

Read Me Before Installing HP PEX Development Environment

HP9000 Series 700 Color Workstations



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June 1996 . . . Edition 1. This manual is valid for HP PEX 5.1v4 on all HP9000 Series 700 Computers running HP-UX 10.20.

HP PEX

Introduction

The Version 4 release of HP PEX 5.1 brings high-performance 3D graphics through the X server to the HP9000, Series 700 family of 3D Color Workstations. The HP PEX server and HP PEXlib client software extend the capabilities of the X Window System and provide integrated 3D distributed graphics in an open systems environment.

The Hewlett-Packard implementation is equipped with a number of features for enhanced performance and interoperability. These features and their operation are explained in the book *HP PEX Implementation and Programming Supplement*.

Among other features, the HP PEX product includes an integrated, on-line hypertext tutorial. And because the PEX standard is an industry standard, Hewlett-Packard is able to offer learning products documentation from O'Reilly & Associates, Inc.—publishers widely acclaimed for making information easy to learn and use.

Read Me First

This document contains important information about the HP PEX product that is essential for those who program using HP PEXlib. This document provides information on some known behaviors that could affect the outcome of your workstation setup and subsequent operation of HP PEXlib programs.

This version of HP PEX is supported on the HP 9000, Series 700 3D Color Workstations running HP-UX 10.20 or later, and HP CDE 1.0 or HP VUE 3.0. However, you can choose not to use HP CDE or HP VUE and use only the X Windows environment instead.

The PowerShade product provides full, 3D surfaces and lighting functionality. HP workstations without PowerShade provide 3D wireframe with flat shading.

In addition, the HP PEX Developer's Environment requires the header files and development tools for the X Window System Version 11, Release 5, available in the HP-UX Developer's Toolkit or the ANSI/C HP-UX Developer's Toolkit.

HP PEX Product Filesets

The HP PEX developer's product consists of the following filesets:

PEXlib Fileset	Contents
PEX5-PRG	Contains headers for the PEXlib programming environment
PEX5-EXAMPLES	Contains source code and makefiles for the example programs from both Hewlett-Packard and O'Reilly & Associates.
PEX5-HELP	Contains the hypertext, interactive on-line information system comprising a PEX tutorial and PEX 5.1v4 reference.

The filesets PEX5-RUN and PEX5-DEMOS are included in the PEX Runtime environment.

If, for any reason, you must reinstall either the X Window System or the HP-UX operating system, you must also reinstall HP PEX. See the section "Information for System Administrators" in Chapter 2 of the *HP PEX Implementation and Programming Supplement*.

Installation Verification

If you are setting up a new workstation, or have already installed the HP-UX 10.20 operating system, all HP PEX software may already be preloaded for you. If the HP PEX developer's software is not loaded on your system, you will have to install it before you can use it. Since the HP PEX Developer's Kit is part of the HP-UX Developer's Toolkit, follow the installation instructions for the HP-UX Developer's Toolkit, and include the PEX-related filesets for installation.

To determine whether or not the PEX 3D run-time libraries are installed, run `/opt/graphics/PEX5/demos/verify_install`. If HP PEX resides on your system, `verify_install` will create a window and draw a rotating "PEX cube" in it—a cube with three letter-shaped holes drilled in it, one per face, one in each dimension. Depending upon your hardware and color map settings, you may experience "technicolor"—the distracting effect of displayed objects changing colors as color maps with different contents are installed. (Color map installation is typically under control of a window manager, and is often triggered by moving the window focus from one window to another.) If there are problems running this test program, the error messages will point you to a solution.

To determine whether you have the HP PEX Developer's software installed, check for the existence of the following include file:

```
/opt/graphics/PEX5/include/X11R5/X11/PEX5/PEX.h
```

Checking the Device Files

Devices specified in X server screen configuration files must correspond to existing device files with appropriate permission. If you don't already have the appropriate device file, you must create it using the `mknod` command. For information on `mknod` see the *Graphics Administration Guide*, the *HP-UX Reference Manual* and/or *Using the X Window System*.

Read the ReleaseNotes File for Time-Critical Information

Before you begin using the HP PEX product, it is important to check on-line files. You will find time-critical information in the HP PEX product's "Release Notes" file, `/opt/graphics/PEX5/RelNotes`, which contains important information about the HP PEX product files. This includes information about

utility programs used for setting up workstations properly and which provide interoperability of programs.

Also, look in the **README** files that may be found in the various subdirectories of the HP PEX product's main directory $\langle pex \rangle$ ¹.

Using Example Programs, Demonstrations, and Utilities

The directory $\langle pex \rangle$ ¹ contains various example programs and demonstrations listed below. It also contains important utilities for running these programs with PEXlib extensions supported by Hewlett-Packard. See the **README** file in this directory for more information.

- The program examples from the *PEXlib Programming Manual* by O'Reilly & Associates are installed in the directory $\langle ora-examples \rangle$ ¹.

A **README** file in this directory contains instructions for using these programs. It specifically describes the use of `book_utils.h`, which contains the macros and declarations used by these O'Reilly programs. An important fact to note about the O'Reilly utility procedure source, `book_utils.c`, is that the source shipped with HP PEX has been modified by Hewlett-Packard to provide for improved interoperability.

We recommend that you look at the HP-modified `book_utils.c` file and at the other utility files for ways to improve the interoperability of your programs and of programs you port from other vendors' platforms.

- HP PEXlib demonstrations are located in the `/opt/graphics/PEX5/demos` directory. A **README** file in this directory explains how to use the example programs.
- Example programs developed by Hewlett-Packard are installed in the $\langle hp-examples \rangle$ ¹ directory. A **README** file in this directory explains how to use the example programs.
- Example programs that demonstrate portability and functionality of the CGE extensions are in $\langle cge-examples \rangle$ ¹.

¹ The actual path names of directories in angle brackets depend on the file system structure. See the *Graphics Administration Guide* for details.

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- Programming utilities for visual selection and color map creation provided by the CGE PEX vendors are in `<ege-utils>`².
- Other important programming utilities are provided in the directory `<pex-utils>`².

By listing the files in these directories, you will see utilities designed for improving the interoperability of programs between workstations of different manufacturers, resolving color map issues, selecting visuals and creating windows for HP workstations. These utilities are documented in a **README** in the same directory.

PEXlib Reference Pages

The reference pages for PEX 5.1v4 are presented via CDE and VUE Help, the hypertext-capable on-line help systems. (This on-line help works even if you're only using regular X windows; you don't need to be running HP CDE or HP VUE.) You can start the on-line help system by executing `<vhelp>`² `bin/pexman`.

The Hewlett-Packard PEX product supplements the standard PEXlib reference pages with reference pages on the HP utilities mentioned above. These are also accessed via `pexman`.

Accompanying Product Documentation

Information about HP PEX/PEXlib is found in these books that are available with the developer's product:

- *HP PEX Implementation and Programming Supplement*—Information and instructions for those who will install and use HP PEX/PEXlib. Enables you to deal with implementation-dependent characteristics of HP workstations as well as accessing and operating the on-line information and tutorial system.
- *PEXlib Programming Manual*—Written by Tom Gaskins, published by O'Reilly & Associates, it provides beginners in PEXlib with the basics for getting started.
- *PEXlib Programming Reference*—Also published by O'Reilly & Associates, is a reference to the PEXlib procedures based on the MIT document.

² The actual path names of directories in angle brackets depend on the file system structure. See the *Graphics Administration Guide* for details.

- *HP PEX On-Line Information*—HP integrates this on-line, hypertext tutorial based on the “Getting Started” chapter from the *PEXlib Programming Manual*.
- *Portable Programming with CGE PEX 5.1*—A CGE-standard document that provides information on how to write applications that will be portable and interoperable across different vendors’ platforms.

Documentation Published by O’Reilly and Associates

O’Reilly and Associates are no longer printing the following manuals:

- *PEXlib Programming Manual*
- *PEXlib Programming Reference*

Although they are no longer orderable from O’Reilly and Associates, you may still find these manuals in bookstores that carry technical documentation.