



## **ATI Radeon 7500 AGP Graphics Controller Installation Guide**

Order Number: EK-R7500-IG, A01

This manual is for managers and operators of *hp AlphaServer*  
ATI Radeon 7500 AGP graphics controllers.

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# Preface

## Intended Audience

This manual is for managers and operators of *HP AlphaServer* ATI Radeon 7500 AGP graphics controller.

## Document Structure

This manual has four chapters.

- **Chapter 1, Overview**, provides a brief overview of the ATI Radeon 7500 AGP graphics controllers.
- **Chapter 2, Installation**, describes the installation of the ATI Radeon 7500 AGP graphics controller module in a supported HP product.
- **Chapter 3, HP Tru64 UNIX Configuration**, describes how to configure the ATI Radeon 7500 AGP 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) graphics with the ATI Radeon 7500 AGP 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 graphics controllers.





# Chapter 1

## Overview

### 1.1 Introduction

This chapter provides a brief overview of the ATI Radeon 7500 AGP graphics controllers.

### 1.2 Module Description

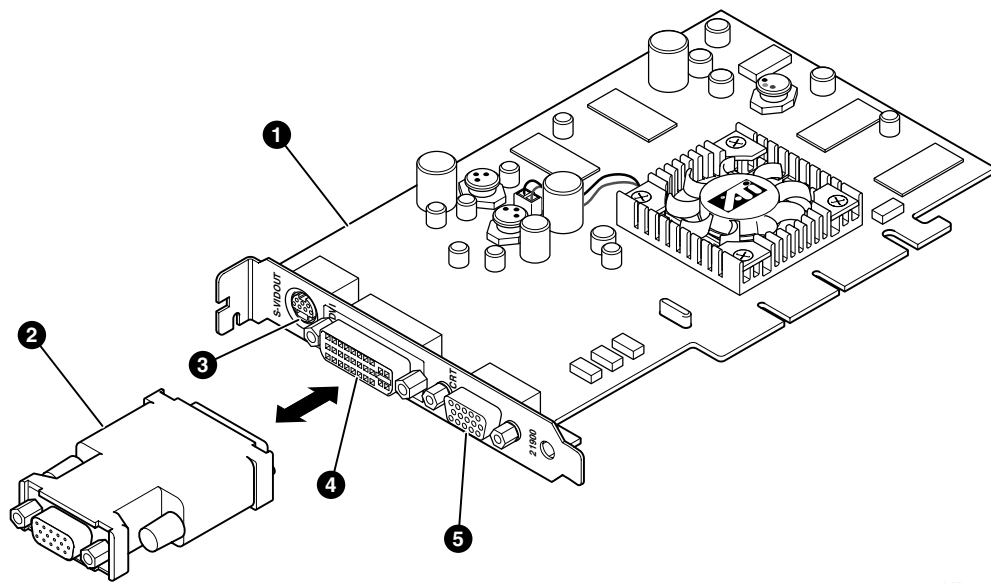
The ATI Radeon 7500 AGP graphics controller accelerator module is a single expansion-slot, 32-bit AGP bus graphics option that provides 2D graphics acceleration for supported HP systems. It is based on ATI's RADEON RV200 graphics chip.

**Table 1-1 Option Numbers**

<b>Option</b>	<b>Description</b>
3X-PBXGG-AB	ATI Radeon 7500 AGP graphics controller with 64 MB of DDR SDRAM memory

For up to date minimum operating system and firmware revision information supported for the ATI Radeon 7500 AGP graphics controller, 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.

### DVI-I to VGA Connector Adaptor:

Each Radeon 7500 AGP card is supplied with a connector adaptor for use on the DVI port so that a standard CRT or LCD monitor with GA interface can be connected to the second port on the Radeon 7500 AGP. ***Tru64 UNIX and OpenVMS require that the DVI-I to VGA connector adaptor supplied with the card always be used.*** Support for the second port and its use with Tru64 UNIX and OpenVMS will be available through optional 3D software and license.

## 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

## 1.4 Specifications

**Table 1-3** list the specifications for the ATI Radeon 7500 AGP graphics controller.

**Table 1-3 ATI Radeon 7500 AGP Graphics Controller Specifications**

Maximum resolution	2048 x 1536 24 bit @ 75 Hz
Color planes	24
Unified memory (frame buffer, Z-buffer, texture memory)	64 MB
Form factor	Short-card AGP ATX
AGP	AGP 2.0, 32-bit, 133 or 266 MHz
Input voltage	1.5, 3.3, 5.0 and 12 Vdc
Power	25 W maximum
Operating temperature	10°C to 40°C (50°F to 104°F)
Relative humidity	5% to 90% noncondensing

# Chapter 2

## Installation

### 2.1 Introduction

This chapter describes the installation of the ATI Radeon 7500 AGP 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>
• One ATI Radeon Graphics Controller, 64MB AGP	3X-PBXGG-AB
• ATI Radeon 7500 AGP Graphics Controllers Installation Guide (this manual)	GK-R7500-IG
• DVI-I to VGA connector adapter	209815-001

## 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 graphics controllers.*

---

The following section describes how to install the ATI Radeon 7500 AGP 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.
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 AGP graphics controller in a system running the hp Tru64 UNIX operating system.

### 3.1 Resolutions

ATI Radeon 7500 AGP graphics controller can support various graphics resolutions and refresh rates as shown in Table 3-1.

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

Resolution	Color Depths (Bits per Pixel)	Refresh Rates
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 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 AGP graphics controller supports 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 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 edit the X server's configuration parameters[MARG1] 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 -nice -2 -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.)

```
For hp Tru64 UNIX V5.* systems use:
# /sbin/init.d/xlogin stop
# /sbin/init.d/xlogin start
```

### 3.2.4 Backing Store and Save Unders

By default, backing store and save unders are enabled. If the default visual depth is changed to 8 or 16, it is recommended that backing store and save unders be disabled.

To disable these features, add the options "`-bs -su`" to the argument list in the X server's configuration file. Refer to the example in Section 3.2.3.



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

There are two X server related files that can be used to configure or change characteristics of the X server. Systems by default use a file named `/usr/var/X11/Xserver.conf` to start and 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 ratio, ALL parameters in `Xserver.conf` should be specified.

---

---

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
      ^
      |--[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.)

For hp Tru64 UNIX V5.\* systems use:

```
# /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 Support

Multihead support will be provided through an optional software product at a later date.

### 3.4.1 Display Power Management

Power management on a workstation will automatically be configured during operating system installation. For an *AlphaServer*, modify two files as follows and rebuild the custom kernel.

1. Alter `/etc/sysconfigtab` as follows:  
Create a temporary file containing the following lines:

```
Pwrmgr:
    default_pwrmgr_state=1
    cpu_slowdown=1
    disk_spindown=1
    disk_dwell_time=20
    graphics_powerdown=1
    graphics_standby_dwell=20
    graphics_suspend_dwell=20
    graphics_off_dwell=160
    pwrmgr_debug=0
```

Assuming that the name you used for the temporary file is "myconfig", as the root user, you should then issue the following command:

```
sysconfigdb -a -f myconfig pwrmgr
```

You will need to reboot to have the change take effect.

To remove power management, as the root user, type the command below and then reboot.

```
sysconfigdb -r -f myconfig pwrmgr
```

2. Add the following line to `"/sysconf/HOSTNAME"`.  

```
options    PWRMGR_ENABLED
```
3. Rebuild the custom kernel with `"doconfig -c HOSTNAME"`.

## 3.5 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.

```
radeon: %dx%d 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) graphics with the ATI Radeon 7500 AGP 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 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 graphics controller support software.

The ATI Radeon 7500 AGP 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 controller. The software to support the ATI Radeon 7500 graphics controller will be fully integrated into future releases of OpenVMS Alpha. The ATI Radeon 7500 Graphics Controller is 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://ftpl.support.HP.com">http://ftpl.support.HP.com</a> in VMS version specific subdirectories of /public/vms/axp/
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 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 graphics controller is capable of supporting the graphics resolutions, color depths, and refresh rates shown in Table 4-2.

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

Resolution	Color Depths (Bits per Pixel)	Refresh Rates (Hertz)
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	60, 75
2048 x 1536	8, 16	60, 65, 70, 75

The modes available are dependent on 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 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 deinstall 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 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 multihead) to the symbolic name `DECW$SERVER_DEFAULT_VISUAL_CLASS` in the DCL procedure `SY$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 multihead).

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

## 4.4.4 Backing Store and Save Unders

By default, backing store and save unders are enabled in 2D. If the default visual depth is changed to 16 or 8, it is recommended that backing store and save unders be disabled.



To disable these features, edit the file `DECW$PRIVATE_SERVER_SETUP.COM` and add the following lines:

```
$ DECW$SERVER_DISABLE_BACKING_STORE := TRUE
$ DECW$SERVER_DISABLE_SAVE_UNDER := TRUE
```

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.

## 4.5 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
$ xdpinfo
```

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\_GF.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 Multihead Support

Multihead support will be provided through an optional software product at a later date.

## 4.7 Messages

Server messages are typically logged to the `DECW$SERVER_0_ERROR.LOG` file located in the `SYSS$MANAGER` directory. Be sure to check this file first for messages related to problems encountered during installation or usage.

## 4.8 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 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.

