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# BeOS User's Guide

Developer Release 8.2 of the BeOS  
for the BeBox and Power Macintosh Computers

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# Introduction

This edition of the *BeOS User's Guide* accompanies Developer Release 8.2 of the Be™ operating system: DR8.2 of the BeOS™. This guide teaches you the basics of working with the BeOS on a BeBox™ or a Power Macintosh™ (or compatible) computer, the Be user interface, and the Be applications. It also introduces you to the process of developing applications for the BeOS.

- Chapter 1, “Learning BeOS Basics,” teaches you the basics of working with the the BeOS, including starting it and shutting it down, using the keyboard and mouse, and managing your files.
- Chapter 2, “Learning Be Application Basics,” introduces you to tasks common to most Be applications, such as starting them up, creating and saving files, and switching among running applications.
- Chapter 3, “Using Be Applications,” provides instructions for using most of the applications that come with the Be software.
- Chapter 4, “Customizing the BeOS,” shows you how to configure the BeOS and how to set your preferences for a number of BeOS features. It also shows you how to add files, such as TrueType™ fonts, that add functionality to the BeOS.
- Chapter 5, “Developing Be Applications,” introduces you to BeIDE, the Be development environment, and the procedures you use to develop and debug Be applications.
- Appendix A, “Creating Screen Dumps,” shows you how to capture images of the Be screen and convert them to a format you can open on other computers.

- Appendix B, “Transferring Files to and from the BeOS,” describes some techniques for moving files from the BeOS to other platforms over a network or using floppy disks.
- Appendix C, “Troubleshooting,” describes some symptoms of problems users have experienced with the BeOS and offers some suggestions for solving them.

In addition to this guide, you’ll also want to refer to:

- The *BeBox Owner’s Guide*, if you’re running the BeOS on a BeBox computer, or if you’re running the BeOS on a Power Macintosh, its owner’s guide. The owner’s guides show you how to set up the computer before you install the BeOS. They also include details about the computer’s ports and other features.
- *Installing the BeOS*, which is a printed booklet that accompanies this user’s guide if you have a BeBox, or is a SimpleText document on the MacOS™ portion of the *BeOS for Power Macintosh* CD-ROM.
- *The Be Book*, the reference to the Be API, now available in HTML format in the **/documentation/The Be Book** folder, and in PostScript and a variety of archive formats on the *BeOS* CD-ROM.
- *CodeWarrior Documents for Be*, a collection of Metrowerks documentation for the Be development environment. These are available in HTML format in the **/documentation/Metrowerks/HTMLDocs** folder.
- The Be World Wide Web site: **<http://www.be.com>**, where you’ll find advice on and support for developing Be applications, additions and corrections to this guide and *The Be Book*, and a great deal of other information about Be, Inc., and the Be hardware and software.
- The “Release Notes” and any other last-minute notes that accompany this guide.

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# 1 Learning BeOS Basics

This chapter shows you the basics of working with the BeOS: Starting it up and shutting it down, working with the mouse and keyboard, and mastering the fundamentals of the user interface. The next chapter picks up where this one leaves off, showing you the basic techniques you use with Be applications. Subsequent chapters show you how to use the applications that come with the BeOS.

## Starting the BeOS

Once you've set up your computer and installed the BeOS, you can start using it.

**Note:** As soon as you're comfortable with the BeOS and Be application basics, it's a good idea to use the Time preferences application to set the computer's internal clock to the correct time, as described in "Time" on page 130.

- 1 Make sure there's no floppy disk or CD-ROM that contains Be system software inserted in a drive connected to your computer.

When you start up the BeOS, it tries to find system software on removable disks first. Then it looks for system software on a hard disk. For more information, see "Selecting a Boot Disk" on page 4.

- 2 Turn on any peripheral devices, such as the monitor or external disk drives.

3 Turn on the computer.

The BeBox On/Off switch is a toggle-style switch on the top of the back panel. Pushing the toggle up turns on the BeBox; pushing it down turns it off.

If you're running the BeOS on a Power Macintosh, see its owner's guide if you're not sure how to turn it on.

4 If you're running the BeOS on a Power Macintosh, double-click the BeOS Launcher application.

The BeOS Launcher application is in the **BeOS Tools** folder on the Macintosh hard disk, which you copied from the *BeOS* CD-ROM as described in *Installing the BeOS*.

When you start the BeOS, the Be logo appears for a moment. Then the computer loads the BeOS system software from the startup disk (this is often called "booting"). As the BeOS boots, it performs some housekeeping tasks, which it may inform you about. Then the BeOS starts the Browser application.

The Browser is where you manage the work you do in the BeOS: Arranging and opening files, starting applications, and so on (the Browser is described in detail in "Working with the Browser" on page 32).

When a BeBox is on, two columns of light-emitting diodes (LEDs) become active on its front. The green LEDs at the bottoms of the columns act as power indicators: They glow whenever the BeBox is turned on. The upper LEDs show the relative load on the BeBox's two PowerPC processors: The more LEDs are lit, the harder the PowerPCs are working. (The Pulse application provides a similar display, as described in "Pulse" on page 102.) The amber LED at the bottom of the right column is a disk activity light: Whenever the BeOS uses an IDE or SCSI disk, the amber LED glows.

## Selecting a Boot Disk

When you boot the BeOS, it looks in a fixed order for a disk to start up (or "boot") from. First, it looks for system software on a floppy disk. If it doesn't find a floppy disk with system software, it then looks for any other kind of removable disk, such as a CD-ROM. If it doesn't find a removable disk with system software, it checks the "boot preference" to determine what disk you prefer to use as the boot disk. The BeOS then tries to boot from the disk specified in the boot preference. If for some reason the preferred disk isn't

available or doesn't contain system software, the BeOS tries to boot from any other available disk with system software on it.

When you install the BeOS on a disk, the Installer asks if you want to change the boot preference to that disk. You can change the boot preference at any time with the Boot preferences application, as described in “Boot” on page 109.

Regardless of the boot preference and what disks are inserted or attached, you can select the disk you want to boot from in the boot selection screen. On a BeBox, you open the boot selection screen by pressing and holding down any key right after you start the BeOS—as soon as you see the Be logo start to appear. On a Power Macintosh, you open the boot selection screen by holding down the Option key immediately after you double-click BeOS Launcher.

```
Select boot options and press Enter.
Or press Escape to use current boot preferences.

Use the up and down arrow keys to select options.
Use the Tab key to switch sets of options.

Select a boot disk:
>> /dev/ide_disk_master (Be disk 'Boot Disk')
    /dev/scsi_disk_000 (Be disk 'Data Disk')
    Rescan for bootable disks

After booting from selected disk:
>> Mount other disks
    Don't mount other disks

When mounting these disks:
>> Preserve their databases
    Erase their databases
```

Each bootable disk is listed by its device name as well as by the name it has in the Browser. Disks that don't have Be system software on them aren't included in the list.

**Caution:** Don't select the “Erase their databases” option without first reading “Rebuilding the Database” on page 175.

For more information about SCSI IDs and IDE disks, see your computer's owner's guide.

## Shutting Down the BeOS

Before you turn off the computer, you must first shut down the BeOS. Shutting down ensures that any open files—including system files—are saved to disk correctly. If you turn off the computer without first shutting down, you risk losing information.

- 1 Save any open files and quit any running applications.

Saving files and quitting applications are described in the next chapter.

- 2 Choose Shut Down from the Browser's main menu.

The main menu is just to the right of the application list, at the top-left corner of the screen. For more information about menus, see “Working with Menus” on page 26.

If you just want to restart the BeOS instead of shutting it down, choose Restart from the main menu instead.

If the Browser is busy copying or moving files or emptying the trash when you choose Shut Down or Restart, a panel asks you to confirm that you want to shut down or restart the BeOS when these tasks are complete.

- 3 When a panel tells you it's safe to turn off the computer, turn it off. You can also click the Restart button in the panel (or press the Enter key) to restart the BeOS right away, without turning it off.
- 4 After you've shut down the BeOS and turned off the computer, turn off any peripheral devices that have their own power switches, such as the monitor or external disk drives.



## Resetting the BeOS

If the BeOS crashes, or if the Shut Down and Restart commands don't work, you can restart the BeOS (without turning the computer off and on) by resetting the BeOS.

There are two ways to reset the BeOS. The nostalgic way is to press "Control-Alt-Delete." In other words, press the following three keys at the same time:

- On a PC keyboard, the key labeled "Ctrl" at the bottom left of the keyboard (not the one next to the arrow keys); either one of the two keys labeled "Alt" on either side of the space bar; and either the key labeled "Del" on the numeric keypad or the key labeled "Delete" above the arrow keys.
- On a Macintosh, the Control key, the Command key, and key labeled "Del" above the arrow keys.

(For help finding these keys on a PC or Macintosh keyboard, see "Using the Keyboard" on page 11.)

The other way to reset the BeOS is to press the Reset switch:

- On a BeBox, press the Reset and Interrupt buttons at the same time. The Reset and Interrupt buttons are built into the BeBox front bezel, on the horizontal surface below the floppy disk drive.
- On a Macintosh, press the Reset switch (see the computer's owner's guide for information on the location of its Reset switch).

**Caution:** If you restart the BeOS without choosing Shut Down first, you risk losing data. In particular, you'll lose any changes you've made to open files since you last saved them. You also risk corrupting the Be database. If you corrupt the Be database, you may need to rebuild it. For details, see "Rebuilding the Database" on page 175.

## Interrupting the BeOS

**Caution:** In the prerelease version of the BeOS, the interaction between the Interrupt button and the Debugger is broken, so you shouldn't use the Interrupt button.

If you're using the Be Debugger, you can interrupt the BeOS and open a debugger window. (Using the Debugger is described in "Using the Be Debugger" on page 155.)

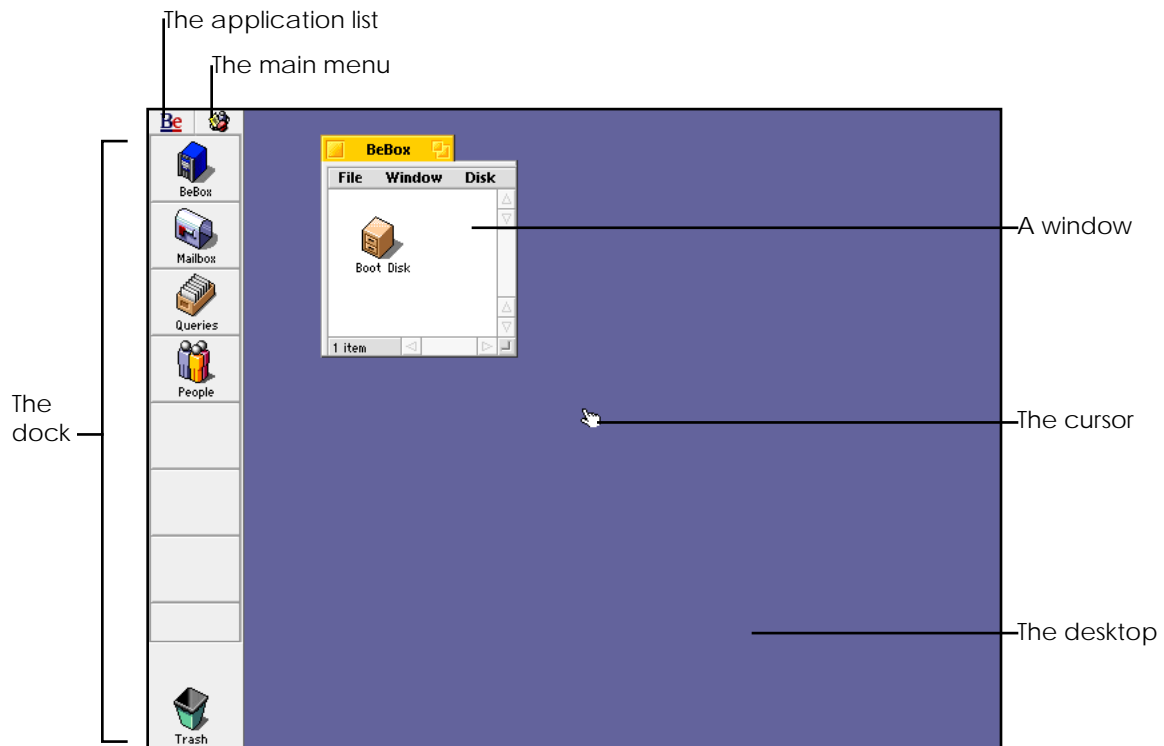
## Getting to Know the BeOS Workspace

To interrupt the BeOS, press the Interrupt button. On a BeBox, the Interrupt button is on the horizontal surface underneath the right side of the floppy disk drive, just above the right LED array. Push up on the button to operate it. If you're running the BeOS on a Macintosh, see its owner's guide to learn the location of its Interrupt switch.

If you press the Interrupt button accidentally, type **g** and press Enter to tell the BeOS to continue doing what it was doing when you interrupted it. Then close the Debugger window.

## Getting to Know the BeOS Workspace

When you start the BeOS, the Browser starts up and the dock appears along the left side of the Be workspace. The background of the workspace is called the *desktop*—initially a solid blue area where windows open and you do your work.





Take a moment to identify the following features of the Be workspace:

- The *cursor* is the hand-shaped icon that moves when you move the mouse. Working with the mouse and using the cursor are described in “Using the Mouse” on page 10.
- The *dock* is a convenient place to keep *icons* for applications, files, and other items you use often. See “Working with the Dock” on page 42.
- The *application list* lists all running applications. You use it to switch applications, as described in “Switching Applications” on page 50.
- The *main menu* contains menu items for the *active application*—the application you’re currently working with. For more information, see “Working with Menus” on page 26.
- *Windows* are where you view and work with files, text, pictures, and other information. See “Working with Windows” on page 14.
- The BeBox icon, at the top of the dock, opens a window that lists mounted disks. See “Working with Disks” on page 36.
- The Mailbox icon opens a window that lists the e-mail you’ve received. For more information, see “BeMail” on page 62.
- The Queries icon opens a window with the Be database queries you’ve created, as described in “Opening a Query” on page 48.
- The People icon opens a window that lists “people” entities in the Be database. Initially, there’s only one person in the database, but you can add people and their e-mail addresses as described in “Creating E-Mail” on page 67.

Though most of this guide concentrates on showing you how to work in this initial workspace, you can create up to 32 workspaces and switch among them using the Workspaces application. For details, see “Workspaces” on page 106.

## Using the Mouse

You use the mouse to control items on the screen. When you move the mouse, a small icon called the *cursor* moves across the screen. The cursor changes shape depending on what you're doing: A hand  for selecting items and choosing from menus, an I-beam  for selecting text, and so on.

You use the mouse buttons to manipulate the items on-screen that are underneath the cursor. The BeOS can take advantage of one-, two-, and three-button mice. On a three-button mouse, the left mouse button is initially the *primary mouse button*, the button you click to perform the most common tasks; the right button is the *secondary mouse button*; and the middle button is the *tertiary mouse button*. You can change the role of the mouse buttons with the Mouse preferences application, as described in “Mouse” on page 117.

If you have a single-button mouse, you can emulate a three-button mouse by pressing Control-Command while you click the mouse button to emulate the secondary mouse button, and by pressing Control-Option while you click to emulate the tertiary mouse button. (On a PC keyboard, the Command key is usually labeled “Alt,” and the Option key is the key labeled “Ctrl” to the right of the spacebar.)

There are a few basic techniques (and terms that describe them) for using the mouse that you should learn before continuing with this guide:

Move	Move the mouse without pressing a mouse button
Click	Press and quickly release a mouse button without moving the mouse
Press	Press and hold down a mouse button without moving the mouse
Drag	Press and hold down a mouse button while you move the mouse
Double-click	Press and release a mouse button twice in quick succession
Triple-click	Like double-clicking, but thrice
Double-click and drag	Like double-clicking, but hold down a mouse button instead of releasing it the second time, then move the mouse

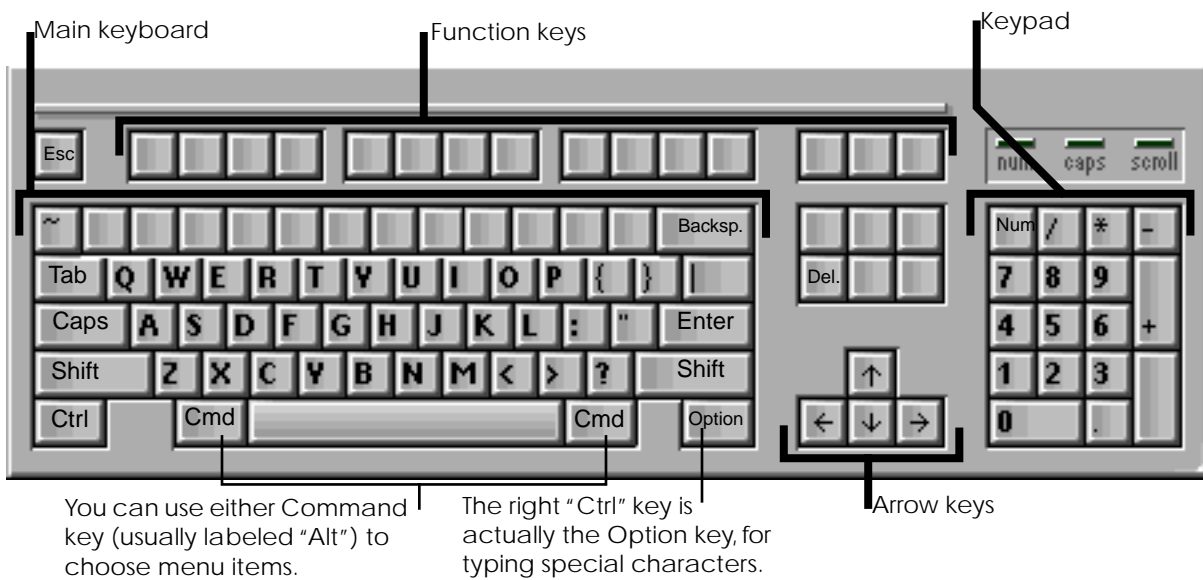
You can adjust how the BeOS interprets multiple clicks and how rapidly the cursor moves across the screen when you move the mouse (see “Mouse” on page 117).

## Using the Keyboard

In addition to using the keyboard to type text, you also use it to modify the action of the mouse, to select items, to choose menu items, and to perform many other tasks. The keyboard has two main parts: The main keyboard and the keypad. Along the top of the keyboard are the Escape key and function keys. Between the main keyboard and the keypad are more function keys, plus the arrow keys. Standard PC keyboards, which you use with a BeBox, are laid out slightly differently than standard Macintosh keyboards.

There are hundreds of different manufacturers of “standard” PC keyboards, employing a considerable variety of key symbols and labels, but the BeOS assigns functions to keys by their position on the keyboard, not by their labels.

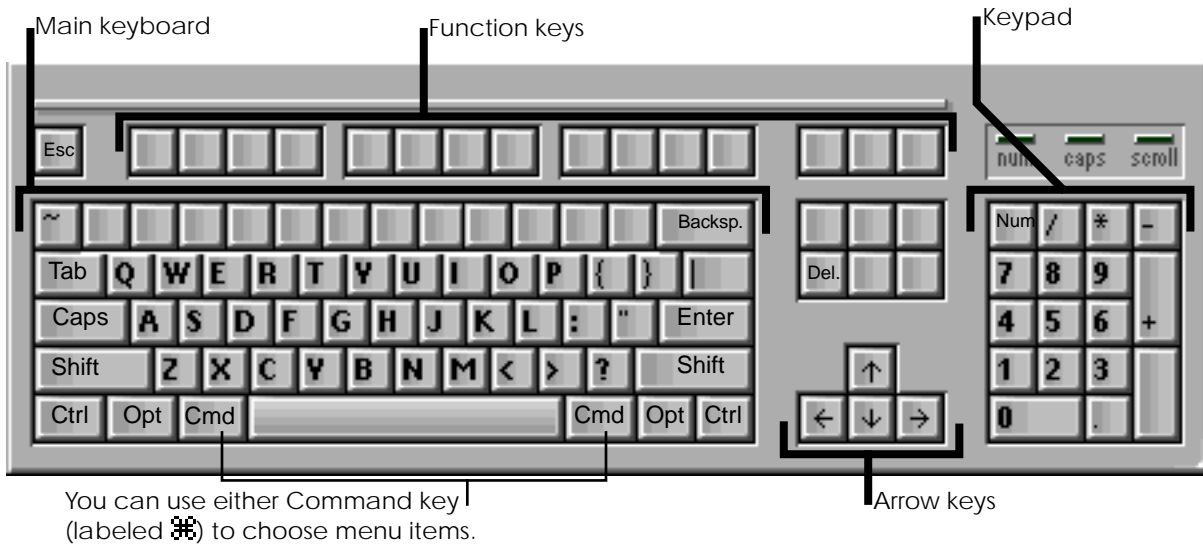
### PC Keyboard Layout



## Using the Keyboard

Most of the labels on a Macintosh keyboard match the roles their keys play in the BeOS. A few exceptions are the Command keys, which are marked with a  $\text{⌘}$  symbol, and the Backspace key (the top-right key on the main keypad), which is often labeled “Delete.”

### Macintosh Keyboard Layout



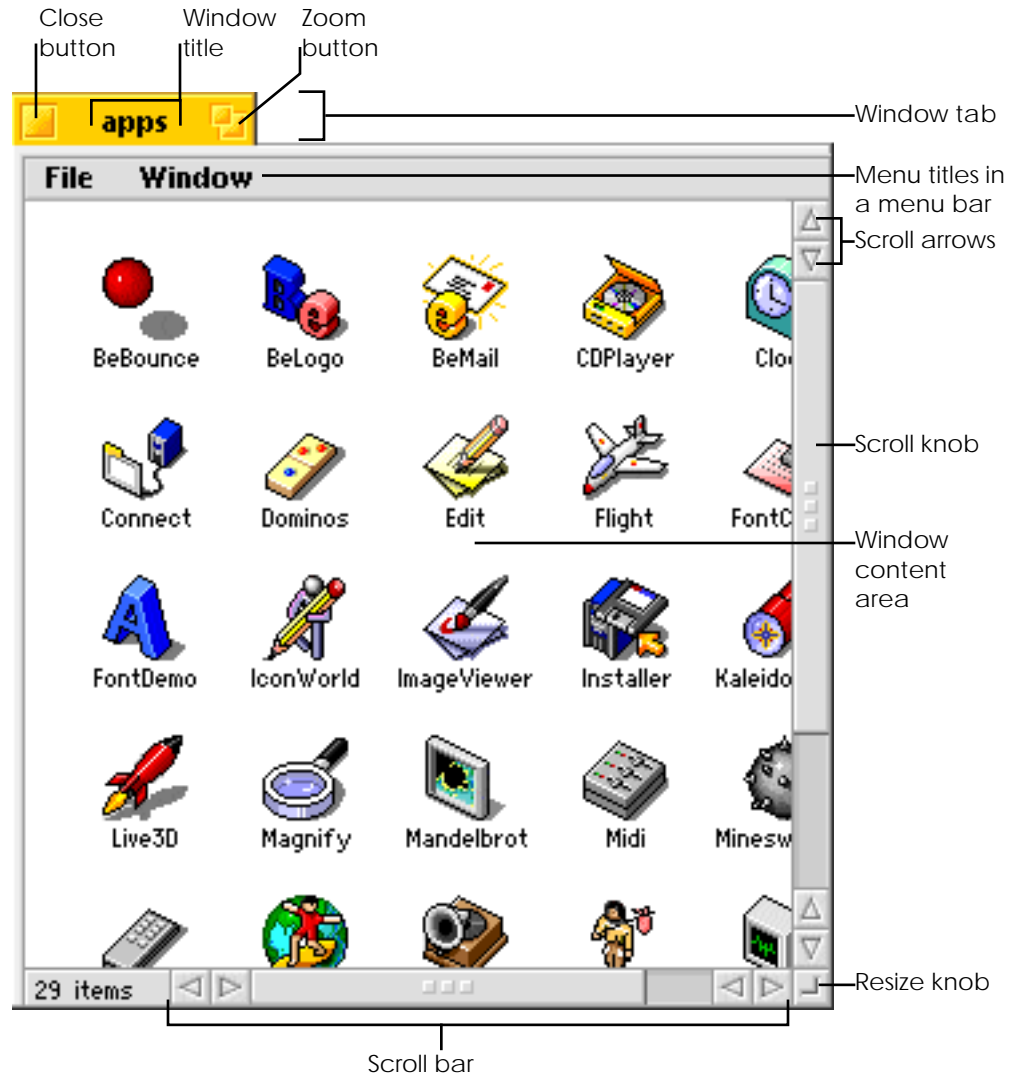
Most of the keyboard keys should be familiar to you from typing class. However, the BeOS uses some of the keys on a PC keyboard in ways you might not guess:

<u>PC Key Label</u>	<u>Mac Key Label</u>	<u>Key Name in the BeOS</u>	<u>Function in the BeOS</u>
Alt	⌘	Command	Used in conjunction with other keys as a shortcut to choosing menu items.
Ctrl (on left)	Control	Control	Used to type special characters, particularly when you're working in the Terminal application.
Ctrl (on right)	Option	Option	Used to type special characters, such as symbols and accented characters.
Enter (or arrow)	Return	Enter	Used to end a paragraph when you're typing. Also used as a shortcut for clicking on-screen buttons, opening files, and other common tasks.
Esc	Esc	Escape	Used as a shortcut to clicking Cancel in many panels and to close open menus.
Tab	Tab	Tab	Used to type the tab character. Also used to select objects in windows and panels so you can manipulate them from the keyboard.
(arrows)	(arrows)	arrow keys	Used to move the cursor in text, to select items, and so on.

Using the keyboard is described throughout this guide. In particular, see “Typing Special Characters” on page 57, “Navigating Menus from the Keyboard” on page 30, and “Navigating Windows and Panels from the Keyboard” on page 24. For information about how the BeOS maps the characters you see on screen to the layout of the keys on the keyboard, see “Keymap” on page 114 and “FontChart” on page 86.

## Working with Windows

The BeOS displays information in windows, areas on the screen with some of all of the following features:





Most windows have a tab at the top, with the title of the window and one or more buttons. In the Browser, the title usually tells you the name of the folder whose contents are shown in the window. (For details, see “Working with the Browser” on page 32.)

You can have one or many windows open at a time, but only the *active window* responds to your actions. For example, pressing keys on the keyboard affects only the active window. Even when windows aren’t overlapping, you can tell which is the active window by its tab: The active window has a yellow tab.

You make a window the active window by clicking its border or (for most windows) anywhere in it. When you start up a new application or switch applications, the frontmost window in the new application becomes the active window.

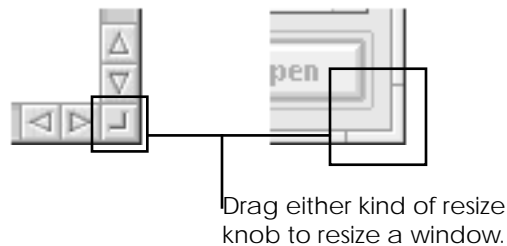
## Moving a Window


You move a window by dragging it by its border. The border includes the tab and the gray area on the edges of windows where there’s no scroll bar. For most Browser windows, this means you can drag the window by its left and top borders, including the tab. You can drag other windows, panels, and palettes by any border.

When you drag a window by its tab, take care not to click the close or zoom button accidentally.

## Resizing a Window

You can change the size and dimensions of a window by dragging its resize knob. The resize knob can be a box-shaped area or just a special part of the bottom-right corner of the window’s border—depending on whether the window has scroll bars.



You can also click a window's zoom button (the  icon in the window's title bar) to make it as big as need be to show all that it contains—or at least as big as the screen. Clicking the zoom button again restores the window to its previous size.

In the Browser, choosing the Resize to Fit command from a window's Window menu has the same effect as clicking its zoom button.

## Scrolling the Items in a Window

Sometimes a window contains more icons, more text, or a bigger picture than can fit in the window. You can move the contents of the window within the window to see the items or parts of the document that aren't visible. This is called *scrolling*.

When a window contains more than you can see in it, its scroll bars become active to show that you can scroll to see more. Initially, windows in the BeOS have *proportional scroll bars*, so called because their scroll knobs change size to give you a rough idea of what proportion of the contents of a window is visible: When you can see almost everything the window contains, the scroll knob is almost as long as the scroll bar; but when you can only see a tiny part of what the window contains, the scroll knob becomes

small in relation to the whole scroll bar. You can turn off proportional scroll bars, change the look of the scroll knob, and set some other options for how scroll bars work with the ScrollBar preferences application, as described in “ScrollBar” on page 128.



The simplest way to scroll is to click or press a scroll arrow. But there are lots of other ways to scroll:

<u>Do This</u>	<u>To</u>
Click a scroll arrow	Move the contents of the window a little
Press a scroll arrow	Keep moving the contents of a window slowly
Drag a scroll knob	Scroll the contents of the window quickly
Click in a scroll bar	Scroll by a windowful

When you're working in the Browser, you can also:

<u>Do This</u>	<u>To</u>
Press Page Up	Scroll up a windowful
Press Page Down	Scroll down a windowful
Press Home	Scroll all the way to the top
Press End	Scroll all the way to the bottom

The contents of a window also scrolls when you select an item that's not in view, for example, when you use the arrow keys to select items in a Browser window.

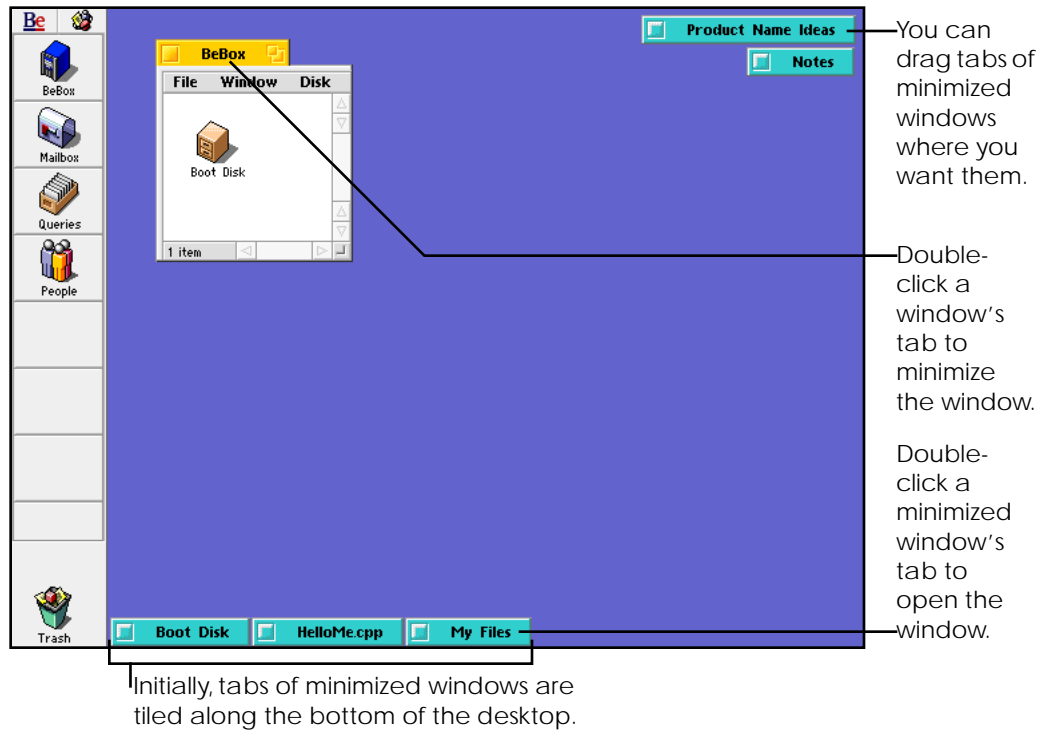
## **Zooming a Window**

You can quickly increase the size of a window by clicking its zoom button. In the Browser, clicking the zoom button is the same as choosing the *Resize to Fit* command from a window's *Window* menu: The window becomes as large as necessary to display everything in it. Click the zoom button again to return the window to its previous size and location. Some applications use the zoom button slightly differently. For example, when you click the zoom button in the *Workspaces* application's window, it moves the window to the lower-right corner of the screen.

## **Minimizing a Window**

If you begin to have more windows open than is convenient, you can minimize one or more windows. Minimizing a window hides all of the window except its tab. To minimize a window, double-click its tab (but be careful not to double-click the close or zoom button). Tabs of minimized windows are initially laid in rows across the bottom of

the desktop. If you prefer a different organization of minimized windows, you can drag tabs to wherever you want on the desktop.



To restore a minimized window to its original size and location, double-click its tab again. Other ways to open minimized windows include:

Type of Window	Way to Open It
Folder	Double-click its icon in the dock or in the window that contains it.
Document	Same as for folder windows. Also, open the document with the Open command. If an application has only minimized windows, switching to that application by double-clicking its icon or choosing it in the application list opens one of its windows.

You can click the close button in the tab of a minimized window to close the window. If the window contains changes you haven't saved, you're asked if you want to save the changes before closing the window.

## Selecting Items

To work with an item in a window, you first select it. Selected items usually change color to show that they're selected. For example, when you click an icon in a Browser window, it becomes darker (or *highlighted*).



Besides clicking, there are lots of techniques and shortcuts for selecting items. The following table summarizes ways you can select items in Browser windows, query windows, and some panels, such as the Open and Save panels.

<u>Do This</u>	<u>To</u>
Click an item	Select it
Drag from an empty place in a window across one or more items	Select the items you drag across
Type one or more letters	Select the item that starts with that letter or letters
Press an arrow key	Select the next item in the direction of the arrow
Press the Tab key	Select the next item in alphabetical order
Hold down the Shift key while you press the Tab key	Select the next item in reverse alphabetical order

<u>Do This</u>	<u>To</u>
Hold down the Shift key while you click, drag, or type	Select or deselect additional items
Choose Select All from the File menu	Select all the items in the window

## Changing Views

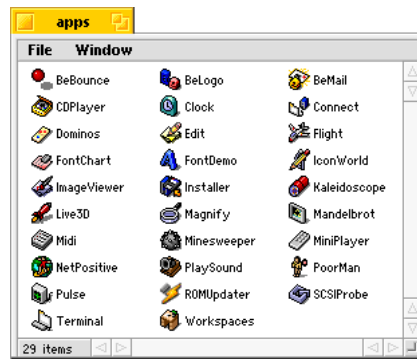
Initially, the items in Browser windows are displayed as large icons with their names underneath them. If you prefer, you can view the items in the window as small icons with their names to the right. You can also view the items in the window in an ordered list view, which can tell you additional information about the items in the window. List views are also used in query windows, as well as some panels, such as the Open and Save panels.

You change views by choosing Icon View, Mini Icon View, or List View from a window's Window menu.

### Working in Icon and Mini Icon View



Icons are easiest to recognize in icon view.



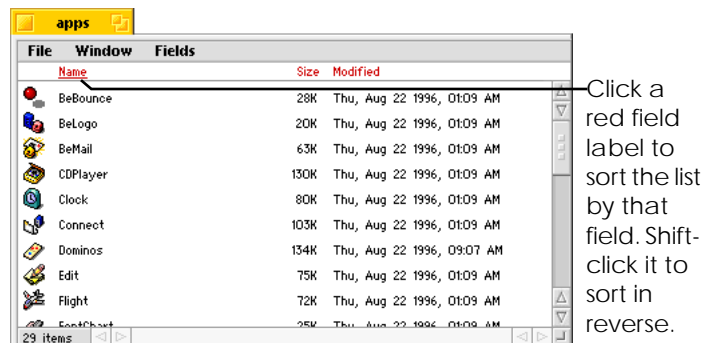
It's easiest to work with a lot of icons in mini icon view.



When you're working in icon view or mini icon view, you can move one or more items in a window to a new location in that window—perhaps to group related items in the same part of the window. Simply drag an item to the location you want. If more than one item is selected, they all move when you drag one of them. If you hold down the Command key (“Alt” on most PC keyboards;  $\text{⌘}$  on Mac keyboards) while you drag icons, they snap to an invisible grid when you release the mouse button.

In icon view and mini icon view, you can use commands in the Window menu to straighten up the arrangement of all the icons in the window. Choose Clean Up to align each icon in the window to the nearest location on the invisible grid. If you hold down the Shift key, the Clean Up command changes to Clean Up All. Choosing this command sorts the icons in the window in alphabetical order on the grid.

### Working in List View



A lot more information about each item is visible in list view.

When you're working in list view, you can change how the items are ordered in the list. Initially, items are sorted alphabetically by name, and the Name field title is underlined at the top of the list. If you click on another field title, the items in the list are sorted in a way that's appropriate for that field, and the field title you clicked becomes underlined. If you click a second time on a field title (or hold down the Shift key while you click on a field title the first time), the items are sorted in reverse order.

You can choose the fields you want to see in list view from the Fields menu. Fields shown in the window are checked in the menu.

## **Closing a Window**

When you're done working with the contents of a window, you can close the window to make more room for other windows on the desktop. To close a window, click its close button. In many applications you can also choose the Close command, which is usually in a window's Window or File menu.

If you're working in an application where you need to save the changes you make, a panel asks if you want to save any unsaved changes when you close a window.

In many Be applications—such as the preferences applications—when you close an application's last (or only) window, the application quits.

## **Navigating Windows and Panels from the Keyboard**

You can manipulate the buttons, pop-up lists, sliders, and other objects in windows and panels from the keyboard (for information on working with menus from the keyboard, see “Navigating Menus from the Keyboard” on page 30). Not all applications' windows and panels take advantage of this support yet (for example, the Open and Save panels retain their own form of keyboard navigation, as described earlier in this chapter). Most of the applications in **/preferences** and the BeMail application offer keyboard navigation.

When you're working in a window or panel that supports keyboard navigation, you use the Tab key to move the focus of keyboard control from one object (or group of objects) to the next. The object that is the focus of keyboard control in a window is typically identified with an underline or a similar marking. To move the focus of keyboard control in the reverse direction of Tab, press Shift-Tab.

You operate the object in focus in different ways, depending on the object:

- When a button is the focus, press the spacebar as a shortcut to clicking it.  
Buttons include large buttons with text labels as well as the “radio buttons” and check boxes for options in panels.
- When a pop-up list is the focus, press the spacebar to open the list. Then use the arrow keys to select an item in the list and press Enter. When the list is open, you can press Escape to close the list without choosing an item in it.
- When a slider is the focus, use the arrow keys to move the slider.
- When a scrolling list of items is the focus, use the arrow keys to select the item you want.
- In 8-bit color palettes, use the arrow keys to select the color you want. In 32-bit color-pickers, use the Tab key to move the focus of keyboard control to one of the sliders; then use the arrow keys to move the sliders.

If a window or panel has a default button, pressing Return is the same as clicking the default button, regardless of the focus of keyboard navigation.

If you’re entering text in a field in which you need to be able to type a tab character (such as the message area of a BeMail window), press Option-Tab to move the focus to the next item in the window (the Option key is the key labeled “Ctrl” on the right side of the spacebar on most PC keyboards).

## Working with Menus

Be menus contain commands, lists of applications, settings, and other items.

You work with menus in three main places:

- 1 At the top-left corner of the screen.

The application list and the main application menu, or *main menu*, are at the top-left corner of the screen. The application list has the Be logo as its title. It's described in "Switching Applications" on page 50. The main menu contains menu items for the active application, that is, the application you're currently working in. The main menu's title is the logo of the active application.

- 2 In windows.

Most of an application's menus are along the tops of its windows.

- 3 In panels.

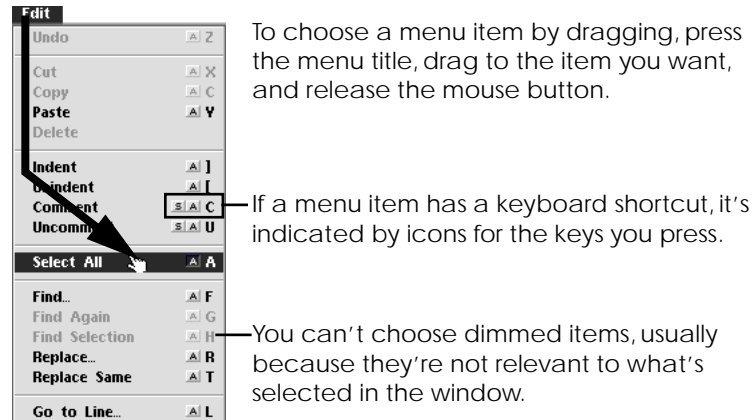
Pop-up lists and other controls in panels work very much like menus.




You can navigate menus and choose items from them in a number of ways, using the mouse, the keyboard, or a combination of the two.

**Note:** This section describes how menus behave when you first install the BeOS, but you can change a number of ways that fonts look and how they work with the Menu preferences application, as described in "Menu" on page 116.

## Navigating Menus by Dragging

You can press a menu title, drag to the menu item you want, and release the mouse button to choose that menu item. If you release the mouse button without choosing a menu item, the menu closes.



When you drag through menus, you also see the *keyboard shortcuts* for the items in the menu. Keyboard shortcuts are combinations of keys you can press as a shortcut to choosing the menu items with the mouse. The  icon represents the Command key (either of the keys labeled “Alt” on either side of the spacebar on most PC keyboards; either of the keys labeled  on Mac keyboards). The  icon represents the Shift key. Choosing menu items from the keyboard is described in “Navigating Menus from the Keyboard” on page 30.

## **Navigating Context-Sensitive Menus**

In some applications, such as the Browser, you can open a menu by selecting an item or positioning the cursor over it and then pressing a mouse button. For example in the Browser, if you position the cursor over an icon in the dock and press the secondary mouse button, a menu with items relevant to the item in the dock opens underneath the cursor. Context-sensitive menus are also available in the Open and Save panels. You can drag to a menu item you want and release the mouse button to choose it. If you don't want to choose one of the items in the menu, drag the cursor out of the menu before you release the mouse button.

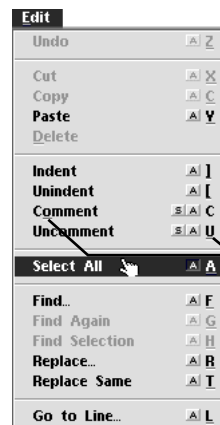
Initially, the secondary mouse button is the right mouse button on a three-button mouse, but you can rearrange the buttons and their roles with the Mouse preferences application. See “Mouse” on page 117 for more information.

You can also open context-sensitive menus by pressing (holding down the mouse button) when the cursor is on an object—such as an icon or selection of icons in the Browser—and waiting for a moment. The delay before the context-sensitive menu opens is related to the double-click speed you set in the Mouse preferences, which is described in “Mouse” on page 117.

## Navigating Menus by Clicking

You can click a menu's title to open the menu and view its contents. Then you can click a menu item to choose it.

When you click a menu title, the menu stays open until you choose a menu item, click another menu title, or click elsewhere on the screen. When you move the cursor (without pressing a mouse button) over items in an open menu, menu items highlight underneath the cursor and submenus open. You can press the Enter key on the keyboard to choose a highlighted menu item.

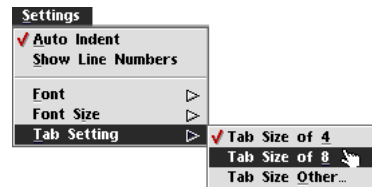


Click a menu title to open the menu, then click the menu item you want to choose. Or move the cursor over an item in an open menu and press the Enter key.

The underlined character in a menu item indicates its "trigger," the character you can type to choose that menu item when the menu is open.


When you click a menu title, you see the menu's *triggers*. Triggers are characters you can type when a menu is open to choose a menu item by typing instead of clicking. Triggers are indicated by underlined letters in menu titles and menu items. For more information, see "Navigating Menus from the Keyboard" on page 30.

An arrow next to a menu item indicates that it's a submenu. Move the cursor over a submenu title to open it. Then click the menu item you want to choose in the submenu.



## **Navigating Menus from the Keyboard**

You can press and release a key to display the triggers for the menu titles in the active window.

- On traditional PC keyboards, press Command (labeled “Alt”) and Escape at the same time.
- On newer PC keyboards that have a Menu key (usually to the left of the right Control key), press the Menu key.
- On Macintosh keyboards, press Command (labeled ) and Escape at the same time; or press the equal sign key (=) that’s on the numeric keypad.

Triggers are underlined letters in menus that indicate the character you can type as an alternative to clicking a menu title or menu item. Type the trigger letter for the menu you want to open. Then type the trigger letter for the menu item you want to choose.

If triggers are showing and you decide you don’t want to choose a menu item, press Escape to hide the triggers.





Most menu items have a trigger. If you want to use the keyboard to choose a menu item that doesn’t have a trigger, you can use the arrow keys to select the menu item and then press Enter.

When you open a menu, you can also use the arrow keys on the keyboard to navigate menus. Use the left and right arrow keys to open different menus and submenus. Use the up and down arrow keys to highlight menu items. When the menu item you want to choose is highlighted, press Enter.

To open an application’s main menu, press Command-spacebar (that is, press the Command key and the spacebar at the same time). To open the application list (so you can switch applications), press Command-Tab.



## Choosing Menu Items by Shortcut

Many menu items have shortcuts: Combinations of keys you can press to choose a menu item instead of choosing it by dragging, clicking, or by navigating to the menu item from the keyboard. If a menu item has a shortcut, it's displayed to the right of the menu item in the menu. The  icon represents the Command key (either of the keys labeled "Alt" on either side of the spacebar on most PC keyboards; the key labeled  on Mac keyboards). The  icon represents the Shift key. Shortcuts are always displayed in menus as uppercase letters, though you need to press the Shift key along with the Command and letter keys only if the shortcut includes the  icon.

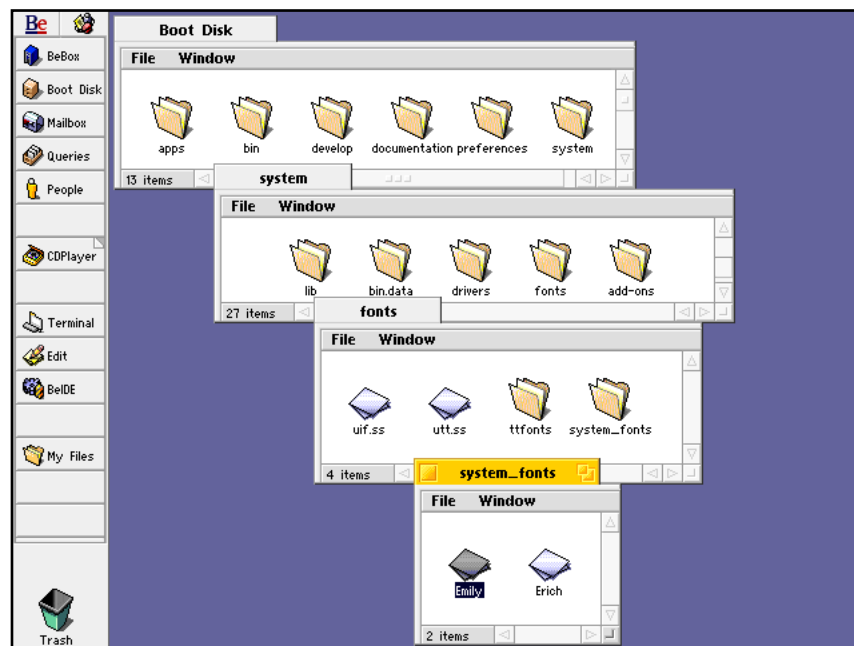
## Working with the Browser

You use the Browser to organize your work: Files, applications, database items, and so on. The Browser is also the main tool you use to start applications.

### Understanding the Hierarchical File System

Applications, documents, and other files in the Be file system are stored on disks. Because the number of files can become quite large, it's convenient to sort them into related groups. To do this, the BeOS—like many other operating systems—uses the metaphor of folders (also called “directories”), where you can keep together related files, and even related folders.

In the following illustration, the file **Emily** (selected at the bottom of the screen) is in the **system\_fonts** folder, which is in the **fonts** folder, which is in the **system** folder, which is on the disk named **Boot Disk**. (In this guide, **boldface** is used for the names of files and folders.)



There's another way of expressing the location of items in this hierarchy that you use, for example, when you're working in the Terminal application: You use an item's *path name*. A path name is a series of folder names separated by slashes. For example, the path name of the Emily font in the illustration is: **/system/fonts/system\_fonts/Emily**. The path for the folder the fonts folder is in is often represented as **/system**. The leading slash indicates that the **system** folder is in the *root* of the boot disk: That is, on the disk you booted from but not in a folder.

This system gets more complicated when you're working with more than one disk. There are also shortcuts to represent items in the same folder and items in folders closer to the root of the hierarchy. For more information, see "Terminal" on page 104.

## Getting Information about an Item

You can get information about an item in a Browser window or the dock by selecting it and choosing Get Info from the File menu.

The information you get depends on the item. For disks, you get information about their capacity and free space. For files, you get information about their size, when they were created and modified, and their location in the file system. For applications, you get this same information, plus a version number.

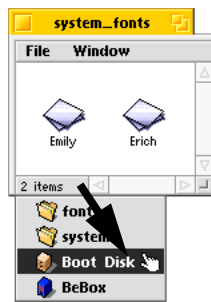
## Opening Folders

You double-click a folder to open a window that shows the contents of the folder. The title of the folder window is the name of the folder.

A folder that contains another folder is often called the *parent* of the folder it contains. When you're viewing the contents of a folder in a window, you can open its parent folder by choosing Open Parent from the Window menu.

### *Working with the Browser*

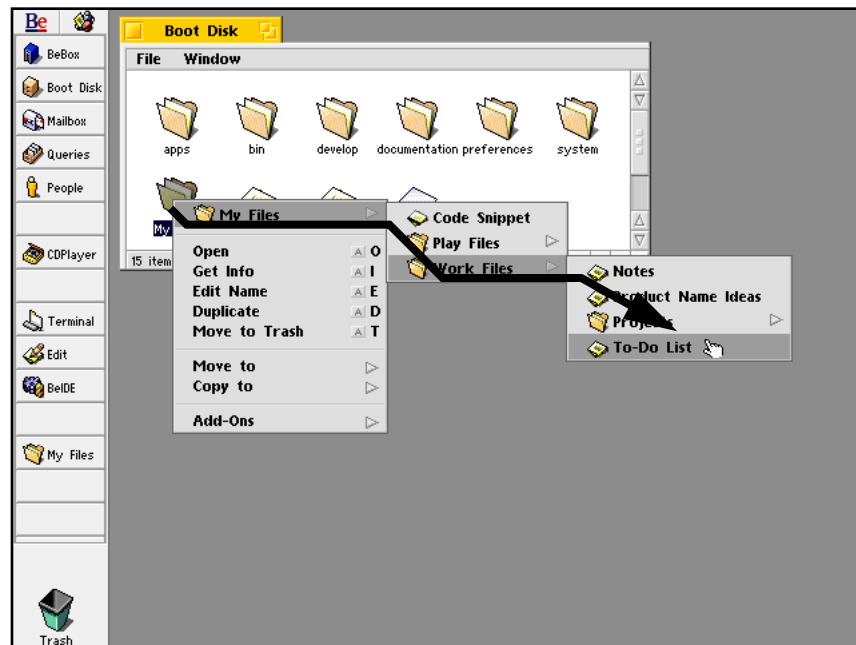
You can also open a folder's parents from the pop-up menu that opens when you press the lower-left edge of a folder window, the area that normally lists the number of items in the window.



Press the lower-left corner of a Browser window to open a menu that lists the parents of the folder whose contents are shown in the window.

If you hold down the Control key when you double-click a folder, the folder's parent closes when the folder you double-clicked opens. This is a handy way to reduce the number of folders open in a workspace.

If you press the secondary mouse button when the cursor is over a folder icon, a disk icon, or an empty area in a folder window, a context-sensitive menu opens under the cursor. The top item in the menu is a submenu that has the same name as the folder the cursor is over. All the folders, applications, and other files in the folder the cursor is over are arranged hierarchically in the submenu. You can navigate the submenu to choose any folder or file to open it.



Press on a folder with the secondary mouse button to open a menu you can use to open a file or folder the first folder contains.

## Working with Disks

In addition to the boot (or “startup”) disk, you can have many disks and their contents available in the Browser and in other applications: Additional SCSI or IDE hard disks, CD-ROMs, floppy disks, and so on. To make a disk available in the Browser and other applications, you *mount* it.

All currently mounted disks are listed in the BeBox window, which you can open by double-clicking the BeBox icon in the dock.

**Tip:** If you’ve removed the BeBox icon from the dock, you use the Browser’s Find command to open a query window, from which you can drag the BeBox icon back to the dock, or just open the icon. For more information, see the tip in “Opening a Query” on page 48.)

Before you can mount any disk the first time, you must use the Installer application to *initialize* the disk, that is, to prepare it to work with the BeOS. For information on initializing disks, see “Installer” on page 89. You can’t mount an uninitialized disk—even if the disk is a hard disk that was connected to the computer and turned on when you started the BeOS, its icon doesn’t appear in the BeBox window until you initialize it.

You work with mounted disks in much the same way as you work with folders: Double-click them to open them, drag files onto them to copy the files onto the disk, and so on.

### Mounting a Disk

The easiest way to mount a SCSI or IDE hard disk is to have it connected to the computer—and if it’s an external device, turned on—when you start the BeOS. Icons for mounted disks are in the BeBox window, which you open by double-clicking the BeBox icon in the dock.

To mount a CD-ROM that has a Be file system on it, simply insert it into the CD-ROM drive: The CD is mounted automatically.

To mount a floppy disk, insert it in the floppy disk drive and choose Mount Floppy Disk from the BeBox window’s File menu. The disk’s icon appears in the BeBox window, where you can work with it in the same way you work with a folder icon. (If the computer can automatically detect floppy disks, they’re mounted automatically when you insert them in the drive—you don’t have to choose Mount Floppy Disk.)

**Note:** The current release of the BeOS supports only high-density floppy disks. (These are usually labeled “HD”.)

To mount all disks connected to the computer, including hard disks, choose Mount All Disks from the BeBox window’s Disk menu.

A disk is also mounted after you initialize it with the Installer application.

### **Unmounting a Disk**

To unmount a floppy disk, CD-ROM, or any other kind of disk, select it in the BeBox window and choose Unmount Disk from the Disk menu (or just drag the disk icon to the Trash icon). The disk’s icon is removed from the BeBox window, any windows for folders on that disk are closed. When you unmount a CD-ROM and some other kinds of disks, it’s ejected from its drive automatically. If the disk is a floppy disk or another kind of disk that isn’t ejected automatically, press the drive’s Eject button when the drive’s light goes out.

### **Renaming Items**

You can rename any file, folder, or other item in a Browser window and in some panels, such as the Open and Save panels. To change an item’s name, select the name by clicking it and type a new one. You can also select an item in a Browser window and choose Edit Name from the window’s File menu to select the name.

You type and edit an item’s name in the same way as you type and edit any other text in Be applications. For more information, see “Working with Text” on page 56.

You can name an item anything you want, as long as there’s no other item in the same folder with that name already. You can use up to 58 letters, numbers, and symbols—anything you can type, except the asterisk ( \* ), slash ( / ), colon ( : ), and backslash ( \ ) characters.

**Tip:** If you change your mind about renaming a file or folder while editing its name, just press the Escape key to restore the original name.

## **Creating a Folder**

You can create a new folder to store related files and even other folders.

- 1 Open the folder where you want to create the new folder, so the folder's window is the active window.

For more information on windows, see "Working with Windows" on page 14.

- 2 Choose New Folder from the folder window's File menu.

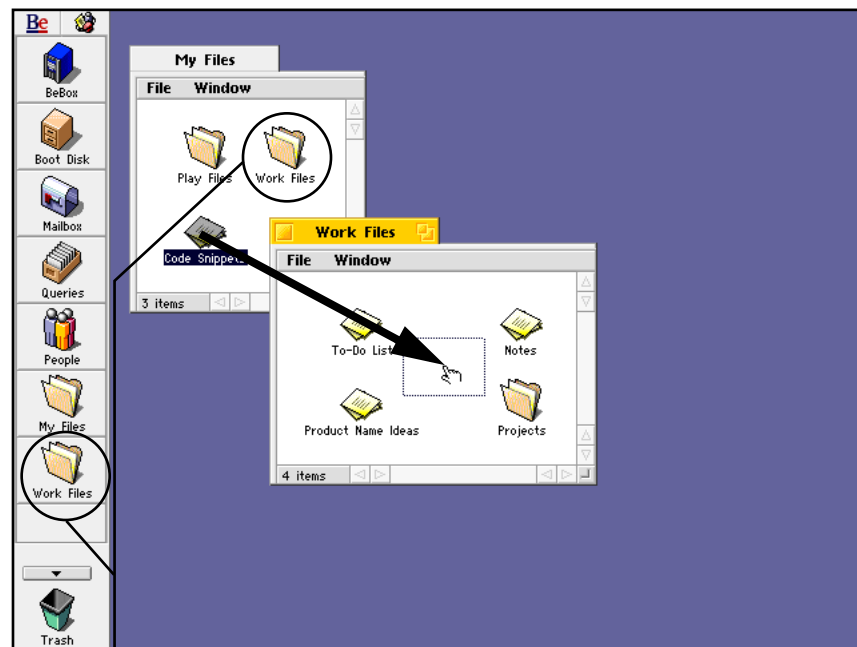
A folder named New Folder is created. The folder's name is selected, so you can simply type a name and press Enter to name the folder.

**Note:** In theory, you can't create a folder more than 60 folders removed from the root.



## Moving and Copying Items

You can move items (such as a file or folder) from one folder to another. Simply drag the item into the window or onto the icon of the folder where you want to move it. You may have to arrange the windows on your desktop so both the item you want to move and the window or folder where you want to move the item are visible.



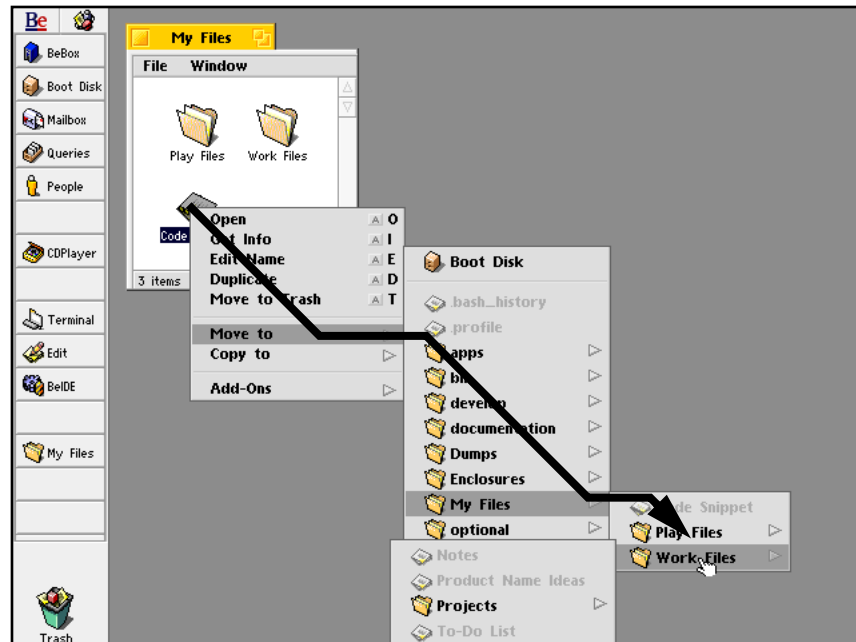
To move an item, drag it into the window where you want to move it. Or drag it onto a folder icon in a window or a folder icon on the dock.

In this example, you could also move the Code Snippets file into the Work Files icon in the same window as the Code Snippets file, or onto the Work Files icon on the dock. These both would have the same effect as dragging the file into the Work Files window.

If the folder you drag an item onto is on a different disk, the item is copied instead of moved. That is, a new copy of the item you drag is created where you dragged it, but the original copy remains in the folder from which you dragged it.

If you want to have copies of the item you're moving in both the source and destination folders on the same disk, hold down the Control key (the key labeled "Ctrl" on the left side of most PC keyboards) while you drag the item. This forces a copy whether the destination is on the same disk or not.

Another way to copy or move files or folders is to use the Browser's context-sensitive menus. Position the cursor over the item you want to move or copy and press the secondary mouse button. In the menu that opens under the cursor, drag to the Move To or Copy To submenu and then through the hierarchy of submenus to select the folder where you want to copy or move the item under the cursor.



Use the secondary mouse button to move or copy the selected item to any location in the file system.

If you're copying or moving a lot of files, a status window opens with updates on the progress of that task. If you're moving or copying more than one set of files or emptying the trash, each such task is listed in the status window. You can click a status bar in the Status window and click Cancel to stop that task in midstream, but whatever has been moved, copied, or deleted so far stays moved, copied, or deleted—it's not undone.

## Duplicating Items

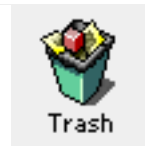
You can create a copy of any item by selecting it and choosing Duplicate from its window's File menu. The duplicate is created in the same folder as the original, and has the same name, with "copy" appended. If you create more than one duplicate of the same item, the duplicates have "copy 2", "copy 3", and so on, appended to the original name.

## Deleting Items

You can delete files, folders, and most other items you see in the Browser by dragging them to the Trash icon on the dock. You can also put items in the trash by selecting them in a Browser window and choosing the Move to Trash command from the window's File menu. When there are items in the trash, the Trash icon appears to have trash in it:



The trash is empty.



There are items in the trash.

Items you put in the trash aren't deleted permanently. You can double-click the Trash icon to see what's in the trash and drag items back into a Browser folder window if you decide you'd rather not delete them after all.

When you're sure you want to remove items permanently, choose the Empty Trash command from the Browser's main menu.

If you make a habit of putting items in the trash and never emptying it, the trash eventually takes up a lot of disk space, so it's a good idea to empty the trash periodically.

**Note:** Dragging an item from the dock to the Trash icon doesn't put it in the trash: It just removes the item from the dock.

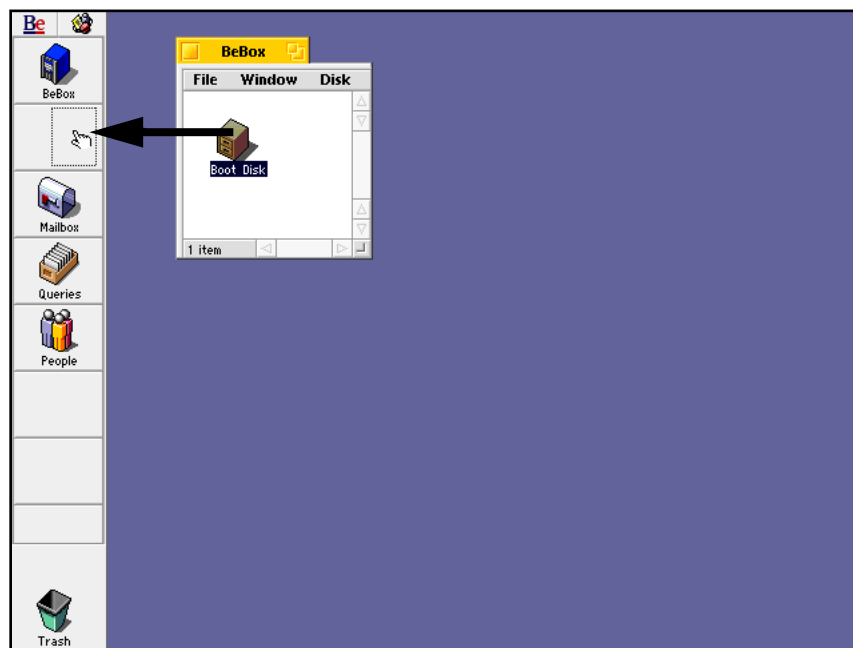
## Working with the Dock

The dock is a convenient place to store icons of the applications, files, folders, and other items you use most often. It's often easier to double-click an icon in the dock than to find the original item in its folder.

An icon in the dock isn't the real item it represents—the original remains in its folder. If you rename the original, the name changes in the dock. Similarly, if you move the original, the icon in the dock still represents the original, but in its new location. Conversely, you can't rename or destroy the icon in the dock, you can only open it, move it to a new location in the dock, or remove it from the dock.

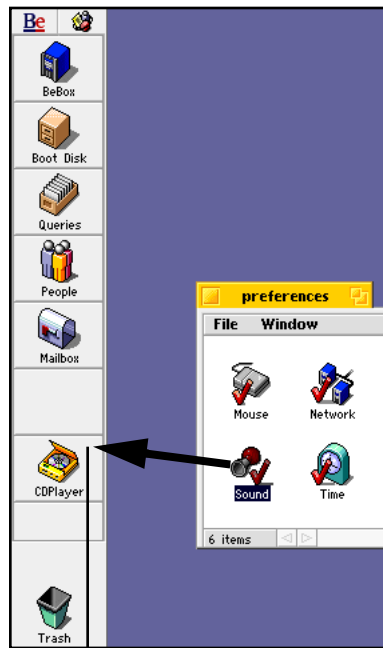
### Adding Items to the Dock

To add an item to the dock, drag it onto one of the dock's slots.

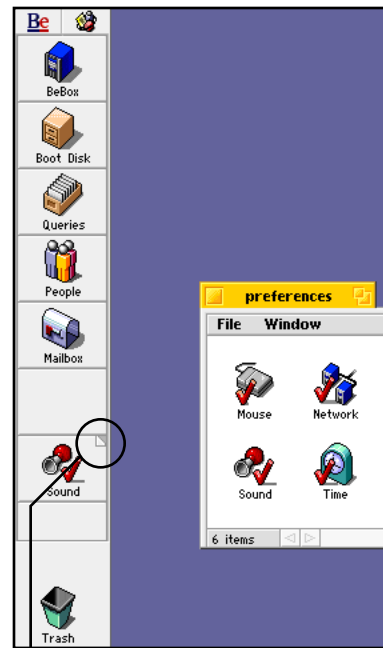


If you drag a file onto an application icon in the dock, the application tries to open the file. If you drag any item onto a disk or folder icon, the item is moved or copied to that

disk or folder. If you drag any item into a space on the dock that already has an icon in it, but not directly onto the icon, both items occupy that space in the dock, and the slot get's a dog-eared corner to indicate there's more than one item in that slot. Click the dog-ear to see the other items in that slot.



Drag an icon to the upper-right corner of a slot in the dock (take care not to drag the icon onto the icon that's in the slot already).



The dog-eared corner indicates there's more than one icon in the slot. Click the dog-ear to make each icon visible in turn.

## Rearranging Items on the Dock

To move an item on the dock to another slot on the dock, drag it to the slot you want.



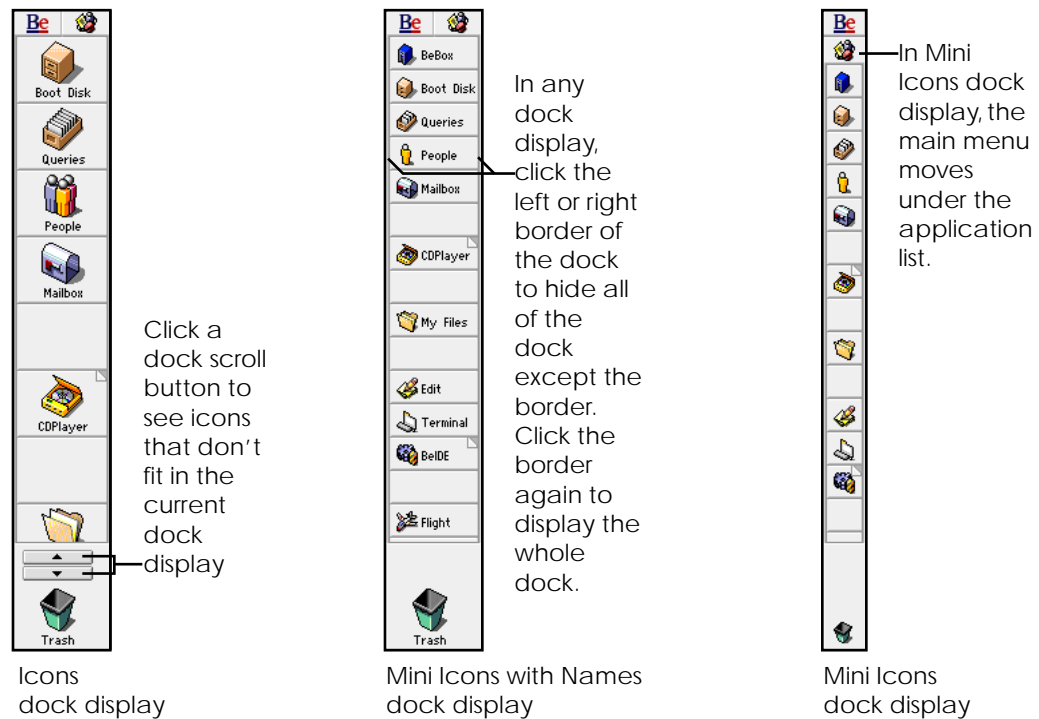
## Removing Items from the Dock

To remove an item from the dock, select it and choose “Remove from Dock” from the Browser’s main menu. Or drag the item to the trash (this doesn’t throw out the original item in the file system—it just removes the icon from the dock).

## Changing the Dock Display

You can change how the dock displays its contents. You can also hide the dock from view.

Initially, items in the dock are displayed as large icons with their names underneath. You change how items are displayed by choosing options from the Dock Display submenu in the Browser's main menu.



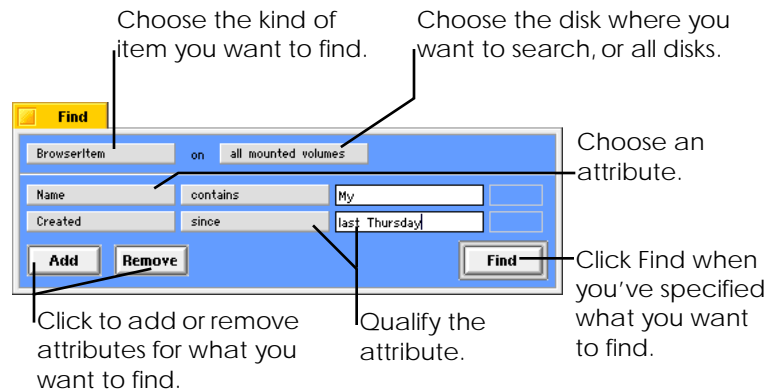
To hide all but a border of the dock from view, click the left or right border. Click the border again to display the whole dock.

## Finding Items

You can use the Find command in the Browser's main menu to search for files, folders, and other items in the Be file system (that is, items stored as files on a disk). You can also search for entities in the Be database, such as e-mail or the names of audio CD tracks you enter in the CDPlayer application. When you choose Find, the Find window opens, where you specify in greater or lesser detail the attributes of what you're looking for. These specifications, called *queries*, are saved in the Be database, so you can reuse them later.

To find an item:

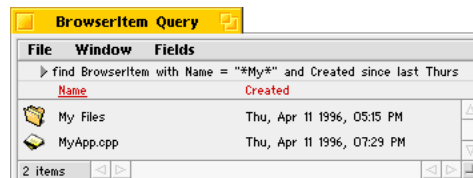
- 1 Choose Find from the Browser's main menu.
- 2 Specify the attributes of the item or items you want to find.





### 3 Click Find.

A query window opens, listing all the items that match the attributes you set in the Find window.



Query windows are very similar to other Browser windows, except they have a gray background and work only in list view. You can double-click items to open them, drag items to the dock and to other folders, add and remove fields using the Fields menu, and so on. (Think twice before dragging items from a query window to a location in the file system: Query windows usually contain items from many parts of the file system, and once you move them, you can't move them back as a set.)

**Caution:** Though you can see and edit a text version of the query in the upper part of a query window, resist the temptation to experiment. The query language is incomplete in the prerelease version of the software, and you can easily create an irreparable query.

## Opening a Query

The Be database saves every query you create—until you decide to delete it. You can double-click the Queries icon in the dock to open a window that lists all your queries. Double-click a query in the window to open another query window, which shows the current result of the saved query.

You can drag queries you don't want any more from the Query window to the trash.

**Tip:** The Queries icon is part of the Be database. Because it isn't a file or folder, you can't find it on a disk. If the Queries icon isn't in the dock, you can use the Find command to search for a `BrowserItem` named Queries. Then you can double-click the Queries icon in the resulting query window or drag the icon back onto the dock. You can also use this technique to restore the BeBox, People, and Mailbox icons to the dock.

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# 2 Learning Be Application Basics

The BeOS comes with a number of applications, some that you use to create documents, some that you use to configure how you prefer to work, and others that demonstrate the potential of the BeOS.

Most applications are in the **/apps** folder, but you can also find applications in the dock, in the **/preferences** folder, and in other locations. The applications in the **/apps** folder are described in Chapter 3 of this guide; the applications in the **/preferences** folder are described in Chapter 4.

You start applications, open files, type and edit text, save files, quit applications, and perform many other tasks the same way in most applications. This section introduces you to these basic techniques.

## Starting an Application

You can start an application by double-clicking its icon. Other ways to start an application include selecting its icon in the Browser and choosing Open from the File menu, and selecting an application icon and pressing Enter.

You also start an application when you open a file—if the application you use with the file isn't already running.

When an application is running, its name is added to the application list—the menu at the top left of the screen that lists all running applications.

## Getting Information about an Application


You can get information about an application by choosing the About command from the application's main menu (the menu with the application's icon, to the right of the application list at the top-left corner of the screen). About commands usually appear in the main menu as "About" followed by the name of the application. For example, "About Edit" is in Edit's main menu.

## Switching Applications

You can run many applications at the same time. The BeOS and the applications themselves understand how to share processors, memory, and other resources, so many applications can do many things simultaneously.

While all running applications are "active," in the sense that they're all doing whatever you told them to do, only one application has its main menu to the right of the application list in the top-left corner of the screen—the main menu has the application's icon as its title. This is the application that responds to what you type on the keyboard, and if it has windows open, one of its windows is the active window.

There are a number of ways to switch among applications. The simplest is to click in a window belonging to the application you want to work in. Another simple way is to choose an application from the application list—the menu with the Be logo icon at the top-left corner of the screen. You also switch applications when you open a file.

You can press Command-Tab to open the application list from the keyboard (the Command key is either key labeled "Alt" on most PC keyboards; it's the key labeled  on Mac keyboards). Then use the arrow keys to select an application and press Enter, or type the trigger for an application in the menu. (For more information, see "Navigating Menus from the Keyboard" on page 30.)

## Quitting an Application

When you're done working with an application, you can quit it. To quit an application, choose its Quit command. In most applications the Quit command is in the main menu.

In many applications, closing all an application's windows causes it to quit.

It's a good idea to quit an application if you're not going to be using it for a while. Quitting an application frees up resources for the applications you're still using.

## Creating a New File

When you start some applications—such as Edit—they open a blank, unnamed file in a window. You can do work in this file and then save it (as described in “Saving a File” on page 51). In most applications, you can create and open another new file by choosing the New command. The New command is in different locations in different applications, but in most applications it's in the application's main menu or in the File menu in the application's windows.

It's important to save a new file as soon as you create work that you don't want to lose.

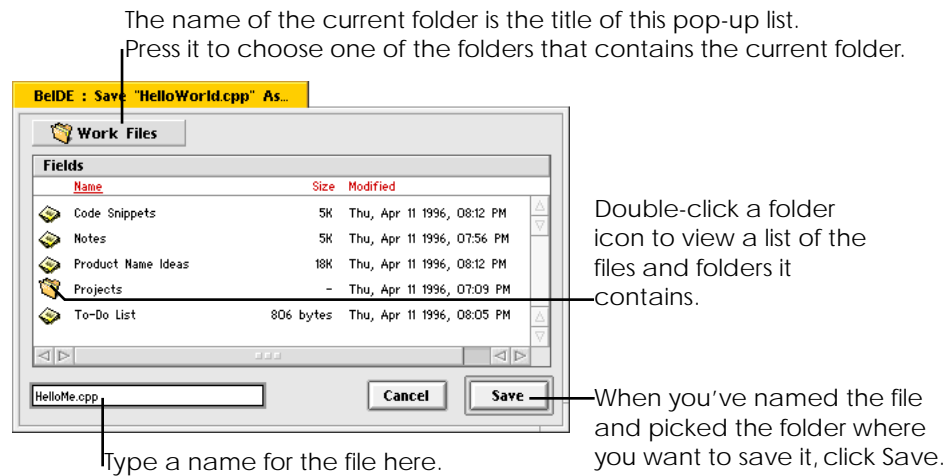
## Saving a File

When you work in a file, your changes aren't stored permanently until you save them. If you experience a power outage, if the BeOS crashes, or if you accidentally press “Control-Alt-Delete,” any changes you haven't saved are lost. Saving a file puts a copy of the file with your latest changes on a disk, where it's stored permanently—until you change the file and save it again.

If you make changes to a file that already has a name and location on a disk, you save changes by choosing the Save command. The Save command is in different menus in different applications, but it's most often each application window's File menu.


## Saving a File

If you create a new file or make changes to a file that doesn't already have a name and location on a disk, choosing Save the first time opens the Save As panel, where you can give the new file a name and pick the folder and disk where you want to save it.



The central portion of the Save As panel is a list view of Browser items. You can work in this list view in much the same way as you work in a folder or query window in list view in the Browser: You can select items, rename them, change how they're sorted in the list, and choose fields you want to view in the panel, and use the secondary mouse button to open context-sensitive menus (for more information on list views, see "Changing Views" on page 21).

To view the contents of a folder that contains the folder listed in the Save As panel, choose a folder name from the pop-up list in the upper-left corner of the Save As panel.

You can use the keyboard to navigate the controls in the Save As panel: Press Tab to select the list view or the name field as the target for what you type (a gray rectangle surrounds the area your typing will affect). When the list view is selected, you can select an item in the list by typing the first few characters in its name, use the arrow keys to select items, and open a selected folder by pressing Enter (the Save button changes to Open when a folder is selected). You can also open the folder that contains the current folder by pressing Command-up arrow (the Command key is either key labeled "Alt" on most PC keyboards; it's the key labeled  on Mac keyboards). To close the panel without saving anything, press Escape or Command-W (this is the same as clicking the Cancel button).

When you name a file, select the folder where you want to save it, and click Save, the file is stored safely on the disk you selected and the title of the file in its window's tab shows the name you gave the file.

You can also use the Save As command to save a copy of a file with your latest changes under a new name or in a different folder or disk. When you do, the original file remains unchanged on disk, and the new file with the new name is displayed in the window you were working in.

## Opening a File

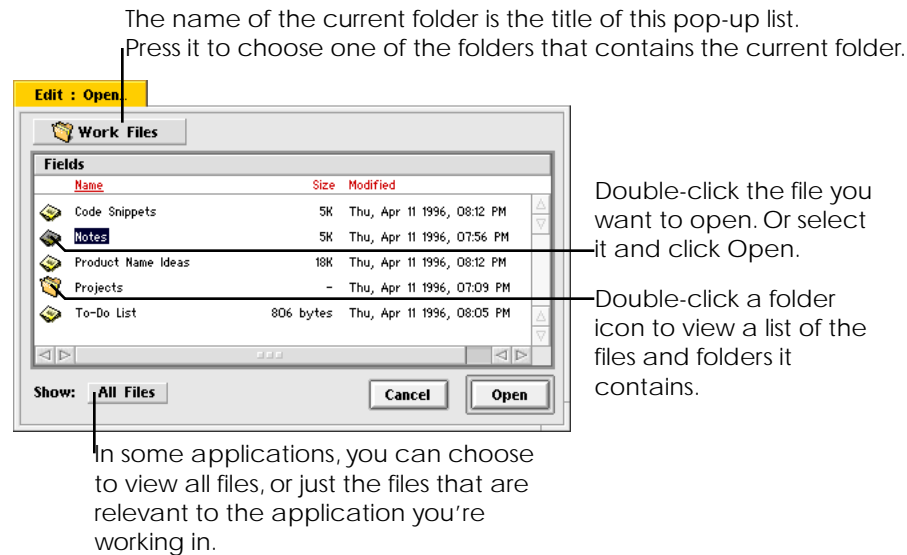
There are many ways to open files. The simplest is to double-click a file's icon. You can also select a file's icon in the Browser or the dock and choose Open from the File menu, or select the file and press Enter.

Most files have an application they're associated with, usually the application they were created in. When you double-click a file, it opens in this application. A file's icon usually resembles the icon of the application it's associated with, so you can usually tell what application a file will open in by looking at its icon. If a file doesn't have an application associated with it, you're asked if you want to use Edit to open the file when you double-click it.

You can drag a file onto an application icon to open the file in that application—even if the file isn't normally associated with that application. This is a good way to open a file in an application it normally isn't associated with: For example, you can use this technique to open a script file you want to read or edit in the Edit application—if you just double-click a script file, the script runs, instead of opening in a document window. (Of course, the application has to know how to open the file, so you can't, for example, drag an ImageViewer file onto the PlaySound icon.)

## Opening a File


If you're working in an application, you can open a file with the application's Open command. The Open command is in different menus in different applications, but it's most often in an application's main menu or File menu. When you choose Open, a panel opens where you can select the file you want to open.



The central portion of the Open panel is a list view of Browser items. You work in this list view in much the same way as you work in a folder or query window in list view in the Browser: You can select items, rename them, change how they're sorted in the list, choose fields you want to view in the panel, and use the secondary mouse button to open context-sensitive menus (for more information on list views, see "Changing Views" on page 21).

To view the contents of a folder that contains the folder listed in the Open panel, choose a folder name from the pop-up list in the upper-left corner.



You can use the keyboard to navigate the controls in the Open panel. You can select an item in the list by typing the first few characters in its name, use the arrow keys to select items, press Tab or Shift-Tab to select the next or previous item, and open a selected folder by pressing Enter. You can also open the folder that contains the current folder by pressing Command-up arrow (the Command key is either key labeled “Alt” on most PC keyboards; it’s the key labeled  on Mac keyboards). To close the panel without opening anything, press Escape or Command-w (this is the same as clicking the Cancel button).

When you double-click a file’s icon in the panel (or select the file and click Open), a window opens that displays the contents of the file.

## Printing

If you have a LaserJet IIp or compatible printer connected to the BeBox parallel port, you can print documents in Edit, messages in BeMail, and soon, other kinds of documents in other applications.

This first version of printing offered by the BeOS is simple and effective: Choose Print. In the panel that opens, type a scale for the pages if you want. Then click Print.

## Undoing

In many applications, you can undo your most recent action by choosing Undo from the Edit menu. For example, if you delete text in an Edit file accidentally, choose Undo to undelete it.

## Working with Text

You use the keyboard and mouse to create and edit text in a lot of locations in the BeOS: You edit file names, text files, settings in panels, and so on.

You edit text by selecting the place you want to type and then typing. You can also copy text from one place and move it to another, or delete text.

The location on screen where what you type (or text you move) will be entered is indicated in two ways. The first is by a blinking vertical bar, called the *insertion point*. The second is by highlighted text you want to replace.

### Selecting Text

There are a number of ways to select text.

<u>Do This</u>	<u>To</u>
Click	Select an insertion point
Double-click	Select a word
Triple-click	Select a paragraph
Drag across text	Select a character at a time
Double-click and drag	Select whole words at a time
Triple-click and drag	Select whole paragraphs at a time
Hold down the Shift key	Extend or reduce a range of selected text

In many applications, you can choose the Select All command to select all the text in a window or document; the Select All command is usually in an application's Edit menu.

## Typing Text

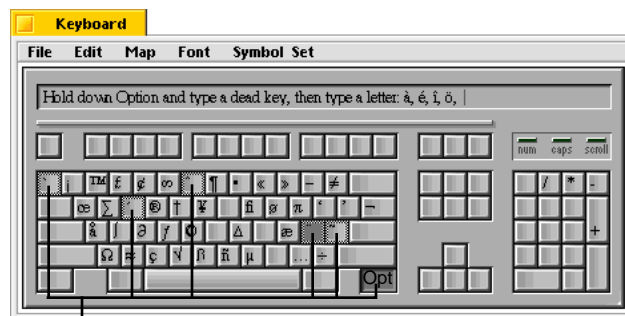
You type text in documents, when you name or rename files in the Browser or the Open and Save panels, and in many other places.

To type text, click to select an insertion point or select text you want to replace. Then type what you want. If you select text, what you type replaces the selection.

## Typing Special Characters

You type accented characters, symbols, and other special characters by holding down the Option key (the key labeled “Ctrl” on the right side of most PC keyboards; the key labeled “Option” on Macintosh keyboards) while you type one or more other keys. You type most accented characters by typing a *dead key* with the accent you want, followed by the letter you want accented. Dead keys are keys that when you press them, don’t place a character on the screen until you type another character. For example, to type *é*, you press Option-E and then you type *e*.

In the Keymap application, dead keys are indicated by a checked border. The keymap application is a good tool to use to find the accents and other special characters you want. For more information, see “Keymap” on page 114.



Hold down the Option key while you type a dead key; then type a letter.

## Copying and Moving Text

You can *copy* selected text and then *paste* (insert) it someplace else. Select the text you want to copy and choose Copy from a window's Edit menu. Then select an insertion point or text you want to replace and choose Paste from the Edit menu. You can paste text in the same document you copied it from or in any other application where you work with text, including the names of items in Browser windows and text fields in panels.

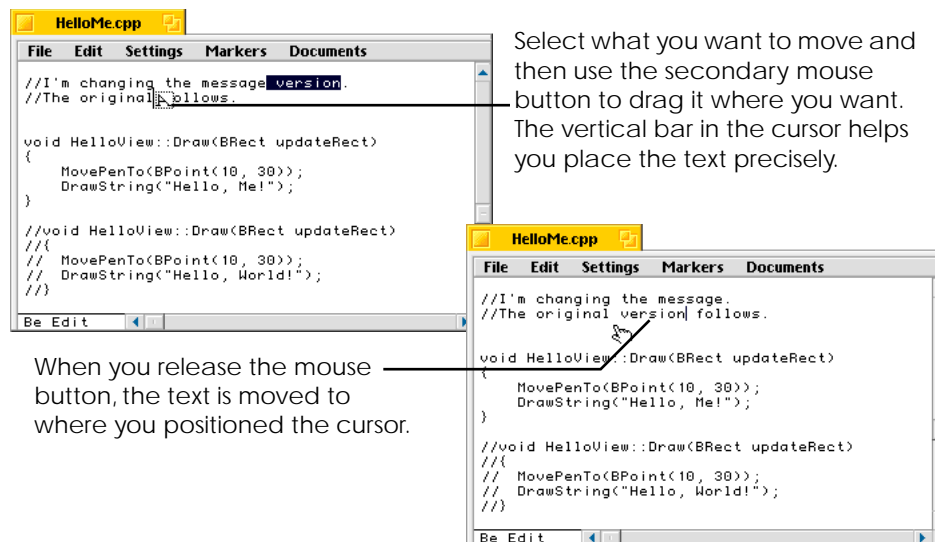
If you want to move text rather than copy it—that is, remove the text you select and paste it elsewhere—choose Cut from the Edit menu instead of Copy.

**Tip:** When copying or moving text, be mindful of the spaces before and after what you copy, and where you intend to paste it.

Text you cut or copy is stored in a special part of memory, called the *clipboard*. What you last cut or copied remains on the clipboard until you cut or copy something else, so you can keep pasting what you cut or copied repeatedly, without having to cut or copy the original again.

## Moving Text with the Mouse

You can use the secondary mouse button to move selected text by dragging it. When you start to drag selected text, the cursor changes shape to help you position the text exactly where you want it.



Initially, the right mouse button is the secondary mouse button on a three-button mouse, but you can change which button is the secondary mouse button with the Mouse preferences application. For details, see “Mouse” on page 117.

## **Deleting Text**

You can delete text in a number of ways. The simplest is to press the Delete key to erase the text to the left of the insertion point letter by letter. (Depending on the keyboard you're using, the Delete key may be labeled "Delete," "Backspace," or just have a left-pointing arrow. See "Using the Keyboard" on page 11 for more information on identifying keys on the keyboard.)

If you select text, you can delete all of it at once by pressing the Delete key. Many applications also have a Delete command in their windows' Edit menus. The Delete command acts on selected text just like pressing the Delete key.

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# 3 Using Be Applications

The BeOS comes with over two dozen applications you can use to create documents, to get or share information, and to demonstrate the potential of the BeOS. Most of the applications and demos that come with the BeOS are in the **/apps** folder. This chapter explains how to use each application in **/apps**, in alphabetical order.

The previous chapter, “Learning Be Application Basics,” tells you how to perform tasks that are common to many Be applications.

The BeOS also comes with a number of applications you can use to customize how the BeOS works. These applications are in the **/preferences** folder and are described in the next chapter.

## BeBounce



BeBounce demonstrates how applications can communicate with each other in the BeOS. When you start BeBounce, a window with a bouncing ball opens. If you start a second copy of BeBounce, its window has no ball, but you can move the windows near each other to open a path between them. The ball can bounce from window to window through this path. You can't run more than two copies of BeBounce.

For details on the code that makes BeBounce work, see the article “Opening the BeBox,” in the January 1996 issue of *MacTech* magazine. A copy of the article is available in the developers area of the Be Web site (<http://www.be.com>). Commented source code for BeBounce is included with the BeOS, in **/develop/projects/BeBounce**.

## BeLogo



When you start BeLogo, it opens a window with a 3D rendition of the Be logo, which rotates in three dimensions on a black background. The logo is a 3D model, which is mathematically rotated at 120 frames per second. BeLogo was designed to take advantage of all the CPU resources it can get, so while it's an interesting way to test the power of the BeOS, you may not want to leave it running when you're trying to get real work done.

BeLogo was written long before the creation of the Be 3D Kit, which is demonstrated in the Live3D application (as described in “Live3D” on page 92).

## BeMail



BeMail is a basic application for creating and reading Internet-style electronic mail—usually referred to as *e-mail*.

Before you can use BeMail to exchange e-mail with others, you need to use the Network and E-Mail preferences applications to configure the BeOS to communicate with an e-mail server. For more information, see “Network” on page 118, and “E-Mail” on page 111.

### Checking for Mail

You can tell if you have new mail in a couple of ways. The easiest is to observe the Mailbox icon in the dock: The icon changes from an empty mailbox to a mailbox with letters in it if you have unread mail:



Mailbox

You have no unread mail



Mailbox

You have unread mail



You can set E-Mail preferences to check for new mail on a regular schedule, as described in “E-Mail” on page 111. You can also check for mail (and send any mail you’ve created but haven’t sent yet) by clicking the Check Now button in the E-Mail preferences application or in the E-Mail Status window (if that window is open).

The E-Mail Status window tells you how many pieces of e-mail you’ve received since you last checked for mail. It also tells you how many pieces of mail you’ve received that you haven’t read.



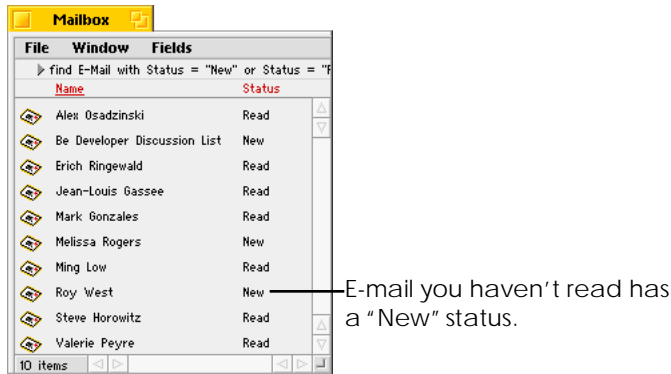
You’ve received 1 piece of e-mail since you last checked for new mail, and there are three pieces of e-mail you haven’t read yet.

In the BeOS, each piece of e-mail you create or receive is stored as an entity in the Be database—not as a file in the file system. To view a list of your mail, you use the Browser’s Find command to find “E-Mail” items in the database. Each time you use the Find command, the criteria you specify in the Find window is saved as a query in the Be database (for more information on the Find command and the Be database, see “Finding Items” on page 46).

The BeOS includes five premade e-mail queries. The Mailbox query is initially in the dock, but all five are listed in the query window that opens when you double-click the Queries icon, which is also in the dock. The five premade queries are:

- Mailbox, which lists e-mail sent to you, whether you’ve read it or not.
- In Box, which lists e-mail sent to you that you haven’t read yet.
- Read Mail, which lists e-mail sent to you that you’ve read.
- Out Box, which lists e-mail you’ve created but that hasn’t been sent to the e-mail server.
- Sent Mail, which lists e-mail you’ve created and that has been sent to the e-mail server.

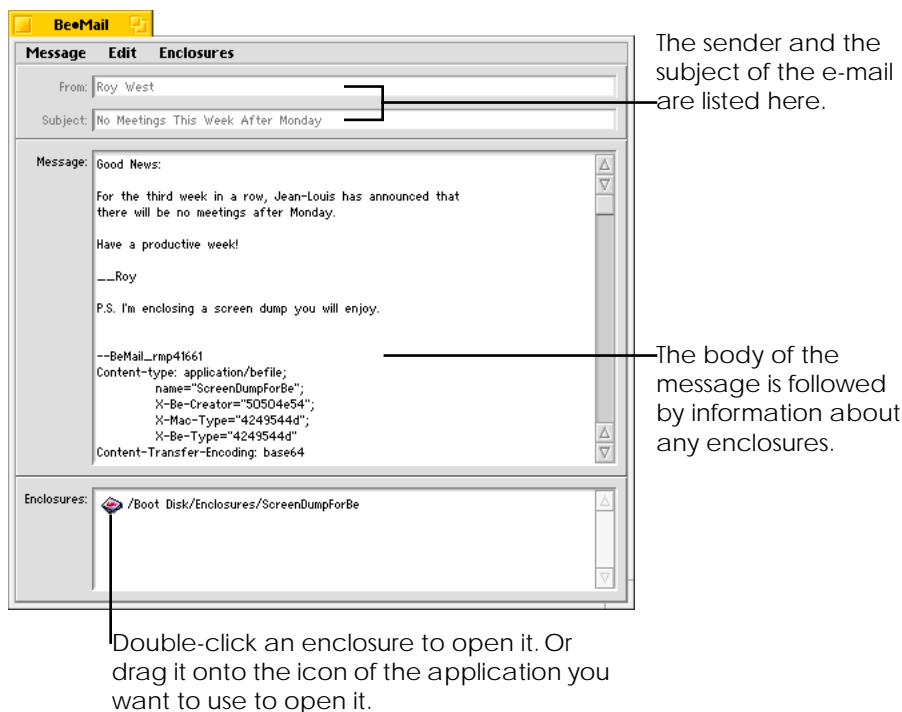
When you double-click the icon for an e-mail query, a query window opens with a list of e-mail in the database that matches that query. For example, when you double-click the Mailbox icon in the dock or in the Queries window, the Mailbox query window opens with a list of all the mail that's been sent to you.



Initially, query windows sort e-mail alphabetically by the name of the person who sent it or the person you sent it to, but you can use the Fields menu to add other fields to the window and then click the field name to sort mail differently. For example, to sort mail in the order it was sent, choose When from the Fields menu and then click the When field title in the window. (See "Working in List View" on page 23 for more information about sorting items in list view.)

## Reading E-Mail

To read a piece of e-mail, double-click it in an e-mail query window, such as the one that opens when you double-click the Mailbox icon in the dock.



The sender and subject of the e-mail message are listed at the top of the window, followed by the body of the message. If the sender enclosed one or more files with the message, they're listed at the bottom of the window. Unlike the body of a message, enclosures are stored as files in the Be file system, not in the Be database, so the path name of the enclosure is listed after its icon.

The BeMail application's main menu contains a Preferences submenu, which in turn contains Font and Size submenus you can use to change the face and size of the font used to display messages.

E-mail messages typically include a number of lines of information before the body of the message. These lines include detailed information about the sender, the addressees, and the route the message traveled. Initially, this information is hidden, but you can view it by choosing Show Header from the Message menu.

If you have a LaserJet IIP or compatible printer connected to the BeBox's parallel port, you can use the Print command to print the message.

When you're done reading a message, you can choose Delete from the File menu to remove it from the Be database. A panel asks you to confirm that you want to delete the message. (If you prefer not to have to confirm the Delete command, choose Expert from the User Level submenu in BeMail's main menu.) If you close the message window instead of deleting it, the message is kept in the Be database: It remains in the list of e-mail in the Mailbox query window, but its status changes from "New" to "Read."

### **Replying to and Forwarding Messages**

You can use the commands in the Message menu to reply to or forward the message in the window.

Choose Reply to Sender to open a new message window with the original sender's e-mail address entered in the To field, "Re:" followed by the original subject in the Subject field, and the body of the original message "quoted" in the message area of the window. Choose Reply to All to include the addresses of all the people the sender sent the original message to in the Cc field.

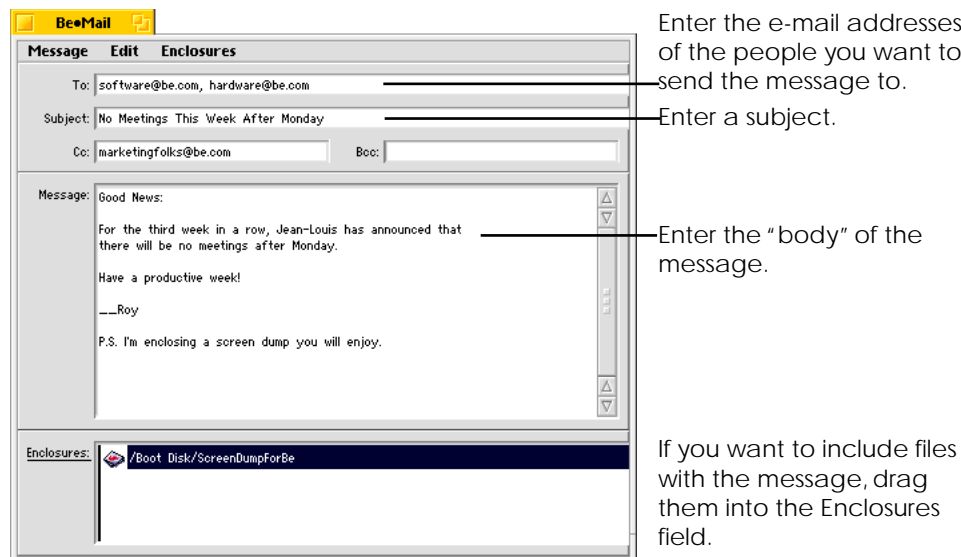
Choose Forward to open a new message window with the subject and quoted body of the message. You can then enter your own message and edit the addresses and subject as you would any other message you create. If you select text in the body of a message before you choose Reply or Forward, only the selected text is included in the new message. Enclosures are retained in messages you forward, but not in those you reply to. (Creating new e-mail messages is described in "Creating E-Mail" on page 67).

### **Saving a Message as a Text File**

If you want to save a message as a text file (so you can work with it in the Edit application, for example), choose Save as Text File from the File menu to open a standard Save As panel (see "Saving a File" on page 51 for more information on saving files).

## Creating E-Mail

You use the BeMail application to create and address new e-mail messages. Start the BeMail application to open a new message window, or if BeMail is already running, choose New Mail Message from BeMail's main menu.



You enter the e-mail addresses of the people you want to send the message to in the To field. If you want to send the message to more than one address, enter each address followed by a comma. Enter the e-mail addresses of people you want to send a copy of the message to in the Cc field. You can also enter the addresses of people you want to send "blind copies" of the message to in the Bcc field: Other recipients can't tell who you "blind cc'd" the message to.

**Tip:** If you've used the Browser's Create Person command to add people and their e-mail addresses to the Be database, you can double-click the People icon in the dock and drag an icon for a person from the People query window into the To field to enter that person's e-mail address. Or drag an icon from the People window onto the BeMail icon to open a new message window with the person's e-mail address entered automatically.

A common convention when "quoting" parts of other people's messages in your own is to start each line with the greater-than symbol (>). You can select text in the message area and choose Quote from the Edit menu to add a greater-than symbol to the beginning of each selected line. You can also remove the greater-than symbols from

selected text by choosing Remove Quote. When you forward or reply to a message, the text of the message is quoted in this way.

The BeMail application's main menu contains a Preferences submenu, which in turn contains Font and Size submenus you can use to change the face and size of the font used to display messages.

You can include one or more files with your messages as enclosures. Drag any file you want to include into the Enclosures area of the message window. You can also use the Add command in the Enclosures menu to open a panel where you can select a file you want to enclose. If you change your mind, select a file in the list of enclosures and choose Remove from the Enclosures menu. (In DR8.2, the Info command in the Enclosures menu isn't implemented.)

If you created a signature, you can paste it into the message by choosing the signature from the Add Signature submenu in the Edit menu. (To learn more about signatures, see the next section, "Creating a Signature.")

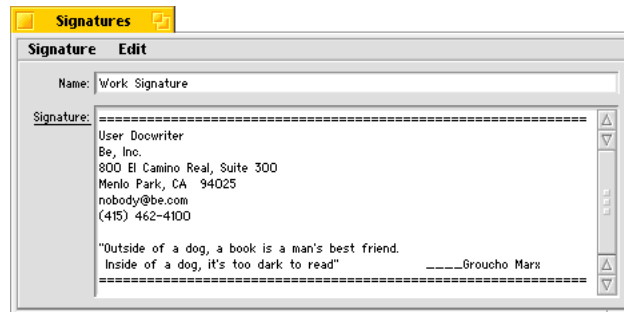
When you're done creating an e-mail message, you can choose Send Now from the Message menu to send the message immediately. Or choose Send Later to store the message in the Be database until the next time the Be software checks for new mail (you set the schedule for when mail is checked with the E-Mail preferences, as described in "E-Mail" on page 111).

### **Creating a Signature**

Signatures are lines of text, typically with your name and information on how to reach you, that you add to many of the messages you send. You can create and save as many signatures as you like; for example, you might have one signature for mail you send as part of your job outside your company, one for inside your company, and one for personal mail.

To create a signature, open the Signatures window by choosing Signatures from the Preferences submenu, which is in BeMail's main menu. In the Signatures window, type

a name for the signature in the Name field and the text of the signature in the Signature field.



When you're done, choose Save from the Signature menu. The signature you created and named is added to the Add Signature submenu, which is in the Edit menu in the windows for messages you create.

## CDPlayer



If you have a CD-ROM drive, you can use the CDPlayer application to play music and other audio CDs through the internal speaker and line-out ports. You can also use CDPlayer to copy audio data from an audio CD to a file on a disk.

**Note:** CDPlayer works best with Toshiba model 3401, 3601, and 3701 CD-ROM drives. Some of its features—such as fast forward, fast reverse, and saving audio data—may not be available if you're working with a drive from another manufacturer.

### Playing CDs

When you start CDPlayer, it opens a window with controls very like those on a home CD deck. If you have a CD deck, you'll recognize the Stop, Play, Back Track, Forward Track, Fast Reverse, Fast Forward (or "scan"), Eject, and other buttons.

If you have more than one CD-ROM drive, choose the one with the CD you want to play from the Devices submenu in CDPlayer's main menu. You can also open a CDPlayer window for each CD-ROM drive: Choose each CD-ROM drive you want to open a

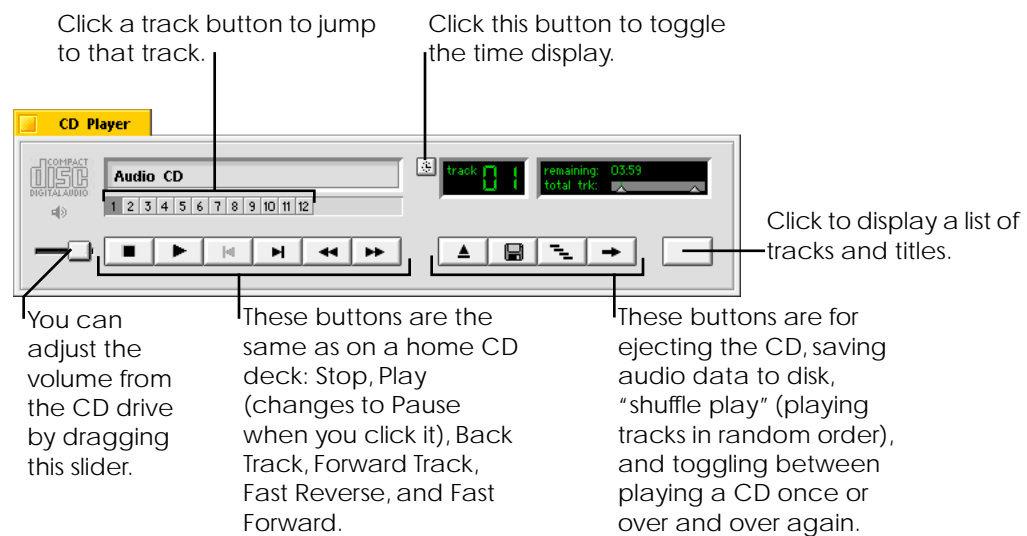
## CDPlayer

window for from the New Player submenu in CDPlayer's main menu. CD-ROM drives are listed in these two menus by their SCSI IDs.

You can double-click the CDPlayer icon to start as many copies of CDPlayer as you want, so if you have more than one CD-ROM drive, you can listen to more than one CD at a time.

The Fast Forward and Fast Reverse buttons scan the disk at double speed; you can hear what you're scanning. Holding down the secondary mouse button when you click Fast Forward or Reverse scans the disk at quadruple speed.

The volume slider adjusts the output of the CD-ROM drive. You use the Sound preferences application to control the input and output volumes for the computer's headphones, line-out, and other ports, as described in "Sound" on page 129.

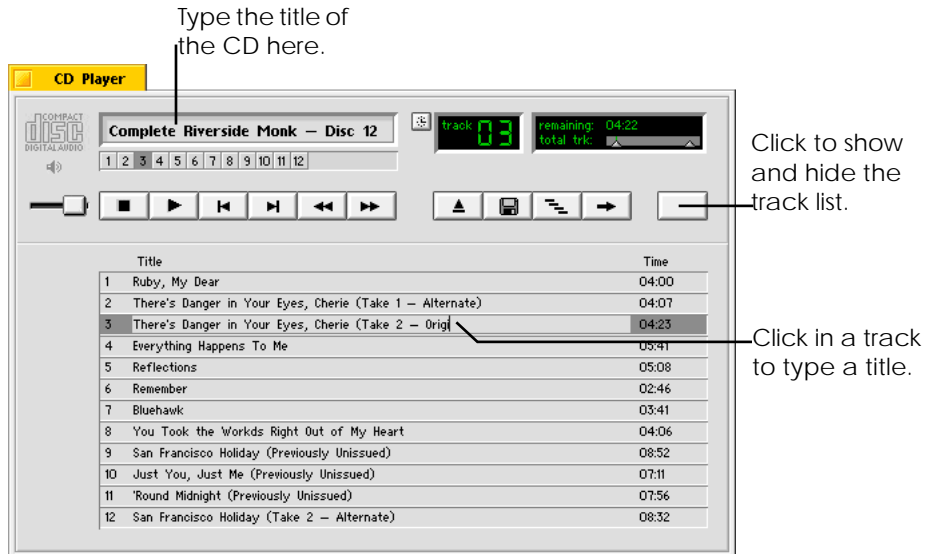


**Note:** In the current version of the BeOS, the shuffle button isn't hooked up.

If you click the rightmost button in the CD Player window, a lower part of the window opens with a list of the tracks on the CD. You can replace "Track 1," "Track 2," and so on with a description of each track—perhaps the title of each track from the play list. Click in the Title column and type the description you want. You can also replace "Audio CD" at the top of the window with the title of the CD. The information you type

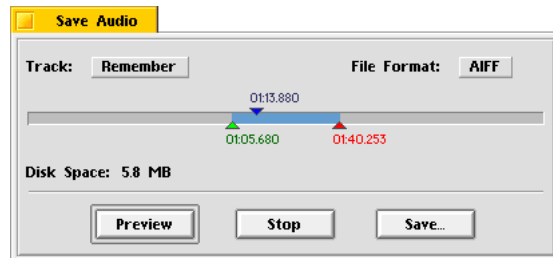


is stored in the Be database as “AudioCDs” data; the next time you use CDPlayer to play that CD, it recognizes the CD and includes the information you typed. You can also use the Browser’s Find command to search for AudioCDs data, such as a track or CD title you typed in a CD Player window (for more information on the Find command, see “Finding Items” on page 46).



### Saving Audio Data

One button you won't recognize from a CD deck is the Disk button. When you click the Disk button, the Save Audio window opens, where you can save some or all of a CD track to a file on a Be disk. Choose the audio format you want from the pop-up list: "Raw" and Audio Interchange File Format (AIFF) are supported now; Waveform Audio File Format (WAVE) files will be supported in the near future.



Drag the green start marker and the red end marker to the starting and ending points in the track you want to save. The blue marker shows the current place in the track when you're playing it. The numbers next to the markers indicate the hours, minutes, and seconds from the beginning of the track. When the markers surround the section of the track you want to save, click the Save button to open a Save panel, where you name the audio file and select the folder where you want to save it (for more information on the Save panel, see "Saving a File" on page 51).

You can play the tracks you save with the PlayAudio application (in **/apps**). Simply drag the track you want to listen to onto the PlayAudio icon.

## Clock



Clock

The Clock application is as simple as its name: When you start it up, it displays an analog clock. Clock has a number of faces. Click in the clock face to switch among them. If you prefer not to see a second hand, click in the face with the secondary mouse button—click again to restore the second hand. You can also uncheck the Show Seconds command in the main menu to hide the second hand.



Click to switch face styles. Click with the secondary mouse button to hide or show the second hand.

You set the date and time with the Time preferences application, as described in “Time” on page 130.

## Connect



Connect

You use the Connect application to communicate with computers and other kinds of devices. You can use Connect to connect to a device directly, via a cable that connects the your computer directly to the device, or via a modem.

When you start Connect, a blank window opens, and there is no connection established (if you type in the window, `parrot`, one of the command-line tools Connect uses, reminds you that no connection is established).

### Setting Communications Parameters and Other Preferences

Before you establish a connection, you need to set the baud rate (the speed at which you'll exchange information), parity, and other communications parameters using the Settings menu. You can also use the Settings menu to change the colors in the window, the window size, and other preferences. Choose Save as Defaults to use these settings each time you start Connect.

## Connect

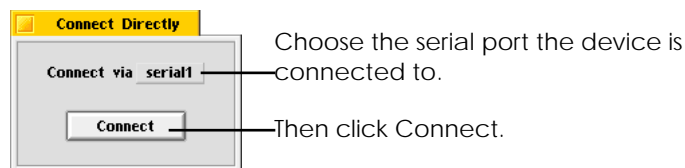
**Note:** On the BeBox, serial ports 1 and 2 are reliable up to 155,200 baud, and serial ports 3 and 4 are reliable up to 38,400 baud.

If you connect to a number of different kinds of devices that require different settings, or if you prefer to use different color schemes as a reminder of which device you're connected to in which Connect window, you can choose Save as Settings File from the Settings menu to save the current settings in a **Connect Settings** file. Whenever you want to connect to a device using those settings, you can double-click the settings file to open a Connect window with those settings in effect.

### Connecting Directly to a Device

If you connect to another device by attaching a cable (typically a null modem cable) to one of your computer's serial ports and to a serial port on the other device, you can use Connect to exchange messages between the two devices.

When the cable is connected and you've set the communications parameters, choose Connect Directly from the Connections menu.



When you click Connect in the Connect Directly panel, what you type in the Connect window is sent out the serial port you chose. Any messages the other device sends across the cable also appear in the window.

## Connecting to a Device via a Modem

If you have a modem connected to one of your computer's serial ports, you can use Connect to dial the modem and establish a connection with another device that's connected to a modem.

When the modem cable is connected and you've set the communications parameters, choose Connect via Modem from the Connections menu.

The screenshot shows a dialog box titled "Connect via Modem". It contains the following fields and values:

- Phone Number: 9 1 415 555 1234
- User Name: me
- Password: mypassword
- Dialing Shell Script: /boot/system/connect/dial-o-rama
- Modem Init. String: ATE100X4

At the bottom of the dialog, there is a label "Modem is connected to serial2", a "Defaults" button, and a "Connect" button.

Enter the phone number for the other device's modem in the Phone Number field. Don't forget to enter a **9** or other number if you normally need to dial a number to get an outside line. Also be sure to enter **1** and the area code if you're dialing long distance.

If you need to log in to the device you're connecting to, enter your user name and password.

Connect uses the `/system/connect/dial-o-rama` script with the `/bin/ali` utility to establish a connection with devices via modem. If you want to use another script, enter its path name in the Dialing Shell Script field.

Different modems require different commands to establish connections with other modems. The Modem Init. String initially contains a general-purpose set of modem commands. You can replace this string with another if you wish (see the modem's owner's guide for information on the commands it uses).

Choose the serial port the modem is connected to from the pop-up list at the bottom of the window.

When you've entered the appropriate information in the Connect via Modem window, click Connect to dial the modem and establish the connection. When the modems establish the connection, what you type in the Connect window is sent to the other device. Any messages the other device sends also appear in the window.

## Disconnecting

When you're done communicating through a serial port with Connect, choose Disconnect from the Connections menu. The connection is severed, and you can establish a new connection through the serial port with Connect or with another application.

## Dominos



Dominos is an application that demonstrates the BeOS Game Kit. When you start Dominos, it takes over the screen of the current workspace with a 3200-pixel by 3200-pixel game board. Dominos then plays the game of Dominos with itself, adding tiles until the board is filled. The red numbers on the lower right of the screen show you how many dominos have been played.

When Dominos can't find any new locations for tiles, the game ends. You can then use the arrow keys on the numeric keypad to move around the board and view the results. In a typical game, Dominos plays about 2600 tiles in six or seven minutes.

You can switch workspaces to leave Dominos to amuse itself while you get back to work (for more information about working with multiple workspaces, see "Workspaces" on page 106). To quit Dominos, press Command-Q.

Complete, commented source code for Dominos is in the **`/develop/projects/Dominos`** folder.

## Edit



Edit is a Be text editor. You can use it to read, create, and edit text (ASCII) and script files.

Edit is not a word processor: It doesn't wrap long lines to fit in a window, you can't change font and paragraph settings for individual words or paragraphs, or do most of the other things you may be used to doing in a word-processing application. But Edit is great for editing programs and shell scripts.

You type text, copy and paste, and type symbols and other special characters just as you do anywhere you work with text in the BeOS. For details, see "Working with Text" on page 56.

If you have more than one Edit file open at once, you can switch from one to another by clicking in the window of the file you want to work in. You can also choose the name of the open file you want to work in from any Edit window's Document menu.

### Changing the Font

You can display an Edit file using any font. Choose the font, style, and size you want from the Font menu.

**Note:** Changing the font in an Edit file isn't the same as setting a font in a word processor—the font you choose is used for all the characters in the file.

For information on adding additional fonts to the BeOS, see "Adding Fonts" on page 131.

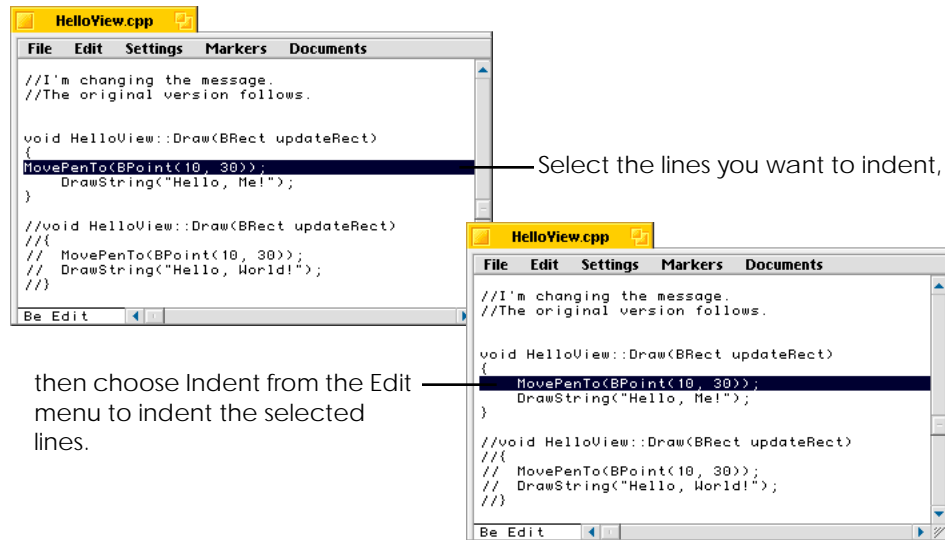
### Automatically Indenting Lines

When you're writing code, it's often convenient to have lines that follow an indented line be indented automatically when you press Enter. Initially, Edit files are set to act this way. To end a series of automatically indented lines, press the Delete key at the beginning of the first line you don't want indented.

You can turn off this behavior by choosing Auto Indent from the Settings menu (this unchecks Auto Indent in the menu).

## Indenting and Unindenting Lines

You can indent selected lines by choosing Indent from the Edit menu.



Unindent selected lines by choosing Unindent from the Edit menu.

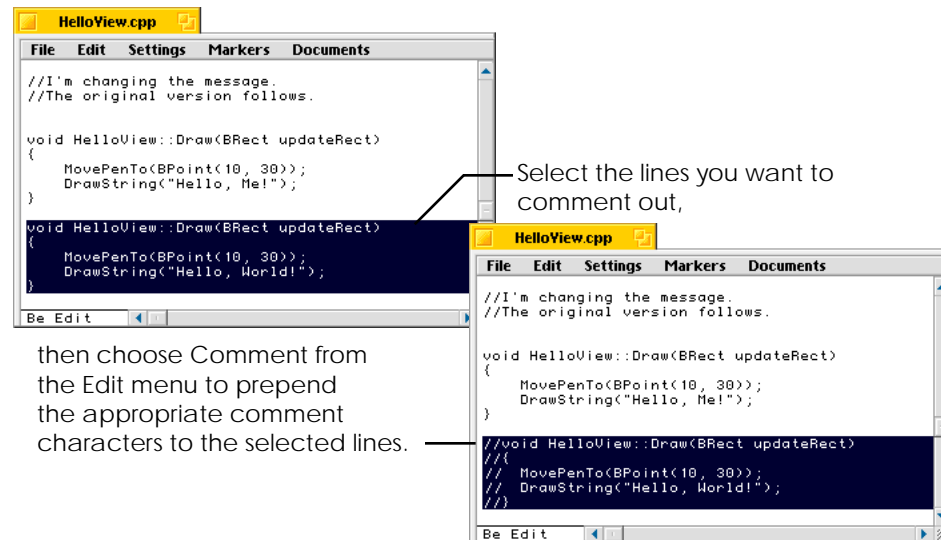
## Changing the Width of Tabs and Indents

Initially, when you press Tab or indent lines with the Indent command, each Tab character or indent moves lines four characters to the right. You can choose to indent eight characters instead of four by choosing “Tab Size of 8” from the Tab Setting submenu in the Settings menu. Or you can set the width you want by choosing Tab Size Other, entering a number for the width you want, and clicking OK. When you change the tab setting, all indented lines move to match the new setting.



## Commenting and Uncommenting Lines

You can select lines in the programs you write and “comment them out,” that is, add the appropriate character or characters to the beginning of lines that you don’t want to get compiled, but rather to serve as comments.



The characters prepended to lines when you choose Comment depend on the kind of file you’re editing, which Edit determines by the file’s *extension*: the period and following characters at the end of the file’s name.

<u>File Extension</u>	<u>Comment Characters</u>
<b>.c, .h, or .cpp</b>	<b>//</b>
<b>.a</b>	<b>;</b>
All others	#

You can remove the comment characters from the beginnings of selected lines by choosing Uncomment from the Edit menu.

## Finding Text

You can find a string of characters in an Edit file.

- 1 Choose Find from the Edit menu.
- 2 Type the string of characters you want to find.



- 3 Check any Find options.

Check Search Backwards to search for the characters in the part of the file that is before the insertion point (in lines with lower line numbers) rather than after the insertion point.

Check Wrap-Around Search to keep searching for the characters from the beginning of the file, after the search reaches the end of the file (this works the other direction if you have Search Backwards checked).

Check Case-Sensitive to search for characters that match the capitalization of what you typed in the Find panel. Otherwise, searching for *Cornichon* finds both *Cornichon* and *cornichon*.

- 4 Click Find.

The first occurrence (after the insertion point) of the characters you're searching for is selected in the window. If the characters aren't found, the insertion point doesn't move.

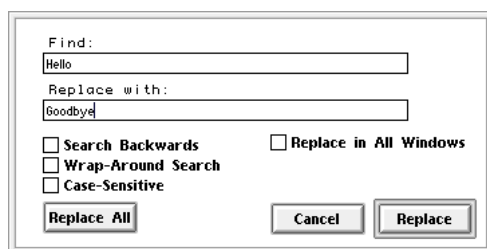
You can choose Find Again from the Edit menu to search for the next occurrence of the characters.

As a shortcut to using the Find command, you can select the characters you want to search for and choose Find Selection to find the next occurrence of those characters in the file.

## Replacing Text

You use the Replace command to automate replacing one string of characters with another string.

- 1 Choose Replace from the Edit menu.
- 2 In the Replace panel, type the string of characters you want to replace and the string of characters you want to replace them with.



- 3 Check any Replace options.

The Search Backwards, Wrap-Around Search, and Case-Sensitive options work the same as in the Find panel.

Check Replace in All Windows if you want to replace the string in all open Edit documents when you click Replace All.

- 4 Click Replace to replace the next occurrence of the string. Or click Replace All to replace all occurrences of the string at once.

You can repeat the last replacement by choosing Replace Same from the Edit menu.

## Showing Line Numbers

You can display a column that shows the number of each line in an Edit file by choosing Show Line Numbers from the window's Settings menu. Choose Show Line Numbers again to hide the line numbers.

### Going to a Specific Line by Line Number

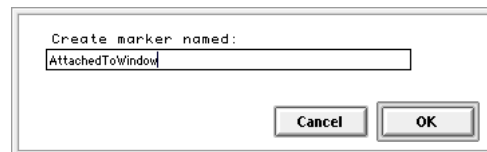
You can move the insertion point to the beginning of any line in an Edit file. Choose Go To Line from the Edit menu, and in the panel that opens, type the line number you want to go to and click OK.

### Creating and Using Markers

You can create and name markers in your Edit files that make it easy to jump directly to whatever locations in the file you want.

- 1 Select an insertion point where you want to create the marker. Or select text to use it as the marker name.
- 2 Choose Create Marker from the Markers menu.
- 3 Type a name for the marker.

If you had text selected when you chose Create Marker, that text is inserted in the Create Marker panel. You can keep that text as the name of the marker or edit it.



- 4 Click OK.

The marker (which is invisible) is inserted at the insertion point or beginning of the text selection, and the name of the marker is added to the Markers menu.

Once you've created a marker, you can go directly to its location by choosing the name of the marker from the Markers menu.

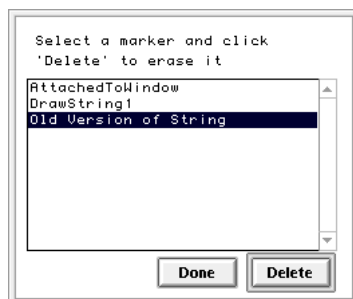
You can choose Alphabetize Markers from the Markers menu to list the names of markers alphabetically, rather than by their order in the file.

## Deleting Markers

You can delete one or more markers when you're done with them.

- 1 Choose Delete Marker from the Markers menu.

A panel opens with a list of the markers in the file.



- 2 Click a marker and click Delete.

The name of the marker is removed from the list in the panel, and the marker is removed from the file.

- 3 Delete more markers if you want. Then click Done.

## Creating a Script File

Script files are text files that take advantage of the Be shell, **bash**. You can write a script file in Edit and then save it as a script file by choosing the Convert to Script File command from Edit's File menu.

You run a script file by double-clicking it.

To edit an existing script file, drag its icon onto the Edit application (you can't double-click it to open it, because double-clicking it runs the script).

For more information about the Be shell, see "Terminal" on page 104.

## Flight



Flight is a simple flying and shooting game. When playing Flight, you fly across a barren landscape and shoot down unarmed helicopters (for 1 point) and other players (for 10 points), while trying to avoid crashing (losing 5 points), shooting down a teammate (granting the other team 10 points), or getting shot down yourself. Flight works best if you set the screen resolution to 800 × 600 or higher (see “Screen” on page 125). At lower resolutions, you can’t see all of Flight’s windows without overlapping. You can play Flight alone, with two players on the same computer, or as a network game with up to eight players.

### Preparing for Battle

When you start Flight, a darkened window opens: Dawn doesn’t break until you start a game.

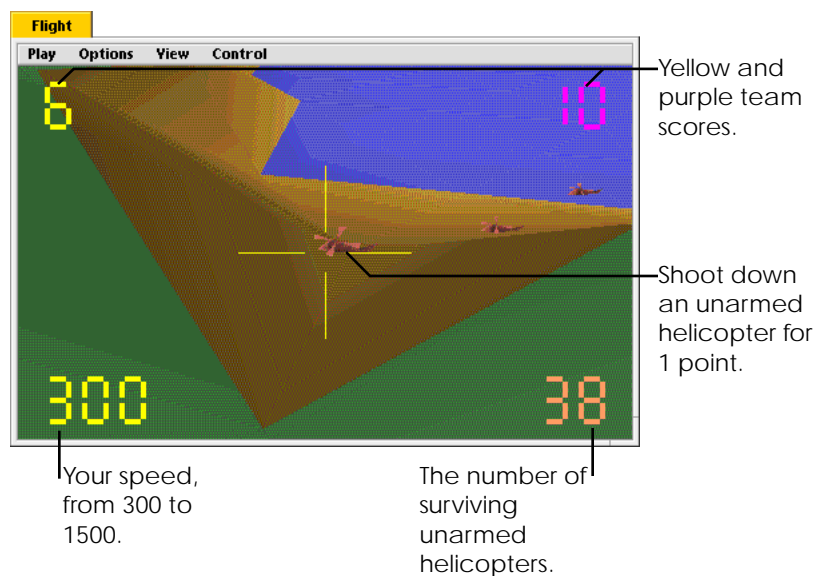
To set up a solo player (or a single entrant in a network game), choose the item from the Control menu that matches whether you’ll control your flight using the keyboard or a joystick. Then ally yourself with the yellow or purple team by choosing the appropriate item from the Options menu.

To set up two players, choose Second Player from the Play menu and then set the control and team alliance for each player using the Control and Options menus in each window.

## Engaging Battle

To start a game, choose Play Game from the first player's Play menu (only the first player can start and stop the game). To host a network game, choose Play NetGame. To join a network game hosted by another computer, choose Join NetGame.

When the game begins, Flight's main window provides a cockpit view of a plane flying through a landscape populated by unarmed helicopters. The crosshairs in the center of the window are for aiming your shooter.



If you're using a joystick, see the instructions that came with it to learn how to steer, change speed, and shoot.

If you're using the keyboard, use the arrows in the numeric keypad to steer, but think of a joystick as you use the up and down arrows: The up arrow points your nose down. Use the left and right arrow keys to the left of the numeric keypad to increase and decrease your speed. Shoot by pressing the right up arrow key that's to the left of the numeric keypad.

Each player can choose Map from the View menu to open a window that shows his position in the landscape. Yellow and purple team players are represented by crosshairs.

## FontChart

Unarmed helicopters are represented by black dots. The other commands in the View menu control how wide a view is displayed in the window.

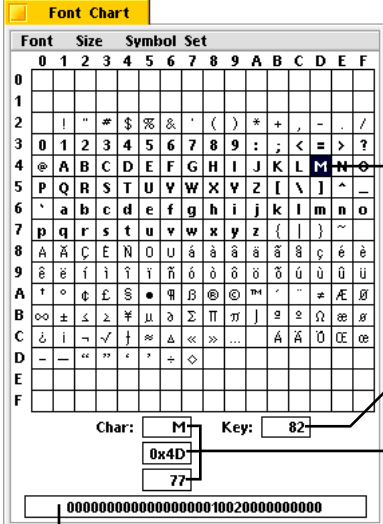
If you find it hard to fly, you can choose Crash on Ground from the Options menu at any time: When it's unchecked, you plow along the surface instead of crashing.

A game of Flight can't be said to have a real conclusion: Each player has an unlimited supply of ammunition and is reincarnated endlessly. However, the landscape does seem bleaker when the last unarmed helicopter is gone.

## FontChart



FontChart opens a window with a chart of the characters in a font.



Click or type a character.

The Key field shows the raw keyboard key number in decimal.

These fields display the character you type (or click in the chart) in the current font, plus the character's code in hexadecimal and decimal.

The bit field shows raw binary data from the keyboard as you press and release keys.

You can use the secondary mouse button to drag a character or the text from any of the fields in FontChart to another application. For example, you can drag a character from



the FontChart window onto a keycap in the Keyboard application or into an Edit document.

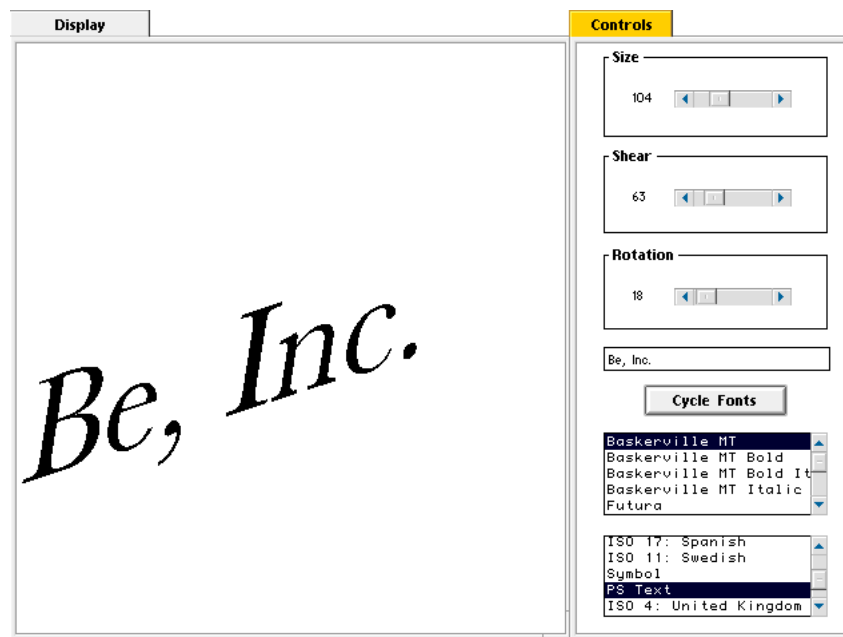
At the bottom of the window, the bit field shows the raw keyboard key number, in binary form, as you press and release keys singly or in combination. This information is useful for game developers and others who rely on raw keyboard data.

The BeOS uses the same symbol set as the Macintosh operating system. For more information on symbol sets, see “Keymap” on page 114.

## FontDemo



FontDemo shows off the BeOS’s speed and versatility with fonts. When you start up FontDemo, two windows open: A window that displays some sample text and a Controls window.



Use the Size scroll bar to change the size of the font in the Display window. Use the Shear scroll bar to shear (or slant) the text. Use the Rotation scroll bar to rotate the text.

Type the text you want to display in the field above the Cycle Fonts button.

Select the font you want to use for the text in the Display window in the upper scrolling list. Select a symbol set from the lower scrolling list.

Click Cycle Fonts to have FontDemo select the available fonts in order. You can use the other controls while FontDemo cycles through the fonts.

For information on adding fonts to the BeOS, see “Adding Fonts” on page 131.

## IconWorld



IconWorld is an application for editing the icons of applications and their associated files. You also use it to assign application resources. Using IconWorld is explained in “Creating Resources for a Be Application” on page 147.

## ImageViewer



You can use ImageViewer to open and view two kinds of image files: Color Tagged Image File Format (TIFF) files and files in the image file format used by the BeOS. The custom Be image file format is the file format of “screen dumps,” the images of the screen you can create by pressing the Print Screen key (F13 on some keyboards).

ImageViewer is also useful for converting image files to a format that’s compatible with Adobe Photoshop on a Macintosh and for showing off the Be drag-and-drop metaphor.

For information about creating screen dumps and ImageViewer’s role in the process, see Appendix A, “Creating Screen Dumps.”

To show off the Be drag-and-drop metaphor, open an image file (a screen dump or one of the files in the **/optional/images** folder on the *BeOS* CD-ROM) and select an area you like by dragging across it. Then drag the selected area to a Browser window: A new image file is created, called **clip**. You can double-click the new file to see that it contains just the area you selected.

## Installer



Installer

The Installer application has two purposes: Preparing disks so you can use them with the BeOS and installing the BeOS. Installing the BeOS is described in *Installing the BeOS*.

### Initializing or Formatting a Disk

You can use the Installer to prepare IDE, SCSI, and floppy disks for use with the BeOS by initializing them or—if necessary—by formatting them.

**Note:** The current release of the BeOS supports only high-density floppy disks. (These are usually labeled “HD”.)

Initializing a disk prepares it to work with the Be file system. You must initialize a disk before you can mount it the first time and store Be files on it. It takes only a few seconds to initialize most disks.

You may need to format a disk if it has never been set up to work with a computer or if it has been damaged. Most disks come preformatted, so it’s rare that you’ll ever need to format one. It can take a very long time to format a disk: The better part of an hour for large disks. After the Installer formats a disk, it also initializes it.

If you’re not sure whether you need to format a disk, try initializing it first. The Installer inspects the disk and lets you know if you need to format it.

**Caution:** Both initializing and formatting a disk erase everything on the disk (in fact, initializing a disk is a good way to erase it quickly), so make sure you’ve backed up any files you want to keep before you initialize or format a disk.

Installer

- 1 If you're initializing or formatting a SCSI or IDE disk, make sure it's connected to your computer.

Depending on the number of disks you connect to your computer and how they're connected, you may need to configure each IDE disk as a "single," "master," or "slave" disk or configure each SCSI disk with a unique SCSI ID and terminate it correctly. For more information, see your computer's owner's guide and the owner's guides that came with the disks. Uninitialized disks don't appear in the Browser.

- 2 Double-click the Installer application.
- 3 Choose Initialize or Format from the left pop-up menu. Then choose the disk you want to initialize or format from the right pop-up menu.



Choose Initialize (or Format). Then choose the disk you want to initialize (or format) and click Begin.

If a disk was previously initialized for the BeOS, it appears by name in the right pop-up menu. If a disk hasn't been initialized, it appears in the pop-up menu by its device name:

<u>Device Name</u>	<u>Description</u>
ide - master	The single IDE disk connected to a BeBox, or the master IDE disk if there are two connected
ide - slave	The slave IDE disk, if there are two IDE disks connected to the BeBox
scsi - id <i>n</i>	The SCSI drive set to SCSI ID number <i>n</i> ( <i>n</i> can be from 0 through 6)
floppy disk	The disk in the floppy disk drive

- 4 Click Begin. Then click Initialize (or Format) in the panel that warns you that initializing (or formatting) the disk will erase it.

When the disk is initialized, a message informs you that it's now available in the BeBox window. Floppy disks are named "fd" when you format them. Other disks are named "NewDisk."

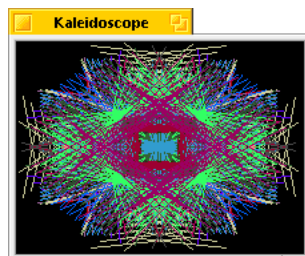
You can now initialize another disk, install the BeOS, or quit the Installer.

## Kaleidoscope



Kaleidoscope

Kaleidoscope is a simple line-drawing application: It opens a window where it draws patterns of colored lines as fast as it can. It's interesting to see the effect of multiple Kaleidoscope windows on the BeOS's performance.



## Live3D



Live3D is an application that offers three demonstrations of the 3D Kit.

When you start Live3D, a window opens with an image of a spinning spacecraft. This image is a 3D Kit model, which is being rendered in real time, with light sources that move as well. Choose Stellar Pulse or Be Logo II from Live3D's main menu to open a window with one of the other 3D Kit demonstrations.

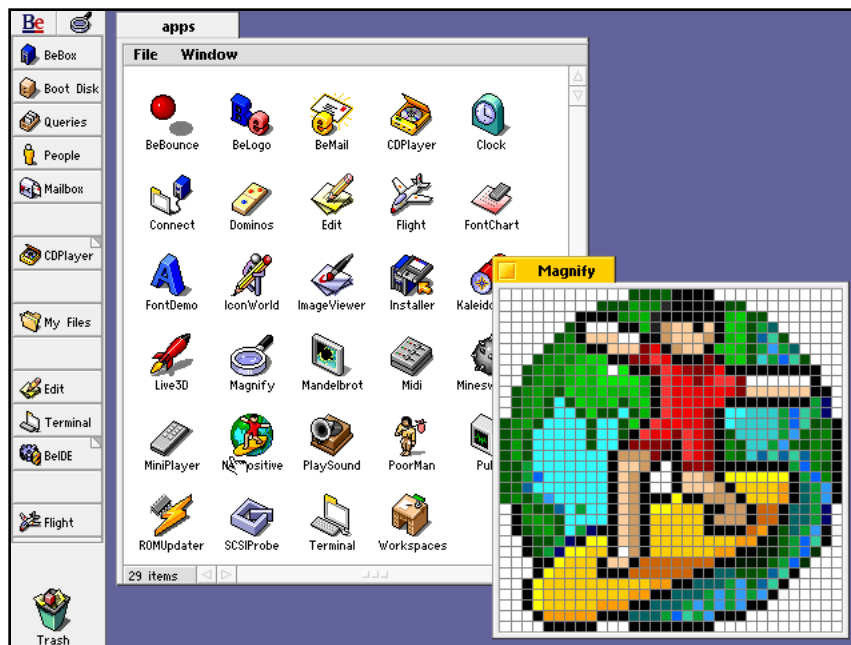
You can drag an object in a Live3D window by any point to rotate it in three dimensions. Use the keyboard arrow keys to move the "camera": The left and right arrow keys between the main part of the keyboard and the numeric keypad move the camera forward and back; the four arrow keys on the numeric keypad (on the 2, 4, 6, and 8 keys) move the camera up and down and left and right. The models continue to be rendered in real time as you drag an object or move the camera. To stop the automated movement of the models and the light sources, check Pause in the main menu.

Complete, commented source code for Live3D and its three demos are in the **/develop/projects/Live3D** folder. For a detailed discussion of the 3D Kit, see the white paper, "Welcome to the 3D World," on the Be Web site: <http://www.be.com/developers/3DWhitePaper.html>.

## Magnify



The Magnify application displays a greatly enlarged image of the area of the screen next to the cursor. This is useful for inspecting the pixel-by-pixel details of icons and other objects on the screen.



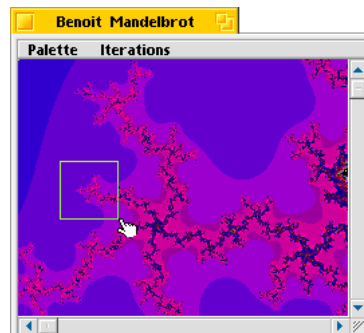
When you double-click Magnify, it opens a window that displays an area 32 pixels high by 32 pixels wide. If you want a different-sized window, start Magnify by typing Magnify's path name in a Terminal window, followed by a space and the number of pixels per side you want for Magnify's window. For example, type `/apps/Magnify 100` in a Terminal window to open a 100-pixel by 100-pixel window. The number you type must be a multiple of four.

Initially, Magnify uses a grid pattern to separate the pixels in its window. You can choose Show Grid from Magnify's main menu to hide the grid.

## Mandelbrot



The Mandelbrot application demonstrates the power of the BeOS by drawing images based on the “Mandelbrot set,” a set of mathematical formulas invented by Benoît Mandelbrot, the Polish mathematician. If you’re running Mandelbrot on a computer with two PowerPC processors, Mandelbrot uses one CPU to compute the odd lines in the image and the other to compute the even lines.



It’s interesting to zoom in on areas of the image in the window. Drag across an area you like to recalculate the image so the area you dragged across fills the window. You can do this indefinitely. To zoom out, hold down the Shift key and click in the window.

You can choose a color palette from the Palette menu. You can choose the level of iteration you want from the Iterations menu. The higher the number you pick, the more precise—and time-consuming—are the calculations used to draw the image. Higher numbers are more important as you zoom further into an area of the image.



## Midi



Midi is an application for playing Musical Instrument Digital Interface (MIDI) files on a MIDI synthesizer. (If you don't have a MIDI synthesizer connected to the MIDI-1 Out port on the BeBox, MIDI will play MIDI files, but you won't be able to hear them.) You open a MIDI file by dragging it onto the Midi application icon, which opens the MIDI window.

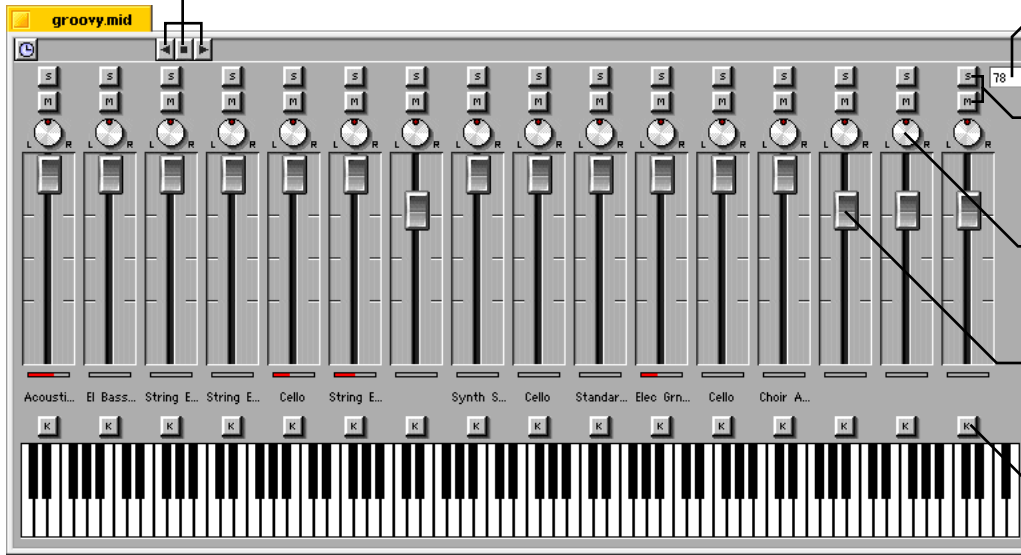
A number of MIDI files are included in the **/optional/midi** folder on the *BeOS* CD-ROM.

The full MIDI window is visible only if you're using a screen grid that's 800 pixels wide by 600 pixels tall. You set the screen grid with the Screen preferences application, as described in "Screen" on page 125.

**Note:** When you first copy a MIDI file onto a BeOS disk, the file doesn't have a MIDI file icon and isn't associated with the Midi application until the first time you drag the file onto the Midi application icon.

## Midi

Click the left arrow to return to the beginning of the MIDI file; drag the square to where you want to start playing; click the right arrow to start playing the file.



Type a different tempo here.

Click S to play a track solo; Click M to mute the track.

Drag the red dot to pan from left to right.

Drag to adjust a track's volume.

Click K to see the track play on the keyboard.

Each track in the MIDI file is represented by a vertical set of controls. You can play a track as a solo, mute the track, pan the track between the left and right audio channels, adjust its volume, and see it play on the keyboard, all by adjusting the controls for that track.

You can synchronize the beginning and end of the MIDI track with other applications' files by dragging the clock icon to or from the Midi application's scroll bar.

**Note:** Be has arranged with Igor's Software Laboratories to develop a software MIDI synthesizer for the BeOS. This will allow you to play MIDI files without a hardware MIDI synthesizer. Be will make the software MIDI synthesizer available to everyone running the BeOS as soon as Igor's is done, possibly before the next release of the BeOS: Watch the Be Web site for the announcement.

## Minesweeper



Minesweeper is a game you may be familiar with. When you start Minesweeper, a window opens with a grid of squares, representing a mine-infested sea. You play Minesweeper by finding and flagging the mines in the sea as quickly as you can, while trying not to blow up a mine.



When you click in a square, a number tells you how many mines are in the eight squares adjacent to it. With practice, you can determine from the numbered squares where the mines are. You flag a square you know contains a mine by clicking on it with the secondary mouse button (initially the right mouse button, though you can change that as described in “Mouse” on page 117). If you want to flag a square as a possible mine, you can mark it with a question mark by clicking it with the secondary mouse button twice; click again to clear the question mark.

The number at the top left of the window tells you how many mines remain unflagged. The seconds that have elapsed since you clicked the first square are displayed at the top right.

If you click on a square that hides a mine, the game is over: The smiling face turns to a frown and all the mines are displayed.

If you flag all the mines, you win. If you had one of the best winning times, a panel prompts you to enter your name. You can choose Best Times from Minesweeper’s main menu to see who the current leaders are and how well they did.

To start a new game, whether you won or lost, click on the face.

As you get better, you may want to increase the challenge. Choose Intermediate or Expert from the main menu to start a game with a larger, more perilous sea.

## MiniPlayer



MiniPlayer

MiniPlayer is a basic audio CD player—the antidote to CDPlayer’s bells and whistles. If you just want to listen to a CD, MiniPlayer can handle it without taking up a lot of screen real estate.



MiniPlayer’s controls are a subset of those in the CDPlayer application. For information about MiniPlayer’s controls and menu items, see “CDPlayer” on page 69.

## NetPositive



If you've used the Network preferences application to establish a direct Ethernet or a PPP connection to the Internet, you can use NetPositive to surf the World Wide Web (for information on Network, see "Network" on page 118). Even if you're not connected to a network, you can use NetPositive to read HTML documents on disk, such as the HTML editions of *The Be Book*, the reference to the Be API, and Metrowerks' *CodeWarrior Documents for Be*. (HTML, the Hypertext Markup Language, is the formatting language used for world-wide web documents, or "pages.")

When you start NetPositive, a window opens with a starting page.



You navigate the World Wide Web by clicking *links*, text or icons that open other Web pages. Text that is a link is marked with an underline. You can tell whether an icon or other art is a link by observing the text field at the top of the window: If the text in the field changes when you position the cursor over an icon, it's a link. This is also a convenient way to tell what page a link refers to.

You can open a page directly if you know its Universal Resource Locator (URL). These start with **http://** and are followed by the unique address of a page. For example,

**http://www.be.com** is the URL for the Be, Inc., home page. Type the URL for a page in the text field at the top of the NetPositive window to go to that page. If you choose Open Location from NetPositive's main menu, you can type a URL for a page and click Open to open a new NetPositive window with that page.

You can open an HTML file that's on disk by dragging the file onto NetPositive's icon. You can also open an HTML file by dragging it into an open NetPositive window or by choosing Open File from NetPositive's main menu. This is how you open the starting pages of the online documentation.

You can click the left-pointing arrow button at the top of the NetPositive window to go back to the last page you had open. Click the right-pointing arrow to go forward again.

Some Web pages take a long time to open because they contain large graphics or other large pieces of information or because they're coming from a computer connected to a slow part of the Internet. You can stop loading a page by clicking the square button to the right of the arrow buttons at the top of the NetPositive window.

NetPositive can play QuickTime movies that were saved using the Cinepak compressor with the "Playable on other computers" option checked (that is, they're "single-fork" or "flattened" movies). If you have QuickTime movies of this kind, you can transfer them to the BeOS, add the ".mov" extension to the ends of their file names, and drag them onto the NetPositive icon to play them. Most movies have information about how fast they should be played. If you check Fast Movies in NetPositive's main menu, NetPositive plays movies as fast as it can. If Fast Movies is unchecked, NetPositive tries to play movies at the speed they were designed to be played.

If you're interested in the HTML code that created the page you're viewing, choose Show HTML from NetPositive's main menu to display the page's HTML code.

## PlaySound



You can listen to an audio file by dragging it onto the PlaySound icon. PlaySound can use a computer's digital-to-analog converter (DAC) circuitry to play audio files in raw, Audio Interchange File Format (AIFF), and Waveform Audio File Format (WAVE) format.

When you drag a sound file onto the PlaySound icon, a small window opens with a Stop button. Click Stop to stop playing the sound. Depending on the Sound preferences application settings and the devices connected to your computer, you hear the audio file on the internal speaker or on a device connected to the line-out ports (see "Sound" on page 129 for more information).

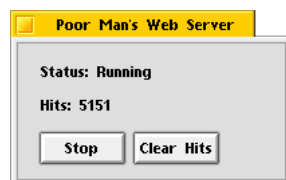
A number of sound files are included in the `/optional/sounds` folder on the *BeOS* CD-ROM.

## PoorMan



PoorMan is a simple but effective World Wide Web server. A Web server is an application that makes a Web site available to a network: Either to a company network or, if the network is configured to allow it, to the whole Internet. PoorMan can host a Web site made up of files in HTML, JPEG, and GIF formats. HTML (the Hypertext Markup Language) is the formatting language used for World Wide Web documents, or "pages." JPEG and GIF are graphics file formats commonly used for illustrations in world-wide web pages.

When you double-click PoorMan, a window opens with a status area and two buttons. When you click Start, PoorMan looks for a "home page" (the starting point for a Web site) named `index.html` in a folder named `/public_html` on the boot disk. If they don't exist, PoorMan creates them. The `index.html` file PoorMan creates is a very simple Web page in HTML format.



## Pulse

When PoorMan is running, others on your network can use their Web browsers to view the pages on your site. Depending on how your network is set up, they may be able to simply type your computer's hostname or IP address to open your site's home page (the `/public_html/index.html` file).

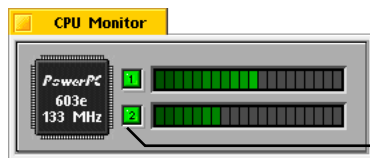
Each time someone browses a page or image on your Web site, the "hit" is recorded in the total in PoorMan's window. Click "Clear Hits" to return the count to zero.

Unfortunately, you can't use NetPositive to browse the pages PoorMan is serving on the same computer (though you can use NetPositive to browse pages PoorMan is serving on other computers on a network). For more information about NetPositive, see "NetPositive" on page 99.

## Pulse



The Pulse application shows you the relative load on your computer's PowerPC microprocessors—an on-screen version of the information displayed by the two LED arrays on the front of a BeBox. Pulse also shows you the model and clock speed of the CPUs.



On multiple-processor computers, click a numbered button to "turn off" one of the CPUs. If you click both buttons, you'll have to reset the computer!

## ROMUpdater



Part of the BeOS system software for the BeBox is actually on a programmable "flash ROM" chip on the BeBox motherboard. If Be sends you a file with updated software for the flash ROM, you update the ROM chip by dragging the update file onto the ROMUpdater application.

Nothing happens if you simply double-click ROMUpdater.



## SCSIProbe



You can use SCSIProbe to find out information about SCSI devices. When you start SCSIProbe, a window opens that lists each SCSI device connected to the computer. The computer itself is always at SCSI ID 7. Other SCSI devices are listed in the window, in order of their SCSI IDs. In the Type column, hard disks are listed as “DISK” and CD-ROM drives are listed as “ROM.”

ID	Type	Vendor	Product	Version
7	DISK	SEAGATE	ST32550N	0015
8	ROM	TOSHIBA	CD-ROM XM-3701TA	3055
9	DISK	SEAGATE	ST51080N	0943
10	CPU	BE INC.	BEB0X	11d8

Update Mount

If you can't read all the text in a column, you can make a column wider by dragging a column divider. Hold down the Option key (the key labeled “Ctrl” to the right of the spacebar on most PC keyboards) while you click on a column divider to restore it to its original position.

To ensure that all devices are listed, click the Update or Mount button.

You can cause the drive light on a SCSI device to flash by clicking its corresponding number in the ID column. This makes it easier to determine which physical disk is at a particular SCSI ID.

SCSIProbe was originally written as a Macintosh control panel, and some features of this port are available in the BeOS version but not recommended: The Update button changes to Reset if you hold down the Option key, but clicking Reset resets the SCSI bus, which will likely crash the BeOS.

## Terminal



The Terminal application opens a window where you can work with the Be shell. The Be shell is a UNIX-style, command-line environment based on **bash** (the Bourne-Again Shell, created by Brian Fox and Chet Ramey).

Most of the programs you work with in a Terminal window are in the **/bin** folder.

You can open as many Terminal windows as you want: Just keep double-clicking the Terminal icon or choose Start New Terminal from the Terminal menu. The Switch Terminals command in the Terminal menu makes another open Terminal window the active window, so you can cycle through them quickly from the keyboard by pressing Command-G.

You can use the commands in the Settings menu to customize how Terminal displays the text in its window:

- Choose traditional dimensions (in characters) for the current window from the Window Size submenu.
- Choose a font and font size Terminal uses to display the text in its window from the Font submenus, but note that only monospaced fonts are included (Terminal relies on the constant character widths of monospaced fonts to align text and to display other text effects). Also note that Kate, the font Terminal uses initially, is available only in one size.
- Set the number of space characters Terminal substitutes for Tab characters by choosing a number from the Tab Width submenu.
- Choose Color to open a panel where you can set the foreground and background colors of text, selected text, and the text cursor.

Choose Save as Defaults to use the current settings every time you start Terminal. You can also use the Save as Settings File command to create a Terminal settings file. You can double-click a Terminal settings file to start Terminal with the saved settings in effect.

You can use the keyboard to scroll the contents of the Terminal window:

<u>Press</u>	<u>To scroll</u>
Shift–up arrow	Up one line
Shift–down arrow	Down one line
Shift–Page Up	Up one windowful
Shift–Page Down	Down one windowful

The default shell environment is set by the `/system/profile` file. You can modify the environment by making a copy of that file, changing it, and saving it in the root folder of the boot disk with the name `.profile`.

### Learning about `bash` and the Programs in the `/bin` Folder

Explaining how to work on a UNIX-style command-line is beyond the scope of this user’s guide. In fact, there are lots of good books on the subject available in any bookstore with a well-stocked section on computers.

A copy of the man pages for `bash` and for a great many of the programs in `/bin` are included in HTML format in the `/documentation/Shell Tools/HTML` folder. Man pages are the traditional, descriptive (if terse) documentation for UNIX-style programs. You can read the man pages by dragging the `index.html` file (it’s in the `HTML` folder) onto the NetPositive icon (for more information on NetPositive, see “NetPositive” on page 99). The `index.html` file contains an alphabetical list of the man pages, with links you can click to open the man page you want to read. Because the man pages make heavy use of the `<pre>` HTML code, you may also find them readable in a text editor, such as Edit.

When you’re working in Terminal, you can also get a small amount of information about many of the programs in `/bin` (often enough to get by) by entering the name of the program followed by the `--help` flag (that’s two hyphens followed by `help`). Enter `help` in Terminal to read about `bash` itself.

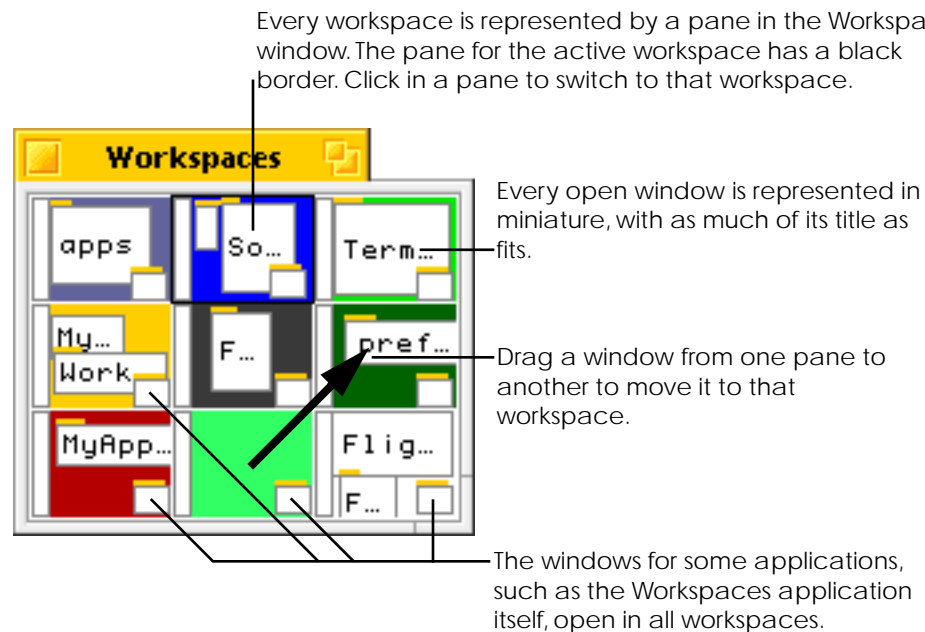
## Workspaces



When you first start working with the BeOS, you have one workspace: A desktop and a set of windows that open on it, which you arrange to suit your projects. With the Workspaces application, you can arrange up to 32 such workspaces.

When you first start Workspaces, a window with nine panes opens. Each pane represents a workspace, with a miniature version of the dock and each window open in that workspace. Click in a pane to switch to that workspace. You can also switch workspaces by holding down the Command key while you press the function key that corresponds to that workspace (counting from left to right, top to bottom in the Workspaces window): Command-F1 to switch to the first workspace, Command-F2 to switch to the second, and so on.

The workspace you're currently working in is called the *active workspace*. When you open a window it opens in the active workspace. Many windows can be open in only one workspace at a time. This is true for Edit document windows and the windows that open when you start most of the preferences applications. If a window is already open in a workspace and you open it again, you switch to the workspace where the window is already open. Other applications and their windows behave differently. For example, when you start the Clock application, the Clock window opens in all workspaces (this is also true for the Workspaces application itself). A third model is offered by folder windows in the Browser: They open in the active workspace when you double-click their folder icons, even if they're already open in another workspace.



If a window is open in more than one workspace, you can move it to a different location in each workspace. However, changing the size of a window, minimizing it, or closing it in one workspace does the same to all copies of the window in all workspaces.

You can drag an application's icon into a pane in the Workspaces window to start it in that workspace.

You can use the Screen application to give each workspace a different desktop color—this can help keep them distinct. The resolution (number of pixels on the screen) and color depth (bits per pixel) also only apply to the current workspace. See “Screen” on page 125 for more information.

If you want to work in more or fewer workspaces, choose the number you want from the Workspaces submenu in the Workspaces application's main menu. If you increase or decrease the number of workspaces, panes are added or removed from the Workspaces window in order, starting from the bottom right. You can't reduce the number of workspaces if it would remove a workspace that has open windows: Close any open windows first. Avoid the higher prime numbers of workspaces—the Workspaces window can't lay them out very legibly.

## *Workspaces*

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# 4 Customizing the BeOS

The BeOS comes with a number of applications you use to configure and customize the way the BeOS works. These applications are in the **/preferences** folder. You can also customize the BeOS by adding files that appear as images on the Be desktop or that add functionality, such as fonts and add-ons. This chapter describes the applications in the **/preferences** folder in alphabetical order. It then tells you how to customize the BeOS by adding fonts, add-ons, and other files.

## Boot

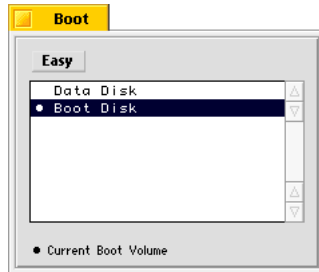


A chip on the computer’s motherboard stores information about the disk you prefer to boot (or “start up”) from—that is, if you have more than one SCSI or IDE disk, which disk you want the computer to try to load system files from first, before trying any other SCSI or IDE disk. You can change the boot preference with the Boot preferences application. (For more information on how the BeOS looks for a boot disk, see “Selecting a Boot Disk” on page 4).

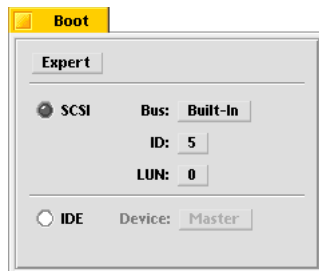
When you start Boot, a window opens that lists each mounted disk by name (for information on mounting disks, see “Working with Disks” on page 36). The current boot disk is marked with a bullet (●). If the configuration of one of the disks in the list (that is, a master or slave IDE disk or SCSI disk at a specific SCSI ID) matches the current

## Boot

boot preference, it's selected in the list. You can change the boot preference to match the configuration of a mounted disk by clicking a name in the list.



You can choose Expert from the pop-up list at the top of the Boot window to view the boot preference as it's stored in the chip on the motherboard: That is, by SCSI or IDE disk configuration rather than by the name.



In Expert view, you can use the buttons and pop-up lists to change the boot preference to any possible configuration of IDE or SCSI disk—even the configuration of a disk that isn't currently mounted. For SCSI disks, only the built-in SCSI bus is typically available, and unless you have a SCSI drive with more than one disk in it, the LUN (Logical Unit Number) should be left at 0.

If you change the boot preference, the BeOS will try to boot from the disk you selected the next time you start the BeOS.

To find out the SCSI IDs of SCSI disks connected to the computer, you can use the SCSIProbe application, which is described in "SCSIProbe" on page 103.

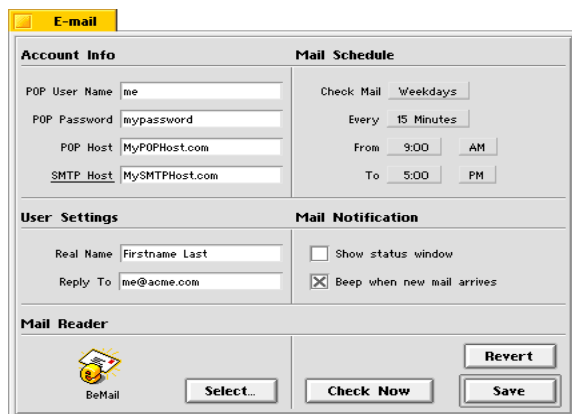


## E-Mail



You use the E-Mail preferences application to configure the Be software (**mail\_daemon** in the **/system** folder) that sends and receives e-mail. To send and receive e-mail, you need an e-mail account on a POP (Point Of Presence) or SMPT (Simple Mail Transfer Protocol) server, which you connect to via an Ethernet network or PPP connection. You set up an Ethernet or PPP network connection with the Network preferences, as described in “Network” on page 118.

When you start the E-Mail preferences application, the E-Mail window opens.



- 1 Enter information about your e-mail account.

Your user name and password are the name and password you use when you log into your e-mail service provider. Typically, your name is the first part of your e-mail address: For example, if your e-mail address is **me@mycompany.com** or **me@myserviceprovider.com**, your user name is *me*.

For most e-mail accounts, the POP host and SMTP host are the same: The IP address or the host name of the computer that stores and forwards the e-mail you send and receive.

If you're not sure what to enter in the Account Info fields, ask your system administrator or Internet service provider.

- 2 Use the pop-up menus in the Mail Schedule area to set when and how often to send mail you've created and to check for and download new mail.

Initially, the E-Mail preferences are set to exchange mail every 15 minutes, from 9:00 AM to 5:00 PM, weekdays. If you want to exchange mail around the clock, set the From and To times to the same time.

- 3 In the User Settings area, enter your full, "real" name and the e-mail address you want correspondents to use when they reply to your mail.

Your "real name" appears in other people's lists of received mail, in place of your e-mail address. The address you enter in the Reply To field is the address that's automatically entered in the To field when others reply to the mail you send them.

- 4 Check options for how you want to be notified when you receive new mail.

- 5 If you have another application that you want to use to compose and read mail, drag it on top of the current icon in the Mail Reader area of the E-Mail window.

You can also use the Select button to open a panel where you can select the application you want to use.

Initially, you use the BeMail application (in the **/apps** folder) to compose and read mail, as described in "BeMail" on page 62. The BeMail application offers basic e-mail features; as third-party developers create more sophisticated e-mail applications, you can use them instead.

- 6 Click Save.

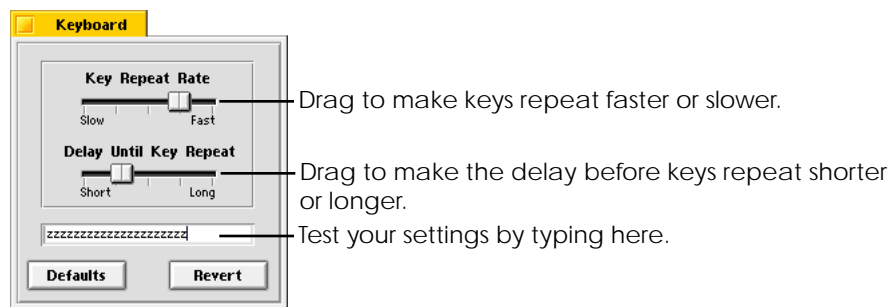
If you checked "Show status window," the E-Mail Status window opens with information about the number of e-mail messages you've received since you last checked for new mail and the number of e-mail messages you haven't read yet.

You read and create e-mail messages with the BeMail application, which is described in "BeMail" on page 62.

## Keyboard



When you press a key on the keyboard, a character appears on-screen (or some other action takes place). If you hold down a key, the BeOS waits a brief moment and then acts as if you were repeatedly pressing that key. For example, if you press and hold down a character key when the insertion point is in a text field, a character appears in the field and then after a brief delay, more copies of that character appear. You can use the Keyboard application to increase or decrease the delay after you first press a key before the key repeats and to set how quickly a key repeats once it starts repeating.

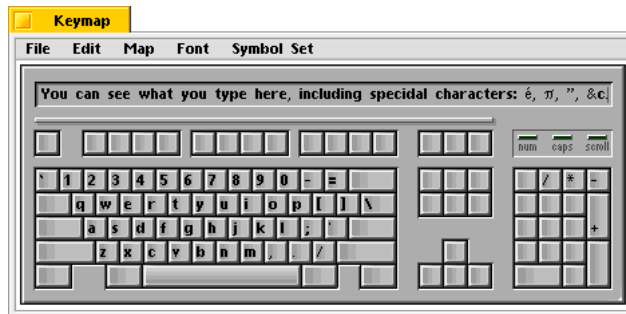


Click Revert to restore the key repeat settings that were in effect when you first started the Keyboard application. Click Defaults to restore the settings that were in effect when you first installed the BeOS.

## Keymap



The Keymap application opens a window that shows you the current keymap, that is, the character you see on-screen when you press each key. You can type on the keyboard or click keys in the Keymap window to see the resulting character in the field at the top of the Keymap window. If you press one or more modifier keys (such as Shift, Option, or Control) on the keyboard or click them in the Keymap window, the keycaps change to show you what characters are mapped to the keys when the modifier keys are pressed.



Different fonts map characters to different keys. You can choose a font from the Font menu to see that font's mapping in the Keymap window. This is also a useful way to look for characters you don't use very often, such as bullets, accents, or other special characters.

The prerelease version of the BeOS comes with two preset keymaps: QWERTY, the standard keymap in the United States; and Dvorak, a popular alternative keymap. You can switch between those two keymaps by choosing one from the Map menu.

You can create a custom keymap by using the secondary mouse button to drag characters to the keys you want to map them to. You can also use the secondary mouse button to drag characters from other applications, such as FontChart.

Each keymap is made up of nine mapping tables: A table of what each key produces when you type it with no modifier key pressed, or with the Shift, Control, or Option key pressed, plus all the possible combinations of these keys.

If you use the tertiary mouse button to drag a character from one keycap to another, you actually drag all nine characters associated with that key in the nine tables in the keymap.

You can save a keymap by choosing Save or Save As from the File menu. To use a keymap you've saved, drag the keymap file into the Keymap window.

Choose Save As System from Keyboard's File menu to save the keymap in the Keyboard window as a special keymap file, **/system/settings/key\_map**, which is used as the default keymap each time you start the BeOS.

You can revert to the default keymap at any time by choosing System Startup from Keymap's Map menu. If you delete the **/system/settings/key\_map** file, you revert to the BeOS's idea of a default keymap the next time you restart the BeOS.

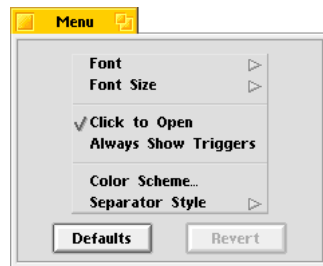
The "Interface Kit" chapter of *The Be Book*, the reference to the Be API, includes information about keymaps of interest to programmers.

You can choose a symbol set from the Symbol Set menu. Symbol sets are conventions for what characters are used in fonts and keymaps. Different computers and countries use different symbol sets. If you're having trouble reading a document that was created on another kind of computer, try switching to the symbol set used by that computer.

## Menu



You can use the Menu preferences application to change the color and other aspects of the appearance of menus throughout the BeOS. You can also use Menu to change how menus behave. When you start Menu, a window opens with a set of controls that look like an open menu. You can “choose” items from this menu to customize the menus in the BeOS.



Choose a font from the Font menu and a font size from the Font Size menu that you want to use in menus. The menu in the Menu window changes right away to reflect your choices.

If you uncheck Click to Open, you can’t open a menu or submenu by clicking its title, you can only drag through menus. (For more information on navigating menus in these ways, see “Working with Menus” on page 26.)

If you check Always Show Triggers, triggers for menu titles, commands, and other menu items are always visible, even when you’re dragging through menus, rather than just when you’re navigating menus from the keyboard or clicking menus and submenus to open them. (For more information about triggers, see “Working with Menus” on page 26.)

Choose Color Scheme to open a panel where you can select the colors you want to use in menus. When you click a color in the panel (if you’re using 8-bit color) or drag one of the red, green, or blue color component sliders (if you’re using 32-bit color), the Menu preferences window changes to show how the highlighting and other uses of color in menus will appear. (For more information about setting 8-bit and 32-bit color, see “Screen” on page 125.)

You can choose one of three styles of menu item separators from the Separator Style submenu.

Click Revert to restore the Menu preferences settings that were in effect when you first started the Menu application. Click Defaults to restore the settings that were in effect when you first installed the BeOS.

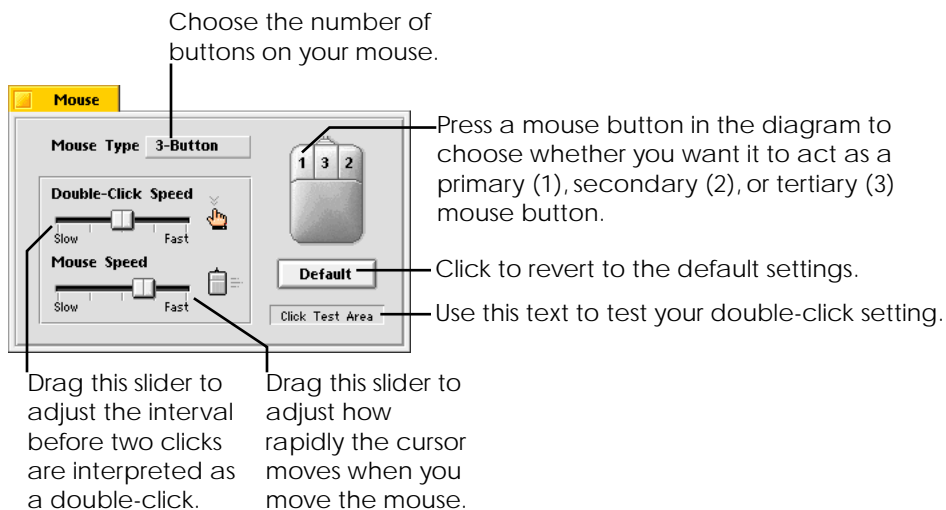
Changes you make in the Menu preferences take effect in other applications the next time you start them (or in the case of the Browser, the next time you start the BeOS).

## Mouse



You can use the Mouse application to set your preference for a number of ways a mouse works with the BeOS. You can set whether you're using a one-, two-, or three-button mouse and which buttons you want to use as the primary, secondary, and tertiary mouse buttons (for more information on the role of the mouse and mouse buttons in the BeOS, see "Using the Mouse" on page 10). You can set how quickly you have to click the mouse button before the BeOS interprets two clicks as a double-click. You can also set how rapidly the cursor moves across the screen when you move the mouse.

When you start up the Mouse application, the Mouse window opens.



**Note:** If you have a single-button mouse, you can emulate a three-button mouse by pressing Control-Command while you click the mouse button to emulate the secondary mouse button, and by pressing Control-Option while you click to emulate the tertiary mouse button.

## Network



You use the Network application to configure how the BeOS communicates with other computers. You can configure the BeOS to communicate across an Ethernet network connected to an Ethernet network adapter in your computer. You can also configure the BeOS to communicate using PPP (the Point-to-Point Protocol) through a serial port, via a modem, or via a direct cable connection to the serial port on another computer.

You can configure multiple network interfaces—for example, if you have more than one network adapter. However, it's up to the software you're using to know what interface to use.

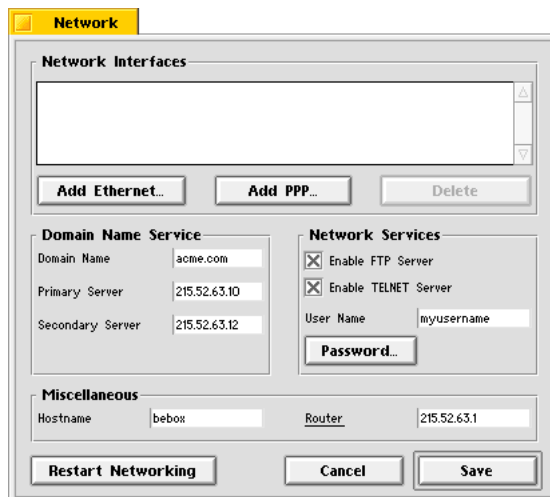
**Important:** Before you start, be sure to let your network administrator or Internet service provider know you're connecting a new computer to the network. Your network administrator or service provider will also provide you with information you'll need to enter in Network.

### Configuring Network Basics

- 1 Start up the Network application.
- 2 Enter information about yourself, the computer, and the network.

You may need to ask your network administrator for some of the information requested by the Network window.





- In the Domain Name field, enter the name of your network domain.
- In the Primary Server field, enter the IP address of your network's primary DNS server, if it has one.

If your network doesn't have a DNS server, or if you or your network administrator decide you don't want to use it, you can create a copy of `/system/hosts-sample`, name it `/system/hosts`, and then edit the copy in the Edit application so it lists the names and IP addresses of the computers you want to connect to. Your network administrator may have a standard **hosts** file for all the machines on your network.

- In the Secondary Server field, enter the IP address of your network's secondary (or backup) DNS server, if it has one.
- In the Hostname field, enter a name for the computer (most network administrators let you pick this name).
- If you want to allow users on other computers to use the **ftp** utility to put files on and get files from your computer, check the Enable FTP Server option.
- If you want to allow users on other computers to use the **telnet** utility to connect to your computer, check the Enable TELNET Server option.

- In the User Name field, enter the name you want to use when connecting to your computer from another computer. (You can't use `ftp` or `telnet` to connect to the computer from another computer unless you enter a name in the User Name field.) The user name you enter is also used as the default user name when you run `ftp` in the BeOS.
- Click the Password button to open a panel where you enter the password you want to use when connecting to your computer from another computer using `ftp` or `telnet`. Because the Password panel doesn't display the text you type for your password, it asks you to enter the password twice to make sure you don't make a mistake while typing.
- In the Router field, enter the name of the "smart" router on your network, if it has one.

### Adding an Ethernet Network Interface

You use the Network application to configure the BeOS to use a computer's Ethernet card or onboard Ethernet circuitry.

- 1 Click Add Ethernet.

A panel opens with a list of the Ethernet adapters supported by the current release of the BeOS.



- 2 Click the kind of Ethernet adapter you're using and click Add.

A panel opens where you enter information about the Ethernet network adapter and about the network it's connected to. You may need to check with your network administrator for this information.



Novell NE2000 compatible adapter (ISA)

IP Address: 215.52.63.2

Netmask: 255.255.255.0

Port: 300

IRQ: 5

Buttons: Cancel, Set

- 3 In the IP Address field, type the IP address of the network adapter.

This number uniquely identifies the computer on the network.

- 4 In the Netmask field, type the netmask for your class of network, if required.
- 5 Depending on the Ethernet card you're using, choose the IRQ, port, and other settings that match the configuration of the network adapter.
- 6 Click Set.

The new network interface is added to the scrolling list at the top of the Network window.

### Adding a PPP Network Interface

You can configure the BeOS to communicate with a network using PPP (the Point-to-Point Protocol). PPP is the protocol many Internet service providers offer to subscribers who connect via modem. If you want your computer to communicate directly with a computer that can host a PPP connection, you can also configure the BeOS to communicate with that computer through the two computers' serial ports, using a cable called a null modem cable.

If you're setting up the BeOS to work with an Internet service provider, review these instructions and check with your service provider to determine the correct settings.

- 1 Click Add PPP.

- 2 If your service provider establishes your IP address each time you connect (this is sometimes called *dynamic addressing*), make sure "Obtain from server" is checked. Otherwise, uncheck this option and type the IP address assigned to you (this is sometimes called *static addressing*).
- 3 Choose the serial port the modem or null modem cable is connected to.
- 4 Choose the speed at which you want to communicate through the serial port.

**Note:** On the BeBox, serial ports 1 and 2 are reliable up to 155,200 baud, and serial ports 3 and 4 are reliable up to 38,400 baud.

- 5 If you're connecting directly to another computer via a null modem cable connected to the computers' serial ports, check "Direct connection." If you're using a modem to call a service provider, uncheck this option and type the phone number of the service provider.

Type the number exactly as you would dial it: If you normally have to dial a number to get an outside line, type that number first, and don't forget to include a **1** and an area code if it's a long-distance call. For more information, see the modem's owner's guide.

- 6 If your service provider uses PAP (the Password Authentication Protocol), leave the "UNIX style" option unchecked. If your service provider uses a more traditional "UNIX style" method to log you in, check that option and enter your user name and password.
- 7 Check the "Display chat when connecting" option if you want to observe the messages your computer and the host computer exchange as a connection is established.
- 8 Unless you're debugging a PPP problem with assistance from Be, it's best to leave the "Log all bytes sent/received" option unchecked.

If you check this option, all bytes sent and received during each PPP session are stored in two files, **/system/ppp-write.log** and **/system/ppp-read.log**. Because these files are never erased, they can grow very large.

- 9 Click Set.

The new PPP interface is added to the list at the top of the Network window.

### Changing the Modem Initialization String

If you use Network to set up a PPP connection via a modem, Network stores a generic modem initialization string in the **/system/settings/network** file (along with the other network settings). This string should work for modems that understand the "Hayes AT" command set, which most modems use. If you need to use a different string for your modem, you can use the Edit application to open the **network** file and edit the string: It's in the line that starts "CHAT\_SCRIPT."

The Be PPP software relies on the following modem settings:

- Disable echo (also known as “full duplex”) between your computer and the modem
- Determine the serial port rate by the rate of the last AT command
- Enable hardware flow control (CTS and RTS) between your computer and the modem
- Disable software flow control between your computer and the modem

If you’re using a U.S. Robotics Sportster modem, set its DIP switches to the factory defaults (switches 1, 2, 4, 6, and 7 up; switches 3, 5, and 8 down). Then replace the entire “CHAT\_SCRIPT” line with the line:

```
CHAT_SCRIPT = \dATE0Q0&B1&H1&R2&I0 OK ATDT\p CONNECT
```

If you’re using a Motorola Bitsurfr ISDN modem, replace the entire “CHAT\_SCRIPT” line with the line:

```
CHAT_SCRIPT = \dAT&F1&C1&D2S0=0%A2=95@B0=2%A4=0 OK ATDT\p CONNECT
```

Note that each time you click Save in the Network application, it edits the **/system/settings/network** file, so you may need to restore your edits to the file using the Edit application.

Another way to send an initialization command to a modem is to use the Connect Directly command in the Connect application, which is described in “Connect” on page 73. Some modems allow you to save an initialization command as a default when you turn them on.

For more information about modem initialization strings, see your modem’s user’s guide.

### Saving Network Settings and Restarting the Network Software

Once you’ve configured the settings in the Network window and added the network interfaces you need—or if you make any changes—click the Save button. Your changes are saved and a panel asks if you want to restart the network. Click Restart to restart the BeOS networking software so the new settings take effect right away (otherwise, the settings don’t take effect until the next time you restart the BeOS).

## Screen



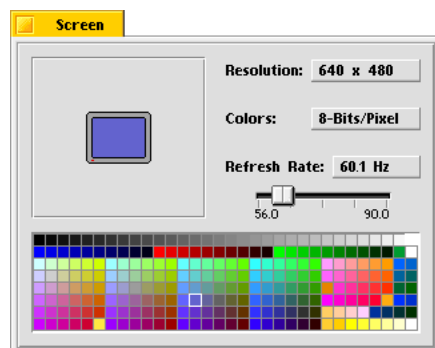
You use the Screen application to set how the BeOS, graphics card, and monitor interact to display the BeOS. You also use Screen to set the color of the desktop.

### Setting the Screen Resolution, Colors, and Refresh Rate

Initially, the BeOS works with the graphics card and monitor to display a screen resolution of 640 pixels horizontally and 480 pixels vertically, using 8 bits of color data per pixel (sometimes referred to as the *screen depth*), with a refresh rate (the number of times per second the screen is redrawn) of 60.1 Hz. If you have a graphics card and monitor that can accommodate a higher resolution, more colors per pixel, or a faster refresh rate, you can change these settings with the Screen preferences application.

For detailed information about what kinds of graphics cards work with the BeOS, see the Be Web site (<http://www.be.com>).

When you start up the Screen application, the Screen window opens.



You change a setting by choosing from the pop-up lists, or by dragging the Refresh Rate slider, and then clicking OK in the panel that asks you to confirm the change. You can also adjust the refresh rate by pressing the left or right arrow key on the keyboard—this technique is useful to fine-tune the best-looking refresh rate.

**Warning:** You risk damaging the monitor and even starting a fire if you select a resolution, number of colors per pixel, or refresh rate the monitor isn't designed to support. Read the owner's guides that come with the monitor and graphics card to find out what combinations of settings are safe for the monitor.

## *Screen*

If your graphics card or monitor can't support a setting you make, you may not be able to read anything on the screen—but if you wait a few seconds, the screen reverts to the previous setting if you don't click OK.

You can uncheck Confirm Changes in Screen's main menu, so you don't have to click to confirm each setting change in a panel. If you do this and then change a setting that makes the screen unreadable, you can use keyboard shortcuts for commands in Screen's main menu to restore the default settings: Command-D for Default Resolution and Command-R for Default Refresh Rate. Or in a pinch, press Command-Control-Shift-F12 to restore all default settings except desktop color (this shortcut works at any time, even when Screen isn't running, though the default settings aren't saved unless Screen is running).

If you choose a very high resolution, a panel warns you that you risk damaging your monitor if it can't support that setting. If you're entirely certain that your graphics card and monitor can support any resolution, number of colors, or refresh rate you choose, you can uncheck Confirm High Resolution in Screen's main menu to circumvent these warnings, but be warned: This is a Be-tested way to destroy expensive monitors!

The changes you make to the resolution and number of colors affect only the active workspace, so if you're working with more than one workspace (as described in "Workspaces" on page 106), you can set a different resolution and number of colors for each workspace.



### Adjusting the Screen Size and Position

When Screen is the active application, you can adjust the size of the screen image on the monitor by holding down the Shift key while you press the up or down arrow key. You can adjust the position of the screen image by holding down the Control key (the key labeled “Ctrl” in the lower-left corner of most PC keyboards) and pressing the up, down, left, or right arrow key. To restore the default screen size and position, choose Default Position from Screen’s main menu.

### Setting a Desktop Color

The desktop—the “background” of the screen—is initially solid blue, but you can pick a different color with the Screen application.

If you choose 8 bits of color information per pixel, the lower portion of the Screen window shows the 256 colors you can choose from for a desktop color (at 8 bits per pixel, you can display up to  $2^8$  (that is, 256) colors on the screen at one time). Click the color you want.

If you choose 32 bits of color information per pixel, the lower portion of the Screen window offers three sliders, for the red, green, and blue components of the more than 16 million colors you can display on the screen at one time (only 24 of the 32 bits are used for color information, and  $2^{24}$  equals 16,777,216). Drag each slider until you find a combination that produces the color you want.

If you’re using the Workspaces application to work in more than one workspace (as described in “Workspaces” on page 106), the color you pick affects only the active workspace—the one where you’re using Screen—so you can give each workspace a distinctive desktop color.

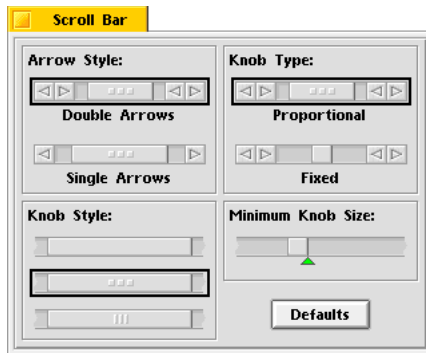
You can also display an image on the desktop, instead of a solid color, as described in “Displaying an Image on the Desktop” on page 133.

## ScrollBar



Initially, many windows in the BeOS use “proportional scroll bars,” as described in “Scrolling the Items in a Window” on page 16.

If you don’t like proportional scroll bars, you can use the ScrollBar application to set your preference to a fixed-size scroll knob and make some other choices about how scroll bars look and behave.



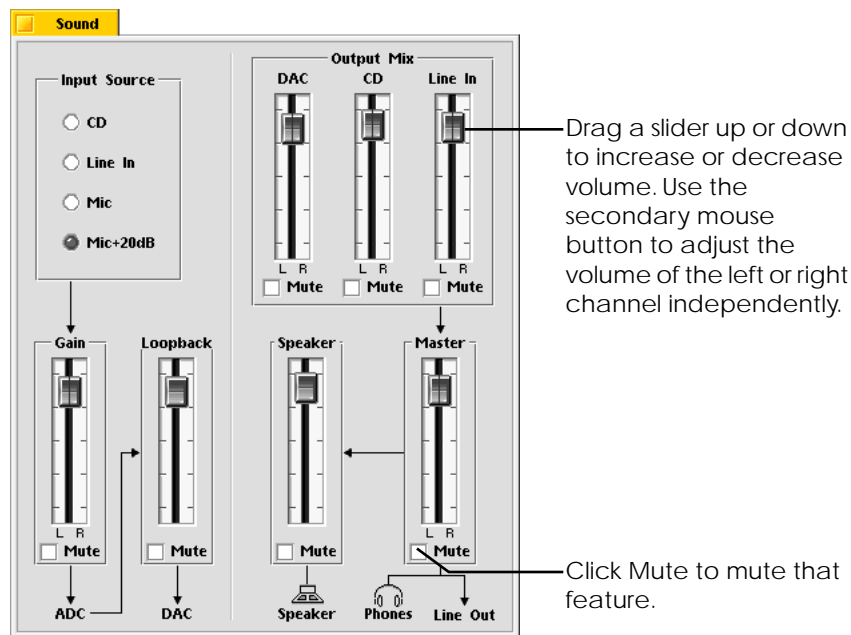
Click the arrow style, knob style, and knob type you prefer. Drag the green arrow to adjust the minimum scroll knob size. Click Defaults to return all the settings to the way they were when you first installed the BeOS. The settings you make in ScrollBar affect windows when you next open them.

## Sound



You can use the Sound application to select the input and output sources and volumes of a number of audio features in the BeOS.

When you start up the Sound application, the Sound window opens. The arrangement of the features in the Sound window shows how you they relate to one another.



Use the controls on the left side of the Sound window to select an input to the ADC (the analog-to-digital converter circuitry in a chip in the computer), and the “loopback” signal from the ADC to the DAC (the digital-to-analog converter).

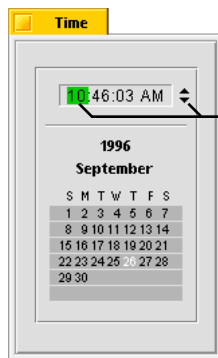
Use the controls on the right side of the Sound window to control the inputs to and the volume of the line-out ports, the headphone port, and the speaker.

Drag a slider to adjust the volume of an input or output feature, or check a Mute box to turn it off. If a slider is split into left and right channels, you can use the secondary mouse button to adjust the channels independently.

## Time



Clock circuitry on the computer motherboard keeps the time, even when the computer is turned off. You set the date and time with the Time application. When you start Time, a window opens with the computer's notion of the current date and time. Click the component of the date or time you want to change and then set the correct date or time using the controls for that component: Adjust the date or time using the small arrows; type an hour, minute, or second; or directly click a date on the calendar. Your changes take effect immediately.



Click the part of the date or time you want to change and then click the arrows to change the current date or time.

## Adding Fonts

The BeOS includes a TrueType font renderer, which displays TrueType-format fonts on the screen at virtually any size. A small set of TrueType fonts is included with the BeOS. They're stored in the `/system/fonts/ttfonts` folder. Two bitmap fonts used by the Be software, Emily and Erich, are stored in the `/system/fonts/system_fonts` folder. (A third bitmap font, Kate, is built into the system software.)

You can purchase additional TrueType fonts in PC (not Macintosh) format and add them to the BeOS, so they're available in applications that work with fonts, such as Edit and FontDemo. A few kinds of TrueType fonts don't work with the BeOS, but most do.

- 1 Copy the TrueType fonts you want to add onto a Macintosh, UNIX, Windows, or DOS computer's disk.

If you're using a recent version of the Macintosh operating system, you can just insert the disk the font came on in the floppy disk drive and copy the fonts you want onto your hard disk. For more information, see the Macintosh *User's Guide* or online help.

- 2 Use `ftp` to copy the fonts to the BeOS.

If you don't have a network set up, you can also use `tar` to copy the fonts to the BeOS using a floppy disk. For more information about `ftp` and `tar`, see Appendix B, "Transferring Files to and from the BeOS."

- 3 Move the fonts to the `/system/fonts/ttfonts` folder on the BeOS hard disk.
- 4 Make sure the fonts have the `.ttf` extension (uppercase letters don't work).
- 5 Restart the BeOS.

## Adding Drivers and Add-Ons

You can add software to the BeOS that makes it work with new kinds of devices or with familiar devices in new ways. This kind of software is called a *driver*. You can also add software that extends the functionality of existing applications. This kind of software is called an *add-on*.

Adding a driver or add-on is as simple as copying it into the appropriate folder in the **/system** folder on the boot disk.

For the purposes of adding them, there are two kinds of drivers: Graphics card drivers (sometimes called “graphics drivers”) and all other kinds of drivers.

### Adding a Driver

To add a graphics card driver, copy it into the **/system/add-ons/app\_server** folder and restart the BeOS.

**Caution:** Don’t replace, rename, or delete the **supervga** file in the **/system/add-ons/app\_server** folder, or you won’t be able to restart the BeOS.

To add any other kind of driver, copy it into the **/system/drivers** folder and restart the BeOS.

### Adding an Add-On

To add an add-on, create a folder in the **/system/add-ons** folder with the same name as the application the add-on adds onto (for example, the BeOS comes with an add-on for the Browser in the **/system/add-ons/Browser** folder). Then copy the add-on into that folder. The add-on is available immediately.

In most applications, the functionality the add-on provides is one or more commands in an Add-Ons menu. For example, the MakeArchive add-on adds the Make Archive command to the Add-Ons submenu in most Browser windows’ File menus. You can use the Make Archive command to make a **tar** archive of selected files or folders.

## Displaying an Image on the Desktop

You can display an image file on the desktop instead of a solid color.

- 1 Use an application on another platform (such as Photoshop on a Macintosh) to save an image file in 24-bit, OS/2 BMP format.

You can use any size image as a desktop image, as long as the width of the image is divisible by 4. However, if you use an image that's not the same size as the resolution you use in the BeOS—such as  $640 \times 480$ ,  $800 \times 600$ , or  $1024 \times 768$  pixels—the image will be cropped if it's larger, or repeated if it's smaller than the screen.

- 2 Use `ftp` or `tar` to place a copy of the image file on the BeOS hard disk.

For information on `ftp` and `tar`, see Appendix B, “Transferring Files to and from the BeOS.”

- 3 Name the image file **DesktopImage** and place it in the `/system` folder.
- 4 Restart the BeOS.

Unlike desktop colors, which can be different in each workspace, the same desktop image appears in all workspaces.

**Caution:** Displaying an image file on the desktop takes up a lot of RAM: 1.6 MB for a 24-bit image. So if memory is tight, use a solid color instead.

*Displaying an Image on the Desktop*



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# 5 Developing Be Applications

You have a number of choices for how you develop applications for the BeOS:

- You can use the BeOS version of Metrowerks' CodeWarrior BeIDE (Be Integrated Development Environment), which is in the **/develop** folder. (This bundled version and the accompanying tools limit the size of the executable, shared library, or add-on you create to 64 K.) Using BeIDE is described in "Developing Applications in the BeOS" on page 137.
- You can purchase the unlimited version of BeIDE from Metrowerks (visit the Metrowerks World Wide Web site to learn how: <http://www.metrowerks.com>).
- You can use the command-line development tools, in the **/develop/tools** folder, as described in "Using the Tools from the Command Line" on page 139.
- You can use the Macintosh version of CodeWarrior to develop Be applications on a Macintosh and then move them to the BeOS, as described in "Developing BeOS Applications on a Macintosh" on page 142.

You also have some choices for how you debug applications:

- You can use the preliminary BeOS version of the Metrowerks source-level debugger, which is in the **/develop/debugger** folder.
- You can use the cross-debugger for the Macintosh and its accompanying BeOS "nub," which are in the **/optional/macintosh/Cross-Debugger** folder on the *BeOS* CD-ROM. Using the cross-debugger is described in "Using the Cross-Debugger" on page 143.

- You can use the Be assembly language debugger, **/bin/db**, as described in “Using the Be Debugger” on page 155.

Other applications you use when developing applications are:

- Terminal, the application you use to work with the Be shell, which is described in “Terminal” on page 104.
- Edit, the Be text editor, which is described in “Edit” on page 77.
- IconWorld, an application for creating and editing an application’s icons and other resources, which is described in “Using IconWorld” on page 148.
- AppSketcher, a tool you can use to build a graphical user interface for your application by placing objects in a window on the screen. You can also use it to connect, or “link,” control objects to target functions, and to initialize the values of the data members in your own classes. When you’re satisfied with the look and feel of your interface, you can take the source code files that AppSketcher generates and drop them into a BeIDE project. AppSketcher and its documentation are included on the *BeOS* CD-ROM. You can get more information and updates to AppSketcher on the Be Web site (<http://www.be.com>).

In addition to this guide, you’ll want to refer to:

- *The Be Book*, the reference to the Be API, which is included in HTML format in the **/documentation/The Be Book** folder. You can read the HTML edition of *The Be Book* with NetPositive (as described in “NetPositive” on page 99) or with any other World Wide Web browser. *The Be Book* is provided in other formats you can print or work with on other platforms in the **/optional/documentation/The Be Book** folder on the *BeOS* CD-ROM.
- *CodeWarrior Documents for Be*, the Metrowerks documentation for BeIDE and the other Metrowerks components of the Be development environment. The **/documentation/Metrowerks/HTMLDocs** folder contains the HTML edition of *CodeWarrior Documents for Be*.

**Caution:** The development environment won’t work as described in this chapter unless you carefully follow the directions in *Installing the BeOS*, the document that accompanies this user’s guide.

## Developing Applications in the BeOS

The BeOS comes with a copy of the Metrowerks development environment for the BeOS. You can use this environment to develop applications in two ways: By using BeIDE, the CodeWarrior Integrated Development Environment for the BeOS, or by using the compiler and linker (**mwcc**, **mwld**) and the **make** command in a Terminal window.

### About the Development Environment for the BeOS

BeIDE, the folders for the headers, libraries, tools, some sample projects, and other parts of the Be development environment are in the **/develop** folder. The folders in the **/develop** folder include:

- **/develop/debugger** contains the Metrowerks symbolic debugger. This preliminary version is not for the faint of heart.
- **/develop/headers** contains three folders:
  - The **be** folder groups the Be header files by kit (or similar software categorization). For example, the **app** folder contains the header files for the Application Kit, **storage** files define the Storage Kit, and so on. The **be** folder also contains **BeHeaders**, a precompiled, tokenized version of all the Be header files.
  - The **gnu** folder contains GNU headers.
  - The **posix** folder contains headers for the POSIX-compliant functions that are included with the BeOS. It also contains the ANSI C headers.
- **/develop/libraries** contains **libdll.a**, the Be run-time support library. It also contains:
  - **libfl.a**, the GNU flex library. flex is a lexical analyzer.
  - **librx.a**, the GNU regular-expression parsing library.
  - **libtermcap.a**, the GNU terminal-handling library.
  - **ralloc.a**, a malloc debugging library.

- **scalls.o**, a system-call library for graphics drivers (this library won't be necessary in future versions of the BeOS).
- **libmoto.o**, an optimized PowerPC library from Motorola, which is described in **/documentation/libmoto**.
- **/develop/plugins** contains an add-on used by the BeIDE editor.
- **/develop/tools** contains the compiler, linker, and disassembler: **mwcc**, **mwld**, and **mwdis**. Other development tools are found elsewhere on the disk. For example, **make** is in **/bin**.
- **/develop/projects** contains folders of sample applications, including HelloWorld, BeBounce, an S3 display adapter driver (complete with a **ReadMe** file and lavishly commented sources), a skeleton driver project, and the sources for the MakeArchive Browser add-on. Each folder contains sources, a makefile, and a BeIDE project file.

**/system/lib** contains an additional Be library: **libbe.so**, the shared library that includes the Be kits and the standard C library.

## Using BeIDE

BeIDE is based on the CodeWarrior IDE for the Macintosh; they work in much the same way. BeIDE is documented in the HTML edition of *CodeWarrior Documents for Be*, which you can read with NetPositive. To start, drag **/documentation/metrowerks/HTMLDocs/index.html** onto NetPositive's application icon.

To create your own application or other project using BeIDE, it's easiest to copy the sample project folder (in **/develop/projects**) that most closely matches the kind of project you want to create. Rename the project file (it has a ".proj" extension) to match the name of your project (keeping the .proj extension), and replace the existing source files with your own.

Double-click the project file you just renamed to start BeIDE and to open a project window. In the project window, select the source files for the project you copied and choose Remove Files from the project window's Project menu. Then use the Project menu's Add Files command to add the source files for your project.

Choose Settings from BeIDE's main menu to open the Settings window. Under Project, click PPC Project and replace the file name of the project you copied with the file name of your project, and type your application's signature in the Creator field (for more information on application signatures, see "Creating an Application-Information Resource" on page 148). Click Access Paths and make sure the Project and System paths include all the headers and libraries you rely on in your code. Refer to the *CodeWarrior Documents for Be* to learn more about these and other settings. When you're done, click the Save button and then close the Settings window.

Now you're ready to build your application: Choose Make from the project window's Project menu. BeIDE compiles and links your project. The compiled application is saved in the project folder, along with an ".xMAP" file for debugging (see "Using the Be Debugger" on page 155).

If you're creating an application, you'll probably want to give it an icon and other resources. To learn how, see "Creating Resources for a Be Application" on page 147.

## Using the Tools from the Command Line

You can use the Metrowerks tools, `mwcc` and `mwld`, to build applications from the command line in the Terminal application. These tools and the disassembler, `mwdis`, are documented in *CodeWarrior Documentation for Be*. This approach is steeped in tradition: To build an application, you edit "make" files and invoke command-line driven tools.

### Preparing the Makefile

The easiest way to build an application is to copy the sample project (in `/develop/projects`) that most closely matches the type of project you want to build, remove the example sources, and add your own.

Edit the project-building instructions, that are contained in the **makefile** file in the project folder. The essential steps are these (using the **makefile** from HelloWorld as an example):

- Replace the line

```
app = HelloWorld
```

with

```
app = MyApplication
```

where *MyApplication* is, of course, the name of your application. (Notwithstanding the example set by HelloWorld, the name of the folder in which your code lives needn't match the name of your application.)

- In the CPPOBJS section, replace the HelloWorld object files with your own:

```
CPPOBJS = \  
$(OBJ)/HelloView.o \  
$(OBJ)/HelloWindow.o \  
$(OBJ)/HelloWorld.o
```

Pay particular attention to the backslash characters. Neighboring lines must be separated by a backslash that immediately precedes the carriage return; the last line mustn't have a backslash:

```
CPPOBJS = \  
$(OBJ)/MyApp.o \  
$(OBJ)/MyWindow.o \  
$(OBJ)/MyView.o \  
$(OBJ)/MyOtherView.o \  
$(OBJ)/MyMisc.o
```

- Near the bottom of the file is a list of compiler instructions that take the form:

```
$(OBJ)/HelloView.o: HelloWorld.cpp HelloWorld.h  
$(CC) $(INCLUDES) $(CFLAGS) -o $@ -c HelloWorld.cpp
```

In general, you create an instruction of this form for each file that you place in the CPPOBJS section, substituting your file names for HelloWorld's. The first line lists the file's "dependencies": The file to the left of the colon depends on the files that are listed (on that same line) to the right of the colon. For example, if

**HelloView.h** changes, **HelloView.o** will be automatically regenerated the next time you build the application.

You can list any number of dependencies. You don't need to match the object file's name. For example, let's say you have a header file (we'll call it **misc.h**) that all of the source files in your application look at. You would add the file to the list of dependencies for each of the source file entries:

```
$(OBJ)/MyApp.o: MyApp.cpp MyApp.h misc.h
$(CC) $(INCLUDES) $(CFLAGS) -o $@ -c MyApp.cpp
```

The second line in the entry is (usually) a list of compiler instructions.

After you've edited the **makefile**, you're ready to build your application.

### Building the Application

To build an application, you start the Terminal application, **cd** to the folder where your application lives, and enter **make**:

```
cd MyAppDir
make -map MyApp.xMAP
```

The **make** program reads the **makefile**, then invokes the compiler (**mwcc**) and linker (**mwld**) according to the instructions that it finds there.

To start from scratch, type:

```
make clean
```

This removes the executable file and all previously compiled object files.

If you're creating an application, you'll probably want to give it an icon and other resources. Each time you compile your application, you need to add the resources to the application file. To learn how, see "Creating Resources for a Be Application" on page 147.

## Developing BeOS Applications on a Macintosh

You can use CodeWarrior on a Macintosh to develop applications for the BeOS. To do this, you first need to install the Macintosh version of the Be headers and libraries, as described in *Installing the BeOS*.

### Using the CodeWarrior IDE

The CodeWarrior IDE is documented in *Inside CodeWarrior*, which is available from Metrowerks. However, stepping through the simple process of building the sample HelloWorld application is a good way to familiarize yourself with using CodeWarrior to build a Be application.

Create a folder on the Macintosh where you will keep your Be project files. Then transfer the six source files (the three files that end in “.cpp” and the three that end in “.h”) from the **/develop/projects/HelloWorld** folder in the BeOS to the new folder on the Macintosh, using a file transfer utility, such as **ftp** or **tar** (see Appendix B, “Transferring Files to and from the BeOS,” for more information). Make sure you transfer the files as text files, or use a file-typing utility on the Macintosh (such as ResEdit or FileTyper) to set their file types as TEXT, so CodeWarrior will be able to open them.

Double-click the CodeWarrior IDE to start it and choose New Project from the File menu. In the dialog box that prompts you to name your project, select Be Application from the pop-up list, type a name for your project (typically the same name as your application, but with a “.π” extension—in this case, **HelloWorld.π**), and save the new project in the folder where you transferred the HelloWorld source files. A project window opens for your new project.

Choose Add Files from the Project menu and in the dialog box that appears, double-click each of the “.cpp” files and then click Done. This adds the HelloWorld sources to the project window. Note that the stationery includes **BeHeaders.pch**, the source file for the precompiled headers, so you will generate the precompiled header file (**BeHeaders**) when you build the project.

Choose Preferences from the Edit menu. In the dialog box that appears, click PPC Project and replace “BeApp” in the File Name field with the name of your application, **HelloWorld** in this example. Then click OK.



Now you can build your application: Choose Make from the Project menu. The IDE precompiles the Be headers first. Then it compiles and links HelloWorld.

The compiled application and two symbol files are saved in the same folder as the project file and sources. You use the symbol file with the “.xMAP” extension to debug the application in the BeOS (as described in “Using the Be Debugger” on page 155), or the symbol file with the “.xSYM” extension to debug your application with the cross-debugger on the Macintosh (as described in the next section, “Using the Cross-Debugger”).

Once you’ve built an application, you can transfer it to the BeOS, as described in Appendix B, “Transferring Files to and from the BeOS,” or by using the Metrowerks cross-debugger (as described in the next section). When you transfer the application to the BeOS, don’t forget to include the symbol file for debugging (it’s the file with the “.xMAP” extension).

## Using the Cross-Debugger

There is a preliminary version of the Metrowerks symbolic debugger for the BeOS in the **/develop/metrowerks/debugger** folder. However, you may find it more convenient to use the cross-debugger on the Macintosh. The Macintosh cross-debugger works with a “nub application” in the BeOS to transfer the application you developed on the Macintosh to the BeOS, either across an Ethernet network or across a direct serial connection. Then you can use the commands and other tools in the cross-debugger on the Macintosh to run, stop, and debug the application in the BeOS.

If you’re planning to communicate between the Macintosh and the BeOS across an Ethernet network, test the connection with **ftp** or another utility to make sure you can transfer files successfully before you try to set up the cross-debugger and the nub. (For more information, see “Using ftp” on page 167.)

**Caution:** The connection between the cross-debugger and the Nub is fragile. Follow the instructions in this section carefully or you will likely crash both the Macintosh and the BeOS when you try to use the cross-debugger.

### Setting Up the Nub in the BeOS

- 1 Double-click the nub: It's named **Nub**.

The nub is in the **/develop** folder, if you copied it from the **/optional/macintosh/Cross-Debugger** folder on the *BeOS* CD-ROM when you installed the BeOS, as described in *Installing the BeOS*.

- 2 Choose Settings from the File menu in the MetroNub window.
- 3 Click the Misc. tab in the NubSettings window and click TCP/IP, if you're using an Ethernet network, or Serial, if you've connected the MacOS computer and BeOS computer directly by their serial ports.
- 4 If you're using a serial connection, click the Serial tab and replace the "3" in "serial3" with the number of the serial port you're using on the BeOS computer to connect to the Macintosh.
- 5 If you're using an Ethernet network, it's best to leave the TCP/IP Port Number in the TCP/IP tab at its default setting: 4712. This matches the default setting on the Macintosh cross-debugger.
- 6 Leave the Files tab alone for the moment.
- 7 Close the NubSettings window.

The nub stores your settings in the Be database. If its settings seem to get scrambled, or if the nub stops working, you can remove all the nub settings from the Be database using the Terminal application: `cd` to the folder that contains the nub and enter **Nub -reset**

**Caution:** If you quit the Nub application, you must restart the BeOS before you can start it again and establish a connection with the Macintosh cross-debugger.

## Setting Up the Cross-Debugger on the Macintosh

Once you've set up the nub in the BeOS, you can set up the cross-debugger on the Macintosh.

- 1 Double-click the cross-debugger. It's named **MW Debug XPPC-1.4.3d1**.

The cross-debugger is in the same folder as the IDE, if you followed the instructions in *Installing the BeOS*.

- 2 In the dialog box that asks you to select a SYM file, click Cancel.
- 3 Choose Target Preferences from the Edit menu and uncheck the "Automatically launch applications when SYM file opened" and "QC-aware" options. Then click OK.
- 4 Choose Cross-PPC Preferences from the Edit menu. If you're using an Ethernet network, click TCP/IP and type the IP address of the BeOS computer in the Address field and leave the "Port no" field set to 4712—unless you had to change the port in the Be nub. If you're using a direct serial connection, click Serial and click the button that matches the port the serial cable is connected to: Modem Port or Printer Port. Then click OK.

The cross-debugger is set up. You can leave it running, or quit it and restart it later, when you're ready to debug an application.

## Debugging Applications

Using the CodeWarrior symbolic debugger is explained in *Inside CodeWarrior*, the documentation available from Metrowerks. But in outline, the process of debugging a Be application is fairly simple.

- 1 Make sure you've set up the cross-debugger on the Macintosh and the nub in the BeOS, as described above.
- 2 Create a folder for your application in the BeOS. Put a copy of the resource file for the application in the same folder (if you've already created one) and give the resource file the same name as the application, but add the ".rsrc" extension.

Creating resources and resource files is described in "Creating Resources for a Be Application" on page 147.

- 3 Start the nub in the BeOS (if it's not already running), choose Settings from the MetroNub window, click the Files tab in the NubSettings window, and click Add. In the Add Program window that opens, type the name of your application and "Save" it in the folder you created in the previous step. Then close the NubSettings window.

**Note:** You must click in the Save panel's file name field to save a file in an empty folder.

Though no file is saved in the folder yet, "saving" in this way tells the nub where to save the file it receives from the cross-debugger on the Macintosh.

- 4 Compile your application using the CodeWarrior IDE on the Macintosh.
- 5 On the Macintosh, drag your application's symbol file onto the cross-debugger icon.

The application's symbol file has the same name as the application, but with an ".xSYM" extension. The code for your application is displayed in the cross-debugger windows.

- 6 Choose Run.

If there isn't a copy of your application in the folder in the BeOS you specified in the nub, the cross-debugger transfers a copy to the BeOS and starts to execute the program, stopping at the main() function. When the connection is established between the cross-debugger and the nub, the message in the MetroNub window in the BeOS changes from "Waiting" to "Connected."

- 7 Set breakpoints if you want them.

Places in your code where you can set breakpoints are indicated by a small dash in the column to the left of the code. Click a dash to set a breakpoint there—the dash turns to a red dot.

- 8 Choose Run again.

The cross-debugger starts the application in the BeOS, and the message in the MetroNub window changes from "Connected" to "Debugging."

- 9 When you're done debugging your application, choose your application's Quit command in the BeOS to quit it.

**Caution:** If you quit the nub while it's connected to the cross-debugger, you will crash the nub. Always quit the cross-debugger on the Macintosh before you quit the nub.

## Creating Resources for a Be Application

Once you have your application in the BeOS, you need to provide it a number of resources, including:

- Icons that represent the application and its documents
- A unique signature that identifies the application
- Other information that will inform the way the application starts (or “launches”) and the way it communicates with other applications

An application's resources are stored at the end of the executable portion of the application file. You can also store resources as separate files—with no required extension, though it's convenient to give them “.rsrc” extensions—so you can add them to an application when you need them. (Be application resources must be set up in the BeOS; you can't do it on a Macintosh. Be resources are not the same as a Macintosh resource fork.)

However, you don't have to recreate an application's resources each time you recompile the application. You can set them up once in a stand-alone file and leave them in the BeOS. When you recompile your application, you copy them into the new version of the recompiled application file (as described in “Adding Resources to Applications” on page 153).

You create and edit resources in either format—as parts of application files or as separate resource files—with the IconWorld application, as described in the next section. You also use three of the tools in **/bin** to list the resources in a file, remove the resources from a file, or copy the resources from one file to another, as described in “Adding Resources to Applications” on page 153.

## Using IconWorld

You create or open an application or resource file in IconWorld in a number of ways:

- Drag an application or a stand-alone resource file onto the IconWorld icon.
- First start IconWorld, then drag the icon for the application or resource file into the IconWorld window.
- Start IconWorld and use the Open command in the IconWorld window's File menu to open an application or a stand-alone resource file. (Note that the Open command opens the resource portion of a file, not the data portion. Therefore, it won't give you access to an image stored in a raw data file. To import a raw image into IconWorld, drag the file into the IconWorld window.)
- Start IconWorld and create the resources from scratch or by copying in raw image data.

If you open an application file in IconWorld, the icons and other resources you create are added to the end of the file when you choose Save, so the resources are assigned to that application. If you open a stand-alone resource file, the resources are simply stored in the file when you choose Save: They aren't assigned to an application until you add them to one. IconWorld's Save As command always creates a stand-alone resource file, even if you started by opening an application.

IconWorld can deal with only one application or resource file at a time; each time it opens an application or resource file, it closes the one it previously had open.

### Creating an Application-Information Resource

IconWorld has an App Info menu, which you can use to set up an application-information resource for an application. This resource is of type 'APPI' (for "application information"), hence the name of the first item in the menu—Create APPI. To create or edit resources for a new or existing application or resource file, make sure this item is checked in the menu (by choosing it if it isn't checked). None of the other items in the App Info menu have any effect unless Create APPI is checked.

After Create APPI, the menu has three sections:

- Choose a launch behavior for your application—Single Launch, Multiple Launch, or Exclusive Launch. If you don't make a choice, Single Launch is the default.
- Turn on the Background App flag if your application doesn't display a user interface, and Argv Only if doesn't respond to messages.
- Set the application's identifying signature. IconWorld expects the signature to be a constant formed from up to four concatenated characters, such as 'abcd' or 'SLiM'. If you type numerals, such as **7890**, the numbers will form the multicharacter constant '7890', not the integer 7,890.

To make sure the signature is unique, contact the Be Developer Support group (**DevSupport@be.com**). You will soon be able to register your resources on the Be Web site: **<http://www.be.com>**.

For documentation on launch behaviors and the other flags, refer to “Application Information” in the “Application Kit” chapter of *The Be Book*.

## Creating Icons

There are two ways to create icon resources using IconWorld. You can draw the icon in IconWorld, either from scratch or by modifying another icon, or you can import a raw bitmap file that was created elsewhere. The raw bitmap must be fully specified 24-bit color data.

Every icon must have both a large 32 pixel × 32 pixel version and a small 16 pixel × 16 pixel variant. The Browser lets users choose whether to view the larger icon or the smaller mini icon. It displays the larger one by default, but always uses the smaller one in list views in Browser windows and in Open and Save panels.

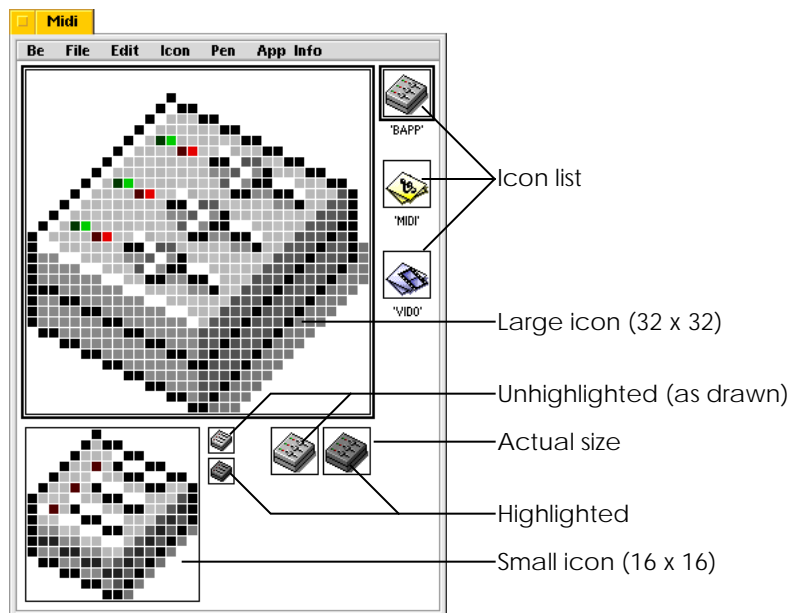
IconWorld assumes the drawing model discussed in “The Interface Kit” chapter of *The Be Book*. It would help to know something about that model—including high and low colors, patterns, and transparent pixels—before proceeding.

## Drawing Icons

The main IconWorld window has areas where you can draw both a large icon and its smaller counterpart. The icon pair is treated as a unit and share a single file type, as discussed below.

Along its right edge, the IconWorld window lists the icons and their file types. Only the larger icon of the pair is shown. When an icon in this list is selected, its large and small variants are displayed in the drawing areas. The list marks the current item by highlighting its border. (To start, before an application or resource file has any resources, an empty square is marked.)

Towards the bottom, the window displays the current icons, both large and small, in their actual sizes. It shows the icons as they are drawn and also as they will be highlighted by the Browser. Highlighting is accomplished by systematically darkening selected colors.





IconWorld displays three palettes you can use for drawing icons—one of colors, one of tools, and one of patterns.

- Patterns are combinations of the high color (called the “front” color by IconWorld) and a low color (called “back”) as explained in “The Interface Kit” chapter in *The Be Book*. The default pattern is the solid high color, but you can pick another from the Patterns palette.
- The Colors palette lets you choose the high and low colors for whatever pattern you pick. The primary mouse button sets the high color and the secondary mouse button sets the low color (initially, these are the left and right mouse buttons, but you can change that as described in “Mouse” on page 117).
- The Tools palette has tools for drawing icons and for selecting portions of what is drawn. They should be fairly self-explanatory. Try them out to see how they work.

IconWorld gives you a transparent background to draw on. Transparency doesn’t have a hue, so it’s displayed on screen as white (you can think of it as a clear sheet of plastic laid over a white surface). In the Colors palette, the transparent color is the white square located at the right bottom corner.

As you draw an icon, keep an eye on how it will be highlighted. You’ll notice that pixels that are truly white (opaquely white) become darker when highlighted, just like other colors, but transparent pixels remain transparent (they stay white).

In general, you’ll want the pixels around the outside boundary of the image to be transparent, and pixels inside—including those that are white—to be opaque (to have a true color). In this way, only the image will appear to be highlighted, not the background. If white portions inside the image don’t darken when the image is highlighted, they’ll appear to be transparent and not part of the image at all.

You can think of icons as being imaged in `OP_OVER` mode and placed over a white background, so that transparency always lets that white color show through.

### **Importing Icons**

You can also import images into IconWorld as 24-bit color bitmaps. Drag a raw data file into IconWorld's main window.

An easy way to create a raw 24-bit color bitmap is to use ResEdit or your favorite paint application on the Macintosh. After the icon is drawn, you need to paste it into a  $32 \times 32$  or a  $16 \times 16$  document in Adobe Photoshop, or any other program that can export 24-bit raw bitmap data.

When creating a new file in Photoshop, set both the width and height to 32 pixels for the larger icon or 16 pixels for the smaller, set the resolution to 72 pixels/inch, and select RGB Color mode.

Once the icon is in a correctly sized Photoshop document, choose Save As from the File menu, name your icon, choose Raw from the pop-up list, and click Save. Then in the dialog box that appears, type **0** in the Header box, click the Interleaved Order option, and click Save (the other options don't matter).

Repeat this process so you have one raw file for the  $32 \times 32$  bitmap and another for the  $16 \times 16$  bitmap.

After you transport the files to the BeOS, simply drag the files into the IconWorld window.

Although their colors will be adapted to the Be color map, IconWorld should display the images as you drew them. However, it interprets all white pixels as being transparent. Look at the way the image will be highlighted; everything that's white stays white. White areas inside the image will appear to be part of the background, as holes you can see through. If there are truly white areas inside the image, you'll need to repaint them with a shade of opaque white chosen from the Colors palette.

### **Setting File Types**

When you save an application or resource file, IconWorld installs both the large and small icons in resources (of type 'ICON' for the large icon and 'MICN' for the mini icon).

If the icon represents the application itself (if it should be displayed for the executable file), its type should be 'BAPP'. If the icon represents a kind of document or other file that the application creates, its type should be identical to the type the application

assigns to those files. Types and application signatures are assigned to files by calling BFile's `SetTypeAndApp()` function. See the BFile class in "The Storage Kit" chapter of *The Be Book* for details.

Each saved icon needs to be associated with a file type (not to be confused with the 'ICON' and 'MICN' resource types). The Browser uses the icon to represent files of that type. The file type is a multicharacter constant that, along with the application's signature, uniquely identifies files belonging to the application. The constant is formed from four concatenated characters; you can type these characters in the space beneath the icon in the list along the right side of main window.

For example, the document type for the Edit application is 'TEXT'. The Midi application associates its files with the 'MIDI' type. These types are local to the application—they have meaning only within the scope of the application's signature. Only the signature needs to be unique between applications.

## Adding Resources to Applications

You add resources to an application in one of three ways:

- Open the application itself in IconWorld and create or edit its resources. Then choose Save. The resources are added to the end of the application file, replacing any resources that were there to begin with.
- Create or edit resources in IconWorld and then use the Save As command to name and save the resources in a stand-alone resource file. Then in a Terminal window, type:

```
copyres resourcefile application
```

to copy the resources in *resourcefile* into the *application* file (replacing any existing resources).

- Have BeIDE or the Metrowerks cross-debugger add the resources to the application for you: Use IconWorld to create a resource file, and use the Save As command to save a resource file with the same name as the application, but with the “.rsrc” extension. Place the file in the same folder where you saved your application with BeIDE or where the cross-debugger transfers the application you developed on the Macintosh. Then each time you compile and link your application with BeIDE or use the cross-debugger, the resources are copied from the resource file to the application.

You can use **copyres** to copy resources from any application or resource file into any other application or resource file. Simply type **copyres file1 file2**, where *file1* contains the resources you want to copy and *file2* is the file to which you want to add the resources. If *file2* already has resources, they’re replaced. If *file2* doesn’t exist, **copyres** creates a resource file with that name. If you use the **-a** flag with **copyres**, a copy of the resources in *file1* are appended to the existing resources in *file2*, only replacing *file2* resources if the same resources are in *file1*.

Two other applications in **/bin** are useful when working with resources: **listres** and **stripres**. In a Terminal window, type **listres filename** to view a table of the resources in *filename*. Type **stripres filename** to remove all resources from *filename* and store them in a stand-alone resource file named *filename.rsrc*.

## Getting the Icons to Be Recognized

When you add resources to an application, the Browser should immediately display your application with its new icons. However, a known bug sometimes prevents it from doing this. To force the Browser to display the new icon, open a Terminal window, **cd** to the folder that contains the application, and enter **setfile** followed by the name of the application.

## Using the Be Debugger

The Be debugger lets you examine and alter the state of a running (or crashed) application. The Be debugger displays assembly language instructions. See “Using the Cross-Debugger” on page 143 for information on the Metrowerks symbolic debugger.

In order to be debugged, an application must be accompanied by a symbol file. Symbol files, which are distinguished by their “.xMAP” extensions, are created automatically when you compile your applications (they’re created by the `mwld` program). When you copy your application into a folder in the BeOS, be sure you copy the application’s symbol file into the same folder.

### Entering the Debugger

There are two ways to enter the debugger: You can fall into it, or force your way in.

- To fall into the debugger, your application must crash. Or, put more intelligibly, when an application crashes, it automatically enters the debugger. You can declare exceptional cases in your own code by using the `debugger()` function defined in the Kernel Kit or the `ASSERT()` and `DEBUGGER()` macros defined by the Support Kit. See the Kernel Kit and Support Kit documentation in *The Be Book* for details.
- To force your way into the debugger, you launch the `db` program. Normally, you launch `db` from the command line (you can also launch `db` by double-clicking its icon in a Browser window—it lives in the `/bin` folder). Launched from the command line, `db` accepts an argument that names the application that you want to debug. For example, to debug the MyApp application, you would launch `db` as follows:

```
$ db MyApp
```

If MyApp is already running (and is a single-launch-only application), the debugger will “attach to” the running application. Otherwise, `db` causes a new image of the application to be launched and then takes over.

The argument to `db` can also be a thread identifier. For example, let’s say MyApp is running and the ID of its main thread is 87 (information that you got from running `ps`). To attach to the thread, we invoke `db` thus:

```
$ db 87
```

## Debugger Windows

When you enter the debugger, a new Terminal-like window appears. The title of the window will look something like this:

```
Team 40 Debug 2
```

**Team 40** signifies that the team that's being debugged is team 40. A team is the group of threads that belong to the same application (see the thread documentation in the Kernel Kit chapter of *The Be Book* if you need a more detailed description of teams). **Debug 2** is simply an identifier for the window.

The team designation implies that the scope of the debugging process is teamwide. And so it is: Even though you may have invoked the debugger by telling it to attack a specific thread, the debug process that's running in a particular window has access to all the threads that belong to the designated team. You can switch between the threads in the team through debugger commands, as explained in a later section.

Each team that you debug is presented in its own window, and in only one window. If you separately invoke **db** on each of two threads that belong to the same team, the second invocation will “appear” in the window that was produced by the first invocation.

## Using the Debugger

A debugger window displays, initially, the assembly code instruction to which the debugger is currently “pointing.” The pointed-to instruction will not yet have been executed. (The format of the instruction display is described in the section “Instruction Display” on page 158.)

Immediately below the instruction display is the debugger prompt. The prompt displays the name of the thread that you're debugging, followed by a colon. For example, if you're debugging MyApp's main thread, the prompt would look like this:

```
MyApp:
```

To this prompt you type commands that let you examine and manipulate your application. The section “The Commands” on page 159 lists and describes all the debugger commands that are currently implemented.

## Conventions

Some debugger commands take arguments; typically, these arguments are address or data values. The following rules apply to the interpretation of the values that you pass to the debugger (in the following examples, the debugger prompt is shown as `db:`):

- Numeric values are taken as hexadecimal. For decimal interpretations, prepend `#`. For example, `#16` (decimal 16) is the same as `10` (hexadecimal 10).
- Numeric values can be arithmetic expressions. `db` knows how to add, subtract, divide, and multiply, and can group expressions.
- An expression without a command displays the value in hexadecimal, decimal, and as a string.
- Register identifiers (`r0...r31`, `pc`, `lr`, and so on) can be used in expressions. Also, register values can be set directly. For example:

```
db: pc = 800003b0
```

sets the program counter to the instruction located at the absolute address `0x800003b0`.

- Symbols can be used in expressions. `db` performs autocompletion on unambiguous partial symbol names.
- Symbol names that look like hexadecimal numbers can be distinguished with a backquote; for example,

```
db: `abc
```

finds the symbol `abc`, not the number `0xabc`.

- The most recently entered address is represented by a dot ( . ). For example,

```
db: i1 80000248 #4
...
db: i1 . #8
...
db: i1 . #16
...
```

displays, successively, four, eight, and sixteen instructions starting at address 0x80000248.

- The circumflex character ( ^ ) following an address performs indirection.

### Instruction Display

The output of commands that display instructions follows this format:

```
function:
+offset:hexDumpoparg1, arg2, ..., argN
```

The ingredients are:

- *function* is the name of the function that the thread (the thread that the debugger is examining) is currently executing.
- *offset* is the location of the current instruction, given as a hexadecimal offset into the function.
- *hexDump* is the instruction itself, encoded as a hexadecimal machine instruction.
- *op* and *arg1, arg2, ..., argN* is the instruction presented in a more readable form. *op* is the instruction's assembly language operator (such as **lwi**, **addi**, **bc**, and so on). The *arg* values are the operator's arguments.

If the instruction's location isn't within 64 K of a recognizable symbol, the *function:* line is omitted, and the instruction's absolute address is given (in place of the *+offset* value).



## The Commands

### General Commands

<u>Command</u>	<u>Meaning</u>
<b>h</b>	Help; display the list of <b>db</b> commands.
<b>cv</b> <i>value</i>	Convert <i>value</i> from decimal to hex, or from hex to decimal (as <i>value</i> does or doesn't have a prepended #).
<b>a</b>	Repeat the previous command verbatim.
<Enter>	Continue the previous command. (Exactly what "continuing" means depends on the command.)
<b>es</b>	Exit to Shell; attempts to exit the current application (which can be perilous).
<b>exit</b>	A synonym for <b>es</b> .

### Displaying and Setting Memory, Registers, and Symbols

<u>Command</u>	<u>Meaning</u>
<b>dm</b> <i>address count</i>	Display <i>count</i> bytes of data starting at the given address.
<b>sm</b> <i>address value</i>	Set the data at the given address to <i>value</i> .
<b>db</b>   <b>dh</b>   <b>dw</b> <i>address</i>	Display <i>address</i> as a byte, half-word, or full-word.
<b>sb</b>   <b>sh</b>   <b>sw</b> <i>address value</i>	Set <i>address</i> as the byte, half-word, or full-word given by <i>value</i> .
<b>wh</b> <i>address</i>	Tell where <i>address</i> is (as an offset into a function or a portion of memory, for example).
<b>regs</b>	Display the contents of the CPU registers.
<b>set</b> <i>symbol value</i>	Set the value of <i>symbol</i> . You can use this command to create new symbols.

## Using the Be Debugger

<u>Command</u>	<u>Meaning</u>
<code>sd <i>prefix</i></code>	Symbol dump; display the symbols whose names start with <i>prefix</i> (case insensitive).
<code>svd</code>	Display all symbols, but in order of their values.
<code>smd <i>prefix</i></code>	Symbol method dump; display the symbols whose method names start with <i>prefix</i> .

## Displaying Frames and Instructions

<u>Command</u>	<u>Meaning</u>
<code>sc</code>	Stack crawl; list the frames on the stack.
<code>il <i>address</i> [ <i>count</i> ]</code>	List <i>count</i> instructions starting at <i>address</i> ; <i>count</i> defaults to 5.
<code>ip [ <i>address</i> ]</code>	List a page of instructions starting at <i>address</i> ; the argument defaults to <code>pc - 20</code> .

*Stepping and Breaking*

<u>Command</u>	<u>Meaning</u>
<b>s</b>	Step one instruction.
<b>so</b>	Step one instruction without entering a function call.
<b>t</b>	Same as <b>so</b> .
<b>g</b>	Go; continue without stopping until the program hits a breakpoint (or exits).
<b>gt <i>address</i></b>	Go to; continue until the instruction at <i>address</i> is met. (This creates a one-shot breakpoint.)
<b>mr</b>	“Magic Return”; runs until returned from the saved return address in the current frame (usually the current function, unless it is a “leaf” routine with no stack frame).
<b>br [ <i>address</i> ]</b>	Set a breakpoint at <i>address</i> . Without the argument, this displays all breakpoints.
<b>cb <i>address</i></b>	Clear the breakpoint at <i>address</i> .
<b>cab</b>	Clear all breakpoints.

*Accessing Other Threads in the Team*

<u>Command</u>	<u>Meaning</u>
<b>ps</b>	Display information about the threads in this team.
<b>nx</b>	Switch to the “next” suspended thread in the team.
<b>stch</b>	Toggle the “stop-child” state. If child stopping is on, threads that are (subsequently) spawned by this thread are suspended at their first instruction. A spawned thread assumes the stop-child state of its parent.

*Using the Be Debugger*

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# A Creating Screen Dumps

You can capture images of the BeOS screen (“screen dumps”) and open them in the ImageViewer application. You can also convert the screen dumps you create into a format that’s understood by Adobe Photoshop and other applications.

## Capturing a Screen Dump

To capture a screen dump, press the Print Screen key (labeled “Print Screen” or “F13” on most keyboards). This saves a Be ImageViewer file with an image of the screen in the root folder of the boot disk. The first dump you capture in this way is named **screen1**, the second **screen2**, and so on. You can double-click these files to view them in ImageViewer.

The size of the screen dump matches the resolution of the screen: 640 × 480, 800 × 600, and so on (for more information on setting the screen resolution, see “Screen” on page 125).

## Converting a Screen Dump to Raw Format

If you want to work with a screen dump or other ImageViewer file on a Macintosh, you can save it in a raw format, which you can open in Adobe Photoshop and other image-editing applications.

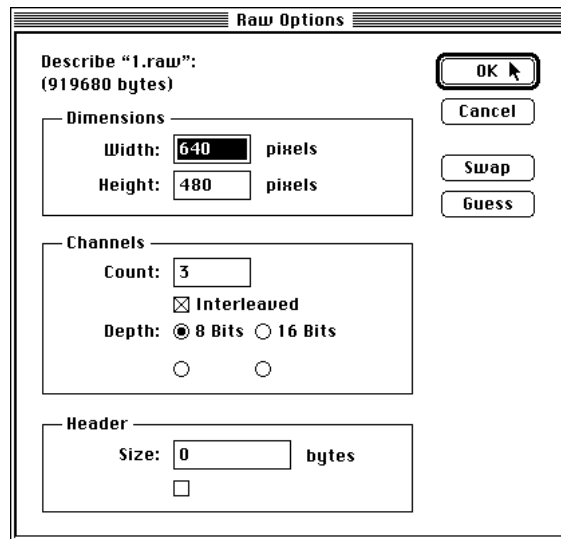
To convert an ImageViewer file, double-click it to open it in the ImageViewer application. Then choose the Export to 24 Bits command from the ImageViewer window's File menu. This saves a raw version of the file in the root folder of your boot disk, with the name **screen.raw**.

## Opening a Raw ImageViewer File in Photoshop

Once you've converted an ImageViewer file to raw format, you can use **ftp** or **tar** to move it to a Macintosh (for more information, see Appendix B, "Transferring Files to and from the BeOS").

When the raw file is on the Macintosh, start Photoshop, choose Open from its File menu, and double-click the file you want to open.

In the dialog box that appears, enter the width and height in pixels that matches the resolution of the BeOS screen when you created the screen dump: 640 × 480, 800 × 600, and so on. Enter 3 in the Count field and make sure Interleaved is checked and the Depth is set to 8 Bits. Then click OK.



The Be file opens in Photoshop, where you can edit it, save it in other formats, and do any other work you want.

*Opening a Raw ImageViewer File in Photoshop*



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# B Transferring Files to and from the BeOS

You can transfer files to and from the BeBox and a Macintosh or other computer in a number of ways: Over a network or serial cable with **ftp**; with a floppy disk using **tar**; or from the MacOS to a Be hard disk using the Be File System Tool.

## Using **ftp**

You can use **ftp**, the “file transfer protocol” utility, to transfer files between a Macintosh (or any other computer that can run **ftp**) and the BeOS. To use **ftp** in the BeOS, you need to establish a connection with an Ethernet network (as described in “Network” on page 118), or connect a null modem cable between the computer running the BeOS and another computer.

**ftp** software is part of the BeOS, but you need to obtain **ftp** software for the Macintosh or other computer you want to exchange files with. There are a number of **ftp** packages available for the Macintosh. One good one, called Netpresenz (the successor to another good program, called FTPd), is available as “shareware” from a number of **ftp** and World Wide Web sites on the Internet. (Shareware is software you can download and try out for free, but if you decide to keep it, you pay a small fee to its author.) Netpresenz makes it possible to get files from a Macintosh using **ftp** on another computer. Another good shareware application is Anarchie. Anarchie makes it possible to get files from another computer that can host an **ftp** session. To find an Internet site where you can get

a copy of Netpresenz and Anarchie, visit **ftp.share.com/peterlewis** (an ftp site) or **http://www.share.com/peterlewis** (a Web site).

You start **ftp** in the BeOS by double-clicking the Terminal application (in **/apps**) and in the window that opens, typing **ftp** followed by the IP address of the computer you want to connect to. If you have a DNS server on your network, or if you've set up a **/system/hosts** file, you can use the names and aliases in that file instead of the address:

```
ftp hostname
```

If **ftp** can find the other computer on the network and establish a connection, **ftp** displays a message such as:

```
Connected to hostname.node.com
220 Peter's Macintosh FTP daemon v2.2.0 awaits your command.
```

**ftp** then asks you to log in to the other computer:

```
Name (default hostname:default username):_
```

Supply your name as you're known on the other computer and press Enter. **ftp** then asks for a password, if required:

```
Password: _
```

The password you supply here is the one that you use on the other computer.

After the password is verified, you can transfer files between the two machines. To do this, you type **ftp** commands at the prompt.

The first command you should type is **help**:

```
ftp> help
```

This lists all the commands **ftp** recognizes. For more help on a specific command, type **help command**:

```
ftp> help cd
cd          change remote working directory
ftp>
```

When examining the commands, keep in mind that the *local* computer is the one running the BeOS; the *remote* computer is the one on the other end of the Ethernet or serial cable.

Among the most commonly used commands are:

<b>bin</b>	To transfer files in binary mode (required for the Macintosh)
<b>cd</b>	To change directories on the remote machine
<b>ls</b>	To list the contents of remote directories
<b>get</b>	To retrieve a single file from the remote machine
<b>mget</b>	To retrieve more than one file
<b>put</b>	To transfer a file to the remote machine
<b>mput</b>	To transfer more than one file
<b>prompt</b>	To use <b>mget</b> or <b>mput</b> for many files, without approving each file
<b>quit</b>	To end the <b>ftp</b> session

For example, to transfer the files **MyApp** and **MyApp.xMAP** from the **Projects** folder on the Macintosh to the **MyAppProject** directory on the BeBox:

```
ftp> bin
200 Type set to I, binary transfer mode [macbinary disabled].
ftp> lcd /MyAppProject
Local directory now BeHardDisk:/MyAppProject
ftp> cd /MacHardDisk/Projects
250 "/MacHardDisk/Projects" cd successful.
ftp> prompt
Interactive mode off.
ftp> mget MyApp*
local: MyApp remote: MyApp
200 PORT command successful.
150 Binary transfer started (144k).
226 Transfer complete.
146693 bytes received in 1.63 seconds (89775 bytes/sec)
local: MyApp.xMAP remote: MyApp.xMAP
200 PORT command successful.
150 Binary transfer started (70k).
226 Transfer complete.
71282 bytes received in 1.28 seconds (55515 bytes/sec)
```

## Using suntar

If you have a Macintosh and BeBox but they aren't connected to an Ethernet network or with a null modem cable, you can use the `tar` utility to transfer files via floppy disk. `tar` is included with the BeOS, but you need to obtain a copy of `suntar`—the free Macintosh `tar` utility. You can download `suntar` from <http://www.be.com> (the Be Web site) or <ftp.be.com/pub/OtherUtilities> (on the Be ftp site).

In `suntar`, you can do everything you need to do using the commands in the Write menu:

- 1 Choose “Create new tar archive” from `suntar`'s Write menu.

A dialog box prompts you to insert a disk.

- 2 Choose the “Write data fork...” command (Macintosh resource forks are of no use in the BeOS). In the dialog box that appears, select the file you want to transfer and click Open. Or click Write Folder to write all the files in the current folder, or Write Selected Files to open a dialog box where you can select more than one file.

You can choose “Write data fork...” as many times as necessary to put everything you want into the archive.

- 3 Choose the “End of writing” command and quit `suntar`.

The disk is ejected.

- 4 In the BeOS, double-click Terminal (in `/apps`), insert the disk, and type:

```
tar xv
```

The files in the archive are copied to the BeOS.

## Using the BeOS File System Tool

If you're running the BeOS on a Power Macintosh computer, you can use the BeOS File System Tool in the MacOS to transfer files to and from the MacOS and the BeOS. The BeOS File System Tool is in the Macintosh hard disk's **BeOS Tools** folder, which you copied from the *BeOS* CD-ROM as described in *Installing the BeOS*.

When you start the BeOS File System Tool, it opens a window where you type commands. You can use the Be File System Tool to copy files from the Macintosh disk to the BeOS disk, and vice versa. You can also use the tool to rename or delete files on the BeOS disk, to view the contents of directories on the disk, and to create and remove directories.

If you only have one BeOS disk (or disk with a BeOS partition), the BeOS File System tool assumes you want to transfer files to and from it. If you have more than one BeOS disk, you need to tell the BeOS File System Tool which one you want to work with.

Type **use** to see what disk the BeOS File System Tool is currently working with. Type **disks** to see a list of the BeOS disks available. To set the disk you want to work with, type **use x y**, where *x* is the bus number and *y* is the SCSI ID of the disk you want to work with (0 is the number of the bus that internal drives are typically connected to).

It's easiest to copy files from the Macintosh disk if they're in the same folder as the BeOS File System Tool itself. When referring to a file on the Macintosh disk, put a colon (:) in front of it. For example, to copy a file named **file1** that's in the same folder as the BeOS File System Tool to the root folder on the BeOS disk, enter:

```
copy :file1 file1
```

Enter **help** for details on the this and the other commands you can use with the BeOS File System Tool.

When you quit the BeOS File System, you're asked if you want to save the text in the window. Click save to save the text in a text file.

*Using the BeOS File System Tool*

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# C Troubleshooting

If you're having trouble with the BeOS or the computer you're running it on, you may be able to narrow down or even fix the problem by reviewing the symptoms and suggestions in this appendix. If the suggestions in this appendix fail to solve the problem, contact Be customer service at [custservice@be.com](mailto:custservice@be.com).

## Trouble Booting

### Utter Darkness

**Check that you have a working power outlet:** Unplug the computer and plug in something a lot simpler, like a lamp. If the power outlet is controlled by a switch, make sure the switch is turned on.

**Check that the voltage switch is set correctly for your area:** On a BeBox, the voltage switch is a small sliding switch next to the BeBox power switch, as described in the *BeBox Owner's Guide*. If you have another kind of computer, see its owner's guide for more information.

## **Sound but No Light, or Vice Versa**

**Check that all cables and cards are firmly connected:** Following the instructions in the computer's owner's guide, make sure that all cables, cards, SIMMs, and other components are firmly seated in their connectors and slots and that all external cables and the power cord are securely connected to the correct ports.

**Watch that memory passes the memory test:** Most computers perform a memory test when you turn them on. The BeBox tries writing to and reading from each pair of installed SIMMs. As it tests writing to a pair of SIMMs, the left LED array on the front of the BeBox illuminates in a rising and falling pattern; as it tests reading from a pair of SIMMs, the right LED array illuminates in the same way. If you don't see this LED pattern, first check that all SIMMs are firmly seated in their sockets. Then try swapping out SIMMs to see if you can identify a bad one. Power Macintosh and compatibles also perform memory tests at startup—see your computer's owner's guide for details.

**Check that all the cards you added are compatible with the BeOS:** Revisit your owner's guide, installation instructions, "Release Notes," and the Be Web site (<http://www.be.com/products>) to make sure the cards and other devices you've added to your computer are the exact models supported by the BeOS.

**Make sure SCSI disks are correctly terminated and don't have ID conflicts:** Review the instructions in your computer's and disks' owner's guides to make sure each SCSI device has a unique SCSI ID and is terminated (or not terminated) correctly.



**Use the boot selection screen to check for bootable disks:** To open the boot selection screen on a BeBox, hold down any key immediately after you turn it on. To open the BeOS boot selection screen on a Macintosh, hold down the Option key immediately after you double-click BeOS Launcher on a Power Macintosh. The boot selection screen lists all disks it can find that contain a plausible **/system** folder, as described in “Selecting a Boot Disk” on page 4.

**Watch for disks to be recognized on a terminal:** Connect a terminal to your computer, as described in “Connecting a Terminal” on page 177, and watch for messages about disks being found.

**Check the contents of the floppy and CD-ROM drives:** The BeOS tries to boot from a floppy and then a CD-ROM drive if it can find anything resembling a functional **/system** folder on one of them.

**Try using a default screen setting:** You can force the BeOS to revert to the default screen settings when booting if you hold down the spacebar as soon as the Be logo disappears. Or if you’re already booted but the screen is a mess, press Command-Control-Shift-F12, using the modifier keys on the left side of the keyboard, to force the BeOS to revert to default screen settings.

## **Rebuilding the Database**

If the BeOS boots but the Browser never starts, you may have a corrupted Be database. You can rebuild the database by selecting the “Erase their databases” option in the boot selection screen (for more information on the boot selection screen, see “Selecting a Boot Disk” on page 4).

**Caution:** Rebuild the Be database only as a last resort. Rebuilding the database erases all information you’ve added to it: You lose all your e-mail, your window layouts, your arrangement of icons on the dock, your database of audio CDs, and all other information you’ve stored in the Be database.

## Trouble after Booting

**An unpleasant window with “Team” in the title opens:** This is the Be Debugger window. It opens when an application crashes. If you wrote the application, refer to “Using the Be Debugger” on page 155. If you didn’t write the application, try typing **es** and pressing Enter to close the Debugger window and to quit the crashed application cleanly. Then it’s usually a good idea to save any open files and restart the BeOS.

**An application goes south, but others don’t seem affected:** You can force an application to die a violent death. If you have a PC keyboard, hold down the keys labeled “Ctrl,” “Alt,” and “Shift” on the right side of the keyboard while you choose the application from the application list. If you have a Macintosh keyboard, press the Command, Option, and Shift keys while you choose the application from the application list. Then it’s usually a good idea to save any open files and restart the BeOS.

**The BeOS freezes up:** You have to restart the BeOS. If you have a PC keyboard, first try pressing the keys labeled “Ctrl,” “Alt,” and “Del” at the same time. If you have a Macintosh keyboard, try pressing Command, Control, and the key labeled “del” above the arrow keys. If that doesn’t work, reset the computer by pressing the Reset and Interrupt buttons at the same time on a BeBox, or the Reset button on a Power Macintosh, as described in “Resetting the BeOS” on page 7.

**When you try to shut down or restart, a panel informs you that an application isn’t responding:** This usually happens when an application has crashed, though it can be because an application is actually still finishing something you asked it to do. When you get tired of waiting, click Blow It Away in the panel.

**An application that uses the new Game Kit crashes:** The creator of the Game Kit included an escape hatch for rogue games: Press Command-Control-Shift-F12, using the modifier keys on the left side of the keyboard, to escape from the game.

## Connecting a Terminal

On a BeBox, the BeOS system software and applications send information out serial port 4 if you hold down the F1 key on the keyboard for a few seconds after turning on the BeBox. On a Macintosh, the BeOS and applications send information out the Modem port if you hold down the Delete key for a few seconds after you double-click BeOS Launcher.

You can see these messages if you have a computer or terminal with a serial port that you connect to serial port 4 on the BeBox or the Modem port on a Power Macintosh using a null modem cable. Set the terminal's communications parameters to 19,200 baud, 8 data bits, no stop bits, and no parity.

**Note:** The messages applications send out the serial port are often misleading and alarmist; many of them were written by people for whom English is not their first language. So it's best to take what you see on a terminal with a grain of salt.

*Connecting a Terminal*