



i n v e n t

# ATI RADEON 7500 AGP and PCI Graphics Controller Installation Guide

Order Number: EK-R7500-IG. C01

This manual is for managers and operators of *hp AlphaServer* systems with ATI RADEON 7500 AGP and PCI graphics controllers.

Hewlett-Packard Company

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EN50082-1 (IEC801-2, IEC801-3, IEC801-4) - Electromagnetic Immunity

EN60950 (IEC950) - Product Safety

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# Preface

## Intended Audience

This manual is for managers and operators of *hp AlphaServer* systems with ATI RADEON 7500 AGP and PCI graphics controllers.

## Document Structure

This manual has four chapters.

- **Chapter 1, Overview**, provides a brief overview of the ATI RADEON 7500 AGP and PCI graphics controllers.
- **Chapter 2, Installation**, describes the installation of the ATI RADEON 7500 AGP and PCI graphics controller module in a supported HP product.
- **Chapter 3, hp Tru64 UNIX Configuration**, describes how to configure the ATI RADEON 7500 AGP and PCI graphics controller in a system running HP's Tru64 UNIX operating system.
- **Chapter 4, hp OpenVMS Alpha - Graphics Software Installation and Customization**, provides information for installing and modifying the software required to support 2D (two-dimensional) and 3D graphics with the ATI RADEON 7500 AGP and PCI graphics controllers under the hp OpenVMS Alpha operating system.

## Information on the Internet

Visit the *AlphaServer* Web site at [www.hp.com/servers/alphaserver/](http://www.hp.com/servers/alphaserver/) for service tools and more information about ATI RADEON 7500 AGP and PCI graphics controllers.



# Chapter 1

## Overview

### 1.1 Introduction

This chapter provides a brief overview of the ATI RADEON 7500 AGP and PCI graphics controllers.

### 1.2 Module Description

The ATI RADEON 7500 AGP graphics controller/accelerator module is a single expansion-slot, 32-bit AGP bus graphics option that provides 2D and 3D graphics acceleration for supported HP systems.

The ATI RADEON 7500 PCI graphics controller/accelerator module is a single expansion-slot 32 bit, 66/33 MHZ Universal PCI option that provides 2D and 3D graphics acceleration for supported HP systems.

Both the AGP and PCI graphics cards are based on ATI's RV200 graphics chip.

**Table 1-1 Option Numbers**

Option	Description
3X-PBXGG-AB	ATI RADEON 7500 AGP graphics controller with 64 MB of DDR SDRAM memory, 2D/3D/Multihead software for OpenVMS and Tru64 UNIX
3X-PBXGG-AA	ATI RADEON 7500 PCI graphics controller with 64 MB of DDR SDRAM memory, 2D/3D/Multihead software for OpenVMS and Tru64 UNIX

**Note: Purchase and Installation of licenses are required to enable 3D features.**

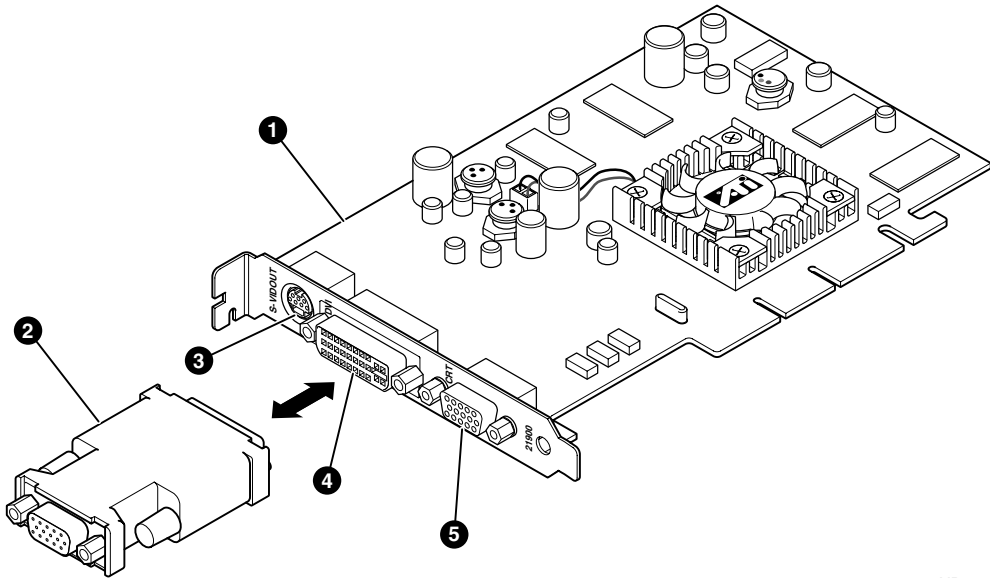
**Separately orderable part numbers are:**

**OL-6ZRA9-AA Tru64 UNIX**

**OL-0ADA9-AA OpenVMS**

For up to date minimum operating system and firmware revision information supported for the ATI RADEON 7500 graphics controllers, refer to the system QuickSpecs located at <http://www.hp.com>.

**Figure 1-1 ATI RADEON 7500 AGP Graphics Controller**

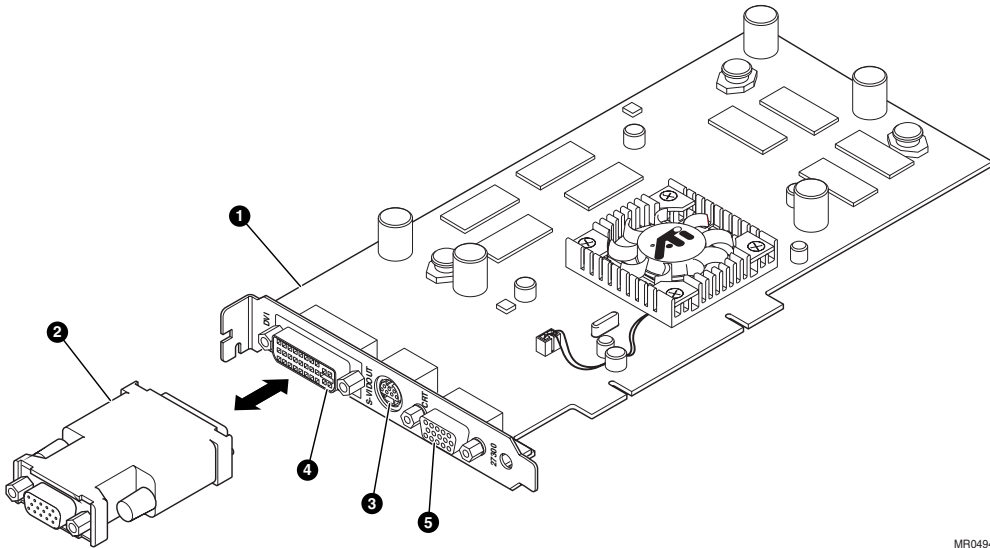


MR0490

- ❶ ATI RADEON 7500 AGP graphics controller
- ❷ DVI-I VGA connector adaptor
- ❸ S-Video connector
- ❹ DVI-I connector
- ❺ Standard 15-pin VGA connector

The ATI RADEON 7500 AGP graphics controller has a standard 15-pin VGA connector, a DVI-I connector and an S-Video connector. The S-Video functionality is not supported by Tru64 UNIX or OpenVMS. There is no VGA switch; VGA functions are automatically configured through the console firmware and software.

Figure 1-2 ATI RADEON 7500 PCI Graphics Controller



MR0494

- ❶ ATI RADEON 7500 PCI graphics controller
- ❷ DVI-I VGA connector adaptor
- ❸ S-Video connector
- ❹ DVI-I connector
- ❺ Standard 15-pin VGA connector

The ATI RADEON 7500 PCI graphics controller has a standard 15-pin VGA connector, a DVI-I connector and an S-Video connector. The S-Video functionality is not supported by Tru64 UNIX or OpenVMS. There is no VGA switch; VGA functions are automatically configured through the console firmware and software.

### DVI-I to VGA Connector Adaptor:

Each ATI RADEON 7500 AGP and PCI card is supplied with a connector adaptor for use on the DVI port so that a standard CRT or LCD monitor with VGA interface can be connected to the second port on the ATI RADEON 7500. ***Tru64 UNIX and OpenVMS require that the DVI-I to VGA connector adaptor supplied with the card always be used.*** For information on support for the second port and its use with Tru64 UNIX and OpenVMS , please see relevant sections in this document and the graphics release notes included on the software CD .

## 1.3 Connector Pinouts

Table 1–2 contains a listing of the pins and signals found on the standard 15-pin VGA connector and the DVI-I to VGA adaptor

**Table 1–2 Standard 15-Pin VGA Connector Pinout**

Pin No.	Signal
1	RED VIDEO
2	GREEN VIDEO
3	BLUE VIDEO
4	No connector
5	GROUND
6	GROUND
7	GROUND
8	GROUND
9	+5V SUPPLY
10	GROUND
11	No connector
12	BI-DIRECTIONAL DATA
13	HORIZONTAL SYNC or COMPOSITE SYNC
14	VERTICAL SYNC (VCLK)
15	DATA CLOCK

# Chapter 2

## Installation

### 2.1 Introduction

This chapter describes the installation of the ATI RADEON 7500 AGP or PCI graphics controller module in a supported HP product. Topics included in this chapter are:

- Unpacking
- Hardware installation

### 2.2 Unpacking

The graphics option hardware is packaged in a single carton that contains one graphic controller and one installation guide.

<b>Description</b>	<b>Part Number</b>
<ul style="list-style-type: none"><li>• One ATI RADEON Graphics Controller, 64MB AGP</li></ul> <p><u>or</u></p> <ul style="list-style-type: none"><li>• One ATI RADEON Graphics Controller, 64MB PCI</li></ul>	3X-PBXGG-AB
<ul style="list-style-type: none"><li>• ATI RADEON 7500 AGP and PCI Graphics Controller Installation Guide (this manual)</li></ul>	EK-R7500-IG
<ul style="list-style-type: none"><li>• DVI-I to VGA connector adapter</li></ul>	209815-001
<ul style="list-style-type: none"><li>• Tru64 UNIX graphics software media</li></ul>	QA-6ZRAA-H8
<ul style="list-style-type: none"><li>• OpenVMS graphics software media</li></ul>	QA-6ZPAA-H8

## 2.3 Installation Procedure

---

**CAUTION:** *Static electricity can damage sensitive electronic components. When handling your graphics option, use an anti-static wriststrap that is connected to a grounded surface on your computer system.*

**NOTE:** *Before installing the module, check your monitor specification for signal compatibility and supported features offered by the ATI RADEON 7500 AGP and PCI graphics controllers.*

---

The following section describes how to install the ATI RADEON 7500 AGP or PCI graphics controller. To install the module, perform the following steps:

1. Perform a normal power-down of your computer system and disconnect the monitor cable.
2. Disconnect all AC power cables from the wall outlet (or turn off the circuit breakers if applicable to your system) to remove power from the system.
3. Remove the cover from your computer (refer to your system documentation).
4. Put on an anti-static wriststrap.
5. If your computer has an existing graphics module, remove the screw that secures it and then remove the module.
6. The slot to be selected depends on the graphic controller you are about to install. If your system had a previously installed graphics option, you can use that expansion slot. Remove the slot cover if you are using a new slot. Refer to your system owner's guide for information about graphics option slots. The AGP card is always installed in the AGP slot.
7. Grasp the top edge of the graphics option, carefully insert it into the slot, and seat it firmly.
8. Secure the module with the screw.
9. Replace the computer cover.
10. Ensure that the monitor cable is connected to the video output connector located on the back of the graphics option.
11. Reconnect the AC power cables to the wall outlet (or turn on the circuit breakers if applicable to your system) to restore power to the system.
12. Perform a normal power-up of your computer system.

# Chapter 3

## hp Tru64 UNIX Configuration

This chapter describes how to configure the ATI RADEON 7500 graphics controller in a system running the hp Tru64 UNIX operating system.

---

*Chapter 3 pertains to the hp Tru64 UNIX operating system only; if you are running the OpenVMS operating system, see Chapter 4.*

*The examples in this manual show version numbers applicable at publication. To determine the most recent version of the operating system or video driver, see the Release Notes on the CD-ROM or the HP website at [www.hp.com](http://www.hp.com).*

---

### 3.1 Resolutions

ATI RADEON 7500 graphics controllers can support various graphics resolutions and refresh rates as shown in Table 3–1.

**Table 3–1 Supported Video Modes – Tru64 UNIX**

<b>Resolution</b>	<b>Color Depths (Bits per Pixel)</b>	<b>Refresh Rates</b>
640x480	8, 16, 24	60, 72, 75, 85 Hz
800x600	8, 16, 24	60, 72, 75, 85 Hz
1024x768	8, 16, 24	60, 70, 75, 85 Hz
1152x864	8, 16, 24	60 Hz
1280x1024	8, 16, 24	60, 75, 85 Hz
1600x1200	8, 16, 24	60, 65, 75, 85 Hz
1920x1440	8, 16, 24	60, 75 Hz
2048x1536	8, 16, 24	60, 65, 70, 75 Hz

---

### 3.2 Restrictions and Limitations

This section of the document contains limitations and restrictions of the ATI RADEON 7500 hardware and software.

### 3.2.1 Minimum Console Revision

The minimum firmware version for ATI RADEON 7500 graphics controller single head support is V1.0 on *hp AlphaServer GS1280*, *ES80* and *ES47* systems. For other Alpha System types, please refer to your System QuickSpecs for information on minimum requirements and restrictions.

### 3.2.2 Multiple Colormaps

Multiple colormaps are not supported. The ATI RADEON 7500 graphics controllers support only one installed colormap at one time. Exceeding this limit will cause colormap flashing, also known as "technicolor."

Applications should not install or de-install colormaps themselves. The window manager should perform these actions. However, the application is responsible for providing the window manager with hints as to which colormaps to install or de-install. You provide this information using the Xlib function `XSetWMColormapWindows()`. This function sets the `WM_COLORMAP_WINDOWS` property for a given window.

### 3.2.3 Default Visual Information

The ATI RADEON 7500 graphics controller can only support one visual type at one time. Supported default visual types are 8-bit PseudoColor, 16-bit TrueColor, and 24-bit TrueColor. The default depth and visual class is 24-bit TrueColor. To change the default visual, you must edit the X server's configuration parameters which are located at `/usr/var/X11/Xserver.conf`.

As an example, to switch to 8-bit PseudoColor, do the following:

```
! RADEON Server args start
    -pn -bs -su -depth 8 -vclass PseudoColor
! RADEON Server args end
```

You then need to restart the X server (you must login remotely or via a serial console):

```
# /sbin/init.d/xlogin stop
# /sbin/init.d/xlogin start
```

### 3.2.4 Backing Store and Save Unders

Backing store and save unders support for the ATI RADEON 7500 is not available in the Tru64 UNIX base system.

The optional ATI RADEON 7500 Graphics Support software provides backing store and save unders support for 2D operations.

To enable backing store and save unders, remove the "-bs -su" options from the argument list in the X server configuration file. Refer to the example in Section 3.2.3.

## 3.3 Configuring Graphics Resolution or Vertical Refresh Rate for Tru64 UNIX

Systems use a file named `"/usr/var/X11/Xserver.conf"` to optionally pass startup configuration parameters to the X server.

### 3.3.1 Current Graphics Resolution

The default graphics resolution and refresh rate are 1024x768 at 70Hz, respectively. The graphics resolution of a running system can be obtained by executing the command `/usr/sbin/sizer -gr`. The refresh rate may be obtained from the Xserver's file `/var/dt/Xerrors`.

### 3.3.2 How to Change the Resolution and Refresh Rate

1. Log in to the system as "root".
2. Edit the file `/usr/var/X11/Xserver.conf` and add the appropriate X server option `"-screen"` and/or `"-vsync"` to the Xserver's configuration parameters. (Refer to the example in Section 3.2.3.)

X server options:

Set screen (W)width and (H)height:  
`-screen[screen] WxH`

Set screen (Hz) Vertical refresh rate:  
`-vsync[screen] Hz`

---

**NOTE:** See Table 3-1 for supported resolutions and refresh rates.

*When changing the resolution and refresh rate, be sure the parameters specified in `Xserver.conf` constitute a valid video mode.*

---

---

The `[screen]` number need not be specified if only one screen exists or if the user wants all screens to use the same values. The `[screen]` value is generally '0' as shown in the example below.

Example:

```
-screen0 1280x1024 -vsync0 75
      ^           ^
      |--[screen] value--|
```

Anything added after the "-I" option will be ignored by the Xserver and passed on to the DDX, Device Dependent X layer of the server. The "-screen" and/or "-vsync" option(s) should precede the "-I" option.

---

3. Restart the Xserver (you must login remotely or via a serial console):  
# /sbin/init.d/xlogin stop  
# /sbin/init.d/xlogin start

### Examples of Typical Resolution and Refresh Rate Settings

Setting the vertical refresh rate to 85Hz (the default screen resolution will be maintained):

```
-vsync0 85
```

Setting the screen resolution to 1280 x 1024 and the vertical refresh rate to 75Hz:

```
-screen0 1280x1024 -vsync0 75
```

Setting the screen resolution to 2048 x 1536 (the default vertical refresh rate will be maintained):

```
-screen0 2048x1536
```

## 3.4 Multihead and 3D Support

Multihead and 3D support are provided through optional software products as shown in Table 3-2:

**Table 3-2 Software Option Numbers**

---

<b>Option</b>	<b>Description</b>
QA-6ZRAA-H8	ATI RADEON 7500 graphics support software for hp Tru64 UNIX
QL-6ZRA9-AA	Open3D PAK for ATI RADEON 7500 OpenGL support

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The driver included with hp Tru64 UNIX V5.1B supports a single ATI RADEON 7500 card, 2D only, and does not support use of the DVI-I port. The optional support software provides the following additional functions (for further details, features, and restrictions, see the release notes provided with the kit):

Section 3.5 explains how to install this software.

### Multihead (2D only)

Up to 4 ATI RADEON 7500 AGP and/or ATI RADEON 7500 PCI cards can be installed in one of the supported configurations. **Prior to plugging in more than one ATI RADEON 7500 card, you must make sure that your installed SRM console revision level is 6.4 or above.** When the driver detects more than one ATI RADEON 7500 in the system, DMA is automatically disabled and no 3D is supported. When dual screen mode is enabled with multiple cards, then only the primary card will have dual screen mode enabled. The SRM console determines which card is the primary card.

### Dual-screen

By default, an ATI RADEON 7500 appears as a single screen device with identical video signals coming out both the DVI-I and VGA ports. If desired, you can configure your system so that two screens are created with the signal of the first screen (:0.0) coming out the VGA port and the signal of the second screen (:0.1) coming out the DVI-I port. Configuring your system for two screens on the single ATI RADEON 7500 board is referred to as “dual-screen” mode.

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*The DVI-I port may be connected only to a VGA monitor through the use of the DVI-I to VGA connector adapter (p/n 209815-001).*

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*A monitor must be attached to the DVI-I connector at the time the system is powered on; otherwise there will be no display output to that port.*

---

3D is supported in dual-screen mode so long as DMA is enabled and the resolution of neither screen is greater than 1280x1024.

## OpenGL 3D

The ATI RADEON 7500 Graphics Support kit supports OpenGL V1.2 and GLX V1.2. Among other features, the kit contains support for the ATI RADEON 7500 TCL hardware, hardware alpha and stencil planes, 3D multitexturing, and 3D cube map textures.

## 3.5 Software Installation

This section describes the installation of the ATI RADEON 7500 Graphics Support kit for the hp Tru64 UNIX operating system. This software is required for multihead, dual-screen, or 3D graphics support.

This software may be safely installed on a cluster, so long as the ATI RADEON 7500 is the only type of 3D device in the cluster.

### 3.5.1 Installation Preparation and Information

#### Required License (3D operation only)

ATI RADEON 7500 Graphics Support software requires an Open3D Product Authorization Key (PAK) for OpenGL server operation. This PAK should be registered using the License Management Facility (LMF) before you install ATI RADEON 7500 Graphics Support. If you do not register the PAK before starting the software, the server will run in 2D mode only (without OpenGL server support).

If your ATI RADEON 7500 graphics controller hardware and software came pre-installed, the PAK will already be registered.

For complete information on using the hp Tru64 UNIX License Management Facility, see the *Software License Management* guide or the `lmf (8)` reference page.

#### Prerequisite Software

You can install ATI RADEON 7500 Graphics Support only on systems that are running hp Tru64 UNIX Version 5.1B or later. hp Tru64 UNIX V5.1B must have Patch Kit 1 or later patch kits installed before installing the ATI RADEON 7500 Graphics Support software.

The OpenGL graphics support libraries require that the OpenGL Runtime component (OSFOPENGL540) of the hp Tru64 UNIX V5.1B operating system be installed.

---

*Before installing ATI RADEON 7500 Graphics Support, you must remove any graphics support layered product kits (such as the PowerStorm 300/350 or PowerStorm 4DxxT kits) from the system. After you have installed ATI RADEON 7500 Graphics Support, if you upgrade or reinstall the operating system, you must first de-install ATI RADEON 7500 Graphics Support. Once the operating system update has completed, you may reinstall ATI RADEON 7500 Graphics Support.*

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Do not install the PowerStorm 300/350, or PowerStorm 4DxxT kit in addition to ATI RADEON 7500 Graphics Support. Installing any of these kits after installing ATI RADEON 7500 Graphics Support may cause unpredictable results.

### Alternate Console

Instead of using the graphics display as the system console, it is possible to attach an external ASCII terminal to serial port 1 and have console interactions take place on that device. This is done at the boot prompt (>>>).

To use an external terminal, the commands are:

```
>>> set console serial
>>> init
```

To return to the graphics display as console, the commands are:

```
>>> set console graphics
>>> init
```

## 3.5.2 Installing ATI RADEON 7500 Graphics Support

You must have super-user (“root”) privileges to perform most operations described below. Login as root before continuing.

### Copying the Kit from CD-ROM

This section describes the procedure for copying the ATI RADEON 7500 Graphics Support kit from a CD-ROM distribution. The kit is distributed as a tar file with the extension `tar`.

If you have downloaded the kit from another source, simply copy it into the `/var/tmp/` directory and skip to the next section. The installation instructions below assume the name of the distribution file is `RAD540.tar`, and that you will be installing on Tru64 UNIX Version 5.1B. Installation of the kit for other versions will be similar.

In the following instructions, `cdrom0` is the CD-ROM disk drive and `/mnt` is a free mount point. Follow these instructions to copy the kit from a CD-ROM drive:

1. Place the CD-ROM media in the appropriate disk drive.
2. Mount the media on a free mount point by entering the following command:  

```
# mount -r /dev/disk/cdrom0c /mnt
```

3. Copy the kit from the CD-ROM to your local hard drive:  
# cp /mnt/Tru64\_UNIX/RAD540.tar /var/tmp/RAD540.tar

## Unpacking the Kit

This section describes the procedure for unpacking the compressed kit into a directory structure on your local filesystem. It is assumed that the compressed kit distribution file exists as /var/tmp/RAD540.tar.

1. Change to the directory where you copied the kit distribution file:  
# cd /var/tmp
2. Use tar to unpack the tar file into a directory structure:  
# tar xvf RAD540.tar

This will create the RAD540 directory and populate it with the kit files.

## Installing the Kit

This section describes the procedure for installing ATI RADEON 7500 Graphics Support. It is assumed that the kit has been obtained and unpacked into the `/var/tmp/RAD540/` directory.

1. Ensure that the system in which you wish to install ATI RADEON 7500 Graphics Support does not already contain a graphics support kit.

To determine if graphics support subsets are installed on the system, enter the command:

```
# setld -i | grep -e O3D -e 3X0 -e 4DT | grep installed
```

If any of these subsets are installed, you must de-install them using the `setld -d` command. For example, to remove the PowerStorm 3x0 V2.3 files, you might enter:

```
# setld -d 3X0CONFIG524 3X0DEVICE524 3X0GLBASE524
```

2. Make sure that you are in the directory where you unpacked the kit:

```
# cd /var/tmp/RAD540/
```

3. Start the installation.

Start the installation by entering the `setld` command with the `-l` (load) function, specifying the current directory as the location of the kit:

```
# setld -l .
```

4. Specify the subsets you wish to install.

The installation procedure displays the list of subsets available for installation and prompts you to choose the desired subsets.

```
*** Enter subset selections ***
```

The following subsets are mandatory and will be installed automatically unless you choose to exit without installing any subsets:

```
* ATI RADEON V1.0 for V5.1B Config
* ATI RADEON V1.0 for V5.1B Device
```

The subsets listed below are optional:

```
There may be more optional subsets than can be presented on a single
screen. If this is the case, you can choose subsets screen by screen
or all at once on the last screen. All of the choices you make will
be collected for your confirmation before any subsets are installed.
```

```
- Other:
* ATI RADEON V1.0 for V5.1B OpenGL
```

Or you may choose one of the following options:

```
2) ALL mandatory and all optional subsets
3) MANDATORY subsets only
```

- 4) CANCEL selections and redisplay menus
- 5) EXIT without installing any subsets

Estimated free diskspace(MB) in root:382.2 usr:3507.8

Enter your choices or press RETURN to redisplay menus.

Choices (for example, 1 2 4-6):2

**5. Confirm your subset selection.**

The installation procedure displays a list of the subsets you selected.

You are installing the following mandatory subsets:

ATI RADEON V1.0 for V5.1B Config  
ATI RADEON V1.0 for V5.1B Device

You are installing the following optional subsets:

- Other:  
ATI RADEON V1.0 for V5.1B OpenGL

Estimated free diskspace(MB) in root:382.2 usr:3502.1

Is this correct? (y/n):

Enter 'y' if the subsets you wish to install are those listed. Enter 'n' to specify other subsets.

**6. Read the informational messages.**

The installation procedure generates messages as it checks that your system has enough space to install the requested subsets, copies these subsets, and then verifies that they were copied correctly.

File system space checked OK.

3 subsets will be installed.

Loading subset 1 of 3 ...

ATI RADEON V1.0 for V5.1B Device  
Copying from . (disk)  
Verifying

Loading subset 2 of 3 ...

ATI RADEON V1.0 for V5.1B OpenGL  
Copying from . (disk)  
Verifying

Loading subset 3 of 3 ...

ATI RADEON V1.0 for V5.1B Config  
Copying from . (disk)  
Verifying

3 of 3 subsets installed successfully.

Saved file ./usr/shlib/X11/libfb.so as ./usr/shlib/X11/libfb.so.pre.RAD540

```

Saved file ./usr/shlib/X11/lib_dec_RADEON.so as
./usr/shlib/X11/lib_dec_RADEON.so.pre.RAD540

Configuring "ATI RADEON V1.0 for V5.1B Device (RADDEVICE540)
Configuring "ATI RADEON V1.0 for V5.1B OpenGL (RADGLBASE540)
Configuring "ATI RADEON V1.0 for V5.1B Config (RADCONFIG540)

**** Creating Context Dependent Symbolic Links ****

New CDSL: ./usr/shlib/radeon_dri.so ->
          /cluster/members/{memb}/./usr/shlib/radeon_dri.so ->
          /usr/opt/RAD540/./usr/shlib/radeon_dri.so
New CDSL: ./usr/shlib/X11/lib_dec_acc_glx.so ->
          /cluster/members/{memb}/./usr/shlib/X11/lib_dec_acc_glx.so ->
          /usr/opt/RAD540/./usr/shlib/X11/lib_dec_acc_glx.so
New CDSL: ./usr/shlib/X11/lib_dec_swGL_GLX.so ->
          /cluster/members/{memb}/./usr/shlib/X11/lib_dec_swGL_GLX.so ->
          /usr/opt/RAD540/./usr/shlib/X11/lib_dec_swGL_GLX.so
New CDSL: ./usr/shlib/X11/lib_dec_drm.so ->
          /cluster/members/{memb}/./usr/shlib/X11/lib_dec_drm.so ->
          /usr/opt/RAD540/./usr/shlib/X11/lib_dec_drm.so
New CDSL: ./usr/shlib/X11/lib_dec_dri.so ->
          /cluster/members/{memb}/./usr/shlib/X11/lib_dec_dri.so ->
          /usr/opt/RAD540/./usr/shlib/X11/lib_dec_dri.so
New CDSL: ./usr/shlib/X11/lib_dec_radeon_gl.so ->
          /cluster/members/{memb}/./usr/shlib/X11/lib_dec_radeon_gl.so ->
          /usr/opt/RAD540/./usr/shlib/X11/lib_dec_radeon_gl.so

          Removing obsolete 3D device clauses from node NODENAME
Xserver.conf...

          Adding ATI RADEON clauses to node NODENAME Xserver.conf...

          Release notes can be found in the /usr/opt/RAD540/ReleaseNotes/
directory.

**** Auto Kernel Configuration ****

*** KERNEL CONFIGURATION AND BUILD PROCEDURE ***

Saving /sys/conf/NODENAME as /sys/conf/NODENAME.bck

*** PERFORMING KERNEL BUILD ***
          Working.... Mon Feb  3 14:51:25 EST 2003
The new kernel is /sys/NODENAME/vmunix
Copying new kernel to /vmunix...
Installation of RADCONFIG540 Complete.

**** SHUTDOWN and POWER-CYCLE to enable new kernel ****

```

7. Dismount the CD-ROM drive from the mount point.

For example, to dismount mount point `/mnt`, enter the command:

```
# umount /mnt
```

8. Remove the CD from the CD-ROM drive.
9. Shutdown and power-cycle the system.

The installation is now completed.

## 3.6 Display Power Management

On a workstation, display power management is enabled by default. On a server, it is disabled by default. To enable display power management on a server, edit the X server configuration file (`/usr/var/X11/Xserver.conf`) and add the "dpm" option to the argument list. Refer to the example in Section 3.2.3.

Display power management dwell times can be set via the `dpm` option of the `xset` command.

## 3.7 Messages

Device driver messages are typically logged to `/var/adm/messages` on Tru64 UNIX systems. Should problems arise, this file should be checked for informational messages; an example is shown here.

```
Radeon0: 100x100 cursor glyph truncated to hardware limits
```

The X server attempted to use a cursor larger than the 64x64 limits of the hardware. Cursor glyph will be displayed incorrectly. Application should be brought into conformance with X11 expectations.

Additional informational and error messages are logged by the Xserver in `/var/dt/Xerrors`.



# Chapter 4

## hp OpenVMS Alpha - Graphics Software Installation and Customization

This chapter provides information for installing and modifying the software required to support 2D (two-dimensional) and 3D graphics with the ATI RADEON 7500 AGP and PCI graphics controllers under the hp OpenVMS Alpha operating system.

The method used to load the software is directly dependent on the version of OpenVMS Alpha that you will be installing or upgrading to. Section 4.2, Installation, explains in detail the steps that must be taken for each of the different OpenVMS Alpha versions.

The behavior of the ATI RADEON 7500 AGP and PCI graphics controllers' support software may be modified after installation on OpenVMS by editing the appropriate files and issuing DCL commands. (See Section 4.5.3.)

### 4.1 Installation Preparation

This section describes how to prepare for installation of the ATI RADEON 7500 AGP and PCI graphics controller support software.

The ATI RADEON 7500 AGP and PCI graphics controller support software is installable on OpenVMS Alpha Version 7.3-1 and higher.

Table 4-1 provides information on OpenVMS support for the ATI RADEON 7500 graphics controllers. The software to support the ATI RADEON 7500 graphics controllers will be fully integrated into future releases of OpenVMS Alpha. The ATI RADEON 7500 graphics controllers are not supported on OpenVMS versions prior to 7.3-1.

**Table 4–1 OpenVMS Version Supporting ATI RADEON 7500 Graphics Controller**

OpenVMS Version	Alpha Platform
7.3-1	Copy the POLYCENTER Software Installation patch kits from net location <a href="http://www.support.HP.com/patches/">http://www.support.HP.com/patches/</a> * OR Copy the patch kits by anonymous ftp at <a href="http://ftp1.support.HP.com">http://ftp1.support.HP.com</a> in VMS version specific subdirectories of <code>/public/vms/axp/</code>
Prior to 7.3-1	Not supported.
* <b>Caution:</b> The required list of patch kits for a particular version of OpenVMS can vary over time. Check the Readme files and/or Release notes associated with each of the kits to be sure that the patch kit is appropriate for your usage.	

## 4.2 Installation

This section covers installation of the ATI RADEON 7500 graphics controllers' support software on various versions of the OpenVMS Alpha operating system.

### 4.2.1 OpenVMS Alpha Version higher than 7.3-1

For OpenVMS Alpha Version higher than 7.3-1, the ATI RADEON 7500 graphics controller support software is loaded automatically following installation and becomes active when the operating system is booted. No other action needs to be taken by the system operator.

### 4.2.2 OpenVMS Alpha Version 7.3-1

The ATI RADEON 7500 graphics controller is not supported on any OpenVMS Alpha Version prior to 7.3-1.

To install the ATI RADEON 7500 graphics controller support software on OpenVMS Alpha Version 7.3-1, you must copy the latest UPDATE and GRAPHICS POLYCENTER Software Installation utility patch kits from the World Wide Web location at <http://www.support.HP.com/patches/> or via anonymous ftp at <ftp1.support.HP.com>. Then, use the POLYCENTER Software Installation utility (DCL PRODUCT INSTALL) to install the latest UPDATE kit and the latest GRAPHICS kit, if required. View the Readme files for each kit to determine if the UPDATE kit has superseded the GRAPHICS kit or if the GRAPHICS kit is newer than the UPDATE kit.

For more information on using POLYCENTER Software Installation utility, see the *POLYCENTER Software Installation Utility User's Guide*.

## 4.3 Video Resolutions Supported

The ATI RADEON 7500 AGP and PCI graphics controllers are capable of supporting the graphics resolutions, color depths, and refresh rates shown in Table 4–2.

**Table 4–2 Supported Video Modes - OpenVMS**

<b>Resolution</b>	<b>Color Depths (Bits per Pixel)</b>	<b>Refresh Rates (Hertz)</b>
640 x 480	8, 16, 24	60, 72, 75, 85
800 x 600	8, 16, 24	60, 72, 75, 85
1024 x 768	8, 16, 24	60, 70, 75, 85
1152 x 864	8, 16, 24	60
1280 x 1024	8, 16, 24	60, 75, 85
1600 x 1200	8, 16, 24	60, 65, 75, 85
1920 x 1440	8, 16, 24	60, 75
2048 x 1536	8, 16, 24	60, 65, 70, 75

The mode chosen should match your monitor capabilities. In general, refresh rates below 70 Hz are discouraged, as they tend to show flicker based on the lighting source and surrounding equipment.

The available resolution is monitor dependent. The default video mode is 1024X768 @70HZ and 24 bits per pixel color depth.

## 4.4 Restrictions and Limitations

This section of the document contains limitations and restrictions of the ATI RADEON 7500 hardware and software.

### 4.4.1 Minimum Console Revision

The minimum console firmware version for support of the ATI RADEON 7500 graphics controller under OpenVMS Alpha is system dependent. Please consult your platform option information for minimum requirements.

### 4.4.2 Multiple Colormaps

Multiple colormaps are not supported. The ATI RADEON 7500 AGP and PCI graphics controllers support only one installed colormap at one time. Exceeding this limit will cause colormap flashing, also known as "technicolor."

Applications should not install or de-install colormaps themselves. The window manager should perform these actions. However, the application is responsible for providing the

window manager with hints as to which colormaps to install or deinstall. You provide this information using the Xlib function `XSetWMColormapWindows()`. This function sets the `WM_COLORMAP_WINDOWS` property for a given window.

### 4.4.3 Single Bit Depth For All Windows

With the RADEON 7500, all windows created on a particular head must have the same bit depth. The RADEON 7500 supports bit depths of 8, 16, and 24 bits per pixel on any graphics head, but once the DECwindows server establishes a bit depth on a particular head, only windows or visuals with that bit depth can be created.

### 4.4.4 Default Visual Information

The ATI RADEON 7500 board can only support one visual type at one time. Supported visual types are 8-bit PseudoColor, 16-bit TrueColor, and 24-bit TrueColor. By default, the default depth and visual class is 24 bit TrueColor.

To change the default visual, you must assign a value (or a comma separated list of values for multiple graphics cards) to the symbolic name `DECW$SERVER_DEFAULT_VISUAL_CLASS` in the DCL procedure `SYSS$MANAGER:DECW$PRIVATE_SERVER_SETUP.COM` (the acceptable values and their meanings are listed in the procedure). To change the pixel depth, edit `DECW$PRIVATE_SERVER_SETUP.COM` and define the executive-mode logical name `DECW$SERVER_PIXEL_DEPTH` in the system logical name table (this may also be a comma-separated list for multiple graphics cards).

As an example, to switch to 24-bit TrueColor, add the following lines to `SYSS$MANAGER:DECW$PRIVATE_SERVER_SETUP.COM`:

```
$ DECW$SERVER_DEFAULT_VISUAL_CLASS ::= 24  
  
$ DEFINE/EXEC/SYSTEM/NOLOG DECW$SERVER_PIXEL_DEPTH 24
```

You then need to restart the X server. Refer to Section 4.5.3 for more information on changing default settings and restarting the X server.

### 4.4.5 No Support for Backing Store and Save Unders

Backing store and save unders are not supported in the Radeon 7500 X server on OpenVMS version 7.3-1. This feature will be supported in the next Graphics update kit. Refer to the Release Notes associated with the version you are installing for updated information.

### 4.4.6 Cloned -Video

If you have monitors connected to both the DVI port and VGA port when you power up the system, identical video output is displayed on both the monitors. This also applies to the first card on a muti-card configuration. The DVI ports on subsequent cards are disabled.

## 4.4.7 Monitor Support

The RADEON 7500 card has two built-in video connectors: an analog VGA connector and a DVI-I connector. You can plug analog monitors or flat panel monitors with VGA interface into the RADEON 7500 card's video connectors.

Only analog interface on DVI connector is supported. The DVI-I to VGA connector adapter supplied with the RADEON 7500 card must be installed on the card to connect a monitor to that port. The monitor(s) you plan to use must already be plugged into the RADEON 7500 card when you power cycle your machine or when you initialize from the system Console.

## 4.5 Graphics Configuration

### 4.5.1 Default Graphics Settings

The default graphics resolution is 1024 x 768. The default refresh rate is 70 Hz. The default color depth is 24 bits per pixel and the default visual type is TrueColor.

### 4.5.2 Determining Current Settings

To find the current settings under OpenVMS, issue the following commands, in order, at the DCL prompt:

```
$ @decw$utils:decw$define_utils
$ xdpiinfo
```

In addition, you can show the following logical names at the DCL prompt:

```
$ SHOW LOGICAL/SYSTEM DECW$SERVER_PIXEL_DEPTH
$ SHOW LOGICAL/SYSTEM DECW$SERVER_REFRESH_RATE
$ SHOW LOGICAL/TABLE=DECW$SERVER* DECW$XSIZE_IN_PIXELS
$ SHOW LOGICAL/TABLE=DECW$SERVER* DECW$YSIZE_IN_PIXELS
$ SHOW LOGICAL/TABLE=DECW$SERVER* DECW$SERVER_DEFAULT_VISUAL_CLASS
```

If any logical name is not defined, then the respective default is in effect (see Section 4.5.1).

Alternatively, you can also view the following error log file to determine current settings:

```
$ TYPE SYS$MANAGER:DECW$SERVER_0_ERROR.LOG
```

### 4.5.3 Overriding Default Settings

To override any of the default settings, follow these steps:

1. Copy or rename the `SYS$MANAGER:DECW$PRIVATE_SERVER_SETUP.TEMPLATE` file to create a new command (.com) file called `DECW$PRIVATE_SERVER_SETUP.COM`.
2. Now make the edits for the settings you want to change using a text editor, and save the file.
3. For the changes to take effect immediately you must restart the X server so that the new command file and changed settings will be used. The command to do this is as follows:

```
$ @SYS$MANAGER:DECW$STARTUP RESTART
```

The new file settings will now override the original default settings.

The `DECW$PRIVATE_SERVER_SETUP` procedure contains documentation for many of the default X server settings that may be changed. For more information on making changes to the default settings, symbols, and system-wide logicals, refer to the manual titled *Managing DECwindows Motif for OpenVMS Systems*. This document describes the symbols and settings that can be changed in the `DECW$PRIVATE_SERVER_SETUP.COM` file. For a copy of the document, contact your local sales support representative or visit the HP Web site located at <http://www.hp.com>.

Additional system logicals are described in

```
SYS$MANAGER:DECW$DEVICE_CONFIG_GH.COM.
```

However, this file should **not** be modified. If you wish to make changes to the default logicals defined within it, redefine them in the `DECW$PRIVATE_SERVER_SETUP.COM` file. These changes will supersede the logicals assigned in the device configuration file.

Some of the items that you can change via system logicals are described in the device configuration file but are not normally defined in `DECW$PRIVATE_SERVER_SETUP.COM` file. Those logical default settings include the following items:

```
DECW$XSIZE_IN_PIXELS  
DECW$YSIZE_IN_PIXELS  
DECW$SERVER_REFRESH_RATE  
DECW$SERVER_PIXEL_DEPTH
```

## 4.6 3D Support

To get the most out of your RADEON 7500 graphic controller, you must have an Open3D license to use the 3D hardware-acceleration (direct rendering) features supported by this product.

The ATI RADEON 7500 Graphics Support kit supports the 3D graphics library OpenGL V1.2 and GLX V1.2. Among other features, the kit contains support for the ATI RADEON 7500 TCL hardware, hardware alpha and stencil planes, 3D multitexturing, and 3D cube map textures.

If you have an Open3D license, OpenGL software for RADEON 7500 will, by default, force a direct-rendered OpenGL rendering context whenever the OpenGL client requests connection to the DECwindows server using the LOCAL transport.

You can override this default behavior and force the default to always be indirect rendering by defining the following logical name before running the 3D application:

```
$ DEFINE LIBGL_ALWAYS_INDIRECT 1
```

### 4.6.1 RADEON 7500 TCL Support

The OpenGL driver for the RADEON 7500 contains support for the on-board transformation, clipping, and lighting (TCL) hardware of the RADEON 7500 for increased primitive rendering performance. You can take advantage of these capabilities if you have an Open3D license.

### 4.6.2 Threads Restriction

The RADEON 7500 OpenGL library for OpenVMS is not thread safe. However, OpenGL can be used in a multithreaded program if the use of OpenGL is restricted to a single thread within the program.

### 4.6.3 No Backing Store/Save Unders for 3D Windows

Backing store and save under features are not supported when 3D is enabled.

## 4.7 Multiple Graphics Cards Support

V0300 and later releases of the Radeon software supports up to 4 Radeon cards per system. You could have one AGP and 3 PCI cards – or you could have 1 to 4 PCI cards. All operations, including hardware accelerated 3D graphics, are supported on every card in the system. Consult your Alpha system options documentation for detailed information on number of cards supported and configuration limitations.

### 4.7.1 Matching Primary Screen with VGA console

Screen 0 is always the VGA-enabled head and must be installed in the lowest numbered slot of all installed graphics cards.

If you wish to change a screen with any of the console displays, you alter the logical order for mapping of physical screens to logical screens by making a copy of the file

DECW\$PRIVATE\_SERVER\_SETUP.TEMPLATE and saving it to a new file named DECW\$PRIVATE\_SERVER\_SETUP.COM. You can then make changes to the default settings by editing the newly created file.

## 4.8 Messages

Server messages are typically logged to the DECW\$SERVER\_0\_ERROR.LOG file located in the SYS\$MANAGER directory. Be sure to check this file first for messages related to problems encountered during installation or usage.

## 4.9 POLYCENTER Software Installation

At the end of the OpenVMS POLYCENTER software installation procedure, a message is displayed that recommends a reboot of the system. At the conclusion of the installation, the POLYCENTER software installation utility does not prompt for or enforce a reboot of the system for the new software image to become effective immediately. The ATI RADEON 7500 AGP and PCI graphics controllers' two-dimensional (2D) support software becomes active only after the operating system has been rebooted.

If the software is being installed in a clustered environment and it is not convenient to perform a reboot immediately following installation, then a rolling reboot may be used for the new image to take effect across all systems.