



Sun™ XVR-600 Graphics Accelerator Installation and User's Guide

Sun Microsystems, Inc.
www.sun.com

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Shielded Cables: Connections between the workstation and peripherals must be made using shielded cables to comply with FCC radio frequency emission limits. Networking connections can be made using unshielded twisted-pair (UTP) cables.

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Declaration of Conformity

Compliance Model Number: **SUNIFB3-Lite**
Product Family Name: **Sun XVR-600 Graphics Accelerator (X3780A)**

EMC

USA—FCC Class B

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1. This equipment may not cause harmful interference.
2. This equipment must accept any interference that may cause undesired operation.

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EN61000-3-3	Pass
EN61000-4-2	6 kV (Direct), 8 kV (Air)
EN61000-4-3	3 V/m 80-1000MHz, 10 V/m 800-960 MHz and 1400-2000 MHz
EN61000-4-4	1 kV AC and DC Power Lines, 0.5 kV Signal Lines
EN61000-4-5	2 kV AC Line-Gnd, 1 kV AC Line-Line and Outdoor Signal Lines, 0.5 kV Indoor Signal Lines > 10m
EN61000-4-6	3 V
EN61000-4-11	Pass

As information Technology Equipment (ITE) Class B per (as applicable):

EN55022:1998/CISPR22:1997	Class B
EN55024:1998	Required Limits:
EN61000-4-2	4 kV (Direct), 8kV (Air)
EN61000-4-3	3 V/m
EN61000-4-4	1 kV AC Power Lines, 0.5 kV Signal and DC Power Lines
EN61000-4-5	1 kV AC Line-Line and Outdoor Signal Lines, 2 kV AC Line-Gnd, 0.5 kV DC Power Lines
EN61000-4-6	3 V
EN61000-4-8	1 A/m
EN61000-4-11	Pass
EN61000-3-2:1995 + A1, A2, A14	Pass
EN61000-3-3:1995	Pass

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Evaluated to all CB Countries	
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Supplementary Information

This product was tested and complies with all the requirements for the CE Mark.

/S/	DATE	/S/	DATE
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Preface

This guide describes how to install the Sun™ XVR-600 graphics accelerator in your Sun computer system.

How This Book Is Organized

[Chapter 1](#) provides an overview of the Sun XVR-600 graphics accelerator product and includes features and supported video formats.

[Chapter 2](#) describes how to install the Sun XVR-600 graphics accelerator software.

[Chapter 3](#) provides hardware installation information for the Sun XVR-600 graphics accelerator.

[Chapter 4](#) describes how to modify the `xservers` configuration file for running more than one frame buffer and how to use Xinerama to configure multiple frame buffers.

[Chapter 5](#) describes features of the Sun XVR-600 graphics accelerator.

[Chapter 6](#) describes framelocking multiple Sun XVR-600 graphics accelerators.

[Appendix A](#) describes how to set the Sun XVR-600 graphics accelerator as the default monitor console display.

[Appendix B](#) provides I/O port specifications for the Sun XVR-600 graphics accelerator.

Using UNIX Commands

This document might not contain information on basic UNIX® commands and procedures such as shutting down the system, booting the system, and configuring devices. See the following for this information:

- Software documentation that you received with your system
- Solaris™ operating environment documentation, which is at <http://docs.sun.com>

Typographic Conventions

Typeface or Symbol	Meaning	Examples
AaBbCc123	The names of commands, files, and directories; on-screen computer output	Edit your <code>.login</code> file. Use <code>ls -a</code> to list all files. % You have mail.
AaBbCc123	What you type, when contrasted with on-screen computer output	% su Password:
<i>AaBbCc123</i>	Book titles, new words or terms, words to be emphasized. Replace command-line variables with real names or values.	Read Chapter 6 in the <i>User's Guide</i> . These are called <i>class</i> options. To delete a file, type rm <i>filename</i> .

Shell Prompts

Shell	Prompt
C shell	<i>machine-name%</i>
C shell superuser	<i>machine-name#</i>
Bourne shell and Korn shell	\$
Bourne shell and Korn shell superuser	#

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Sun XVR-600 Graphics Accelerator Installation and User's Guide,
part number 817-2195-11

Sun XVR-600 Graphics Accelerator Overview

This chapter provides an overview of the Sun XVR-600 graphics accelerator.

- “Installation Kit” on page 1
- “Sun XVR-600 Graphics Accelerator Overview” on page 2
- “Installation Process” on page 5
- “Video Formats” on page 5
- “Technical Support” on page 8
- “Accessing Field Replaceable Unit Information” on page 7

To find the systems that support the Sun XVR-600 graphics accelerator, go to “System Configurations” on page 22, or:

<http://www.sun.com/desktop/products/graphics/xvr600/>

Installation Kit

The Sun XVR-600 graphics accelerator installation kit includes:

- Sun XVR-600 graphics accelerator (hardware)
- Sun XVR-600 graphics accelerator software (CD-ROM)
- DVI-I to HD15 monitor adapter
- Antistatic wrist strap
- *Sun XVR-600 Graphics Accelerator Installation and User’s Guide*, this document

See [Chapter 6](#) to order framelock cables, if required.

Sun XVR-600 Graphics Accelerator Overview

To find the systems that support the Sun XVR-600 graphics accelerator, go to:

<http://www.sun.com/desktop/products/graphics/xvr600/>

The Sun XVR-600 graphics accelerator is a PCI-based graphics accelerator that provides high resolution and high performance PCI 3D graphics. Features include texture memory, PCI 66/33 MHz 64-bit interface, and DVI-I video output. The Sun XVR-600 graphics accelerator occupies one physical PCI slot.

FIGURE 1-1 shows the Sun XVR-600 graphics accelerator.

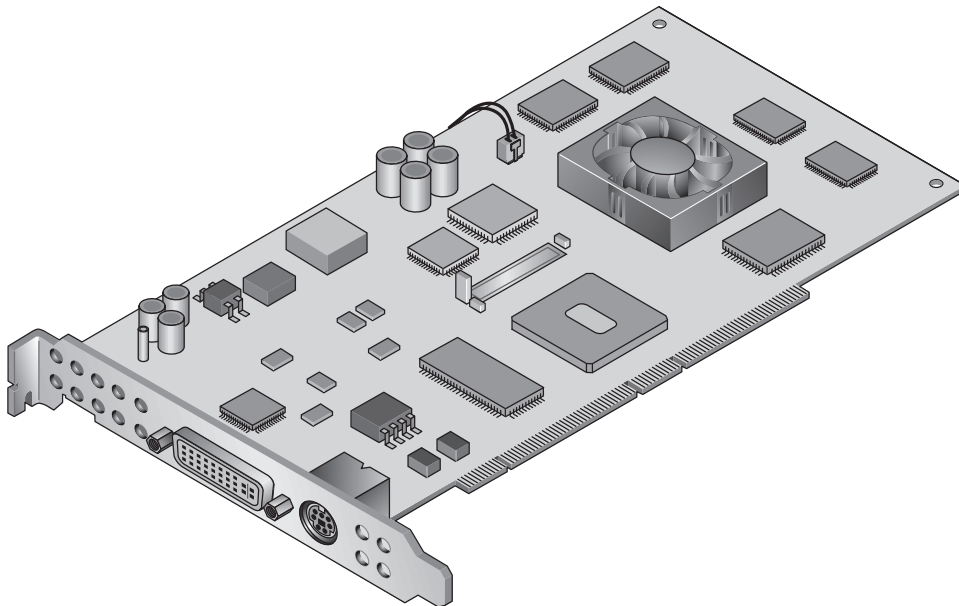


FIGURE 1-1 Sun XVR-600 Graphics Accelerator

FIGURE 1-2 shows the Sun XVR-600 graphics accelerator I/O backplate.

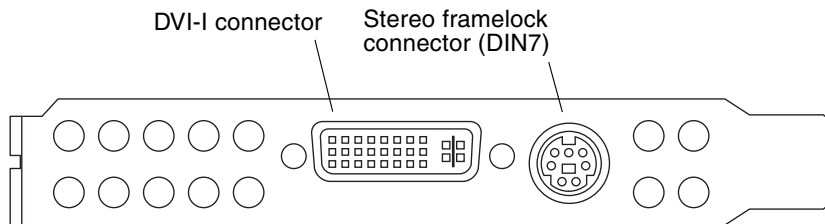


FIGURE 1-2 Sun XVR-600 Graphics Accelerator Backplate I/O Ports

Features

- 32 Mbytes of DDR display list memory
- 32 Mbytes of texture memory
- 64 Mbytes of frame buffer memory
- 10-bit gamma correction
- Resolution up to $2048 \times 1536 \times 40$ Hz at 24-bit color
- 1920×1200 screen support
- 1280×1024 stereo screen support
- Hardware cursor
- Stereoscopic viewing support (frame sequential)
- Stereo output
- Display Data Channel (DDC) monitor support for bidirectional communication
- Display Power Management Signaling (DPMS) to enable monitor power-saving mode
- High-speed, full-featured DMA over the PCI bus
- PCI 66/33 MHz 64-bit interface
- Multiscreen support using multiple cards in a single workstation
- Framelocking of the video timing to an external timing source
- Multiview functionality for framelocking of multiple cards
- Two video lookup tables
- DVI-I video out

Additional Features

- Geometry acceleration
 - Model view matrix transformation of vertex and normal coordinates
 - Texture matrix transformation of texture coordinates
 - Full lighting calculations with up to 32 light sources
 - Up to six user clip planes
 - Perspective transformation
 - Viewport transformation
 - View volume clipping
- OpenGL operations (supports Sun OpenGL[®] 1.3 and 1.2.3 for Solaris)
 - Cube-mapping
 - Points (2D, 3D, wide)
 - Vectors (2D and 3D lines and line strips; wide, stippled)
 - Polygons (triangles, triangle strips, quads, quad strips, polygons, point/line polygon mode)
 - Antialiased points, vectors, and polygons
 - Image support (multiple formats, zoom, bilinear scaling, color matrix, color tables)
 - Alpha operations
 - Scissoring
 - Window clipping
 - Masking
 - Fogging (linear, exponential, exponential², user-defined)
 - Texture mapping (point, bilinear, trilinear, multiple internal formats)
 - Stencil operations
 - Dithering
 - Rich set of blending operations
 - Fast window clears
 - Fast window-mode double buffering
 - Frame-sequential stereo support
- Extensive support of OpenGL
 - Imaging extensions such as pixel buffer, color table, and color matrix
 - Blend extensions such as blend color, blend minmax, and blend function separate
 - Texture extensions (edge clamp, border clamp, LOD clamp, generate mipmap)
 - Texture color table
 - Post-texturing specular
 - Stencil operation wrap

Installation Process



Caution – The Sun XVR-600 graphics accelerator is *not* hot-swappable.

Note – The Sun XVR-600 graphics accelerator operates best when installed in the system 66 MHz PCI bus connector slots (applies to systems with available 66 MHz PCI bus slots).

1. Install the Sun XVR-600 graphics accelerator software ([Chapter 2](#)).
2. Shutdown the system.
3. Install the Sun XVR-600 graphics accelerator hardware ([Chapter 3](#)), repower the system, and reboot (`boot -r`) for reconfiguration.
4. Modify the `Xservers` configuration file, if needed ([Chapter 4](#)).

Video Formats

[TABLE 1-1](#) lists the supported video formats for the Sun XVR-600 graphics accelerator.

- To get a list of all graphics devices on your system, type:

```
host% fbconfig -list
```

This system output is an example of listed graphics devices:

```
Device-Filename                Specific Config Program
-----
/dev/fbs/jfb0                  SUNWjfb_config
```

- To get a list of available resolutions for your display device, type:

```
host% fbconfig -dev jfb0 -res \?
```

TABLE 1-1 also includes static multisampling sizes for the applicable video formats (SPP is samples per pixel).

TABLE 1-1 Sun XVR-600 Graphics Accelerator Video Formats

Display Resolution	Vertical Refresh Rate	Sync Standard	Aspect Ratio Format	Maximum Number of SPP Single Screen
1920 x 1200	60, 70, 75 Hz	Sun	16:10	1
1920 x 1200	60_240T Hz	Sun	16:10	1
1920 x 1080	60, 72 Hz	Sun	16:9	1
1792 x 1344	75 Hz	VESA	4:3	1
1600 x 1280	76 Hz	Sun	5:4	1
1600 x 1200	60, 75 Hz	VESA	4:3	1
1600 x 1024	60 Hz	Sun	16:10	1
1600 x 1000	66, 76 Hz	Sun	16:10	1
1440 x 900	76 Hz	Sun	16:10	1
1360 x 768	60 Hz	Sun	5:3	2
1280 x 1024	60, 75, 85 Hz	VESA	5:4	2
1280 x 1024	67, 76 Hz	Sun	5:4	2
1280 x 1024	96, 108, 112 Hz	Sun-stereo	5:4	1
1280 x 800	112 Hz	Sun-stereo	16:10	1
1280 x 800	76 Hz	Sun	16:10	2
1280 x 768	56 Hz	Sun	5:3	2
1152 x 900	66, 76 Hz	Sun	5:4	1
1152 x 900	120 Hz	Sun-stereo	5:4	1
1024 x 800	84 Hz	Sun	5:4	2
1024 x 768	75 Hz	VESA	4:3	2
1024 x 768	60, 70, 77 Hz	Sun	4:3	2
1024 x 768	96 Hz	Sun-stereo	4:3	1
960 x 680	108, 112 Hz	Sun-stereo	7:5	2
800 x 600	75 Hz	VESA	4:3	4
640 x 480	60 Hz	VESA	4:3	8

Accessing Field Replaceable Unit Information

You can obtain Sun XVR-600 graphics accelerator subcomponent version numbers and other data using `fbconfig`.

- To obtain FRU ID (field replaceable unit identifier) information, type:

```
host% fbconfig -dev jfb0 -prconf

--- Hardware Configuration for /dev/fbs/jfb0 ---

Type: XVR-600
Sun Serial Number: 3753153400011
Hardware Revision: -01 rev50
Manufacture Date: Tue Sep 30 13:15:52 2003
PROM Information: @(#)xvr600.fth 1.5 03/05/09 SMI

Monitor/Resolution Information:
  EDID Data: Available - EDID version 1 revision 3
  Monitor type: Sun P/N 365-16981 S/N 02190012336
  Current resolution setting: 1920x1200x60
  Monitor possible resolutions: 1024x768x60, 1024x768x70, 1024x768x75,
  1152x900x66, 1280x1024x60, 1280x1024x75, 1280x1024x76, 640x480x60,
  1920x1200x60, 1920x1200x60_240T, 1600x1200x60, 800x600x75,
  1920x1080x60

Framelock Configuration:
  Slave Mode: Disabled

Memory Information:
  Total Video Memory: 67108864
  Video Memory Used: 20971520
  Total Texture Memory: 33554432
  Texture Memory Used: 0
  Total Display List Memory: 33554432
```

Technical Support

For assistance and other information not found in this document concerning the Sun XVR-600 graphics accelerator, see Support Services at:

<http://www.sun.com/service/online>

For the most up-to-date version of the installation guide, go to:

<http://www.sun.com/documentation>

For the latest software patches, go to:

<http://sunsolve.sun.com>

Installing the Sun XVR-600 Graphics Accelerator Software

This chapter provides Sun XVR-600 graphics accelerator software installation information.

- “Software Requirements” on page 9
- “Sun XVR-600 Graphics Accelerator Software Packages” on page 10
- “Installing the Software” on page 15
- “Removing the Software” on page 18
- “Man Pages” on page 19
- “Avoiding Colormap Flash” on page 20

Software Requirements

Your system requires the Solaris 8 2/02 and Solaris 9 operating environments, or a subsequent compatible version of the operating environment, before installing the Sun XVR-600 graphics accelerator software. Your system also requires:

- 1.5 Mbytes of available disk space for Sun XVR-600 graphics accelerator Solaris system software
- 65-110 Mbytes of disk space for Sun OpenGL for Solaris (up to 110 Mbytes if 64-bit Sun OpenGL for Solaris is installed)

Note – If your system does not have the Solaris 8 2/02 operating environment installed, you must install it or a subsequent compatible version of it, such as the Solaris 9 operating environment. Refer to the main Solaris installation manuals for this information.

Updated versions of Sun OpenGL for Solaris are available at:

<http://www.sun.com/software/graphics/OpenGL>

Sun XVR-600 Graphics Accelerator Software Packages

Install the required software packages for your Solaris operating environment from the CD-ROM provided with your Sun XVR-600 graphics accelerator installation kit. [TABLE 2-1](#) lists the Sun XVR-600 graphics accelerator CD directories:

TABLE 2-1 Sun XVR-600 Graphics Accelerator CD Directories

Directory name	Description
License	Binary Code License
XVR-600/Solaris_8/Packages/	Solaris 8 graphics accelerator software packages
XVR-600/Solaris_8/Patches/	Solaris 8 graphics accelerator software patches
XVR-600/Solaris_9/Packages/	Solaris 9 graphics accelerator software packages
XVR-600/Solaris_9/Patches/	Solaris 9 graphics accelerator software patches
Docs/	Sun XVR-600 graphics accelerator documentation
Copyright	English version of copyright
FR_Copyright	French version of copyright
install	Product installation script
uninstall	Product removal script
OpenGL/1.3/Packages/	Sun OpenGL 1.3 packages
OpenGL/1.3/Patches/	Sun OpenGL 1.3 patches
OpenGL/1.2.3/Packages/	Sun OpenGL 1.2.3 packages
OpenGL/1.2.3/Patches/	Sun OpenGL 1.2.3 patches

Software Package Locations

The Sun XVR-600 graphics accelerator software packages are located in the directories listed in [TABLE 2-2](#). If the CD is not already mounted, `/cdrom/XVR-600/` is the path.

TABLE 2-2 Location of Sun XVR-600 Graphics Accelerator Software Packages

Software packages	Directory location
Solaris 8 software	<code>/cdrom/cdrom0/XVR-600/Solaris_8/Packages</code>
Solaris 9 software	<code>/cdrom/cdrom0/XVR-600/Solaris_9/Packages</code>

Software Packages

[TABLE 2-3](#) lists the Sun XVR-600 graphics accelerator software package names and descriptions.

TABLE 2-3 Sun XVR-600 Graphics Accelerator Software Package Names

Package name	Description
<code>SUNWjfbcf</code>	Sun XVR-600 and XVR-1200 Graphics Configuration Software
<code>SUNWjfbmn</code>	Sun XVR-600 and XVR-1200 Graphics Manual Page
<code>SUNWjfbr</code>	Sun XVR-600 and XVR-1200 Graphics System Software (Root)
<code>SUNWjfbw</code>	Sun XVR-600 and XVR-1200 Graphics Window System Support
<code>SUNWjfbx.u</code>	Sun XVR-600 and XVR-1200 Graphics System Software/Device Driver (64-bit)

Software Patches

[TABLE 2-4](#) lists the patches required for the Solaris operating environments.

TABLE 2-4 Patches for Solaris 8 and 9 Operating Environments

Patch	Location
114554-09 or later	<code>/cdrom/cdrom0/XVR-600/Solaris_8/Patches</code>
114555-09 or later	<code>/cdrom/cdrom0/XVR-600/Solaris_9/Patches</code>

Sun OpenGL for Solaris Software

The Sun XVR-600 graphics accelerator is supported in Sun OpenGL Versions 1.2.3 and 1.3 and subsequent compatible Sun OpenGL versions, for Solaris operating environments.

Software Package Locations

TABLE 2-5 lists the directory locations of the Sun OpenGL for Solaris software packages.

TABLE 2-5 Location of Sun OpenGL for Solaris Software Packages

Sun OpenGL for Solaris Software Packages	Directory Location
Sun OpenGL 1.3 software	/cdrom/cdrom0/OpenGL/1.3/Packages/
Sun OpenGL 1.2.3 software	/cdrom/cdrom0/OpenGL/1.2.3/Packages/

Updated versions of Sun OpenGL for Solaris are available at:

<http://www.sun.com/software/graphics/OpenGL>

Sun OpenGL for Solaris Patches

TABLE 2-6 lists the patches required for Sun OpenGL 1.3 for Solaris.

TABLE 2-6 Patches for Sun OpenGL 1.3 for Solaris

Patch	Location
113886-10 (32-bit) or later	/cdrom/cdrom0/OpenGL/1.3/Patches
113887-10 (64-bit) or later	/cdrom/cdrom0/OpenGL/1.3/Patches

TABLE 2-7 lists the patches required for Sun OpenGL 1.2.3 for Solaris.

TABLE 2-7 Patches for Sun OpenGL 1.2.3 for Solaris

Patch	Location
112628-20 (32-bit) or later	/cdrom/cdrom0/OpenGL/1.2.3/Patches
112629-20 (64-bit) or later	/cdrom/cdrom0/OpenGL/1.2.3/Patches

Note – If your currently installed version of Sun OpenGL for Solaris does *not* include the current patch level, the Sun XVR-600 graphics accelerator software installation script upgrades to the proper patch level.

Note – Always check for the latest software patches at:
<http://sunsolve.sun.com/>

Sun OpenGL for Solaris Software Package Names

TABLE 2-8 lists the Sun OpenGL 1.3 for Solaris software package names and descriptions.

TABLE 2-8 Package Names for Sun OpenGL Version 1.3

Package Name	Description
SUNWgldoc	Sun OpenGL for Solaris Documentation and Man Pages
SUNWgldp	Sun OpenGL for Solaris Device Pipeline Support
SUNWgldpx	Sun OpenGL for Solaris 64-bit Device Pipeline Support
SUNWglh	Sun OpenGL for Solaris Header Files
SUNWglrt	Sun OpenGL for Solaris Runtime Libraries
SUNWglrtu	Sun OpenGL for Solaris Platform Specific Runtime Libraries
SUNWglrtx	Sun OpenGL for Solaris 64-bit Runtime Libraries
SUNWglshr	Sun OpenGL for Solaris Runtime Generic Software
SUNWglsrx	Sun OpenGL for Solaris 64-bit Optimized SW Rasterizer
SUNWglsrz	Sun OpenGL for Solaris Optimized SW Rasterizer

TABLE 2-9 lists the Sun OpenGL 1.2.3 for Solaris software package names and descriptions.

TABLE 2-9 Package Names for Sun OpenGL Version 1.2.3

Package Name	Description
SUNWafbg1	Sun OpenGL for Solaris Elite3D support
SUNWafbgx	Sun OpenGL for Solaris 64-bit Elite3D support
SUNWffbg1	Sun OpenGL for Solaris Creator Graphics (FFB) Support
SUNWffbgx	Sun OpenGL for Solaris 64-bit Creator Graphics (FFB) Support
SUNWgfbg1	Sun OpenGL for Solaris Gfb Support
SUNWgfbgx	Sun OpenGL for Solaris 64-bit Gfb Support
SUNWgl1doc	Sun OpenGL for Solaris Documentation and Man Pages
SUNWgl1h	Sun OpenGL for Solaris Header Files
SUNWgl1rt	Sun OpenGL for Solaris Runtime Libraries
SUNWgl1rtu	Sun OpenGL for Solaris Platform Specific Runtime Libraries
SUNWgl1rtx	Sun OpenGL for Solaris 64-bit Runtime Libraries
SUNWgl1sr	Sun OpenGL for Solaris Runtime Generic Software
SUNWgl1srx	Sun OpenGL for Solaris 64-bit Optimized SW Rasterizer
SUNWgl1srz	Sun OpenGL for Solaris Optimized SW Rasterizer
SUNWifbg1	Sun OpenGL for Solaris Expert3D/Expert3D-Lite/XVR-500 Graphics Support
SUNWifbgx	Sun OpenGL for Solaris 64-bit Expert3D/Expert3D-Lite/XVR-500 Graphics Support
SUNWjfbg1	Sun OpenGL for Solaris XVR-600/XVR-1200 Graphics Support
SUNWjfbgx	Sun OpenGL for Solaris 64-bit XVR-600/XVR-1200 Graphics Support

Installing the Software

Use the `install` utility on the CD-ROM to install the Sun XVR-600 graphics accelerator software. This utility installs necessary driver software and patches.

1. **Log in as superuser.**
2. **Insert the Sun XVR-600 graphics accelerator CD into the drive.**
 - If the drive is already mounted, type the following, and go to [Step 3](#):

```
# cd /cdrom/cdrom0
```

- If the CD is not already mounted, type:

```
# mount -F hsfs -O -o ro /dev/dsk/c0t6d0s0 /cdrom
# cd /cdrom
```

Note – The CD-ROM device might be different on your system. For example, `/dev/dsk/c0t2d0s2`.

3. To install the Sun XVR-600 graphics accelerator software, type:

```
# ./install
```

The following is displayed:

```
Welcome to the Sun XVR-600 Graphics Accelerator installation.

Copyright 2003 Sun Microsystems, Inc. All rights reserved.
Use is subject to license terms.

This program installs the software for the Sun XVR-600 and Sun XVR-1200
Graphics Accelerators. This install process refers to the Sun XVR-600
Graphics Accelerator, but applies to the Sun XVR-1200 Graphics
Accelerator as well.

Please select the version of Sun OpenGL to install:
1) Sun OpenGL 1.3
2) Sun OpenGL 1.2.3
3) Do not install Sun OpenGL
Enter a number:
```

The installation program checks if the Sun XVR-600 graphics accelerator software is already installed. If already installed, the following is displayed:

```
*** Sun XVR-600 Graphics Accelerator packages are already installed.
*** Sun OpenGL 1.3 packages are already installed.

This script is about to take the following actions:
- Remove existing pre-release Sun XVR-600 Graphics Accelerator patch 114554-09
- Install Sun XVR-600 Graphics Accelerator patch(es) 114554-09
Press return to continue, or 'Q' to quit:
```

- If the above is *not* displayed, proceed to [Step 4](#) to continue the installation process.
- If the above *is* displayed, press Return and the following is displayed indicating that the Sun XVR-600 graphics accelerator patches are installed:

```
*** Installing patch 114554-09 for Solaris 8...
*** Done. A log of this installation is at:
    /var/tmp/XVR-600.install.2003.09.16
```

4. Select the Sun OpenGL for Solaris version and press Return.

The following is displayed. (Option 1, Sun OpenGL 1.3 for Solaris, is selected for this example on a Solaris 8 operating environment.)

```
This script is about to take the following actions:  
- Install Sun XVR-600 Graphics Accelerator software  
- Install Sun XVR-600 Graphics Accelerator patch(es) 114554-09  
- Install Sun OpenGL 1.3  
Press return to continue, or 'Q' to quit:
```

5. Press Return to begin installation.

When complete, the following is displayed:

Note – Depending on your system configuration and time of installation, the actual output from the installation process might differ from what is shown below.

```
*** Installing Sun XVR-600 Graphics Accelerator packages...  
*** Installing patch 114554-09 for Solaris 8...  
*** Installing Sun OpenGL 1.3 packages...  
*** Done. A log of this installation is at:  
    /var/tmp/XVR-600.install.2003.09.16
```

6. Shut down the system after the Sun XVR-600 graphics accelerator software is installed:

```
# shutdown
```

See the shutdown(1M) and boot(1M) man pages for more details.

7. Install the Sun XVR-600 graphics accelerator hardware.

Go to [Chapter 3](#) for information on installing the Sun XVR-600 graphics accelerator hardware.

8. Boot your system at the ok prompt:

Halt (Stop-A) your system for the ok prompt.

```
ok boot -r
```

Removing the Software

1. Log in as superuser.
2. Insert the Sun XVR-600 graphics accelerator CD into the drive.
 - If the drive is already mounted, type the following, and go to Step 3:

```
# cd /cdrom/cdrom0
```

- If the CD is not already mounted, type:

```
# mount -F hsfs -O -o ro /dev/dsk/c0t6d0s0 /cdrom
# cd /cdrom
```

3. To remove the Sun XVR-600 graphics accelerator software, become superuser and type:

```
# ./uninstall
```

The following list of options is displayed:

```
This program removes the software for the Sun XVR-600 and Sun
XVR-1200 Graphics Accelerators. This removal process refers to the
Sun XVR-600 Graphics Accelerator, but applies to the Sun XVR-1200
Graphics Accelerator as well.
```

```
1) Remove Sun XVR-600 Graphics Accelerator support
2) Remove Sun OpenGL
3) Remove All (Sun XVR-600 Graphics Accelerator and Sun OpenGL)
4) Quit
Select an option:
```

4. Select Option 3 to remove all listed software packages.

The following text is displayed:

```
About to take the following actions:
- Remove Sun XVR-600 Graphics Accelerator support
- Remove Sun OpenGL
Press 'q' to quit, or press any other key to continue:
```

5. Press Return to start the removal process.

Once complete, the following is displayed and the program provides the location of a removal log:

```
*** Removing packages...
*** Done. A log of this removal can be found at:
        /var/tmp/jfb.remove.2003.09.16
```

Man Pages

The Sun XVR-600 graphics accelerator man pages describe how you can query and set frame buffer attributes such as screen resolutions and visual configurations.

Use the `fbconfig(1M)` man page for configuring all Sun graphics accelerators. `SUNWjfb_config(1M)` contains Sun XVR-600 device-specific configuration information. To get a list of all graphics devices on your system, type:

```
host% fbconfig -list
```

This example shows a list of graphics devices displayed:

Device-Filename	Specific Config Program
-----	-----
/dev/fbs/jfb0	SUNWjfb_config

Use the `fbconfig -help` option to display the attributes and parameters information of the man page.

```
host% fbconfig -dev jfb0 -help
```

- To access the `fbconfig` man page, type:

```
host% man fbconfig
```

- To access the Sun XVR-600 graphics accelerator man page, type:

```
host% man SUNWjfb_config
```

Avoiding Colormap Flash

When multiple windows are used in an 8-bit window system, the colors can change as the cursor is moved from window to window. There are two methods for avoiding colormap flash:

- Using the `-defdepth 24` command option to run the window system in 24-bit mode, or
- Use `-fake8 enable` if you need both 8-bit and 24-bit visuals simultaneously.

The default is 8-bit.

Using the `-defdepth 24` Option

1. Using the `fbconfig` command, type:

```
host% fbconfig -dev jfb0 -defdepth 24
```

2. Log out, then log back in.

Note – 24-bit depth performance can be slower than 8-bit depth mode.

Using the `-fake8` Option

1. Using the `fbconfig` command, type:

```
host% fbconfig -dev jfb0 -fake8 enable
```

Note – 8-bit depth performance is slower in 8+24 (`-fake8`) mode.

2. Log out, then log back in.

Installing the Sun XVR-600 Graphics Accelerator Hardware

This chapter provides Sun XVR-600 graphics accelerator hardware installation information.

- “Before Installation” on page 21
- “System Configurations” on page 22
- “Installing the Hardware” on page 23
- “Monitor Cables” on page 23
- “Changing the Monitor Screen Resolution” on page 24

Before Installation

Refer to your system platform documentation for proper procedures on how to shut down the system safely before installing or removing any internal boards and how to reboot the system after installation. Access documentation at:

<http://www.sun.com/documentation>

System Configurations

TABLE 3-1 lists the maximum number of Sun XVR-600 graphics accelerators for each Sun system supported.

Note – The Sun XVR-600 graphics accelerator consumes 25 watts of system power.

To find the most recent information on supported systems for the Sun XVR-600 graphics accelerator, and additional specifications, go to:

<http://www.sun.com/desktop/products/graphics/xvr600/>

TABLE 3-1 Supported Systems and Maximum Number of Sun XVR-600 Graphics Accelerators Per System

System	Maximum Number of Sun XVR-600 Graphics Accelerators
Sun Blade™ 150 system	1
Sun Blade 1500 system	2
Sun Blade 2500 system	3
Sun Fire™ V210 server	1
Sun Fire V240 server	1
Sun Fire V440 server	2
Sun Fire V480 server	3
Sun Fire V880 server	4
Netra 20 server	1

Sun Fire V480 Server Configuration

When using two or three Sun XVR-600 graphics accelerators in a Sun Fire V480 server (which supports up to three), there *must* be an empty slot between each Sun XVR-600 graphics accelerator. Doing so assures that each installed Sun XVR-600 graphics accelerator meets temperature specifications.

Installing the Hardware

Note – The Sun XVR-600 graphics accelerator operates best when installed in the system 66 MHz PCI bus connector slots (applies to systems with available 66 MHz PCI bus slots).

Refer to the platform documentation provided with your Sun system for detailed instructions on installing Sun PCI bus graphics boards.

Access system hardware documentation at:

<http://www.sun.com/documentation>

After installing your graphics accelerator and securing your system enclosure:

- 1. Connect the monitor cable, power on the monitor, then power on the system and reboot (boot -r) for reconfiguration.**
- 2. For multiple graphics boards, modify the `/etc/dt/config/Xservers` file.**

This file tells your system to run the X window system on each of the frame buffers listed in your `Xservers` file. If you remove graphics boards from your system, you also need to modify your `Xservers` file. See [Chapter 4](#), “Configuring Multiple Frame Buffers.”

Monitor Cables

Use the proper DVI-I monitor adapter cable that support your monitor. The DVI-I to HD15 monitor adapter, Sun part number 530-3305, comes with the Sun XVR-600 graphics accelerator installation kit. You can also order the DVI-I to HD15 adapter through the Sun store (<http://store.sun.com>).

Changing the Monitor Screen Resolution

Note – The monitor *must* be connected to the Sun XVR-600 graphics accelerator and powered on for the graphics accelerator to configure to the initial monitor resolution.

For most installations, the Sun XVR-600 graphics accelerator device automatically configures itself to the screen resolution and refresh rate for your monitor. If it is not a Sun monitor, however, that is connected to the Sun XVR-600 graphics accelerator device, the monitor might have the wrong screen resolution. To change the screen resolution, use the `fbconfig` utility, which is used for configuring all Sun graphics accelerators. `SUNWjfb_config(1M)` contains device-specific configuration information for the Sun XVR-600 graphics accelerator.

- To access the `fbconfig` man page, type:

```
host% man fbconfig
```

- To access the `SUNWjfb_config` man page, type:

```
host% man SUNWjfb_config
```

Configuring Multiple Frame Buffers

This chapter describes procedures for setting up multiple frame buffers.

- [“Configuring Multiple Frame Buffers Through the Xservers File”](#) on page 25
- [“Xinerama”](#) on page 27

Configuring Multiple Frame Buffers Through the Xservers File

To run more than one frame buffer you must modify your Xservers file: `/etc/dt/config/Xservers`. The Sun XVR-600 graphics accelerator device name is `jfb` (for example, `jfb0` and `jfb1` for two Sun XVR-600 graphics accelerator devices). To do this:

1. **Become superuser and open the `/etc/dt/config/Xservers` file.**

```
# cd /etc/dt/config
# vi + Xservers
```

If the `/etc/dt/config/Xservers` file does not exist, create the `/etc/dt/config` directory and copy the Xservers file from `/usr/dt/config/Xservers` to `/etc/dt/config`.

```
# mkdir -p /etc/dt/config
# cp /usr/dt/config/Xservers /etc/dt/config
# cd /etc/dt/config
# vi + Xservers
```

2. Modify the file by adding the device locations for the applicable frame buffers being used. See the following examples:

Enter the `Xservers` file content on a single line.

This example shows the `Xservers` configuration file modified for one Sun XVR-500 graphics accelerator and one Sun XVR-600 graphics accelerator:

```
:0 Local local_uid@console root /usr/openwin/bin/Xsun -dev /dev/fbs/ifb0  
-dev /dev/fbs/jfb0
```

This example shows the `Xservers` configuration file modified for one Sun XVR-600 graphics accelerator:

```
:0 Local local_uid@console root /usr/openwin/bin/Xsun -dev /dev/fbs/jfb0
```

3. Log out, then log back in.

If you are editing the `Xservers` file after completing all the installation steps outlined in Chapter 1, [“Installation Process” on page 5](#), including the reconfiguration, simply reboot your system.

Xinerama

Xinerama is an X window system feature available in Solaris 8 system software and subsequent compatible releases for Sun graphics boards including the Sun XVR-600 graphics accelerator.

Refer to the proper `Xservers(1)` man page and `Xservers` documentation for further information.

Using Xinerama

When the window system is started in Xinerama mode, all windows can be seamlessly moved across screen boundaries, thus creating one large, super high-resolution, virtual display. With Sun OpenGL 1.2.3 and 1.3 for Solaris or subsequent compatible releases, this functionality is extended to OpenGL applications. No recompilation is necessary for a legacy application to work with Xinerama mode across multiple screens, even if the application was compiled with an older version of Sun OpenGL for Solaris.

1. **To enable Xinerama mode (single logical screen) on multiscreen displays, add `+xinerama` to the `Xsun` command line in the `/etc/dt/config/Xservers` file.**

As superuser, type:

```
# cd /etc/dt/config
# vi + Xservers
```

2. **Modify the `Xservers` file.**

Enter the `Xservers` file content on a single line:

```
:0 Local local_uid@console root /usr/openwin/bin/Xsun +xinerama
-dev /dev/fbs/jfb0 -dev /dev/fbs/jfb1
```

Restrictions When Using Xinerama

- Sample density is irrelevant to Xinerama. Therefore, screens of different sample density can be combined using Xinerama.
- Both screens must have the same visuals to be combined using Xinerama. In practice, this means they must be the same Sun PCI-based graphics device (family).
- Both screens that the X window system thinks are side by side must have the same height to be combined using Xinerama.
- Both screens that the X window system thinks are above and below must have the same width to be combined using Xinerama.

Using Sun XVR-600 Graphics Accelerator Features

This chapter provides Sun XVR-600 graphics accelerator feature information.

- [“Dynamic Multisample Antialiasing” on page 29](#)
- [“Checking Device Configuration” on page 32](#)

Dynamic Multisample Antialiasing

Multisampling (full-scene dynamic multisample antialiasing) removes the jagged edges on 3D data. An image is sampled at a higher resolution than the screen, typically two to eight samples per pixel. This method yields improved images, but at the price of possibly increased render time.

The Sun XVR-600 graphics accelerator has 64 Mbytes of memory for the frame buffer so that the image can be multisampled at up to eight samples per pixel in a single pass, depending on the resolution. The higher number of samples per pixel, the better the image quality but the longer the rendering time (and the more memory is consumed). Depending on the video format ([TABLE 1-1 on page 6](#)), the number of samples per pixel, or *sample density*, can be increased to improve image quality.

To invoke multisampling, use the `fbconfig` command's `-multisample` and `-samples` options. You can enable multisample mode for all Sun OpenGL for Solaris applications.

`fbconfig` controls frame buffer memory consumption (at the time the X window system starts).

Enabling Multisampling for All Sun OpenGL for Solaris Applications

1. Use `fbconfig` to enable all Sun OpenGL for Solaris application windows for multisampling.

```
host% fbconfig -dev jfb0 -multisample forceon
```

This enables multisampling for all Sun OpenGL for Solaris applications.

2. Log out, then log back in.

Multisampling

Multisample allocation occurs when the window system is started or restarted. The configuration `samples-per-pixel` parameter specifies the depth that is pre-allocated. [TABLE 5-1](#) describes the `fbconfig -multisample` options.

`-multisample [available | disable | forceon]`

TABLE 5-1 Multisample Options

Option	Description
<code>available</code>	Multisample is possible but is selected on a per application basis or per visual basis.
<code>disable</code>	No multisample is possible. <code>disable</code> is the default.
<code>forceon</code>	Multisampling for all Sun OpenGL for Solaris windows. (<code>force</code> is an acceptable abbreviation for this option.)

Sample Density

The `-samples` option specifies the number of samples per pixel to allocate when `multisample` is not set to `disable`. The available `-sample` density are 1, 2, 4, or 8.

`-samples [1 | 2 | 4 | 8 | adaptive]`

The maximum sample density is 8 samples per pixel. Using `-samples 8`, the sample density is automatically allocated based on the frame buffer memory and video resources available to the stream as the window system starts up. Though the allowable choices are 1 to 8, a very high sample density can be allocated only at low resolution. See [“Disabling Multisampling” on page 31](#).

The adaptive option is the default setting for `-samples`. When you use the `-samples adaptive` option, two samples are preallocated per pixel (extra samples are then assigned to pixels that need them).

See [TABLE 1-1](#) on [page 6](#) for a list of how many samples per pixel are supported at various maximum 3D resolutions.

Disabling Multisampling

When you disable multisampling, no multisample rendering is possible. Only one sample per pixel is allocated, despite any `-samples` option value.

1. To disable multisampling, type:

```
host% fbconfig -dev jfb0 -multisample disable
```

Or, select a sample density of 1 to disable multisampling:

```
host% fbconfig -dev jfb0 -samples 1
```

2. Log out, then log back in.

Default Color Depth

Use the `-defdepth` option to set the default depth (bits per pixel) on the device. Possible values are 8 or 24.

```
-defdepth 8 | 24
```

Any depth setting in the `Xserver` command line takes precedence over what is set using `fbconfig`. The default is 8.

- Log out, then log back in to restart the X window system for the changes to take effect.

Checking Device Configuration

Use `fbconfig` to check the X window system (`-propt`) and Sun XVR-600 graphics accelerator (`-prconf`) device configuration values.

The `fbconfig -propt` option displays the values of all options (for the specified device) saved in the `OWconfig` file (see below for an example). These are the values the X window system will use the next time it starts on that device:

```
host% fbconfig -dev jfb0 -propt

--- OpenWindows Configuration for /dev/fbs/jfb0 ---

OWconfig: machine
Video Mode: NONE
Accum: Enabled (allocate an accumulation buffer if possible)

Multisample Information:
  Multisample Mode: Disabled (multisample visuals will not be available)
  Samples Per Pixel: N/A (multisampling disabled)

Visual Information:
  Default Visual: Non-Linear Normal Visual
  Visual Ordering: Linear Visuals are last
  Gamma Correction Value: 2.22
  Gamma Correction Table: Not Available
  Fake8 rendering: enabled
  Default Visual Depth (defdepth): 8
```

Note – `Video Mode: NONE` indicates that the graphics accelerator will use the display device EDID data, if present, to select a video mode appropriate for the display device.

The `fbconfig -prconf` option displays the current Sun XVR-600 graphics accelerator device configuration. See below for an example. If certain values differ from those displayed in `-propt`, it is because those values have been configured since the X window system started.

```
host% fbconfig -dev jfb0 -prconf

--- Hardware Configuration for /dev/fbs/jfb0 ---

Type: XVR-600
Sun Serial Number: 3753153400011
Hardware Revision: -01 rev50
Manufacture Date: Tue Sep 30 13:15:52 2003
PROM Information: @(#)xvr600.fth 1.5 03/05/09 SMI

Monitor/Resolution Information:
  EDID Data: Available - EDID version 1 revision 3
  Monitor type: Sun P/N 365-16981 S/N 02190012336
  Current resolution setting: 1920x1200x60
  Monitor possible resolutions: 1024x768x60, 1024x768x70, 1024x768x75,
  1152x900x66, 1280x1024x60, 1280x1024x75, 1280x1024x76, 640x480x60,
  1920x1200x60, 1920x1200x60_240T, 1600x1200x60, 800x600x75,
  1920x1080x60

Framelock Configuration:
  Slave Mode: Disabled

Memory Information:
  Total Video Memory: 67108864
  Video Memory Used: 20971520
  Total Texture Memory: 33554432
  Texture Memory Used: 0
  Total Display List Memory: 33554432
```


Sun XVR-600 Graphics Accelerator Framelocking

This chapter describes Sun XVR-600 graphics accelerator framelocking.

- [“Sun XVR-600 Graphics Accelerator Framelock System” on page 35](#)
- [“Configuring Sun XVR-600 Graphics Accelerators for Framelocking” on page 36](#)
- [“Framelock Cable Assembly” on page 38](#)
- [“Connecting the Framelock Cable Assembly” on page 39](#)

Sun XVR-600 Graphics Accelerator Framelock System

The framelock synchronization feature enables vertical retracing to occur simultaneously on each Sun XVR-600 graphics accelerator subsystem. The framelock cable assembly is used to daisy-chain two or more Sun XVR-600 graphics accelerator subsystems. Vertical retrace synchronization eliminates flicker between multiscreen displays.

Framelocking is often necessary when running in stereo in a multihead environment. All the displays can be synchronized so that the left and right views can be seen correctly through one set of LCD stereo glasses.

When frame buffers are framelocked, you should make sure they are all running at the same video resolution and vertical retrace rate (see `fbconfig -help` for details). See [“Configuring Sun XVR-600 Graphics Accelerators for Framelocking” on page 36](#).

To use the framelock features, the framelock cable assembly is required. See [“Framelock Cable Assembly” on page 38](#) for installation.

For the maximum number of boards supported for each system, go to:

<http://www.sun.com/desktop/products/graphics/xvr600/>

To order the framelock cable assembly, call Sun Telesales at 1-800-786-0404 and request spare part number 530-2754. You can also order the framelock cable assembly through the Sun store (<http://store.sun.com>) by ordering this part number under spare parts.

Configuring Sun XVR-600 Graphics Accelerators for Framelocking

1. **Designate a Sun XVR-600 graphics accelerator as master for the graphics boards to be in framelock.**

You can use the Sun XVR-600 graphics accelerator that serves as the boot/console head for that system.

Refer to the `boot -r` man page for device location and device numbering information for how devices are numbered based on their physical location. For framelock, you may select any device (that is, `jfb0`, `jfb1`, `jfb2`,...and so on) to be the master Sun XVR-600 graphics accelerator device.

2. **Make sure that each Sun XVR-600 graphics accelerator installed has the same monitor resolution as the one in master mode.**

- a. **Check the resolution of an Sun XVR-600 graphics accelerator by using the `fbconfig` command. For example:**

```
host% fbconfig -dev /dev/fbs/jfb0 -prconf
```

You must repeat this command for each Sun XVR-600 graphics accelerator in the system or systems.

The `fbconfig` command displays the current monitor resolution setting. It also displays additional information such as whether the Sun XVR-600 graphics accelerator is a master or slave.

- b. (Optional) Change the resolution of a Sun XVR-600 graphics accelerator using the `fbconfig` command.

If the resolution on each Sun XVR-600 graphics accelerator is not the same, you must change it to match the Sun XVR-600 graphics accelerator in master mode. For example:

```
host% fbconfig -dev /dev/fbs/jfb1 -res 1280x1024x76 now nocheck
```

3. Connect the framelock cable to each Sun XVR-600 graphics accelerator.

Make sure to first connect the top of the framelock cable assembly to the master Sun XVR-600 graphics accelerator.

See the section [“Framelock Cable Assembly”](#) on page 38.

4. From the master Sun XVR-600 graphics accelerator display window, configure the other Sun XVR-600 graphics accelerators in slave mode.

Use the `fbconfig` command. For example:

```
host% fbconfig -dev /dev/fbs/jfb1 -slave stereo
```

You must configure each board separately (that is, for `jfb1`, `jfb2`, `jfb3`, and so on).

Your system is now ready for framelocking.

To reconfigure your Sun XVR-600 graphics accelerator from slave mode back to master mode, use the `fbconfig` command. For example:

```
host% fbconfig -dev /dev/fbs/jfb1 -slave disable
```

Framelock Cable Assembly

The framelock cable assembly, [FIGURE 6-1](#), is a Y-shaped cable assembly with three connectors for daisy-chaining multiple Sun XVR-600 graphics accelerator within a computer system. See [Appendix B, “Stereo Output Port” on page 48](#), for the stereo connector pinout signals.

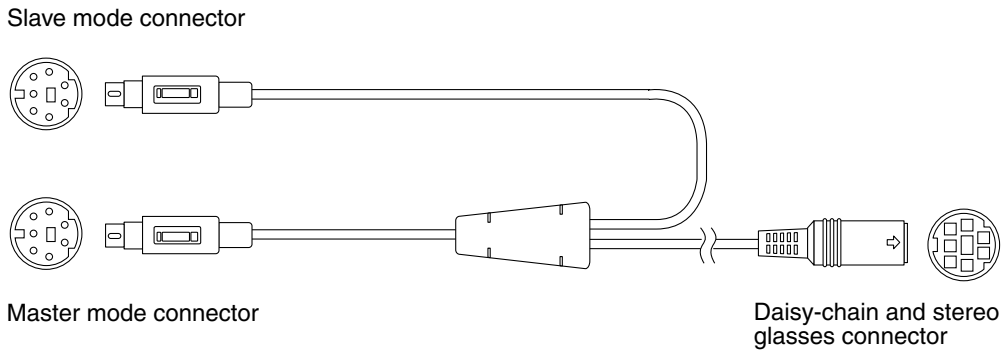


FIGURE 6-1 Framelock Cable Assembly

TABLE 6-1 Framelock Cable Connections

Framelock Connector	Description
Master connector (shortest cable-male)	Connects into the stereo connector located on the Sun XVR-600 graphics accelerator that is designated as the master device. It also plugs into the daisy-chain connector for slave Sun XVR-600 graphics accelerators.
Slave connector (longest cable male)	Connects into the stereo connector located on the Sun XVR-600 graphics accelerator that is designated as a slave device.
Daisy chain/stereo glasses connector (female connector)	Can connect a pair of stereo glasses directly into this connector or the connector can be used to daisy chain to other framelock cables for slave Sun XVR-600 graphics accelerator devices.

Note – There can only be one master Sun XVR-600 graphics accelerator device. You must configure all other Sun XVR-600 graphics accelerator devices as slaves. See the section [“Configuring Sun XVR-600 Graphics Accelerators for Framelocking” on page 36](#).

Connecting the Framelock Cable Assembly

1. Locate the master mode connector of the framelock cable assembly ([FIGURE 6-1](#)).
2. Locate the master Sun XVR-600 graphics accelerator I/O backplate on the rear of your system and connect the master mode connector of the framelock cable assembly to the stereo (DIN7) connector ([FIGURE 6-2](#)).
3. Connect the slave cable connector to a slave Sun XVR-600 graphics accelerator stereo connector ([FIGURE 6-2](#)).
4. Connect a second slave Sun XVR-600 graphics accelerator, if applicable, or connect stereo glasses to the daisy-chain/stereo connector ([FIGURE 6-2](#)).

First and second slave Sun XVR-600 graphics accelerators

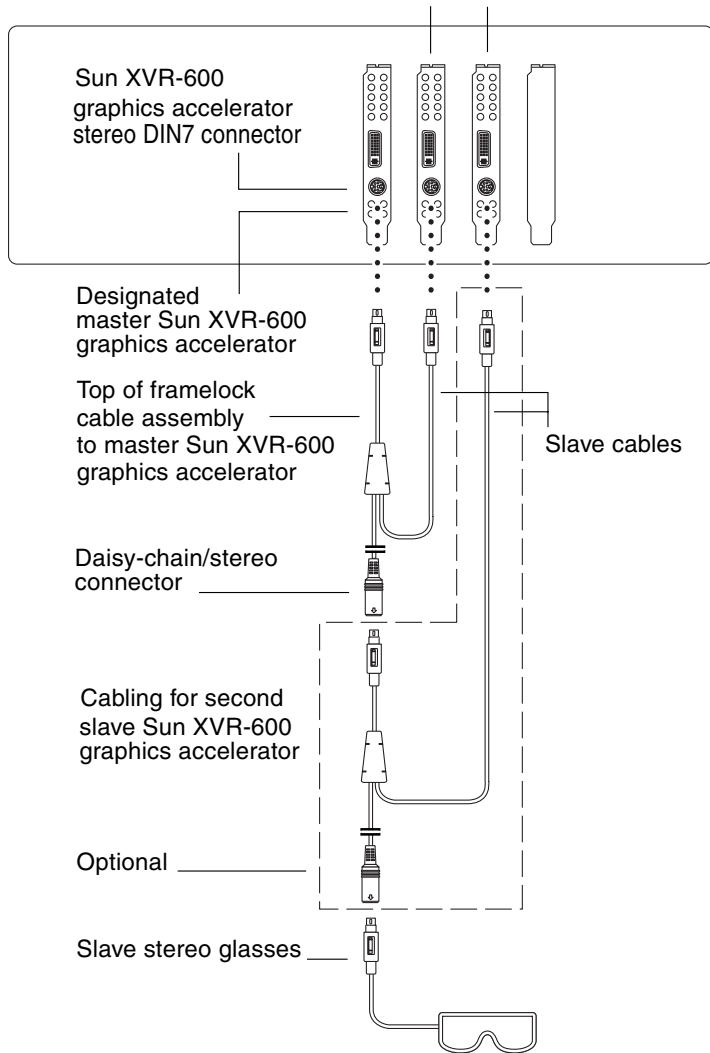


FIGURE 6-2 Sun XVR-600 Graphics Accelerator and Framelock Cable Assembly

Setting the Default Console Display

These instructions describe how to set the Sun XVR-600 graphics accelerator as the default monitor console display.

1. At the ok prompt, type:

```
ok show-displays
```

Information similar to the text below is displayed:

```
a) /pci@8,700000/SUNW,pfb@1  
b) /pci@8,700000/SUNW,XVR-600@1  
q) NO SELECTION  
Enter Selection, q to quit: b
```

2. Select the graphics board you want to be the default console display.

In the above example, we typed **b** for the Sun XVR-600 graphics accelerator. Your selection is confirmed by the following output:

```
/pci@8,700000/SUNW,XVR-600@1 has been selected.  
Type ^Y ( Control-Y ) to insert it in the command line.  
e.g. ok nvalias mydev ^Y  
for creating devalias mydev for /pci@8,700000/SUNW,XVR-600@1
```

3. Create an alias name for the Sun XVR-600 device.

This step is optional for all systems. Creating the alias, however, will simplify future OpenBoot PROM commands.

a. Use `nvalias` to name the Sun XVR-600 graphics accelerator device.

This example uses `mydev` as the device.

```
ok nvalias mydev (Control-Y)
```

Complete the line entry by pressing Control-Y on your keyboard (that is, press and hold Control and press the Y key) and then Return. The output displays as:

```
ok nvalias mydev /pci@8,700000/SUNW,XVR-600@1
```

b. Verify the alias.

```
ok devalias  
mydev                /pci@8,700000/SUNW,XVR-600@1  
screen               /pci@8,700000/SUNW,XVR-600@1  
mouse                /pci@9,700000/usb@1,3/mouse@2  
keyboard             /pci@9,700000/usb@1,3/keyboard@1  
....
```

In the above output, both `mydev` and `screen` are mapped to `/pci@8,700000/SUNW,XVR-600@1` and are therefore interchangeable alias names.

In this procedure example, you can now refer to `mydev` as the Sun XVR-600 graphics accelerator device, as shown in the next step.

4. Set the selected device to be the default console display.

For example,

```
ok setenv output-device mydev  
output-device = mydev
```

If you did not execute Step 3 (creating an alias name), you need to type the entire device name precisely. In this example, you would need to enter the following:

```
ok setenv output-device /pci@8,700000/SUNW,XVR-600@1  
output-device = /pci@8,700000/SUNW,XVR-600@1
```

5. Reset the system using the new `output-device` as the console:

```
ok reset-all
```

6. Connect your monitor cable to the Sun XVR-600 graphics accelerator on your system back panel.
7. To set a resolution (for example, $1280 \times 1024 \times 112$), type:

```
ok setenv output-device mydev:r1280x1024x112  
output-device=mydev:r1280x1024x112
```

Reset the system:

```
ok reset-all
```

You can get a list of available resolutions for your display device by typing the following:

```
ok cd /pci@8,700000/SUNW,XVR-600@1  
ok .screen-resolutions
```


Sun XVR-600 Graphics Accelerator Specifications

This appendix provides I/O port specifications for the Sun XVR-600 graphics accelerator.

- “I/O Port Specifications” on page 45
- “DVI Video Output Port” on page 46
- “Stereo Output Port” on page 48

I/O Port Specifications

The external I/O ports are accessible through the I/O connectors on the Sun XVR-600 graphics accelerator backplate ([FIGURE B-1](#)).

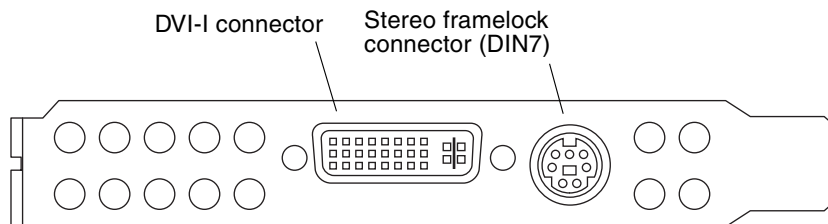


FIGURE B-1 Sun XVR-600 Graphics Accelerator I/O Connectors

The Sun XVR-600 graphics accelerator has the following external I/O ports:

- Stereo framelock DIN7 connector
- DVI-I connector

DVI Video Output Port

FIGURE B-2 and TABLE B-1 shows the Sun XVR-600 graphics accelerator DVI connector and pinout signals. The DVI video output port is a 30-pin connector for a supported workstation monitor. The DVI video port supports both analog and digital resolutions, but both cannot be used simultaneously from the individual DVI port.

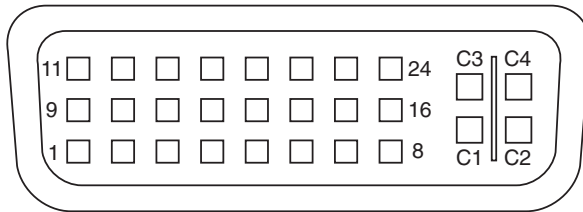


FIGURE B-2 Sun XVR-600 Graphics Accelerator DVI Connector

TABLE B-1 Sun XVR-600 Graphics Accelerator DVI Video Output Port

Pin	Signal
1	TMDS Data2—
2	TMDS Data2+
3	TMDS Data2/4 Shield
4	No connect
5	No connect
6	DDC Clock (SCL)
7	DDC Bi-directional Data (SDA)
8	Analog vertical sync
9	TMDS Data1—
10	TMDS Data1 +
11	TMDS Data1/3 Shield
12	No connect
13	No connect
14	+5V DC power

TABLE B-1 Sun XVR-600 Graphics Accelerator DVI Video Output Port *(Continued)*

Pin	Signal
15	GND Return: +5V, Hsync, Vsync
16	Hot Plug Detect
17	TMDS Data0—
18	TMDS Data0+
19	TMDS Data0/5 shield
20	No connect
21	No connect
22	TMDS Clock shield
23	TMDS Clock+
24	TMDS Clock—
C1	Analog Red
C2	Analog Green
C3	Analog Blue
C4	Analog Horizontal Sync
C5	Analog GND Return: (analog R, G, B)

Stereo Output Port

FIGURE B-3 and TABLE B-2 shows the Sun XVR-600 graphics accelerator stereo DIN7 connector and pinout signals.

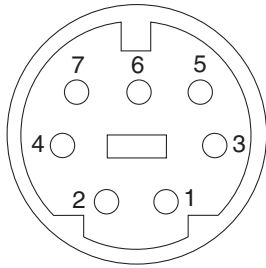


FIGURE B-3 Sun XVR-600 Graphics Accelerator 7-Pin DIN Female Stereo Connector

TABLE B-2 Sun XVR-600 Graphics Accelerator Stereo Connector Pinout

Pin	Signal
1	Signal ground
2	5.0V (Fused, supplies up to 300mA, limited to 1.0A)
3	12.0V (Fused, supplies up to 300mA, limited to 1.0A)
4	Master stereo field Select Out
5	Slave stereo field Select In
6	No connection
7	No connection

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