PATHWORKS for DOS

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PC DECwindows Motif Guide

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Preface

Purpose

This manual introduces PC DECwindows Motif concepts and describes how to do the following:

- Get ready to use PC DECwindows Motif software
- Start the X server and X applications
- Perform advanced user functions, such as troubleshoot problems and compile new font files

Note

If your personal computer has been set up to run PC DECwindows Motif and you need instructions on how to manipulate X applications, windows, and menus in a PC DECwindows Motif environment, see your *User's Handbook*.

Audience

This manual is written for advanced users and for system administrators.

Advanced users should be:

- Proficient in using DOS
- Familiar with X terminology and concepts
- Comfortable with networking
- Familiar with personal computer hardware

System administrators should use this manual to make the DECnet Application Startup program available to users and to troubleshoot problems. They can also use this book to help novice users set up their personal computers and get started in using PC DECwindows Motif.

Organization

The following table can help you find information in this manual.

Chapter 1	Introduces PC DECwindows Motif and describes prerequisite software, hardware, and memory requirements of PC DECwindows Motif. It also provides a list of tasks that must be completed before you can use PC DECwindows Motif. System administrators and advanced users should read this chapter.
Chapter 2	Provides information you need to consider before you configure your personal computer to run PC DECwindows Motif. The person configuring the personal computer should read this chapter. Usually, advanced users configure their own personal computers.
Chapter 3	Describes how to configure your personal computer to run PC DECwindows Motif. The person configuring the personal computer should complete the tasks described in this chapter.
Chapter 4	Describes how to make the DECnet Application Startup program available to users. The system administrator should complete the tasks described in this chapter.
Chapter 5	Describes how to start the X server. Read this chapter when you are ready to start the X server or when you want to learn how to override parameters while starting the X server.
Chapter 6	Provides detailed instructions for each available method of starting X applications. Read this chapter when you are ready to start X applications.

Chapter 7	Provides techniques and hints for using the X server. The tasks described in this chapter are not required. After you become proficient at using the X server, you may find it helpful to use the techniques and hints described in this chapter.
Chapter 8	Contains information to help you analyze problems that occur when you use the X server. Advanced users should refer to this chapter when problems arise.
Chapter 9	Describes how to redefine the use of individual keys as required by an X application. If you are an advanced user, perform the tasks described in this chapter only if you use an X application that requires an interpretation of a key that is undefined for your keyboard.
Chapter 10	Describes how to compile new font files. If you are an advanced user, perform the tasks described in this chapter only if you use an X application that requires fonts other than those provided with PC DECwindows Motif.
Appendix A	Provides information about messages generated by the X server, the Keysym Compiler utility, and the Font Compiler utility. Users should refer to this appendix as needed.
Appendix B	Contains illustrations of keyboard mappings included with PC DECwindows Motif software. Refer to this appendix to help you understand which keyboard mappings are available to you.
Appendix C	Contains illustrations of the keycode for each key on your keyboard. If you are an advanced user, use this appendix with Chapter 9. Use this appendix to identify keys by their keycode names so you can redefine keys as required by an X application.
Appendix D	Contains tables of valid keysym names. If you are an advanced user, use this appendix with Chapter 9 to obtain the valid keysym name for the key definition you want to assign.
Appendix E	Describes X font naming conventions. This appendix provides information about conventions for naming X fonts.

Related Documents

The following table provides pointers to other manuals that contain more information on topics mentioned in this manual.

For information on...	See...
Installing PC DECwindows Motif software (which is installed automatically with the PATHWORKS client software)	Your *Client Installation and Configuration Guide*
Running the Netsetup utility	Your *Client Installation and Configuration Guide*
Configuring memory on your personal computer	*Memory Solutions for Client Administrators*
Manipulating X applications, windows, and menus	*User's Handbook*
How to use a particular X application	The documentation accompanying the application

Conventions

This manual uses the following conventions:

Convention	Meaning
Ctrl/*x*	While you hold down the Ctrl key, press another key or a pointing device button.
Ctrl/Alt/Del	While you hold down the Ctrl and Alt keys, press the Del key.
Return	Press the key that executes commands or terminates a sequence. This key is labeled Return, Enter, or ↵, depending on your keyboard.
"enter"	Type all required text, spaces, and punctuation marks; then press Return, Enter, or ↵, depending on your keyboard.
MB1, MB2, MB3	MB1 indicates the left mouse button, MB2 indicates the middle mouse button, and MB3 indicates the right mouse button. (The buttons can be redefined by the user.)

Convention	Meaning
UPPERCASE	In VMS and DOS syntax, uppercase letters indicate commands and qualifiers. You can enter commands and qualifiers in any combination of uppercase or lowercase, unless otherwise noted. ULTRIX commands are case-sensitive. You must enter commands in the correct case, as printed in the text.
lowercase	Lowercase letters in VMS and DOS syntax indicate parameters. You must substitute a word or value, unless the parameter is optional.
teal blue type	In examples of dialog between you and the system, teal blue type indicates information that you enter.
boldface	Boldface type indicates a new term that appears in the glossary.
two-line commands	In VMS commands, a hyphen (-) at the end of a command line indicates that the command continues to the next line. If you type the hyphen and press Return, the system displays the _$ prompt at the beginning of the next line. Continue entering the command. If you do not type the hyphen, VMS automatically wraps text to the next line. In ULTRIX and UNIX commands, a backslash (\ ) performs the same function. In DOS commands, no character is used at the end of the first line; DOS automatically wraps text. Enter the complete command, then press Return at the end of the command.
[ ]	Square brackets in command descriptions enclose the optional command qualifiers. Do not type the brackets when entering information enclosed in the brackets.
/	A forward slash in command descriptions indicates that a command qualifier follows.
. . .	A vertical ellipsis in an example indicates that not all the data is shown.

Convention	Meaning
NOTE	Notes provide information of special importance.
CAUTION	Cautions provide information to prevent damage to equipment or software.
Margin notes	Notes in the left margin summarize information in the text and provide related information.

1

Introduction to PC DECwindows Motif

This chapter describes:

- DECwindows Motif software, on which PC DECwindows Motif is based
- PC DECwindows Motif software
- Requirements of PC DECwindows Motif
- What you need to do before you can run the X server

What Is DECwindows Motif?

DECwindows Motif software is based on the X Window System, Version 11. DECwindows Motif provides a common user interface that allows you to use a variety of X applications located on VMS, ULTRIX, UNIX, and DOS nodes as though they were running locally.

The X Window System is based on the following client/server relationship:

X server

- **X servers** provide a user interface and input/output services for X applications. The X server takes display requests from many X applications and performs the display operation and manages the display screen in an orderly fashion. The X server also manages input from personal computer devices, such as the mouse and keyboard. It returns input events to the appropriate X application. Built-in security features ensure that access to the personal computer is restricted.

X client

- The X server and X applications communicate via the X protocol. Also called **X clients**, X applications send messages to X servers with display requests. X applications receive input events from the X server through the use of devices such as the keyboard and pointer. This process is entirely transparent to the user.

What Is PC DECwindows Motif?

PC DECwindows Motif is Digital's X Window System implementation for 80286, 80386, and 80486 DOS-based personal computers. With PC DECwindows Motif, you can access and display multiple remote X applications that run on VMS, ULTRIX, or UNIX nodes. In essence, PC DECwindows Motif turns a personal computer into an X terminal capable of accessing remote applications that support X.

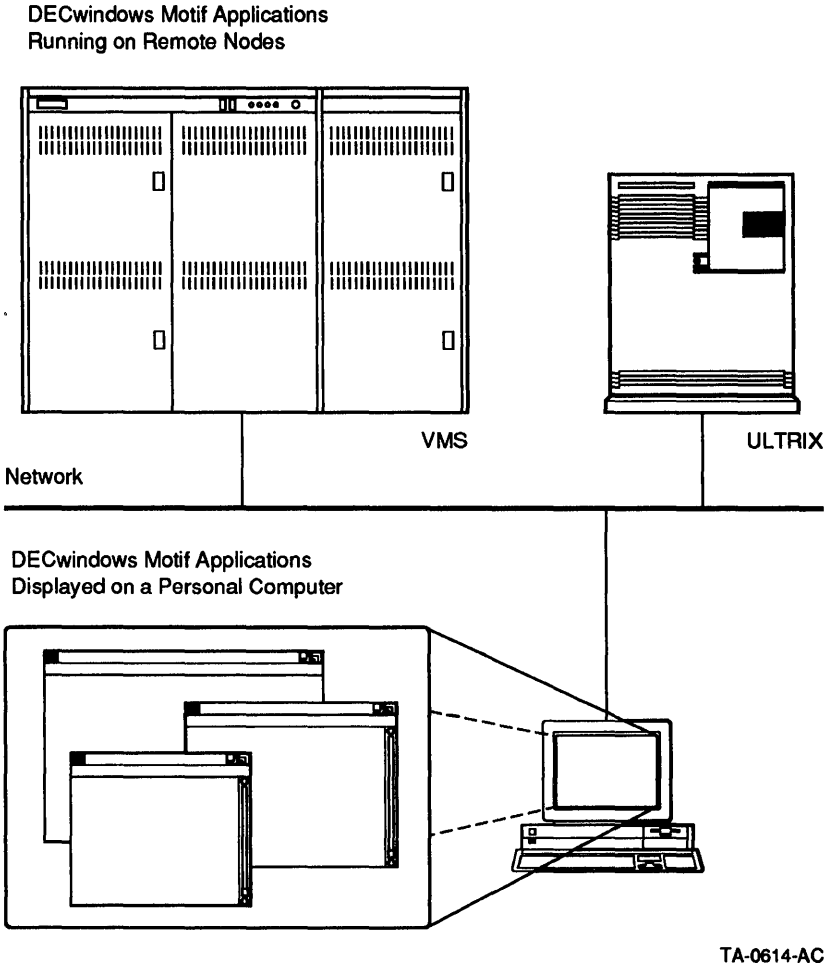
DWDOS286 and DWDOS386

DWDOS286 and **DWDOS386** are Digital's X servers for 80286, 80386, and 80486 DOS-based personal computers. DWDOS286 and DWDOS386 are DOS applications that connect DOS-based personal computers to X applications over DECnet or TCP/IP networks.

Using one of the X servers on your personal computer, you can access and manipulate X applications located anywhere on your network. You use the X applications in a windowing environment as if they were running locally on your personal computer. You execute commands to the X applications using pull-down menus, eliminating the need to enter VMS, ULTRIX, or UNIX commands.

Figure 1–1 represents VMS and ULTRIX nodes running X applications with the output of the X applications displayed in windows at a personal computer.

Figure 1–1 X Applications Displayed by a DOS X Server



Features of each X server included with PC DECwindows Motif include:

- The PC Session Manager, which lets you manage your personal computer and start X applications
- A complete library of fonts
- The ability to suspend the X server session, execute DOS applications, and then resume the X server session

- Support for DECnet and TCP/IP network transport protocols
- Compliance with MIT's X11 Release 4 specification
- Nonrectangular window support
- Security features, including password encryption
- High-resolution video support
- Virtual memory management support

Other components of PC DECwindows Motif

In addition to the X servers DWDOS286 and DWDOS386, PC DECwindows Motif consists of the following components:

- The PC DECwindows Motif Configuration utility

  The Configuration utility consists of a series of screens that help you set up your personal computer to use PC DECwindows Motif.

- The PC DECwindows Motif Keysym Compiler utility

  The Keysym Compiler utility lets you make new key definitions available to X applications.

- The PC DECwindows Motif Font Compiler utility

  The Font Compiler utility lets you compile font source files so DWDOS286 and DWDOS386 use them.

- The PC DECwindows Motif information utilities, DWINFO2 and DWINFO3

  DWINFO2 and DWINFO3 let you obtain information about the amount of conventional and extended memory seen by DWDOS286 and DWDOS386, respectively.

What You Need

This section describes the software, hardware, and memory requirements of PC DECwindows Motif. For VMS users, this section also provides required VMS process account quotas.

Prerequisite Network Software

PC DECwindows Motif software is installed automatically when PATHWORKS client software is installed. For instructions on installing PATHWORKS client software, see your *Client Installation and Configuration Guide.*

In addition to the PATHWORKS client software, you need some PATHWORKS for DOS software components installed on your workstation. The components you install depends on the network transport protocol you use:

Requirements for DECnet users

- If you use the DECnet network transport protocol, you need:
  - The basic DECnet components that are installed by the Netsetup utility when you select DECnet as your protocol
  - Any Microsoft and compatible MOUSE.SYS or MOUSE.COM driver

Requirements for TCP/IP users

- If you use the TCP/IP network transport protocol, you need:
  - The basic TCP/IP components that are installed by the Netsetup utility when you select TCP/IP as your protocol
  - The component SOCKTSR, which you install with the Netsetup utility (in either intermediate or advanced operator mode)
  - The BAPI and TELNET components, if you plan to access X applications located on a VMS node

    BAPI and TELNET are installed with the Netsetup utility (in either intermediate or advanced operator mode).
  - Any Microsoft or compatible MOUSE.SYS or MOUSE.COM driver

Prerequisite Personal Computer Hardware

To run PC DECwindows Motif, you need the following supported devices:

- 80286, 80386, or 80486 DOS-based computer
- Keyboard
- Graphics display adapter and monitor

Note

Though it is not required, a pointer device is highly recommended. You can use either a mouse or a keyboard as a pointer device.

Memory Requirements

PC DECwindows Motif requires at least:

- 1 Mbyte of free memory on the personal computer for simple X applications

  The 1 Mbyte of free memory must be configured as conventional or extended memory or both.

  For more information about configuring extended memory, see *Memory Solutions for Client Administrators.*

- 2 to 3 Mbytes of available memory on the personal computer for memory-intensive X applications
- 1 Mbyte of available disk space on a local hard drive or diskette drive or on a writable file or disk service

Prerequisite VMS Process Account Quotas

Some X applications located on a VMS node require that you set some VMS process account quotas to the values shown in Table 1–1. Some X applications do not require the values shown in Table 1–1, but will perform better if you set them.

You need full system privileges to set VMS process account quotas. Usually, a system administrator sets process account quotas.

For information on changing VMS process account quotas, see the *VMS Authorize Utility Manual.*

Table 1–1 VMS Process Account Quotas

Quota	Recommended Value
FILLm	40
BIOlm	100
DIOlm	100
ASTlm	325
TQElm	10
Enqlm	600
BYTlm	64000
JTquota	4096
WSdef	512
WSquo	1024
WSextent	16384
Pgflquo	32000
Maxjobs	0
Maxacctjob	0
Prclm	10

What You Need to Do Before You Can Use the X Server

Before you can use the X server, you need to:

1. Make sure your personal computer and network meet the software, hardware, and memory requirements described in this chapter.
2. Plan how you want to use the X server.

   Before you configure your personal computer to use the X server, you need to know which X server you will use and which method you will use to start X applications.

   See Chapter 2.
3. Configure your personal computer.

   See Chapter 3.

4. Have your system administrator make the Application Startup program available on DECnet nodes where X applications that you plan to use regularly are located.

   See Chapter 4.

2

Planning How to Use PC DECwindows Motif

How you configure your personal computer depends on which X server you want to use and how you want to start X applications.

This chapter provides information to help you decide how to make configuration selections that depend on the following things:

- The X server that you use
- The method of starting X applications that you use

Selecting an X Server

There are two X servers provided with PC DECwindows Motif:

- DWDOS286.EXE, commonly called DWDOS286
- DWDOS386.EXE, commonly called DWDOS386

Guidelines for selecting an X server

Use the following guidelines to help you select which X server to use:

- If you don't know which to choose, use DWDOS286.
- If you have an 80286-based personal computer, you must use DWDOS286.
- If you have an 80386- or 80486-based personal computer, you can use either one. Base your decision on the type of memory in your personal computer, as described in the following table.

Memory Considerations	Use...
If you want to use maximum suspend session memory	DWDOS286
To start the X server from Microsoft Windows running in enhanced mode	DWDOS286
If you want better performance and better swapping performance for low-memory conditions	DWDOS386

Planning How to Start X Applications

The following sections describe:

- Methods of starting X applications that are available to you
- The requirements for each method of starting X applications

Available Methods of Starting X Applications

You can start X applications using more than one method.

Three methods of starting X applications are available to you:

- Automatically at startup of the X server
- From the PC Session Manager
- From a terminal session

It is not necessary to select only one method; many users use a combination of methods for starting applications.

The following sections provide a brief description of each method to help you plan how you will use PC DECwindows Motif.

Note

Detailed instructions for each method of starting X applications are provided in Chapter 6, Starting X Applications.

Automatic Startup

If you routinely use the same X applications, it is most convenient to configure your personal computer so that X applications start automatically. With automatic startup of applications, windows displaying the applications appear automatically after you start the X server.

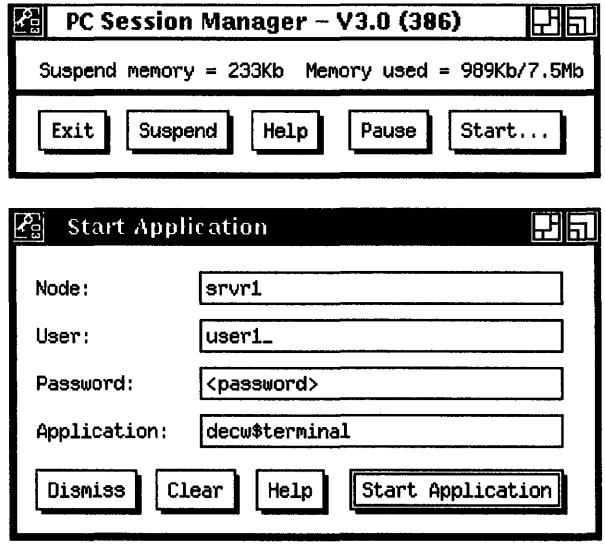
You specify automatic startup with the PC DECwindows Motif Configuration utility, described in Chapter 3.

From the PC Session Manager

If your working environment causes you to use different X applications on a regular basis, it is most convenient to start X applications from the PC Session Manager. This method involves entering information in the PC Session Manager dialog box for each application you want to start.

Figure 2–1 displays sample information entered in the PC Session Manager dialog box to start an X application.

Figure 2–1 PC Session Manager Dialog Box



From a Terminal Session

Another method of starting an X application is by logging into your account on the node where the X application is located and entering commands.

This method is required if you use the DECnet network transport protocol and both of the following are true:

- Neither PATHWORKS for VMS nor PATHWORKS for ULTRIX is installed on the node where the X application is located.
- The Application Startup program is not installed on the node where the X application is located.

  The Application Startup program provides software that lets DECnet users access applications located on remote nodes. Instructions for installing the Application Startup program are provided in Chapter 4.

Requirements for Each Method of Starting X Applications

Table 2–1 shows the requirements that must be met before you can access X applications using each available method.

Table 2–1 Requirements for Each Method of Starting X Applications

Requirements	Automatic Startup	From PC Session Manager	Through Terminal Emulation
Does the user need an account on node where the X application is located?	Yes	Yes	Yes
Is it necessary to set any parameters with the PC DECwindows Motif Configuration utility?	Yes. Set the Application Startup Information parameter as described in Chapter 3.	Yes. Set the PC Session Manager parameter to ON as described in Chapter 3.	No.
Define node name (on your personal computer) for node where X application is located?	Yes. For instructions, see Defining Node Names.	Yes. For instructions, see Defining Node Names.	No
Must the Application Startup program be available on the node where application is located?	Yes. Instructions are provided in Chapter 4.	Yes.Instructions are provided in Chapter 4.	No

Next Step

Configure your personal computer for use with PC DECwindows Motif. See Chapter 3 for instructions.

3

Configuring Your Personal Computer for PC DECwindows Motif

Before you can use the X server, you must configure your personal computer.

This chapter describes:

- How to use the PC DECwindows Motif Configuration utility to set up the configuration file
- The parameters that are set using the Configuration utility
- Additional configuration tasks you must perform after you run the Configuration utility
- What you need to do next

Running the PC DECwindows Motif Configuration Utility

You must run DWCONFIG and set some parameters.

Use the PC DECwindows Motif Configuration utility (DWCONFIG) to set up the configuration file for your personal computer.

The Configuration utility presents a series of screens from which you make selections or enter information to set parameters. Defaults have been established for most parameters by PC DECwindows Motif, but you must set the following parameters so that they reflect your personal computer setup:

- Video
- Swap file location
- Font file location

- Keysym file
- Maximum links

Note

Before you begin configuring your personal computer, review the descriptions of the required parameters set by the Configuration utility, so you can collect any necessary information. For information about each parameter, see the section Understanding Parameters Set by the Configuration Utility in this chapter.

To configure your personal computer so you can run the X server, complete the following steps:

Starting the Configuration utility

1. Start the Configuration utility using one of the following methods. The method you use depends on whether you want to use the default name for the configuration file or specify a name of your choice.

   - To create or edit a configuration file with the default name DWDOS.INI, enter:

     ```
     C:\> DWCONFIG
     ```

   - To create or edit a configuration file with a file name other than DWDOS.INI, enter:

     ```
     C:\> DWCONFIG filename
     ```

Command Element	Explanation
filename	Is the name of the configuration file.

For example, to create or edit a configuration file named OTHER.INI, enter:

```
C:\> DWCONFIG OTHER.INI
```

Note

If you specify a name other than DWDOS.INI for the configuration file, the command you enter to start the X server must reflect the name of your configuration file. For more information, see Chapter 5.

The Configuration utility searches for the file called DWCONFIG.STR. If the utility cannot find it, the message "DWCONFIG.STR?????" is displayed for each directory searched. If you get this message instead of the configuration welcome message, copy the DWCONFIG.STR file into a directory on the path or into the current directory. (The DWCONFIG.STR file is in the same location as the DWCONFIG.EXE file; usually, both files are in the \PCAPP directory.)

Guidelines for using the utility

2. Follow these guidelines when you use the Configuration utility:

   - To proceed from the welcome message screen to set parameters, press Return.

     A separate screen is displayed for each parameter.

     Understanding Parameters Set by the Configuration Utility in this chapter describes each parameter.

   - To choose a parameter setting from a list of available settings, use the arrow keys.

   - After you choose or enter a parameter setting, press Return to proceed.

Note

Instructions for actions available to you are displayed at the bottom of each configuration screen.

Reviewing or changing a parameter

3. After you set the required parameters, the Configuration utility displays a summary screen of all the parameters. To review or change a required or optional parameter:

   a. Use the arrow keys to select the parameter you want to review or change.

   b. Press Return.

Saving your settings

4. When you are ready to save your parameter settings in a configuration file, press F10 at the Summary screen.

Specifying a location

5. At the Configuration File Location screen, enter the drive, directory, and file name for the configuration file you want to save. For example, to store the configuration file in the directory C:\DWDOS on your hard disk with the default name DWDOS.INI, backspace over the default information on the screen to erase text and enter:

   ```
   C:\DWDOS\DWDOS.INI
   ```

Exiting

6. To exit the Configuration utility, press Esc.

You can reconfigure your personal computer for PC DECwindows Motif as your needs change. For example, you can reconfigure to change the screen color or to specify automatic startup of a new X application.

Understanding Parameters Set by the Configuration Utility

This section provides information about individual parameters that are set when you make selections with the PC DECwindows Motif Configuration utility.

Video Parameter

Required parameter

You must set this parameter. If it is set incorrectly, the X server may not start. In some situations, the X server will start, but the video mode (such as monochrome or color mode, or the dimensions of the video screen) will be different from your expectations.

The video parameter specifies the video type that is appropriate for your graphics adapter and monitor. Monochrome devices perform better and require less memory than color devices. If you want to conserve memory, you can select a monochrome device even if you have a color device.

In addition to the video type, the video parameter specifies the pixel dimensions for the viewing area of your video monitor screen.

Understanding pixel dimensions

The standard dimensions of the viewing area on the most common video monitor screens are 640 pixels wide by 480 pixels high. With this parameter, you can select a viewing area that is wider and/or higher than the standard dimensions for a video monitor screen. A viewing area that is larger than the dimensions of your video monitor screen is called a **virtual screen**.

If you use this parameter to specify pixel dimensions that are greater than the pixel dimensions of your screen, some of the screen area will be hidden from your view. That part of the screen that is in your view is known as the **viewport**.

Panning the virtual screen area into your view

You can move hidden areas of your virtual screen into your view by **panning**. For instructions on panning, see Chapter 7.

Note

If you specify pixel dimensions greater than the pixel dimensions of your screen, some applications may be displayed at startup on a portion of the virtual screen beyond your viewport.

Swap File Location

Required parameter

You must specify the swap file location. Otherwise, the X server may not start.

A **swap file** adds virtual memory capability to your personal computer. The swap file is a temporary file created by the virtual memory manager of the X server. When the memory requirements of an X application exceed the physical memory on the personal computer, the virtual memory manager moves data that is not being accessed to a temporary swap file.

How you specify the swap file location depends on which X server you use (DWDOS286 or DWDOS386):

DWDOS286

- If you use DWDOS286, use this swap file location parameter to specify a location for the temporary swap file. The device you specify must have at least 1 Mbyte of available disk space for the swap file. If available, specify a hard drive or diskette drive on your personal computer. You can specify a file or disk service; however, you may experience problems with the X server if the swap file is used when there are a lot of network operations.

DWDOS386

- If you use DWDOS386, set the swap file location according to the instructions in Completing Other Configuration Tasks in this chapter.

If you do not specify a directory, the X server attempts to use your current directory.

Font File Location

Required parameter

You must set this parameter. If it is not set correctly, the X server may not start.

The font file location parameter sets the path for the font information used by X applications. This font information includes the typeface and typesize of the different kinds of text characters the X server uses.

The default font file directory displayed is:

- %_SYSD%\XSERVER\FONTS100, if your video adapter supports at least 100 dots per inch resolution
- %_SYSD%\XSERVER\FONTS75, if your video adapter supports 75 dots per inch resolution

Note

%_SYSD% represents the drive letter for the PATHWORKS system service drive. The X server automatically substitutes %_SYSD% with the correct drive letter.

Standard VGA adapters are approximately 75 dpi, while higher resolution adapters such as the 8514/A are approximately 100 dpi.

When PC DECwindows Motif software is installed, the font files are placed on the system disk. If you have since moved your font files to a different location, specify that location in this parameter.

Two additional directories of font files are also provided:

- %_SYSD%\XSERVER\FONTSMIT, which contains Massachusetts Institute of Technology (MIT) fonts and aliases for older X applications that use the R2 font naming convention
- %_SYSD%\XSERVER\FONTSOL, which contains Sun Open Look fonts for Sun Open Look applications

You can specify more than one font file location. Separate each path with a semi-colon (;). For example, to specify a directory on drive C called NEWFONT containing new font files you compiled in addition to the \XSERVER\FONTS75 and \XSERVER\FONTSMIT directories, enter:

```
%_SYSD%\XSERVER\FONTS75;%_SYSD%\XSERVER\FONTSMIT;C:\NEWFONT
```

Note

If, at any time, you install a different video adapter on your personal computer, be sure the resolution for the font files in the font file location specified in this parameter matches the resolution of the video adapter.

Keysym File

Required parameter

You must set this parameter. If it is not set correctly, the X server may not start. In some situations, the X server will start, but the output of some keys will be incorrect.

The keysym file parameter sets the keysym file name and path for your system. Keysym files contain keyboard mapping information. Keyboard mapping information defines the use of individual keys, associating the key you press with the X application's interpretation of that key.

There are three steps in setting up your keysym file parameter. Each step is presented on a separate Configuration utility screen. The steps in setting up your keysym file parameter are:

1. Specify the path.

   The default path is %_SYSD%\XSERVER\KEYSYMS.

   %_SYSD% represents the drive letter for the PATHWORKS system service drive. The X server automatically substitutes %_SYSD% with the correct drive letter.

2. Choose the keyboard type and keyboard mapping preference.

   Illustrations of the keyboard types and mappings are provided in Appendix B.

3. Choose the keyboard country or language.

Note

After you finish setting parameters, the Summary screen displays the name of the binary keysym file for the settings you entered. For example, the keysym file name for an LK201 layout on an LK250 keyboard for the United States is named LK250DUS.XKS. A full explanation of the naming convention for keysym files is provided in Chapter 9. An example of a path name displayed on the Summary screen is I:\XSERVER\KEYSYMS\LK250DUS.XKS.

Maximum Links

Required parameter for DECnet users

How you set the maximum number of links allowed depends on whether you use the DECnet or the TCP/IP network transport protocol:

DECnet users

- If you use the DECnet network transport protocol, use this parameter to set the maximum links.

  Enter the maximum number of network links you want for your personal computer. For example, if you want to run three X applications, access two file servers, access two different print servers, and allow one more link for the X server, you must set the maximum number of links to 8.

The maximum number of links allowed is 32; Digital recommends 12. The default is the number of maximum links that was set for your personal computer with the Netsetup utility.

If you change the number of maximum links, you need to reboot your personal computer for the change to take effect.

TCP/IP users

- If you use the TCP/IP network transport protocol, do not use this parameter to set the maximum links. The number of network links for TCP/IP users is set automatically by the Netsetup utility (when you specify that you run the TCP/IP network transport protocol). The Netsetup utility sets the maximum links to 8; maximum links for TCP/IP users cannot be set to a number greater than 8.

Note

This is the end of the required parameters. The remaining parameters are optional.

PC DECwindows Motif Password

PC DECwindows Motif password parameter is an optional feature you can use to increase your security. If you specify a password and save the configuration file, you are required to enter the same password each time you:

- Start the X server
- Resume an X server session that has been paused

The password can consist of 1 to 32 characters.

The password you specify is encrypted and stored in your configuration file.

Application Startup Information

The application startup information parameter lets you automatically start X applications when you start an X server.

It is useful to automatically start a Window Manager.

Some users find it helpful to set this parameter so that a Window Manager starts automatically when they start the X server. The Window Manager lets you select, move, and change the size of windows; it also lets you shrink windows to icons, expand icons to windows, and to stack overlapping windows.

For automatic startup of an X application, you must specify:

- The node on which the X application is located
- The user name for your account on the node where the application is located
- The password for your account on the node where the application is located

Note

If you use the DECnet network transport protocol and set the user name and password with the Network Control Program (NCP), the user name and password for your account on the node on which the X application is located are optional. If you do specify them with this parameter, the password is encrypted and stored in your configuration file. If you do not specify a user name and password here, they must be stored in the NCP database.

- The X application that you want to start automatically

  Specify only one X application per screen. To start multiple X applications, set this parameter separately for each X application you want to start automatically.

Controlling Hosts and Valid Nodes

The controlling hosts parameter works in conjunction with the valid nodes parameter to control access to the X server on your personal computer.

These two parameters work together.

- The valid nodes parameter limits the nodes that can access the X server on your personal computer.
  - The nodes you specify as valid nodes are the only nodes, other than the controlling hosts, that can access the X server.
  - If you do not specify any valid nodes, access control is disabled; any node can connect to your display station.
- The controlling hosts parameter specifies one or more nodes that can make changes to the valid nodes list.

  Controlling hosts can access the X server.

Table 3–1 shows examples of controlling access with the controlling host and valid nodes parameters.

Table 3–1 Examples of Controlling Hosts and Valid Nodes

If you specify:	This is the result:
NODE_A as a controlling host and no valid nodes	NODE_A can make changes to the list of valid nodes, and any node can access the X server on your personal computer
No controlling host, and NODE_B and NODE_C as valid nodes	NODE_B and NODE_C can access the X server, but can make no changes to the list of valid nodes
NODE_A as a controlling host, and NODE_B and NODE_C as valid nodes	NODE_A, NODE_B, and NODE_C can access the server; only NODE_A can change the list of valid nodes

Note

If you define a different list of valid nodes from an X application, that list overrides the list of valid nodes defined by this valid nodes parameter for the duration of the X server session. When you exit the X server, the list of valid nodes defined by the valid nodes parameter comes back into effect.

Message Log File

The message log file parameter lets you generate a log file for error messages. You can use the log file to help diagnose problems with the X application and the X server.

You designate the location and name of the message log file.

If you choose to generate a message log file, you must periodically delete it because messages accumulate from one X server session to another.

Each time you exit an X server session during which an error has occurred, a message is displayed reporting one of the following:

- The number of messages that were entered in this log file, if you set this parameter to generate a log file.
- The number of messages that would have been logged if you had set this parameter to generate a log file.

Screen Color

The screen color parameter lets you select the color for the background color of your personal computer screen. (Monochrome videos automatically have a basketweave background, regardless of how this parameter is set.)

Even though X applications can use colors that may not be included on this list, you can only choose colors from the list displayed. The default is cyan.

For information on selecting colors for additional screen elements and on creating additional colors, see Chapter 7, Techniques and Hints.

Mouse Button 3 Emulation

This parameter lets 2-button mouse users to select a key combination or a key and mouse button combination that emulates a third mouse button.

For example, if you select Ctrl/MB2, you can emulate a third mouse button by holding down the Ctrl key while you press mouse button 2.

The default is none. Select none if you have a three-button mouse.

VMS TCP/IP Prompt

The VMS TCP/IP prompt parameter lets you run X applications located on a VMS node when all of the following are true:

- The VMS node uses the TCP/IP network transport protocol.
- In your account on the VMS node, you have specified a prompt other than the default DCL prompt ($).
- You are starting X applications automatically (using the application startup information parameter) or from the PC Session Manager.

If you plan to access X applications located on multiple VMS nodes that use TCP/IP, your account on each node must match the prompt specified here.

The default is $.

Note

If you use X applications located on a VMS node that uses TCP/IP, you may also need to change the VMS TCP/IP Timeout parameter.

Suspend Session Memory Reserve

Set this parameter only if you use DWDOS286.

With both X servers, you can suspend an X server session and return temporarily to DOS by clicking on the Suspend Session button in the PC Session Manager window.

This suspend session memory reserve parameter lets you determine the amount of conventional memory available to applications during a suspended DWDOS286 session.

For DWDOS386, the amount of conventional memory available to the suspend session feature is determined by the X server. You cannot change the value.

Note

You can also reserve extended memory for use by applications during suspended sessions. For more information, see Chapter 7.

Use the following guidelines to determine how to set the suspend session memory reserve parameter for DWDOS286:

- The suspend session memory reserve parameter has a default value of 100 Kbytes. The minimum amount of memory needed to suspend a session is 50 Kbytes.
- If there is a DOS application you want to run during a suspended session that requires more than 100 Kbytes, increase the default value. The maximum setting is 640 Kbytes.
- If your personal computer has at least 1 Mbyte of extended memory, and you want to reserve all of the conventional memory for running DOS applications during a suspended session, set the suspend session memory reserve parameter to 640 Kbytes.

Caution

When you suspend a session and exit to DOS, make sure you do not change or delete the temporary swap file. Otherwise, you will be unable to resume the DWDOS286 session.

Session Manager

The session manager parameter lets you choose whether to run the PC Session Manager.

Features of the PC Session Manager

With the PC Session Manager, you can:

- Start X applications
- Exit from the X server

  Without the PC Session Manager, you can exit from the X server by pressing Ctrl/ALT/F10.
- Pause the X server session, putting the current session on hold

  This feature is available only with the PC Session Manager.

- Suspend the session to return temporarily to DOS, execute DOS commands, then return to your X server session

  This feature is available only with the PC Session Manager.

- Obtain statistics on the memory used by the X server

  This feature is available only with the PC Session Manager.

The default for this parameter is ON.

Video Panning Speed

This parameter lets you specify the speed of screen panning when the pointer reaches the outer edge of the screen. The panning range is from 1 (the slowest speed) to 50 (fastest); the default is 20.

Save Unders

This parameter lets you select whether the X server should save the section of a window that is obscured by a new window (for applications that request save unders). With this feature ON, the X application that owns the obscured window does not have to repaint the window when the new window goes away.

This feature improves performance; however, it does use memory.

The default is OFF.

Backing Store

This parameter lets you select whether the X server should save the pixel contents of an entire window in off-screen memory (for applications that request backing stores).

This feature improves performance in restoring the original window whenever an obscuring pull-down menu or pop-up window is removed. If the obscured window is large, however, this feature requires large amounts of memory: as much as 60 Kbytes for monochrome video modes; and up to 100 Kbytes for color video modes.

This feature works best with black and white video modes.

The default for this feature is OFF.

Pointing Device

The pointing device parameter specifies whether a pointing device has been configured for the personal computer. If this parameter is set to ON, a mouse driver must be loaded for the X server to start.

The default setting is ON.

Note

You can still use the keyboard mouse, even if the pointing device parameter is set to ON.

Pointer Acceleration

The pointer acceleration parameter lets you control how quickly the pointer moves on the screen.

The default is 2.

Pointer Threshold

The pointer threshold parameter determines how soon the pointer acceleration should begin. Enter a setting from 1 to 100; a setting of 1 means that there is no delay.

The default is 1.

Keyboard Mouse Speed

This parameter determines how fast the mouse cursor moves when you use the keyboard mouse. This speed may be from 1 (slowest) to 100 (fastest). The default setting is 4.

Shift Lock State Interpretation

This parameter determines whether the keyboard's Lock key acts as a shift key for the:

- Entire keyboard, including the numbers on the main keyboard and the keypad (ON)
- Alpha keys on the main keyboard (OFF)

The default is OFF.

Bell Pitch

The parameter specifies the keyboard bell tone in Hz. The range is 0 (lowest pitch) to 2000 (highest pitch) Hz; the default is 440 Hz.

Bell Duration

The bell duration parameter specifies the duration, in milliseconds, of the keyboard bell tone. The range is from 0 to 32000 milliseconds; the default is 100.

Note

The bell volume cannot be changed.

Screen Saver Timeout

The screen saver timeout parameter specifies how long an inactive session should wait before the screen goes blank.

You can specify any number of minutes between 0 and 480 (8 hours). A value of 0 disables the screen saver timeout feature. The default is 30 minutes.

Backward Compatibility

The backward compatibility parameter lets you select whether to support older versions of X applications that are not completely compatible with X Windows System Version 11, Release 4. PC DECwindows Motif is Version 11, Release 4 compatible.

The default is to support older versions (ON).

VMS TCP/IP Timeout

The VMS TCP/IP timeout parameter lets you specify the time, in seconds, before the X server stops an attempt to connect to an X application located on a VMS node that uses the TCP/IP network transport protocol. This parameter applies only if you start X applications automatically (using the application startup information parameter) or from the PC Session Manager.

The default for this parameter (30 seconds) is usually sufficient; you should increase the number of seconds only if you get a timeout error message when you try to start an X application.

Note

If you use X applications located on a VMS node that uses TCP/IP, you may also need to change the VMS TCP/IP Prompt parameter.

Completing Other Configuration Tasks

This section describes additional configuration tasks you must perform after you run the PC DECwindows Motif Configuration utility. Complete each of the following configuration tasks that pertain to your setup:

- Define node names of nodes where X applications are located.
- If you use a pointing device, such as a mouse, you need to load the mouse driver.
- If you use DWDOS386, set the swap file location using the SET command with the DOSX environment variable.
- Ensure you have enough conventional and extended memory to run the X server.

Defining Node Names

Complete the steps in this section so your personal computer can recognize the names of nodes where X applications are located.

How you define node names for your personal computer depends on the network transport protocol you use:

- If you use the DECnet network transport protocol, use the **Network Control Program** (NCP) to define a DECnet node name in your personal computer's database.

  For instructions, see Defining DECnet Node Names in this chapter.

- If you use the TCP/IP network transport protocol, edit the HOSTS. file to define the Internet node name.

  For instructions, see Defining Internet Node Names for TCP/IP in this chapter.

Note

It is possible to access a node with an undefined node name. Just substitute the DECnet or Internet node address for the node name when you start an X application from the PC Session Manager. Most users, however, find it more convenient to define the node name in the personal computer's database if they plan to regularly access the node.

Defining DECnet Node Names

If you use the DECnet network transport protocol, complete the following steps to define node names in your personal computer's database:

Is the node name already defined?

1. Determine whether the DECnet node name for the node you want to access is already defined in your personal computer's DECnet database:

   ```
   C:\> NCP LIST KNOWN NODES
   ```

   If the DECnet node name is listed, it is already defined. Proceed to Next Steps at the end of this chapter.

   If the DECnet node name for the node you want to access is not listed, go to step 2.

Defining the node

2. To define a node in your personal computer's DECnet database, enter:

```
C:\> NCP DEFINE NODE nodeaddress NAME nodename
[USER "username" PASSWORD "password"]
```

Command Element	Explanation
nodeaddress	Is the DECnet node number that identifies the node. The system administrator for the node you are defining can provide you with the node number.
nodename	Is the name that uniquely identifies the node.
username and password	Optional. If you specify the user name and password here, you won't have to specify them each time you start X applications located on the node. Enter ULTRIX and UNIX user names and passwords in lowercase letters and enclose the letters with quotation marks.

Note

Setting the user name and password in NCP lets you omit the user name and password when you start X applications from the PC Session Manager or through automatic startup in the configuration file. For more information on the application startup information parameter, see Chapter 3.

The following example defines the VMS node SRVR1 with the DECnet node address 13.99:

```
C:\> NCP DEFINE NODE 13.99 NAME SRVR1
```

The next example defines the ULTRIX node name SRVR3 with the DECnet node address 13.46; it specifies a username (user1) and password (secret):

```
C:\> NCP DEFINE NODE 13.46 NAME SRVR3 USER
"user1" PASSWORD "secret"
```

3. Repeat step 2 for each node name you want to add to the DECnet database.

Defining Internet Node Names for TCP/IP

If you use the TCP/IP network transport protocol, complete the following steps to define Internet node names in the HOSTS. file:

1. Using any text editor, open the HOSTS. file, located in your \TCPIP subdirectory.

Is the node name already defined?

2. Determine whether the node name is already defined by looking for the node name and node address for the node you want to access.

   If the node name and node address are listed, the node name is already defined. Proceed to Next Steps at the end of this chapter.

   If the node name and node address are not listed in the file, go to step 3.

Defining the node

3. Edit the file to add the Internet node address and node name of each node you want to access.

   For example, to add the node names srvr2 (Internet address 13.130.192.98) and srvr3 (Internet address 13.140.198.22) add the following lines to your HOSTS. file:

```
13.130.192.98 srvr2
13.140.198.22 srvr3
```

   Note

   The system administrator for the node you are defining can give you the Internet node address.

4. Exit the file.

Loading the Mouse Driver

You need to load the driver if you use a mouse.

If you use a mouse as a pointing device, you must load a Microsoft-compatible mouse driver for your personal computer before running the X server.

See the documentation that accompanies your mouse for instructions on how to load the driver.

Setting the Swap File Location for DWDOS386

If you use DWDOS386, you are unable to set the swap file location using the Configuration utility.

To set the swap file location for DWDOS386, use the DOS SET command with the DOSX environment variable. The device you specify must have at least 1 Mbyte of available memory for the swap file. If available, specify a hard drive or diskette drive on your personal computer.

Note

You can specify a file or disk service; however, you may experience problems with the X server if the swap file is used when there are a lot of network operations.

Specify the swap file location as follows:

```
C:\> SET DOSX=-SWAPDIR drive:[\directory]
```

Command Element	Explanation
drive	Is a writable drive.
directory	Is an optional subdirectory on that drive. For example, \SWAP.

To specify a temporary directory each time you boot your personal computer, add the command to your AUTOEXEC.BAT file. For example, to swap to the subdirectory X\TMP on drive D, enter:

```
C:\> SET DOSX=-SWAPDIR D:\X\TMP
```

Note

Do not add a trailing slash to the directory. For example, to set the swap file location to the root of drive C, specify SET DOSX=-SWAPDIR C:

If you do not set the DOSX environment variable, the X server attempts to use your current directory.

Checking the Amount of Memory Visible to the X Server

To check the amount of conventional and extended memory visible to the X server, run one of the following utilities:

- DWINFO2, to check the memory visible to DWDOS286
- DWINFO3, to check the memory visible to DWDOS386

Note

DWINFO2 and DWINFO3 are not designed to be general purpose memory utilities; they are designed to report the memory available to the X server.

Running DWINFO2

To start the DWINFO2 utility for DWDOS286, enter the following command:

```
C:\> DWINFO2
```

After you start the DWINFO2 utility, information is displayed about the amounts of DOS (conventional memory) and extended memory.

Figure 3–1 shows sample output for DWINFO2.

Figure 3–1 Sample Output from the DWINFO2 Utility

```
     Protected Mode and Extended Memory Performance Measurement -- 3.93
             Copyright 1988, 1989, 1990 by Rational Systems, Inc.

DOS memory   Extended memory          CPU is 24.9 MHz 80386.
----------   ---------------
       639             7168   K bytes configured (according to BIOS).
       640             7168   K bytes physically present (SETUP).
       384             7168   K bytes available for DOS/16M programs.
                                 (DOS/16M memory range 1024K to 8192K)
11.3 (0.5)       11.5 (0.0)   MB/sec word transfer rate (wait states).
20.7 (0.5)       22.8 (0.5)   MB/sec 32-bit transfer rate (wait states).

Overall CPU and memory performance (non-floating point) for typical
DOS programs is 4.82   0.39 times an 8MHz IBM PC/AT.

Protected/Real switch rate = 12300/sec (81  sec/switch, 44 up + 36 down),
using DOS/16M switch mode 3 (386).
```

To determine the amount of extended memory that is visible to DWDOS286, check the line labeled "K bytes available for DOS/16M programs".

Note

All of the time-based measurements made by DWINFO2 may vary slightly each time it is run.

Running DWINFO3

To start the DWINFO3 utility for DWDOS386, enter the following command:

```
C:\> DWINFO3
```

After you start the DWINFO3 utility, information is displayed about the amounts of conventional and extended memory visible to DWDOS386.

Figure 3–2 shows sample output for DWINFO3.

Figure 3–2 Sample Output from the DWINFO3 Utility

```
          80386 and 80486 Extended Memory Information Utility
            Copyright 1990 by Digital Equipment Corporation
                                Version 1.0

DOS memory   Extended memory
----------   ---------------
       546              7168   K bytes available to DWDOS386.EXE
```

Next Steps

The next chapter describes how to make the Application Startup program available to users. This task is usually done by a system administrator and must be completed before you can access X applications automatically or by using the PC Session Manager. Your system administrator also needs to create an account for you on the node where the X applications are located (if you do not have one already).

After you have completed the tasks in Chapters 1 through 3 and your system administrator has completed the tasks in Chapter 4, you are ready to start the X server. See Chapter 5 for instructions.

4

Installing the Application Startup Program

As described in Chapter 2, there are three available methods of starting X applications. Users can start applications:

- Automatically at startup of the X server
- From the PC Session Manager
- From a terminal session

The only requirement for starting X applications from a terminal session is that the user must have an account on the node where the applications are located. For users to start applications automatically or from the PC Session Manager, however, special software must be present on the node where the applications are located. (Users must also have an account on the node.)

Software necessary for starting applications may already be present on the host node.

There are a variety of ways that the software that is required to start X applications automatically or from the PC Session Manager can be present on the node where the applications are located. If any of the following conditions exist, the software is already available:

- The X applications are located on nodes where either PATHWORKS for VMS or PATHWORKS for ULTRIX is installed.
- The X applications are located on a UNIX node that supports the REXEC shell.

  The REXEC shell provides the necessary software to access X applications using the TCP/IP network transport.
- The X applications are located on an ULTRIX node running TCP/IP.

  The REXEC shell is available with TCP/IP, providing the necessary software to access X applications.

The system manager may need to install the Application Startup program.

If none of the previous conditions exist and you use the DECnet network transport, the system administrator must install the Application Startup Program on the node where the X applications are located. The system administrator must also install the Application Startup Program if the X applications are located on a VMS node running VMS/ULTRIX Connection software, and PATHWORKS for VMS is not installed on the VMS node.

This chapter describes how to install the Application Startup Program on nodes that run:

- VMS operating system software
- ULTRIX operating system software

The system administrator for the node where the X applications are located usually completes the tasks in this chapter.

Installing the Startup Program on VMS Nodes

To install the Application Startup program on a VMS node, copy the PCX$SERVER.COM file and the PCX$WINMGR.EXE file to the target VMS node. Copy the files from either:

- A VMS node that has PATHWORKS for VMS installed
- The PATHWORKS system service drive on your personal computer

Copying the Startup Program from a VMS Node

Use this method if you have access to a node with PATHWORKS for VMS software.

To copy the Startup program from another VMS node that has PATHWORKS for VMS installed, follow these instructions:

1. Log in with full system privileges to the target VMS node.
2. Copy the PCX$SERVER.COM file from a VMS node that has PATHWORKS for VMS software installed, by entering:

```
$ COPY nodename::SYS$SYSTEM:PCX$SERVER.COM -
_$ SYS$SYSTEM:PCX$SERVER.COM
```

Command Element	Explanation
nodename	Is the node name of the VMS node (with PATHWORKS for VMS installed) from which you are copying the file.

For example, to copy the PCX$SERVER.COM file from the VMS node SRVR1, enter the following at the target VMS node:

```
$ COPY SRVR1::SYS$SYSTEM:PCX$SERVER.COM -
_$ SYS$SYSTEM:PCX$SERVER.COM
```

3. Copy the PC DECwindows Motif Window Manager (the PCX$WINMGR.EXE file) from the VMS node (with PATHWORKS for VMS installed) to the target VMS node by entering:

```
$ COPY nodename::SYS$SYSTEM:PCX$WINMGR.EXE -
_$ SYS$SYSTEM:PCX$WINMGR.EXE
```

Command Element	Explanation
nodename	Is the node name of the VMS node (with PATHWORKS for VMS installed) from which you are copying the file.

For example, to copy the PCX$WINMGR.EXE file from the VMS node SRVR1, enter the following at the target VMS node:

```
$ COPY SRVR1::SYS$SYSTEM:PCX$WINMGR.EXE -
_$ SYS$SYSTEM:PCX$WINMGR.EXE
```

4. Log in to the SYSTEM account on the target VMS node.
5. At the target VMS node, define the new DECnet object PCX$SERVER in the permanent database by entering:

```
$ MCR NCP DEFINE OBJECT PCX$SERVER NUMBER 0 FILE -
_$ SYS$SYSTEM:PCX$SERVER.COM
```

6. At the target VMS node, define the DECnet object PCX$SERVER in the volatile database by entering:

```
$ MCR NCP SET OBJECT PCX$SERVER NUMBER 0 FILE -
_$ SYS$SYSTEM:PCX$SERVER.COM
```

7. At the target VMS node, make the Application Startup program executable by entering:

```
$ SET PROTECTION=(W:RE) -
_$ SYS$SYSTEM:PCX$SERVER.COM
```

8. At the target VMS node, make the Window Manager executable by entering:

```
$ SET PROTECTION=(W:RE) -
_$ SYS$SYSTEM:PCX$WINMGR.EXE
```

Copying the Startup Program from Your System Service Drive

Use this method if you have only PATHWORKS for DOS software.

To copy the files to the VMS node from the \XSERVER\REMOTE directory on your personal computer to the target VMS node, follow these instructions:

1. At your personal computer, copy the PCX_VAX.VMS file by entering:

```
C:\XSERVER\REMOTE\> NFT COPY PCX_VAX.VMS
nodename"username password"::
SYS$SYSTEM:PCX$SERVER.COM
```

Command Element	Explanation
nodename	Is the node name of the VMS node to which you are copying the file.
username	Is the user name for the privileged account on the VMS node.
password	Is the password for the privileged account on the VMS node.

The following example copies the PCX_VAX.VMS file from the \XSERVER\REMOTE directory on the hard disk to the VMS node SRVR1; it copies the file to the user account PRIV1 with the password SECRET:

```
C:\XSERVER\REMOTE\>  NFT COPY PCX_VAX.VMS
SRVR1"PRIV1 SECRET"::SYS$SYSTEM:PCX$SERVER.COM
```

2. At your personal computer, copy the PCX_WINM.VMS file to the target VMS node, and name it PCX$WINMGR.EXE, by entering:

```
C:\XSERVER\REMOTE\>  NFT COPY/IMAGE PCX_WINM.VMS
nodename"username password"::SYS$SYSTEM:
PCX$WINMGR.EXE
```

Command Element	Explanation
nodename	Is the node name of the VMS node to which you are copying the file.
username	Is the user name for the privileged account on the VMS node.
password	Is the password for the privileged account on the VMS node.
PCX$WINMGR.EXE	Is the name you must give to the file on the VMS node.

The following example copies the PCX_WINM.VMS file from the \XSERVER\REMOTE directory on the hard disk to the VMS node SRVR1; it copies the file to the user account PRIV1 with the password SECRET, and names the file PCX$WINMGR.EXE:

```
C:\XSERVER\REMOTE\> NFT COPY/IMAGE PCX_WINM.VMS
SRVR1"PRIV1 SECRET"::SYS$SYSTEM:PCX$WINMGR.EXE
```

3. Log in to the SYSTEM account on the target VMS node.
4. At the target VMS node, define the new DECnet object PCX$SERVER in the permanent database by entering:

```
$ MCR NCP DEFINE OBJECT PCX$SERVER NUMBER 0 FILE -
_$ SYS$SYSTEM:PCX$SERVER.COM
```

5. At the target VMS node, define the DECnet object PCX$SERVER in the volatile database by entering:

```
$ MCR NCP SET OBJECT PCX$SERVER NUMBER 0 FILE -
_$ SYS$SYSTEM:PCX$SERVER.COM
```

6. At the target VMS node, make the Application Startup program executable by entering:

```
$  SET PROTECTION=(W:RE SYS$SYSTEM:PCX$SERVER.COM)
```

7. At the target VMS node, make the Window Manager executable by entering:

```
$  SET PROTECTION=(W:RE SYS$SYSTEM:PCX$WINMGR.EXE)
```

Installing the Startup Program on ULTRIX Nodes

The following sections describe how to install the Application Startup program on a:

- VAX node running ULTRIX operating system software
- DECstation node running ULTRIX operating system software

Installing on a VAX Node Running ULTRIX

To install the Application Startup program on a VAX node running ULTRIX, complete the following steps.

1. Copy the PCX_VAX.ULT file to the target ULTRIX node using one of the following methods:

Use this method if you have access to a VAX node with PATHWORKS for ULTRIX software.

- To copy the file to the target ULTRIX node from a VAX node running PATHWORKS for ULTRIX software, follow these steps:

  a. Log in with full system privileges to the target VAX node running ULTRIX.

  b. Copy the Application Startup program, by entering:

```
# dcp nodename::/usr/local/bin/pcx_server \
/usr/local/bin/pcx_server
```

Command Element	Explanation
nodename	Is the node name of the VAX node (with PATHWORKS for ULTRIX installed) from which you are copying the file.

For example, to copy the Application Startup program from the node SRVR1, enter the following at the VAX node with PATHWORKS for ULTRIX installed:

```
# dcp srvr1::/usr/local/bin/pcx_server \
/usr/local/bin/pcx_server
```

Use this method if you have only PATHWORKS for DOS software.

- To copy the file to the target VAX node from the \XSERVER\REMOTE directory on your personal computer, enter the following at your personal computer:

```
C:\XSERVER\REMOTE\>  NFT COPY/IMAGE PCX_VAX.ULT
nodename "username password"::/usr/local/bin/
pcx_server
```

Command Element	Explanation
nodename	Is the node name of the VAX node running ULTRIX to which you are copying the file.
username	Is the user name for the privileged account on the VAX node running ULTRIX.
password	Is the password for the privileged account on the VAX node running ULTRIX.

The following example copies the PCX_VAX.ULT file from a personal computer to the target VAX node running ULTRIX named srvr6; it copies the file to the account priv6 with the password secret:

```
C:\XSERVER\REMOTE\>  NFT COPY/IMAGE PCX_VAX.ULT
srvr6"priv6 secret"::/usr/local/bin/pcx_server
```

2. Log in to the ULTRIX node as root.
3. At the ULTRIX prompt (#), define the new DECnet object in the permanent database by entering:

```
# ncp define object 'PCX$SERVER' number 0 \
file /usr/local/bin/pcx_server
```

4. Define the object in the volatile database by entering:

```
# ncp set object 'PCX$SERVER' number 0 \
file /usr/local/bin/pcx_server
```

5. Make the program executable by entering:

```
# chmod 755 /usr/local/bin/pcx_server
```

Installing on a DECstation Node Running ULTRIX

To install the Application Startup program on a DECstation node running ULTRIX, complete the following steps:

1. Copy the Startup program to the target ULTRIX node using one of the following methods:

Use this method if you have access to a DECstation node with PATHWORKS for ULTRIX software.

- To copy the Startup program to the target ULTRIX node from a DECstation node running PATHWORKS for ULTRIX software, follow these steps:

  a. Log in with full system privileges to the target DECstation running ULTRIX.

  b. Copy the Application Startup program, by entering:

```
# dcp nodename::/usr/local/bin/pcx_server \
/usr/local/bin/pcx_server
```

Command Element	Explanation
nodename	Is the node name of the DECstation node (with PATHWORKS for ULTRIX installed) from which you are copying the file.

For example, to copy the Startup program from the node srvr10 with PATHWORKS for ULTRIX installed, enter the following at the target DECstation running ULTRIX:

```
# dcp srvr10::/usr/local/bin/pcx_server \
/usr/local/bin/pcx_server
```

Use this method if you have only PATHWORKS for DOS software.

- To copy the file to the target DECstation node from the \XSERVER\REMOTE directory on your personal computer, enter the following at your personal computer:

```
C:\XSERVER\REMOTE\> NFTCOPY/IMAGE PCX_DECS.ULT
nodename "username password"::/usr/local/bin/
pcx_server
```

Command Element	Explanation
nodename	Is the node name for the target ULTRIX node.
username	Is the user name associated with the target node.
password	Is the password associated with the target node.

For example, to copy the Startup Program from the PATHWORKS system drive to the DECstation STRWARS using the user account JONES (with the password SECRET), enter:

```
C:\XSERVER\REMOTE\> NFT COPY/IMAGE  PCX_DECS.ULT
strwars"jones secret"::/usr/local/bin/pcx_server
```

2. Log in to the ULTRIX node as root.
3. At the ULTRIX prompt (#), define the new DECnet object in the permanent database by entering:

```
# ncp define object 'PCX$SERVER' number 0 \
file /usr/local/bin/pcx_server
```

4. Define the object in the volatile database by entering:

```
# ncp set object 'PCX$SERVER' number 0 \
file /usr/local/bin/pcx_server
```

5. Make the program executable by entering:

```
# chmod 755 /usr/local/bin/pcx_server
```

Next Step

If you are a system administrator, make sure each user has an account on the node where they want to access X applications.

If you are a user, you are ready to start the X server. See Chapter 5 for instructions.

5

Starting the X Server

This chapter describes how to start the X server.

Guidelines for starting the X server

When you start the X server, keep the following guidelines in mind:

- The command must reflect which X server you want to use.
- If you named your configuration file something other than the default DWDOS.INI, the command must reflect the name of the configuration file.
- You can override parameters set by the configuration file by specifying parameters on the command line.

This chapter describes each of these guidelines and tells you what to do next.

Specifying Which X Server to Use

The following instructions use a configuration file on your path with the default name DWDOS.INI.

To start DWDOS286, enter:

```
C:\ DWDOS286
```

To start DWDOS386, enter:

```
C:\ DWDOS386
```

Note

See Chapter 2 to determine which X server to use.

Specifying the Configuration File

Specifying the X server and a configuration file

If you named your configuration file something other than the default name DWDOS.INI, start the X server by entering:

```
C:\ DWDOSx86 filename.ini
```

Command Element	Explanation
DWDOSx86	Either DWDOS286 or DWDOS386, depending on which X server you want to use.
filename.ini	The name of the configuration file. For example, OTHER.INI.

Example

For example, to start DWDOS386 with the configuration file OTHER.INI, enter:

```
C:\ DWDOS386 OTHER.INI
```

Overriding Parameters Set in the Configuration File

Specifying an X server, the configuration file, and parameters

To override a parameter setting that is in the configuration file you are using, enter:

```
C:\ DWDOSx86 filename.INI /param=setting
```

Note

You must use either a slash (/) or a hyphen (-) before each parameter name.

Command Element	Explanation
DWDOSx86	Either DWDOS286 or DWDOS386, depending on the X server you want to use.
filename.ini	If you named your configuration file something other than the default DWDOS.INI, filename represents the name of the configuration file. For example, OTHER.INI. (It is not necessary to specify DWDOS.INI on this command line.)
param	The parameter you are setting.
setting	The setting of the parameter that should take effect for the duration of this X server session.

Table 5–1 contains the following information for each parameter that you can specify on the command line when you start an X server:

- The correct syntax for entering parameters
- Settings you can specify for each parameter

Note

Explanations for each parameter are provided in Chapter 3, Configuring Your Personal Computer for PC DECwindows Motif .

Examples

The following example starts DWDOS386; it uses the configuration file with the default name DWDOS.INI, and specifies the font path location L:\NEWFONT:

```
C:\ DWDOS386 /FONT_PATH=L:\NEWFONT
```

The next example starts DWDOS286; it uses a configuration file named NEWINI.INI, and starts the XUI Window Manager located on SRVR1 (user name USER1, password SECRET). Note that the quotation marks (") start before the slash (/) when you specify a parameter that has a space in it:

```
C:\ DWDOS286 NEWINI.INI "/APPLICATION=SRVR1/USER1/SECRET DECW$WINMGR"
```

Table 5–1 Syntax for Setting Parameters at the Command Line

Corresponding Parameter Name in Configuration Utility	Specify this Parameter Name on the Command Line	Parameter Setting Information
Not applicable	HELP	To display the syntax and valid settings for specifying parameters at the command line. Specifying DWDOSx86 /HELP does not start the X server. For example, DWDOS286 /HELP.
Not applicable	VERSION	To obtain the version number, date, and time of the X server. For example, DWDOS386 /VERSION.
Swap File Location	TMP_DIRECTORY	Specify drive:\directory. For example, DWDOS286 /TMP_DIRECTORY=C:\SWAP.
Font File Location	FONT_PATH	Specify drive:\directory. For example, DWDOS386 /FONT_PATH=F:\FONTS75.
Keysym File	KEYSYM_FILE	Specify drive:\directory, and file name. For example, DWDOS286 /KEYSYM_FILE= F:\KEYSYM\LK250DUS.XKS.
Mouse Button 3 Emulation	MB3_EMULATION	If you use a 2-button mouse, specify the key combination you want emulate MB3. Specify 0 for no emulation; 1 for Ctrl/MB2; 2 for Alt/MB2; 3 for Ctrl/Alt/MB2; 4 for Shift/MB2; 5 for Ctrl/Shift/MB2; 6 for Alt/Shift/MB2; 7 for Ctrl/Alt/Shift/MB2. For example, DWDOS386 /MB3_EMULATION=1.
VMS TCP/IP Prompt	TELNET_PROMPT	Enter the DCL prompt for the VMS account that uses TCP/IP. For example, DWDOS286 "/TELNET_PROMPT=PUBLIC".

(continued on next page)

Table 5–1 (Cont.) Syntax for Setting Parameters at the Command Line

Corresponding Parameter Name in Configuration Utility	Specify this Parameter Name on the Command Line	Parameter Setting Information
Application Startup Information	APPLICATION	Enclose the parameter, node, username, password, and X application name in quotation marks. For example, DWDOS386 "/APPLICATION= SRVR1/JONES/SECRET DECW$CALC". To start more than one application, specify the full parameter for each application. For example: DWDOS386 "/APPLICATION=SRVR1/JONES/ SECRET DECW$CALC" "/APPLICATION= SRVR1/ JONES/SECRET DECW$CALENDAR".
Controlling Hosts	CONTROLLING_HOSTS	Specify the node name. For example, DWDOS286 /CONTROLLING_HOSTS=SRVR2. You can specify only one controlling host at the command line.
Valid Nodes	VALID_NODES	Specify the node name. For example, DWDOS386 /VALID_ NODES=NODE4. You can specify only one valid node at the command line.
Message Log File	LOG_FILE	Specify the location and name for the log file. For example, DWDOS286 /LOG_ FILE=C:\ERRORS.LOG.

(continued on next page)

Table 5–1 (Cont.) Syntax for Setting Parameters at the Command Line

Corresponding Parameter Name in Configuration Utility	Specify this Parameter Name on the Command Line	Parameter Setting Information
Screen Color	SCREEN_COLOR	Specify a a valid color. Enclose the parameter and color in quotation marks. Two examples are: DWDOS286 "/SCREEN_ COLOR=BLUE" and DWDOS286 "/SCREEN_COLOR=LIGHT BLUE". You can use this parameter to specify a color from the DWDOS.RBG file that is not specified on the screen for the screen color parameter. For example, DWDOS286 /SCREEN_ COLOR=antiquewhite2.
Suspend Session Memory Reserve	DOS_RESERVE	Specify the amount in Kbytes of conventional memory you want to reserve. For example, DWDOS286 /DOS_RESERVE=20.
Session Manager	SESSION_MANAGER	Specify 1 for ON; 0 for OFF. For example, DWDOS386 /SESSION_ MANAGER=0.
Video Panning Speed	PANNING_SPEED	Specify a value from 1 to 50; 1 is the slowest. For example, DWDOS286 /PANNING_ SPEED=50.
Save Unders	SAVE_UNDERS	Specify 0 for OFF; 1 for ON. For example, DWDOS386 /SAVE_ UNDERS=1.
Backing Store	BACKING_STORE	Specify 0 for OFF; 1 for ON. For example DWDOS286 /BACKING_ STORE=1.
Pointer	POINTER	Specify 1 for ON; 0 for OFF. For example, DWDOS386 /POINTER=0.

(continued on next page)

Table 5–1 (Cont.) Syntax for Setting Parameters at the Command Line

Corresponding Parameter Name in Configuration Utility	Specify this Parameter Name on the Command Line	Parameter Setting Information
Pointer Acceleration	POINTER_ACCELERATION	Specify 1 for none; 2 for slow; 3 for medium; 4 for fast. For example, DWDOS286 /POINTER_ ACCELERATION=3.
Pointer Threshold	POINTER_THRESHOLD	Specify a value from 1 to 100 where 1 is fastest and 100 is slowest. For example, DWDOS386 /POINTER_ THRESHOLD=20.
Keyboard Mouse Speed	KBDPOINTER_ACCELERATION	Specify a value from 1 to 100 where 1 is no delay and 100 is longest delay. For example, DWDOS286 /KBDPOINTER_ ACCELERATION=90.
Shift Lock State Interpretation	SHIFT_LOCK	For shift lock key to shift entire keyboard, specify 1; for only alpha keys on main keyboard, specify 0. For example, DWDOS386 /SHIFT_LOCK=0.
Bell Pitch	BELL_PITCH	Specify a value from 0 to 2000 (in Hz). For example, DWDOS286 /BELL_PITCH=440.
Bell Duration	BELL_DURATION	Specify a value from 0 to 32000 (in milliseconds). For example, DWDOS386 /BELL_ DURATION=100.

(continued on next page)

Table 5–1 (Cont.) Syntax for Setting Parameters at the Command Line

Corresponding Parameter Name in Configuration Utility	Specify this Parameter Name on the Command Line	Parameter Setting Information
Screen Saver Timeout	SCREENSAVER_TIMEOUT	Specify a value from 0 to 480 (in minutes). For example, DWDOS286 /SCREENSAVER_ TIMEOUT=30.
Backward Compatibility	BUG_COMPATIBILITY	Specify 1 for ON; 0 for OFF. For example, DWDOS386 /BUG_ COMPATIBILITY=0.
VMS TCP/IP Timeout	TELNET_TIMEOUT	Specify the number of seconds before the attempt to start an X application on the VMS TCP/IP node times out. For example, DWDOS286 /TELNET_ TIMEOUT=60.

Next Step

For information on starting X applications, see Chapter 6, Starting X Applications.

6

Starting X Applications

This chapter describes the following methods of starting X applications:

- From the PC Session Manager
- Automatically at startup
- From a terminal session

Note

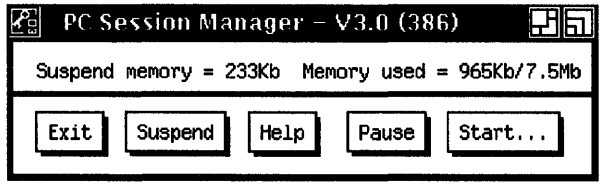
If you did not configure your workstation to automatically start a window manager when you start the X server, you should start a window manager as the first X application.

A window manager allows you to select, move, and change the size of windows; it also allows you to shrink windows to icons, expand icons to windows, and to stack overlapping windows.

Starting X Applications from the PC Session Manager

After you start the X server, the DIGITAL logo is displayed. After a few moments, the DIGITAL logo is replaced by the PC Session Manager, as shown in Figure 6–1.

Figure 6–1 PC Session Manager



Memory information is displayed by the PC Session Manager.

The PC Session Manager displays information about available and used memory. Explanations for the memory information are provided by the PC Session Manager are provided in Table 6–1.

Table 6–1 Memory Information Displayed by the PC Session Manager

Memory Information	Explanation
Suspend memory	This is the amount of memory available to use if you suspend the X server session.
Memory used	The amount of memory you are currently using is reported first, followed by a slash (/) and the amount of memory presently available.

For example, Figure 6–1 reports the following memory information:

- 233 Kbytes of memory available to use during a suspended X server session
- 965 Kbytes of memory currently being used
- 7.5 Mbytes of memory available

Note

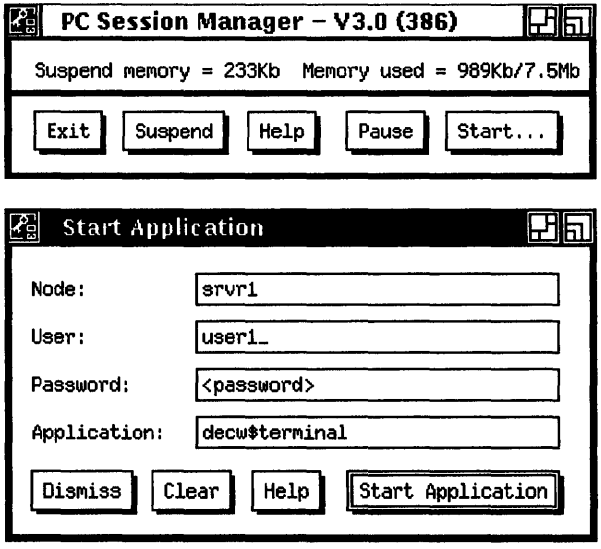
If the PC Session Manager does not appear, run the PC DECwindows Motif Configuration utility to ensure that the session manager parameter is set to on. For information on using the Configuration utility, see Chapter 3.

*Click on **Start** to bring up the dialog box.*

To start an application, complete the following steps:

1. Start the PC Session Manager dialog box by clicking on **Start**. The PC Session Manager dialog box is shown in Figure 6–2.

Figure 6–2 PC Session Manager Dialog Box



2. Select the PC Session Manager dialog box by clicking anywhere on it.
3. In the **Node** field, enter the name of the VMS, ULTRIX, or UNIX node where the application is located; then press Tab.
4. In the **User** field, enter your user name for your account on the node where the application is located; then press Tab.

5. In the **Password** field, enter your password for your account on the node where the application is located; then press Tab.

6. In the **Application** field, enter the command to start the application.

   To determine what you should enter in the Application field to start some common DECwindows Motif applications, see Table 6–2. For example, to start the Calendar application located on a VMS node, enter the following:

   ```
   DECW$CALENDAR
   ```

   To start the Calendar application located on an ULTRIX node, enter:

   ```
   dxcalendar
   ```

   Some X applications for VMS, such as the CDA Viewer, require that you enter a DCL command. For example, to start the CDA Viewer, enter the following DCL command in the Application field:

   ```
   $ VIEW/INTERFACE=DECWINDOWS
   ```

   For a list of DCL command lines to start some X applications, see Table 6–3.

   To start any other X application, see the documentation for the application to determine what to enter in the Application field.

Additional ways to use the Application field

Additionally, you can use the Application field in the following ways:

- You can start multiple X applications located on an ULTRIX or UNIX node by entering the commands in the Application field, separated by semicolons (;). For example, to start Calculator, Calendar, and Fileview, enter the following in the Application field:

  ```
  dxcalc;dxcalendar;dxue
  ```

- You can use VMS command files to start some VMS applications from the PC Session Manager. First, you need to create a VMS command file in your account on a VMS node. Then you can start the application by entering the name of the command file in the Application field.

  For example, to use the EVE editor as a PC DECwindows Motif application, complete the following steps:

  a. Create a command file named EVE.COM in your account on a VMS node.

  b. Enter the following line in the EVE.COM file:

  ```
  $ EDIT/TPU/DISPLAY=DECWINDOWS
  ```

  c. Start the EVE editor from the PC Session Manager, by entering the following in the Application field:

  ```
  EVE.COM
  ```

- You can also issue any ULTRIX or UNIX command in the Application field. For example, to check the current processes on your system, enter the following command:

  ```
  ps -alx > tmp.txt; dxnotepad tmp.txt; rm tmp.txt
  ```

7. Click on the **Start Application** button.

   After a few moments, the application window is displayed.

Note

During application startup, the cursor changes shape to a "do not enter" sign. While the cursor is in this shape, all windows are frozen, and you cannot perform any operations.

Exiting the X server

8. When you are ready to exit the X server, select the PC Session Manager and click on **Exit**.

Caution

Before you exit the X server, be sure to close all applications. If you do not close applications, you can lose data. For more information on closing applications, see your application documentation.

Table 6–2 Commands to Start Applications from the PC Session Manager

Application and Description	Command to Start the VMS Version	Command to Start the ULTRIX or UNIX Version
Bookreader - Lets you read VMS DECwindows books online.	DECW$BOOKREADER	Not applicable
Calculator - Lets you perform simple arithmetic functions.	DECW$CALC	dxcalc
Calendar - Provides a method of scheduling appointments and planning work.	DECW$CALENDAR	dxcalendar
Cardfiler - Provides a system for organizing information that is similar to index cards.	DECW$CARDFILER	dxcardfiler
CDA Viewer - Lets you view Digital Document Interchange Format (DDIF) files	$ VIEW/INTERFACE=DECWINDOWS	dxview
Clock - Displays the time and date.	DECW$CLOCK	dxclock
DECterm - Displays a window that functions like VT300-series terminals.	DECW$TERMINAL	dxterm
FileView - Provides access to host applications and provides commands for you to work with files.	VUE$MASTER	dxue
Mail - Allows you to communicate online with other users.	DECW$MAIL	dxmail
Notepad - Provides basic text editing capabilities.	DECW$NOTEPAD	dxnotepad
Paint - Allows you to create bitmapped graphics.	DECW$PAINT	dxpaint

(continued on next page)

Table 6–2 (Cont.) Commands to Start Applications from the PC Session Manager

Application and Description	Command to Start the VMS Version	Command to Start the ULTRIX or UNIX Version
PC DECwindows Window Manager - Allows you to organize and manage windows.	PCX$WINMGR	Not applicable
Puzzle - A numeric game with moveable squares.	DECW$PUZZLE	dxpuzzle
XUI Window Manager - Allows you to organize and manage windows.	DECW$WINMGR	dxwm

Starting Applications Automatically

After you start the X server, the DIGITAL logo is displayed. After a few moments, the DIGITAL logo is replaced by windows containing the applications you specified in the Application Startup Information parameter.

You can start additional applications using either of the other methods described in the chapter. However, to start applications from the PC Session Manager, the Session Manager parameter must be set to ON (ON is the default setting).

Note

To specify applications that should start automatically, use the PC DECwindows Motif Configuration utility and set the Application Startup Information parameter. For more information, see Chapter 3.

Starting Applications from a Terminal Session

The following sections describe how to start applications from a terminal session when the applications are located on:

- A VMS node
- An ULTRIX or UNIX node

Starting Applications Located on a VMS Node

You need an account on the VMS node.

To start an application located on a VMS node:

1. Log in to your account on the VMS node on which the application is located.
2. In your account on the VMS node, identify the personal computer on which you want to display the application by entering:

```
$ SET DISPLAY/CREATE/NODE=pcnode[/TRANSPORT=transport]
```

Command Element	Explanation
pcnode	Is the node name of your personal computer.
transport	If you use the TCP/IP network transport protocol, specify /TRANSPORT=TCPIP. If you use the DECnet network transport protocol, you do not need to include this qualifier.

For example, to identify the personal computer MYNODE that uses the DECnet network transport protocol, enter:

```
$ SET DISPLAY/CREATE/NODE=MYNODE
```

3. Start one or more applications on the node.

Starting a single application

- To start a single application, enter:

```
$ RUN application
```

Command Element	Explanation
application	Is the name of the application you want to start.

For example, to start Bookreader, enter the following on the node:

```
$ RUN SYS$SYSTEM:DECW$BOOKREADER
```

Starting multiple applications

- If you want the terminal session to return to the command line prompt so you can start multiple applications from a single session, enter:

```
$ SPAWN/NOWAIT/INPUT=NL: RUN application
```

For example, to start Calculator and Clock, enter the following commands:

```
$ SPAWN/NOWAIT/INPUT=NL: RUN SYS$SYSTEM:DECW$CALC
$ SPAWN/NOWAIT/INPUT=NL: RUN SYS$SYSTEM:DECW$CLOCK
```

Table 6–3 lists some X applications and the commands to start them from a terminal session.

Note

The command lines shown in Table 6–3 start a single application. If you want the terminal session to return to the command line prompt so you can start multiple applications, begin the command with SPAWN/NOWAIT/INPUT=NL:. (It is not necessary, however, to begin the command that starts the DECterm application with SPAWN/NOWAIT/INPUT=NL:.)

Table 6–3 Commands to Start Applications on VMS Nodes from a Terminal Session

Application	Command Line to Start the Application
Bookreader	RUN SYS$SYSTEM:DECW$BOOKREADER
Calculator	RUN SYS$SYSTEM:DECW$CALC
Calendar	RUN SYS$SYSTEM:DECW$CALENDAR
Cardfiler	RUN SYS$SYSTEM:DECW$CARDFILER
CDA Viewer	VIEW/INTERFACE=DECWINDOWS
Clock	RUN SYS$SYSTEM:DECW$CLOCK
DECpaint	RUN SYS$SYSTEM:DECW$PAINT
DECterm	CREATE/TERMINAL/DETACH
EVE	EDIT/TPU/DISPLAY=DECWINDOWS
FileView	RUN SYS$SYSTEM:VUE$MASTER
Mail	RUN SYS$SYSTEM:DECW$MAIL
Notepad Editor	RUN SYS$SYSTEM:DECW$NOTEPAD
PC DECwindows Window Manager	RUN SYS$SYSTEM:PCX$WINMGR
Puzzle	RUN SYS$SYSTEM:DECW$PUZZLE
XUI Window Manager	RUN SYS$SYSTEM:DECW$WINMGR

Starting Applications Located on an ULTRIX or UNIX Node

You need an account on the ULTRIX or UNIX node.

To start an application located on an ULTRIX or UNIX node:

1. Log in to your account on the ULTRIX or UNIX node on which the application is located.

ULTRIX and UNIX commands are case-sensitive.

2. In your account on the ULTRIX or UNIX node, identify the personal computer on which you want to display the application by entering:

```
# setenv DISPLAY pcnode:[:]0.0
```

Command Element	Explanation
pcnode	Is the node name of your personal computer.
colons	If you use the DECnet network transport protocol, enter 2 colons (::) as shown. If you use the TCP/IP network transport protocol, enter 1 colon (:).

For example, to identify the personal computer MYNODE that uses the TCP/IP network transport protocol, enter:

```
# setenv DISPLAY mynode:0.0
```

3. Start one or more applications on the node.

Starting a single application

- To start a single application, enter:

```
# application
```

Command Element	Explanation
application	Is the name of the application you want to start.

For example, to start Calculator, enter the following on the node:

```
# /usr/bin/dxcalc
```

Starting multiple applications

- If you want the session on the ULTRIX or UNIX node to return to the command line prompt so you can start multiple applications from a single session, enter:

  ```
  # application &
  ```

  For example, to start Calculator and Calendar, enter the following commands:

  ```
  # /usr/bin/dxcalc &
  # /usr/bin/dxcalendar &
  ```

Table 6–4 lists some X applications and the commands to start them from a terminal session.

Note

The command lines shown in Table 6–4 start a single application. To start multiple applications, add an ampersand (&) at the end of the command.

Table 6–4 Commands to Start Applications on ULTRIX or UNIX Nodes from a Terminal Session

Application	Command Line to Start the Application
Calculator	/usr/bin/dxcalc
Calendar	/usr/bin/dxcalendar
Cardfiler	/usr/bin/dxcardfiler
CDA Viewer	/usr/bin/dxview
Clock	/usr/bin/dxclock
DDIF Viewer	/usr/bin/dxvdoc
DECterm	/usr/bin/dxterm
Mail	/usr/bin/dxmail
Notepad Editor	/usr/bin/dxnotepad
Paint	/usr/bin/dxpaint
Puzzle	/usr/bin/dxpuzzle
User Executive	/usr/bin/dxue
XUI Window Manager	/usr/bin/dxwm

7

Techniques and Hints

This chapter provides information on:

- Panning
- Creating special characters
- Using the keyboard mouse
- Disabling Motif Window Manager accelerators for a 2-button mouse
- Using time-saving techniques with the X server
- Using the X server from Microsoft Windows
- Specifying and creating colors for window elements
- Customizing window size and placement
- Saving memory
- Resolving problems with incompatible DOS device drivers

Panning

If you specified, in the Video parameter, screen dimensions that are larger than your video screen, some of the screen area is hidden from your view. A viewing area that is larger than the dimensions of your video monitor screen is called a virtual screen.

Panning allows you to bring hidden areas of your virtual screen into your view.

How to pan

To pan, move the pointing device so that the pointer on the screen moves toward the part of the screen that you want to view, into the edge of the screen. For example, to view the virtual screen area that is located beyond the right edge of your video monitor screen, move your pointing device so that the pointer on the screen moves into the right edge of the video monitor screen.

Locking and unlocking panning

To lock the panning movement after you have positioned the virtual screen, press Ctrl/F2. To reenable panning, press Ctrl/F2 again.

Locating the Compose Key to Create Special Characters

You can use compose sequences to create special characters. A **compose sequence** is a series of keystrokes that creates characters that do not exist as standard keys on your keyboard.

Table 7–1 lists the location of compose keys on keyboards supported by PC DECwindows Motif.

Table 7–1 Location of Compose Keys

Keyboard	Compose Key
IBM and compatible Enhanced keyboards mapped to an LK201 keyboard layout	Shifted [Escape]
IBM and compatible Enhanced keyboards mapped to an IBM keyboard layout	Not available
LK250 keyboards mapped to an LK201 keyboard layout	[Compose]
LK250 keyboards mapped to an IBM keyboard layout	[Compose]
IBM and compatible 84-key keyboards mapped to an LK201 keyboard layout	Shifted [Sys Req]
IBM and compatible 84-key keyboards to an IBM keyboard layout	Not available

Another way to locate the Compose key on your keyboard is to refer to Appendix B, Illustrations of Supported Keyboard Mappings.

For more information about using compose sequences, see:

- Either of the following user's guides:
  - *VMS DECwindows Desktop Application User's Guide*
  - *ULTRIX Worksystems Software DECwindows Desktop Applications Guide*
- The documentation for your X application

Using the Keyboard Mouse

Ctrl/F3 enables and disables

With the keyboard mouse, you use keys on your keyboard to simulate mouse actions.

To enable the keyboard mouse, press Ctrl/F3.

To disable the keyboard mouse mode, press Ctrl/F3 again.

Table 7–2 provides keyboard equivalents to mouse actions.

Table 7–2 Keyboard Equivalents to Mouse Actions

To simulate this mouse action...	Use this key on the keyboard...
Move the pointer	Arrow keys Press the arrow keys to move the pointer left, right, up, or down. To continuously move the pointer, press and hold an arrow key. The longer you hold an arrow key, the faster the pointer moves.
MB1	KP1 or F1
MB2	KP2 or F2
MB3	KP3 or F3

Note

When the keyboard mouse is enabled, the keys specified in the right column of Table 7–2 are unavailable to X applications. To make the keys available to X applications, you must disable the keyboard mouse.

Disabling Motif Window Manager Accelerators for a 2-Button Mouse

The Motif Window Manager defines **accelerators**, or shortcuts, for common windowing operations, such as push to the back. The accelerators are executed by mouse buttons.

If both of the following are true, you must disable the accelerators for the second and third mouse buttons:

- You use the Motif Window Manager.
- You have a 2-button mouse.

To disable the accelerators, copy the MWM2B.RC file from the \XSERVER\REMOTE directory on your personal computer's PATHWORKS system service drive to the root directory in your account on the node where X applications are located. To copy the MWM2B.RC file, enter:

```
C:\> NFT COPY/IMAGE d:\XSERVER\REMOTE\MWM2B.RC
nodename"username password"::mwm2b.rc
```

Command Element	Explanation
d	The drive letter for the PATHWORKS system service drive on your personal computer.
nodename	The node name for the VMS, ULTRIX, or UNIX node where X applications are located.
username	The user name for your account on the VMS, ULTRIX, or UNIX node.
password	The password for your account on the VMS, ULTRIX, or UNIX node.

The following example copies the MWM2B.RC file from the PATHWORKS system service drive N to the VMS account USER1 with the password SECRET; the VMS node is SRVR1:

```
C:\> COPY N:\XSERVER\REMOTE\MWM2B.RC SRVR1"USER1 SECRET"::MWM2B.RC
```

Using Time-Saving Techniques with the X Server

This section describes the following time-saving techniques available to you when you use the X server:

- Exiting the X server
- Clearing fields in the PC Session Manager dialog box
- Using DOS applications without suspending the X server session
- Starting X applications with a command file
- Decreasing X application startup time on VMS nodes (if you use the DECnet network transport protocol)

Exiting the X Server

Ctrl/Alt/F10

You can exit the X server at any time by pressing Ctrl/Alt/F10.

Be sure to exit X applications before exiting the X server; otherwise, you may lose data.

Clearing Fields in the PC Session Manager Dialog Box

Shift/Backspace

To clear information entered in a field of the PC Session Manager dialog box, complete the following steps:

1. Position the cursor somewhere on the field you want to clear; for example, the Application field.
2. Press Shift/Backspace.

Using DOS Applications without Suspending the Session

To use a DOS application without suspending the X server session, enter the following information in the PC Session Manager dialog box:

Enter #DOS in the Node field.

1. In the Node field, enter:

   ```
   #DOS
   ```

Enter the full command in the Application field.

2. In the Application field, enter the full command to start the DOS application you want to use.

For example, to use the SEDT editor to edit the AUTOEXEC.BAT file, enter the following command in the Application field:

```
SEDT AUTOEXEC.BAT
```

3. Click on **Start Application**.

   The DOS application is displayed on your screen.

4. When you are done using the DOS application, exit or quit the application.

   The X server session reappears on your screen.

Starting X Applications with a Command File

If you routinely start the same X applications, you can save time at startup by:

1. Creating a VMS command file or ULTRIX/UNIX shell script that starts the X applications
2. Using the Configuration utility, specifying the command or shell script file in the applications field on the Application Startup Information screen

This section describes how to create:

- A command file to start multiple X applications on a VMS node
- A shell script file to start multiple X applications on an ULTRIX or UNIX node

To Start X Applications on a VMS Node

To create the command file, complete the following steps:

1. Log in to your account on the VMS node.
2. Using any text editor, create a .COM file in your login directory; for example, XAPPS.COM.

3. Enter the commands to start the X applications. Follow these guidelines for determining the correct command line for starting an X application:

Starting DECterm

- To start a DECterm application, use the command CREATE/TERM/DETACH.

Starting other X applications

- For other X applications, use the command lines for starting applications provided in Table 6–3 in Chapter 6 or see the X application's documentation. Precede those commands with SPAWN/NOWAIT. For example, to start the Clock application, enter:

```
$ SPAWN/NOWAIT RUN SYS$SYSTEM:DECW$CLOCK
```

Starting the last X application

- Omit SPAWN/NOWAIT from the last X application you specify in this command file. For example, if the last X application you specify is the XUI Window Manager, enter:

```
$ RUN SYS$SYSTEM:DECW$WINMGR
```

- The last X application you start must be an application that you do not terminate during the X server session.

Examples

The following example command file starts four DECterm applications and the Window Manager:

```
$ CREATE/TERM/DETACH
$ CREATE/TERM/DETACH
$ CREATE/TERM/DETACH
$ CREATE/TERM/DETACH
$ RUN SYS$SYSTEM:DECW$WINMGR
```

The next example command file starts one DECterm application, FileView, Bookreader, and the Window Manager:

```
$ CREATE/TERM/DETACH
$ SPAWN/NOWAIT RUN SYS$SYSTEM:VUE$MASTER
$ SPAWN/NOWAIT RUN SYS$SYSTEM:DECW$BOOKREADER
$ RUN SYS$SYSTEM:DECW$WINMGR
```

4. Save and exit the .COM file.

Specify the .COM file in your configuration file.

5. Start the Configuration utility and complete the following steps:
   a. Choose **Application startup information**.
   b. Enter the node, username, and password for the node on which the X applications are located.

c. In the application field, specify the .COM file. For example:

```
XAPPS.COM
```

The next time you start the X server, the X applications you specified will start automatically.

To Start X Applications on an ULTRIX or UNIX Node

To create a shell script file to start X applications on an ULTRIX or UNIX node:

1. Log in to your user's account on the ULTRIX or UNIX node.
2. Using any editor, create a shell script file in your login directory; for example, **xapps**.
3. Enter the commands to start the X applications. Follow these guidelines for determining the correct command line for starting an application:

Guidelines for starting X applications

- Use the command lines for starting X applications provided in Table 6–4 in Chapter 6 or see the X application's documentation.
- Enter an ampersand (&) at the end of each command.

Examples

The following example shell script file starts four DECterm applications and the Window Manager:

```
/usr/bin/dxterm &
/usr/bin/dxterm &
/usr/bin/dxterm &
/usr/bin/dxterm &
/usr/bin/dxwm &
```

The next example shell script file starts one DECterm application, FileView, and the Window Manager:

```
/usr/bin/dxterm &
/usr/bin/dxue &
/usr/bin/dxwm &
```

4. Save and exit the shell script file.

Make it executable.

5. Make the shell script file executable by entering:

```
# chmod +x scriptfilename
```

Replace scriptfilename with the file name for the shell script file you created.

Specify the shell script file in your configuration file.

6. Start the Configuration utility and:
   a. Choose **Application startup information.**
   b. Enter the node, user name, and password for the node on which the X applications are located.
   c. In the X application field, specify the shell script file. For example:

      ```
      xapps
      ```

   The next time you start the X server, the X applications you specified will start automatically.

Decreasing Startup Time for X Applications on VMS Nodes with DECnet

This section describes how to decrease the startup time for X applications located on a VMS node if you use the DECnet network transport protocol.

Starting an X application on a VMS node using DECnet is a network process. To decrease application startup time for an application located on a VMS node, complete the following steps:

1. Log into your account on the VMS node where the X applications are located.
2. Using any text editor, add the following line to your LOGIN.COM file:

   ```
   $ if f$mode() .eqs "NETWORK" THEN exit
   ```

   Note

   Any symbols placed after this command in your LOGIN.COM file will not be processed for network events; be sure to plan where in your LOGIN.COM file you want to execute this command.

3. Save and exit the LOGIN.COM file.
4. Log out of your account on the VMS node.

Using the X Server from Microsoft Windows

This section provides:

- Information about using the X servers with different memory managers and Microsoft Windows modes with DECnet and TCP/IP
- Guidelines for using the X server from Microsoft Windows

Using the X Server from the Different Microsoft Windows Modes

You can access DWDOS286 and DWDOS386 from several Microsoft Windows modes.

Table 7–3 provides the following information for DWDOS286 and DWDOS386:

- Whether you can access the X server from different combinations of Microsoft Windows modes and memory managers
- The type of memory that is available to the X server when accessing it from the various Microsoft Windows modes
- How quickly you can switch between each Microsoft Windows mode and the X server

Note

The following table refers to the HIMEM.SYS and EMM386.SYS memory managers, which are provided with Microsoft Windows. You may be able to obtain similar results with some third-party memory managers that provide similar functionality. However, use of third-party memory managers is not supported.

Table 7–3 Access to X Servers from Microsoft Windows Modes

Mode and Memory Manager	Able to access DWDOS286?	Able to access DWDOS386?	Memory Available	Switching Performance
Real, with no memory manager	Yes, if you use DECnet and DW286R.PIF[1]	Yes, if you use DECnet and DW386R.PIF[1]	All available extended memory	Medium
Real, with HIMEM	Yes	Yes	All available XMS memory	Medium
Real, with HIMEM and EMM386	Yes	Yes	All available EMS memory	Medium
Standard, with HIMEM	Yes	Yes	All available XMS memory, up to XMS limit in .PIF file	Slow
Standard, with HIMEM and EMM386	Yes	Yes	All available XMS memory, up to XMS limit in .PIF file	Slow
Enhanced, with HIMEM	Yes	No (memory conflict)	Approximately 2 Mbyte, regardless of .PIF file	Fast
Enhanced, with HIMEM and EMM386	Yes	No (memory conflict)	Approximately 2 Mbyte, regardless of .PIF file	Fast

[1]Cannot access with TCP/IP due to insufficient conventional memory to run Microsoft Windows.

Guidelines for Using the X Server from Microsoft Windows

If you use DWDOS286 or DWDOS386 from Microsoft Windows, keep the following guidelines in mind:

Starting the X server

- Start the X server from a Microsoft Windows session.

Note

The configuration file for PC DECwindows Motif (usually called DWDOS.INI) must be on the path.

Use the appropriate .PIF files.

- Digital recommends that you use the appropriate Program Information File (.PIF). Program Information Files provide:
  - Proper memory allocation
  - Faster switching time between Microsoft Windows and the X server
  - Proper execution of the X server when started from Microsoft Windows in the enhanced mode

  For the X servers, use:
  - DWDOS286.PIF or DWDOS386.PIF, under most circumstances
  - DWDOS286R.PIF or DWDOS386R.PIF, if you use Microsoft Windows in real mode with no memory manager

  To use the DWINFO2 or DWINFO3 utilities from Microsoft Windows, use:
  - DWINFO2.PIF or DWINFO3.PIF, under most circumstances
  - DWINFO2R.PIF or DWINFO3R.PIF, if you use Microsoft Windows in real mode with no memory manager

Note

.PIF files are located in the \MSWINV30 directory on the PATHWORKS system service drive.

If your configuration file for the X server is either not on the path or is named something other than DWDOS.INI, you must specify the path or filename in the .PIF file.

Switching between Microsoft Windows and the X server

- Use the Alt/Esc or Ctrl/Esc key combination to switch back to Microsoft Windows from the X server.
- If you are unable to switch from the X server to Microsoft Windows using Alt/Esc or Ctrl/Esc, suspend the X server session and try again.
- After switching to the X server from Microsoft Windows, the screen saver may be enabled, causing the screen to be black. Refresh the display by pressing a key, such as the Shift key.

Running DWDOS286 in enhanced mode

- If you run DWDOS286 from Microsoft Windows in enhanced mode, both of the following are true:
  - The virtual memory manager is unavailable to DWDOS286.
  - The Digital logo screen is not displayed.
- If you use a graphic adapter or video mode supported by PC DECwindows Motif or Microsoft Windows, but not by both, performance may be impacted. For example, you cannot switch between Microsoft Windows in enhanced mode with a VGA driver and the X server when configured for an 8514/a video. Additionally, Microsoft Windows may not recognize all of the enhanced VGA modes (800 x 600) supported by the X server.
- If you switch from an X server to Microsoft Windows or to DOSSHELL (in DOS, Version 5.0), and the X server is configured for a different video graphics adapter than Microsoft Windows or DOSSHELL, you may experience display problems.

  For example, if you switch from the an X server (configured to use the 8514/a video graphics adapter) to Microsoft Windows (configured to use the TIGA video graphics adapter), the X server will continue to be displayed even though Microsoft Windows is active.

  You can switch back to the X server.

Error messages

- Upon termination of the X server, error messages related to DWDOS286 or DWDOS386 are displayed in a Microsoft Windows window. You need to close the window.

Cutting and pasting

- Cut and paste operations between the X server and Microsoft Windows are not supported.

Creating and Specifying Colors for Window Elements

This section describes how to:

- Create additional colors for window elements
- Specify colors for window elements

Creating Additional Colors for Window Elements

The DWDOS.RGB file, located in the \PCAPP directory on your PATHWORKS system service drive, contains the colors available to you for window elements if you use a supported color video card. You can create additional colors.

To add additional colors to the DWDOS.RGB file:

1. Copy the DWDOS.RGB file from the \PCAPP directory to a writeable directory on the path.

   ```
   C:\> COPY DWDOS.RGB C:\directory\*.*
   ```

   Replace "directory" in the command line with the writeable directory where you are copying the DWDOS.RGB file.

   Note

   The DWDOS.RGB file you edit must appear on the path before the \PCAPP directory.

2. Using any text editor, edit the DWDOS.RGB file.

   Each line of the DWDOS.RGB file consists of the color name and three columns of numbers. The three columns of numbers represent the amount of red, green, and blue used in making a particular color. 0 represents the least amount, and 255 represents the greatest amount of the color.

   For example, the DWDOS.RGB file uses the following combinations of red, green, and blue to create the colors light red, black, and midnight blue:

```
                        R      G      B
"lightred"      =     255    127    127
"black"         =       0      0      0
"midnightblue"  =      25     25    112
```

a. Specify a name for the color you are creating. Enclose the color name in quotation marks ("). For example,

```
"strawberryred"
```

b. Specify values for the amount of red, green, and blue to use in the color you are creating.

3. Save and exit the DWDOS.RGB file.

   To assign the color to a window element, see Specifying Colors for Window Elements in this chapter.

Specifying Colors for Window Elements

What colors you can change

If you use a color video mode, you can specify the color of the following window elements:

- Border, for the window manager and for other windows
- Foreground (text or graphics), for the window manager and for other windows
- Background
- Highlighted text or graphics

How to change colors

To specify the color of window elements, complete the following steps:

1. Review the list of colors available to you in the DWDOS.RGB file located in the \PCAPP directory on your PATHWORKS system service drive.
2. Using any text editor, create or modify one of the following defaults files, whichever is appropriate:
   - DECW$XDEFAULTS.DAT file in the SYS$LOGIN directory in your account on the VMS node where your X applications are located
   - .Xdefaults file in the home directory in your account on the ULTRIX or UNIX node where your X applications are located
3. Specify the colors of your choice for the individual window elements. The sample .Xdefaults file in Figure 7–1 specifies the following:
   - Red as the border color of the window manager
   - Yellow as the foreground color of the window manager

- Magenta as the border color of all windows other than the window manager
- Light green as the foreground color of all windows other than the window manager
- Black as the background color of all windows
- White as the color of highlighted text or graphics in all windows

Figure 7–1 Sample Color Specifications in .Xdefaults File

```
wm*WmForm.BorderColor:       red
wm*WmForm.ForegroundColor:   yellow
*BorderColor:                magenta
*Foreground:                 light green
*Background:                 black
*Highlight:                  white
```

4. Save and exit the file.

Customizing Window Sizes and Placement

Since most personal computer screens are smaller than workstation screens, some X applications create windows that do not fit on the personal computer screen.

Two ways to customize windows

If you prefer to customize the window size and placement rather than move hidden portions of the window into view by panning or moving the windows, there are two possible methods available to you:

- Many X applications now have a customize option that allows you to specify the placement of windows.

  See the X application's documentation for information on customizing windows.

- For X applications that do not offer a customize option for the placement of windows, you can usually specify the starting coordinates and size of the windows in a .DAT file on the node where the application is located.

How to edit a .DAT file

To customize the window size and placement by editing a .DAT file:

1. Copy the .DAT file for the X application to your home directory in your account on the node on which the X application is located:

   - If the X application is located on a VMS node, the .DAT file for the application is usually located in either the SYS$LIBRARY directory or the DECW$SYSTEM_DEFAULTS directory.
   - If the X application is located on an ULTRIX or UNIX node, the .DAT file for the application is located in the **/usr/lib/X11/app-defaults** directory in your account on the ULTRIX or UNIX node where your X applications are located.

     The .DAT file name for an X application on an ULTRIX or UNIX node is usually the same as the name for the application's executable with the first letter in uppercase. For example, the name of the executable for Mail is **dxmail**; the name of the .DAT file for Mail is *Dxmail*.

2. Using any text editor, you can change the:

   - X and Y coordinates to specify the placement of windows for the X application
   - Number of columns and rows to specify the size of windows for the X application

Note

Some .DAT files refer to width and height of windows rather than the number of columns and rows. The following sample line from a .DAT file represents a window placement with the X coordinate at 15 and the Y coordinate at 10; the width is 75 and the height is 25.

```
geometry: 15x10+75+25
```

Figure 7–2 shows a sample .DAT file for the EVE editor (TPU.DAT). This file looks the same for X applications located on either a VMS node or an ULTRIX or UNIX node.

Figure 7–2 A Sample TPU.DAT File

```
#
# TPU.DAT - VAXTPU V2.2 1989-05-10  17:49 defaults
# Copyright (c) 1989 Digital Equipment Corporation
#
#
# The following are all the resource names that VAXTPU supports.
#
Tpu.Tpu$MainWindow.Title:  DECwindows VAXTPU
Tpu.Tpu$MainWindow.IconName:  VAXTPU
Tpu.Tpu$MainWindow.X:    10
Tpu.Tpu$MainWindow.Y:    10
#
# The following resource names are commented out so that users
# can specify *rows and *columns and have VAXTPU obey those
# directives. If VAXTPU finds no resource names governing
# the number of rows and columns it should have, it uses 24 rows
# and 80 columns.
#
Tpu.Tpu$MainWindow.Columns: 75
Tpu.Tpu$MainWindow.Rows:  25
#
#
# End of TPU.DAT
```

Saving Memory

This section describes how to increase available memory by:

- Disabling blinking cursors in an X application
- Modifying memory requirements for widgets
- Disabling reserved memory used by widgets and dialog boxes

Disabling Blinking Cursors

A blinking cursor in an X application uses CPU time on the node on which the X application is located. You can disable the blink and save CPU time.

To disable a cursor's blink, complete the following steps:

1. Using any text editor, create or modify one of the following defaults files, whichever is appropriate:
   - DECW$XDEFAULTS.DAT file in the SYS$LOGIN directory in your account on the VMS node where your X applications are located
   - .Xdefaults file in the home directory in your account on the ULTRIX or UNIX node where your X applications are located
2. Add the following lines to the file:

```
*cursorBlinkEnable:off
*blinkRate: 0
```

3. Save and exit the file.

Modifying Memory Requirements for Widgets

You can save memory by editing the defaults file to modify the following file specifications for widgets:

- Size of fonts used
- Width
- Height

The Open dialog box in the Notepad application is an example of a widget that would be affected by editing your defaults file as described in this section.

1. Using any text editor, create or modify one of the following defaults files, whichever is appropriate:
   - DECW$XDEFAULTS.DAT file in the SYS$LOGIN directory in your account on the VMS node where your X applications are located
   - .Xdefaults file in the home directory in your account on the ULTRIX or UNIX node where your X applications are located
2. Edit the "*DwtFileSection*Font:" line so it looks like this:

```
*DwtFileSection*Font: -*-MENU-MEDIUM-R-Normal--*-100-*-*-P-*ISO8859-1
```

3. Save and exit the file.

Disabling Reserved Memory Used by Widgets and Dialog Boxes

By default, after a widget or dialog box has been displayed for the first time during a session, memory is reserved to reduce the amount of time used to display the same widget or dialog box the next time it is needed during the session.

You can conserve memory by disabling the reserve of memory for the display of widgets and dialog boxes in your defaults file.

To disable the reserve of memory for widgets and dialog boxes:

1. Using any text editor, create or modify one of the following defaults files, whichever is appropriate:
   - DECW$XDEFAULTS.DAT file in the SYS$LOGIN directory in your account on the VMS node where your X applications are located
   - .Xdefaults file in the home directory in your account on the ULTRIX or UNIX node where your X applications are located
2. Add a new line or edit the "*autoUnrealize": line so it looks like this:

   ```
   *autoUnrealize: true
   ```

3. Save and exit the file.

Reserving Extended Memory for Suspended Sessions

If, during a suspended session, you run applications that use extended memory, you may want to limit the amount of extended memory available to the X server. Any amount of extended memory beyond the amount you allocate to the X server is available to applications you run during a suspended session.

This section describes how to limit the amount of extended memory available to each of the X servers.

Note

Chapter 3 provides instructions for reserving conventional memory for use with the suspend session feature.

Limiting Extended Memory Available to DWDOS286

To reserve extended memory for applications by limiting the amount of extended memory available to DWDOS286, enter:

```
C:\> SET DOS16M=:[limit]
```

Command Element	Explanation
limit	The maximum amount of extended memory to allocate to DWDOS286.

For example, to limit a maximum of 2 Mbytes of extended memory to DWDOS286, enter:

```
C:\> SET DOS16M=:2M
```

Limiting Extended Memory Available to DWDOS386

To reserve extended memory for applications by limiting the amount of extended memory available to DWDOS386, enter:

```
C:\> SET DOSX=-MAXVCPIMEM [limit]
```

Command Element	Explanation
limit	The maximum amount of extended memory, in bytes, to allocate to DWDOS386.

For example, to limit a maximum of 2 Mbytes of extended memory to DWDOS386, enter:

```
C:\> SET DOSX=-MAXVCPIMEM 2097152
```

Resolving Problems with Incompatible Device Drivers

If you use any of the following extended memory device drivers, you must set the appropriate DOS environment variable to resolve conflicts with the X server:

Incompatible device drivers

- Any 386 memory manager that does not use the 386 Virtual Memory Control Program Interface (VCPI)
- IBM's VDISK (versions prior to Version 4.0)
- IBM's XMA2EMS EMS simulator for PS/2
- Other RAMDRIVE, disk caching, or VDISK programs for which both of the following are true:
  - They do not allocate extended memory other than by the method used by the IBM VDISK Version 4.0 standard or the Microsoft RAMDRIVE standard.
  - They cannot be detected by the X server memory manager or those which cannot be detected by the PC DECwindows Motif memory manager.

This section describes how to run incompatible device drivers with DWDOS286 and DWD0S386.

Running Incompatible Device Drivers with DWDOS286

This section describes how to use DWDOS286 when incompatible DOS drivers are loaded in extended memory.

Specify which portion of extended memory the device drivers must use.

To force DWDOS286 to run with incompatible DOS drivers loaded in extended memory, use the DOS16M environment variable to specify which portion of extended memory DWDOS286 should use.

Enter the following command:

```
C:\> SET DOS16M=[@start_addr[-end_addr]][:size]
```

Command Element	Explanation
start_addr	The starting memory address for DWDOS286 to use.
-end_addr	The ending memory address for DWDOS286 to use.
size	The size of memory for DWDOS286 to use, regardless of its address.

For example, to assign DWDOS286 to use the memory between the memory address areas of 2 Mbytes and 3 Mbytes, leaving other areas of memory available to device drivers, enter the following:

```
C:\> SET DOS16M=@2m-3m
```

To assign DWDOS286 to use any extended memory available above 2 Mbytes, but no extended memory below 2 Mbytes, enter:

```
C:\> SET DOS16M=@2m
```

To assign DWDOS286 to use the last full Mbyte of extended memory, but no extended memory below the last full Mbyte, enter:

```
C:\> SET DOS16M=:1024
```

To make this environment variable effective each time you boot your personal computer, add the command to your AUTOEXEC.BAT file.

Running Incompatible Device Drivers with DWDOS386

This section describes how to use DWDOS386 under any of the following circumstances:

- Your 386 memory manager does not use the 386 Virtual Memory Control Program Interface (VCPI).
- You have an incompatible VDISK driver.
- You have RAMDRIVE, disk caching, or VDISK programs that do not allocate extended memory.

Instructions follow for using the DOSX environment variable to force DWDOS386 to run under each of these conditions.

Note

To make any of the following environment variables effective each time you boot your personal computer, add the appropriate commands to your AUTOEXEC.BAT file.

For a 386 memory manager without the 386 VCPI

To run DWDOS386 with a 386 memory manager that does not use the 386 Virtual Memory Control Program Interface (VCPI), disable the memory manager by entering:

```
C:\> SET DOSX=-CEMM
```

For an incompatible VDISK driver

To run DWDOS386 with an incompatible VDISK driver, enter the following to override inconsistencies in the amount of extended memory available:

```
C:\> SET DOSX=-VDISK
```

For programs that do not allocate extended memory

To limit the amount of extended memory that DWDOS386 can use, specify the starting address in memory available to DWDOS386 by entering:

```
C:\> SET DOSX=-EXTLOW nH
```

Command Element	Explanation
n	The starting memory address to use. "H" represents hex.

For example, if you are using an incompatible disk cache program in the 1 Mbyte to 2 Mbyte extended memory address range, set 2 Mbyte as the starting extended memory address for DWDOS386. To accomplish this, enter the following:

```
C:\> SET DOSX=-EXTLOW 200000H
```

8

Troubleshooting Problems with the X Server

This chapter provides information to help you analyze the following types of problems:

- Abnormal termination of the X server
- X application startup and resource problems
- Problems suspending a session
- Problems with memory

Analyzing Problems with Abnormal Termination

If the X server terminates abnormally and no error messages are displayed on the screen, generate a log file by completing the following steps:

1. Start the X server with the following command:

```
C:\> DWDOSx86 > file.ERR
```

Command Element	Explanation
DWDOSx86	Either DWDOS286 or DWDOS386, depending on the X server you use.
file.ERR	Is the error message log file you are generating; for example, ERROR.ERR.

2. Try to reproduce the problems.

3. Send the .LOG file and a description of the steps that led to the problem to your system administrator or support center.

Note

When generating a log file for X server messages, do not use the suspend session feature. If you do suspend a session, all the output on the screen for the suspended session will be redirected to the log file. To return to the X server session, enter EXIT.

Analyzing X Application Startup and Resource Problems

If you have problems starting an X application located on a VMS node, or if application resources (such as fonts or colors) behave incorrectly, you can troubleshoot the problem by trying one or more of the following methods to analyze the problem:

- If you use the TCP/IP network transport protocol and you tried to start the X application from the PC Session Manager, the name of the X application may be wrong. (This problem cannot be indicated in an error message as it can be with DECnet.)
- Read the NETSERVER.LOG file, created on the VMS node.

  A NETSERVER.LOG file is created on the VMS node every time you try to start an X application from the X server. The messages contained in the NETSERVER.LOG file list the following things:

  - The name of the X application being run
  - Any errors or warnings that occurred
- Start an X application on the VMS node (from a DECterm window) so you can view the error and warning messages that are generated at the node where the application is located.

  The messages will be displayed in the DECterm window.
- If you set the message log file parameter to generate a log file, check that log file for error messages. Otherwise, use the PC DECwindows Motif Configuration utility to generate a log file, then check the log file for error messages.

- You may have reached your maximum configured DECnet or TCP/IP links. Remember, some X applications use more than one link.

  See Chapter 3 for more information on setting the maximum links parameter.

- If the font files are located on a network drive, suspend or exit the session and check the status of the drive.

Analyzing Problems Suspending a Session

If you have problems with suspending a session, check the following:

- Is the swap file location a writeable hard disk drive with at least 1 Mbyte of available memory?

  The swap file location is specified in:

  - The Swap File Location parameter (for DWDOS286)
  - The SET DOSX command in your AUTOEXEC.BAT file (for DWDOS386)

- If you suspended a session to exit to DOS, did you change or delete the temporary swap file?

  If you did change or delete the temporary swap file, you cannot resume the X server session; you must reboot and start the X server again.

Analyzing Problems with Memory

If the X server starts very slowly or if you run out of memory when you run X applications, run one of the memory utilities included with PC DECwindows Motif. The memory utilities included with PC DECwindows Motif are:

- DWINFO2, to check the memory available to DWDOS286
- DWINFO3, to check the memory available to DWDOS386

  Instructions for running DWINFO2 and DWINFO3 are provided in Chapter 3.

- MEMMAN

  Instructions for running MEMMAN are included in *Memory Solutions for Client Administrators*.

The memory utilities let you check the amount of conventional and extended memory that is visible to the X server.

To resolve problems with memory, use the following guidelines:

- If your personal computer does not meet the minimum memory requirements described in Chapter 1, you may need to rearrange memory in your personal computer or reassign PATHWORKS components to different types of memory.

  See *Memory Solutions for Client Administrators* for information on rearranging memory in your personal computer.

  To reassign PATHWORKS components to different types of memory, use the Netsetup utility.

- If the amount of extended memory that is visible to the X server is much lower than the amount installed on your personal computer, you may be using a 386 memory manager that does not use the 386 Virtual Memory Control Program Interface (VCPI).

  If you use a non-VCPI-compliant 386 memory manager, you can do either of the following:

  - See Chapter 7 for information on how to set a DOS environment variable to run the X server with incompatible device drivers.
  - Remove memory managers from the CONFIG.SYS file and reboot your personal computer.

9

Creating Additional Keyboard Mappings

X applications require keyboard mapping information. A **keyboard mapping** defines the use of individual keys, associating the key you press with the X application's interpretation of that key.

Keyboard mapping information is contained in **keysym files**. Ninety-two keysym files are included with the PC DECwindows Motif software. Some applications, however, may use key definitions that are not provided in the keysym file for your your keyboard and country.

You may need to create a new keysym file.

If you use an application that requires a key definition that is not available to you, you can create a new keysym file by modifying a copy of an existing one.

This chapter:

- Describes how to locate and identify existing keysym files so you can select the appropriate file to copy and modify
- Describes the contents of a keysym file so you can make modifications to an existing one
- Describes how to create a new keysym file by modifying an existing file

Appendix B contains illustrations of the keyboard mappings included with the PC DECwindows Motif software.

Appendix C contains illustrations that show the location keys by their X server **keycode** name so you can redefine keys in your keysym file.

A keycode is the hexadecimal number assigned to the key for the purpose of identifying the key regardless of how the key is defined.

Locating and Identifying Existing Keysym Files

Location of keysym files

Keysym files are located in the \XSERVER\KEYSYMS directory on the PATHWORKS system service drive on your personal computer.

Keysym files included with PC DECwindows Motif

Keysym files included with PC DECwindows Motif map each of the following keyboards in different languages/countries:

- IBM and compatible Enhanced keyboards to an LK201 keyboard layout
- IBM and compatible Enhanced keyboards to an IBM keyboard layout
- LK250 keyboards to an LK201 keyboard layout
- LK250 keyboards to an IBM keyboard layout
- IBM and compatible 84-key keyboards to an LK201 keyboard layout
- IBM and compatible 84-key keyboards to an IBM keyboard layout

Naming convention for keysym files

The naming convention for keysym files is:

```
mmmmmklc.TXT
```

Command Element	Explanation
mmmmm	Is one of the following keyboard makes and models: LK250, ISENH (IBM Enhanced and compatible keyboards), or IS84 (IBM and compatible 84-key keyboards).
k	Indicates whether the keyboard is mapped to a Digital LK201 keyboard layout or to an IBM keyboard layout. The letter "D" identifies LK201 keyboard layouts; "I" identifies IBM and compatible keyboard layouts.
lc	Identifies the language/country. US stands for United States English; UK for United Kingdom English; DE for German; SD for Swiss German; FR for French; NO for Norwegian; DK for Danish; IT for Italian; FI for Finnish; CA for Canadian; ES for Spanish; BE for Belgian; LA for Latin American; PO for Portuguese.

For example, the keysym file that maps an LK250 keyboard to an LK201 keyboard layout for the United States is named LK250DUS.TXT.

The file that maps an IBM Enhanced Canadian keyboard layout is named ISENHICA.TXT.

Understanding the Contents of a Keysym File

A keysym file consists of three columns:

The left column identifies the key

- The left column identifies the key by its keycode, as identified in Appendix C.

The middle column specifies the key state

- The middle column specifies which of the following conditions is required for the key definition to apply to the key:
  - Unshifted

    Neither the Shift key nor the Alt key is held down.
  - Shifted

    The Shift key is held down.
  - Altunshifted

    The Alt key is held down, but the Shift key is not held down.
  - Altshifted

    The Alt key and the Shift key are both held down.

Note

The Alt key state for keys located on the numeric keypad is achieved by having the Numlock key on.

The right column defines the use of the key

- The right column contains the keysym name that defines the use of the key identified in the left and middle columns.

  Keysym names always begin with "XK_" or "DXK_". For example:
  - XK_F1 is the keysym name that defines a key as the F1 key.
  - XK_dollar is the keysym name that defines a key as the $ key.

Figure 9–1 displays the beginning of the LK250DUS.TXT file. This part of the file defines the function keys located across the top of LK250 keyboards.

Figure 9–1 Part of a Keysym File

```
;
; LK250D KeySym Text File
;
Version = "DWDOS KEYSYM COMPILER V3.0"
;
Description "Digital LK250 keysym file with DEC LK201-style layout"
;
0x3B    unshifted XK_F1
0x3C    unshifted XK_F2
0x3D    unshifted XK_F3
0x3E    unshifted XK_F4
0x3F    unshifted XK_F5
0x40    unshifted XK_F6
0x41    unshifted XK_F7
0x42    unshifted XK_F8
0x43    unshifted XK_F9
0x44    unshifted XK_F10
0x5F    unshifted XK_F11
0x60    unshifted XK_F12
0x61    unshifted XK_F13
0x62    unshifted XK_F14
;
0x63    unshifted XK_Help
0x64    unshifted XK_Menu
;
0x65    unshifted XK_F17
0x66    unshifted XK_F18
0x67    unshifted XK_F19
0x54    unshifted XK_F20
;
```

Creating a New Keysym File

This section describes how to create a new keysym file so you can define keys required by an X application.

To create a new keysym file:

1. Determine which keysym file contains the keyboard mapping information that most closely resembles the keyboard mapping you need to create.

For example, if you have an LK250 keyboard mapped to a United States LK201 keyboard and you need to redefine two additional keys, you need to copy and modify the LK250DUS.TXT file.

2. Copy the keysym file you want to modify from the \XSERVER\KEYSYMS directory on your personal computer to a writeable directory by entering:

```
C:\> COPY C:\XSERVER\KEYSYMS\mmmmmklc.TXT
C:\directory\
```

Command Element	Explanation
mmmmmklc.TXT	Is the name of the keysym file you are copying.
directory	Is the directory to which you want to copy the .TXT file.

For example, to copy the LK250DUS.TXT file from the \XSERVER\KEYSYMS directory to the C directory, enter:

```
C:\>  COPY C:\XSERVER\KEYSYMS\LK250DUS.TXT C:\*.*
```

3. Identify the keycode for the key you are defining by referring to the illustrations in Appendix C.

4. Using any text editor, modify the keysym file to include the key definitions you need:

   a. Delete the existing keysym name for the key you want to remap.

   b. Enter the valid keysym name for the function you want the key to have.

      Valid keysym names are listed in Appendix D.

   For example, the current definition in the LK250 keysym file for the unshifted key coded 0x3B is F1:

```
0x3B    unshifted       XK_F1
```

   To redefine the key to be a three-quarters (3/4) key, check Appendix D to find the keysym name for the three-quarters key. Edit the line in the keysym file so it looks like this:

```
0x3B    unshifted       XK_threequarters
```

In this example, the unshifted 0x3B key no longer functions as an F1; it now functions as a three-quarters key.

5. Save and exit the file.
6. Run the Keysym Compiler utility to create a binary table by entering the following:

```
C:\> DWKEYSYM mmmmmmklc.TXT [mmmmmmklc.XKS]
```

Command Element	Explanation
mmmmmmklc.TXT	Is the keysym .TXT file you created with new key definitions.
mmmmmmklc.XKS	Is the name for the binary keysym file you are creating.

For example:

```
C:\> DWKEYSYM LK250DUS.TXT LK250DUS.XKS
```

Note

If the path location, keyboard type, and country/language are the same as what is already specified in the keysym file parameter, you do not need to complete the next step.

7. Using the PC DECwindows Configuration utility, specify the new keysym file information on the keysym file parameter screen.

   The X server can now use this file with the new mapping information when you run the X application.

10

Creating Font Files

The font files included with PC DECwindows Motif contain compiled versions of the fonts used by many X applications. Some X applications, however, may use fonts that are not provided with PC DECwindows Motif.

If you use an X application that requires a font that is not available to you, you can do one of the following:

- If the X application provides a .BDF source file for the font you need, you can create the font by compiling the .BDF source file. To compile source files, use the PC DECwindows Motif Font Compiler utility.
- If the X application does not provide a .BDF source file for the font you need, you can substitute a similar, existing font and name it with a font alias that the X application recognizes.

This chapter provides instructions for both of these tasks.

Compiling Additional Font Files

Follow the instructions in this section if both of the following are true:

- You use an X application that requires a font that is not available to you.
- The X application provides a .BDF source file for the font you need.

You can use the Font Compiler utility to compile the .BDF source file so that the file can be used by the X server.

The .BDF source file is a Bitmap Distribution Format file; the compiled file is a .SNF (Server Natural Format) file.

This section describes how to use the Font Compiler utility to compile .BDF source files.

To compile font files, complete the following steps:

1. Change directories to the directory where you want to make the font file available.

Note

You need write access on the drive where you are compiling the font file.

Adding fonts to an existing font directory

- To make the font file available to all users, compile the .BDF source file on the PATHWORKS system service drive in one of the existing directories:
  - \XSERVER\FONTS100 - 100DPI fonts
  - \XSERVER\FONTS75 - 75DPI fonts
  - \XSERVER\FONTSMIT - MIT sample fixed pitch fonts
  - \XSERVER\FONTSOL - Open Look fonts

Note

You must have system privileges to write to the PATHWORKS system service drive. Your system manager should be the one to compile .BDF source files on the PATHWORKS system service drive.

For example:

```
C:\> CD M:\XSERVER\FONTS75
M:\XSERVER\FONTS75> COPY C:NEWFONT.BDF
M:\XSERVER\FONTS75> DWFONT NEWFONT.BDF
```

Making a new font directory

- To make a new font directory, create an empty directory on a local or network drive.

Note

To create a font directory on a network drive you must have write access to the drive.

2. Copy the .BDF source file to the drive and directory where you will compile it, such as C:\NEWFONTS.

Note

.BDF source files are usually provided by the X application. Typically, they are installed when the application is installed. See the application's installation guide for information about the location of the .BDF source files. You may need to rename the .BDF source file so it has a valid DOS file name.

3. Compile the .BDF source file by entering the following at the DOS prompt:

```
C:\> DWFONT fontfilename.BDF
```

Command Element	Explanation
fontfilename.BDF	Is the name of the .BDF file you are compiling.

Caution

Make sure the name of the .BDF input file does not duplicate the name of a .SNF file in the current working directory. After the file is compiled and given a .SNF extension, it overwrites any file with the same name in the current working directory, deleting the previous file.

When the compilation has been successfully completed, the utility displays the full font name of the font just compiled.

The output file has the same name as the input file, except it has a .SNF extension. The output file is placed in the current working directory.

4. Compile any additional .BDF source files you want to make available to the X server.

The Font Compiler utility builds a FONTNAME.MAP file every time a new font is compiled. If a FONTNAME.MAP file already exists, a new entry is added to the file.

The X server uses the FONTNAME.MAP file to locate the DOS file name for a .SNF file. There should be one entry in the FONTNAME.MAP file for every font in the directory.

When a new font is compiled, entries in the FONTNAME.MAP file are sorted alphabetically. The alphabetic sorting is necessary so the X server can locate the entry.

5. If you compiled the font files in a new directory, you need to specify the path location for the new set of fonts in the font path parameter in the personal computer's PC DECwindows Motif configuration file.

   Use the PC DECwindows Motif Configuration utility to modify the font file location parameter. For example, to include fonts located in the \XSERVER\FONTS75 subdirectory on the PATHWORKS system service drive and fonts located in the \NEWFONTS subdirectory on the personal computer's hard disk drive, specify the following for the font file location parameter:

   ```
   %_SYSD%\XSERVER\FONTS75;C:\NEWFONTS\
   ```

Command Element	Explanation
%_SYSD%\XSERVER\FONTS75	Sets the path to search the \XSERVER\FONTS75 directory on the PATHWORKS system service drive.
C:\NEWFONTS\	Sets the path to also search the subdirectory \NEWFONTS on drive C if the font was not found in %_SYSD%\XSERVER\FONTS75.

For more information on running the PC DECwindows Motif Configuration utility, see Chapter 3.

Creating a Font Alias

Follow the instructions in this section if both of the following are true:

- You use an X application that requires a font that is not available to you.
- The X application does not provide a .BDF source file for the font you need.

You can rename an existing font with a **font alias** that the X application recognizes. For example, if an application requires Baskerville fonts (which are not provided by PC DECwindows Motif), you can substitute Times fonts for Baskerville fonts by creating a font alias.

To create a font alias, complete the following steps:

1. Edit or create a file named FONTS.ALI to contain the following for each alias:
   - The alias name you are assigning to an existing font
   - The full font name of the existing font you are using as a substitute

   Note

   Font names and aliases are not case sensitive. If the alias name or the font name contains a space character, the name must be placed in quotes.

   For example, the sample FONT.ALI file in Figure 10–1 does the following:
   - It creates the font alias MY TIMES24 and substitutes an existing Times Roman font.
   - It creates the font alias Baskerville and substitutes an existing DEC Lost World font.

Figure 10–1 Sample FONT.ALI File

```
"MY TIMES24" -adobe-times-medium-r-normal--25-180-100-100-p-125-iso8859-1
Baskerville "-DEC-Lost World-bold-r-normal--50-360-100-100-p-125-iso8859-1"
```

2. Ensure that the location of the FONT.ALI file is on your font path.

   Use the PC DECwindows Motif Configuration utility to modify the font file location parameter. For example, to include fonts located in the \XSERVER\FONTS75 subdirectory on the PATHWORKS system service drive and a FONT.ALI file located in the \ALIAS subdirectory on the personal computer's

hard disk drive, specify the following for the font file location parameter:

```
%_SYSD%:\XSERVER\FONTS75;C:\ALIAS\
```

Command Element	Explanation
%_SYSD%\XSERVER\FONTS75	Sets the path to search the \XSERVER\FONTS75 directory on the PATHWORKS system service drive.
%_SYSD%\NEWFONTS\	Sets the path to also search the subdirectory \ALIAS on drive C if the font was not found in %_SYSD%\XSERVER\FONTS75.

For more information on running the PC DECwindows Motif Configuration utility, see Chapter 3.

A

Messages

This appendix provides information about messages generated by the following components of PC DECwindows Motif:

- The X server
- Keysym Compiler utility
- Font Compiler utility

X Server Messages

This section describes:

- The types of messages you can receive from the X server
- Explanations for X server messages and what action you should take
- Error message code numbers

Types of X Server Messages

Three types of messages

There are three types of messages you can receive from the X server:

- Message boxes
- Log file messages
- Fatal messages

This section provides a brief description of each type of message.

Message Boxes

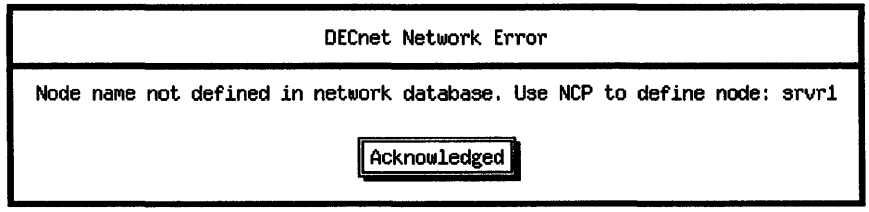
Message boxes are used for informational messages and notify you of minor errors that may be of immediate interest.

A message box contains a title, a message, and an Acknowledged button. While the message box is displayed, no further message boxes will appear so it is important to dismiss the message box after reading the message. Take one of the following actions to dismiss the message box:

- Click on the Acknowledged button.
- Press the Enter or Return key

Figure A–1 shows an example of a message box.

Figure A–1 Message Box Example



Log File Messages

Log file messages are not displayed on the screen; they are displayed in a message log file if the message log file parameter is set to generate one.

Each time you exit an X server session during which an error has occurred, a message is displayed reporting one of the following:

- The number of messages that were entered in this log file, if you set this parameter to generate a log file.

  If you generate a message log file, you must periodically delete it because messages accumulate from one X server session to another.

- The number of messages that would have been logged if you had set this parameter to generate a log file.

For information on setting the message log file parameter to generate a message log file, see Chapter 3, Configuring Your Personal Computer for PC DECwindows Motif .

Fatal Messages

Fatal error messages stop the X server and display a message. These messages are also written to a log file, if you have specified one.

Explanations for X Server Messages

The following information is provided for each X server message:

- The text of the message
- The explanation for the message
- The action you should take

386/VMM: Error reading swap file

Explanation: The X server cannot read a previously written part of the DWDOS386 temporary swap file.

Action: The connection to the network may be down. Try again later.

386/VMM: Error writing swap file

Explanation: The temporary swap file has been deleted or damaged.

Action: Check the temporary swap device to see if it is still valid.

386/VMM: Out of space for swap file

Explanation: The X server was not able to allocate enough disk space for the DWDOS386 temporary swap file.

Action: Check the DOSX environment variable and make sure it points to a valid and writable disk and directory. For more information on the DWDOS386 temporary swap file, see Chapter 3, Configuring Your Personal Computer for PC DECwindows Motif .

Allocation over 64K

Explanation: The DWDOS286 executable tried to allocate a block of memory larger than 64K for internal data.

Action: Restart DWDOS286. If the problem persists, use DWDOS386.

An invalid password was specified

Explanation: This is a Start Application error. The password you entered in the PC Session Manager dialog box is invalid.

Action: Clear the password field and reenter the password. You can clear the field either by clicking on it and pressing the delete key till the field is blank or by pressing Shift/Backspace.

Application not found on remote node: 'node'

Explanation: This is a Start Application error. The application name you have entered in the PC Session Manager dialog box cannot be found on the remote node.

Action: Check your spelling and reenter the application name.

Cannot create DECnet socket. Check that DNP is running.

Explanation: The X server is unable to open a socket/link.

Action: Use the Configuration utility to disconnect some links or increase the NCP "maxlinks" count in the maximum links parameter.

Cannot find color in RGB file: 'colorname'

Explanation: An application is looking for a color that is not listed in the DWDOS.RGB file.

Action: No action is necessary. You may, however, copy the DWDOS.RGB file to the current directory and edit it to contain the missing color name. For more information on adding colors to the DWDOS.RGB file, see Chapter 7, Techniques and Hints. Then restart the X server session.

Cannot find font: 'file specification'

Explanation: The X server cannot find the specified font specification.

Action: Either you specified an incorrect path for the font file or the application requested a nonexistent font file. Use the Configuration utility to check the drive and path in the font file location parameter. If the file does not exist, either compile a new font file or create a font alias. If the application is an older X application that uses the R2 font naming convention, add \XSERVER\FONTSMIT (provided with PC DECwindows Motif to the font path. If the application is a Sun Open Look

application, add \XSERVER\FONTSOL (also provided with PC DECwindows Motif to the font path.

If the font specification is for a font resolution that you are not using (for example, you use the fonts in the \XSERVER\FONTS75 directory, and the font calls for 100 dots per inch resolution as provided by the fonts in the \XSERVER\FONTS100 directory), you may want to add the other fonts directory to the font file location parameter. To make changes to the font file location parameter, use the Configuration utility. (For information about font resolution, see Appendix E.)

Cannot open RGB file: 'filename'

Explanation: The file DWDOS.RGB was not found in the current directory, in any directory on the search path nor in the directory from which the X server was loaded.

Action: Reinstall the PATHWORKS client software correctly. The DWDOS.RGB file should be in the same directory as DWDOS286.EXE and DWDOS386.EXE, usually the \PCAPP directory on the PATHWORKS system service drive.

Cannot read keysym file 'filename'

Explanation: The X server cannot find the file named.

Action: Use the Configuration utility to check the keysym file parameter to see if the keysym drive, directory, and file name are valid.

Cannot read PROTOCOL.INI

Explanation: The file PROTOCOL.INI was found but an error occurred while it was being read.

Action: Reinstall the network.

COMMAND.COM not found. Unable to suspend the session.

Explanation: The COMMAND.COM file pointed to by the environment variable COMSPEC is invalid or was not found at the location specified.

Action: Use the SET COMSPEC command to make sure COMSPEC points to a valid COMMAND.COM file. For example:

```
C:\>  SET COMSPEC=C:\COMMAND.COM
```

Configuration file not found. Run DWCONFIG to create 'filename'.

Explanation: The X server cannot find the configuration file. The X server first looks in the current directory, then in the command search path, and finally in the directory that the executable file is in. If you do not specify a name for the configuration file, the X server searches for DWDOS.INI.

Action: Check that the name is correct and that the file is in one of the searched directories. Use the Configuration utility to create a new configuration file if the desired one doesn't exist.

Could not find the TIGA extended primitives .RLM file

Explanation: The file containing the TIGA extended graphics primitives could not be found. Either the file EXTPRIMS.RLM is missing from the main TIGA directory or the -m option of the TIGA environment variable is not set up correctly.

Action: Reinstall the file EXTPRIMS.RLM from your TIGA V2.0 driver installation disk or correct the -m option of the TIGA environment variable.

Could not open default cursor font 'filename'

Explanation: The X server is unable to open font file 'filename'.

Action: Use the Configuration utility to check the font path and file name in the font file location parameter. Make corrections, if necessary. Restart the X server. If the error still occurs, contact your system administrator.

Could not open default font 'filename'

Explanation: The X server is unable to open font file 'filename'.

Action: Use the Configuration utility to check the font path and file name in the font file location parameter. Make corrections, if necessary. Restart the X server. If the error still occurs, contact your system administrator.

Could not set the default TIGA video mode.

Explanation: The default TIGA graphics mode could not be set. This is most likely because the mode is not supported by the display adapter.

Action: Check the installation of the TIGA V2.0 driver. Be sure that the default video mode that you selected during the TIGA driver installation is appropriate for your video adapter.

DECnet node not found: 'node'

Explanation: The X server was unable to find the address of the specified node name.

Action: Enter the node address directly or use the DECnet Network Control Program (NCP) to add the node name to the personal computer's DECnet database.

Duplicate font name in FONTNAME.MAP: 'filename'

Explanation: The FONTNAME.MAP file in each font directory contains a list of font names with their associated file names. In this case more than one file name was associated with the same font name.

Action: Reinstall the fonts. If both XSERVER\FONTS75 and XSERVER\FONTS100 are specified in the font file location parameter, ignore this message for the fonts that are common between the two directories. Fonts common to both directories are: 6x13, cursor, decw$cursor, decw$session, fixed, and variable.

Error binding DECnet socket.

Explanation: The X server is unable to open a socket/link.

Action: Reboot your personal computer and start the X server again. If you still receive this error message, use the Configuration utility to disconnect some links or increase the NCP "maxlinks" count in the maximum links parameter.

Error creating VM swap file of size 0

Explanation: The DWDOS386 executable could not create the swap file because of insufficient disk space.

Action: Set the DOSX environment variable to point to a swap directory on disk with at least 1 Mbyte available.

Error decoding remote startup password for 'username'

Explanation: This is a Start Application error. The encoded password in the Application Startup Information line of the configuration file is not properly encoded.

Action: Use the Configuration utility to create a new configuration file.

Error initializing pointer device. Load a Microsoft or compatible MOUSE.COM driver.

Explanation: A Microsoft or compatible mouse driver such as MOUSE.COM must be loaded before the server is started.

Action: Load the mouse driver for your mouse hardware or turn off the pointer device with the Configuration utility.

Error messages NOT logged: 'number'
To log messages in a file use DWCONFIG to set Message Log File parameter.

Explanation: This message reports the number of messages that would have been logged if you had set the message log file parameter to generate a log file.

Action: Generating a message log file is not required; however, if you want to generate a log file for messages, use the Configuration utility to set the message log file parameter.

Error reading DWDOS286.EXE file.

Explanation: The network is not available.

Action: Make sure the network is running, or contact your system administrator. You may have lost data during your X server session.

Error reading font: 'filename'

Explanation: The X server cannot read the specified font file.

Action: Using the Configuration utility, check the font file location parameter to see if a network drive is included in the font path. If so, the connection to the network may be down. Try again later.

Error reading from drive: 'drive'

Explanation: This is an MS-DOS error. Data was needed from a removed floppy disk or a network connection that failed. This message is to inform you that some needed data was unavailable.

Action: Suspend the X server session and reestablish the failed network connection. Or, continue the X server session; if other problems occur, terminate the session and start again.

Error reply sent: to client number 'number', request = 'string' error = 'string'

Explanation: The X server received an invalid request from an application. The application is being informed of the error. The strings displayed in this error message are from the DWDOS.STR file.

Action: None required.

Error setting parameter: 'parameter'

Explanation: The parameter name is not valid or the value specified for the parameter is not valid.

Action: If you entered the parameter name on the command line to start the X server, make sure you entered the correct syntax. Or, use the Configuration utility to set all parameters to valid values.

Error writing to drive: 'drive'

Explanation: This is an MS-DOS error. The X server was attempting to write data to a removed floppy disk or a network connection that failed. This message is to inform you that some data may be lost.

Action: Suspend the X server session and reestablish the failed network connection. Or, continue the X server session; if other problems occur, terminate the session and start again.

Failed to set default font path: 'fontpath'

Explanation: The default font path specified in the Font_ path parameter was not valid.

Action: Use the Configuration utility to check and correct the font path parameter. For information on setting the font path parameter, see Chapter 3, Configuring Your Personal Computer for PC DECwindows Motif .

Fatal error: Could not reopen VM swap file after exec

Explanation: The DWDOS386 executable could not open the swap file after resuming from a suspended session.

Action: Restart the X server.

Fatal error: Missing value to command switch

Explanation: The DWDOS386 executable was run, and the DOSX environment variable switch had a bad parameter.

Action: Check the DOSX environment variable. Make sure there is a value after the DOSX variable name. For example, SWAPDIR requires a directory name.

Format error in TIGA extended primitives .RLM file.

Explanation: An error was found in the file EXTPRIMS.RLM when loading the TIGA extended graphics primitives functions.

Action: Recopy the EXTPRIMS.RLM file from the TIGA V2.0 driver installation disk that came with your display adapter.

Host name not found in the HOSTS. file: 'filename'

Explanation: The node name you entered in PC Session Manager dialog box is not defined in the name server's service (if there is one installed) and it is not defined in the TCP/IP HOSTS. file.

Action: Add the node name to the name server's service or add the node name to the HOSTS. file using a text editor. Or, if you prefer, enter the node address, instead of the node name, in the PC Session Manager's Node field.

HOSTS file not found

Explanation: The HOSTS. file, which contains node name information for a TCP/IP network, was not found on the search path.

Action: Run the Netsetup utility. At the Advanced Configuration summary screen, select NETFILES. Specify the full path for the location of the HOSTS. file. Do not include a trailing slash. An example of a path name without a trailing slash is, C:\TCPIP.

Insufficient disk space for swap file

Explanation: The directory specified for temporary files lacks the required 1 Mbyte of available space.

Action: Use the Configuration utility to check the swap file location parameter to make sure it points to a large writable disk that has at least 1 Mbyte of available space, then restart the X server.

Invalid file extension in FONTNAME.MAP: 'filename'

Explanation: The FONTNAME.MAP file in each font directory contains a list of font names with their associated file names. In this case there was a file name that did not have the extension '.SNF'.

Action: Reinstall the fonts.

Invalid password. Please try again.

Explanation: This is a Pause Session error. The password you entered in the Pause Session password field does not match the password stored in the configuration file.

Action: Clear the password field by clicking on the Clear button, then reenter the password. If you have forgotten your password, click on the Cancel button to cancel the X server session and create a new configuration file with the Configuration utility.

Invalid version in font file: 'filename'

Explanation: The version of the font file is not the latest.

Action: Reinstall the font files for the X server.

Invalid version of data file: 'filename'

Explanation: The version of the specified file does not match the required version.

Action: Check that there are no earlier versions of the data file in any directory on the search path or in the current directory.

Invalid version of font map file: 'filename'

Explanation: The version of the specified file does not match the required version.

Action: Check that there are no old font directories in the font search path. Reinstall the font files for the X server.

Invalid video adapter type: 'type'

Explanation: The video parameter is set to a value not found in the DWDOS.VID file.

Action: Use the Configuration utility to check the video parameter to ensure that the appropriate video driver is being loaded.

Local host not defined.

Explanation: The node address for your personal computer is not defined in the TCP/IP HOSTS. file.

Action: Add the node address to the name server's service or add the node name to the HOSTS. file using a text editor.

Maximum network links reached

Explanation: This is a DECnet or TCP/IP Network error. The maximum number of applications that you can run is limited by the maximum links parameter in your configuration file.

Action: If you use DECnet, use the Configuration utility to increase the maximum links parameter. (With TCP/IP, you are limited to 8 links.)

Memory allocation error returned to client 'client number'

Explanation: A request to allocate memory for an application failed.

Action: If you have multiple application windows open, free up memory by exiting any unnecessary applications. If necessary, add memory to your personal computer, or run the application at a different personal computer that has more memory. If the X application ignores this message and continues to attempt allocations, the message could be repeated; if this happens, stop the X application or X server session and start again.

Messages written to log file: 'number'

Explanation: This message reports the number of messages that were logged to the message log file.

Action: Read the message log file to find the errors that occurred during the X server session. Be sure to delete the message log file from time to time, because messages accumulate in the file from one X server session to another.

No application name was specified

Explanation: This is a Start Application error. You did not enter the application name in the Application field in the PC Session Manager dialog box.

Action: Enter the application name and restart the application.

Node name not defined in network database. Use NCP to define node: 'nodename'

Explanation: The node name you entered is not defined in DECnet database.

Action: Use the DECnet Network Control Program (NCP) to define the node. Or enter the node address, instead of the node name, in the PC Session Manager's Node field. For more information on NCP, see your system administrator or Defining Node Names.

No node name was specified

Explanation: This is a Start Application error. You did not enter the node name in the PC Session Manager dialog box.

Action: Enter the node name and restart the application.

Not enough conventional memory to spawn DOS or application

Explanation: There is not enough conventional memory to start an MS-DOS session. You need at least 50 Kbytes to suspend the session.

Action: If you are using the DWDOS286.EXE executable, end the X server session and use the Configuration utility to change the suspend session memory reserve parameter to a higher value.

Not enough disk space for swapping

Explanation: The DWDOS286 executable was started on a machine with too little disk space in the swap file directory.

Action: Use the Configuration utility to change the swap file location to a drive with more available space.

Not enough physical memory. Run DWINFO2 or DWINFO3 to check available memory.

Explanation: There is not enough memory visible to the X server.

Action: Run DWINFO2 or DWINFO3 to check the amount of memory visible to the X server. Sometimes a memory manager program on a 80386 machine will hide extended memory from DWDOS286. Try running the X server without the memory manager. If your personal computer does not meet the minimum memory requirements of PC DECwindows Motif, you may need to rearrange memory in your personal computer or reassign PATHWORKS components to different types of memory. If the amount of extended memory that is visible to the X server is much lower than the amount installed on your personal computer, you may be using a 386 memory manager that does not use the 386 Virtual Memory Control Program Interface (VCPI). For more information, see Chapter 8.

Not enough TMS340 memory to load graphics primitives.

Explanation: There is not enough memory on your TIGA display adapter to load the TIGA extended graphics library functions.

Action: Terminate any applications that may be using TMS340 memory and restart DWDOS. If this fails, restart your computer and reload the TIGA V2.0 driver. If the problem persists, run the appropriate diagnostics on your TMS340 display adapter to check the adapter's memory.

Not enough TMS340 memory to store graphics library symbols.

Explanation: There is not enough memory on your TIGA display adapter to store the TIGA graphics library symbols.

Action: Terminate any applications that may be using TMS340 memory and restart DWDOS. If this fails, restart your computer and reload the TIGA V2.0 driver. If the problem persists, run the appropriate diagnostics on your TMS340 display adapter to check the adapter's memory.

No user name was specified for password

Explanation: This is a Start Application error. You entered a password in the password field but did not enter the user name in the User field of the PC Session Manager dialog box.

Action: Enter the user name and restart the application or clear the password field if you want to use the user name and password in your network database (DECnet only).

No video adapter was specified.

Explanation: The video parameter is not set.

Action: Use the Configuration utility to select a video adapter.

Out of memory allocating local data

Explanation: The X server ran out of memory while trying to allocate space for internal tables.

Action: Remove any unnecessary DOS drivers or terminate-and-stay-resident (TSR) programs. Use the Configuration utility to change the suspend session memory reserve parameter to reduce the amount of conventional memory available, and add more extended memory to your computer. Sometimes a memory manager program on a 80386 machine will hide extended memory from DWDOS286. Try running without the memory manager.

Protected mode requires VCPI within Virtual 8086

Explanation: The X server requires a 386 memory manager that conforms to the Virtual Control Program Interface (VCPI).

Action: Remove the nonconforming 386 memory manager from the CONFIG.SYS file or use one that conforms, then restart the X server.

PROTOCOL.INI not found

Explanation: The file PROTOCOL.INI contains setup information for a TCP/IP network. It was not found on the search path.

Action: Create a new TCP/IP startup diskette using the NETSETUP program.

Remote node is unreachable: 'nodename'

Explanation: This is a Start Application error. The remote node is shut down or your personal computer is not connected to the network.

Action: Try again to start the X server, or check the remote node to make sure it is running and connected to the network. If you are trying to start an application located on a VMS node that uses the TCP/IP network transport, the maximum number of session links on VMS may be exceeded. Check with your VMS system administrator.

Remote Start Error: Login Incorrect.

Explanation: This error occurs when you use TCP/IP and you enter the wrong user name when you try to start applications located on an ULTRIX or UNIX node.

Action: Reenter the user name.

Remote Start Error: Password Incorrect.

Explanation: This error occurs when you use TCP/IP and you enter the wrong password when you try to start applications located on an ULTRIX or UNIX node.

Action: Reenter the password.

Remote startup file not installed on remote node: 'nodename'

Explanation: The application startup software is not installed on the remote DECnet node.

Action: Install the application startup software. For information on installing the software, see your system administrator or Chapter 4, Installing the Application Startup Program.

System does not have an 80386 processor

Explanation: The DWDOS386 executable was run on a system that does not have an Intel 80386 processor.

Action: Run the DWDOS386 executable on a system with an Intel 80386 processor.

TCP/IP host not found: 'node'

Explanation: The X server was unable to find the address of the specified node name.

Action: Check the node name. If correct, add the node name to the name server's service or enter the name and address in the TCP/IP HOSTS. file.

The 386 chip is currently executing in virtual mode under the control of another program. You must turn off this program in order to use 386 | DOS-Extender in protected mode.

Explanation: The DWDOS386 executable was run when a non-VCPI 386 memory manager was already running.

Action: Use a VCPI 386 memory manager or turn off the memory manager with the SET DOSX= -CEMM command.

TIGA board communications initialization failure.

Explanation: The TIGA V2.0 driver was found, but the communications driver could not be opened for use.

Action: Check the installation of the TIGA V2.0 driver. Make sure that the software interrupt that you selected for use by the TIGA driver is not used by any other programs.

TIGA CD is not installed.

Explanation: The TIGA V2.0 communications driver has not been loaded into memory. The driver is needed before the TIGA video mode can be used.

Action: Follow the directions provided with your video adapter for loading the communications driver. Make sure that your TIGA driver conforms to the Version 2.0 standard. If all else fails, select another video type (such as VGA).

TIGA is only supported in 4 and 8 plane Pseudo-color currently.

Explanation: The TIGA support in the server is limited to TIGA video modes with either 4 or 8 planes and a writeable color lookup table.

Action: If the video adapter is capable of more than one TIGA mode, select a default mode that fits within the restrictions. If none of the available modes fits within the restrictions, select another video type (such as VGA).

Timeout occurred connecting to node: 'node'

Explanation: The X server ended its attempt to start an X application because the VMS TCP/IP prompt did not match the prompt specified in the VMS TCP/IP prompt parameter; or the startup time was longer than the number of seconds specified in the VMS TCP/IP timeout parameter.

Action: Using the Configuration utility, either specify the correct prompt in the VMS TCP/IP prompt parameter or increase the number the seconds in the VMS TCP/IP timeout parameter.

Unable to connect to remote node: 'nodename'

Explanation: This is a DECnet or TCP/IP network error. The X server cannot connect to the remote node using the node name you entered in the PC Session Manager dialog box.

Action: There are several things you can do:

1. Check the node name. You may have entered an invalid name.
2. If the node name is correct, the node address definition may be wrong. If you use DECnet, use the Network Control Program (NCP) to check and make corrections the node address. If you use TCP/IP, check the name server's address mapping if there is one installed on your network; otherwise, check and make corrections to the TCP/IP address in the HOSTS. file.
3. If the node name is correct, the application startup software may not be installed on the remote node. The system administrator usually installs this software. Instructions are provided in Chapter 4, Installing the Application Startup Program.
4. Try starting the application by entering the node address, instead of the node name, in the PC Session Manager's Node field.
5. If you use TCP/IP and you are trying to start an application located on a VMS node, use the Netsetup utility to ensure that the network drivers TELNET and BAPI are loaded.
6. If the error continues to occur, the network is disabled. Contact your system administrator.

Unable to initialize network. Load DNP for DECnet and SOCKTSR for TCP/IP.

Explanation: Your personal computer is unable to connect to the PATHWORKS network.

Action: If you use DECnet, make sure the DECnet Protocol driver (DNP) is loaded; if not, run the Netsetup utility to load DNP. If you use TCP/IP, make sure the terminate-and-stay-resident (TSR) socket driver (SOCKTSR) is started; if not, run the Netsetup utility to load that component.

Unauthorized access rejected from node: 'node'

Explanation: An application attempted to connect from a node that was not in the list of authorized nodes.

Action: Use the Configuration utility to modify the Valid Nodes parameter to include the new node name.

Unauthorized modification of access control rejected from node: 'node'

Explanation: An application NOT running on a Controlling Host attempted to change the list of authorized nodes.

Action: Use the Configuration utility to modify the controlling hosts parameter to include the new node name.

Unresolved reference in TIGA extended primitives library

Explanation: The TIGA extended primitives library could not be loaded due to an unresolved reference in the library.

Action: To determine the name of the symbol that is unresolved, invoke "TIGALNK -ec" from the command line. Consult your TIGA driver installation kit for help.

User authorization failure connecting to remote node: 'node-name'

Explanation: This is a Start Application error. You have specified an incorrect user name or password.

Action: Enter this information again and try to start the application.

Write failure occurred connecting to node

Explanation: A failure occurred in an attempt to start an X application.

Action: Make sure the network is running, or contact your system administrator.

Error Message Code Numbers

The following lists of codes correspond to the X server error messages described earlier in this section. If the error message file cannot be found by the X server, a code number is displayed on the screen instead of the message.

How to use error message code numbers

Use the following lists to find the code numbers and corresponding messages for message boxes, log file messages, and fatal messages. Then refer to the section, Explanations for X Server Messages, in this appendix for possible solutions.

Note

The internal error messages indicate internal software errors. In each case, try running the X server again. If the error still occurs, contact your system administrator.

Following is a list of codes and corresponding messages for message box messages:

Message Box error messages - printed in a dialog box on the screen

mb.000 DECnet Network Error
mb.001 Node name not defined in network database. Use NCP to define node.
mb.002 Remote startup file not installed on remote node.
mb.003 Maximum network links reached.
mb.004 User authorization failure connecting to remote node.
mb.005 Remote node is unreachable.
mb.006 Unable to connect to remote node.
mb.007 Application not found on remote node:
mb.008 No application name was specified.
mb.009 No node name was specified.
mb.010 TCP/IP Network Error
mb.011 Unauthorized access rejected from node:
mb.012 Unauthorized modification of access control rejected from node:
mb.013 Error decoding remote startup password for:
mb.014 Not enough conventional memory to spawn DOS or application.

mb.016 COMMAND.COM not found. Unable to suspend the session.
mb.017 Suspend Session Error
mb.018 Start Application Error
mb.019 An invalid password was specified.
mb.020 No user name was specified for password.

mb.022 Memory Error

mb.024 Pause Session Error
mb.025 Invalid Password. Please try again.
mb.026 Host name not found in the HOSTS. file: 'file'
mb.027 Local host not defined.
mb.028 Remote start error:
mb.029 Memory allocation error returned to client:
mb.030 MS-DOS Error
mb.031 Error reading from drive:
mb.032 Error writing to drive:
mb.033 Allocation over 64K
mb.034 Write failure occurred connecting to node:
mb.035 Initial Password Error
mb.036 Unable to connect to remote node. BAPI and TN drivers must be loaded.
mb.037 TCP/IP Remote Startup Error
mb.038 Timeout occurred connecting to node:

Following is a list of codes and corresponding messages for log file messages:

```
Log file messages - only printed when the log_file=file parameter is used

el.000     ******** Starting PC DECwindows Motif ********
el.001     Failed to set default font path:
el.002     Internal error: bad smode in ConfigureWindow:
el.003     Internal error: tying to add resource to invalid client:
el.004     Internal error: backing store clip list void.
el.005     Internal error: trying to rotate odd-sized pixmap.
el.006     Internal error (386): Callbuf too small:
el.007     Internal error: Select error in WaitForSomething():
el.008     Cannot open RGB file:
el.009     Cannot find color in RGB file:
el.010     Internal error: Cannot create TCP/IP socket.
el.011     Internal error: Cannot bind TCP/IP socket.
el.012     Internal error: Cannot create TCP/IP Listening socket.
el.013     Internal error: Error setting TCP/IP socket option:
el.014     Invalid version in font file:
el.015     DECnet node not found:
el.016     TCP/IP host not found:
el.017     PROTOCOL.INI not found
el.018     Cannot read PROTOCOL.INI
el.019     HOSTS file not found
el.020     Duplicate font name in FONTNAME.MAP:
el.021     Invalid file extension in FONTNAME.MAP:
el.022     Cannot find font:
el.023     Error reading font:
el.033     Error reply sent to client number:
el.034     Request =
el.035     Error =
```

Following is a list of codes and corresponding messages for fatal error messages:

```
Fatal error messages - printed after the X server exits

ee.000     PC DECwindows Motif Fatal Error Condition:
ee.001     Messages written to log file:
ee.002     Internal error: Cannot initialize predefined atoms.
ee.003     Internal error: Trying to free non-existent resource:
ee.004     Internal error: Could not create root tile.
ee.005     Internal error: Invalid event number:
ee.006     Internal error: Could not alloc/realloc sprite Trace.
ee.007     Internal error: Invalid keyboard event:
ee.008     Internal error: Invalid pointer event:
ee.009     Internal error: Could not realloc focus trace.
ee.010     Internal error: Client not on event list.
ee.011     Internal error: Could not allocate client array.
ee.012     Internal error: Could not create server client.
ee.013     Internal error: Could not initialize server resources.
ee.014     Internal error: Could not allocate root window table.
ee.015     Internal error: No screens found.
ee.016     Internal error: Failed to create root window.
ee.017     Internal error: Failed to initialize core devices.
ee.018     Could not open default font:
ee.019     Could not open default cursor font:
ee.020     Internal error: Could not create connection block info.
ee.021     Internal error: miBSLineHelper called.
ee.022     Internal error: miSpriteLineHelper called.
ee.023     Internal error: Illegal quadrant mask bit in miarc.c:
ee.024     Internal error: Cannot establish any listening sockets.
ee.025     Internal error: Failed to create data structures for
           input devices.
ee.026     Internal error: Cannot create popup window
ee.027     Cannot read keysym file:
ee.028     Internal error: not implemented.
ee.029     Out of memory allocating local data.
ee.030     No video adapter was specified.
ee.031     Invalid video adapter type:
ee.032     Cannot create DECnet socket. Check that DNP is running.
ee.033     Error binding DECnet socket.
ee.034     Internal error: Error creating DECnet listening socket.
```

ee.035 Error initializing pointer device. Load a Microsoft or compatible MOUSE.COM driver
ee.036 Error setting parameter:
ee.037 Invalid version of data file:
ee.038 Configuration file not found. Run DWCONFIG to create.
ee.039 Internal error: Cannot create refresh window
ee.040 Invalid version of font map file:
ee.041 Unable to initialize network: Load DNP for DECnet and SOCKTSR for TCP/IP.
ee.042 Allocation over 64K
ee.043 Error messages NOT logged
ee.044 To log messages in a file use DWCONFIG to set Message Log File parameter.

ee.048 TIGA CD is not installed.
ee.049 TIGA board communications initialization failure.
ee.050 Could not open the TIGA Communication Driver.
ee.051 Could not set the default TIGA video mode.
ee.052 Not enough TMS340 memory to load graphics primitives.
ee.053 Could not find the TIGA extended primitives .RLM file
ee.054 Unresolved reference in TIGA extended primitives library.
ee.055 Format error in TIGA extended primitives .RLM file.
ee.056 Not enough TMS340 memory to store graphics library symbols.
ee.057 Could not load TIGA extended primitives.
ee.058 TIGA is only supported in 4 and 8 plane Pseudo-color currently:

Following is a list of codes and corresponding messages for fatal error messages related to the Virtual Memory Manager:

```
# Virtual memory manager messages from VMERR.H
# ID is 200 greater than the VM ID.
ee.199      Internal memory manager error: Error
ee.200      Internal memory manager error: Normal exit
ee.201      Internal memory manager error: can't map address to block
ee.202      Internal memory manager error: bad block index
ee.203      Internal memory manager error: can't alloc special seg
ee.204      Internal memory manager error: can't allocate vm info
ee.205      Internal memory manager error: vmi
ee.206      Internal memory manager error: disjoint segments
ee.207      Internal memory manager error: bad alias
ee.208      Internal memory manager error: virtual audit
ee.209      Internal memory manager error: execute prog failure
ee.210      Internal memory manager error: Specify SWAPSIZE or VIRTSIZE
ee.211      Internal memory manager error: MIGRATE option conflict
ee.212      Internal memory manager error: .VMC: max selector must be
            0x100 to 0xFFF8
ee.213      Internal memory manager error: .VMC: blocksize must be 256 to 16K
ee.214      Internal memory manager error: .VMC: blocksize must be power of 2
ee.215      Internal memory manager error: can't open .VMC
ee.216      Internal memory manager error: unrecognized .VMC option:
ee.217      Internal memory manager error: minmem > maxmem
ee.218      Internal memory manager error: TSR Exit
ee.219      Internal memory manager error: insufficient memory
ee.220      Internal memory manager error: can't allocate VMFAT
ee.221      Internal memory manager error: can't allocate VM tables
ee.222      Internal memory manager error: insufficient DOS memory
ee.223      Not enough physical memory. Run DWINFO2 or DWINFO3 to check
            available memory.
ee.224      Internal memory manager error: VM memory allocation error
ee.225      Internal memory manager error: program larger than virtual memory
ee.226      Internal memory manager error: can't create swapfile
ee.227      Not enough disk space for swapping
```

ee.228 Internal memory manager error: out of memory
ee.229 Internal memory manager error: not enough swapspace
ee.230 Internal memory manager error: out of swap space
ee.231 Internal memory manager error: swap out
ee.232 Internal memory manager error: incomplete swap out
ee.233 Internal memory manager error: swapin, no sfx
ee.234 Internal memory manager error: swap in
ee.235 Internal memory manager error: incomplete swap in
ee.236 Internal memory manager error: seg fault recursion
ee.237 Internal memory manager error: DOS active at time of seg fault
ee.238 Internal memory manager error: not vm seg fault
ee.239 Internal memory manager error: codefile seek
ee.240 Error reading DWDOS286.EXE file
ee.241 Internal memory manager error: moveseg
ee.242 Internal memory manager error: moveseg 2
ee.243 Internal memory manager error: vmFree
ee.244 Internal memory manager error: can't open trace
ee.245 Internal memory manager error: can't open binary trace
ee.246 Internal memory manager error: EMS save
ee.247 Internal memory manager error: EMS seek error
ee.248 Internal memory manager error: EMS restore
ee.249 Internal memory manager error: DPMI is incompatible with VMM
ee.300 Internal memory manager error: file format not supported
ee.301 Internal memory manager error: beyond VM selector limit
ee.302 Internal memory manager error: could not allocate transparent segments
ee.303 Internal memory manager error: overlapping selectors
ee.304 Internal memory manager error: too many selectors for GDTs
ee.305 Internal memory manager error: no available vm memory
ee.306 Internal memory manager error: no available selectors
ee.307 Internal memory manager error: 1st selector < 0x100
ee.308 Internal memory manager error: too many spawned programs
ee.309 Internal memory manager error: can't open .EXP file
ee.310 Internal memory manager error: vm loader error

Keysym Compiler Utility Messages

This section describes error messages that may occur when you use the Keysym Compiler utility.

Altunshifted scancode already defined:
'filename(linenumber)',
'scancodename'

Altshifted scancode already defined:
'filename(linenumber)',
'scancodename'

Explanation: You have already defined output for this state of the scancode.

Action: Select whichever of the four states you want and correct the file.

Description not found in 'filename(linenumber)'

Explanation: There is no Description found in the file.

Action: Add a Description to the specified file.

Duplicate Description error in 'filename(linenumber)'

Explanation: There is more than one Description line in the specified file.

Action: Delete the extra description lines.

Error closing file 'outputfilename'

Explanation: There is an error closing the output file.

Action: Try running the compiler again.

Error creating output file due to previous errors: 'outputfilename'

Explanation: Your desired .XKS file has not been created because one or more of the errors listed above has occurred.

Action: Follow the directions for fixing individual errors and recompile.

Error finding input file 'inputfilename'

Explanation: DWKEYSYM could not find the input file you specified.

Action: Check for correct input file name spelling and location.

Error opening output file 'outputfilename'

Explanation: DWKEYSYM could not open the output file you specified. It may already exist and be write-protected.

Action: Ensure that file does not exist, or, that if it does, that it is not write-protected.

Error writing to file 'outputfilename'

Explanation: There is an error writing the output file.

Action: Try running the compiler again after checking the file/disk protection.

Incorrect or missing version string: should be "DWDOS KEYSYM COMPILER Vx.x"

Explanation: The .TXT file you are compiling does not have the current version number in it.

Action: Make sure that the .TXT file you're using is part of the current release of PC DECwindows Motif.

Invalid key state specified: 'filename(linenumber)', statename

Explanation: There is an incorrect key state in the specified file.

Action: Correct the state using one of the following key states:

- unshifted
- shifted
- altunshifted
- altshifted

Invalid keysym: 'filename(linenumber)','keysymname'

Explanation: There is an invalid keysym name in the specified file.

Action: Check Chapter 9 for legal keysym names and their correct spelling.

Invalid scancode name: 'filename(linenumber)',
'scancodename'

Explanation: There is an invalid (misspelled or nonexistent) scancode name used in the file.

Action: Check the .H file for legal entries and spellings.

Scancode number out of range (1-120):
'filename(linenumber)',
scancodename

Explanation: Scancode number is not between 1 and 120.

Action: Correct the scancode number in the specified file.

Shifted scancode already defined:
'filename(linenumber)',
'scancodename'

Unshifted scancode already defined:
'filename(linenumber)',
'scancodename'

Usage: DWKEYSYM filename.txt [filename.xks]

Explanation: You invoked DWKEYSYM with incorrect input or output file names.

Action: Use correct input and, optionally, output file names.

Zero length Description error in 'filename(linenumber)'

Explanation: The Description line contains no description.

Action: Add Description text to the file.

Font Compiler Utility Messages

Bad font file 'filename.snf'

Explanation: The .SNF file is not in the correct format.

Action: Delete the .SNF file. Recompile the font file in the current directory.

Cannot create font name map file

Explanation: You cannot create the font name map file in the current directory.

Action: Move the .SNF files to a different directory and run the Font Compiler utility with the -S option.

Cannot open file snf file 'filename.snf'

Explanation: The .SNF file is found but cannot be read.

Action: Delete the .SNF file. Recompile the font file in the current directory and run the Font Compiler utility with the -S option to create and sort the map file.

Cannot open input file 'filename'

Explanation: The input file specified does not exist.

Action: Restart the compiler with the correct input file name.

Cannot open output file 'filename'

Explanation: You cannot create the output file in the current directory.

Action: Change the current directory to a writeable directory and run the Font Compiler utility again.

Cannot read from file snf file 'filename.snf'

Explanation: The .SNF file cannot be read.

Action: Delete the .SNF file. Recompile the font file in the current directory and run the Font Compiler utility with the -S option to create the map file.

Font requires too much memory

Explanation: The font size exceeds the memory limits of the server.

Action: No user action.

No font files found in current directory

Explanation: The font name map file cannot be created because the .SNF files are not found in the current directory.

Action: Change the current directory to the directory where the .SNF files reside and run the Font Compiler utility with the -S option.

Syntax Errors

If you receive an error with the words "Syntax error" at the beginning of the message, the text after these words tell you what kind of syntax error you made in the .BDF file. Check this text and correct the .BDF file.

The following is a list of the possible syntax errors:

Syntax error: bad 'startfont'

Syntax error: bad 'font'

Syntax error: missing 'size'

Syntax error: bad 'size'

Syntax error: x and y resolution must be equal

Syntax error: missing 'fontbounding box'

Syntax error: missing 'properties'

Syntax error: missing 'endproperties'

Syntax error: too few properties

Syntax error: must have 'font_ascent' and 'font_descent' properties

Syntax error: missing 'property' parameter value

Syntax error: invalid 'property' parameter value

Syntax error: property value missing final right quote

Syntax error: missing 'chars'

Syntax error: bad character name

Syntax error: bad encoding

Syntax error: character 'character name' with encoding = -1 ignored

Syntax error: 'character name' has encoding too large

Syntax error: 'character name' has a negative sized bitmap

Syntax error: bad 'width'

Syntax error: missing 'bitmap'

Syntax error: missing endchar

Syntax error: missing endfont

Syntax error: too few characters

Syntax error: no characters with valid encodings

Syntax error: unexpected EOF

B

Illustrations of Supported Keyboard Mappings

This appendix contains illustrations of keyboard mappings included with PC DECwindows Motif.

The legend accompanying each keyboard mapping provides the following keyboard mapping information:

- The **Key** column identifies a particular key on the physical keyboard.
- The **Unshifted** column specifies the meaning of that key when the key is unshifted.
- The **Shifted** column specifies the meaning of that key when the key is shifted.

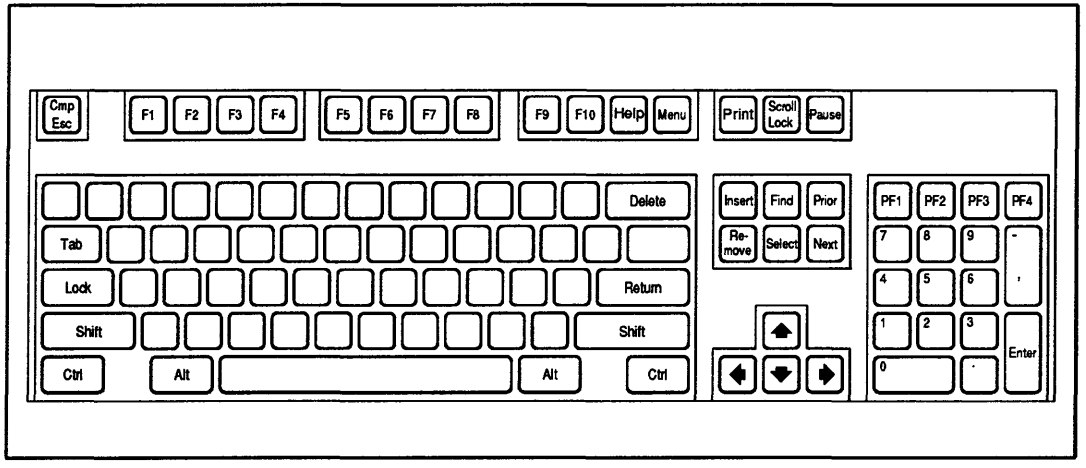


Figure B–1 IBM and Compatible Enhanced Keyboard with LK201 Keyboard Layout

Upper Keypad

Key	*Unshifted*	*Shifted*
Esc	XK_Escape	XK_Multi_key (Compose)
F1	XK_F1	
F2	XK_F2	
F3	XK_F3	
F4	XK_F4	
F5	XK_F5	
F6	XK_F6	
F7	XK_F7	
F8	XK_F8	
F9	XK_F9	
F10	XK_F10	
F11	XK_Help	
F12	XK_Menu	
Print Screen	XK_Print	
Scroll Lock	XK_Scroll Lock	
Pause	XK_Pause	

Editing Keypad

Key	*Unshifted*	*Shifted*
Insert	XK_Insert	
Home	XK_Find	
Page Up	XK_Prior	
Delete	DXK_Remove	
End	XK_Select	
Page Down	XK_Next	
Up Arrow	XK_Up	
Down Arrow	XK_Down	
Left Arrow	XK_Left	
Right Arrow	XK_Right	

Numeric Keypad

Key	*Unshifted*	*Shifted*
Num Lock	XK_KP_F1	
/	XK_KP_F2	
*	XK_KP_F3	
-	XK_KP_F4	
7	XK_KP_7	
8	XK_KP_8	
9	XK_KP_9	
+	XK_KP_Separator	XK_KP_Subtract
4	XK_KP_4	
5	XK_KP_5	
6	XK_KP_6	
1	XK_KP_1	
2	XK_KP_2	
3	XK_KP_3	
Enter	XK_KP_Enter	
0	XK_KP_0	
.	XK_KP_Decimal	

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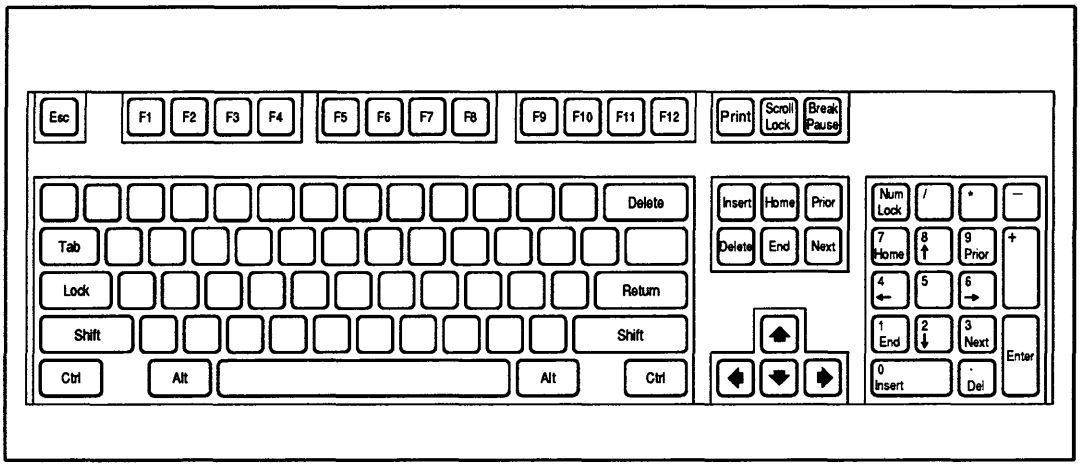

Figure B–2 IBM and Compatible Enhanced Keyboard with IBM Keyboard Layout

Upper Keypad

Key	*Unshifted*	*Shifted*	*Key*	*Unshifted*	*Shifted*
Esc	XK_Escape		F8	XK_F8	
F1	XK_F1		F9	XK_F9	
F2	XK_F2		F10	XK_F10	
F3	XK_F3		F11	XK_F11	
F4	XK_F4		F12	XK_F12	
F5	XK_F5		Print Screen	XK_Print	
F6	XK_F6		Scroll Lock	XK_Scroll_Lock	
F7	XK_F7		Pause	XK_Pause	XK_Break

Editing Keypad

Key	*Unshifted*	*Shifted*
Insert	XK_Insert	
Home	XK_Home	
Page Up	XK_Prior	
Delete	XK_Delete	
End	XK_End	
Page Down	XK_Next	
Up Arrow	XK_Up	
Down Arrow	XK_Down	
Left Arrow	XK_Left	
Right Arrow	XK_Right	

Numeric Keypad

Key	*Unshifted*	*Shifted*	*Key*	*Unshifted*	*Shifted*
Num Lock	XK_Num Lock		5		XK_KP_5
/	XK_Divide		6	XK_Right	XK_KP_6
*	XK_Multiply		1	XK_End	XK_KP_1
-	XK_Subtract		2	XK_Down	XK_KP_2
7	XK_Home	XK_KP_7	3	XK_Next	XK_KP_3
8	XK_Up	XK_KP_8	Enter	XK_Enter	
9	XK_Prior	XK_KP_9	0	XK_Insert	XK_KP_0
+	XK_Add	XK_Add	.	XK_Delete	XK_Decimal
4	XK_Left	XK_KP_4			

NOTE:
Shift and Num Lock can be used to toggle the Numeric Keypad between numeric and editing output. When Num Lock is on, the shifted key value will be in effect.

TA-0783-AC

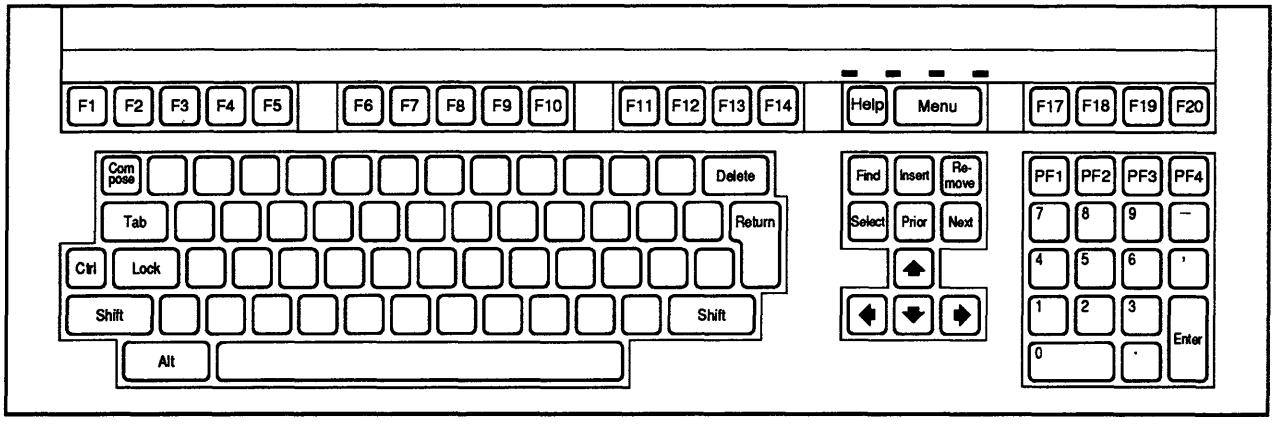

Figure B–3 LK250 Keyboard with LK201 Keyboard Layout

Upper Keypad

Key	*Unshifted*	*Shifted*
F1	XK_F1	
F2	XK_F2	
F3	XK_F3	
F4	XK_F4	
F5	XK_F5	
F6	XK_F6	
F7	XK_F7	
F8	XK_F8	
F9	XK_F9	
F10	XK_F10	

Key	*Unshifted*	*Shifted*
F11	XK_F11	
F12	XK_F12	
F13	XK_F13	
F14	XK_F14	
F15	XK_Help	
F16	XK_Menu	
F17	XK_F17	
F18	XK_F18	
F19	XK_F19	
F20	XK_F20	
Compose	XK_Multi_key	

Editing Keypad

Key	*Unshifted*	*Shifted*
Find	XK_Find	
Insert Here	XK_Insert	
Remove	DXK_Remove	
Select	XK_Select	
Prev	XK_Prior	
Next	XK_Next	
Up Arrow	XK_Up	
Down Arrow	XK_Down	
Left Arrow	XK_Left	
Right Arrow	XK_Right	

Numeric Keypad

Key	*Unshifted*	*Shifted*
PF1	XK_KP_F1	
PF2	XK_KP_F2	
PF3	XK_KP_F3	
PF4	XK_KP_F4	
7	XK_KP_7	
8	XK_KP_8	
9	XK_KP_9	
-	XK_KP_Subtract	
4	XK_KP_4	

Key	*Unshifted*	*Shifted*
5	XK_KP_5	
6	XK_KP_6	
,	XK_KP_Separator	
1	XK_KP_1	
2	XK_KP_2	
3	XK_KP_3	
Enter	XK_KP_Enter	
0	XK_KP_0	
.	XK_KP_Decimal	

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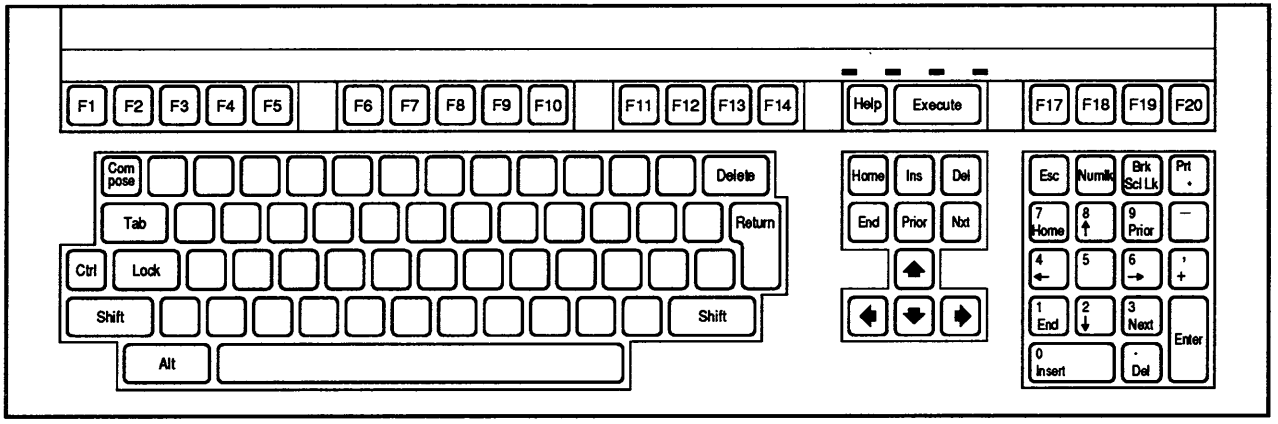

Figure B–4 LK250 Keyboard with IBM and Compatible Keyboard Layout

Upper Keypad

Key	*Unshifted*	*Shifted*
F1	XK_F1	
F2	XK_F2	
F3	XK_F3	
F4	XK_F4	
F5	XK_F5	
F6	XK_F6	
F7	XK_F7	
F8	XK_F8	
F9	XK_F9	
F10	XK_F10	

Key	*Unshifted*	*Shifted*
F11	XK_F11	
F12	XK_F12	
F13	XK_F13	
F14	XK_F14	
Help	XK_Help	
Do	XK_Execute	
F17	XK_F17	
F18	XK_F18	
F19	XK_F19	
F20	XK_F20	
Compose	XK_Multi_key	

Editing Keypad

Key	*Unshifted*	*Shifted*
Find	XK_Home	
Insert Here	XK_Insert	
Remove	XK_Delete	
Select	XK_End	
Prev	XK_Prior	
Next	XK_Next	
Up Arrow	XK_Up	
Down Arrow	XK_Down	
Left Arrow	XK_Left	
Right Arrow	XK_Right	

Numeric Keypad

Key	*Unshifted*	*Shifted*
PF1	XK_Escape	
PF2	XK_Num Lock	
PF3	XK_Scroll Lock	XK_Break
PF4	XK_Multiply	XK_Print
7	XK_Home	XK_KP_7
8	XK_Up	XK_KP_8
9	XK_Prior	XK_KP_9
-	XK_KP_Subtract	
4	XK_Left	XK_KP_4

Key	*Unshifted*	*Shifted*
5		XK_KP_5
6	XK_Right	XK_KP_6
,	XK_KP_Add	XK_KP_Separator
1	XK_End	XK_KP_1
2	XK_Down	XK_KP_2
3	XK_Next	XK_KP_3
Enter	XK_KP_Enter	
0	XK_Insert	XK_KP_0
.	XK_Delete	XK_KP_Decimal

NOTE:
Shift and Num Lock can be used to toggle the Right Keypad between numeric and editing output. When Num Lock is on, the shifted key value will be in effect.

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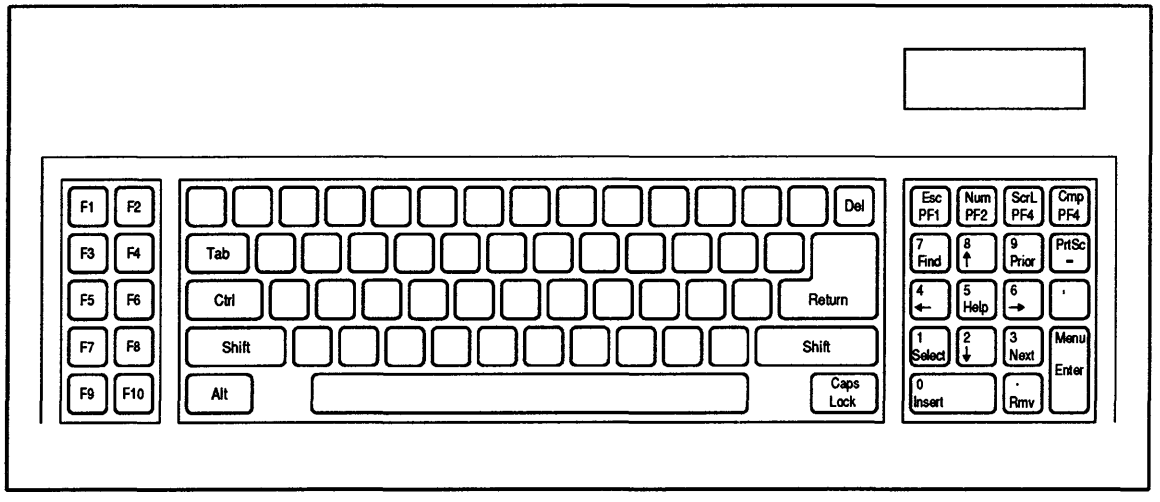

Figure B–5 IBM and Compatible 84-Key Keyboard with LK201 Keyboard Layout

Left (Function) Keypad

Key	*Unshifted*	*Shifted*
F1	XK_F1	
F2	XK_F2	
F3	XK_F3	
F4	XK_F4	
F5	XK_F5	
F6	XK_F6	
F7	XK_F7	
F8	XK_F8	
F9	XK_F9	
F10	XK_F10	

Numeric Keypad

Key	*Unshifted*	*Shifted*
Esc	XK_KP_F1	XK_Escape
Num Lock	XK_KP_F2	XK_Num_Lock
Scroll Lock	XK_KP_F3	XK_Scroll_Lock
SysReq	XK_KP_F4	XK_Multi_key (Compose)
7	XK_Find	XK_KP_7
8	XK_Up	XK_KP_8
9	XK_Prior	XK_KP_9
PrtScr	XK_KP_Subtract	XK_Print
4	XK_Left	XK_KP_4
5	XK_Help	XK_KP_5
6	XK_Right	XK_KP_6
-	XK_KP_Separator	XK_KP_Separator
1	XK_Select	XK_KP_1
2	XK_Down	XK_KP_2
3	XK_Next	XK_KP_3
+	XK_Menu	XK_KP_Enter
0	XK_Insert	XK_KP_0
.	DXK_Remove	XK_KP_Decimal

NOTE:
Shift and Num Lock can be used to toggle the Right Keypad between numeric and editing output. When Num Lock is on, the shifted key value will be in effect.

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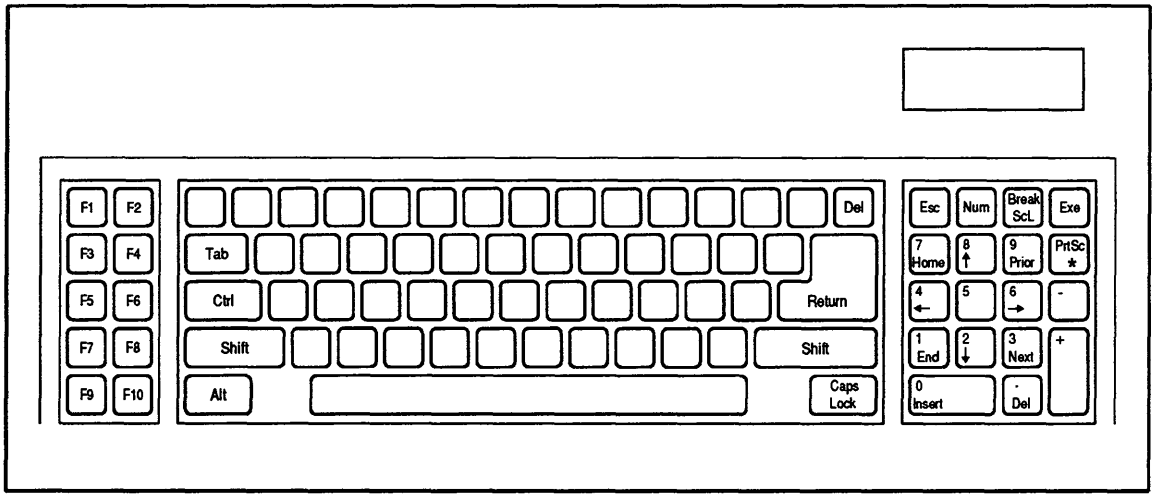

Figure B–6 IBM and Compatible 84-Key Keyboard with IBM Keyboard Layout

Left (Function) Keypad

Key	*Unshifted*	*Shifted*
F1	XK_F1	
F2	XK_F2	
F3	XK_F3	
F4	XK_F4	
F5	XK_F5	
F6	XK_F6	
F7	XK_F7	
F8	XK_F8	
F9	XK_F9	
F10	XK_F10	

Right (Numeric) Keypad

Key	*Unshifted*	*Shifted*
Esc	XK_Escape	
Num Lock	XK_Num_Lock	
Scroll Lock	XK_Scroll_Lock	XK_Break
SysReq	XK_Execute	
7	XK_Home	XK_KP_7
8	XK_Up	XK_KP_8
9	XK_Prior	XK_KP_9
PrtScr	XK_KP_Multiply	XK_Print
4	XK_Left	XK_KP_4

Key	*Unshifted*	*Shifted*
5		XK_KP_5
6	XK_Right	XK_KP_6
-	XK_KP_Subtract	XK_KP_Subtract
1	XK_End	XK_KP_1
2	XK_Down	XK_KP_2
3	XK_Next	XK_KP_3
+	XK_KP_Add	XK_KP_Add
0	XK_Insert	XK_KP_0
.	XK_Delete	XK_KP_Decimal

NOTE:
Shift and Num Lock can be used to toggle the Right Keypad between numeric and editing output. When Num Lock is on, all shifted key value will be in effect.

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C

Keycode Mappings of Supported Keyboards

This appendix contains illustrations of keycode mappings for:

- IBM and compatible Enhanced 101-key keyboards (Figure C–1)
- IBM and compatible Enhanced 102-key keyboards (Figure C–2)
- LK250 keyboards (Figure C–3)
- IBM and compatible 84-key keyboards (Figure C–4)

Use these keycode mappings to identify keys by their keycode name so you can redefine keys in your keysym file. See Chapter 9 for instructions on creating additional keyboard mappings.

Figure C–1 Keycode Map of IBM and Compatible Enhanced 101-Key Keyboards

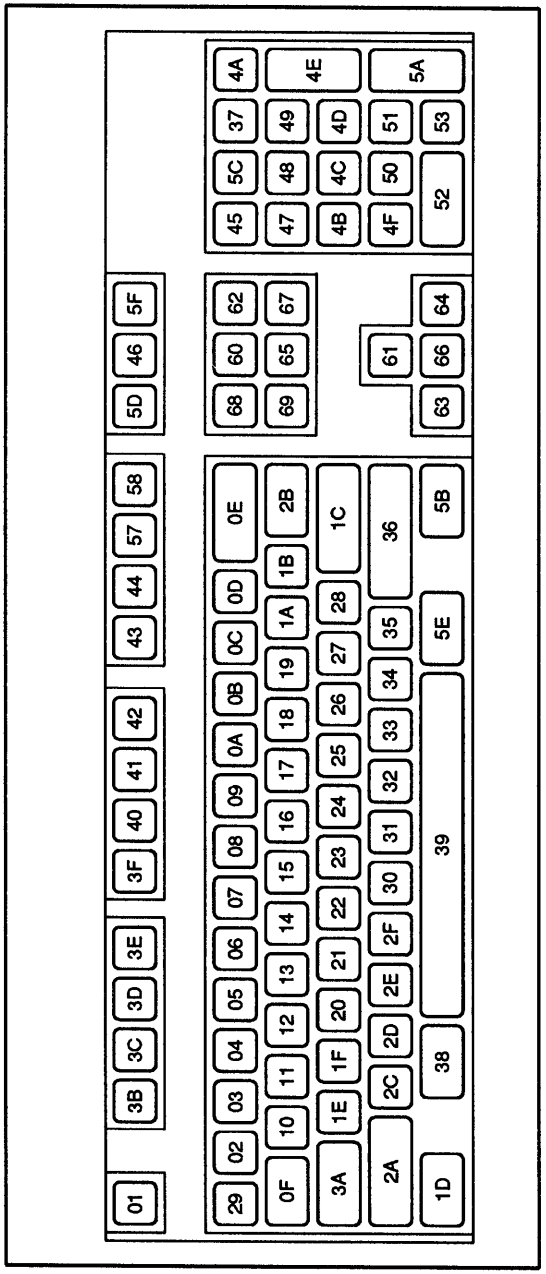


Figure C–2 Keycode Map of IBM and Compatible Enhanced 102-Key Keyboards

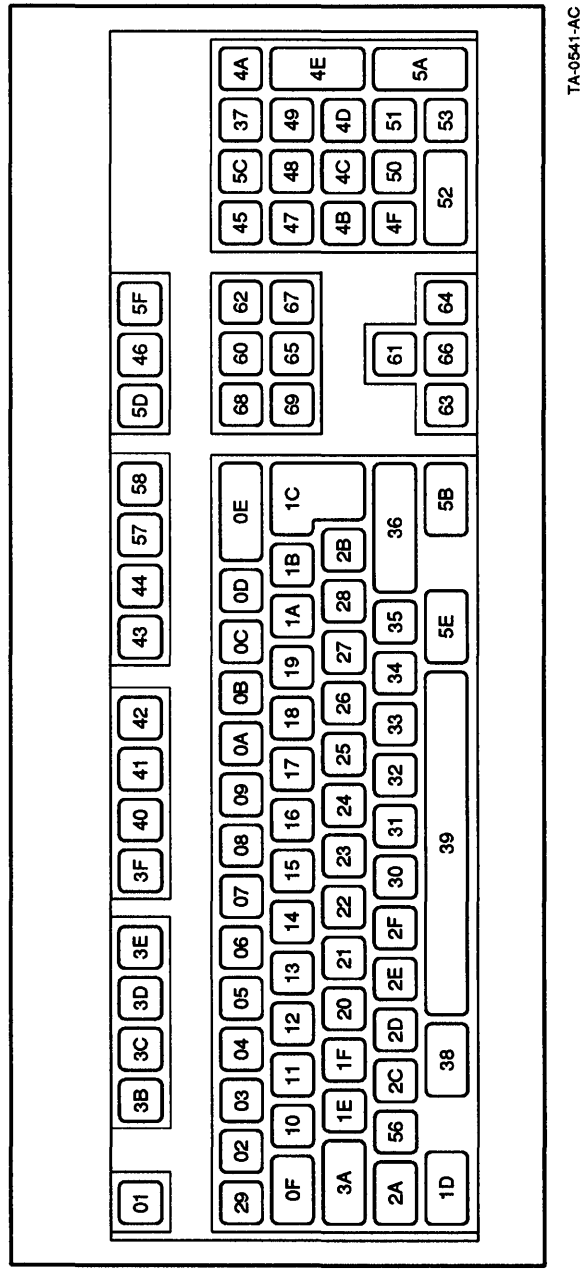


Figure C–3 Keycode Map of LK250 Keyboards

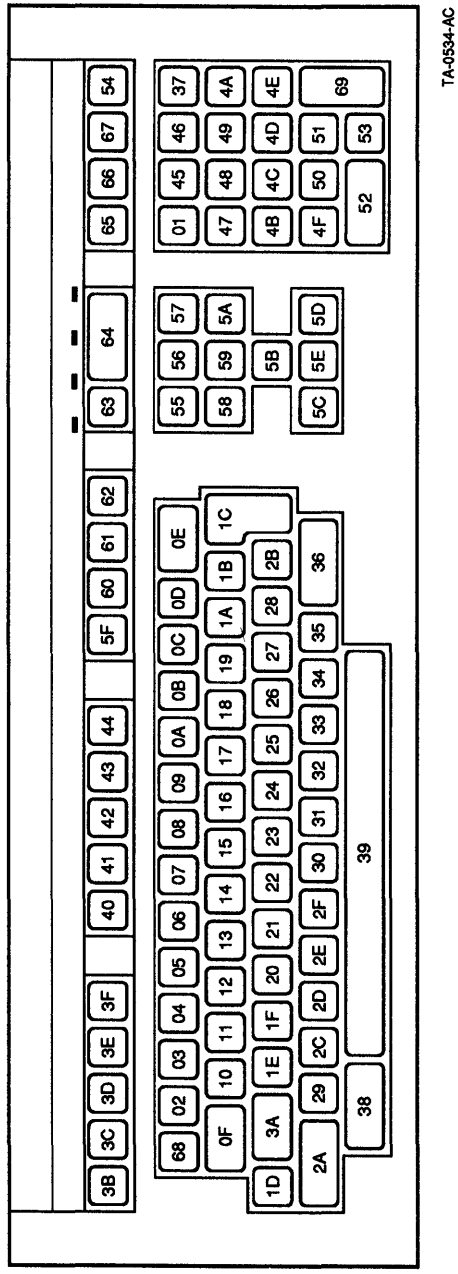
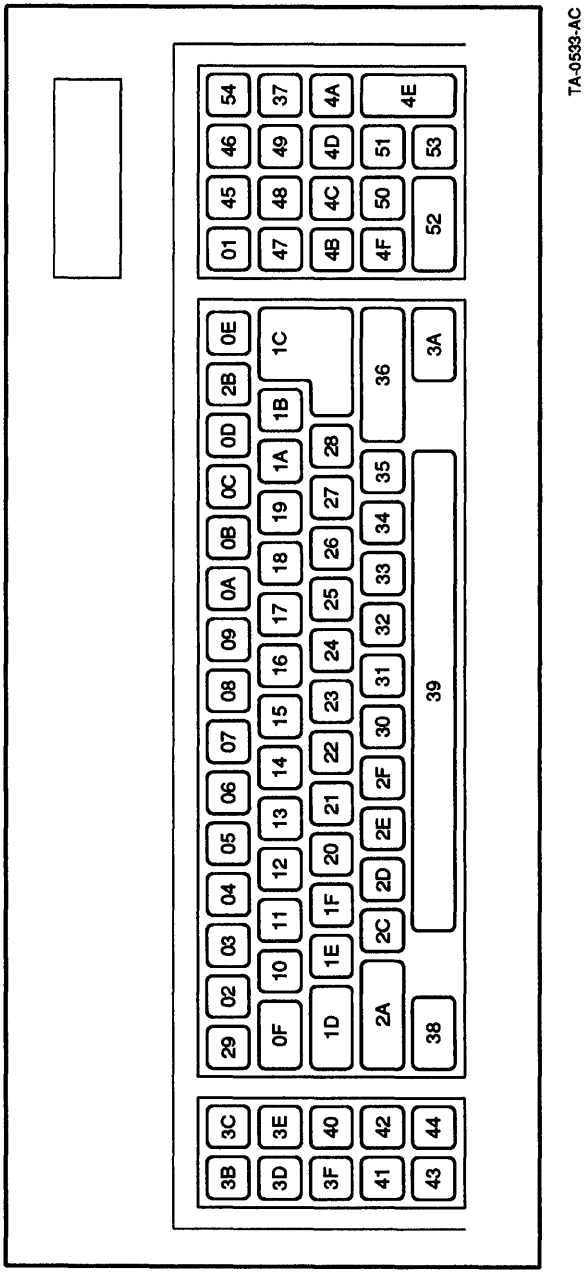


Figure C–4 Keycode Map of IBM and Compatible 84-Key Keyboards



D

Valid Keysym Names

Use this appendix with Chapter 9 to redefine keys in the keysym file for your keyboard and country. Locate the key definition you want to assign to a key on your keyboard to obtain the valid keysym name.

The tables in this appendix specify keysym names for the following types of keys:

- Miscellaneous (Table D–1)
- ISO Latin-1 (Table D–2)
- ISO Latin-2 (Table D–3)
- ISO Latin-3 (Table D–4)
- ISO Latin-4 (Table D–5)
- Katakana (Table D–6)
- Arabic (Table D–7)
- Cyrillic (Table D–8)
- Greek (Table D–9)
- Technical (Table D–10)
- Special (Table D–11)
- Publishing (Table D–12)

- APL (Table D–13)
- Hebrew (Table D–14)
- DEC Private (Table D–15)

Table D–1 Valid Keysym Names—Miscellaneous

Keysym Name	Key Definiton
XK_BackSpace	Backspace, Back Space, or Back Char
XK_Tab	Tab
XK_Linefeed	Linefeed or LF
XK_Clear	Clear
XK_Return	Return or Enter
XK_Pause	Pause or Hold
XK_Scroll_Lock	Scroll Lock
XK_Escape	Escape
XK_Multi_key	Multi-Key Character Preface
XK_Kanji	Kanji or Kanji Convert
XK_Muhenkan	Cancel Conversion
XK_Henkan_Mode	Start/Stop Conversion
XK_Henkan	Alias for Henkan_Mode
XK_Romaji	to Romaji
XK_Hiragana	to Hiragana
XK_Katakana	to Katakana
XK_Hiragana_Katakana	Hiragana/Katakana toggle
XK_Zenkaku	to Zenkaku
XK_Hankaku	to Hankaku
XK_Zenkaku_Hankaku	Zenkaku/Hankaku toggle
XK_Touroku	Add to Dictionary
XK_Massyo	Delete from Dictionary
XK_Kana_Lock	Kana Lock
XK_Kana_Shift	Kana Shift
XK_Eisu_Shift	Alphanumeric Shift
XK_Eisu_toggle	Alphanumeric toggle
XK_Home	Home
XK_Left	Left, Move Left, or Left Arrow
XK_Up	Up, Move Up, or Up Arrow
XK_Right	Right, Move Right, or Right Arrow
XK_Down	Down, Move Down, or Down Arrow
XK_Prior	Prior or Previous
XK_Next	Next
XK_End	END or EOL

(continued on next page)

Table D–1 (Cont.) Valid Keysym Names—Miscellaneous

Keysym Name	Key Definiton
XK_Begin	BEGIN or BOL
XK_Select	Select or Mark
XK_Print	Print
XK_Execute	Execute, Run, or Do
XK_Insert	Insert or Insert Here
XK_Undo	Undo or Oops
XK_Redo	Redo or Again
XK_Menu	Menu
XK_Find	Find or Search
XK_Cancel	Cancel, Stop, Abort, or Exit
XK_Help	Help or Question Mark
XK_Break	Break
XK_Mode_switch	Mode Switch, Script Switch, or Character Set Switch
XK_script_switch	Alias for Mode_switch
XK_Num_Lock	Num Lock
XK_KP_Space	Keypad Space
XK_KP_Tab	Keypad Tab
XK_KP_Enter	Keypad Enter
XK_KP_F1	Keypad F1, PF1, or A
XK_KP_F2	Keypad F2, PF2, or B
XK_KP_F3	Keypad F3, PF3, or C
XK_KP_F4	Keypad F4, PF4, or D
XK_KP_Multiply	Keypad Multiplication Sign or Asterisk
XK_KP_Add	Keypad Plus Sign
XK_KP_Separator	Keypad Separator or Comma
XK_KP_Subtract	Keypad Minus Sign or Hyphen
XK_KP_Decimal	Keypad Decimal Point or Full Stop
XK_KP_Divide	Keypad Division Sign or Solidus
XK_KP_0	Keypad Digit Zero
XK_KP_1	Keypad Digit One
XK_KP_2	Keypad Digit Two
XK_KP_3	Keypad Digit Three
XK_KP_4	Keypad Digit Four
XK_KP_5	Keypad Digit Five
XK_KP_6	Keypad Digit Six
XK_KP_7	Keypad Digit Seven
XK_KP_8	Keypad Digit Eight
XK_KP_9	Keypad Digit Nine
XK_KP_Equal	Keypad Equals Sign

(continued on next page)

Table D–1 (Cont.) Valid Keysym Names—Miscellaneous

Keysym Name	Key Definiton
XK_F1	F1
XK_F2	F2
XK_F3	F3
XK_F4	F4
XK_F5	F5
XK_F6	F6
XK_F7	F7
XK_F8	F8
XK_F9	F9
XK_F10	F10
XK_F11	F11 or L1
XK_L1	F11 or L1
XK_F12	F12 or L2
XK_L2	F12 or L2
XK_F13	F13 or L3
XK_L3	F13 or L3
XK_F14	F14 or L4
XK_L4	F14 or L4
XK_F15	F15 or L5
XK_L5	F15 or L5
XK_F16	F16 or L6
XK_L6	F16 or L6
XK_F17	F17 or L7
XK_L7	F17 or L7
XK_F18	F18 or L8
XK_L8	F18 or L8
XK_F19	F19 or L9
XK_L9	F19 or L9
XK_F20	F20 or L10
XK_L10	F20 or L10
XK_F21	F21 or R1
XK_R1	F21 or R1
XK_F22	F22 or R2
XK_R2	F22 or R2
XK_F23	F23 or R3
XK_R3	F23 or R3
XK_F24	F24 or R4
XK_R4	F24 or R4
XK_F25	F25 or R5

(continued on next page)

Table D–1 (Cont.) Valid Keysym Names—Miscellaneous

Keysym Name	Key Definiton
XK_R5	F25 or R5
XK_F26	F26 or R6
XK_R6	F26 or R6
XK_F27	F27 or R7
XK_R7	F27 or R7
XK_F28	F28 or R8
XK_R8	F28 or R8
XK_F29	F29 or R9
XK_R9	F29 or R9
XK_F30	F30 or R10
XK_R10	F30 or R10
XK_F31	F31 or R11
XK_R11	F31 or R11
XK_F32	F32 or R12
XK_R12	F32 or R12
XK_F33	F33 or R13
XK_R13	F33 or R13
XK_F34	F34 or R14
XK_R14	F34 or R14
XK_F35	F35 or R15
XK_R15	F35 or R15
XK_Shift_L	Left Shift
XK_Shift_R	Right Shift
XK_Control_L	Left Control
XK_Control_R	Right Control
XK_Caps_Lock	Caps Lock
XK_Shift_Lock	Shift Lock
XK_Meta_L	Left Meta
XK_Meta_R	Right Meta
XK_Alt_L	Left Alt
XK_Alt_R	Right Alt
XK_Super_L	Left Super
XK_Super_R	Right Super
XK_Hyper_L	Left Hyper
XK_Hyper_R	Right Hyper
XK_Delete	Delete or Rubout

Table D–2 Valid Keysym Names—ISO Latin-1

Keysym Names	Key Definition
XK_space	Space
XK_exclam	Exclamation Point
XK_quotedbl	Quotation Mark
XK_numbersign	Number Sign
XK_dollar	Dollar Sign
XK_percent	Percent Sign
XK_ampersand	Ampersand
XK_apostrophe	Apostrophe, Quote Right
XK_parenleft	Left Parenthesis
XK_parenright	Right Parenthesis
XK_asterisk	Asterisk
XK_plus	Plus Sign
XK_comma	Comma
XK_minus	Hyphen or Minus Sign
XK_period	Full Stop
XK_slash	Solidus
XK_0	Digit Zero
XK_1	Digit One
XK_2	Digit Two
XK_3	Digit Three
XK_4	Digit Four
XK_5	Digit Five
XK_6	Digit Six
XK_7	Digit Seven
XK_8	Digit Eight
XK_9	Digit Nine
XK_colon	Colon
XK_semicolon	Semicolon
XK_less	Less Than Sign
XK_equal	Equals Sign
XK_greater	Greater Than Sign
XK_question	Question Mark
XK_at	Commercial At
XK_A	Latin Capital Letter A
XK_B	Latin Capital Letter B
XK_C	Latin Capital Letter C
XK_D	Latin Capital Letter D
XK_E	Latin Capital Letter E
XK_F	Latin Capital Letter F

(continued on next page)

Table D–2 (Cont.) Valid Keysym Names—ISO Latin-1

Keysym Names	Key Definition
XK_G	Latin Capital Letter G
XK_H	Latin Capital Letter H
XK_I	Latin Capital Letter I
XK_J	Latin Capital Letter J
XK_K	Latin Capital Letter K
XK_L	Latin Capital Letter L
XK_M	Latin Capital Letter M
XK_N	Latin Capital Letter N
XK_O	Latin Capital Letter O
XK_P	Latin Capital Letter P
XK_Q	Latin Capital Letter Q
XK_R	Latin Capital Letter R
XK_S	Latin Capital Letter S
XK_T	Latin Capital Letter T
XK_U	Latin Capital Letter U
XK_V	Latin Capital Letter V
XK_W	Latin Capital Letter W
XK_X	Latin Capital Letter X
XK_Y	Latin Capital Letter Y
XK_Z	Latin Capital Letter Z
XK_bracketleft	Left Square Bracket
XK_backslash	Reverse Solidus
XK_bracketright	Right Square Bracket
XK_asciicircum	Circumflex Accent
XK_underscore	Low Line
XK_grave	Grave Accent, Quote Left
XK_a	Latin Small Letter a[1]
XK_b	Latin Small Letter b
XK_c	Latin Small Letter c
XK_d	Latin Small Letter d
XK_e	Latin Small Letter e
XK_f	Latin Small Letter f
XK_g	Latin Small Letter g
XK_h	Latin Small Letter h
XK_i	Latin Small Letter i
XK_j	Latin Small Letter j
XK_k	Latin Small Letter k

[1]Use this convention for the following small letter keysyms: for a single, alphabetic keysym that is case-sensitive, treat it as equivalent to a two-element list of the lower and uppercase keysyms.

(continued on next page)

Table D–2 (Cont.) Valid Keysym Names—ISO Latin-1

Keysym Names	Key Definition
XK_l	Latin Small Letter l
LK_m	Latin Small Letter m
XK_n	Latin Small Letter n
XK_o	Latin Small Letter o
XK_p	Latin Small Letter p
XK_q	Latin Small Letter q
XK_r	Latin Small Letter r
XK_s	Latin Small Letter s
XK_t	Latin Small Letter t
XK_u	Latin Small Letter u
XK_v	Latin Small Letter v
XK_w	Latin Small Letter w
XK_x	Latin Small Letter x
XK_y	Latin Small Letter y
XK_z	Latin Small Letter z
XK_braceleft	Left Curly Bracket
XK_bar	Vertical Line
XK_braceright	Right Curly Bracket
XK_asciitilde	Tilde
XK_nobreakspace	No-Break Space
XK_exclamdown	Inverted Exclamation Mark
XK_cent	Cent Sign
XK_sterling	Pound Sign
XK_currency	Currency Sign
XK_yen	Yen Sign
XK_brokenbar	Broken Vertical Bar
XK_section	Paragraph Sign or Section Sign
XK_diaeresis	Diaeresis
XK_copyright	Copyright Sign
XK_ordfeminine	Feminine Ordinal Indicator
XK_guillemotleft	Left Angle Quotation Mark
XK_notsign	Not Sign
XK_hyphen	Hyphen or Minus Sign
XK_registered	Registered Trademark
XK_macron	Macron
XK_degree	Degree Sign or Ring Above
XK_plusminus	Plus-minus Sign
XK_twosuperior	Superscript Two
XK_threesuperior	Superscript Three

(continued on next page)

Table D–2 (Cont.) Valid Keysym Names—ISO Latin-1

Keysym Names	Key Definition
XK_acute	Acute Accent
XK_mu	Micro Sign
XK_paragraph	Paragraph Sign or Pilcrow Sign
XK_periodcentered	Middle Dot
XK_cedilla	Cedilla
XK_onesuperior	Superscript One
XK_masculine	Masculine Ordinal Indicator
XK_guillemotright	Right Angle Quotation Mark
XK_onequarter	Vulgar Fraction One Quarter
XK_onehalf	Vulgar Fraction One Half
XK_threequarters	Vulgar Fraction Three Quarters
XK_questiondown	Inverted Question Mark
XK_Agrave	Latin Capital Letter A with Grave Accent
XK_Aacute	Latin Capital Letter A with Acute Accent
XK_Acircumflex	Latin Capital Letter A with Circumflex Accent
XK_Atilde	Latin Capital Letter A with Tilde
XK_Adiaeresis	Latin Capital Letter A with Diaeresis
XK_Aring	Latin Capital Letter A with Ring Above
XK_AE	Latin Capital Diphthong AE
XK_Ccedilla	Latin Capital Letter C with Cedilla
XK_Egrave	Latin Capital Letter E with Grave Accent
XK_Eacute	Latin Capital Letter E with Acute Accent
XK_Ecircumflex	Latin Capital Letter E with Circumflex Accent
XK_Ediaeresis	Latin Capital Letter E with Diaeresis
XK_Igrave	Latin Capital Letter I with Grave Accent
XK_Iacute	Latin Capital Letter I with Acute Accent
XK_Icircumflex	Latin Capital Letter I with Circumflex Accent
XK_Idiaeresis	Latin Capital Letter I with Diaeresis
XK_ETH	Icelandic Capital Letter ETH
XK_Ntilde	Latin Capital Letter N with Tilde
XK_Ograve	Latin Capital Letter O with Grave Accent
XK_Oacute	Latin Capital Letter O with Acute Accent
XK_Ocircumflex	Latin Capital Letter O with Circumflex Accent
XK_Otilde	Latin Capital Letter O with Tilde
XK_Odiaeresis	Latin Capital Letter O with Diaeresis
XK_multiply	Multiplication Sign
XK_Ooblique	Latin Capital Letter O with Oblique Stroke
XK_Ugrave	Latin Capital Letter U with Grave Accent
XK_Uacute	Latin Capital Letter U with Acute Accent

(continued on next page)

Table D–2 (Cont.) Valid Keysym Names—ISO Latin-1

Keysym Names	Key Definition
XK_Ucircumflex	Latin Capital Letter U with Circumflex Accent
XK_Udiaeresis	Latin Capital Letter U with Diaeresis
XK_Yacute	Latin Capital Letter Y with Acute Accent
XK_THORN	Icelandic Capital Letter THORN
XK_ssharp	German Small Letter Sharp s
XK_agrave	Latin Small Letter a with Grave Accent
XK_aacute	Latin Small Letter a with Acute Accent
XK_acircumflex	Latin Small Letter a with Circumflex Accent
XK_atilde	Latin Small Letter a with Tilde
XK_adiaeresis	Latin Small Letter a with Diaeresis
XK_aring	Latin Small Letter a with Ring Above
XK_ae	Latin Small Diphthong ae
XK_ccedilla	Latin Small Letter c with Cedilla
XK_egrave	Latin Small Letter e with Grave Accent
XK_eacute	Latin Small Letter e with Acute Accent
XK_ecircumflex	Latin Small Letter e with Circumflex Accent
XK_ediaeresis	Latin Small Letter e with Diaeresis
XK_igrave	Latin Small Letter i with Grave Accent
XK_iacute	Latin Small Letter i with Acute Accent
XK_icircumflex	Latin Small Letter i with Circumflex Accent
XK_idiaeresis	Latin Small Letter i with Diaeresis
XK_eth	Icelandic Small Letter eth
XK_ntilde	Latin Small Letter n with Tilde
XK_ograve	Latin Small Letter o with Grave Accent
XK_oacute	Latin Small Letter o with Acute Accent
XK_ocircumflex	Latin Small Letter o with Circumflex Accent
XK_otilde	Latin Small Letter o with Tilde
XK_odiaeresis	Latin Small Letter o with Diaeresis
XK_division	Division Sign
XK_slash	Latin Small Letter o with Oblique Stroke
XK_ugrave	Latin Small Letter u with Grave Accent
XK_uacute	Latin Small Letter u with Acute Accent
XK_ucircumflex	Latin Small Letter u with Circumflex Accent
XK_udiaeresis	Latin Small Letter u with Diaeresis
XK_yacute	Latin Small Letter y with Acute Accent
XK_thorn	Icelandic Small Letter thorn
XK_ydiaeresis	Latin Small Letter y with Diaeresis

Table D–3 Valid Keysym Names—ISO Latin-2

Keysyn Names	Key Definition
XK_Aogonek	Latin Capital Letter A with Ogonek
XK_breve	Breve
XK_Lstroke	Latin Capital Letter L with Stroke
XK_Lcaron	Latin Capital Letter L with Caron
XK_Sacute	Latin Capital Letter S with Acute Accent
XK_Scaron	Latin Capital Letter S with Caron
XK_Scedilla	Latin Capital Letter S with Cedilla
XK_Tcaron	Latin Capital Letter T with Caron
XK_Zacute	Latin Capital Letter Z with Acute Accent
XK_Zcaron	Latin Capital Letter Z with Caron
XK_Zabovedot	Latin Capital Letter Z with Dot Above
XK_aogonek	Latin Small Letter a with Ogonek
XK_ogonek	Ogonek
XK_lstroke	Latin Small Letter l with Stroke
XK_lcaron	Latin Small Letter l with Caron
XK_sacute	Latin Small Letter s with Acute Accent
XK_caron	Caron
XK_scaron	Latin Small Letter s with Caron
XK_scedilla	Latin Small Letter s with Cedilla
XK_tcaron	Latin Small Letter t with Caron
XK_zacute	Latin Small Letter z with Acute Accent
XK_doubleacute	Double Acute Accent
XK_zcaron	Latin Small Letter z with Caron
XK_zabovedot	Latin Small Letter z with Dot Above
XK_Racute	Latin Capital Letter R with Acute Accent
XK_Abreve	Latin Capital Letter A with Breve
XK_Lacute	Latin Capital Letter L with Acute Accent
XK_Cacute	Latin Capital Letter C with Acute Accent
XK_Ccaron	Latin Capital Letter C with Caron
XK_Eogonek	Latin Capital Letter E with Ogonek
XK_Ecaron	Latin Capital Letter E with Caron
XK_Dcaron	Latin Capital Letter D with Caron
XK_Dstroke	Latin Capital Letter D with Stroke
XK_Nacute	Latin Capital Letter N with Acute Accent
XK_Ncaron	Latin Capital Letter N with Caron
XK_Odoubleacute	Latin Capital Letter O with Double Acute Accent
XK_Rcaron	Latin Capital Letter R with Caron
XK_Uring	Latin Capital Letter U with Ring Above
XK_Udoubleacute	Latin Capital Letter U with Double Acute Accent

(continued on next page)

Table D–3 (Cont.) Valid Keysym Names—ISO Latin-2

Keysyn Names	Key Definition
XK_Tcedilla	Latin Capital Letter T with Cedilla
XK_racute	Latin Small Letter r with Acute Accent
XK_abreve	Latin Small Letter a with Breve
XK_lacute	Latin Small Letter l with Acute Accent
XK_cacute	Latin Small Letter c with Acute Accent
XK_ccaron	Latin Small Letter c with Caron
XK_eogonek	Latin Small Letter e with Ogonek
XK_ecaron	Latin Small Letter e with Caron
XK_dcaron	Latin Small Letter d with Caron
XK_dstroke	Latin Small Letter d with Stroke
XK_nacute	Latin Small Letter n with Acute Accent
XK_ncaron	Latin Small Letter n with Caron
XK_odoubleacute	Latin Small Letter o with Double Acute Accent
XK_rcaron	Latin Small Letter r with Caron
XK_uring	Latin Small Letter u with Ring Above
XK_udoubleacute	Latin Small Letter u with Double Acute Accent
XK_tcedilla	Latin Small Letter t with Cedilla
XK_abovedot	Dot Above

Table D–4 Valid Keysym Names—ISO Latin-3

Keysym Names	Key Definition
XK_Hstroke	Latin Capital Letter H with Stroke
XK_Hcircumflex	Latin Capital Letter H with Circumflex Accent
XK_Iabovedot	Latin Capital Letter I with Dot Above
XK_Gbreve	Latin Capital Letter G with Breve
XK_Jcircumflex	Latin Capital Letter J with Circumflex Accent
XK_hstroke	Latin Small Letter h with Stroke
XK_hcircumflex	Latin Small Letter h with Circumflex Accent
XK_idotless	Small Dotless Letter i
XK_gbreve	Latin Small Letter g with Breve
XK_jcircumflex	Latin Small Letter j with Circumflex Accent
XK_Cabovedot	Latin Capital Letter C with Dot Above
XK_Ccircumflex	Latin Capital Letter C with Circumflex Accent
XK_Gabovedot	Latin Capital Letter G with Dot Above
XK_Gcircumflex	Latin Capital Letter G with Circumflex Accent
XK_Ubreve	Latin Capital Letter U with Breve
XK_Scircumflex	Latin Capital Letter S with Circumflex Accent

(continued on next page)

Table D–4 (Cont.) Valid Keysym Names—ISO Latin-3

Keysym Names	Key Definition
XK_cabovedot	Latin Small Letter c with Dot Above
XK_ccircumflex	Latin Small Letter c with Circumflex Accent
XK_gabovedot	Latin Small Letter g with Dot Above
XK_gcircumflex	Latin Small Letter g with Circumflex Accent
XK_ubreve	Latin Small Letter u with Breve
XK_scircumflex	Latin Small Letter s with Circumflex Accent

Table D–5 Valid Keysym Names—ISO Latin-4

Keysym Names	Key Definition
XK_kra	Small Greenlandic Letter kra
XK_Rcedilla	Latin Capital Letter R with Cedilla
XK_Itilde	Latin Capital Letter I with Tilde
XK_Lcedilla	Latin Capital Letter L with Cedilla
XK_Emacron	Latin Capital Letter E with Macron
XK_Gcedilla	Latin Capital Letter G with Cedilla
XK_Tslash	Latin Capital Letter T with Oblique Stroke
XK_rcedilla	Latin Small Letter r with Cedilla
XK_itilde	Latin Small Letter i with Tilde
XK_lcedilla	Latin Small Letter l with Cedilla
XK_emacron	Latin Small Letter e with Macron
XK_gcedilla	Latin Small Letter g with Cedilla Above
XK_tslash	Latin Small Letter t with Oblique Stroke
XK_ENG	Lappish Capital Letter ENG
XK_eng	Lappish Small Letter eng
XK_Amacron	Latin Capital Letter A with Macron
XK_Iogonek	Latin Capital Letter I with Ogonek
XK_Eabovedot	Latin Capital Letter E with Dot Above
XK_Imacron	Latin Capital Letter I with Macron
XK_Ncedilla	Latin Capital Letter N with Cedilla
XK_Omacron	Latin Capital Letter O with Macron
XK_Kcedilla	Latin Capital Letter K with Cedilla
XK_Uogonek	Latin Capital Letter U with Ogonek
XK_Utilde	Latin Capital Letter U with Tilde
XK_Umacron	Latin Capital Letter U with Macron
XK_amacron	Latin Small Letter a with Macron
XK_iogonek	Latin Small Letter i with Ogonek
XK_eabovedot	Latin Small Letter e with Dot Above

(continued on next page)

Table D–5 (Cont.) Valid Keysym Names—ISO Latin-4

Keysym Names	Key Definition
XK_imacron	Latin Small Letter i with Macron
XK_ncedilla	Latin Small Letter n with Cedilla
XK_omacron	Latin Small Letter o with Macron
XK_kcedilla	Latin Small Letter k with Cedilla
XK_uogonek	Latin Small Letter u with Ogonek
XK_utilde	Latin Small Letter u with Tilde
XK_umacron	Latin Small Letter u with Macron

Table D–6 Valid Keysym Names—Katakana

Keysym Names	Key Definition
XK_overline	Overline
XK_kana_fullstop	Kana Full Stop
XK_kana_openingbracket	Kana Opening Bracket
XK_kana_closingbracket	Kana Closing Bracket
XK_kana_comma	Kana Comma
XK_kana_conjunctive	Kana Conjunctive
XK_kana_WO	Kana Letter WO
XK_kana_a	Kana Letter Small a
XK_kana_i	Kana Letter Small i
XK_kana_u	Kana Letter Small u
XK_kana_e	Kana Letter Small e
XK_kana_o	Kana Letter Small o
XK_kana_ya	Kana Letter Small ya
XK_kana_yu	Kana Letter Small yu
XK_kana_yo	Kana Letter Small yo
XK_kana_tsu	Kana Letter Small tsu
XK_prolongedsound	Prolonged Sound Symbol
XK_kana_A	Kana Letter A
XK_kana_I	Kana Letter I
XK_kana_U	Kana Letter U
XK_kana_E	Kana Letter E
XK_kana_O	Kana Letter O
XK_kana_KA	Kana Letter KA
XK_kana_KI	Kana Letter KI
XK_kana_KU	Kana Letter KU
XK_kana_KE	Kana Letter KE
XK_kana_KO	Kana Letter KO

(continued on next page)

Table D–6 (Cont.) Valid Keysym Names—Katakana

Keysym Names	Key Definition
XK_kana_SA	Kana Letter SA
XK_kana_SHI	Kana Letter SHI
XK_kana_SU	Kana Letter SU
XK_kana_SE	Kana Letter SE
XK_kana_SO	Kana Letter SO
XK_kana_TA	Kana Letter TA
XK_kana_CHI	Kana Letter CHI
XK_kana_TSU	Kana Letter TSU
XK_kana_TE	Kana Letter TE
XK_kana_TO	Kana Letter TO
XK_kana_NA	Kana Letter NA
XK_kana_NI	Kana Letter NI
XK_kana_NU	Kana Letter NU
XK_kana_NE	Kana Letter NE
XK_kana_NO	Kana Letter NO
XK_kana_HA	Kana Letter HA
XK_kana_HI	Kana Letter HI
XK_kana_FU	Kana Letter FU
XK_kana_HE	Kana Letter HE
XK_kana_HO	Kana Letter HO
XK_kana_MA	Kana Letter MA
XK_kana_MI	Kana Letter MI
XK_kana_MU	Kana Letter MU
XK_kana_ME	Kana Letter ME
XK_kana_MO	Kana Letter MO
XK_kana_YA	Kana Letter YA
XK_kana_YU	Kana Letter YU
XK_kana_YO	Kana Letter YO
XK_kana_RA	Kana Letter RA
XK_kana_RI	Kana Letter RI
XK_kana_RU	Kana Letter RU
XK_kana_RE	Kana Letter RE
XK_kana_RO	Kana Letter RO
XK_kana_WA	Kana Letter WA
XK_kana_N	Kana Letter N
XK_voicedsound	Voiced Sound Symbol
XK_semivoicedsound	Semi-voiced Sound Symbol
XK_kana_switch	Alias for Mode_switch

Table D–7 Valid Keysym Names—Arabic

Keysym Names	Key Definition
XK_Arabic_comma	Arabic Letter COMMA
XK_Arabic_semicolon	Arabic Letter SEMICOLON
XK_Arabic_question_mark	Arabic Letter QUESTION_MARK
XK_Arabic_hamza	Arabic Letter HAMZA
XK_Arabic_maddaonalef	Arabic Letter MADDAONALEF
XK_Arabic_hamzaonalef	Arabic Letter HAMZAONALEF
XK_Arabic_hamzaonwaw	Arabic Letter HAMZAONWAW
XK_Arabic_hamzaunderalef	Arabic Letter HAMZAUNDERALEF
XK_Arabic_hamzaonyeh	Arabic Letter HAMZAONYEH
XK_Arabic_alef	Arabic Letter ALEF
XK_Arabic_beh	Arabic Letter BEH
XK_Arabic_tehmarbuta	Arabic Letter TEH MARBUTA
XK_Arabic_teh	Arabic Letter TEH
XK_Arabic_theh	Arabic Letter THEH
XK_Arabic_jeem	Arabic Letter JEEM
XK_Arabic_hah	Arabic Letter HAH
XK_Arabic_khah	Arabic Letter KHAH
XK_Arabic_dal	Arabic Letter DAL
XK_Arabic_thal	Arabic Letter THAL
XK_Arabic_ra	Arabic Letter RA
XK_Arabic_zain	Arabic Letter ZAIN
XK_Arabic_seen	Arabic Letter SEEN
XK_Arabic_sheen	Arabic Letter SHEEN
XK_Arabic_sad	Arabic Letter SAD
XK_Arabic_dad	Arabic Letter DAD
XK_Arabic_tah	Arabic Letter TAH
XK_Arabic_zah	Arabic Letter ZAH
XK_Arabic_ain	Arabic Letter AIN
XK_Arabic_ghain	Arabic Letter GHAIN
XK_Arabic_tatweel	Arabic Letter TATWEEL
XK_Arabic_feh	Arabic Letter FEH
XK_Arabic_qaf	Arabic Letter QAF
XK_Arabic_kaf	Arabic Letter KAF
XK_Arabic_lam	Arabic Letter LAM
XK_Arabic_meem	Arabic Letter MEEM
XK_Arabic_noon	Arabic Letter NOON
XK_Arabic_ha	Arabic Letter HA
XK_Arabic_waw	Arabic Letter WAW
XK_Arabic_alefmaksura	Arabic Letter ALEF MAKSURA

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Table D–7 (Cont.) Valid Keysym Names—Arabic

Keysym Names	Key Definition
XK_Arabic_yeh	Arabic Letter YEH
XK_Arabic_fathatan	Arabic Letter FATHATAN
XK_Arabic_dammatan	Arabic Letter DAMMATAN
XK_Arabic_kasratan	Arabic Letter KASRATAN
XK_Arabic_fatha	Arabic Letter FATHA
XK_Arabic_damma	Arabic Letter DAMMA
XK_Arabic_kasra	Arabic Letter KASRA
XK_Arabic_shadda	Arabic Letter SHADDA
XK_Arabic_sukun	Arabic Letter SUKUN
XK_Arabic_switch	Alias for Mode_switch

Table D–8 Valid Keysym Names—Cyrillic

Keysym Names	Key Definition
XK_Serbian_dje	Serbian Small Letter dje
XK_Macedonia_gje	Macedonian Small Letter gje
XK_Cyrillic_io	Cyrillic Small Letter io
XK_Ukrainian_ie	Ukrainian Small Letter je
XK_Macedonia_dse	Macedonian Small Letter dse
XK_Ukrainian_i	Byelorussian/Ukrainian Cyrillic Small Letter i
XK_Ukrainian_yi	Ukrainian Small Letter yi
XK_Cyrillic_je	Cyrillic Small Letter je
XK_Cyrillic_lje	Cyrillic Small Letter lje
XK_Cyrillic_nje	Cyrillic Small Letter nje
XK_Serbian_tshe	Serbian Small Letter tshe
XK_Macedonia_kje	Macedonian Small Letter kje
XK_Byelorussian_shortu	Byelorussian Small Letter Short u
XK_Cyrillic_dzhe	Cyrillic Small Letter dzhe
XK_numerosign	Numero Sign
XK_Serbian_DJE	Serbian Capital Letter DJE
XK_Macedonia_GJE	Macedonian Capital Letter GJE
XK_Cyrillic_IO	Cyrillic Capital Letter IO
XK_Ukrainian_IE	Ukrainian Cyrillic Capital Letter JE
XK_Macedonia_DSE	Macedonian Capital Letter DSE
XK_Ukrainian_I	Byelorussian/Ukrainian Capital Letter I
XK_Ukrainian_YI	Ukrainian Capital Letter YI
XK_Cyrillic_JE	Cyrillic Capital Letter JE
XK_Cyrillic_LJE	Cyrillic Capital Letter LJE

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Table D–8 (Cont.) Valid Keysym Names—Cyrillic

Keysym Names	Key Definition
XK_Cyrillic_NJE	Cyrillic Capital Letter NJE
XK_Serbian_TSHE	Serbian Capital Letter TSHE
XK_Macedonia_KJE	Macedonian Cyrillic Capital Letter KJE
XK_Byelorussian_SHORTU	Byelorussian Capital Letter Short U
XK_Cyrillic_DZE	Cyrillic Capital Letter DZE
XK_Cyrillic_yu	Cyrillic Small Letter yu
XK_Cyrillic_a	Cyrillic Small Letter a
XK_Cyrillic_be	Cyrillic Small Letter be
XK_Cyrillic_tse	Cyrillic Small Letter tse
XK_Cyrillic_de	Cyrillic Small Letter de
XK_Cyrillic_ie	Cyrillic Small Letter ie
XK_Cyrillic_ef	Cyrillic Small Letter ef
XK_Cyrillic_ghe	Cyrillic Small Letter ghe
XK_Cyrillic_ha	Cyrillic Small Letter ha
XK_Cyrillic_i	Cyrillic Small Letter i
XK_Cyrillic_shorti	Cyrillic Small Letter Short i
XK_Cyrillic_ka	Cyrillic Small Letter ka
XK_Cyrillic_el	Cyrillic Small Letter el
XK_Cyrillic_em	Cyrillic Small Letter em
XK_Cyrillic_en	Cyrillic Small Letter en
XK_Cyrillic_o	Cyrillic Small Letter o
XK_Cyrillic_pe	Cyrillic Small Letter pe
XK_Cyrillic_ya	Cyrillic Small Letter ya
XK_Cyrillic_er	Cyrillic Small Letter er
XK_Cyrillic_es	Cyrillic Small Letter es
XK_Cyrillic_te	Cyrillic Small Letter te
XK_Cyrillic_u	Cyrillic Small Letter u
XK_Cyrillic_zhe	Cyrillic Small Letter zhe
XK_Cyrillic_ve	Cyrillic Small Letter ve
XK_Cyrillic_softsign	Cyrillic Small Soft Sign
XK_Cyrillic_yeru	Cyrillic Small Letter yeru
XK_Cyrillic_ze	Cyrillic Small Letter ze
XK_Cyrillic_sha	Cyrillic Small Letter sha
XK_Cyrillic_e	Cyrillic Small Letter e
XK_Cyrillic_shcha	Cyrillic Small Letter shcha
XK_Cyrillic_che	Cyrillic Small Letter che
XK_Cyrillic_hardsign	Cyrillic Small Hard Sign
XK_Cyrillic_YU	Cyrillic Capital Letter YU
XK_Cyrillic_A	Cyrillic Capital Letter A

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Table D–8 (Cont.) Valid Keysym Names—Cyrillic

Keysym Names	Key Definition
XK_Cyrillic_BE	Cyrillic Capital Letter BE
XK_Cyrillic_TSE	Cyrillic Capital Letter TSE
XK_Cyrillic_DE	Cyrillic Capital Letter DE
XK_Cyrillic_IE	Cyrillic Capital Letter IE
XK_Cyrillic_EF	Cyrillic Capital Letter EF
XK_Cyrillic_GHE	Cyrillic Capital Letter GHE
XK_Cyrillic_HA	Cyrillic Capital Letter HA
XK_Cyrillic_I	Cyrillic Capital Letter I
XK_Cyrillic_SHORTI	Cyrillic Capital Letter Short I
XK_Cyrillic_KA	Cyrillic Capital Letter KA
XK_Cyrillic_EL	Cyrillic Capital Letter EL
XK_Cyrillic_EM	Cyrillic Capital Letter EM
XK_Cyrillic_EN	Cyrillic Capital Letter EN
XK_Cyrillic_O	Cyrillic Capital Letter O
XK_Cyrillic_PE	Cyrillic Capital Letter PE
XK_Cyrillic_YA	Cyrillic Capital Letter YA
XK_Cyrillic_ER	Cyrillic Capital Letter ER
XK_Cyrillic_ES	Cyrillic Capital Letter ES
XK_Cyrillic_TE	Cyrillic Capital Letter TE
XK_Cyrillic_U	Cyrillic Capital Letter U
XK_Cyrillic_ZHE	Cyrillic Capital Letter ZHE
XK_Cyrillic_VE	Cyrillic Capital Letter VE
XK_Cyrillic_SOFTSIGN	Cyrillic Capital Soft Sign
XK_Cyrillic_YERU	Cyrillic Capital Letter YERU
XK_Cyrillic_ZE	Cyrillic Capital Letter ZE
XK_Cyrillic_SHA	Cyrillic Capital Letter SHA
XK_Cyrillic_E	Cyrillic Capital Letter E
XK_Cyrillic_SHCHA	Cyrillic Capital Letter SHCHA
XK_Cyrillic_CHE	Cyrillic Capital Letter CHE
XK_Cyrillic_HARDSIGN	Cyrillic Capital Hard Sign

Table D–9 Valid Keysym Names—Greek

Keysym Names	Key Definition
XK_Greek_ALPHAaccent	Greek Capital Letter ALPHA with Accent
XK_Greek_EPSILONaccent	Greek Capital Letter EPSILON with Accent
XK_Greek_ETAaccent	Greek Capital Letter ETA with Accent
XK_Greek_IOTAaccent	Greek Capital Letter IOTA with Accent

(continued on next page)

Table D–9 (Cont.) Valid Keysym Names—Greek

Keysym Names	Key Definition
XK_Greek_IOTAdiaeresis	Greek Capital Letter IOTA with Diaeresis
XK_Greek_OMICRONaccent	Greek Capital Letter OMICRON with Accent
XK_Greek_UPSILONaccent	Greek Capital Letter UPSILON with Accent
XK_Greek_UPSILONdiaeresis	Greek Capital Letter UPSILON with Diaeresis
XK_Greek_OMEGAaccent	Greek Capital Letter OMEGA with Accent
XK_Greek_accentdiaresis	Diaresis and Accent
XK_Greek_horizbar	Horizontal Bar
XK_Greek_alphaaccent	Greek Small Letter Alpha with Accent
XK_Greek_epsilonaccent	Greek Small Letter Epsilon with Accent
XK_Greek_etaaccent	Greek Small Letter Eta with Accent
XK_Greek_iotaaccent	Greek Small Letter Iota with Accent
XK_Greek_iotadiaeresis	Greek Small Letter Iota with Diaeresis
XK_Greek_iotaaccentdiaeresis	Greek Small Letter Iota with Accent and Diaeresis
XK_Greek_omicronaccent	Greek Small Letter Omicron with Accent
XK_Greek_upsilonaccent	Greek Small Letter Upsilon with Accent
XK_Greek_upsilondiaeresis	Greek Small Letter Upsilon with Diaeresis
XK_Greek_upsilonaccentdiaeresis	Greek Small Letter Upsilon with Accent and Diaeresis
XK_Greek_omegaaccent	Greek Small Letter Omega with accent
XK_Greek_ALPHA	Greek Capital Letter ALPHA
XK_Greek_BETA	Greek Capital Letter BETA
XK_Greek_GAMMA	Greek Capital Letter GAMMA
XK_Greek_DELTA	Greek Capital Letter DELTA
XK_Greek_EPSILON	Greek Capital Letter EPSILON
XK_Greek_ZETA	Greek Capital Letter ZETA
XK_Greek_ETA	Greek Capital Letter ETA
XK_Greek_THETA	Greek Capital Letter THETA
XK_Greek_IOTA	Greek Capital Letter IOTA
XK_Greek_KAPPA	Greek Capital Letter KAPPA
XK_Greek_LAMDA	Greek Capital Letter LAMDA
XK_Greek_MU	Greek Capital Letter MU
XK_Greek_NU	Greek Capital Letter NU
XK_Greek_XI	Greek Capital Letter XI
XK_Greek_OMICRON	Greek Capital Letter OMICRON
XK_Greek_PI	Greek Capital Letter PI
XK_Greek_RHO	Greek Capital Letter RHO
XK_Greek_SIGMA	Greek Capital Letter SIGMA
XK_Greek_TAU	Greek Capital Letter TAU
XK_Greek_UPSILON	Greek Capital Letter UPSILON
XK_Greek_PHI	Greek Capital Letter PHI

(continued on next page)

Table D–9 (Cont.) Valid Keysym Names—Greek

Keysym Names	Key Definition
XK_Greek_CHI	Greek Capital Letter CHI
XK_Greek_PSI	Greek Capital Letter PSI
XK_Greek_OMEGA	Greek Capital Letter OMEGA
XK_Greek_alpha	Greek Small Letter alpha
XK_Greek_beta	Greek Small Letter beta
XK_Greek_gamma	Greek Small Letter gamma
XK_Greek_delta	Greek Small Letter delta
XK_Greek_epsilon	Greek Small Letter epsilon
XK_Greek_zeta	Greek Small Letter zeta
XK_Greek_eta	Greek Small Letter eta
XK_Greek_theta	Greek Small Letter theta
XK_Greek_iota	Greek Small Letter iota
XK_Greek_kappa	Greek Small Letter kappa
XK_Greek_lamda	Greek Small Letter lamda
XK_Greek_mu	Greek Small Letter mu
XK_Greek_nu	Greek Small Letter nu
XK_Greek_xi	Greek Small Letter xi
XK_Greek_omicron	Greek Small Letter omicron
XK_Greek_pi	Greek Small Letter pi
XK_Greek_rho	Greek Small Letter rho
XK_Greek_sigma	Greek Small Letter sigma
XK_Greek_finalsmallsigma	Greek Small Letter final small sigma
XK_Greek_tau	Greek Small Letter tau
XK_Greek_upsilon	Greek Small Letter upsilon
XK_Greek_phi	Greek Small Letter phi
XK_Greek_chi	Greek Small Letter chi
XK_Greek_psi	Greek Small Letter psi
XK_Greek_omega	Greek Small Letter omega
XK_Greek_switch	Alias for Mode_switch

Table D–10 Valid Keysym Names—Technical

Keysym Names	Key Definition
XK_leftradical	Left Radical
XK_topleftradical	Top Left Radical
XK_horizconnector	Horizontal Connector
XK_topintegral	Top Integral
XK_botintegral	Bottom Integral

(continued on next page)

Table D–10 (Cont.) Valid Keysym Names—Technical

Keysym Names	Key Definition
XK_vertconnector	Vertical Connector
XK_topleftsqbracket	Top Left Square Bracket
XK_botleftsqbracket	Bottom Left Square Bracket
XK_toprightsqbracket	Top Right Square Bracket
XK_botrightsqbracket	Bottom Right Square Bracket
XK_topleftparens	Top Left Parenthesis
XK_toprightparens	Top Right Parenthesis
XK_botrightparens	Bottom Right Parenthesis
XK_leftmiddlecurlybrace	Left Middle Curly Brace
XK_rightmiddlecurlybrace	Right Middle Curly Brace
XK_topleftsummation	Top Left Summation
XK_botleftsummation	Bottom Left Summation
XK_topvertsummationconnector	Top Vertical Summation Connector
XK_botvertsummationconnector	Bottom Vertical Summation Connector
XK_toprightsummation	Top Right Summation
XK_botrightsummation	Bottom Right Summation
XK_rightmiddlesummation	Right Middle Summation
XK_lessthanequal	Less Than or Equal Sign
XK_notequal	Not Equal Sign
XK_greaterthanequal	Greater Than or Equal Sign
XK_integral	Integral
XK_therefore	Therefore
XK_variation	Variation or Proportional to
XK_infinity	Infinity
XK_nabla	Nabla or Del
XK_approximate	Is Approximate to
XK_similarequal	Similar or Equal to
XK_ifonlyif	If and Only if
XK_implies	Implies
XK_identical	Identical
XK_radical	Radical
XK_includedin	Is Included in
XK_includes	Includes
XK_intersection	Intersection
XK_union	Union
XK_logicaland	Logical and
XK_logicalor	Logical or
XK_partialderivative	Partial Derivative
XK_function	Function

(continued on next page)

Table D–10 (Cont.) Valid Keysym Names—Technical

Keysym Names	Key Definition
XK_leftarrow	Left Arrow
XK_uparrow	Upward Arrow
XK_rightarrow	Right Arrow
XK_downarrow	Downward Arrow

Table D–11 Valid Keysym Names—Special

Keysym Names	Key Definition
XK_blank	Blank
XK_soliddiamond	Solid Diamond
XK_checkerboard	Checkerboard
XK_ht	"HT"
XK_ff	"FF"
XK_cr	"CR"
XK_lf	"LF"
XK_nl	"NL"
XK_vt	"VT"
XK_lowrightcorner	Lower-Right Corner
XK_uprightcorner	Upper-Right Corner
XK_upleftcorner	Upper-Left Corner
XK_lowleftcorner	Lower-Left Corner
XK_crossinglines	Crossing-Lines
XK_horizlinescan1	Horizontal Line or Scan 1
XK_horizlinescan3	Horizontal Line or Scan 3
XK_horizlinescan5	Horizontal Line or Scan 5
XK_horizlinescan7	Horizontal Line or Scan 7
XK_horizlinescan9	Horizontal Line or Scan 9
XK_leftt	Left "T"
XK_rightt	Right "T"
XK_bott	Bottom "T"
XK_topt	Top "T"
XK_vertbar	Vertical Bar

Table D–12 Valid Keysym Names—Publishing

Keysym Names	Key Definition
XK_emspace	Em Space
XK_enspace	En Space
XK_em3space	3/Em Space
XK_em4space	4/Em Space
XK_digitspace	Digit Space
XK_punctspace	Punctuation Space
XK_thinspace	Thin Space
XK_hairspace	Hair Space
XK_emdash	Em Dash
XK_endash	En Dash
XK_signifblank	Significant Blank Symbol
XK_ellipsis	Ellipsis
XK_doubbaselinedot	Double Baseline Dot
XK_onethird	Vulgar Fraction One Third
XK_twothirds	Vulgar Fraction Two Thirds
XK_onefifth	Vulgar Fraction One Fifth
XK_twofifths	Vulgar Fraction Two Fifths
XK_threefifths	Vulgar Fraction Three Fifths
XK_fourfifths	Vulgar Fraction Four Fifths
XK_onesixth	Vulgar Fraction One Sixth
XK_fivesixths	Vulgar Fraction Five Sixths
XK_careof	Care of
XK_figdash	Figure Dash
XK_leftanglebracket	Left Angle Bracket
XK_decimalpoint	Decimal Point
XK_rightanglebracket	Right Angle Bracket
XK_marker	Marker
XK_oneeighth	Vulgar Fraction One Eighth
XK_threeeighths	Vulgar Fraction Three Eighths
XK_fiveeighths	Vulgar Fraction Five Eighths
XK_seveneighths	Vulgar Fraction Seven Eighths
XK_trademark	Trademark Sign
XK_signaturemark	Signature Mark
XK_trademarkincircle	Trademark Sign In Circle
XK_leftopentriangle	Left Open Triangle
XK_rightopentriangle	Right Open Triangle
XK_emopencircle	Em Open Circle
XK_emopenrectangle	Em Open Rectangle
XK_leftsinglequotemark	Left Single Quotation Mark

(continued on next page)

Table D–12 (Cont.) Valid Keysym Names—Publishing

Keysym Names	Key Definition
XK_rightsinglequotemark	Right Single Quotation Mark
XK_leftdoublequotemark	Left Double Quotation Mark
XK_rightdoublequotemark	Right Double Quotation Mark
XK_prescription	Prescription, Take, or Recipe
XK_minutes	Minutes
XK_seconds	Seconds
XK_latincross	Latin Cross
XK_hexagram	Hexagram
XK_filledrectbullet	Filled Rectangle Bullet
XK_filledlefttribullet	Filled Left Triangle Bullet
XK_filledrighttribullet	Filled Right Triangle Bullet
XK_emfilledcircle	Em Filled Circle
XK_emfilledrect	Em Filled Rectangle
XK_enopencircbullet	En Open Circle Bullet
XK_enopensquarebullet	En Open Square Bullet
XK_openrectbullet	Open Rectangle Bullet
XK_opentribulletup	Open Triangle Bullet Up
XK_opentribulletdown	Open Triangle Bullet Down
XK_openstar	Open Star
XK_enfilledcircbullet	En Filled Circle Bullet
XK_enfilledsqbullet	En Filled Square Bullet
XK_filledtribulletup	Filled Triangle Bullet Up
XK_filledtribulletdown	Filled Triangle Bullet Down
XK_leftpointer	Left Pointer
XK_rightpointer	Right Pointer
XK_club	Club
XK_diamond	Diamond
XK_heart	Heart
XK_maltesecross	Maltese Cross
XK_dagger	Dagger
XK_doubledagger	Double Dagger
XK_checkmark	Check Mark or Tick
XK_ballotcross	Ballot Cross
XK_musicalsharp	Musical Sharp
XK_musicalflat	Musical Flat
XK_malesymbol	Male Symbol
XK_femalesymbol	Female Symbol
XK_telephone	Telephone Symbol
XK_telephonerecorder	Telephone Recorder Symbol

(continued on next page)

Table D–12 (Cont.) Valid Keysym Names—Publishing

Keysym Names	Key Definition
XK_phonographcopyright	Phonograph Copyright Sign
XK_caret	Caret
XK_singlelowquotemark	Single Low Quotation Mark
XK_doublelowquotemark	Double Low Quotation Mark
XK_cursor	Cursor

Table D–13 Valid Keysym Names—APL

Keysym Names	Key Definition
XK_leftcaret	Left Caret
XK_rightcaret	Right Caret
XK_downcaret	Down Caret
XK_upcaret	Up Caret
XK_overbar	Overbar
XK_downtack	Down Tack
XK_upshoe	Up Shoe (CAP)
XK_downstile	Down Stile
XK_underbar	Underbar
XK_jot	Jot
XK_quad	Quad
XK_uptack	Up Tack
XK_circle	Circle
XK_upstile	Up Stile
XK_downshoe	Down Shoe (CUP)
XK_rightshoe	Right Shoe
XK_leftshoe	Left Shoe
XK_lefttack	Left Tack
XK_righttack	Right Tack

Table D–14 Valid Keysym Names—Hebrew

Keysym Names	Key Definition
XK_hebrew_doublelowline	Double Low Line
XK_hebrew_aleph	Hebrew Letter Aleph
XK_hebrew_bet	Hebrew Letter Bet
XK_hebrew_gimel	Hebrew Letter Gimel

(continued on next page)

Table D–14 (Cont.) Valid Keysym Names—Hebrew

Keysym Names	Key Definition
XK_hebrew_dalet	Hebrew Letter Dalet
XK_hebrew_he	Hebrew Letter He
XK_hebrew_waw	Hebrew Letter Waw
XK_hebrew_zain	Hebrew Letter Zain
XK_hebrew_chet	Hebrew Letter Chet
XK_hebrew_tet	Hebrew Letter Tet
XK_hebrew_yod	Hebrew Letter Yod
XK_hebrew_finalkaph	Hebrew Letter Final Kaph
XK_hebrew_kaph	Hebrew Letter Kaph
XK_hebrew_lamed	Hebrew Letter Lamed
XK_hebrew_finalmem	Hebrew Letter Final Mem
XK_hebrew_mem	Hebrew Letter Mem
XK_hebrew_finalnun	Hebrew Letter Final Nun
XK_hebrew_nun	Hebrew Letter Nun
XK_hebrew_samech	Hebrew Letter Samech
XK_hebrew_ayin	Hebrew Letter A'Yin
XK_hebrew_finalpe	Hebrew Letter Final Pe
XK_hebrew_pe	Hebrew Letter Pe
XK_hebrew_finalzade	Hebrew Letter Final Zade
XK_hebrew_zade	Hebrew Letter Zade
XK_hebrew_qoph	Hebrew Letter Qoph
XK_hebrew_resh	Hebrew Letter Resh
XK_hebrew_shin	Hebrew Letter Shin
XK_hebrew_taw	Hebrew Letter Taw
XK_hebrew_switch	Alias for Mode_switch

Table D–15 Valid Keysym Names—DEC Private

Keysym Names	Key Definition
DXK_ring_accent	Ring Accent[1]
DXK_circumflex_accent	Circumflex Accent[1]
DXK_cedilla_accent	Cedilla Accent[1]
DXK_acute_accent	Acute Accent[1]
DXK_grave_accent	Grave Accent[1]
DXK_tilde	Tilde[1]
DXK_diaeresis	Diaeresis[1]
DXK_Remove	Remove[2]

[1]2-key compose sequence initiator

[2]Special keysym for the Remove key on the LK201 keyboard editing keypad

E

X Font Naming Conventions

This appendix provides the following:

- An overview of X font naming conventions
- A definition of each field in a font name
- Examples of valid font names

Overview of X Font Naming Conventions

A font name uniquely identifies the font. It also contains information about the origin of the font and the attributes of the font.

Currently all font names begin with a dash (-). In the future, font names will start with *+version-*, where *version* is the version of the font naming convention.

A font name consists of the following fields, each preceded with a dash:

- FOUNDRY
- FAMILY_NAME
- WEIGHT_NAME
- SLANT
- SETWIDTH_NAME
- ADD_STYLE_NAME
- PIXEL_SIZE
- POINT_SIZE
- RESOLUTION_X
- RESOLUTION_Y

- SPACING
- AVERAGE_WIDTH
- CHARSET_REGISTRY
- CHARSET_ENCODING

The entire font name string must have no more than 255 characters. It is recommended that when X applications specify font names with the wildcard characters * and ? that they explicitly include all field delimiters to avoid unexpected results.

Note

SPACE is a valid character of a font name field, e.g., a FAMILY_NAME might be *ITC Avant Garde Gothic.*

Font Name Field Definitions

This section provides a brief definition of each field in a font name:

- FOUNDRY

  FOUNDRY is the name or identifier of the organization that digitized and supplied the font.

- FAMILY_NAME

  FAMILY_NAME identifies the range or "family" of typeface designs that are all variations of one basic typographic style.

  Examples of FAMILY_NAMEs:

```
Helvetica
ITC Avant Garde Gothic
Times
Times Roman
Bitstream Amerigo
Stone
```

- WEIGHT_NAME

  WEIGHT_NAME identifies the font's typographic weight, i.e., the nominal *blackness* of the font, according to the FOUNDRY's judgement.

The interpretation of this field is somewhat problematic, as the typographic judgement of weight has traditionally depended upon the overall design of the typeface family in question. (It is possible that the demibold weight of one font could be almost equivalent in typographic feel to a bold font from another family.)

- SLANT

  SLANT is a *code-string* that indicates the overall posture of the typeface design used in the font.

  The encoding is explained in Table E–1.

Table E–1 SLANT Encodings

Code	English String	Description
"R"	Roman	Upright design
"I"	Italic	Italic design, slanted clockwise from vertical
"O"	Oblique	Obliqued upright design, slanted clockwise from vertical
"RI"	Reverse Italic	Italic design, slanted counterclockwise from vertical
"RO"	Reverse Oblique	Obliqued upright design, slanted counterclockwise from vertical
"OT"	Other	Other

- SETWIDTH_NAME

  SETWIDTH_NAME gives the font's typographic proportionate width, that is, the nominal width per horizontal unit of the font, according to the FOUNDRY's judgment.

  As with WEIGHT_NAME, the interpretation of this field is somewhat problematic, as the designer's judgment of setwidth has traditionally depended upon the overall design of the typeface family in question. X applications should use the RELATIVE_SETWIDTH font property which gives the relative coded proportionate width, or calculate the proportionate width, for purposes of font matching or substitution.

  Examples of SETWIDTH_NAMEs:

```
Normal
Condensed
Narrow
Double Wide
```

- ADD_STYLE_NAME

  ADD_STYLE_NAME identifies additional typographic style information not available in other fields, but needed to uniquely identify the font.

  ADD_STYLE_NAME is *not* a typeface classification field, and is only used for uniqueness. Its usage, as such, is not limited to typographic style distinctions.

  Examples of ADD_STYLE_NAMEs:

  ```
  Serif
  Sans Serif
  Informal
  Decorated
  ```

- PIXEL_SIZE

  PIXEL_SIZE gives the height, in pixels, of the font.

- POINT_SIZE

  POINT_SIZE gives the height, in decipoints, of the font. There are 722.7 decipoints to the inch. This value assumes that the display device has the vertical resolution specified in the RESOLUTION_Y field.

- RESOLUTION_X and RESOLUTION_Y

  RESOLUTION_X and RESOLUTION_Y are the horizontal and vertical resolution that the font was designed for, measured in dots per inch (dpi).

- SPACING

  SPACING indicates the escapement class of the font, that is, monospace (fixed pitch), proportional (variable pitch), or charcell (a special monospaced font that conforms to the traditional data processing character cell font model).

The encoding is explained in Table E–2:

Table E–2 SPACING Encodings

Code	English String	Description
"P"	Proportional	A font whose character widths vary for each character
"M"	Monospace	A font whose character widths are the same for all characters
"C"	CharCell	A font whose character widths and heights are the same for all characters

- AVERAGE_WIDTH

  AVERAGE_WIDTH is the average width of all characters in the font, measured in 1/10th pixels.

- CHARSET_REGISTRY and CHARSET_ENCODING

  CHARSET_ENCODING identifies the ordering of characters within the font.

  CHARSET_REGISTRY identifies the registration authority that owns the specified encoding.

  The ISO Latin 1 character set has the CHARSET_REGISTRY *"ISO8859"* and the CHARSET_ENCODING *"1"*.

Examples of Font Names

The following examples of font names are derived from the screen fonts shipped with the R3 server.

Table E–3 Examples of X Font Names

Font	X Font Name
Courier 8pt @75dpi	-Adobe-Courier-Medium-R-Normal--8-80-75-75-M-50-ISO8859-1
Courier 12pt	-Adobe-Courier-Medium-R-Normal--12-120-75-75-M-70-ISO8859-1
Courier Bold 10pt	-Adobe-Courier-Bold-R-Normal--10-100-75-75-M-60-ISO8859-1
Courier BoldOblique 10pt	-Adobe-Courier-Bold-O-Normal--10-100-75-75-M-60-ISO8859-1
Courier Oblique 10pt	-Adobe-Courier-Medium-O-Normal--10-100-75-75-M-60-ISO8859-1
Times Roman 10pt @100dpi	-Adobe-Times-Medium-R-Normal--14-100-100-100-P-74-ISO8859-1
Times Bold 10pt	-Adobe-Times-Bold-R-Normal--14-100-100-100-P-76-ISO8859-1
Charter 12pt @75dpi	-Bitstream-Charter-Medium-R-Normal--12-120-75-75-P-68-ISO8859-1
Charter BoldItalic 12pt	-Bitstream-Charter-Bold-I-Normal--12-120-75-75-P-75-ISO8859-1
Charter Bold 12pt	-Bitstream-Charter-Bold-R-Normal--12-120-75-75-P-76-ISO8859-1
Charter Italic 12pt	-Bitstream-Charter-Medium-I-Normal--12-120-75-75-P-66-ISO8859-1

Glossary

The terms that appeared in the text of this book in **boldface** are explained in this glossary. Some additional terms related to PC DECwindows Motif are also explained here.

386 memory manager (n.)

A software program that manages the allocation of all PC memory types.

accelerators (n.)

Shortcuts for common windowing operations defined by the Motif Window Manager and executed by mouse buttons.

account (n.)

An account allows users access to a computer. It includes the user's name, other identifiers, a list of services and privileges the user is allowed, and files belonging to the user.

append path (n.)

A search path that is used to tell DOS where to search for executable files in the directory structure. See also *search path* and *path name*.

Bitmap Distribution Format (BDF) (n.)

An X Consortium standard for font interchange, intended to be easily understood by both humans and computers.

button (n.)

An on-screen control that asks users to choose actions or options or to set states.

click (v.)

To quickly press and release a mouse button.

click on (v.)

To point to an active object and quickly press and release the mouse button.

command line (n.)

That area of the screen where commands are entered and displayed.

compose sequence (n.)

A series of keystrokes that create characters that do not exist as standard keys on your keyboard.

configuration (n.)

The set of hardware, hardware options, and software on a computer or network.

configure (v.)

To select, install, and modify hardware and software for a computer or network.

conventional memory (n.)

That portion of system memory that is available for DOS and DOS application software. Its maximum range is 640 Kbytes.

current directory (n.)

The directory in which you are currently working.

cursor blink rate (n.)

The frequency with which the cursor flashes.

DECnet (n.)

Digital networking software that runs on server and PATHWORK client nodes in both local area and wide area networks. With DECnet, different types of computers that have different operating systems can be connected and users can access information and services on a remote computer over the network connections.

A networking protocol. See also *TCP/IP*.

DECnet link (n.)

A virtual or logical connection between a PATHWORKS client and a server or between two nodes in the network.

DECnet node database (n.)

The file that contains information about the network nodes with which a personal computer communicates.

default (n.)

The value assumed by a program if not supplied by a user.

definition file (n.)

A file that specifies:

- What operation is performed when you press a key
- What operation is performed when you click a mouse button
- What options are displayed in the menu

destination (n.)

The drive, file, or media to which a user is copying or moving information. Also called a target. See also *source*.

dialog box (n.)

A window displayed in response to user action that presents a choice of further actions. You must choose an action to continue working.

double click (v.)

To point to an active object with a mouse and click the mouse button twice rapidly.

drag (v.)

To press and hold a mouse button, move the cursor or object, and release the button.

DWDOS286 (n.)

One of the X servers for PC DECwindows Motif. See also *DWDOS386* and *X server*.

DWDOS386 (n.)

One of the X servers for PC DECwindows Motif. See also *DWDOS286* and *X server*.

EMS (n.)

See *expanded memory* and *Expanded Memory Specification 4.0*.

expanded memory (EMS) (n.)

Physical memory outside the addressing range of a processor that can be accessed through a 64 Kbyte frame. Portions of expanded memory, called pages, are switched into a designated area of upper memory for execution. See also *extended memory.*

extended memory (XMS) (n.)

Memory beyond the one Mbyte addressable boundary up to 16 Mbytes. This space is normally not available to DOS applications. The High Memory Area (HMA) is the first 64 Kbytes above the 1 Mbyte line and can often be accessed by DOS.

font alias (n.)

A name you assign to an existing font for purposes of substituting the font for a font required by an application.

icon (n.)

A symbol that represents an application, object, process, or window.

icon bar (n.)

In DECwindows Motif, a portion of the Window Manager that contains the icons for all open applications.

icon box (n.)

In DECwindows Motif, a special window that contains icons representing the applications available to the user.

keyboard mapping (n.)

Information contained in files that defines the use of individual keys, associating the key you press with the application's interpretation of that key.

keyboard mouse (n.)

Keys on the keyboard used to move the cursor on the screen.

keycode (n.)

The hexadecimal number assigned to a key for the purpose of identifying the key regardless of how the key is defined.

keysym files (n.)

Files containing keyboard mapping information.

local (adj.)

Stored on or physically connected to a personal computer, such as a file or a printer. Opposite to being available over a network. See also *remote*.

log on (v.)

To enter a username and a password that identifies you as a user and starts the session. Also called log in.

MB1, MB2, MB3 (n.)

Mouse button 1, mouse button 2, mouse button 3. Usually, MB1 is the left mouse button, MB2 the center button, and MB3 the right button; however, users can redefine the setup.

Memory Manager (n.)

A software program for 80286- or 80386-based personal computers that manages the allocation of all memory types.

menu (n.)

A pull-down list of available options. A menu takes the place of typed commands.

message box (n.)

A standard dialog box that displays information requiring immediate action, such as warnings and questions; the current status of work in progress; and error messages.

mouse (n.)

A pointing device that, when moved across any surface, causes a corresponding movement of the pointer on the screen. A mouse can have one or more buttons.

Network Control Program (NCP) (n.)

A utility for defining DECnet node names in your personal computer's DECnet database.

node (n.)

An individual computer that can communicate with other computers in a network.

node address (n.)

A unique numerical identification of a node in a network. It includes the area and node number.

node name (n.)

A one- to six-character name uniquely identifying a node within a network. The characters must be alphanumeric and contain at least one alphabetic character. A valid node name is SERVR7.

options menu (n.)

In DECwindows Motif, a menu that allows users to customize aspects of the application.

panning (v.)

To move a part of the virtual screen area into your viewing area with your pointing device.

password (n.)

A string of characters that uniquely confirms the identity of a user to the system. See also *user name*.

path name (n.)

In DOS, a description of the location of directories and/or files in the operating system. A path name can consist of drives, directories, and files. Each directory and file name is preceded by a backslash. For example, \LMDOS\DRIVERS\PCSA is a valid path name. See also *search path*.

pixel (n.)

A picture element. The size of the smallest displayable unit on a monitor screen. The resolution of a monitor screen is measured in pixels; the more pixels, the better the display quality.

point (v.)

To use the mouse and move the cursor to where you want the next action to occur.

pointer (n.)

A symbol displayed on the screen that specifies a position you mark by moving a mouse. In DECwindows Motif, the shape of the pointer indicates the type of operation being performed.

pop (v.)

In DECwindows Motif, to move a window or icon to the front or top of a stack.

pop-up menu (n.)

In DECwindows Motif, a context-sensitive menu that appears at the pointer position when you press the mouse button defined for the pop-up menu function.

program information file (PIF) (n.)

In Microsoft Windows, a file that contains information about how a standard application uses personal computer resources. Microsoft Windows uses this information when you run an application.

protocol (n.)

A set of rules that govern the operation of a communication link. For example, DECnet and TCP/IP are network protocols.

pull-down menu (n.)

A menu that is displayed when you position the pointer on a menu name in the menu bar and press a mouse button.

push (v.)

In DECwindows Motif, to move a window to a lower position or to the bottom position in a stack.

push button (n.)

In DECwindows Motif, a rectangular box on the screen that is labeled with a command to be performed. Push buttons allow you to execute commands quickly.

remote (adj.)

A characteristic of being stored on (or physically connected to) a server or other computer and available to a PATHWORKS client over the network only. Opposite of local. See also *local*.

scroll bar (n.)

In DECwindows Motif, a component along the side and bottom of a window that allows users to move through a block of information that is too large to be displayed at one time. See also *scroll region*, *slider*, and *stepping arrow.*

scroll region (n.)

In DECwindows Motif, a scroll bar component in which the slider moves, allowing you to move the work area over a block of information that is too large to be displayed at one time. See also *slider* and *stepping arrow.*

search path (n.)

The series of directories and subdirectories that DOS uses when locating a file. See also *path name.*

slider (n.)

In DECwindows Motif, a scroll bar component used to move the work area over a block of information that is too large to be displayed at one time. See also *scroll region.*

source (adj.)

The drive, file, or media from which the user is copying or moving information. See also *target.*

submenu (n.)

A menu associated with a pull-down or pop-up menu that is displayed in response to dragging the pointer over the submenu icon.

swap file (n.)

A temporary file created by the virtual memory manager. When the memory requirements of an X application exceed the physical memory on the personal computer, the virtual memory manager moves data that is not being accessed to a temporary swap file on one of your personal computer drives.

target (adj.)

The drive, file, or media to which the user is copying or moving information. Also called the destination. See also *source.*

TCP/IP

Transmission Control Protocol/Internet Protocol. A set of protocols that govern the transport of information between computers and networks of dissimilar types. The Internet is a group of networks that includes regional networks, military networks, and local networks at universities and commercial institutions. An alternative to DECnet transport protocols. See also *DECnet*.

terminate-and-stay resident (TSR) (adj.)

A program that stays in memory, running in the background, even after the user closes the application.

toggle button (n.)

In DECwindows Motif, a square, on-screen control that allows you to choose one of two alternate states.

user name (n.)

The name a user types when logging in to the system. A combination of the user name and password uniquely identifies a user account to the system. See also *password*.

VCPI

See *Virtual Control Program Interface*.

viewport (n.)

That part of the screen that is in your view when a viewing area is specified that is greater than the dimensions of your video monitor screen.

Virtual Control Program Interface (VCPI) (n.)

A specification that defines guidelines for compatible operation between programs that use any of the three different 80386 processor modes of operation.

virtual screen (n.)

A viewing area larger than the dimensions of your video monitor screen.

window (n.)

An area within a display that is specifically defined and dedicated to a certain application or portion of an application.

window manager (n.)

In DECwindows Motif, the application that manipulates windows on the screen.

X application (n.)

An application meeting X Window System standards. You access from the X server.

X client (n.)

An X application.

X server (n.)

The primary component of PC DECwindows Motif, the X server processes display requests from many X applications, performs the display operation, and manages the display screen in an orderly fashion. The X server also manages input from personal computer devices, such as the mouse and keyboard. It returns input events to the appropriate X application. There are two X servers available with PC DECwindows Motif: DWDOS286 and DWDOS386.

XMS

See *extended memory.*

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PC DECwindows Motif Guide

AA–PAFBC–TK

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