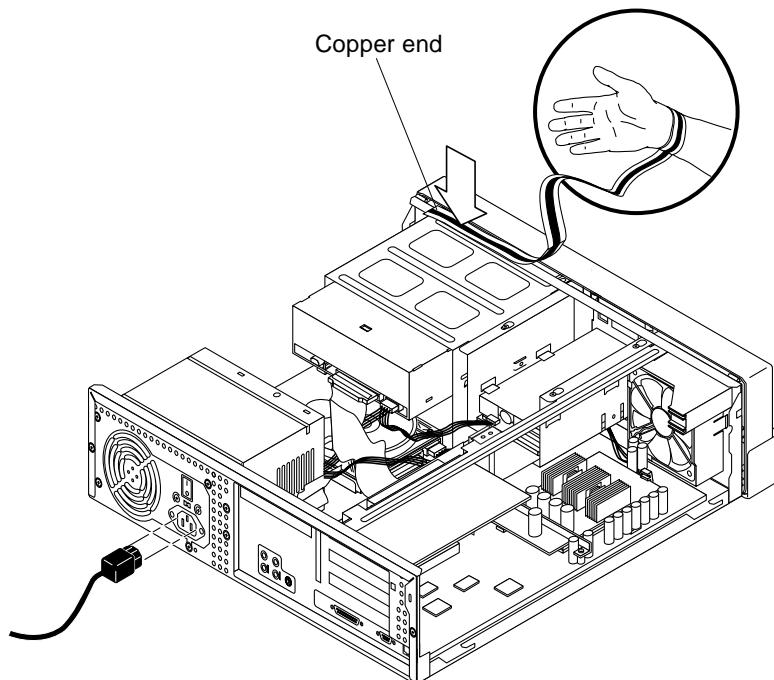
FIGURE 5   Attaching the Wrist Strap to the Chassis (Ultra 5)

4. Remove the PCI card from slot 2 (FIGURE 6**):**

   a. Using a number 2 Phillips screwdriver, remove the screw securing the bracket tab adapter to the chassis.

   b. Remove the bracket tab adapter.

   c. At the two corners of the card, pull the card from the riser board connector.

   d. Move the PCI card so that the card backplate clears the chassis back panel slot.

   e. Remove the PCI card.

   f. Place the PCI card on an antistatic mat.
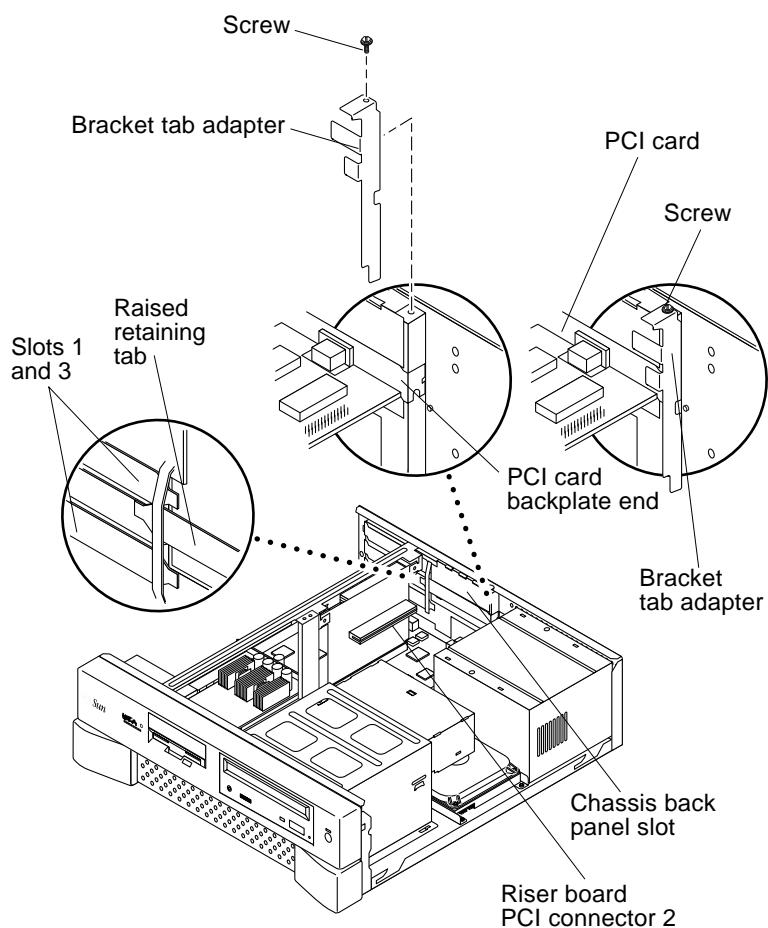
FIGURE 6   Removing and Replacing the PCI Card from PCI Slot 2 (Ultra 5)

Replacing a PCI Card

Caution – Use proper ESD grounding techniques when handling components. Wear an antistatic wrist strap and use an ESD-protected mat. Store ESD-sensitive components in antistatic bags before placing them on any surface.

1. Replace the PCI card into PCI slot 2 (FIGURE 6**):**

a. Position the PCI card into the chassis.

Caution – The PCI card backplate end *must* be inserted *between* the back panels in slots 1 and 3 (opposite side of riser card) and the raised retaining tab on the back of the system chassis.

b. Insert the PCI card connector so that it touches the associated riser board PCI connector.

Caution – Insure the backplate does not snag the shielding fingers on the system back panel.

c. Guide the PCI card backplate into the chassis back panel slot.

Caution – Support the riser card with the fingers of one hand, to insure full insertion of the PCI card into the riser board.

d. At the two corners of the card, push the card into the riser board connector until the card is fully seated.

e. Position the PCI card bracket tab.

f. Using a number 2 Phillips screwdriver, replace the screw securing the PCI card bracket tab to the system unit chassis.

2. Detach the wrist strap.

3. Replace the top cover (FIGURE 4**):**

a. Position the top cover onto the system unit chassis. Slide the top cover toward the front of the system unit until the top cover tabs lock.

b. Using a number 2 Phillips screwdriver, replace the two screws securing the top cover to the chassis.

4. Connect the cable(s) to the PCI card(s).

5. **Power on the system unit:**

   a. **Turn on power to all connected peripherals.**

   Note – Peripheral power is activated prior to system power so the system can recognize the peripherals when it is activated.

   ---

   b. **Set the voltage selector switch to the appropriate setting: 115V or 230V.**

   c. **Connect the AC power cord.**

   d. **If necessary, set the power on/off switch to the on position (FIGURE 3).**

   e. **Press the standby switch (FIGURE 1) or press the Sun Type-5 keyboard standby key (FIGURE 2).**

   f. **Verify the following:**
      - The front panel LED is on.
      - The system fans are spinning.

OpenBoot Diagnostics

This section of the product note contains changes to Section 4.7 that were made after release of the *Sun Ultra 5/10 Service Manual.*

The OpenBoot diagnostic (OBDiag) is a menu-driven diagnostic tool that verifies:
- Internal I/O system
- Ethernet
- Keyboard
- Mouse
- Diskette Drive (Floppy)
- Parallel port
- Serial ports
- NVRAM
- Audio
- EIDE
- Video

OBDiag performs root-cause failure analysis on the referenced devices by testing internal registers, confirming subsystem integrity, and verifying device functionality.

Note – The OBDiag test result data captured in CODE EXAMPLE 3 through CODE EXAMPLE 17 represent the test result data that is output when the system being tested is connected to a remote shell window through a `tip` connection. When the system being tested is tested in a stand-alone configuration, the test result data may differ from the test result data captured in CODE EXAMPLES 3 through 17.

Starting the OBDiag Menu

1. **At the** `ok` **prompt, type:**

```
ok setenv mfg-mode on

mfg-mode = on
```

2. **At the** `ok` **prompt, type:**

```
ok setenv diag-switch? true

diag-switch? = true
```

3. **At the** `ok` **prompt, type:**

```
ok setenv auto-boot? false

auto-boot? = false
```

4. **At the** `ok` **prompt, type:**

```
ok reset-all
```

5. **Verify that the platform resets (**CODE EXAMPLE 1**).**

CODE EXAMPLE 1   Reset Verification

```
ok setenv mfg-mode on
mfg-mode =              on
ok setenv diag-switch? true
diag-switch? =          true
```

CODE EXAMPLE 1   Reset Verification *(Continued)*

```
ok setenv auto-boot? false
auto-boot? =           false
ok reset-all
Resetting...

Software Power ON

@(#) Sun Ultra 5/10 UPA/PCI 3.11 Version 9 created 1998/03/06
10:31
Clearing E$ Tags Done
Clearing I/D TLBs Done
Probing Memory Done
MEM BASE = 0000.0000.2000.0000
MEM SIZE = 0000.0000.1000.0000
11-Column Mode Enabled
MMUs ON
Copy Done
PC = 0000.01ff.f000.1ffc
PC = 0000.0000.0000.2040
Decompressing into Memory Done
Size = 0000.0000.0006.e160
ttya initialized
Reset Control: BXIR:0 BPOR:0 SXIR:0 SPOR:1 POR:0
UltraSPARC-IIi 2-2 module
Probing Memory Bank #0 256 + 256: 512 Megabytes
Probing Memory Bank #2   0 +   0:   0 Megabytes
Probing UPA Slot at 1e,0 SUNW,ffb

Probing /pci@1f,0/pci@1,1 at Device 1 pci108e,1000 network
Probing /pci@1f,0/pci@1,1 at Device 2 SUNW,m64B
Probing /pci@1f,0/pci@1,1 at Device 3 ide disk cdrom
Probing /pci@1f,0/pci@1 at Device 1 pci
Probing /pci@1f,0/pci@1/pci@1 at Device 0 pci108e,1000 SUNW,hme
Probing /pci@1f,0/pci@1/pci@1 at Device 1 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 2 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 3 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 4 SUNW,isptwo sd st
Probing /pci@1f,0/pci@1/pci@1 at Device 5 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 6 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 7 Nothing there

Probing /pci@1f,0/pci@1/pci@1 at Device 8 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 9 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device a Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device b Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device c Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device d Nothing there
```

```
Probing /pci@1f,0/pci@1/pci@1 at Device e Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device f Nothing there

Probing /pci@1f,0/pci@1 at Device 2 Nothing there
Probing /pci@1f,0/pci@1 at Device 3 Nothing there
Probing /pci@1f,0/pci@1 at Device 4 Nothing there
Reset Control: BXIR:0 BPOR:0 SXIR:0 SPOR:1 POR:0
UltraSPARC-IIi 2-2 module
Probing Memory Bank #0 256 + 256: 512 Megabytes
Probing Memory Bank #2   0 +   0:   0 Megabytes
Probing UPA Slot at 1e,0 SUNW,ffb
Probing /pci@1f,0/pci@1,1 at Device 1 pci108e,1000 network
Probing /pci@1f,0/pci@1,1 at Device 2 SUNW,m64B
Probing /pci@1f,0/pci@1,1 at Device 3 ide disk cdrom
Probing /pci@1f,0/pci@1 at Device 1 pci
Probing /pci@1f,0/pci@1/pci@1 at Device 0 pci108e,1000 SUNW,hme
Probing /pci@1f,0/pci@1/pci@1 at Device 1 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 2 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 3 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 4 SUNW,isptwo sd st
Probing /pci@1f,0/pci@1/pci@1 at Device 5 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 6 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 7 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 8 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device 9 Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device a Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device b Nothing there

Probing /pci@1f,0/pci@1/pci@1 at Device c Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device d Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device e Nothing there
Probing /pci@1f,0/pci@1/pci@1 at Device f Nothing there

Probing /pci@1f,0/pci@1 at Device 2 Nothing there
Probing /pci@1f,0/pci@1 at Device 3 Nothing there
Probing /pci@1f,0/pci@1 at Device 4 Nothing there

Sun Ultra 5/10 UPA/PCI (UltraSPARC-IIi 300MHz), No Keyboard
OpenBoot 3.11, 512 MB memory installed, Serial #9337777.
Ethernet address 8:0:20:8e:7b:b1, Host ID: 808e7bb1.


ok
```

6. **At the** `ok` **prompt, type** `obdiag`**. Verify that the OBDiag menu is displayed**
   (CODE EXAMPLE 2**).**

7. **At the** `OBDiag` **menu prompt, type** `16` **to enable toggle script-debug messages.**

> **Note –** Enable toggle script-debug messages allows verbose test message displays.

8. **At the** `OBDiag` **menu prompt, type** `18` **to disable external loopback test.**

CODE EXAMPLE 2 OBDiag Menu

```
ok obdiag
stdin: fffe2008
stdout: fffe2010
loading code into: /pci@1f,0/pci@1,1/ebus@1
loading code into: /pci@1f,0/pci@1,1/ebus@1/eeprom@14,0
loading code into: /pci@1f,0/pci@1,1/ebus@1/ecpp@14,3043bc
loading code into: /pci@1f,0/pci@1,1/ebus@1/su@14,3062f8
loading code into: /pci@1f,0/pci@1,1/ebus@1/se@14,400000
loading code into: /pci@1f,0/pci@1,1/network@1,1
loading code into: /pci@1f,0/pci@1,1/ebus@1/fdthree@14,3023f0
loading code into: /pci@1f,0/pci@1,1/ebus@1/
SUNW,CS4231@14,200000
loading code into: /pci@1f,0/pci@1,1/ide@3
loading code into: /pci@1f,0/pci@1,1/ide@3/disk
loading code into: /pci@1f,0/pci@1,1/ide@3/cdrom
loading code into: /pci@1f,0/pci@1,1/SUNW,m64B@2
Debugging enabled


          OBDiag Menu

 0..... PCI/Cheerio
 1..... EBUS DMA/TCR Registers
 2..... Ethernet
 3..... Keyboard
 4..... Mouse
 5..... Floppy
 6..... Parallel Port
 7..... Serial Port A
 8..... Serial Port B
 9..... NVRAM
10..... Audio
11..... EIDE
12..... Video
13..... All Above
14..... Quit
15..... Display this Menu
16..... Toggle script-debug
17..... Enable External Loopback Tests
18..... Disable External Loopback Tests

Enter (0-13 tests, 14 -Quit, 15 -Menu) ===>
```

PCI/PCIO

The PCI/PCIO diagnostic performs the following:

a. `vendor_ID_test` – Verifies the PCIO ASIC vender ID is 108e.

b. `device_ID_test` – Verifies the PCIO ASIC device ID is 1000.

c. `mixmode_read` – Verifies the PCI configuration space is accessible as half-word bytes by reading the EBus2 vender ID address.

d. `e2_class_test` – Verifies the address class code. Address class codes include bridge device (0 x B, 0 x 6), other bridge device (0 x A and 0 x 80), and programmable interface (0 x 9 and 0 x 0).

e. `status_reg_walk1` – Performs walk-one test on status register with mask 0 x 280 (PCIO ASIC is accepting fast back-to-back transactions, DEVSEL timing is 0 x 1).

f. `line_size_walk1` – Performs tests a through e.

g. `latency_walk1` – Performs walk one test on latency timer.

h. `line_walk1` – Performs walk one test on interrupt line.

i. `pin_test` – Verifies interrupt pin is logic-level high (1) after reset.

CODE EXAMPLE 3 identifies the PCI/PCIO output message.

CODE EXAMPLE 3   PCI/PCIO Output Message

```
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===> 0

TEST='all_pci/PCIO_test'
SUBTEST='vendor_id_test'
SUBTEST='device_id_test'
SUBTEST='mixmode_read'
SUBTEST='e2_class_test'
SUBTEST='status_reg_walk1'
SUBTEST='line_size_walk1'
SUBTEST='latency_walk1'
SUBTEST='line_walk1'
SUBTEST='pin_test'
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===>
```

EBus DMA/TCR Registers

The EBUS DMA/TCR registers diagnostic performs the following:

a. `dma_reg_test` – Performs a walking ones bit test for control status register, address register, and byte count register of each channel. Verifies that the control status register is set properly.

b. `dma_func-test` – Validates the DMA capabilities and FIFOs. Test is executed in a DMA diagnostic loopback mode. Initializes the data of transmitting memory with its address, performs a DMA read and write, and verifies that the data received is correct. Repeats for four channels.

CODE EXAMPLE 4 identifies the EBus DMA/TCR registers output message.

CODE EXAMPLE 4   EBus DMA/TCR Registers Output Message

```
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===> 1

TEST='all_dma/ebus_test'
SUBTEST='dma_reg_test'
SUBTEST='dma_func_test'
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===>
```

Ethernet

The Ethernet diagnostic performs the following:

a. `my_channel_reset` – Resets the Ethernet channel.

b. `hme_reg_test` – Performs Walk1 on the following registers set: global register 1, global register 2, bmac xif register, bmac tx register, and the mif register.

c. `MAC_internal_loopback_test` – Performs Ethernet channel engine internal loopback.

d. `10_mb_xcvr_loopback_test` – Enables the 10Base-T data present at the transmit MII data inputs to be routed back to the receive MII data outputs.

e. `100_mb_phy_loopback_test` – Enables MII transmit data to be routed to the MII receive data path.

f. `100_mb_twister_loopback_test` – Forces the twisted-pair transceiver into loopback mode.

CODE EXAMPLE 5 identifies the Ethernet output message.

CODE EXAMPLE 5   Ethernet Output Message

```
Enter (0-13 tests, 14 -Quit, 15 -Menu) ===> 2

TEST='ethernet_test'
Using Onboard Transceiver - Link Up.
SUBTEST='my_channel_reset'
SUBTEST='hme_reg_test'
SUBTEST='global_reg1_test'
SUBTEST='global_reg2_test'
SUBTEST='bmac_xif_reg_test'
SUBTEST='bmac_tx_reg_test'
SUBTEST='mif_reg_test'
SUBTEST='mac_internal_loopback_test'
SUBTEST='10mb_xcvr_loopback_test'
SUBTEST='100mb_phy_loopback_test'
SUBTEST='100mb_twister_loopback_test'
Enter (0-13 tests, 14 -Quit, 15 -Menu) ===>
```

Keyboard

The keyboard diagnostic consists of an external and internal loopback. The external loopback requires a passive loopback connector. The internal loopback verifies the keyboard port by transmitting and receiving 128 characters.

CODE EXAMPLE 6 identifies the keyboard output message.

CODE EXAMPLE 6   Keyboard Output Message

```
setenv Enter (0-13 tests, 14 -Quit, 15 -Menu) ===> 3

TEST='keyboard_test'
SUBTEST='internal_loopback'
Enter (0-13 tests, 14 -Quit, 15 -Menu) ===>
```

Mouse

The mouse diagnostic performs a keyboard-to-mouse loopback.

CODE EXAMPLE 7 identifies the mouse output message.

CODE EXAMPLE 7   Mouse Output Message

```
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===> 4

TEST='mouse_test'
SUBTEST='mouse_loopback'

###OBDIAG_MFG_START###
TEST='mouse_test'
STATUS='FAILED'
SUBTEST='mouse_loopback'
ERRORS='1 '
TTF='1656 '
SPEED='295.99 MHz'
PASSES='1 '
MESSAGE='Error: Timeout receiving a character'
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===>
```

Floppy

The floppy diagnostic verifies the diskette drive controller initialization. It also validates the status of a selected disk drive and reads the diskette drive header.

CODE EXAMPLE 8 identifies the floppy output message.

CODE EXAMPLE 8   Floppy Output Message

```
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===> 5

TEST='floppy_test'
SUBTEST='floppy_id0_read_test'
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===>
```

Parallel Port

The parallel port diagnostic performs the following:

a. `sio-passive-lb` – Sets up the SuperIO configuration register to enable extended/compatible parallel port select, then does a write 0, walk one, write 0 x ff to the data register. It verifies the results by reading the status register.

b. `dma_read` – Enables ECP mode and ECP DMA configuration, and FIFO test mode. Transfers 16 bytes of data from memory to the parallel port device and then verifies the data is in TFIFO.

CODE EXAMPLE 9 identifies the parallel port output message.

CODE EXAMPLE 9   Parallel Port Output Message

```
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===> 6

TEST='parallel_port_test'
SUBTEST='dma_read'
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===>
```

Serial Port A

The serial port A diagnostic invokes the `uart_loopback` test. This test transmits and receives 128 characters and checks serial port A transaction validity.

CODE EXAMPLE 10 identifies the serial port A output message.

CODE EXAMPLE 10   Serial Port A Output Message

```
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===> 7

TEST='uarta_test'
BAUDRATE='1200'
SUBTEST='internal_loopback'
BAUDRATE='1800'
SUBTEST='internal_loopback'
BAUDRATE='2400'
SUBTEST='internal_loopback'
BAUDRATE='4800'
SUBTEST='internal_loopback'
BAUDRATE='9600'
```

CODE EXAMPLE 10 Serial Port A Output Message *(Continued)*

```
SUBTEST='internal_loopback'
BAUDRATE='19200'
SUBTEST='internal_loopback'
BAUDRATE='38400'
SUBTEST='internal_loopback'
BAUDRATE='57600'
SUBTEST='internal_loopback'
BAUDRATE='76800'
SUBTEST='internal_loopback'
BAUDRATE='115200'
SUBTEST='internal_loopback'
BAUDRATE='153600'
SUBTEST='internal_loopback'
BAUDRATE='230400'
SUBTEST='internal_loopback'
BAUDRATE='307200'
SUBTEST='internal_loopback'
BAUDRATE='460800'
SUBTEST='internal_loopback'
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===>
```

Note – The serial port A diagnostic will stall if the TIP line is installed on serial port A. CODE EXAMPLE 11 identifies the serial port A output message when the TIP line is installed on serial port A.

CODE EXAMPLE 11 Serial Port A Output Message with TIP Line Installed

```
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===> 7

TEST='uarta_test'
'UART A in use as console - Test not run.'
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===>
```

Serial Port B

The serial port B diagnostic is identical to the serial port A diagnostic.

CODE EXAMPLE 12 identifies the serial port B output message.

Note – The serial port B diagnostic will stall if the TIP line is installed on serial port B.

CODE EXAMPLE 12   Serial Port B Output Message

```
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===> 8

TEST='uartb_test'
BAUDRATE='1200'
SUBTEST='internal_loopback'
BAUDRATE='1800'
SUBTEST='internal_loopback'
BAUDRATE='2400'
SUBTEST='internal_loopback'
BAUDRATE='4800'
SUBTEST='internal_loopback'
BAUDRATE='9600'
SUBTEST='internal_loopback'
BAUDRATE='19200'
SUBTEST='internal_loopback'
BAUDRATE='38400'

SUBTEST='internal_loopback'
BAUDRATE='57600'
SUBTEST='internal_loopback'
BAUDRATE='76800'
SUBTEST='internal_loopback'
BAUDRATE='115200'
SUBTEST='internal_loopback'
BAUDRATE='153600'
SUBTEST='internal_loopback'
BAUDRATE='230400'
SUBTEST='internal_loopback'
BAUDRATE='307200'
SUBTEST='internal_loopback'
BAUDRATE='460800'
SUBTEST='internal_loopback'
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===>
```

NVRAM

The NVRAM diagnostic verifies the NVRAM operation by performing a write and read to the NVRAM.

CODE EXAMPLE 13 identifies the NVRAM output message.

CODE EXAMPLE 13   NVRAM Output Message

```
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===> 9

TEST='nvram_test'
SUBTEST='write/read_patterns'
SUBTEST='write/read_inverted_patterns'
Enter (0-12 tests, 13 -Quit, 14 -Menu) ===>
```

Audio

The audio diagnostic performs the following:

a. `cs4231_test` – Verifies the cs4231 internal registers.

b. Line-in to line-out external loopback.

c. Microphone to headphone external loopback.

CODE EXAMPLE 14 identifies the audio output message.

CODE EXAMPLE 14   Audio Output Message

```
Enter (0-13 tests, 14 -Quit, 15 -Menu) ===> 10

TEST='audio_test'
SUBTEST='cs4231_test'
Codec_ID='8a'
Version_ID='a0'
SUBTEST='external_lpbk'

###OBDIAG_MFG_START###
TEST='audio_test'
STATUS='FAILED'
SUBTEST='external_lpbk'
ERRORS='1 '
TTF='505 '
```

CODE EXAMPLE 14   Audio Output Message *(Continued)*

```
SPEED='299.80 MHz'
PASSES='1 '
MESSAGE='Error: External Audio Test not run: Please set the mfg-
mode to sys-ext.'
Enter (0-13 tests, 14 -Quit, 15 -Menu) ===>
```

EIDE

The EIDE diagnostic validates both the EIDE chip and the IDE bus subsystem.

CODE EXAMPLE 15 identifies the EIDE output message.

CODE EXAMPLE 15   EIDE Output Message

```
Enter (0-13 tests, 14 -Quit, 15 -Menu) ===> 11

TEST='ide_test'
SUBTEST='probe-cmd-device'
SUBTEST='hd-and-cd-check'
Enter (0-13 tests, 14 -Quit, 15 -Menu) ===>
```

Video

The video diagnostic validates the UPA graphics.

CODE EXAMPLE 16 identifies the video output message.

CODE EXAMPLE 16   Video Output Message

```
Enter (0-13 tests, 14 -Quit, 15 -Menu) ===> 12

TEST='video_test'
Please connect the monitor and use ttya/ttyb when running this test
if you are using the screen it may be become unreadable
SUBTEST='mach64-chip-id-vendor-id-check'
SUBTEST='video-frame-buffer-test'
SUBTEST='mach64-walk-one-test'
SUBTEST='mach64-walk-zero-test'
Enter (0-13 tests, 14 -Quit, 15 -Menu) ===>
```

All Above

The all above diagnostic validates the system unit.

CODE EXAMPLE 17 identifies the all above output message.

Note – The all above diagnostic will stall if the TIP line is installed on serial port A
or serial port B.

CODE EXAMPLE 17   All Above Output Message

```
Enter (0-13 tests, 14 -Quit, 15 -Menu) ===> 13

TEST='all_pci/cheerio_test'
SUBTEST='vendor_id_test'
SUBTEST='device_id_test'
SUBTEST='mixmode_read'
SUBTEST='e2_class_test'
SUBTEST='status_reg_walk1'
SUBTEST='line_size_walk1'
SUBTEST='latency_walk1'
SUBTEST='line_walk1'
```

```
SUBTEST='pin_test'

TEST='all_dma/ebus_test'
SUBTEST='dma_reg_test'
SUBTEST='dma_func_test'

TEST='ethernet_test'
Using Onboard Transceiver - Link Up.
SUBTEST='my_channel_reset'
SUBTEST='hme_reg_test'
SUBTEST='global_reg1_test'
SUBTEST='global_reg2_test'
SUBTEST='bmac_xif_reg_test'
SUBTEST='bmac_tx_reg_test'
SUBTEST='mif_reg_test'
SUBTEST='mac_internal_loopback_test'
SUBTEST='10mb_xcvr_loopback_test'
SUBTEST='100mb_phy_loopback_test'
SUBTEST='100mb_twister_loopback_test'

TEST='keyboard_test'
SUBTEST='internal_loopback'

TEST='mouse_test'
SUBTEST='mouse_loopback'

###OBDIAG_MFG_START###
TEST='mouse_test'
STATUS='FAILED'
SUBTEST='mouse_loopback'
ERRORS='1 '
TTF='1011 '
SPEED='299.80 MHz'
PASSES='1 '
MESSAGE='Error: Timeout receiving a character'

TEST='floppy_test'
SUBTEST='floppy_id0_read_test'

TEST='parallel_port_test'
SUBTEST='dma_read'

TEST='uarta_test'
'UART A in use as console - Test not run.'

TEST='uartb_test'
```

CODE EXAMPLE 17   All Above Output Message *(Continued)*

```
BAUDRATE='1200'
SUBTEST='internal_loopback'
BAUDRATE='1800'
SUBTEST='internal_loopback'
BAUDRATE='2400'
SUBTEST='internal_loopback'
BAUDRATE='4800'
SUBTEST='internal_loopback'
BAUDRATE='9600'
SUBTEST='internal_loopback'
BAUDRATE='19200'
SUBTEST='internal_loopback'
BAUDRATE='38400'
SUBTEST='internal_loopback'
BAUDRATE='57600'
SUBTEST='internal_loopback'
BAUDRATE='76800'
SUBTEST='internal_loopback'
BAUDRATE='115200'
SUBTEST='internal_loopback'
BAUDRATE='153600'
SUBTEST='internal_loopback'
BAUDRATE='230400'
SUBTEST='internal_loopback'
BAUDRATE='307200'
SUBTEST='internal_loopback'
BAUDRATE='460800'
SUBTEST='internal_loopback'

TEST='nvram_test'
SUBTEST='write/read_patterns'
SUBTEST='write/read_inverted_patterns'

TEST='audio_test'
SUBTEST='cs4231_test'
Codec_ID='8a'
Version_ID='a0'
SUBTEST='external_lpbk'

###OBDIAG_MFG_START###
TEST='audio_test'
STATUS='FAILED'
SUBTEST='external_lpbk'
ERRORS='1 '
TTF='1030 '
SPEED='299.80 MHz'
```

```
PASSES='1 '
MESSAGE='Error: External Audio Test not run: Please set the mfg-
mode to sys-ext.'

TEST='ide_test'
SUBTEST='probe-cmd-device'
SUBTEST='hd-and-cd-check'

TEST='video_test'
Please connect the monitor and use ttya/ttyb when running this test
if you are using the screen it may be become unreadable
SUBTEST='mach64-chip-id-vendor-id-check'
SUBTEST='video-frame-buffer-test'
SUBTEST='mach64-walk-one-test'
SUBTEST='mach64-walk-zero-test'
Enter (0-13 tests, 14 -Quit, 15 -Menu) ===>
```

Ending the OBDiag Menu

1. **At the** ok **prompt, type:**

```
ok setenv mfg-mode off

mfg-mode = off
```

2. **At the** ok **prompt, type:**

```
ok setenv diag-switch? false

diag-switch? = false
```

3. **At the** ok **prompt, type:**

```
ok setenv auto-boot? true

auto-boot? = true
```

4. **At the** `ok` **prompt, type:**

```
ok reset-all
```

Ultra 10 Features

This section of the product note contains changes to Section 1.3 that were made after release of the *Sun Ultra 5/10 Service Manual.*

The Ultra 10 workstation provides the following unique features:

- 300-MHz CPU module, 512-Kbyte cache or 333-MHz CPU module, 2-Mbyte cache
- 1-gigabyte (Gbyte) memory (maximum)
- Four PCI slots (riser card expansion with four long PCI cards)
- One UltraSPARC port architecture (UPA) graphics slot
- One internal hard drive bay
- One dedicated front-access 5.25-inch bay
- One optional front-access 5.25-inch bay
- Minitower enclosure
- 250-watt power supply

Amended Tables

This section of the product note contains changes to TABLE 1-3 and TABLE 11-2 that were made after release of the *Sun Ultra 5/10 Service Manual.*

TABLE 1 lists the items that should be amended to TABLE 1-3 and TABLE 11-2.

> **Note –** Part numbers listed in TABLE 1 are correct as of this product note publication date but are subject to change without notice. Consult your authorized Sun sales representative or service provider to confirm a part number prior to ordering a replacement part.

TABLE 1   Ultra 5 and Ultra 10 System Unit Replaceable Components

Component	Part Number	Ultra 5 only	Ultra 10 only	Description
CPU module	501-5090		Yes	333-MHz, 2-Mbyte external cache
Graphics card	501-4860		Yes	Elite3D m3 Lite UPA graphics card

CPU Module (Ultra 10)

This section of the product note contains changes to section C.1.1.2 that were made after release of the *Sun Ultra 5/10 Service Manual.*

The Ultra 10 may contain either a 300-MHz CPU module or a 333-MHz CPU module. The 300-MHz CPU module contains 512 Kbytes of second level cache. The second level cache has four 64K x 18 SRAMs for data and one 64K x 18 SRAM for TAG. The 333-MHz CPU module contains 2 Mbytes of second level cache. The second level cache has four 256K x 18 SRAMs for data and one 64K x 18 SRAM for TAG.

UPA

This section of the product note contains changes to section C.1.2 that were made after release of the *Sun Ultra 5/10 Service Manual.*

The system unit supports one slave-only UPA slot for a UPA-based graphics device. The UPA 64-bit data bus provides the connection between the CPU module and the UPA graphics. The 64-bit UPA data shares the data bus with memory through six transceiver chips.

The UPA graphics slot receives a differential signal (`UPA_CLK +/-`) from the CPU module which is in synchronization with the CPU module clock.
`UPA_CLK +/-` clocks at one third the frequency as the CPU module frequency. All transfers to and from the graphics connector are fully synchronous. The CPU module transfers UPA data to the graphics connector on leading clock edges that correspond to the UPA clock edges. The maximum interface rate is 120 MHz.

ShowMe How Audio Button Problem

This section of the product note describes a problem you may experience when using the audio buttons in the ShowMe™ How™ multimedia documentation on some Ultra 5/10 systems. The problem is caused by alias settings in the system's .cshrc file.

Problem Description

The audio buttons in the ShowMe How multimedia documentation might not work correctly if the shell from which you invoked ShowMe How has an alias that contains file name range-substitution functions.

For example, adding the following line

```
alias lh ls -a .[a-z] [a-z]*
```

to your `.cshrc` file could cause the audio buttons in ShowMe How not to work correctly.

Problem Resolution

To fix this problem:

1. **Check which alias statements are included in your shell's** `.cshrc` **file:**

   At a command line prompt within the shell from which you are trying to run ShowMe How, type alias and press Return.

   All alias statements in the `.cshrc` file are listed.

2. **Use an editor to remove any alias statements that contain file name range substitutions from the** `.cshrc` **file (and from any additional files it sources).**

3. **Save your changes and close the** `.cshrc` **file.**

4. **Type** `source .cshrc` **at the command prompt.**

5. **Restart ShowMe How.**

German Acoustic Compliance Statement

This section of the product note contains a compliance statement that is required for customers in Germany:

ACHTUNG: Der arbeitsplatzbezogenr Schalldruckpegel nach DIN 45 635.

Teil 1000 beträgt 70 Db(A) order weniger.

Serial Port B Connector

The serial port B connector is a DB-9 type connector located on the serial/parallel connector back panel. The serial port B connector provides asynchronous serial communications. FIGURE 7 illustrates the serial port A connector configuration and TABLE 2 lists the pin assignments.
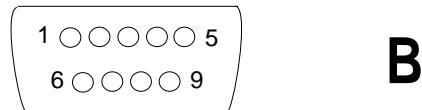

FIGURE 7   Serial Port B Connector Pin Configuration

TABLE 2   Serial Port B Pin Assignments

Pin	Signal	Description
1	CD	Carrier detect
2	RD	Receive data
3	TD	Transmit data
4	DTR	Data terminal ready
5	GND	Ground
6	DSR	Data set ready

TABLE 2   Serial Port B Pin Assignments

Pin	Signal	Description
7	RTS	Request to send
8	CTS	Clear to send
9	RI	Ring indicator