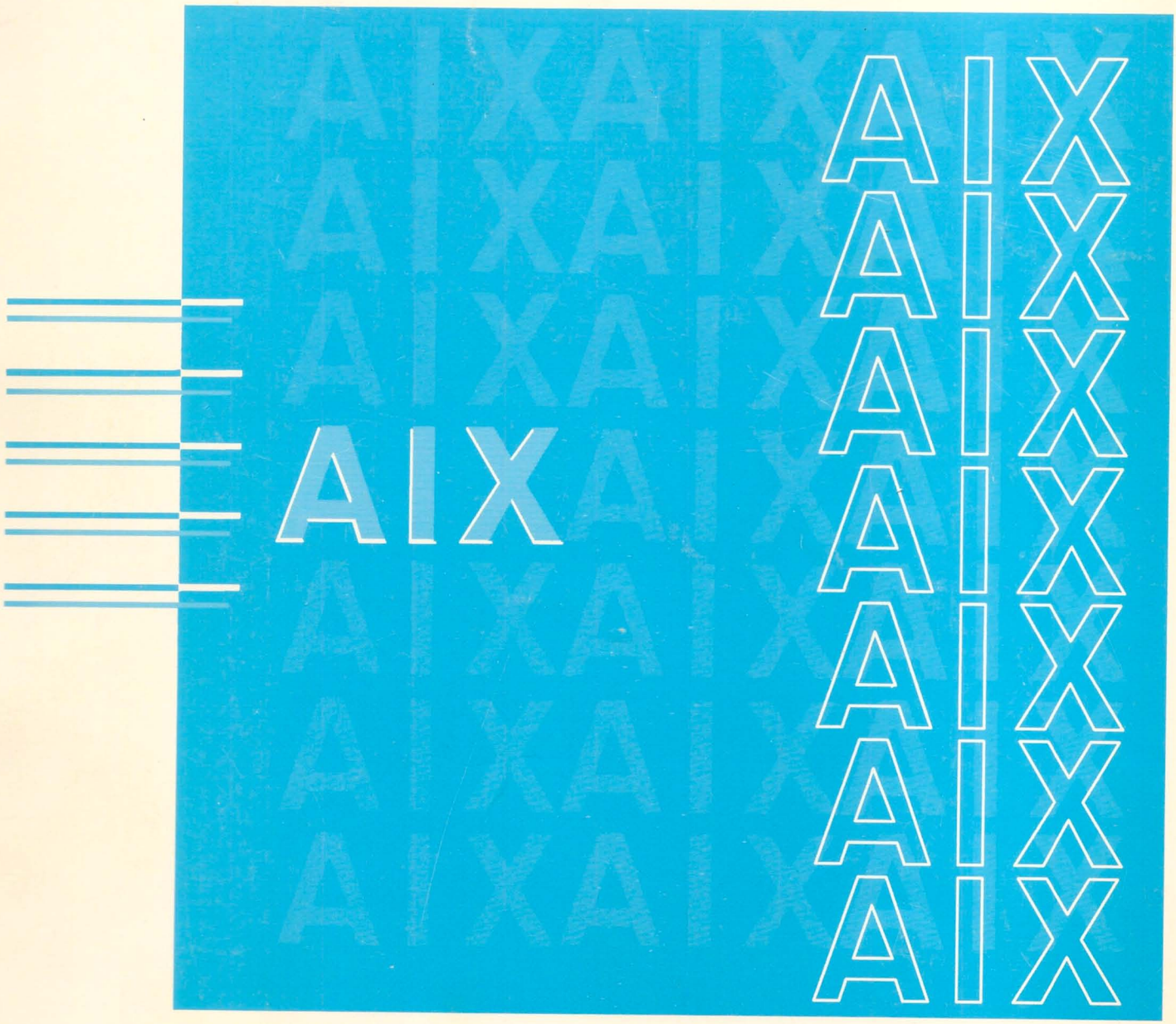
B. Smith

AIX Operating System

IBM AIX X-Windows User's Guide



IBM

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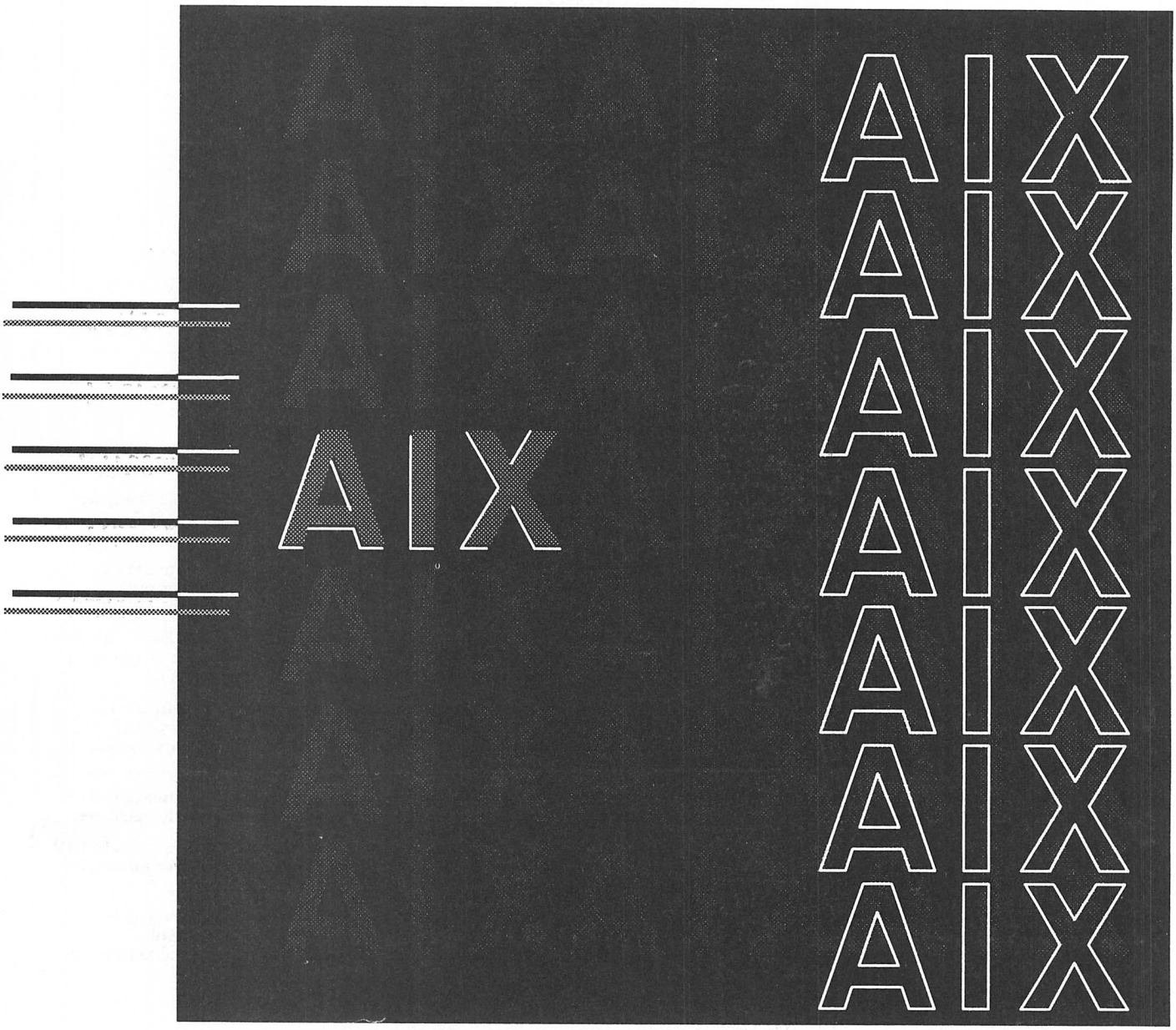

IBM

Second Edition (September 1988)

Portions of the code and documentation described in this book were developed at the Electrical Engineering and Computer Sciences Department at the Berkeley Campus of the University of California under the auspices of the Regents of the University of California.

This edition applies to IBM AIX/RT X-Windows, Version 2.1, IBM AIX PS/2 X-Windows, Version 1.1. Changes are made periodically to the information herein; these changes will be reported in technical newsletters or in new editions of this publication.

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About This Book

The IBM AIX X-Windows licensed program is a windowing system that allows you to view several programs simultaneously on a bit-mapped high-resolution display. It also provides remote display support for remote systems connected by a local area network (LAN). (Exceptions for each system will be noted.)

The *IBM AIX X-Windows User's Guide* is intended for anyone using AIX X-Windows. It provides information about starting, running, customizing, and using the X-Windows commands.

The *IBM AIX X-Windows Programmer's Reference* contains detailed reference material on AIX X-Windows C language functions, FORTRAN X-Windows library functions, and other technical information.

The appendices contain information on installation and messages.

Before You Begin

Before you can use AIX X-Windows, you must have the latest level of the AIX Operating System licensed program installed. You must also have the appropriate level of the IBM AIX X-Windows licensed program according to the hardware you are using.

To use AIX X-Windows with the Interface Program for use with TCP/IP, refer to the *Interface Program for use with TCP/IP* book.

How to Use This Book

This section discusses the order in which information is presented in this book, as well as the way particular kinds of information appear.

Chapter 1, "Getting Started with X-Windows," contains information on starting X-Windows and running X-Windows functions.

Chapter 2, "AIX X-Windows Commands," gives a description of AIX X-Windows commands and the options associated with them.

Chapter 3, "Customizing X-Windows," discusses how to customize X-Windows, change defaults for X-Windows commands, and automatically log in to X-Windows.

Appendix A, "Installing AIX X-Windows," explains how to install the X-Windows licensed program.

Appendix B, "X-Windows Messages," describes AIX X-Windows error messages.

A Reader's Comment Form and Book Evaluation Form are provided at the back of this book. Use the Reader's Comment Form at any time to give IBM information that can improve the book. After you become familiar with the book, use the Book Evaluation Form to give IBM specific feedback about the book.

Fast-Path Boxes and Highlighting

In the first section, you will see boxes containing instructions you should follow to perform a task on the system. In some cases, "Additional Information" or "More Detailed Information" gives you more information about each step in the box above it. This information also may include helpful hints or optional ways of doing a step.

Throughout this guide, new terms introduced in the text are shown in ***boldface italics*** type. These words also are defined in the glossary. Key names are shown in **boldface** type.

Command names are shown in **boldface** type (for example, **xinit** and **aixterm**). Also shown in **boldface** type are file names that the system supplies or creates (for example, **/bin**).

Examples of commands in this book are shown in `monospace black` type (for example, `aixterm -fg blue`). Text that you type or that appears on your display screen is shown in `monospace color` (for example, Select `Move`).

Example Programs

Example programs are provided with the X-Windows licensed program. These programs demonstrate some of the ways you can use X-Windows. The example programs are stored on the X-Windows Examples program diskettes. IBM makes no representations about the suitability of these programs for any purpose. They are supplied *as is* without expressed or implied warranty. For more information about installing the example programs, see Appendix A, "Installing AIX X-Windows."

Related Publications

Where necessary, this book directs you to use other reference materials. You should refer to the appropriate publications according to the hardware you are using. Some of the publications you may require include information on installing, customizing and, using the operating system and using commands for the operating system and hardware where X-Windows is installed.

Ordering Additional Copies

To order additional copies of this publication and the *IBM AIX X-Windows Programmer's Reference* (without program diskettes) from your IBM representative, use Order Number SBOF-1868.

To order from your IBM dealer, use Part Number 08F3438.

For information on ordering a manual or other components separately, contact your IBM representative or your IBM dealer.

Contents

Chapter 1. Getting Started with X-Windows

CONTENTS

About This Chapter

X-Windows is a tool designed to help enhance the usability of the overall application processing environment. X-Windows provides facilities that can help you work with existing application programs as well as design and implement new applications.

X-Windows permits multiple application processes to operate within multiple windows displayed on a virtual terminal. You can manage windows directly or with application programs. You can hide windows partially or completely. You can also update partially hidden and completely hidden windows.

Each window can have a specific character set (font) associated with it. Additionally, each window can have its own keyboard mapping. This capability permits character sets available on the IBM RT, PS/2, or the S/370 systems (with some exceptions) to be connected to a specific window. Keyboard mapping coupled with the capability to access all system characters provides National Language Support (NLS).

X-Windows provides many popular window management functions, including opening, moving, resizing, or circulating a window.

X-Windows provides the capability to manage local and remote displays. Remote display management can be accomplished with other RT, PS/2, and S/370 systems connected through TCP/IP.

X-Windows also provides a library of C language functions and macros and FORTRAN functions and subroutines to interface clients with servers. Refer to *IBM AIX X-Windows Programmer's Reference* for more information on these functions. Through various commands and calls, end users or application programs can acquire the services of the windowing functions.

This chapter shows you how to use the following X-Windows functions:

- Starting X-Windows
- Moving and resizing a window
- Opening a clock window
- Hiding and showing a window
- Opening an AIX shell window
- Circulating a window
- Canceling a window
- Stopping the server.

Starting X-Windows

The steps in the following box tell you how to start X-Windows. Be sure that X-Windows is installed. (For installation instructions, refer to Appendix A, "Installing AIX X-Windows.")

Starting X-Windows

1. Log in to your system.
2. At the shell prompt, type:

   ```
   xinit
   ```

   Press **Enter**.
3. Run programs in the AIX Shell or use the window manager menu to manipulate windows.

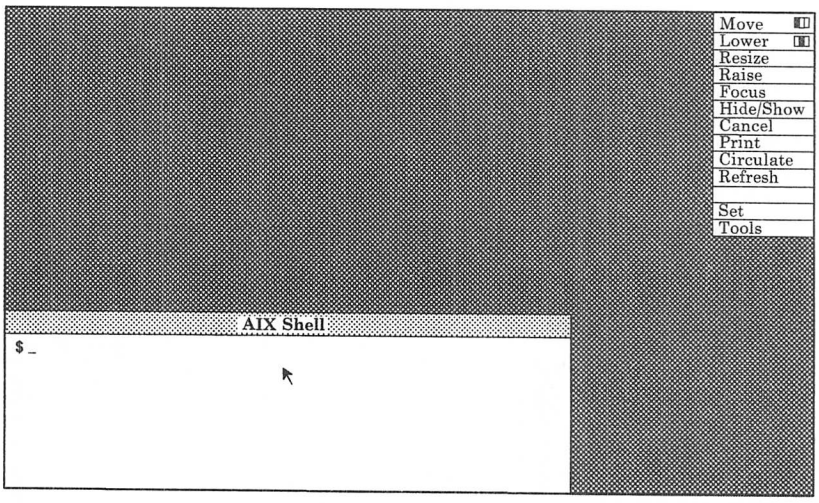
Additional Information

1. If you do not know how to log in, refer to *Using the AIX Operating System.*

   If you want X-Windows to start each time you log in, see "Logging into AIX X-Windows Automatically" on page 3-4.
2. Next to the shell prompt, type the command `xinit`. The **xinit** command does three things:
   a. Starts the X Server, except on the S/370 system, using the **X** command. This controls the input and output of X-Windows.
   b. Opens the window manager menu in the upper right corner of the screen using the **aixwm** command.
   c. Opens the initial X-Windows AIX Shell window using the **aixterm** command.

   Note: For more information on these X-Windows commands, see Chapter 2, "AIX X-Windows Commands."

3. After executing **xinit**, you see a screen similar to this:



Note: To type in a window, the mouse cursor must be in that window.

An AIX Shell window functions as a terminal. The mouse cursor must be in the AIX Shell window to type in it. You can run programs just as you would on any other terminal connected to your system. For example, type `li` and press **Enter** to see the contents of your current directory.

Menu Selection

aixwm provides two ways to make menu selections using the mouse. To choose an item in a menu, do one of the following:

- Use the mouse to move the cursor to the desired item, and then click any button on the mouse.

  OR

- Press and hold a button on the mouse while you move the cursor to the desired item. Then release the button.

aixwm highlights your selection.

For fast selection, refer to "Button/Key Selection" and "Pop-up Button Selection" on page 2-24.

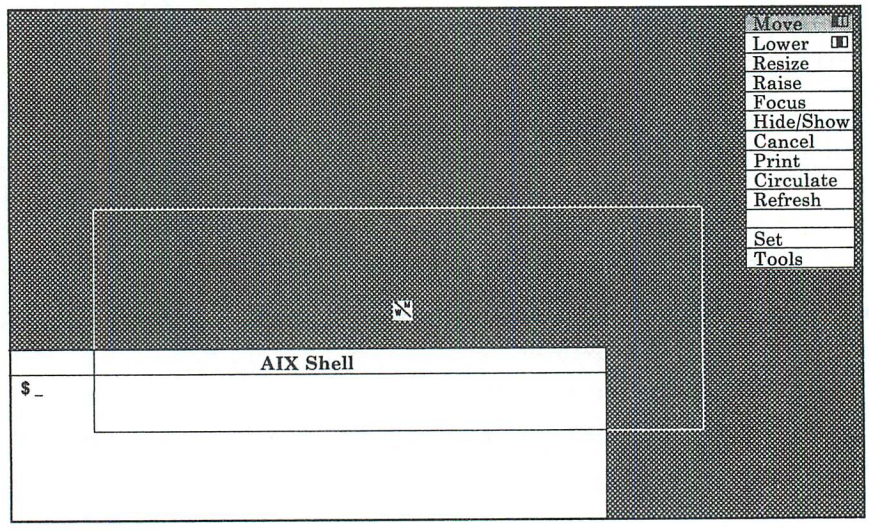
Moving a Window

You can use the window manager to manipulate windows. Use Move to move a window. For example, you may want the AIX Shell window in a different place. When you apply **Move** to a window, a ***rubber-band outline*** is moved with the mouse. The rubber-band outline is the outline that is displayed in the window. Use the following steps to move a window:

Moving a Window

1. Select Move from the window manager menu.
2. Use the mouse to move the cursor inside the AIX Shell window.
3. Press and hold the same button you used in Step 1. A rubber-band outline is displayed.
4. Use the mouse to move the rubber-band outline while holding the button down on the mouse.
5. Release the button when the rubber-band outline is in the location you desire. The window is moved to fill the rubber-band outline.

The following figure shows an example of an AIX Shell window and the rubber-band outline created by using the Move item in the window manager menu:



Resizing a Window

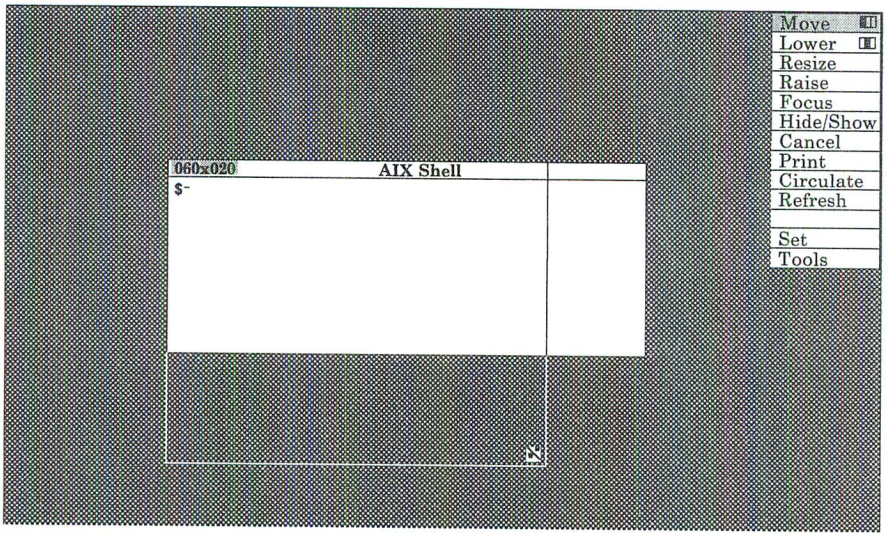
In addition to moving a window, you can also resize it. Use `Resize` to resize a window by moving a corner or an edge. When you apply **Resize** to a window, a rubber-band outline of the window is displayed. Use the following steps to resize a window:

Resizing a Window

1. Select `Resize` from the window manager menu.
2. Move the cursor to any corner or edge of the window that you want to resize.
3. Press and hold the same mouse button you used in step 1. A rubber-band outline of the window is displayed, and a box is displayed inside the window with the screen size in it.
4. Move the rubber-band outline while holding the button down on the mouse. The numbers in the box change as you move the mouse to show the screen size in characters.
5. Release the mouse button when you have the size you want. The window is resized.

Note: You may need to restart some commands or programs after resizing a window.

The following is an example of a window with a rubber-band outline which was created by using the `Resize` item in the window manager menu. (The cursor shape changes when using `Resize`.)



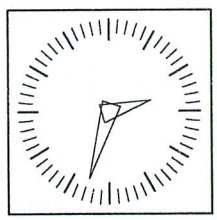
Opening a Clock Window

Two kinds of X-Windows clocks are available from the Tools submenu: the Analog Clock and the Digital Clock. Use the following steps to open the Analog Clock window:

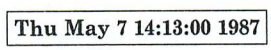
Opening a Clock Window

1. Select Tools from the window manager menu.
2. Select Analog Clock from the Tools submenu.
3. The Analog Clock window is opened in the lower right corner of the display.

The following figure shows a clock similar to the analog clock:



To display a digital clock, follow the same steps as those for the analog clock, but select Digital Clock. The digital clock looks similar to this on your screen:



Hiding and Showing a Window

When you apply Hide/Show to a window, it makes the window into an ***icon window***. When you apply Hide/Show to an icon window, it makes the window reappear. Programs or commands running in a window continue running when you use Hide/Show. For example, if you are compiling a C language program in a window, you can hide the window and the program will continue compiling. To use Hide/Show, use the following steps:

Hiding and Showing a Window

To hide a window:

1. Select Hide/Show in the window manager menu.
2. Move the cursor into the window you want to hide.
3. Click the same button you used in step 1. The window is represented on your display as an icon window.

To show a window:

1. Select Hide/Show in the window manager menu.
2. Move the cursor into the icon window you want to show.
3. Click the same button you used in step 1. The icon window is changed into a window on your display. The window is displayed at its previous location on your display.

Note: An icon window can be moved to any place on the display just as any other window can be moved to any place on the display.

The following is an example of an icon window:

Opening an AIX Shell Window

To open an AIX Shell window, use the following steps:

Opening an AIX Shell Window

1. Select `Tools` from the window manager menu.
2. Select `AIX Shell` from the **Tools** submenu.
3. An AIX Shell window is displayed.
4. Run programs in the AIX Shell window or use the window manager menu to manipulate the window.

Circulating a Window

`Circulate` causes the lowest window in a stack of overlapping windows to be raised. If used successively, `Circulate` causes each window to be raised in turn. If you think of windows as being stacked on top of each other, then imagine when you circulate windows, the lowest one is raised to the top. If a window covers a large area of the display, there may be windows that you cannot see until you circulate them. To circulate among the windows, use the following steps:

Circulating Windows

1. Select `Circulate` from the window manager menu.
2. The lowest window is raised to the top.
3. Repeat the first two steps to view all the windows in order.

Canceling a Window

When you select Cancel, **aixwm** disconnects the selected window from the X Server. The window disappears from the display. In most cases, commands or programs running in the window are also canceled.

To cancel a window, use the following steps:

Canceling a Window

1. Select Cancel from the window manager menu.
2. Move the cursor into the window you want to cancel.
3. Click the same button you used in step 1. The window is canceled.

Stopping the Server

Stopping the Server

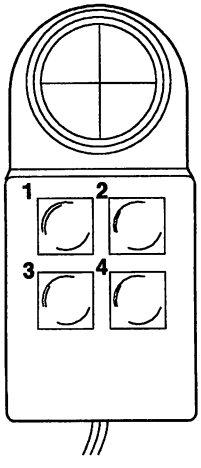
Press **Ctrl-Alt-Bksp** to stop the X Server and return to the shell prompt.

Note: Stopping the server also kills the clients.

Using Other Functions

X-Windows also provides the following functions:

- Copy and paste between terminal windows. For more information, "The COPY, PASTE, and RE-EXECUTE Functions" on page 2-11.
- Fast selection of window manager menu items. For more information, see "Pop-up Button Selection" on page 2-24.
- Change initial layout of screen. For more information, see the **xinit** command on page 2-41.
- Use **Set** to set various keyboard and mouse options, display the window manager horizontally, reverse video, change available colors (on the RT only), and set the bell volume (on the RT only) For more information, see "Set" on page 2-26.
- Customize the window manager menu. For more information, see "Modifying the Window Manager Tools Menu" on page 3-5 and the **aixwm** command on page 2-21.
- Use a tablet as a locator device. (AIX X-Windows supports the tablet on the RT only.) The tablet puck buttons correspond to the mouse buttons as follows:
  - button 1 is the **left** button
  - button 2 is the **middle** button
  - button 3 is the **right** button
  - button 4 is not assigned.



Chapter 2. AIX X-Windows Commands

CONTENTS

About This Chapter

This chapter discusses general command information and describes the AIX X-Windows commands in alphabetical order. An opening section on syntax diagrams discusses how to interpret the parts of the command syntax diagrams.

Each command description includes the following sections:

- A **Purpose** section that explains the command.
- A **Syntax** diagram that shows the required, optional, and default command syntax.
- A **Description** section that gives a detailed explanation of command usage.
- A **Flag** section that discusses each flag that can be specified with the command. Where appropriate, the default setting of the flag is given.

Explanations of file structures and command submenus are included where relevant.

You can use the commands in this chapter to start X-Windows ***clients*** from the command line within a window. Some commands can be selected from the window manager menu. See "Window Manager Command Menu" on page 2-24.

Note: Not all X-Windows commands function on the S/370 system; these exceptions are noted after each command that is affected.

General Information

The following sections discuss topics that are applicable to several different X-Windows commands.

Command Defaults

You can customize X-Windows by copying the file **/usr/lpp/X11/defaults/Xdefaults** into the home directory (**$HOME**) as **.Xdefaults** and customizing the values defined in the file. The format of each line in the file is:

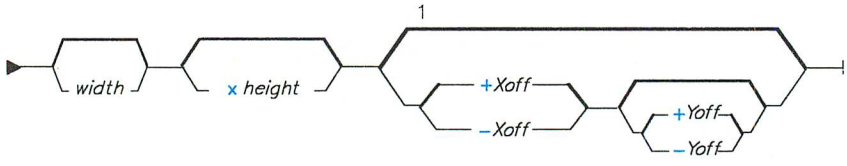
command.keyword:string

If you omit *command*, the specified default value is used for all appropriate X-Windows commands. Global defaults must appear in the file before any specific command defaults.

Each command has keywords that correlate to the command arguments. For more information about keywords and default values, see "Changing X-Windows Defaults" on page 3-4 and the discussions of specific commands.

Geometry Specification

Most commands accept a ***geometry specification***, which defines the size and the placement of windows on the screen. A geometry specification is written in the following format:



[1] Mouse must be used to position the window.

You specify the *width* and *height* as the number of characters for text programs, and usually as pixels for graphics programs. The offsets *Xoff* and *Yoff* are specified as pixels.

If you do not specify an offset, you must use a mouse to position a window. If you specify a size and an offset, a window is automatically sized and positioned when the program begins.

Xoff and *Yoff* specify distances from a corner of the screen to the nearest corner of the window in the following way:

+*Xoff*+*Yoff*	Upper left to upper left
−*Xoff*+*Yoff*	Upper right to upper right
+*Xoff*−*Yoff*	Lower left to lower left
−*Xoff*−*Yoff*	Lower right to lower right

Keyboard Specification

You can change the standard keyboard layout or the default values of the keymap and function keys. Some programs search for and use the **.Xkeymap** file in the home directory of the user for setting up key and function key input resolution.

The **.Xkeymap** file is produced by the ***keycomp*** program (keycomp is an abbreviation for keymap compiler). **.Xkeymap** is the file used to translate keystrokes into character strings.

Many programs perform the translation process by calling the library routine **XLookupMapping**. This routine searches for the keymap table in the following order:

1. **$XDIR/.Xkeymap** (program directory)
2. **$HOME/.Xkeymap** (home directory)
3. **/usr/lpp/X11/defaults/.Xkeymap** (system directory).

Depending on what combinations of the **Shift**, **Lock**, **Ctrl**, **Alt**, and **Alt Graphic** keys you use, each key can have up to 32 different interpretations or ***bindings***. (The **Alt Graphic** keys are only on non-US keyboards.) With US English keyboard mapping, for example, pressing A produces an A (an uppercase *A*) when **Shift** or **Lock** is down, an octal 001 when **Ctrl** is down, and an a (a lowercase *a*) when no other key is down.

For more information on keyboard mapping, see "Keyboard Mapping" on page 3-6. For more information on customizing the **.Xkeymap** file, see "**keycomp**" on page 2-30. See the *IBM AIX X-Windows Programmer's Reference* for more information on the **XLookupMapping** routine.

Color Specification

Many programs allow you to specify colors for things such as the text or the screen background. A color specification can be given as either a color name (such as **blue**) or as a string of three hexadecimal values with each value specifying the intensity of the red, green, or blue color components.

The color names are defined in the **/usr/lpp/X11/rgb/rgb.txt** file. The following is a list of some of the colors defined in the file:

Black	Blue
Cyan	Green
Navy	Red
Tan	White
Yellow.	

The hexadecimal values must be given in one of the following formats:

#*RGB*

#*RRGGBB*

#*RRRGGGBBB*

#*RRRRGGGGBBBB*

In this table, *R*, *G*, and *B* represent single hexadecimal digits (uppercase or lowercase). When fewer than 16 bits each are specified, they represent the most significant bits of the value. For more information, see **XParseColor** in the *IBM AIX X-Windows Programmer's Reference.*

Note: When using one of these values as part of a **sh** (shell) command, enclose the value in double quotation marks. Normally, # indicates a comment in a shell script.

Display Specification

When you first run the **xinit** command, the **$DISPLAY** environment variable is set to the following string:

name:number

The contents of this variable specify the display used by programs running with X-Windows:

- The *name* is usually the host name of a particular system.
- The *number* is used to specify a specific X Server on the named system.

Some commands accept a display specification. If the command accepts a display specification, it causes the command to run on the named system and to display on the numbered X Server on that system.

Syntax Diagrams

Before each command discussion, a syntax diagram shows you how to enter that command correctly on the command line. These diagrams show:

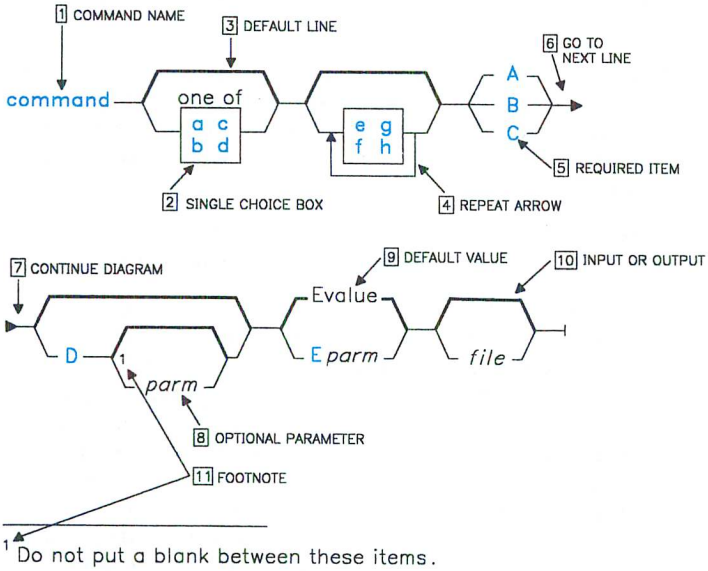
- Which flags can be entered on the command line
- Which flags must take parameters
- Which flags have optional parameters
- Default values of flags and parameters, if any
- Which flags can and cannot be entered together
- Where you must enter flags or parameters and where you have a choice
- Where you can repeat flag and parameter sequences.

The following discussion explains how to interpret the syntax diagrams. It begins with an example diagram that shows most of the conventions used in diagrams. Each part of the diagram is labeled and explained. Following the example are sample diagrams.

Diagram items that must be entered literally on the command line are in **bold**. These items include the command name, all flags, and literal characters. Variable items are in *italics*. These items include parameters that follow flags, and parameters that the command reads, such as *files* and *directories*. If an item has a default value, it is shown in the normal font and the path is shown in bold. You do not enter on the command line any item shown in the normal font on a bold path.

Example of a Syntax Diagram

The following diagram illustrates the conventions used in the syntax diagrams:



You interpret the diagram as follows:

1 COMMAND NAME

The first item in the diagram is the name of the command you want to invoke. It is in bold, so it must be entered exactly as it appears in the diagram.

After the command name, the path branches into two paths. You can follow either path.

2 SINGLE CHOICE BOX

If you follow the lower path, you encounter a box with the words `one of` over it. You can choose only one item from this box.

3 DEFAULT LINE	If you follow the upper path, you bypass the single choice box, and enter nothing. The bold line around the box is a default line, which means that you do not have to enter anything from that part of the diagram. Exceptions are usually explained under "Description." One important exception, the empty default line around input and output files, is explained in item **10**.
4 REPEAT ARROW	When you follow a path that takes you to a box with an arrow around it, you must choose at least one item from the box. Then you can either follow the arrow back around and continue to choose items from the box, or you can continue along the path. When following the arrow around just the box (rather than an arrow that includes several branches in the diagram), do not choose the same item more than once.
5 REQUIRED ITEM	Following the branch with the repeat arrow is a branch with three choices and no default line around them. This means that you must choose one of **A**, **B**, or **C**.
6 GO TO NEXT LINE	If a diagram is too long to fit on one line, this character tells you to go to the next line of the diagram to continue entering your command line. The diagram does not end until you reach the vertical mark.
7 CONTINUE DIAGRAM	This character shows you where to continue with the diagram after it breaks on the previous line.
8 OPTIONAL PARAMETER	If a flag can, but does not have to, take a parameter, the path branches after the flag to show this parameter. If you cannot enter a space between the flag and parameter, you are told in a footnote.
9 DEFAULT VALUE	Often, a command has default values or actions that it will follow if you do not enter a specific item. If the default is not something you can enter on the command line, it is not indicated in the diagram. However, it is discussed under "Flags." **Note:** Default values are included in the diagram for your information. Do not enter them on the command line.
10 INPUT OR OUTPUT	A command that can read either standard input or input files has an empty default line around the file parameter. If the command can write its output to either a file or to standard output, it is also shown with an empty default line around the output file parameter. If a command can read only from standard input, input is not shown in the diagram, and standard input is assumed. If a command writes only to standard output, this is also assumed and output is not included in the diagram. When you must supply a file name for input or output, the file parameter is included in the diagram without a default line around it.

Following are examples of how to enter this command based on this syntax diagram:

```
command A
command C
command a B
command d B
command e A
command e g f A
command C D
command C D8
command A E7
command B myfile
command a e g B D3 E6 myfile
command d f e h C D myfile
```

Note: Although the diagram implies that the order of the flags is important, it is usually not. When the order of the flags is important, it is indicated in the diagram, under "Flags," or in both places. With this in mind, an additional example of how to enter this command is:

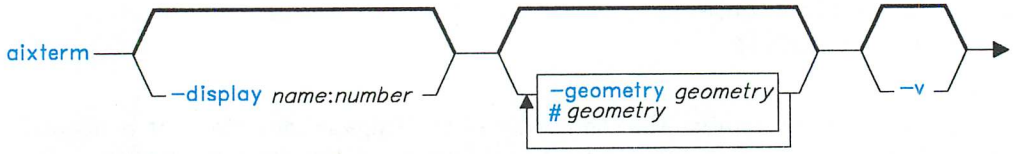
```
command E9 a D g A h f myfile
```

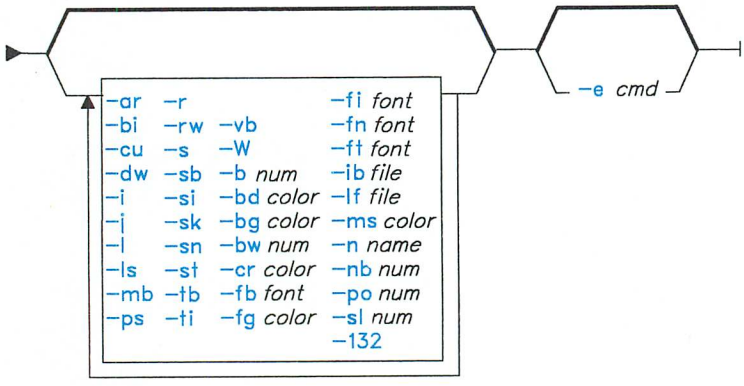
aixterm

Purpose

Initializes an X-Windows terminal emulator.

Syntax





Description

The **aixterm** command provides a standard terminal type for programs that do not interact directly with X-Windows. It can emulate either an HFT terminal or a VT102 terminal. The default is HFT emulation. The VT102 mode is activated by the **-v** flag.

aixterm supports the display of up to 16 colors at a time.

The **aixterm** terminal supports escape sequences that perform terminal functions such as cursor control, moving and deleting lines, and **aixterm** private functions.

Many of the special **aixterm** features (like the scroll bar and logging) can be modified under program control through a set of private **aixterm** escape sequences. You can also use escape sequences to change the title in the title bar and to specify a new logging file name.

For more information on these escape sequences and the supported data streams, see *IBM AIX X-Windows Programmer's Reference* and *AIX Operating System Technical Reference.*

There are four different areas in the **aixterm** window:

- Title bar
- Scroll bar
- Status line
- Terminal window.

By default, only the title bar and the terminal window are initially displayed.

The terminal window is the area provided for the terminal emulation. When you create a window, a pseudo terminal is allocated and a command (usually a shell) is started.

The **aixterm** command automatically highlights the window border, text cursor, and title bar when the mouse cursor enters the window (selected) and unhighlights them when the mouse cursor leaves the window (unselected). If the window is the ***focus window***, the window is highlighted regardless of the location of the mouse cursor.

In addition to using the window manager, an **aixterm** window can also be hidden by clicking the window name in the title bar. If output occurs while an **aixterm** window is hidden and the bitmap icon is displayed, a box is drawn around the icon title. To monitor the **aixterm** window while it is hidden, the user can display a miniature version of the terminal window instead of the default icon bitmap. This miniature window is called an ***active icon***.

The environment variable **WINDOWID** is set to the resource ID number of the **aixterm** window.

The COPY, PASTE, and RE-EXECUTE Functions

Once you create a terminal window, **aixterm** allows you to save text and restore it within the same or other terminal windows by using COPY, PASTE, and RE-EXECUTE button functions. These text functions are available in both HFT and VT102 emulation. The selected text is highlighted while the button is pressed.

The COPY, PASTE, and RE-EXECUTE button functions perform as described below:

COPY — Pressing the **left** button saves text in the cut buffer. **aixterm** does a text cut, not a box cut. Move the cursor to the beginning of the text. Then hold the button down while moving the cursor to the end of the desired region and release the button. The selected text is highlighted and saved in the global cut buffer when the button is released.

- Use ***double-clicking*** to select words.
- Use ***triple-clicking*** to select lines.

Multiple-clicking is determined from the time that the button is released to the time the button is pressed again.

You can also use **markers** to cut text. Click the **left** button at the starting position of the desired region. With all the buttons up, move the mouse cursor to the end of the desired region and click the **right** button. The desired region will be highlighted and saved in the cut buffer.

The **right** button also extends the current selection. Once a desired region has been selected, pressing the **right** button again will add the region between the current mouse position and the previously selected region to the cut buffer. The extension will be in the same selection mode that the previous selection or extension was performed. Use multiple-clicking to cycle through the various selection modes.

PASTE — Pressing **both** buttons at once (or the **middle** button on a three-button mouse) types the text from the cut buffer into the terminal window that contains the mouse cursor, inserting it as keyboard input.

RE-EXECUTE — Pressing **Shift** and the **left** mouse button takes the text from the cursor (at button release) through the end of line (including the new line), saves it in the global cut buffer and immediately retypes the line, inserting it as keyboard input. The selected text is highlighted. Moving the mouse cursor off of the initial line cancels the selection. If there is no text beyond the initial cursor point, **aixterm** sounds the bell, indicating an error.

By cutting and pasting pieces of text without trailing new lines, you can take text from several places in different terminal windows and form a command to the shell, for example, or take output from a program and insert it into your favorite editor running in a terminal window. The cut buffer is globally shared among different terminal windows. The

terminal emulator treats the cut buffer like a text file, in that the text is delimited by new lines.

Menu Usage

The **aixterm** command has three different menus:

- Options
- Modes
- Scrollbar.

Each menu pops up under the correct combinations of key and button presses. Each menu contains various modes that can be toggled. Most of the menu items can also be altered by the use of command options. A + (plus sign) appears next to a mode that is currently active. Selecting one of these modes toggles its state. Some items of the menus are command entries; selecting one of these performs the indicated function.

The Options menu pops up when **Ctrl** and the **left** mouse button are pressed in a window. The menu contains items that apply to all emulation modes. This menu can also be activated by pressing the **left** mouse button while the mouse cursor is in the title bar.

The Modes menu sets various modes for each emulation mode. The menu is activated by pressing simultaneously the **Ctrl** key and the **right** mouse button while the mouse cursor is in the window. The soft reset entry resets scroll regions, a function that can be useful when a program leaves the scroll regions set incorrectly. The full reset entry clears the screen, resets tabs to every eight columns, and resets the terminal modes (such as wrap and smooth scroll) to their states after **aixterm** finishes processing the command line options. This menu can also be activated by pressing the **right** mouse button while the mouse cursor is in the title bar.

The Scrollbar menu pops up when **both** mouse buttons are pressed at once (or the **middle** button is pressed on a three-button mouse) while the mouse cursor is on the scroll bar. This menu allows several modes particular to the scroll bar to be set.

Scrollbar

The **aixterm** command supports an optional scroll bar composed of a scroll button displayed at the top of the scroll bar and a scroll region at the bottom. The scroll bar is hidden until its display is requested. Pressing **both** buttons on the mouse at once (or the **middle** button on a three-button mouse) while the cursor is in any part of the scroll bar displays the scroll bar menu.

The ***scroll region*** displays the position and amount of text currently showing in the window (highlighted) relative to the amount of text actually saved in the scrolling buffer. As more text is saved in the scrolling buffer, the size of the highlighted area decreases. Clicking either the **left** or **right** button while the mouse cursor is in the scroll region positions the top of the display window at the mouse cursor.

The scroll button causes the window to scroll up and down within the saved text. Clicking the **left** button moves the window position up (the text scrolls downward), while clicking the **right** button moves the window position down (the text scrolls upward). The amount of scrolling is modified by the **Shift** and **Ctrl** keys. If neither key is pressed, the window scrolls a single line at a time. Pressing the **Shift** key causes the text to scroll a full window at a time, minus one line. Pressing the **Ctrl** key causes the text to be positioned at the extreme top or bottom of the file.

HFT Emulation Summary

The **aixterm** command supports a window that is equivalent to an HFT virtual terminal.

The following is a summary of HFT emulation functions:

- A subset of HFT ioctl/VTDs is supported. For more information, see *IBM AIX X-Windows Programmer's Reference.*
- Keyboard mapping is defined by **XLookupMapping** and the **keycomp** command. For more information, see "**keycomp**" on page 2-30. For more information about

XLookupMapping refer to *IBM AIX X-Windows Programmer's Reference*. For information on keyboard mapping, see *Keyboard Description and Character Reference.*

- International Character Support is provided for code page switching single-shift control characters. For more information on the datastream, see *AIX Operating System Technical Reference.*
- The HFT datastream as defined in *AIX Operating System Technical Reference* is supported.
- Mouse reports are supported.
- HFT escape sequences beyond the standard VT102 set are implemented. For more information, see *IBM AIX X-Windows Programmer's Reference.*

VT102 Emulation Summary

The **aixterm** command emulates a VT102 terminal when the **-v** command option is specified. When VT102 emulation is requested, **aixterm** sets the **TERM** environment variable to **vt100**.

Five keyboard states are handled by **XLookupMapping**. In order to have VT102 keyboard mapping, a VT102 **.Xkeymap** file must reside in the home directory of the user or in a directory supported by **XLookupMapping**.

The VT102 emulation does not support a blinking character attribute nor double-wide and double-size character sets. Also, International Character Support is not provided during VT102 emulation.

Flags

An option takes on the opposite value if the - (minus sign) is changed to a + (plus sign). These options override those set in the **.Xdefaults** file.

The **aixterm** command uses the following flags:

-ar Turns on the auto-raise mode of **aixterm**, which automatically raises the window (after a delay determined by keyword **autoRaiseDelay**) when the mouse cursor enters the window. The default is off.

This flag can be turned on and off from the Options menu.

-b *num* Specifies the width in pixels of an ***inner border***. The inner border is the distance between the outer edge of the characters and the window border. The default is **2**.

-bd *color* Specifies the color of the highlighted border on color displays. The default is black.

-bg *color* Specifies the color of the window background on color displays. The default is white.

-bi Defines the icon window to be a miniature terminal window (active icon) instead of an icon bitmap. The default is an icon bitmap.

This option can be turned on and off from the Options menu.

-bw *num* Specifies the width of the window border in pixels. The default is 2 pixels.

-cr *color* Determines the color of the text cursor on color displays. The default is the foreground color.

-cu Causes certain curses applications to display leading tabs correctly. The default is off.

This option can be turned on and off from the Modes menu.

-display *name:number* Identifies the host name and X Server display number where **aixterm** is to run. By default, **aixterm** gets the host name and display number from the environment variable **DISPLAY**. For more information, see "Display Specification" on page 2-6.

-dw Causes the mouse cursor to move (*warp*) automatically to the center of the **aixterm** window when the **aixterm** icon window is deiconified. The default is off.

-e *cmd* Specifies a command to be executed in the window. This flag executes the command; it does not start a shell. If this flag is used, the command and its arguments (if any) must appear last on the **aixterm** command line.

-fb *font* Specifies the name of the bold font. This font must be the same height and width as the normal font.

-fg *color* Determines the foreground color of the text on color displays. The default is black.

-fi *font* Specifies the font to be used for the active icon window. The default is **Rom6.500** for HFT mode. In VT102 emulation, the default is **nil2**.

-fn *font* Specifies the name of a normal font. Any fixed-width font can be used. In HFT emulation, the default is **Rom14.500** for a large display, **Rom10.500** for a medium display, **Rom8.500** for a small display. In VT102 emulation, the default is **vtsingle**.

-ft *font* Specifies the name of a title bar font. The default is the normal font.

-geometry *geometry* Specifies the location and the dimensions of a window. The default is **80x25+0+0**.

For more information on geometry, see "Geometry Specification" on page 2-4.

 # geometry Specifies the location of an icon window. If specified, width and height are ignored. Width and height are taken from the size of the bitmap and the length of the title.

Note: When using one of these values as part of a **sh** (shell) command, enclose the value in double quotation marks. Normally, # indicates a comment in a shell script.

For more information on geometry specifications, see "Geometry Specification" on page 2-4.

-i Causes **aixterm** to display the icon window rather than the normal window when the window is opened. The default is off.

-ib *file* Specifies the bitmap file to read for use as the icon bitmap file instead of the default bitmap file. See **/usr/include/X11/bitmaps** for a sample bitmap file.

-j Causes **aixterm** to move multiple lines up at once (***jump scroll***) if many lines are queued for display. The default is off.

This option can be turned on and off from the Modes menu.

-l Causes **aixterm** to append output from the window to the end of the **logfile** file. The default is off.

This option can be turned on and off from the Options menu.

This does not override **LogInhibit** in the **.Xdefaults** file. For more information about **LogInhibit**, see page 2-18.

-lf *file*
Specifies the file where the output is saved, instead of the default file **XtermLog.***xxxxx*, where *xxxxx* is the process ID of **aixterm**. The file is created in the directory where **aixterm** is started, or in the home directory for a login **aixterm**. If the file name begins with a | (pipe symbol), the rest of the string is interpreted as a command to be executed by the shell and a pipe is opened to the process.

-ls
Causes the shell run under **aixterm** to be a login shell. The user's **.login** or **.profile** file is read, and the initial directory is usually the home directory. The default is off.

-mb
Turns on the right margin bell. The default is off.

This option can be turned on and off from the Modes menu.

-ms *color*
Determines the color of the mouse cursor on color displays. The default is the foreground color.

-n *name*
Specifies a window name for use by **aixterm**. This name is displayed in the title bar.

-nb *num*
Specifies the right margin distance at which the margin bell rings. The default is 10 spaces from the right edge of the window.

-po *num*
Specifies the number of lines from the previous screen that will still be displayed on the screen when the window is scrolled one page. The default is 1 line.

-ps
Turns on the page scroll mode.

After a page of lines is displayed, **aixterm** stops displaying new lines and the text cursor disappears. Pressing the **Enter** key displays one new line. Pressing the space bar or a character key displays a new page.

-r
Reverses the foreground and background colors. This becomes the normal video mode.

This option can be turned on and off from the Modes menu.

-rw
Turns on reverse-wraparound mode. The default is off.

This mode allows the cursor to wraparound from the leftmost column to the rightmost column of the previous line. This can be useful in the shell to allow erasing characters backwards across the previous line.

This option can be turned on and off from the Modes menu.

-s
Turns off synchronous scrolling on the display. The default is on.

When this flag is specified, **aixterm** no longer attempts to keep the screen current while scrolling and can run faster when network latencies are very high.

-sb
Causes the scrollbar to be displayed.

This option may be turned on and off from the Modes menu. The default is off.

-si
While using the scrollbar to review previous lines of text, the window is normally repositioned automatically at the bottom of the scroll region before output to the screen is processed. The default is on.

This option disables window repositioning on output.

-sk	Causes the window to be repositioned automatically in the normal position at the bottom of the scroll region when a key is pressed. The default is off. This option is intended for use with the scroll bar to review previous lines of text. Pressing a key also creates output, which will be affected by the **-si** option. This option can be turned on and off from the Scrollbar menu.
-sl *num*	Specifies the maximum number of lines to save that are scrolled off of the top of the window. The default is **64**.
-sn	Displays the status line to be displayed in normal video (the status line is still enclosed in a box). By default, the status line appears in reverse-video relative to the rest of the window. This option can be turned on and off from the Modes menu.
-st	Displays the status line on startup. The default is off.
-tb	Disables the display of the title bar on startup. By default, the title bar is displayed on startup. This option can be turned on and off from the Options menu.
-ti	Displays the title to the right of the bitmap in the icon window. By default, the title appears under the bitmap.
-v	Enables VT102 emulation. By default, an HFT terminal is emulated. **Note:** Keyboard map is needed for this mode.
-vb	Enables the visual bell mode. The visual bell flashes the window on receipt of the **Ctrl-G** key combination instead of ringing the bell. The default is off.
-W	Causes the mouse cursor to move (warp) to the middle of the **aixterm** window when the window is created. The default is off.
-132	Causes the **sm/rm** escape sequences to be recognized and the **aixterm** window to be resized as specified. Normally, the **sm/rm** escape sequences that switch between the 80-column and 132-column modes are ignored. The default is off. This option can be turned on and off from the Modes menu. For more information, see *IBM AIX X-Windows Programmer's Reference.*

.Xdefaults Keywords

The following default keywords are used with the **aixterm** command. (An example default file is in **/usr/lpp/X11/defaults**.)

activeIcon
If true, displays the **aixterm** icon window as a miniature terminal window (active icon) instead of an icon bitmap. The default is false.

allowIconInput
If true, allows keyboard input to the miniature terminal window (active icon). The default is false.

autoRaise
If true, raises the **aixterm** window automatically (after a delay of **autoRaiseDelay**) when the mouse cursor enters the window. The default is false.

autoRaiseDelay
If **autoRaise** is true, specifies the number of seconds to delay before automatically raising a window. The default is **2** seconds.

background
Specifies the color of the window background on color displays. The default is a white background.

boldFont
Specifies a bold font. This font must have the same height and width as the normal body font.

borderColor
Specifies the color of the window border.

borderWidth
Specifies the width of the window border in pixels. The default is **2** pixels.

c132
If true, specifies that the **sm/rm** escape sequences to resize the **aixterm** window between 80 and 132 columns be recognized. The default is false.

curses
If true, causes certain curses applications to display leading tabs correctly. The default is false.

cursorColor
Specifies the color of the text cursor on color displays. The default is the foreground color.

deiconifyWarp
If true, moves or warps the mouse to the center of the window when replacing the **aixterm** icon window with the **aixterm** window. The default is false.

font
Specifies the name of the normal text font used in the body of the **aixterm** window.

foreground
Specifies the color for the text displayed inside the body of the window on color displays. The default is black.

geometry
Specifies the location or dimensions of the window. For more information about geometry, see "Geometry Specification" on page 2-4.

iconBitmap
Reads the bitmap filename and uses the resulting bitmap as the icon.

iconFont
Specifies the name of the text font used in miniature active icon windows.

iconGeometry
Specifies the location of the icon window. For more information about geometry, see "Geometry Specification" on page 2-4.

iconStartup
If true, it causes **aixterm** to start by displaying an icon window rather than the normal window.

internalBorder
Specifies the number of pixels between the text characters and the window border. The default is **2** pixels.

jumpScroll
If true, it enables jump scroll. The default is false.

logFile
If **logging** is true, it specifies the file in which the log is written. The default is **Xterm.log***XXXXX*, where *XXXXX* is a unique ID of **aixterm**.

logging
If true, appends all input from the pseudo tty to the logfile. The default is false.

logInhibit
If true, it prevents a user or an application program from enabling logging. This overrides any values set for **Logging**.

marginBell
If true, it enables the right margin bell. The default is false.

nMarginBell
Specifies the distance from the right edge of the window where the margin bell rings. The default is 10 spaces from the right edge of the window.

pageOverlap
Specifies the number of lines from the previous screen that will remain on the screen when the terminal is scrolled one page. In page scroll mode, a ***page*** is the number of lines in the the scrolling region minus the page overlap. The default is **1** line.

pageScroll
If true, it enables the page scroll mode. The default is false.

After a page of lines is displayed, **aixterm** stops displaying new lines and the text cursor disappears. Pressing the **Enter** key displays one new line. Pressing the space bar or a character key displays a new page.

pointerColor
Specifies the color of the mouse cursor on color displays. The default is the color of the text cursor.

pointerShape
Specifies the shape of the mouse cursor to be used in an **aixterm** window. See the *IBM AIX X-Windows Programmer's Reference* for a list of cursors. The default is **XC_left_ptr**.

reverseVideo
If true, it reverses the foreground and background color. The default is false.

reverseWrap
If true, it sets reverse-wraparound mode, which allows the cursor to wrap from the leftmost column to the rightmost column of the previous line. The default is false.

saveLines
When lines are scrolled off the top of a window, they can be saved. This number specifies the maximum number of lines to save. The default is 64 lines.

scrollBar
If true, it displays the scroll bar during startup.

scrollInput
Specifies whether or not output to the terminal should automatically cause the scrollbar to go to the bottom of the scrolling region. The default is true.

scrollKey
If true, it automatically repositions the window in the normal position, at the bottom of the scroll region, when a key is pressed while using the scroll bar to review previous lines of text. The default is false.

Pressing a key also creates input, which is affected by keyword **scrollInput**.

statusLine
If true, it displays the status line on startup. The default is false.

statusNormal
If true, it displays the status line in normal video (the status line is still enclosed in a box). By default, the status line is in reverse-video relative to the rest of the window.

textUnderIcon
If true, it displays the title of the icon window at the right of the bitmap in the icon window. By default, the title is displayed under the bitmap.

title
Specifies the title to be shown in the titlebar. The default is **aixterm**.

titleBar
If false, it disables the title bar from being displayed on startup. The default is true.

titleFont
Specifies the name of the font to be used in the title bar. The default is the normal body font.

visualBell
If true, it enables the visual bell mode which flashes the window on receipt of a **CTRL-G**. The default is false.

vt102
If true, it enables VT102 mode. The default is HFT emulation.

warp
If true, it automatically warps (moves) the mouse cursor to the center of a newly created **aixterm** window. The default is false.

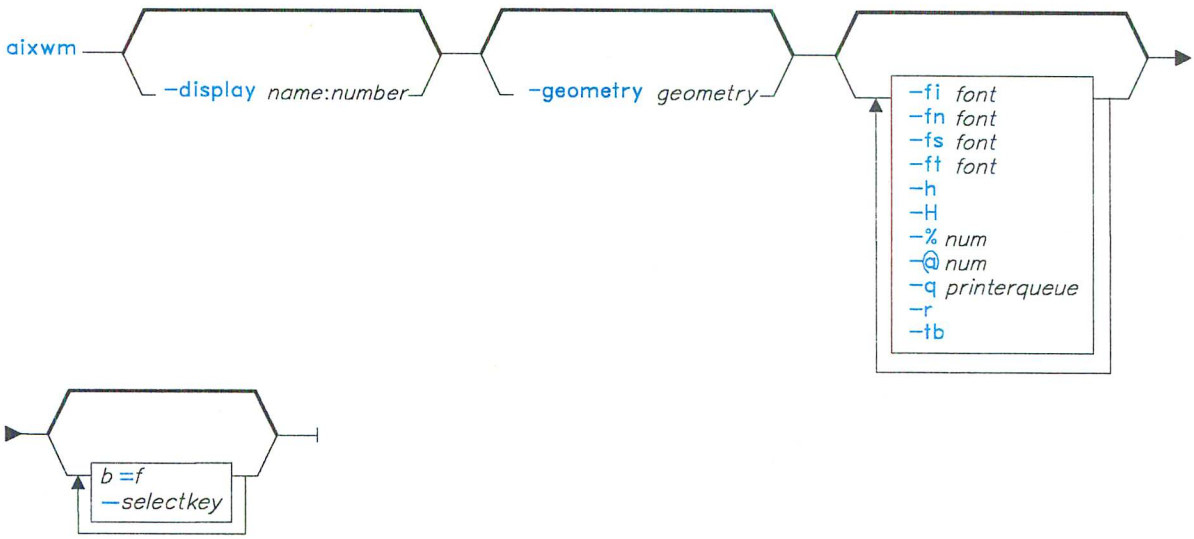
For more information about the use of these keywords, see "Changing X-Windows Defaults" on page 3-4.

aixwm

Purpose

Provides window manager functions.

Syntax



Description

The window manager allows you to manipulate the windows on the screen. **aixwm** does the following:

- Implements overlapping windows
- Allows windows to be moved, hidden, and resized
- Allows the order of the windows in a stack of overlapping windows to be manipulated
- Allows the keyboard focus to be attached to a window
- Allows commands to be invoked from a window
- Allows various display options to be set.

While performing window manager operations, the window manager normally takes control of the screen at various times to assure that the screen image remains correct. When this happens, requests from other applications are temporarily suspended until the window manager finishes the operation.

Flags

b=*f*

Specifies an association between a button (*b*) and a function (*f*).

b can be one of the following:

l left
r right
m both (middle).

l indicates the left mouse button, **r** indicates the right mouse button, and **m** indicates the **both** mouse button. When using a three-button mouse, specify **m** by pressing the middle button.

f can be one of the following functions:

c circulate
C Cancel
f focus
h hide/show
l lower
m move
p pop
P Print
r raise
R Refresh
S Set
T Tools
z resize.

pop specifies the button that is used to pop up the command menu at the position of the mouse cursor.

−display *name:number*

Identifies the host name and display number where **aixwm** is to run. Normally, the host name and display number are obtained from the environment variable **DISPLAY**. For more information, refer to "Display Specification" on page 2-6.

−fi *font*

Specifies an ***icon font*** to use when hiding a window. Any fixed-width font can be used. The default is **Rom14.500** for a large display and **Rom10.500** for a small display.

−fn *font*

Specifies a font for use in display of the menu. Any fixed-width font can be used. The default is **Rom14.500** for a large display and **Rom10.500** for a small display.

−fs *font*

Specifies the font to use when sizing a window. Any fixed-width font can be used. The default is **Rom14.500** for a large display and **Rom10.500** for a small display.

−ft *font*

Specifies the font to use in the title bar for a client window. Any fixed-width font can be used. The default is **Rom14.500** for a large display and **Rom10.500** for a small display.

−geometry *geometry*

Specifies the location of the **aixwm** window. The default is **−0+0**. Values for width and height, if entered, are not used. For more information, refer to "Geometry Specification" on page 2-4.

−h

Displays the menu horizontally. The default is vertical.

−H

Specifies hide mode. The default is off.

−% *num*

Controls where the icon is to be placed when hiding a window. The default threshold amount is **5** pixels.

If the mouse is moved more than a threshold amount or if this is the first time the window has been hidden, the icon appears at the location of the mouse cursor when the button is released. Otherwise, the icon reappears at its previous location. A negative value disables this effect.

-@ *num*	Specifies the width in pixels of the border when a window is focused. The default is **5** pixels.
-q *printerqueue*	Specifies the printer queue to use when a request is issued to print the screen.
-r	Enables reverse video.
-selectkey	Specifies the selection key used in combination with the mouse button to select menu items automatically. *selectkey* is one of the following: **a** signifying left **Alt (Alt)** **c** signifying **Ctrl** **g** signifying right **Alt (Alt Graphic)** **l** signifying **Lockshift** **m** signifying left **Alt (Meta)** **s** signifying **Shift** **n** signifying none. The default is **a**.
-tb	Disables the display of the window manager title bar for client windows on startup. By default, the window manager title bar is displayed for the client window on startup.

Menu Modes

The window manager has two modes of operation:

- Normal
- Hidden.

For more information about the hidden mode, see "Button/Key Selection" on page 2-24.

The default mode is normal. The default pop-up button is the right button. The default selection key is the **Alt** key.

In the normal mode, the command menu is always visible. The menu window's home position is the upper-right corner of the screen. To perform an action, click any mouse button in the appropriate menu box and click the same button in the window you wish to select.

To activate hidden mode, use the **-H** option. In the hidden mode, the menu's home position is hidden until it is popped up. The command menu pops up when the pop-up button is pressed. At least one button must be defined to cause the command menu to pop up. Whenever the pop-up button is clicked while the appropriate combination of **Ctrl**, **Alt**, and **Shift** keys are pressed, or any time a button is clicked in the background, the menu appears beneath the cursor. You can then use the menu as defined for the pop-up button.

Selection Methods

Selection within the menu can be done with one of the following methods:

- Moving the mouse cursor to the window manager menu and selecting a menu item with any button.
- Pressing the pop-up button to view the window manager menu and, then releasing the button at a menu item.
- Pressing button and key combinations for automatic selection. This mechanism, which is represented in the window manager command menu, allows a key in combination with a mouse button to automatically select a menu item and immediately apply the function to a window. Automatic selection is applied to the window containing the mouse cursor. For an example of the window manager command menu, refer to "Window Manager Command Menu" on page 2-24.

Pop-up Button Selection

Pressing the pop-up button (by default with **Alt** down) moves the command menu with the previously selected item or the central one beneath the mouse cursor. The menu remains at that location until an item is selected or until the mouse cursor is moved out of the menu. By default, the pop-up button is the right button, but it can be defined to be any button.

When a command is selected:

- The menu item remains selected until the command is completed.
- The menu is returned to its previous state and location if **aixwm** is in normal mode. If the menu is in hidden mode, the menu is removed from the display.

If the mouse cursor is moved out of the menu, nothing is selected. This is useful if you decide not to select an item once the menu is activated.

Button/Key Selection

aixwm reserves certain button/key combinations and interprets them as operations on existing windows. Button/key selection can be used in place of the default mouse button and menu selection method to automatically select and run an operation.

The key combination can be specified in the command line with some subset of the options:

a signifying left **Alt (Alt)**
c signifying **Ctrl**
g signifying right **Alt (Alt Graphic)**
l signifying **Lockshift**
m signifying left **Alt (Meta)**
s signifying **Shift**
n signifying none.

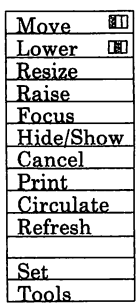
The default is **a**.

For example, if you specify the options **−ca**, the **Ctrl** and **Alt** keys must be down at the time a mouse button is pressed. The option **−n** means that no keys need to be held down. The option **−n** is not recommended because it means that application programs never receive unshifted mouse clicks.

Window Manager Command Menu

The window manager displays a menu of commands that you can use to manipulate windows on the display. By default, the menu is displayed vertically in the upper-right corner of the display.

On your screen, the window manager command menu looks similar to the following:



Use the menu by selecting an item within the menu, and then applying the command to a window. Once you select a menu item, **aixwm** controls the mouse until the command is completed or canceled. You can deselect an item on the menu by clicking a different button than the one used to select the item.

For example, to hide a window, you can use the following steps:

1. Move the mouse cursor to Hide/Show in the menu and select it. The item Hide/Show is highlighted in the menu.
2. Move the mouse cursor to the window to be hidden and press the same button.

The window is hidden. An icon window is displayed and Hide/Show is unhighlighted.

The commands in the window manager command menu provide the following functions:

Move	Moves a window. When you select a window, you can use the mouse to move an outline of the window. When you release the button, the window is moved.
Lower	Pushes the window you select to the bottom of any stack of overlapping windows.
Resize	Resizes a window. When you apply the mouse cursor to a window, an outline of the window is displayed. Moving the mouse cursor changes the size of the outline, leaving the opposite corner fixed. The corner that moves depends on the location of the mouse cursor when the button is pressed. The window is divided into a logical grid of four rectangles. If the mouse cursor is in one of the four corner rectangles, the corner closest to the mouse cursor is moved. When the button is released, the window is resized.
Focus	Attaches the keyboard to a window. Keyboard input goes to that window even when the mouse cursor is outside the window. It also raises the focused window. Focusing the background detaches the keyboard from any window by attaching it to the background window. When no window is focused, the keyboard input goes to the window that contains the mouse cursor. The focused window is highlighted by a partial frame.
Hide/Show	Makes a window into an icon or an icon into a window. When applied to an icon, Hide/Show makes the original window reappear at its former position on the screen. If a window has not provided an icon, the window manager creates its own icon and places the name of the window or icon in it. In this case, the mouse movement and editing functions discussed in this section are valid. If the mouse is moved more than a threshold amount or if this is the first time the window is being hidden, the icon appears at the location on the screen where the button is released. Otherwise, the icon reappears at its previous location. The threshold amount can be changed with the **−%** *num* flag. Giving a negative value disables this effect. The icon name can be edited. Pressing the **Delete** or the **Backspace** key deletes the last character of the icon name, pressing **Ctrl-U** deletes the entire name, pressing the **Enter** key detaches the keyboard from the icon window, and pressing other character keys appends the characters to the current name.
Cancel	Causes the X Server to disconnect from the selected window. The window is taken away. Applications usually terminate when disconnected from the X Server.

Raise	Raises a window to the top of any stack of overlapping windows.
Print	Prints the contents of a window on the printer. The printer device name is obtained from the environment variable XPRINTDEV (for example, XPRINTDEV="-device 3812"). Printer devices are supported as shown below: **3812** IBM 3812 Pageprinter **5201** IBM 5201 Quietwriter Model 2 **5202** IBM 5202 Quietwriter III.
Circulate	Causes the lowest window in the stack of overlapping windows to be raised. Successive applications reveal each window in turn.
Refresh	Clears the display and forces each application to redraw its contents.
Set	See "Set."
Tools	See "Tools" on page 2-27.

Both Set and Tools display a submenu below or above the mouse cursor location, depending on the space available. The submenu remains visible until a selection is made or until the mouse cursor is moved out of the submenu.

Set

Selecting Set from the window manager command menu displays a submenu through which you can set various display options. Some of the options are toggle buttons that can be set either on or off. If an option is marked with a + (plus sign), the option is set to on.

The following table lists the options on the **Set** menu:

Autorepeat	Enables or disables key repeat while a key is pressed.
Hide Menu	Causes **aixwm** to hide the command menu until it is activated. Once a command is complete, the command menu is hidden again.
Horizontal Menu	Enables or disables the horizontal display of menu items.
Reverse Video	Reverses foreground and background colors in the window manager menu.
Raise After Action	Raises the window to the top of the window stack after it is manipulated, for example, moved or resized.
Window Title Bar	Enables or disables the title bar for client windows on startup. The **aixwm** window manager automatically highlights the title bar when the mouse cursor enters the window and unhighlights it when the mouse cursor exits the window. If the window is the Focus window, the window is highlighted regardless of the location of the mouse cursor. By clicking any mouse button on the title bar, a client window is changed into an icon window. Then, by clicking any mouse button on the icon window, the icon window changes to the client window. The client window reappears at its former position on the screen. By default, if a window does not have a window name, the title bar is not displayed.
Assign Button	Displays a copy of the command menu and enables the association of a mouse button with a menu item. Clicking a button while the mouse cursor is on a menu item associates the button with the item.

Click	Sets the keyboard click to either off (0) or to a volume level from 1 through 100. A menu with the current volume is displayed. Pressing the right button increases the value and pressing the left button decreases the value. Pressing both buttons sets the volume. **−1** restores the default. (This option is supported on the RT only.)
Foreground Color	Displays a menu of available colors from which you can select a foreground color. (This option is supported on the RT only.)
Background Color	Displays a menu of available colors from which you can select a background color. (This option is supported on the RT only.)
Bell	Sets the bell to either off (0) or to a volume level from 1 through 100. A menu with the current volume is displayed. Pressing the right button increases the value and pressing the left button decreases the value. Pressing both buttons sets the volume. **−1** restores the default. (This option is supported on the RT only.)
Mouse	Sets the acceleration and threshold for the mouse. A menu for each value is displayed in sequence. Pressing the right button increases the value and pressing the left button decreases the value. Pressing both buttons sets the value. **−1** restores the default.
Screen	Sets the length of time in minutes before the server clears the screen. A menu with the default value is displayed. Pressing the right button increases the value and pressing the left button decreases the value. Pressing both buttons sets the time. **−1** restores the default.

Tools

Selecting Tools displays a menu of application program names that can be invoked within **aixwm**. Using this menu, you can select and start programs within X-Windows. The **Tools** menu supports the invocation of three classes of programs:

X-Windows applications	Application programs written directly to the X library and invoked by their command names.
Emulation applications	Character application programs that are supported by the **aixterm** HFT emulation function; invoked with the **aixterm −e app** command.
Full-screen applications	Programs that write directly to the display adapter card and run in monitor mode; invoked with the **xopen app** command.

The Tools Menu Controller

The file **/usr/lpp/X11/defaults/X.txt** controls what is displayed in the command menu. The format of a line in this file is:

function_context!!*function_name*!*description*

aixwm uses the *function_context* field to invoke a function or open another pop-up text file and uses the *function_name* field to build the command menu. The *description* is a comment field.

You can modify **X.txt** by editing its contents with a text editor or, on the RT, by using the **Menu Update** command. This command is similar to the **Tools Update** menu in Usability

Services. To use **Menu Update**, Usability Services must be installed on the system. For more information about Usability Services, see *Usability Services Reference*.

A file named **Xtools.txt** for the **Tools** pop-up is added within **X.txt**. The default **Xtools.txt** contains the AIX shell and the analog and digital clock applications.

The Tools Menu File

The file **Xtools.txt** contains information on application programs accessible through the **Tools** window. The format of a line in this file is:

!!!!*exec_program*!*command_name*!*description*

aixwm uses the *exec_program* field to invoke the application program. The *exec_program* field allows a command string to be supplied rather than just a command name. This allows the customization of commands. The *command_name* field is used to build the **Tools** pop-up. The *description* is a comment field.

For example, the command:

```
aixterm -geometry 80x24 -fn Rom14.500 -em78
```

specifies that the EM78 program be invoked in a new window with the **Rom14.500** font. This must be done to support invocation of full-screen applications.

.Xdefaults Keywords

The following default keywords are used to customize the **aixwm** command. (An example default file is in **/usr/lpp/X11/defaults**.)

bodyFont
Specifies any fixed-width body font used for the **aixwm** menu.

frameWidth
Specifies the width of the border in pixels when you choose to focus on a window. One way to focus on a window is to choose Focus from the window manager menu. When you focus on a window, all keyboard input goes to that window regardless of the location of the mouse cursor.

geometry
Specifies the location or dimensions of the window. For more information about geometry, see "Geometry Specification" on page 2-4.

hide
If true, it enables hide mode.

iconFont
Specifies the font used in the icon window.

iconifyDelta
Controls where the icon window is to be placed when using the **Hide** option from the window manager menu. If this is the first time that the window has been hidden, or if the mouse is moved more than a threshold amount, the icon window is displayed at the location on the screen where the button is released. Otherwise, the icon window reappears at its previous location. A negative value disables this effect.

Note: For more information about the mouse threshold, see **−t** flag on page 2-35.

keyCombination
Specifies the selection key to be used by the window manager.

leftButton
Specifies an association between the left button and a function. For more information, see "Button/Key Selection" on page 2-24.

menuFormat
If h is indicated, it displays the menu horizontally.

middleButton
Specifies an association between both buttons and a function. For more information, see "Button/Key Selection" on page 2-24.

raised
Raises the window to the top of the window stack after it is manipulated.

queueName
Specifies the printer queue to use when a request is issued to print the screen.

reverseVideo
If true, it reverses the foreground and background color.

rightButton
Specifies an association between the right button and a function. For more information, see "Button/Key Selection" on page 2-24.

sizeFont
Specifies any fixed-width font as the default font used when displaying the new geometry while resizing a window.

titleBar
Disables the title bar for client windows at startup.

titleFont
Specifies the title font to use in the title bar of the client windows.

For more information about the use of these keywords, see "Changing X-Windows Defaults" on page 3-4.

keycomp

Purpose

Reads a textual description of the keyboard and produces a binary keymap file.

Syntax

Description

The **keycomp** command reads a textual description of the keyboard and produces a binary keymap file. The keymap file is used to translate keystrokes into character strings. For more information on the keymap file, see "Keyboard Specification" on page 2-5.

The **keycomp** command supports the full range of HFT keyboard mapping, including the **Alt Graphic** shift state, on non-U.S. keyboards only.

You can use **keycomp** to define ***diacritical*** keys (dead keys). The code-point combinations that produce the actual diacritical characters are predefined and cannot be changed using **keycomp**. The pre-defined combinations are listed in the data stream section of the *AIX Operating System Technical Reference*.

Seven different states are supported in the base keymap files. Additional states are either mapped to single states or defined as **UNBOUND** (return nothing) for the keymap files.

Keycomp Source File

The input file to **keycomp** consists of one or more lines, each beginning with an octal, decimal, or hexadecimal number designating an X-Windows ***keysym*** value. (A keysym is a symbol that has been engraved on a keyboard key.) Items follow the keysym, each representing the binding for a particular combination of the **Ctrl**, **Alt**, **Shift**, **Lock**, and **Alt Graphic** keys. Items on the line are separated by a space.

If only one item is present on a line, it represents the binding for this keysym regardless of the position of the shift keys. The first 16 states are required in the source file. If more than 16, but fewer than 32 states are provided, the last state is extended to all the missing states up to state 32.

The bindings of items are made in the order defined below:

#1	Base state; no **Ctrl**, **Alt**, **Shift**, **Lock**, or **Alt Graphic** down
#2	**Shift** down
#3	**Lock** down
#4	**Lock** and **Shift** down
#5	**Ctrl** down
#6	**Ctrl** and **Shift** down

#7	**Ctrl** and **Lock** down
#8	**Ctrl**, **Lock**, and **Shift** down
#9	**Alt** down
#10	**Alt** and **Shift** down
#11	**Alt** and **Lock** down
#12	**Alt**, **Lock**, and **Shift** down
#13	**Alt** and **Ctrl** down
#14	**Alt**, **Ctrl**, and **Shift** down
#15	**Alt**, **Ctrl**, and **Lock** down
#16	**Alt**, **Ctrl**, **Lock**, and **Shift** down
#17	**Alt Graphic** down
#18	**Alt Graphic** and **Shift** down
#19	**Alt Graphic** and **Lock** down
#20	**Alt Graphic**, **Lock**, and **Shift** down
#21	**Alt Graphic** and **Ctrl** down
#22	**Alt Graphic**, **Ctrl**, and **Shift** down
#23	**Alt Graphic**, **Ctrl**, and **Lock** down
#24	**Alt Graphic**, **Ctrl**, **Lock**, and **Shift** down
#25	**Alt Graphic** and **Alt** down
#26	**Alt Graphic**, **Alt**, and **Shift** down
#27	**Alt Graphic**, **Alt**, and **Lock** down
#28	**Alt Graphic**, **Alt**, **Lock**, and **Shift** down
#29	**Alt Graphic**, **Alt**, and **Ctrl** down
#30	**Alt Graphic**, **Alt**, **Ctrl**, and **Shift** down
#31	**Alt Graphic**, **Alt**, **Ctrl**, and **Lock** down
#32	**Alt Graphic**, **Alt**, **Ctrl**, **Lock**, and **Shift** down

Keycomp Source File Items

Each item should be one of the following:

- An octal, decimal or hexadecimal number, indicating a keysym.
- A C character literal surrounded by single quotes. Escape sequences (such as **\252**) are allowed.
- A C string literal surrounded by double quotes. Standard C escape sequences are allowed within the string.
- The letter **U**, indicating no binding. If there is no binding, **XLookupMapping** returns an empty string for this key combination.
- The string format "**D***nn*." to define a key position as a diacritical key. There are 15 pre-defined diacritical keys. **XLookupMapping** combines a specified diacritical key with the following key pressed to determine the actual code point to be returned. The code point returned is based on the pre-defined diacritical lookup table. Strings "**D01**" through "**D15**" are not allowed for **keycomp**.

A comma can, but does not need to, follow each item. A space or tab must separate the items, regardless of whether a comma follows each item. A \ (backslash) after an item indicates that the item list is continued on the next line. The \ should not be enclosed in single or double quotes.

Blank lines are ignored, as are lines beginning with a # character (except control statements). All text between # and the following line, including \, is ignored unless # is part of a string enclosed in single or double quotes. This allows you to place comments at the end of a line that contains only a single item.

The **keycomp** command can identify function key strings and compress these within the keymap file. The set of function key strings is defined in the keyboard section of *AIX Operating System Technical Reference.*

The source must specify the exact string to be returned.

See the files **/usr/include/X11/AIXkeymap.h** and **/usr/include/X11/keysymdef.h** for a list of keysyms and key names of function keys.

Keycomp Source File Control Statements

The following control statements are recognized by **keycomp**:

1. **#S Control Statement**

   Lines starting with **#S** in the first column define which states are defined within the **keycomp** table. This statement allows the states not being used to be compressed out of the keymap file. If this line is not specified, it is assumed that all states are built into the table. All states must be coded in the source file.

   The states not included in **#S** are **UNBOUND** and return nothing unless remapped to another state (see the **#M** control statement).

   The **keycomp** object file provides a **state_mapping_table** to map keyboard-state flags to indexes in the table. The **state_mapping_table** maps the state detail of a **KeyPressed** event from an X Server to an index within the keymap table.

   Following **#S** is a series of numbers representing the states defined in a table on page 2-30. The states provided are built into the table in the order in which they are defined.

   For example, the **Alt** key is normally mapped to index **9** in the keymap file. With the following definition:

   ```
   #S 1 2 3 5 9 17
   ```

   the **Alt** key is mapped to index **5** because state **#9** is the fifth state in the **#S** statement.

2. **#M Control Statement**

   Lines starting with **#M** in the first column define mapping of states to an index within the keymap table. This statement allows specification of a state hierarchy as defined for the RT and allows mapping of multiple states to a single state. For example, the **#M** statement enables **Ctrl-Shift** keys to be mapped to **Ctrl** keys.

   The format of a **#M** line is:

   #M *STATE s1 s2 ... sn*

   where states *s1, s2, ... sn* are mapped to state *STATE*. *STATE* is a base state depending on the **#S** specifications.

The **#M** line must follow all **#S** lines. Multiple **#M** lines can be specified but must be specified after the **#S** statement.

For example, the following line:

```
#M 9 10 12
```

maps the **Alt-Shift** and **Alt-Lock-Shift** states to **Alt**.

To be compatible with *Keyboard Description and Character Reference*, keyboard files supplied with X-Windows contain the following control statements:

```
#S 1 2 3 4 5 9 17
#M 5 6 7 8 13 14 15 16 21 22 23 24 29 30 31 32
#M 9 10 11 12 25 26 27 28
#M 17 18 19 20
```

Flags

< *infile*	Specifies a source file to be compiled by **keycomp**.
> *outfile*	Specifies the name of the keymap file to be created.

Files

/usr/include/X11/AIXkeymap.h

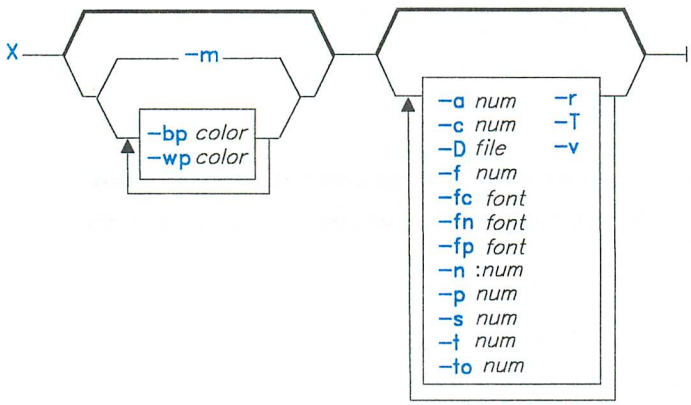
/usr/include/X11/keysymdef.h

X

Purpose

Starts the X Server.

Syntax



Description

The ***X Server*** is a display server that runs on computers with bitmapped terminals. (The X Server command does not run on the S/370 system.) The X Server distributes user input to and accepts output requests from programs located either on the host system or on systems connected to it through a network.

Unless you specify otherwise, only programs running on the host system can interact with the display. To allow another system to use your display, you must define that system to a specific X Server with the **xhost** command. For more information on the **xhost** command, see "**xhost**" on page 2-40.

After the X Server is initialized, it sends `unix:? AIX X-Windows` to standard output, where *?* is the display number. This string is used by the **xinit** command to set the default **DISPLAY** environment variable.

The X Server and all windows opened from it can be terminated by pressing **Ctrl-Alt-Backspace**. Remote windows usually display an error message concerning a broken connection before they terminate.

The X Server logs messages in the file **/tmp/.X?.msgs**, where *?* is the display number.

Flags

The following flags have default values supplied with the program:

-a *num* Specifies the acceleration. The default is 4 pixels. The ***acceleration*** is a multiplier for mouse movement. For example, specifying 4 causes the cursor to move four times as fast as the mouse. The specified value must be a positive value greater than zero.

-bp *color* Specifies a Blackpixel color for the display. Generally, the Blackpixel value corresponds to the background color. The default depends on the display.

-c *num* Specifies the key click volume. The default is **-1** or medium. (This option is supported on the RT only.) The following values are supported:

0	off
1 - 33	low
-1 or **34 - 66**	medium
67 - 100	high

-D *file* Specifies the full path name of the color definition database file The default is **/usr/lpp/X11/rgb/rgb**.

Refer to **dbm** in the *IBM RT AIX Operating System Technical Reference*.

-f *num* Specifies the beep volume. The default is **-1** or medium. (This option is supported on the RT only.) The supported values are the same as those supported for the **-c** *num* flag.

-fc *font* Specifies the cursor font for cursor glyphs and cursor masks. The default depends on the operating system and the display.

-fn *font* Specifies the text font used as the default text font. The default depends on the operating system and the display.

-fp *font* Specifies the path for fonts. The default depends on the operating system and the display.

-m Specifies the use of monochrome display characteristics. (This option is supported on the RT only.)

-n *:num* Specifies the connection number. Valid values for *num* are **0** to **255**. The default is the next available number. *num* is used by programs to communicate with a specific X Server. For example, the command:

```
X -n :18
```

specifies that communication to the activated X Server takes place by **unix:18** or by *hostname*:**18**.

-p *num* Specifies the screen saver interval. This flag is used with the **-s** (screen saver timeout) flag to control the blanking of the screen.

-r Disables auto repeat. The default is auto repeat enabled.

-s *num* Specifies the number of minutes to wait until making the display blank. The default is **10** minutes. A specified value must be a number greater than zero.

-t *num* Specifies the mouse threshold. The default is **2** pixels. Acceleration takes effect only if the mouse is moved more than the mouse threshold in one time interval and only applies to the amount beyond the threshold.

-to *num* Specifies the number of minutes to elapse between connection checks. The default is **60** minutes. A specified value must be a positive number greater than zero.

-T Disables the **Ctrl-Alt-Backspace** key sequence that, by default, terminates the X Server and all windows opened from it.

−v Replaces the display with the current background color, after the amount of time specified by the **−s** flag. By default, if the **−v** flag is not specified, the entire display is painted with the background tile after the amount of time specified by **−s**. On color displays, random foreground and background colors are also used.

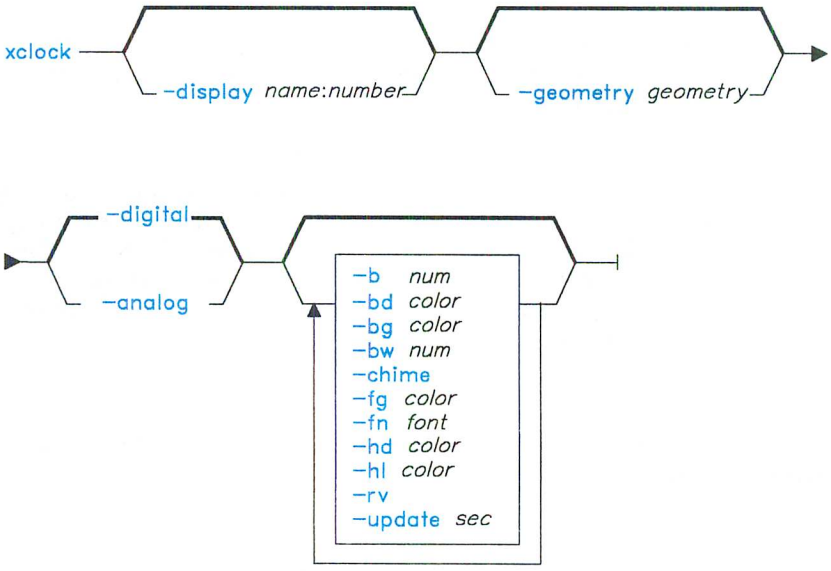
−wp *color* Specifies a Whitepixel color for the display. Generally, the Whitepixel color correponds to the foreground color. The default depends on the display.

xclock

Purpose

Continuously displays the current time of day.

Syntax



Description

The **xclock** command gets the time from the system clock. This time is displayed and updated by X-Windows in the form of either a digital or an analog clock.

Flags

-analog	Sets analog display mode. Draws a conventional 12-hour clock face with ticks for each minute and stroke marks on each hour. The default is digital mode.
-b *num*	Specifies the width in pixels of padding white space between the window border and anything **xclock** displays. The default is **10** in digital mode and **2** in analog mode.
-bd *color*	Specifies the border color on color displays. The default is black.
-bg *color*	Specifies the color of the background on color displays. The default is white.
-bw *num*	Specifies the width in pixels of the border. The default is **1**.
-chime	Specifies the sounding of a chime every 60 minutes on the hour. The default is off or zero.
-digital	Sets digital display mode. Displays date and time in digital form.

-display *name:number*	Identifies the host name and display number where the clock is to run. Normally the host name and display number are found in the environment variable **DISPLAY**. Refer to "Display Specification" on page 2-6.
-fg *color*	Determines the color of the text and tick marks on color displays. The default is black.
-fn *font*	Specifies a font for use instead of the default font. Any fixed-width font can be used. The default is **Rom14.500**.
-geometry *geometry*	Specifies the location and dimensions of the window. The default setting is **-0-0**. For more information, refer to "Geometry Specification" on page 2-4.
-hd *color*	Specifies the color of the hands in analog mode on color displays. The default is black.
-hl *color*	Specifies the highlight color. For example, the outline of the hands of the analog clock can be highlighted with this color. The default is black.
-rv	Reverses foreground and background colors.
-update *sec*	Specifies the frequency in seconds with which **xclock** updates its display. If the **xclock** window is obscured and then exposed, **xclock** overrides this and redisplays immediately. The default update frequency is **60** seconds. The specification of an update frequency greater than 30 seconds disables the display of the second hand in analog mode.

.Xdefaults Keywords

The following default keywords are used with the **xclock** command. (An example default file is in **/usr/lpp/X11/defaults**.)

background
Specifies the color of the background on color displays.

bodyFont
Specifies a font to use instead of default font.

border
Determines the color of the highlighted border on color displays.

borderWidth
Specifies the width of the window border in pixels.

foreground
Determines the color of the text and tick marks on color displays.

geometry
Specifies the location or dimensions of the window. For more information about geometry, see "Geometry Specification" on page 2-4.

hands
Determines the color of the hands in the analog clock on color displays.

highlight
Determines the color of the outline of the hands in the analog clock on color displays.

internalBorder
For the **xclock** command in analog mode, specifies an ***inner border*** (the distance between characters and the window's border) in pixels.

mode
Specifies whether the **xclock** command starts a digital or analog clock by default.

reverseVideo
Reverses the foreground and background color.

update
Specifies the frequency in seconds with which **xclock** updates its display.

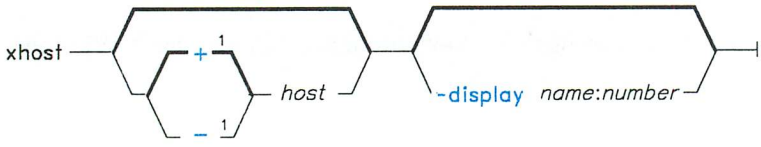
For more information about the use of these keywords, see "Changing X-Windows Defaults" on page 3-4.

xhost

Purpose

Controls who can have access to X-Windows on the current host machine.

Syntax



[1] Do not put a blank after these items.

Description

The **xhost** command adds and deletes hosts on the list of machines from which the X Server accepts connections.

This command must be executed on the machine to which the display is connected. You can remove a host from the access list by using the *−host* option. Do not remove the current host from the access list. If you do, you must log off the system before making any corrections.

Entering **xhost** with no arguments shows the names of the hosts allowed to access your X Server.

To enable a remote host by default, the host can be defined in the file **/etc/X?.hosts** (*?* is the display number to which you enable access).

For example, the display **norma:0** can be accessed by systems defined in the file **/etc/X0.hosts** on a system that uses the default host name of **norma**. In both the display name and the file name, **0** indicates the number of the display that the defined remote systems are allowed to access through X-Windows.

Flags

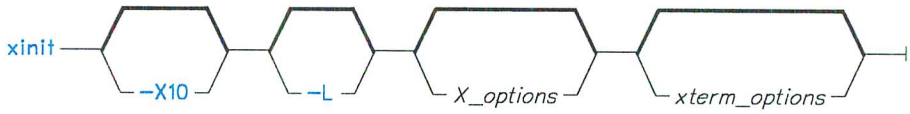
−display *name:number*	Identifies the host name and display number where **xhost** is to run.
+host	Specifies a host node ID number and adds the host to the X-Windows access list. (Same as the *host* option; the + is optional.)
−host	Specifies a host node ID number and deletes a host from the X-Windows access list.

xinit

Purpose

Starts an X Server with a single command.

Syntax



Description

The **xinit** command is a shell script that can be customized to include any commands you need and to open as many windows as you need. The **xinit** command starts the X Server, an **aixterm** window, and an **aixwm** window manager. This command can be entered from the AIX command line or as a user's login command specified in the **/etc/passwd** file. If **xinit** is used as a login command in **/etc/passwd**, the user is automatically logged into X-Windows.

xinit performs the following operations:

- Executes the user's profile, depending on the **-L** option
- Starts an X Server, except on the S/370 system, on the default display
- Sets up the **DISPLAY** environment variable
- Sets up the **XPROTO** environment variable to be **X11**
- Starts the **aixwm** command
- Starts the **aixterm** command.

xinit uses the **SHELL** environment variable to start the command within **aixterm**.

If **xinit** is the login program invoked or if **xinit** is invoked from **/dev/console**, a new virtual terminal is opened and an X Server is started on the new virtual terminal. Terminating the initial terminal window automatically terminates the X Server.

Flags

-L	Specifies that **xinit** be used as the login program and that the profile of the user (**$HOME/.profile**) be read and executed. Otherwise the profile is assumed to be set up.
X_options	Specifies any valid X options that do not conflict with *aixterm_options*.
aixterm_options	Specifies any one of the three valid **aixterm** options: **-geometry** **-e** **-n**

These options are passed to the **aixterm** command, which opens the initial window. These options allow the customization of the location, size, and contents of the initial window.

The default for **-geometry** is **80x12+0-0**. You use the **-e** option to execute an initial command within the login window. For example, the following line in **/etc/passwd** starts X-Windows with DOS Services as the login shell:

```
/usr/bin/xinit -L -e /usr/bin/dos
```

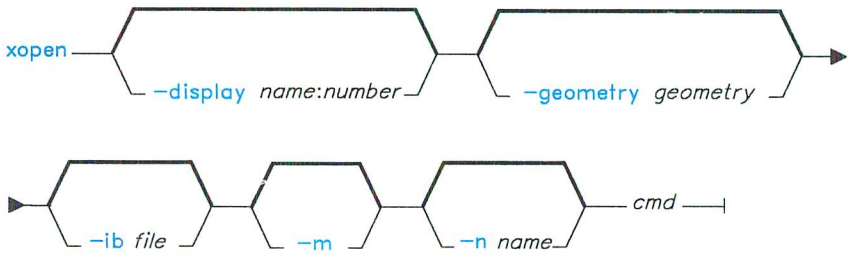
-X10 Specifies that the IBM RT X-Windows Version 1.1 X Server should be invoked. This must be the first option passed to **xinit**. (IBM RT X-Windows Version 1.1 must be installed for this option to work. This option is supported on the RT only.)

xopen

Purpose

Opens a full-screen window (virtual terminal) and monitors it.

Syntax



Description

The **xopen** command monitors the full-screen window as follows:

- A virtual terminal is opened for the full-screen application.
- An icon window is created in the X-Windows display for the full-screen application.
- Moving the cursor to the icon window and clicking any button on the mouse activates the full-screen application's virtual terminal.
- When the full-screen application ends, the icon window is removed from the X-Windows display.

Note: **xopen** does not work on a remote system.

Flags

cmd	Specifies a command to be executed within the full screen window. Any number of valid command arguments can also be entered.
-display *name:number*	Identifies the host name and display number where **xopen** is to run.
-geometry *geometry*	Specifies the location of the icon window. The default location is that of the locator cursor. Values for width and height are not used if they are not specified.
-ib *file*	Specifies the name of an icon bitmap file to be used instead of the default icon bitmap file. This file, assumed to be in bitmap format, is read and the resulting bitmap file is used as the icon bitmap file. See **/usr/include/X11/bitmaps** for a sample bitmap file.
-m	Turns off monitoring of the virtual terminal. The icon is not displayed in the window and no monitor process is created. (This option is supported on the RT only.)
-n *name*	Provides a window name. If no name is provided, the command name is used as the window name.

.Xdefaults Keywords

The following default keywords are used with the **xopen** command. (An example default file is in **/usr/lpp/X11/defaults**.)

geometry
Specifies the placement of the icon window.

iconBitmap
Specifies the icon bitmap file to use instead of the default icon bitmap file.

monitor
If false, turns off the monitoring of the virtual terminal.

For more information about the use of these keywords, see "Changing X-Windows Defaults" on page 3-4.

Chapter 3. Customizing X-Windows

CONTENTS

About This Chapter

This chapter contains additional information that can help you customize X-Windows. It includes the following:

- Instructions for changing some defaults of X-Windows commands
- Instructions for logging in automatically to X-Windows
- Instructions for modifying the Tools menu
- A keyboard mapping chart
- Instructions for using X-Windows on a remote system
- Help with tuning the AIX Operating System for X-Windows.

Changing X-Windows Defaults

You can set defaults such as the color, location, and size of windows by creating a file in your home directory. This section shows you how to set up a file and includes some sample entries. These sample entries are examples, not specifications. In some instances, you may need to use multiple keywords to fully specify a default.

Creating the Default File

To change X-Windows defaults, first create a file named **.Xdefaults** in your home directory. Using this file, you can specify global defaults for X-Windows or defaults for one X-Windows command.

A sample default file is in the **/usr/lpp/X11/defaults** directory.

Specifying Global Defaults

Specify all global defaults before any specific command defaults. The format of a global default specification is:

keyword:value

For example, to set the default window border to 2 pixels wide, put the following line in your **.Xdefaults** file:

```
borderWidth:2
```

Specifying Defaults for A Command

The format of a default specification for one command is:

command.keyword:value

For example, if you always want new **aixterm** windows to display in reverse video, put the following line in your **.Xdefaults** file:

```
aixterm.reverseVideo:true
```

Each time you start X-Windows, windows created by the **aixterm** command display in reverse video.

Note: Some commands have flags that set options which are also specified by using keywords. When a command flag is used, it overrides default values set by keywords.

Logging into AIX X-Windows Automatically

You can run the **xinit** command and start AIX X-Windows each time you log in to the system.

Use the **users** command, and change the **Program** field to `xinit -L`. The default login shell is **/bin/sh**. For more information on adding users, see the *IBM RT Managing the AIX Operating System*. For more information on the **xinit** command, see "**xinit**" on page 2-41.

The **xinit** command is a script shell file that you can modify to run other commands, like **xclock**. Although you can modify the **xinit** command to change the default locations for the **aixterm** command and the **aixwm** command, you can change these default values with others by using the **.Xdefaults** file in your home directory. For more information on using the **.Xdefaults** file, see "Changing X-Windows Defaults" on page 3-4.

The terminal window started from **xinit** will show

```
(Logoff window)
```

after the title in the title bar of the window.

Note: If you modify the **xinit** command, make sure that the exec **/usr/lpp/X11/bin/aixterm** is the last command issued. Any other command might become the controlling terminal process. Terminating the controlling terminal process will log you off X-Windows.

Modifying the Window Manager Tools Menu

You can modify the menu that appears when you select `Tools` from the window manager menu.

The values for the Tools menu are in the **/usr/lpp/X11/defaults/Xtools.txt** file. Two examples are shown below:

1. Copy the **/usr/lpp/X11/defaults/Xtools.txt** file into your HOME directory. You can then modify this file without affecting other X-Windows users on your system.
2. One of the lines in the **/usr/lpp/X11/defaults/Xtools.txt** file contains the following information:

   ```
   !   !   !       !xclock -geometry -0-0 -a &          !Analog Clock   !
   ```

   You can change any of the values in this line and modify the way the analog clock looks when you choose `Analog Clock` from the Tools menu. For example, if you change the `-0-0` to `+0-0`, the analog clock starts in the lower left corner instead of the lower right corner.
3. You can also add programs to the Tools menu. For example, you can add an option to start a new X Server from the Tools menu by inserting the following line in the **/usr/lpp/X11/defaults/Xtools.txt** file:

   ```
   !   !   !       !xopen xinit   !X       !Run another X Server
   ```

   By adding this option to the Tools menu, you can start another X Server without leaving X-Windows.

Keyboard Mapping

X-Windows allows each window to have its own keyboard mapping.

The following keyboard source files are delivered with the X-Windows licensed program:

- keymap.gr — Austrian/German
- keymap.be — Belgian
- keymap.cf — Canadian (French)
- keymap.de — Danish
- keymap.uk — English (UK)
- keymap.us — English (US)
- keymap.sw — Finnish/Swedish
- keymap.fr — French (AZERTY)
- keymap.it — Italian
- keymap.ja — Japanese English
- keymap.no — Norwegian
- keymap.po — Portuguese
- keymap.sp — Spanish
- keymap.sf — Swiss (French)
- keymap.sg — Swiss (German)
- keymap.vt — VT102

At installation time, the language menu allows you to select any or all of these languages. The VT102 keyboard mapping is always installed. These files are installed into the directory **/usr/lpp/X11/defaults**. The first language selected during installation is the one that is compiled into binary form.

The following examples show commands issued to perform a specific keyboard mapping task. They all assume that:

- Default mapping is English (US)
- Appropriate source maps are installed
- Commands are issued from an X-Windows window.

Example 1 — Building a VT102 keyboard map

```
cd /usr/lpp/X11/defaults
mkdir vt
keycomp < keymap.vt > vt/.Xkeymap
```

Example 2 — Running aixterm with VT102

```
XDIR=/usr/lpp/X11/defaults/vt
export XDIR
aixterm -v
```

Example 3 — Building the French and Spanish maps

```
cd /usr/lpp/X11/defaults
mkdir fr
mkdir sp
keycomp < keymap.fr > fr/.Xkeymap
keycomp < keymap.sp > sp/.Xkeymap
```

Example 4 — Running a French, Spanish, and English (US) X-Windows window

```
XDIR=/usr/lpp/X11/defaults/fr
export XDIR
aixterm
XDIR=/usr/lpp/X11/defaults/sp
export XDIR
aixterm
```

Keyboard Description and Character Reference gives you the detailed mappings of the keyboards for each national language.

Tuning System Parameters for X-Windows

The X-Windows server makes extensive use of the AIX operating system and its resources. You may be able to improve the performance of X-Windows by tuning system parameters. This section provides information about tuning the following areas:

- ptys
- processes
- X Server malloc space. For more information about malloc on the RT, see *IBM RT Managing the AIX Operating System.*

ptys

Each window opened by the **aixterm** command uses one pty (asynchronous pseudo terminal). You have two ways of defining the limits on the number of ptys:

- The number of ptys that can be configured into the kernel
- The number of pty device nodes in **/dev**.

For additional information about ptys, see *AIX Operating System Technical Reference.*

Kernel pty Customization

By default, the kernel is configured for 16 possible ptys. You can change this number and rebuild the kernel to adjust the number of ptys. The maximum number of ptys is 256 (the maximum number of minor devices per major device). Use the following steps to change the number of possible ptys:

1. Edit the **/etc/master** file.
2. Modify the **ptybuffers** attribute in the **sysparms** stanza.
3. Modify the **maxminor** attribute in the **uptc** and **upts** stanzas.
4. Edit the **/etc/ddi/pty** file.
5. Add an entry for each additional pty.

   The additional pty entries should be entered after the `dpty15` entry. Each pty entry should consist of two lines:

   - The first line should contain `dptyN`, where *N* is the number of the pty, for example, `dpty16`.
   - The second line should be left blank.
6. Re-build and install the kernel.

Each pty uses some kernel memory. Other system parameters should be tuned to reflect any additional ptys. Each pty implies at least two processes in use: one (the master) for the controller and one for the slave.

As you increase the number of ptys, you should also increase the number of charlists. Each charlist (or cblock) has space for 64 characters. Try to have a minimum of three or four charlists for each pty to be in use at the same time. For ptys that are heavily used, increasing the number of charlists may improve performance.

Note: It is possible to run out of charlists and hang the system.

If an X Server is hidden by another virtual terminal, there may be processes (such as **aixterm**) writing to that server. If the sockets to the server fill up, the ptys may fill up on the slave-to-master path and use all the charlists. To resolve this, **hot-key** to the X Server, allowing its display to appear, thus freeing charlists.

To avoid running out of charlists, provide enough charlists so that **aixterm** slave processes can block on output without using up all the free charlists. This means you should provide approximately five additional charlists (about 300 characters) for each pty.

The charlists are defined by the **charlists** attribute in the **sysparms** stanza of the **/etc/master** file.

System pty Customization

Each device is declared in a stanza of **/etc/system**. Use the **devices** command to add devices to the system. The **devices** command adds devices to the configuration files and makes a special device node in **/dev**. Many programs other than X-Windows use ptys. Most of the other programs require the use of a **getty** that supports login. You may have more ptys in the kernel than you have defined by **devices**. Ordinarily, you should not use **devices** to create more than 64 ptys.

Processes

The maximum number of processes is defined by the **procs** attribute in the **sysparms** stanza of the **/etc/master** file. Increase this parameter if you are using X-Windows intensively.

To change the number of processes:

1. Edit the **/etc/master** file.
2. Change the **procs** attribute in the **sysparms** stanza.
3. Rebuild and install the kernel.

Once you increase the number of processes to about 100, you need to increase some additional parameters. These parameters are:

charlists number of clists for tty subsystem

filetab number of files the system can have open at once

inodetab number of inodes the system can have open at once.

The **filetab** and **inodetab** should be the same.

X Server malloc Space

The X Server does a **malloc** to get space for the various objects it creates and manipulates. If the ulimit size is too low, the server may run out of space.

Use the **sh ulimit** command to increase the ulimit size. (This option is supported on the RT only.) For more information, see *AIX Operating System Commands Reference.*

Using AIX X-Windows on a Remote System

You use X-Windows client programs on a remote computer system in the same way you use it on your own system. However, you must be able to access and log in to the remote system. For more information, see "RT Installation Requirements for Remote Usage" on page A-11.

Starting X-Windows client programs on the remote system after logging in to that system allows you to work with programs and files stored on both your system and the remote system at the same time and through different windows. Logging in to a remote system enables you, for example, to display, side-by-side through different windows, a file stored on your own system and another file stored on the remote system. You can also edit a file or run a program on one system through one window while you run another program on another system through another window.

In summary, X-Windows allows you to have immediate access to both your own computer system and to the processing power, programs, and files stored on a remote system.

A Sample Remote X-Windows Session

This section explains the steps for using AIX X-Windows on a remote system. Steps are listed in the box. The detailed explanations that follow the box contain examples of what you can enter on your system to perform each step.

Steps in Remote AIX X-Windows Usage

1. Start an AIX Shell window on your display.
2. Enable a particular remote system to use your display.
3. Log in to the remote system and start an X-Windows client program on the remote system to display on your local screen.
4. Work just as you work on your own system.
5. End the client program.

More Detailed Information

The examples in the following explanations assume that:

- Two RT systems or two PS/2 systems, or an RT system and a S/370 system, or a PS/2 system and a S/370 system are attached to one another through a communications link.
- The program TCP/IP manages the communications between the two systems and is installed and running correctly on both machines.
- AIX X-Windows is installed on both machines.
- The host name of your system (the ***local system***) is `norma`.
- The host name of the system attached remotely to your system (the ***remote system***) is `jackie`.
- You are logged in to and working at `norma`.
- You know how to log in to a remote computer system.
- You want to edit a file stored on system `jackie` using system `norma`.
- There is a single X Server running on system `norma`.

To use **aixwm** and **aixterm** to edit a file on a remote system, perform the following steps:

1. Start aixwm.
2. To start an AIX Shell client program on your display, first select `Tools` from the menu. The **Tools** submenu appears on your display. Then select `AIX Shell` from the **Tools** submenu. A window with the window name `AIX Shell` appears on your display.

   Note: In this example, the host name of your system is `norma`. This is the first X Server you have opened on `norma`. Therefore, the full default name of the X Server in which the AIX Shell window is running is `norma:0`. `norma` is the host name and `0` is the display (server) number.
3. To enable the remote system `jackie` to use your display, you enter the X-Windows **xhost** command. First you move the mouse cursor into the AIX Shell window. Then you enable the remote system `jackie` for X-Windows by entering:

   ```
   xhost + jackie
   ```

   The execution of **xhost** enables the specified remote system only until you terminate X-Windows. However, you can eliminate the need to run **xhost** to enable a remote system by enabling the system by default in a file called **/etc/X?.hosts** (*?* is the display number).

   For example, the display `norma:0` can be accessed by systems defined in the file **/etc/X0.hosts** on the system with a host name of `norma`. In both the display name and the file name, `0` indicates the number of the display that the remote system is allowed to access using X-Windows.

   There must be a separate **/etc/X*n*.hosts** file on the local system, which contains one host name per line, for each display that a remote system will access through X-Windows.

   For more information about the **xhost** command, see "**xhost**" on page 2-40.
4. Log in to the remote system from the AIX Shell window on your system and open an X-Windows client program that runs on the remote system but displays on your system.

   For instance, if TCP/IP is the communications program managing the data link between your system `norma` and the remote system `jackie`, you can enter the following **rexec** command to log in to `jackie` and open a window that runs on `jackie` and appears on your display (attached to `norma`):

   ```
   rexec jackie aixterm -display norma:0 -n JACKIE
   ```

   The parts of the TCP/IP **rexec** command define the following:

`rexec`	The TCP/IP command that sends a specified command to run on a specified remote system. **rexec** initiates a login process on the remote system that must complete successfully before the command is executed.
`jackie`	The name of the remote system on which the command is to be run.
`aixterm`	The X-Windows command that is to be run on the remote system. In this case, **aixterm** opens a new X-Windows client program on `jackie`.
`-display norma:0`	A parameter of the **aixterm** command that indicates the full name of the display where the new window is to appear. In this case, the new window running on `jackie` appears on your display, which is physically attached to `norma`. The host name `norma` and the display number `0` must be separated by a `:` (colon).

-n JACKIE	A flag of the **aixterm** command that indicates the window name to be used for the new window.

For more information on the **rexec** command, see the *Interface Program for use with TCP/IP* publication. For more information about the **aixterm** command, see "**aixterm**" on page 2-10.

The **aixterm** command causes a rubber-band window to appear on your display (norma:0) after you complete the login initiated by the **rexec** command. You can press and hold down a mouse button to move the rubber-band window. When you release the mouse button, the window border becomes a solid line and the window name JACKIE appears at the top of the new window.

Note: Although the work you perform in the new X-Windows client program is primarily processed by the remote system jackie, your current host name is not changed. Your current host name is still norma (the name of your system) and the JACKIE window is the second window that you open from that current host. Therefore, the full default name of the display that the remote window JACKIE uses is norma:0.

5. At this point, for example, you can start an editor and edit a file stored on the remote system jackie through the remote window named JACKIE.

   In general, through a window running on a remote system, you can run programs and access files that your login user ID on jackie has permission to run and access. For example, you can use the programs and files stored on the remote machine jackie through the remote X-Windows client program JACKIE. At the same time, through another window, you can use any program and file stored on your local system norma that your local user ID has permission to use.

6. When you complete your work on the remote system jackie, you enter **Ctrl-D** to shut the remote window JACKIE. This action also logs you off of the remote system.

Note: TCP/IP may not be required to run remote client programs. For example, a system administrator might write a program to put up messages in an X-Windows window. The system administrator can open such a message window on a remote system if the following conditions are met:

- The remote system name is known.
- The remote system allows access.

Appendix A. Installing AIX X-Windows

This appendix contains the installation instructions for both the AIX RT X-Windows, Version 2.1 licensed program, see "Installing AIX RT X-Windows, Version 2.1" on page A-2, and the AIX PS/2 X-Windows licensed program, "Installing AIX PS/2 X-Windows, Version 1.1" on page A-12.

Installing AIX RT X-Windows, Version 2.1

Before you install X-Windows on the RT, the following tasks must be performed:

- Install the AIX Operating System. See *Installing and Customizing the AIX Operating System.*
- Install the Extended Programming Support from the Extended Services diskette. (Make sure that **/usr/lib/libdbm.a** is installed.)
- Install the Advanced Display Graphics Support Library from Multi-User Services.

Before you can use AIX RT X-Windows, Version 2.1, you must create a number of pty devices using the **devices** command. Add a pty device for each **aixterm** window you plan to use. The procedure to add pty devices is contained in *Installing and Customizing the AIX Operating System.*

Make sure that no one else is using the system and that no user programs are running before you install the X-Windows licensed program. If other users are working on the system, installation may fail.

Operating from the AIX Shell or Usability Services

You must be in the AIX Shell or Usability Services to install the X-Windows licensed program. If you are now using the AIX Shell, go to "Installing X-Windows from the AIX Shell" on page A-2.

If you are using Usability Services, (the Usability Services licensed program must be installed), you have two choices:

- Turn to the customization **install** and **devices** commands, described in *Usability Services Reference.* You can select the **install** and **devices** commands and follow the prompts.
- Go to the WINDOWS window and select `AIX` from the Window Types pane. Select `OPEN` from the command bar. Enter the **installp** and the **devices** commands and follow the prompts.

Installing X-Windows from the AIX Shell

To install the AIX RT X-Windows, Version 2.1 licensed program from the AIX Shell, follow these steps. If you receive an error message during the procedure, see *Messages Reference* for details.

To Install X-Windows

1. Log in as `su` (superuser) or `root.`
2. Add pty devices using the **devices** command.
3. Make sure no one else is using the system and that no user programs are running.
4. Type `installp.` Follow the prompts to insert the X-Windows licensed program diskettes and install the program.

More Detailed Information

1. Log on the system as `su` (superuser) or `root`. After logging in, you see the AIX Operating System # prompt.

```
IBM AIX Operating System
(C) Copyright IBM CORP. 1985, 1988
(/dev/console)
login: su

#
```

   See *Using the AIX Operating System* if you require more information.

2. Run the **devices** command. For step-by-step information about running devices, see *Installing and Customizing the AIX Operating System*. For more information about the **devices** command, see *AIX Operating System Commands Reference*.

   Note: For **aixterm** windows, **ae** and **logger** should be false. For other values, use the default.

3. Repeat the **devices** command for each terminal window you want to open. Four windows is a suggested number to get started. When you have completed adding all pty devices, press **F3**.

```
Devices session ended.

# _
```

   You are now ready to install the X-Windows licensed program.

4. Locate the X-Windows licensed program diskettes in the X-Windows licensed program diskette binder. You should have both X-Windows licensed program diskettes and X-Windows example diskettes. Do not put a diskette in the diskette drive until you are prompted to do so.

5. Type `installp`. Then press **Enter**.

```
#  installp
```

   You see the following prompt:

```
000-123 Before you continue, you must make sure there is no other
        activity on the system.  You should have just restarted
        the system, and no other terminals should be enabled.  Refer
        to your messages reference book for more information.

        Do you want to continue this command (y or n):
```

   See the discussion of message 000-123 in *Messages Reference* if you require more information.

Warning: Make sure that you are the only user on your system while you are installing the X-Windows licensed program. You should not be running programs or have files open during the installation process.

Use the **who** command to display a list of users on the system.

6. To continue, type y. Then press **Enter**.

   You see the following prompt:

```
Please mount volume 1 on /dev/rfd0
 . . .  and press Enter to continue
```

7. Insert the first X-Windows licensed program diskette into the diskette drive, close the diskette drive, and press **Enter**.

   You see the following prompt:

```
The program "X-Windows" will be installed.

Do you want to do this? (y/n)
```

8. To continue the installation, type y and press **Enter**.

   Follow the prompts until all the program diskettes are loaded. (The following is only an example of the licensed program diskette label, it may not be complete or accurate.)

```
IBM AIX/RT X-Windows Licensed Program
Version 2.1 (C) Copyright International Business Machines Corp. 1988
Licensed Material-Program Property of IBM-All Rights Reserved
AIX is a trademark of International Business Machines Corp.
Copyright (C) Massachusetts Institute of Technology 1985, 1988
Copyright (C) Donald E. Knuth 1985
```

9. The next screen allows you to choose the items to be installed:

```
Choose one or more of the following items to be installed.
1  X-Windows          - base X system
2  Fonts              - font tools and other fonts
3  All of the above

To cancel the "installp" command, enter "quit".

To install one or more items, type the ID numbers
separated by spaces (for example:  1 3).  Then press Enter.

---> _
```

   To choose an item from the menu, type the ID number for the item you want. Then press **Enter**.

   a. **1 X-Windows** contains the base X-Windows programs.

   b. **2 Fonts** includes font tools and additional fonts.

   c. **3 All of the above** includes both items 1 and 2.

10. To proceed with the installation of the X-Windows licensed program, see the pages listed below:
    - To install **1 X-Windows**, see "Installing X-Windows" on page A-5.
    - To install **2 Fonts**, see "Installing Fonts" on page A-7.
    - To install **3 All of the above**, see "Installing All of the X-Windows Programs" on page A-8.

    To cancel the **installp** command, type `quit` and press **Enter**.

Installing X-Windows

Continue with the following procedure if you have chosen X-Windows installation option 1, X-Windows.

1. After choosing option 1 and pressing **Enter**, you see the following menu:

```
From the list below, choose the language(s) for keyboard mapping.

1  Austrian/German              9  Italian
2  Belgian                     10  Japanese English
3  Canadian ( French)          11  Norwegian
4  Danish                      12  Portuguese
5  English (UK)                13  Spanish
6  English (US)                14  Swiss ( French )
7  Finnish / Swedish           15  Swiss ( German )
8  French (AZERTY)

To cancel the "installp" command, enter "quit".

To install one or more languages, type the group ID numbers
separated by spaces (for example: 1 3).  Then press Enter.
The first number will be the default language used.

---> 6 3_
```

   Type the number corresponding to the language you want to use. If you want to use more than one language, type more than one number. Separate numbers with a space. The first number you type is the default language.

2. After you have chosen the language you will use, the following message appears. No action is required at this time.

```
045-001  Installation of "IBM AIX/RT X-Windows" is in progress.
         Installation will take several minutes.
         Time = 01:35
```

3. The following prompt appears; no action is required.

```
045-009  Linking X with GSL.  This will take a few moments.
         Time = 01:35
```

Follow the prompts until all the program diskettes are loaded.

4. Installation of X-Windows licensed program is complete when you see the following message.

```
Program "X-Windows"
is now installed.
```

Installing Fonts

Continue with the following procedure if you have chosen X-Windows licensed program installation option 2, Installing Fonts.

1. After choosing option 2 and pressing **Enter**, you see the following menu. Choose the font group you wish to install.

```
"Fonts" are divided into several groups, each of
which can be separately installed.  The groups and
their ID numbers are:

1  VT100 Fonts                          - vtsingle, vtbold, nil2, ...
2  Character Fonts                      - 6x10, 8x13, ...
3  Miscellaneous Fonts                  - math5, ...
4  Font Tools                           - font compiler, source, ...
5  All of the above

To cancel the "installp" command, enter "quit".

To install one or more groups, type the group ID numbers
separated by spaces (for example: 1 3).  Then press Enter.

---> _
```

2. After you have chosen the font set you will use, the following message appears. No action is required at this time.

```
045-001  Installation of "IBM AIX X-Windows" is in progress.
         Installation will take several minutes.

         Time = 01:35
```

Follow the prompts until all the program diskettes are loaded.

3. When you see the next message, installation of X-Windows Fonts is complete.

```
Program "X-Windows"
is now installed.
```

Installing All of the X-Windows Programs

Continue with the following procedure if you have chosen X-Windows licensed program installation option 3, Installing All of the X-Windows Programs.

1. After choosing option 3 and pressing **Enter**, you see the following menu:

```
From the list below, choose the language(s) for keyboard mapping.

1  Austrian/German              9  Italian
2  Belgian                     10  Japanese English
3  Canadian ( French)          11  Norwegian
4  Danish                      12  Portuguese
5  English (UK)                13  Spanish
6  English (US)                14  Swiss ( French )
7  Finnish / Swedish           15  Swiss ( German )
8  French (AZERTY)

To cancel the "installp" command, enter "quit".

To install one or more languages, type the group ID numbers
separated by spaces (for example: 1 3).  Then press Enter.
The first number will be the default language used.

---> 6 3_
```

Type the number corresponding to the language you want to use. If you want to use more than one language, type more than one number. Separate numbers with a space. The first number you type is the default language.

2. After choosing the language you will use, the following information is displayed. Choose the font group you wish to install.

```
"Fonts" are divided into several groups, each of
which can be separately installed.  The groups and their ID
numbers are:

1  VT100 Fonts                    - vtsingle, vtbold, nil2, ...
2  Character Fonts                - 6x10, 8x13, ...
3  Miscellaneous Fonts            - math5, ...
4  Font Tools                     - font compiler, source, ...
5  All of the above

To cancel the "installp" command, enter "quit".

To install one or more groups, type the group ID numbers
separated by spaces (for example: 1 3).  Then press Enter.

---> _
```

3. After you have chosen the fonts you will use, the following message appears. No action is required at this time.

```
045-001  Installation of "IBM AIX X-Windows" is in progress.
         Installation will take several minutes.
         Time = 01:35
```

   Follow the prompts until all the program diskettes are loaded.

4. The following message appears; no action is required.

```
045-009  Linking X with GSL.  This will take a few moments.
         Time = 01:35
```

5. Installation of X-Windows licensed program is complete when you see the following message.

```
Program "X-Windows"
is now installed.
```

Installing Example X-Windows Programs

Continue with the following procedure if you want to install the X-Windows example programs.

1. Type `installp`. Then press **Enter**.

```
#  installp
```

   You see the following prompt:

```
000-123 Before you continue, you must make sure there is no other
        activity on the system.  You should have just restarted
        the system, and no other terminals should be enabled.  Refer
        to your messages reference book for more information.

        Do you want to continue this command (y or n):
```

   See the discussion of message 000-123 in *Messages Reference* if you require more information.

   Warning: Make sure that you are the only user on your system while you are installing the X-Windows licensed program. You should not be running programs or have files open during the installation process.

   Use the **who** command to display a list of users on the system.

2. To continue, type y. Then press **Enter**.

   You see the following prompt:

```
Please mount volume 1 on /dev/rfd0
 . . .  and press Enter to continue
```

3. Insert the first X-Windows Example program diskette into the diskette drive, close the diskette drive, and press **Enter**.

   You see the following prompt:

```
The program "X-Windows Example"
will be installed.

Do you want to do this? (y/n)
```

4. To continue the installation, type y and press **Enter**.

   Follow the prompts until all the diskettes are loaded. (The following is only an example of the X-Windows example program diskette label, it may not be complete or accurate.)

```
IBM AIX X-Windows Example Program
Version 2.1 (C) Copyright International Business Machines Corp. 1988
Licensed Material-Program Property of IBM-All Rights Reserved
AIX is a trademark of International Business Machines Corp.
Copyright (C) Massachusetts Institute of Technology 1985, 1986
Copyright (C) Digital Equipment Corp., Massachusetts 1985, 1986, 1987
```

5. When you see the next message, installation of the X-Windows example program is complete.

```
Program "X-Windows Examples"
is now installed.
```

RT Installation Requirements for Remote Usage

Before the X-Windows licensed program can be used remotely, certain components in addition to X-Windows must be installed and running on both the host and remote systems. For example, the components required for remote use of X-Windows may be:

- The VRM Baseband Adapter Device Driver and IBM RT Baseband Adapter

  OR

- VRM Token-Ring Device Driver and IBM Token-Ring Network RT Adapter

  OR

- Both.

TCP/IP is highly recommended for using network facilities.

Refer to the installation procedures packaged with each licensed program for more information.

For information on using X-Windows remotely, see "Using AIX X-Windows on a Remote System" on page 3-10.

Installing AIX PS/2 X-Windows, Version 1.1

On the PS/2, you must install the AIX Operating System before you can install X-Windows. See *Installing and Customizing the AIX Operating System.*

Before you can use AIX PS/2 X-Windows, you must create a number of pty devices using the **devices** command. Add a pty device for each **aixterm** window you plan to use. The procedure to add pty devices is contained in *Installing and Customizing the AIX Operating System.*

Make sure that no one else is using the system and that no user programs are running before you install the X-Windows licensed program. If other users are working on the system, installation may fail.

You must be in the AIX Shell to install the X-Windows licensed program. To install, follow the steps listed. If you receive an error message during this procedure, see *Messages Reference* for details.

To Install X-Windows

1. Log in as `root.`
2. Add pty devices using the **devices** command.
3. Make sure no one else is using the system and that no user programs are running.
4. Type `installp.` Follow the prompts to insert the X-Windows licensed program diskettes and install the program.

More Detailed Information

1. Log on the system as `root.` After logging in, you see the AIX Operating System # prompt.

```
IBM AIX PS/2 Operating System
(C) Copyright IBM CORP. 1985, 1988
login: root
#
```

   See *Using the AIX Operating System* if you require more information.

2. Run the **devices** command. For step-by-step information about running devices, see *Installing and Customizing the AIX Operating System.* For more information about the **devices** command, see *AIX Operating System Commands Reference.*

   Note: For **aixterm** windows, **ae** and **logger** should be false. For other values, use the default.

3. Repeat the **devices** command for each terminal window you want to open. Four windows is a suggested number to get started. When you have completed adding all pty devices, press **F3**.

```
Devices session ended.

# _
```

You are now ready to install the X-Windows licensed program.

4. Locate the X-Windows licensed program diskettes in the X-Windows licensed program diskette binder. You should have both X-Windows licensed program diskettes and X-Windows sample diskettes. Do not put a diskette in the diskette drive until you are prompted to do so.

5. Type `installp`. Then press **Enter**.

```
#  installp
```

You see the following prompt:

```
000-123 Before you continue, you must make sure there is no other
        activity on the system.  You should have just restarted
        the system, and no other terminals should be enabled.  Refer
        to your messages reference book for more information.

        Do you want to continue this command (y or n):
```

See the discussion of message 000-123 in *Messages Reference* if you require more information.

Warning: Make sure that you are the only user on your system while you are installing the X-Windows licensed program. You should not have programs running or files open during the installation process.

Use the **who** command to display a list of users on the system.

6. To continue, type `y`. Then press **Enter**.

You see the following prompt:

```
Please mount volume 1 on /dev/rfd0
 . . .  and press Enter to continue
```

7. Insert the first X-Windows licensed program diskette into the diskette drive, close the diskette drive, and press **Enter**.

You see the following prompt:

```
The program for AIX PS/2 X-Windows will be installed.

Do you want to do this? (y/n)
```

8. To continue the installation, type `y` and press **Enter**.

Follow the prompts until all the program diskettes are loaded. (The following is only an example of the licensed program diskette label, it may not be complete or accurate.)

```
IBM AIX PS/2 X-Windows Licensed Program
Version 1.1 (C) Copyright International Business Machines Corp. 1989
Licensed Material-Program Property of IBM-All Rights Reserved
Copyright (C) Massachusetts Institute of Technology 1985, 1988
```

9. The system will build a new kernel now. Then, it will re-boot.

Installing Sample X-Windows Programs

Continue with the following procedure if you want to install the X-Windows sample programs.

1. Type `installp`. Then press **Enter**.

```
# installp
```

You see the following prompt:

```
000-123 Before you continue, you must make sure there is no other
        activity on the system.  You should have just restarted
        the system, and no other terminals should be enabled.  Refer
        to your messages reference book for more information.

        Do you want to continue this command (y or n):
```

See the discussion of message 000-123 in *Messages Reference* if you require more information.

Warning: Make sure that you are the only user on your system while you are installing the X-Windows licensed program. You should not be running programs or have files open during the installation process.

Use the **who** command to display a list of users on the system.

2. To continue, type `y`. Then press **Enter**.

You see the following prompt:

```
Please mount volume 1 on /dev/rfd0
 . . .  and press Enter to continue
```

3. Insert the first X-Windows sample program diskette into the diskette drive, close the diskette drive, and press **Enter**.

You see the following prompt:

```
The program AIX PS/2 X11 Sample Programs
will be installed.

Do you want to do this? (y/n)
```

4. To continue the installation, type `y` and press **Enter**.

Follow the prompts until all the diskettes are loaded. (The following is only an example of the X-Windows sample program diskette label, it may not be complete or accurate.)

```
IBM AIX X-Windows Sample Program
Version 1.1 (C) Copyright International Business Machines Corp. 1988
Licensed Material-Program Property of IBM-All Rights Reserved
Copyright (C) Massachusetts Institute of Technology 1985, 1986
Copyright (C) Digital Equipment Corp., Massachusetts 1985, 1986, 1987
```

5. When you see the next message, installation of the X-Windows sample programs is complete.

```
Program "AIX PS/2 X11 Sample Programs"
is now installed.
```

PS/2 Installation Requirements for Remote Usage

Before you can use X-Windows remotely, certain components, in addition to X-Windows, must be installed and running on both the host and remote systems. For example, the components required for remote use of X-Windows with the PS/2 may be:

- PS/2 Baseband Adapter

  OR

- IBM Token-Ring Network PS/2 adapter

  OR

- Both.

TCP/IP is highly recommended for using network facilities.

Refer to the installation procedures packaged with each licensed program for more information.

For information on using X-Windows remotely, see "Using AIX X-Windows on a Remote System" on page 3-10.

Appendix B. X-Windows Messages

This appendix contains error messages that are generated by the X-Windows licensed program. When X-Windows creates a message, it will display the message in one of the following ways:

- at the current virtual terminal
- at the console
- in a message pop-up in the window that had the error. To remove the message pop-up, click any button on your mouse within the pop-up.

Read the message and take the appropriate action.

X-Windows messages start with the number **073**.

Refer to *IBM RT Messages Reference* for information on other messages.

Messages Created by the aixwm Command

073-001 The aixwm command cannot open menu font *font.*

Cause: You specified a font that does not exist. The **aixwm −fn** flag specifies a font to use in the display of the menu. The default font is **Rom14.500** for a large display and **Rom10.500** for a small display.

Action: Indicate a valid font for the **aixwm −fn** flag and try again. Refer to "**aixwm**" on page 2-21 for more information.

073-002 The aixwm command cannot open size font *font.*

Cause: You specified a font that does not exist. The **aixwm −fs** flag specifies a font to use when sizing a window. The default font is **Rom14.500** for a large display and **Rom10.500** for a small display.

Action: Indicate a valid font for the **aixwm −fs** flag and try again. Refer to "**aixwm**" on page 2-21 for more information.

073-003 The aixwm command cannot open icon font *font.*

Cause: You specified an icon font that does not exist. The **aixwm −fi** flag specifies a font to use when hiding a window. The default font is **Rom14.500** for a large display and **Rom10.500** for a small display.

Action: Indicate a valid font for the **aixwm −fi** flag and try again. Refer to "**aixwm**" on page 2-21 for more information.

073-005 The aixwm command cannot open menu text file *filename.*

Cause: You requested a file that cannot be opened.

Action: Make sure you have permission to access this file. Then, try again. Refer to "**aixwm**" on page 2-21 for more information.

073-006 The aixwm command cannot find a valid entry in menu text file *filename*.

Cause: You requested an entry in a menu text file that was not valid.

Action: Make sure that you requested the proper file and that the file contains valid text entries. Use an editor to convert the text entries in the menu text file. Or, re-install X-Windows. Refer to"**aixwm**" on page 2-21 for more information.

073-007 The aixwm command cannot find file *filename*.

Cause: You requested a menu text file that does not exist.

Action: Make sure that you requested the proper file or that it exists. Then, try again. Refer to "**aixwm**" on page 2-21 for more information.

073-008 The aixwm command cannot find menu text file *filename*. This file must be in your $HOME directory or /usr/lpp/X11/defaults.

Cause: You requested a menu text file that does not exist.

Action: Check the following:

- That the file exists in **$HOME** or in **/usr/lpp/X11/defaults**
- That the filename is correct.

Then, try again. Refer to "**aixwm**" on page 2-21 for more information.

073-009 A text entry *line number* in *filename* is not valid.

Cause: You requested a text entry that is either not valid or not in the menu text file.

Action: Verify that the format of the entry in *line number* that you requested is the same as the *#nnn* in the file. Then, try again.

073-010 The *function name* function is not valid in Xset.txt file.

Cause: You requested a function that is not valid in the **Xset.txt** file.

Action: Make sure the function name is correct. Then, try again.

073-011 Warning: The foreground color *color* is the same as the background color.

Cause: You specified a foreground color that is the same as the background color on your display.

Action: Specify another foreground color. For more information, see "Color Specification" on page 2-5.

073-012 Warning: The background color *color* is the same as the foreground color.

Cause: You specified a background color that is the same as the foreground color on your display.

Action: Specify another background color. See "Color Specification" on page 2-5 for more information.

073-013 The aixwm command cannot open output print file *filename*.

Cause: You do not have write permission to the file on **\tmp**.

Action: Make sure you have permission to access this file. Then, try again.

073-014 When the client program opened a window, it specified an invalid initial_state flag.

Cause: Your client program requested an invalid *initial_state* flag in the **XWMHints** structure.

Action: Change the *initial_state* field in the **XWMHints** structure to one of the following:

- **DontCareState**
- **NormalState**
- **ClientIconState**
- **IconicState**
- **InactiveState**
- **IgnoreState**

Relink the client program and try again. For more information on **XWMHints**, refer to the *IBM AIX X-Windows Programmer's Reference.*

073-015 The aixwm command cannot create a title for window *window name*.

Cause: You requested a title bar for an **InputOnly** window. X-Windows does not support title bars for **InputOnly** windows.

Action: Change the window class of this window to **InputOutput** and try your request again. Or, use a NULL window name and try again.

For more information about **InputOnly** and **InputOutput** windows, refer to the *IBM AIX X-Windows Programmer's Reference.*

073-016 The client program passed an invalid pixmap ID for the icon pixmap.

Cause: Your client program passed a pixmap ID for the icon pixmap that is not valid.

Action: Set the pixmap ID to a valid ID and try again. Or, set the pixmap ID to NULL and try again.

For more information about pixmaps, refer to the *IBM AIX X-Windows Programmer's Reference.*

073-017 The aixwm command cannot make a connection to the X Server.

Cause: Your request to connect to the X Server failed because the server is not running.

Action: Make sure that the X Server is running. If the X Server is not running, execute **xinit** and try again. If the X Server is running, make sure that the display number you are using is a valid display number and try again.

073-018 The aixwm command cannot store the wmCursor in StoreCursors.

Cause: The **aixwm** cannot find the specified cursor font. Specify a valid cursor font using the **aixwm** − **fc** option.

Action: Check that cursor glyphs exists in your cursor font. Otherwise, follow your local procedures for reporting software problems.

073-019 The aixwm command cannot query the string width in SetUpWindow.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-020 The aixwm command cannot open the menu in SetUpWindow.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-021 The aixwm command cannot open the menu button in SetUpWindow.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-022 The aixwm command cannot create size Window in SetUpSizeWindow.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-023 The aixwm command cannot allocate memory.

Cause: There is insufficient system memory for **aixwm**.

Action: Increase the physical system memory or terminate unnecessary processes, and try **aixwm** again.

073-024 The aixwm command cannot install the default colormap.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problem.

073-025 The aixwm command cannot open titlebar font *font name.*

Cause: The **aixwm** command cannot open the titlebar font because the font information is not valid or not supported.

Action: Specify a valid titlebar font with the **aixwm** − **ft** flag. Then, try again. Refer to "**aixwm**" on page 2-21 for more information.

Messages Created by the keycomp Command

073-030 The keycomp command cannot fseek output file.

Cause: Setting the position of next output operation failed.

Action: Be sure that the standard output is redirected into a file.

073-031 Keycomp parse error at item <#> on line <#> : <Error description>.

Cause: A syntax error was found at the item and line indicated.

Action: Correct the syntax error in the keycomp source file and execute the **keycomp** command again.

Messages Created by the X Command

073-035 The X Server cannot open the default font *font name.*

Cause: You requested a font that either does not exist or is not supported.

Action: Make sure that the font or font path is valid.

073-036 The X Server cannot open the default cursor font *font.*

Cause: You requested a cursor font that the X Server cannot access.

Action: Make sure that the font exists or that the default font path is valid. Use the **−fn** or the **−fp** flag to change these values when starting the server.

- The **−fn** flag specifies the text font for the server.
- The **−fp** flag specifies the path where the server will look for the fonts.

Refer to "**X**" on page 2-34 for more information about these flags.

073-037 The X Server cannot open RGB database *filename.*

Cause: When invoking the X Server with the **X −D** flag, you specified a database path that is not valid.

Action: Check the database *filename.* If the database is valid, try to invoke the server again. For more information about this flag, refer to "**X**" on page 2-34.

073-038 usage: X [option]

Cause: You attempted to invoke the server with a flag that is not valid or with the **−help** option.

Action: Try again with the correct flags.

073-039 An internal error occurred while attempting to initialize the predefined atoms.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-040 An invalid event number was specified during internal processing.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-041 A NULL cursor was detected during cursor processing.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-042 An invalid keyboard event was detected during keyboard processing.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-043 An invalid client ID was detected during internal processing of events.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-044 An invalid client ID was detected during internal processing of passive grabs.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-045 An internal error was detected during the initialization of the server.

Cause: This could be a problem with your program.

Action: Follow your local procedures for reporting software problems.

073-046 An internal error occurred during screen initialization.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-047 An invalid client ID was used in a Resource Manager function.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-048 An invalid function was specified in a Resource Manager function.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-049 An invalid resource id was specified in an internal function.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-050 Error number *xxx* was received while attempting to bind a UNIX domain socket.

Cause: The server cannot access the a UNIX domain socket.

Action: Check permissions in **/dev/sock** file. Refer to the *AIX Operating System Technical Reference* for more information.

073-051 An error was detected while attempting to bind the TCP socket.

Cause: The X Server cannot access a TCP/IP socket.

Action: Be sure the network is available, the network is configured correctly, and any necessary devices are configured correctly.

073-052 The Xfree function detected an invalid memory position while attempting to free existing storage.

Cause: This could be a software problem.

Action: Follow your local procedures for reporting software problems.

073-053 The X Server has attempted to add a line cap to a line segment of 0 length.

Cause: You attempted to draw a line of zero length (a point) with a cap style of CapProjecting and the server cannot determine the direction to project the cap.

Action: Select a different cap style. Draw a line of longer length.

073-055 The X Server is unable to query current keyboard.

Cause: The X Server cannot detect the current keyboard.

Action: Check that the keyboard is in working condition and firmly attached to the machine.

073-056 The X Server is unable to query display device IDs.

Cause: The X Server cannot detect the specified display.

Action: Check that the device of the specified type is attached and configured correctly.

073-057 The X Server is unable to locate display *number*.

Cause: The X Server cannot locate the display specified.

Action: Be sure that the device specified is attached to the X Server and is configured correctly.

073-066 The X Server cannot configure the locator device.

Cause: The X Server cannot configure the locator device.

Action: Be sure that the device is attached to the computer and configured correctly.

Messages Created by the aixterm Command

073-070 The aixterm command encountered the internal error "xxxxx".

Cause: An internal error occurred inside **aixterm**. This error is normally caused by lack of physical memory when allocating memory for windows and buffers.

Action: Check for unusually large window sizes or unusually small physical memory with respect to the number of applications running on the system. Otherwise, follow your local procedures for reporting software or hardware problems.

073-071 The aixterm command cannot allocate memory.

Cause: There was not enough system memory for the **aixterm** window size requested.

Action: Increase the physical system memory or use a smaller window size.

073-072 The aixterm command cannot allocate bitmap *bitmap filename.*

Cause: You requested a bitmap file that is too large for the system memory available.

Action: Use a smaller bitmap file or increase the physical system memory.

073-073 The aixterm command encountered a syntax error in bitmap *bitmap filename.*

Cause: You cannot read the bitmap file because a syntax error was found.

Action: Check your file for syntax errors. For an example of a bitmap file, refer to **/usr/include/X11/bitmaps**.

073-074 The aixterm command found an invalid font entry at line *number.*

Cause: You specified an entry in **/usr/lpp/X11/defaults/Xfonts** that is incorrect or not found.

Action: Refer to the *IBM AIX X-Windows Programmer's Reference* for information about the **/usr/lpp/X11/defaults/Xfonts** file syntax.

073-075 The aixterm command cannot open the bitmap *bitmap filename.*

Cause: You specified a bitmap file that does not exist or that you do not have permission to read.

Action: Check that the file exists and that you have permission to access it.

073-076 X Server named *display name* was not found.

Cause: The **aixterm** command cannot find the X Server running on the host you specified.

Action: Verify that the X Server is running on the host specified.

073-077 The aixterm command cannot execute *command name*.

Cause: The *command name* command after the **aixterm** **−e** option cannot be executed.

Action: Check the following:

- *command name* exists,
- *command name* is in a directory in the environment path,
- You have permission to execute the command.

For more information, refer to "**aixterm**" on page 2-10.

073-078 The aixterm command cannot open font *font name*.

Cause: The **aixterm** command cannot open the font file specified because it does not exist in **/usr/lpp/fonts** or you do not have permission to access the file **/usr/lpp/fonts**.

Action: Verify that the font exists in **/usr/lpp/fonts** and that you have permission to access it.

073-079 No system ptys are available for aixterm.

Cause: The **aixterm** command tried to open a pty device, but no ptys were available.

Action: Add more pty devices with the **devices** command. (Auto enable and logger should be **FALSE**.)

Messages Created by the xclock Command

073-081 The xclock command cannot open the display *display name*.

Cause: You requested a connection to the X Server and it failed.

Action: Verify that the specified X Server (display) is running.

073-082 The xclock command cannot open font *font name*.

Cause: The **xclock** command cannot open the font file specified because it does not exist in **/usr/lpp/fonts** or, you do not have permission to access the file **/usr/lpp/fonts**.

Action: Verify that the font exists in **/usr/lpp/fonts** and that you have permission to access the file.

Messages Created by the xhost Command

073-083 The xhost command cannot open display *display name*.

Cause: The **xhost** command cannot find an X Server running on the specified host.

Action: Verify that an X Server is running on the host specified.

073-084 The xhost command cannot get a host name.

Cause: The **xhost** command cannot get the host name information from a name server program or from the **/etc/hosts** file.

Action: Verify that the network is working. If the name server program cannot be accessed, make sure the host name entry exists in the **/etc/hosts** file and try again.

073-085 The host name *hostname* **is unacceptable.**

Cause: You specified a host name to the **xopen** command that is not recognized.

Action: Check the host name you specified and try again.

Messages Created by the xinit Command

073-086 Unable to start the X Server

Cause: The X Server cannot execute.

Action: For more information check the **/tmp/.X?.msgs** file, where ? is the display (server) number.

Messages Created by the xopen Command

073-087 The xopen command was not invoked on the local display *display name* **system.**

Cause: The **xopen** command cannot be invoked from a remote terminal window because the new virtual terminal would be created on the remote system.

Action: Invoke **xopen** from a local terminal window.

073-088 The xopen command cannot connect to display *display name*.

Cause: The **xopen** command cannot find an X Server running on the host specified.

Action: Verify that an X Server is running on the host specified.

073-089 The xopen command cannot open the font *fontname*.

Cause: You cannot open the font file because it does not exist in **/usr/lpp/fonts** or, you do not have permission to access **/usr/lpp/fonts**.

Action: Verify that the font is in **/usr/lpp/fonts** and that you have permission to access the file.

073-090 The xopen command cannot open the bitmap file *bitmap file*.

Cause: You cannot open the bitmap file because it does not exist or, you do not have permission to access it.

Action: Verify that the file exists and that you have permission to access it.

073-091 The xopen command encountered a syntax error in bitmap file *filename*.

Cause: You cannot read a bitmap file because a syntax error was found.

Action: Check the file for syntax errors. For an example of a bitmap file, refer to **/usr/include/X11/bitmaps**.

Glossary

acceleration. A multiplier for mouse movement.

access list. Programs can use the display if they are run on the host system or on any of the systems listed in this file.

binding. An interpretation of what a key produces when used with a modifier key. For example, pressing **A** and the **Shift** or **Lock** key produces an A (an uppercase *A*) with the US English keyboard mappings.

active icon. The miniature terminal window that is displayed instead of an icon window.

button grabbing. The mouse can be grabbed by a client, either passively by the program itself, or actively by clicking a button.

client. An application program connects to X-Windows by some interprocess communication path (IPC) path, such as a TCP connection or a shared memory buffer. The program may be referred to as the client of the server, but it is actually the IPC path itself. Programs with multiple paths open to the server are viewed as multiple clients by the protocol. Examples of client programs include **aixwm**, **xclock**, and **aixterm**.

connection. The IPC path between the server and a client program.

coordinate system. X is the horizontal axis and Y is the vertical axis. The origin [0,0] is at the upper-left. For a window, the origin is upper-left, inside the border. Coordinates are discrete and are specified in pixels. Each window and pixmap has its own coordinate system.

cursor. The visible shape of the pointer on a screen. In X-Windows, it consists of a hot spot, a source bitmap, and a pair of colors.

diacritical. Keys not used or dead keys. These keys cannot be changed. The diacritical key characters are defined in **XLookupMapping**.

focus. To force all keyboard input to go to a specific window regardless of where the mouse cursor is.

focus window. A window that is highlighted regardless of where the mouse cursor resides.

font. A set of glyphs, usually characters. The protocol does not translate or interpret character sets. The client indicates values used to access the glyph arrays.

geometry specification. Command options that define the size and placement of windows on the screen.

input focus. Where the main keyboard input goes. By default, keyboard events are sent to the client using the window the pointer is in. It is also possible to attach the keyboard input to a specific window. Events are then sent to the appropriate client regardless of the pointer position.

icon font. The font used in the icon window.

icon window. The window that is displayed when Hide/Show is used on an X-Windows window.

inner border. The distance in pixels between the characters inside a window and the border of the window.

jump scroll. Moving a multiple number of lines at once when many lines are queued for the display.

keycomp. An abbreviation for keymap compiler. The keymap compiler produces a binary keymap file from a textual description of the keyboard.

keysym. The logical engraving on a key.

page. The number of lines in the scrolling region minus the page overlap.

pointer. The device attached to the cursor and tracked on the screen.

pointing device. A device with effective dimensional motion, usually a mouse. One visible cursor is defined by the core protocol, and it tracks whatever pointing device is attached as the pointer.

root window. Each screen has a root window covering it. It cannot be reconfigured or unmapped, otherwise it performs like any other window. A root window has no parent.

rubber-band outline. A movable outline normally displayed on the screen when moving or resizing a window.

scroll region. Displays the position and amount of text currently showing in the window (highlighted) relative to the amount of text actually saved.

server. Provides the basic windowing mechanism. It handles IPC connections from

clients, demultiplexes graphics requests onto screens, and multiplexes input back to clients.

warp. Moving the mouse to the center of the window.

window manager. The client that manipulates windows on a screen and provides much of the user interface.

X Server. A display server that runs on computers with bitmapped terminals.

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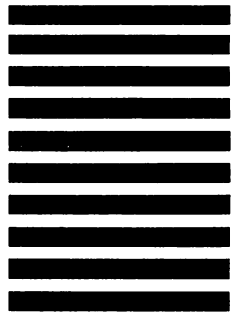

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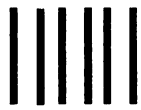

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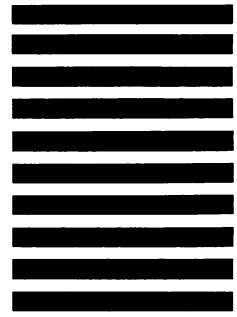

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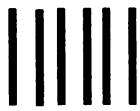

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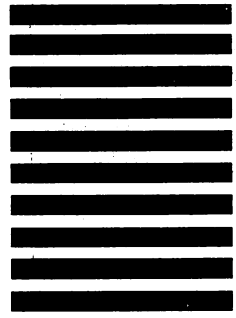

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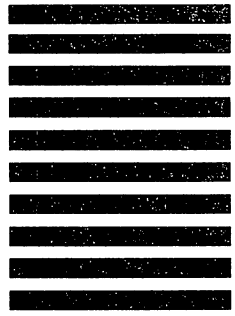

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