# Be User's Guide

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# Introduction

This preliminary draft of the *Be User's Guide* accompanies Developer Release 8 of the Be™ operating system: DR8 of the BeOS.™ This guide shows you how to set up a BeBox,™ it teaches you the basics of the BeOS, the Be user interface, and the Be applications, and it introduces you to the process of developing Be applications.

- Chapter 1, "Assembling the BeBox," shows you how to assemble the BeBox and connect a variety of internal and external devices to it.
- Chapter 2, "Learning BeOS Basics," teaches you the basics of working with the BeBox and the BeOS, including turning it on and off, using the keyboard and mouse, and managing your files.
- Chapter 3, "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 4, "Using Be Applications," provides instructions for using most of the applications that come with the Be software.
- Chapter 5, "Customizing the BeOS," shows you how to configure the BeOS and to set your preferences for a number of its features. It also shows you how to add files, such as TrueType™ fonts, that add functionality to the BeOS.
- Chapter 6, "Developing Be Applications," introduces you to BeIDE, the Be development environment, and the procedures you use to develop and debug Be applications.
- Chapter 7, "The BeBox Ports," provides diagrams, pin-out tables, and other technical information about the many BeBox ports, from the industry-standard disk drive connectors to the unique Be GeekPort.™

- 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 BeBox and the BeOS and offers some suggestions for solving them.

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

- *Installing Developer Release 8 of the BeOS*, the booklet that accompanies this user’s guide.
- *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.

# 1 Assembling the BeBox

The BeBox comes in a number of configurations, but at a minimum, you need:

- A PC or Microsoft keyboard with 101 or more keys
- A PS/2 or serial mouse
- A high-quality “multisync” monitor
- A PC floppy disk drive
- An IDE or SCSI hard disk drive
- A graphics card (for a list of compatible cards, see “Adding a Graphics Card” on page 5)
- 8 megabytes of RAM
- For software installation, a SCSI CD-ROM drive
- An NE2000, 3Com 3C503, DEC 21040, DEC 21041, or compatible network adapter (if you want to connect the BeBox to an Ethernet network)

This chapter shows you how to assemble a BeBox with these and other devices. For details on the connectors and ports both inside the BeBox and on the back panel, see Chapter 7, “The BeBox Ports.”

# Adding Internal Devices

To add memory, a graphics card, a network adapter, or internal disk drives, you need to open the BeBox.

## Opening the BeBox

Opening the BeBox is easy:

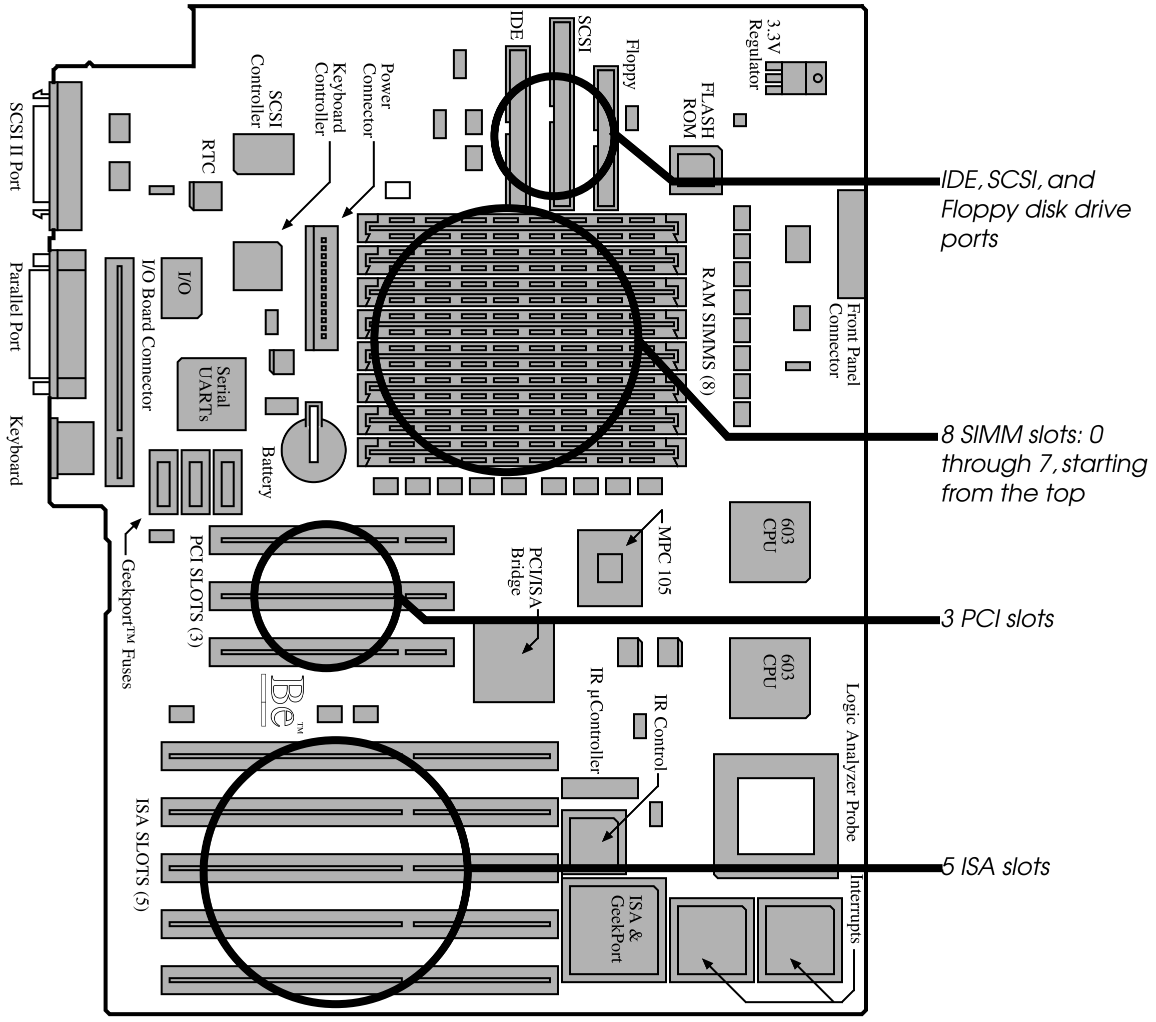
1. Make sure the BeBox isn't plugged in and you don't have any devices connected to the external ports.
2. Unscrew the two thumbscrews on either side of the back panel.
3. Move the cover forward about two inches and then lift it up and off the internal chassis.

## Working Inside

Once the cover is off, it's easiest to add devices to the inside of the BeBox if you set it flat on its side, with the large opening facing up.

If the back panel is to your left, you can see the steel housing of the power supply on the upper left, next to the back panel. The drive bays are to the right of the power supply: One bay hangs from the top of the BeBox, the other is connected to the front. The *motherboard* is the large circuit board on the bottom, with the I/O board plugged into it perpendicularly, on the left side.

The motherboard has slots for 3 PCI cards, 5 ISA cards, IDE drives, SCSI drives, floppy disk drives, and 8 SIMMs (Single In-line Memory Modules). Take a moment to find these connectors on the motherboard, using the following diagram:


SCSI II Port
Parallel Port
Keyboard
SCSI Controller
RTC
Keyboard Controller
Power Connector
IDE
SCSI
Floppy
3.3V Regulator
FLASH ROM
I/O
I/O Board Connector
Serial UARTs
Battery
RAM SIMMS (8)
Front Panel Connector
MPC 105
603 CPU
603 CPU
PCI/ISA Bridge
PCI SLOTS (3)
Geekport™ Fuses
Be™
IR μController
IR Control
Logic Analyzer Probe
ISA SLOTS (5)
ISA & GeekPort
Interrupts

IDE, SCSI, and Floppy disk drive ports

8 SIMM slots: 0 through 7, starting from the top

3 PCI slots

5 ISA slots

The BeBox Motherboard

### Adding Memory

You can add up to 256 MB of RAM to the BeBox by inserting identical pairs of 2, 4, 8, 16, 32, 64, or 128 MB, 60-nanosecond or faster, 72-pin SIMMs in memory slots 0 and 1, 2 and 3, 4 and 5, or 6 and 7.While each pair of SIMMs must be made up of identical twins, no two sets of twins must be alike: For example, you could insert 32 MB SIMMs in slots 0 and 1 and 2 MB SIMMs in slots 2 and 3. Add SIMMs to the slots in order—start with slots 0 and 1 and don't leave a gap between the slots. The BeBox can use parity SIMMs, but it doesn't yet support parity-checking.

To add a SIMM module, start with the top empty SIMM slot (the one with the lowest number). With the notch on the SIMM's connector edge to the left (nearer the back panel), slide the SIMM into the slot at a 45-degree vertical angle—that is, with the connector edge of the SIMM closer to the top of the BeBox than the edge nearer to you. When the SIMM is all the way into the slot, lift up the edge nearer you so the SIMM snaps into place (it's held in the slot by a pair of metal clips).

To remove a SIMM module, start with the bottom SIMM (the one in the slot with the highest number). Release the SIMM by pushing the two metal clips away from the SIMM while gently pushing down on the edge of the SIMM. When it's free from the clips, lift it out.

### Inserting ISA and PCI Cards

You can add up to 5 ISA and 3 PCI cards to the BeBox. The ISA and PCI slots are on the motherboard, as shown in the diagram on page 3. You can insert cards in any slot: Order and slot number make no difference.

1. Unscrew the metal plate that covers an unused slot's opening through the back panel. Save the screw—you'll need it in a moment.

   Store the metal plate someplace safe, in case you ever remove the card from the slot. The plate helps keep dust out of the BeBox and reduces electromagnetic interference.

**2** Insert the card in the slot.

It's best to start by lining up the gold "fingers" on the connecting edge of the card with the slot, and the metal connector plate with the opening through the back panel. Make sure the card is started into the slot correctly. Then firmly push the card all the way into the slot.

**3** Replace the screw you removed in step 1.

The screw keeps the card from coming loose, particularly when you're connecting a cable to the card.

### Adding a Graphics Card

Currently, the BeBox works with a number of PCI graphics cards based on graphics chips manufactured by Cirrus Logic and S3. You can insert a graphics card into any one of the three PCI slots.

For the most current list of supported graphics cards, visit the Be products area on the Be web site (**http://www.be.com/products**).

At the time this guide is being written, you can use any graphics card based on the Cirrus 5430, 5434, 5436, and 5440 family of chips. For example, the BeBox has been tested with the Orchid Kelvin 32 (based on the 5430), the Orchid Kelvin 64 (based on the 5434), the Diamond SpeedStar Pro SE (based on the 5430), and the STB Nitro 64 (based on the 5434). Cards that are based on the Cirrus 5434 or 5436 and have 2 MB of RAM can display the BeOS with 8 or 32 bits of color data per pixel. Cards that are based on the other two Cirrus chips or that only have 1 MB or RAM can display the BeOS with 8 bits of color data per pixel.

You can also use a graphics card based on the S3 Vision 864 (combined with the ATT21C498 RAMDAC chip) and S3 Vision 964 (combined with the TVP3025 RAMDAC chip). For example, the BeBox has been tested with the #9 GXE64 (based on the Vision 864) and the #9 GXE64 Pro (based on the Vision 964). With 2 MB of RAM, these cards display the BeOS with 8 or 32 bits of color data per pixel. With 1 MB of RAM, the #9 GXE can display the BeOS with 8 bits of color data per pixel.

You set the number of colors per pixel, the resolution (the number of pixels on the screen), and other settings for how the BeOS is displayed with the Screen preferences application. See “Screen” on page 135.

Third-parties are writing drivers, so you can expect to see support for more graphics cards soon. For more information about writing drivers, see *The Be Book*, the “ReadMe” file that accompanies the S3 sample project (**/develop/projects/s3/ReadMe**), and the Be web site (**http://www.be.com**). The “ReadMe” file also provides additional information about features supported by cards based on S3 chips.

### Adding a Network Adapter

You can add one or more Ethernet network adapters to the BeBox. With a network connection, you can use the **ftp** and **telnet** utilities to connect to other computers on a network and transfer files. If the Ethernet network has a connection to the Internet, you can even surf the world-wide web.

You use the Network preferences application to configure the BeBox to use the network adapters you add. You can also use Network to configure the BeBox to communicate with another computer using a modem or a direct serial connection. See “Network” on page 128.

Three kinds of Ethernet network adapters work with the BeBox: The NE2000, 3Com 3C503, and the DEC 21040 or 21041. You can also use any of the many models of network adapters that are compatible with the NE2000.

Most ISA network adapter cards come set to IRQ 3 and I/O port 300. The BeBox serial ports use IRQ 3, so you must change the network adapter’s IRQ before you install it. The default value in the Be networking software is IRQ 5 and port 300, but you can use IRQ 5, 9, 10, 11, 13 or 15 and I/O port 220, 240, 280, 2A0, 2C0, 300, 320, 340, or 3C0. If you add more than one network adapter, you must set each to a unique IRQ and I/O port.

For information on changing network adapter settings, see the owner’s guide that came with the adapter.

### Adding an Internal Disk Drive

The BeBox has two internal *drive bays*—metal frames where you can mount disk drives. One drive bay hangs from the top of the BeBox's internal chassis, the other bay is connected to the front. You can mount up to two 3.5-inch drives in the top bay. You can mount a floppy disk drive in the bottom section of the front bay, plus either one full-height 5.25-inch or two half-height drives in the front bay. If you have the appropriate mounting brackets, you can also mount 3.5-inch drives in the 5.25-inch area of the front bay.

You add an internal disk drive by removing a bay, mounting the drive in the bay, replacing the bay, and then connecting the drive to the motherboard.

### Removing a Drive Bay

1. Disconnect any cables connected to drives already mounted in the bay you want to remove.

2. Remove the screws that hold the bay in place.

   The top bay is held in place by screws through the top of the BeBox's internal chassis.

   The front bay is held in place by screws through the front of the BeBox's internal chassis.

   Support the bay with your hand as you remove the last screw, so it doesn't fall.

3. Remove the bay.

   Once the screws are removed, the top bay is held only by metal flanges hanging from the top of the BeBox. You tilt the bay down a bit and slide it out.

   The front bay slides straight out of the front of the BeBox.

### Mounting a Drive in the Top Drive Bay

Remove the drive bay from the chassis, as described above. Then slide the drive into either the left or right side of the bay, with the circuit-board face of the drive facing down. Align the screw holes on the circuit-board face of the drive with the mounting holes on the bottom of the bay. Then screw the drive to the bay, using the screws that came with the drive.

**Warning:** Some 3.5-inch drives have components that stick so high above the circuit-board face of the drive that they will form an electrical connection that will likely destroy the drive if you mount it without insulating these components from the drive bay. If you're not sure how to insulate components, get advice from someone with experience assembling computers.

### Mounting a Drive in the Front Drive Bay

Remove the drive bay from the chassis, as described above. Slide the drive into the bay. Align the screw holes on the side of the drive with one of the sets of mounting holes on the sides of the bay. Then screw the drive to the bay, using the screws that came with the drive. If you installed a floppy disk drive, CD-ROM drive, or another drive that uses removable media, remove the corresponding cover plate from the *bezel*, the plastic cover on the front of the cover of the BeBox. If the panel is attached to the cover with screws, remove the screws first. Then simply push the panel in until it's free.

### Replacing a Drive Bay

Reverse the steps you followed to remove the drive bay. Be sure to replace the screws that secure the bay to the internal chassis.

### Connecting a Drive to the BeBox Motherboard and Power Supply

After you mount a drive in a drive bay and replace the bay in the chassis, you can use the cables that come with the BeBox to connect the drive to the BeBox motherboard and power supply.

1. Use one of the provided ribbon cables to connect the drive to the appropriate drive connector on the motherboard.

   Ribbon cables must be connected with the correct orientation: Make sure pin 1 in the connectors on the motherboard and on the drive are aligned with pin 1 on the cable. On most cables, the edge of the ribbon carrying the signal for pin 1 is marked with a line or with stripes.

   If you're connecting a SCSI device, use the connectors at both ends of the SCSI ribbon cable first, and only use the connectors in the middle of the cable to attach additional devices. Make sure the device at the end of the ribbon cable is terminated. Also make sure that each SCSI device has a unique SCSI ID, from ID 0 through 6 (ID 7 is reserved for the SCSI controller on the motherboard). For instructions on terminating a SCSI device and setting its SCSI ID, see its owner's guide.

2. Plug one of the plastic power supply connectors into the drive.

### Connecting a CD-ROM Drive to the I/O Board

You can use a "pass-though cable" to connect an internal CD-ROM drive to the BeBox I/O board. With a pass-through cable, you can listen to audio CDs on the BeBox's internal speaker and through the line-out and headphone ports. You can also save sections of CD audio tracks as disk files. (For more information on listening to CDs, see "CDPlayer" on page 80.)

Pass-through cables are available at larger electronics supply stores. (One source is TTS Multimedia Systems, 2045 San Elijo Ave., Cardiff, CA 92007, (800) 887-4968.) Make sure you buy a pass-through cable that has a connector for your brand of CD-ROM drive at one end, and a connector compatible with a MediaVision ProAudio Spectrum 16 card at the other (this is the end you connect to the I/O board).

Connect the pass-through cable's ProAudio Spectrum 16 connector to the connector on the I/O board: The connector is on the corner of the card farthest from the power supply and the motherboard. Then connect the other end of the pass-through cable to the CD-ROM drive.

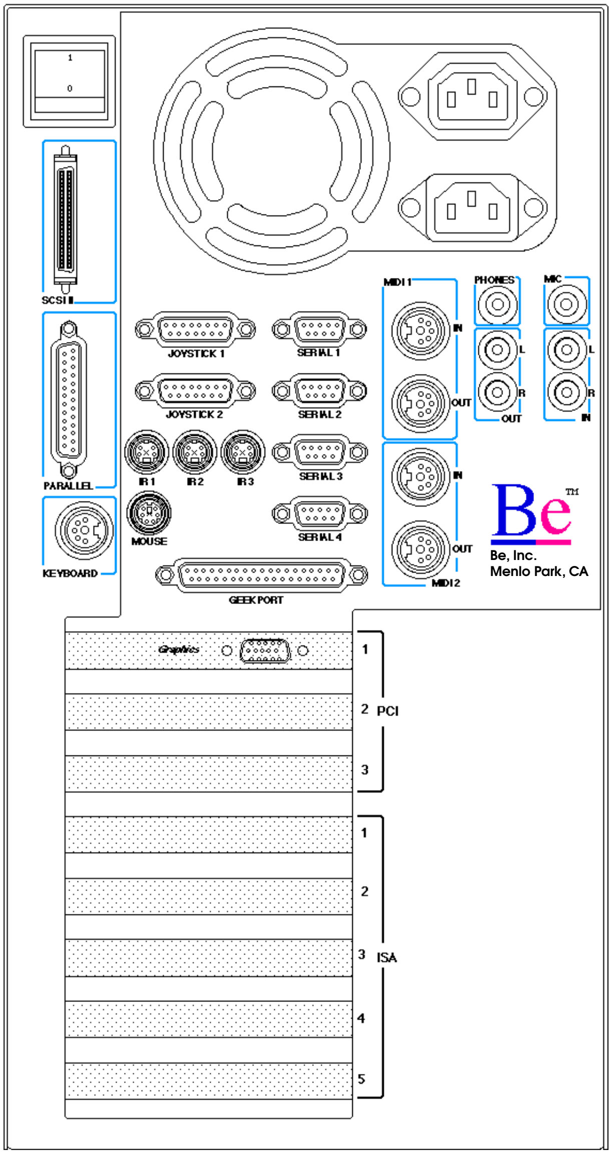
## Closing the BeBox

When you're done adding internal devices, put the cover back on. This protects you and the internal components from each other, and reduces electromagnetic interference.

1. With the cover positioned over the internal chassis, but about two inches farther forward, lower the cover into place.
2. Make sure the floppy disk drive and the corresponding opening in the bezel are aligned. Then slide the cover back until it's closed.
3. Tighten the thumbscrews in the back panel.

# Connecting External Devices

You can refer to the following diagram to identify the ports on the back of the BeBox:


1
0
SCSI II
PARALLEL
KEYBOARD
JOYSTICK 1
JOYSTICK 2
SERIAL 1
SERIAL 2
SERIAL 3
SERIAL 4
IR 1
IR 2
IR 3
MOUSE
GEEK PORT
MIDI 1
IN
OUT
IN
OUT
MIDI 2
PHONES
L
R
OUT
MIC
L
R
IN
Be™
Be, Inc.
Menlo Park, CA
Graphics
1
2 PCI
3
1
2
3 ISA
4
5

1. Make sure the switch between the two power sockets on the back of the BeBox is set to the correct voltage.

   **Warning:** The voltage switch has two settings: 115 volts and 230 volts. The switch is initially set to 115 volts, which is the correct setting in North America. Outside of North America, make sure the switch matches the voltage in your area. If the voltage switch is set incorrectly when you turn on the BeBox, you risk destroying the BeBox.

2. Plug one end of the power cable into the back panel of the BeBox and the other end into a grounded, three-prong electrical outlet.

   **Warning:** You must electrically ground the BeBox using the power cable provided by Be. The power cable includes a three-prong plug—a plug with a grounding pin—that will only fit in a three-prong grounded outlet. The grounding pin is for the safety of the BeBox and—more important—for your safety. If you don't have a grounded outlet, hire a licensed electrician to install one. Do not circumvent the three-prong plug by finding a way to plug it into an outlet that isn't grounded!

3. Connect the keyboard to the keyboard port on the back panel.

4. Connect the mouse to the appropriate port on the back panel.

   You can connect a serial mouse to any one of the four serial ports.

   You connect a PS/2 mouse to the Mouse port.

   When you turn on the BeBox, it finds the mouse wherever you connected it.

5. Plug the monitor's power cord into a grounded outlet or—if you have the appropriate plug—into the socket on the back of the BeBox. Then connect the monitor to the port on the graphics card in a PCI slot.

6. If you installed a network adapter card, use an Ethernet cable to connect it to your network.

   If you don't maintain the network at your location, be sure to check with your system administrator before connect the BeBox to the network. (Configuring the BeBox to communicate over the network is described in "Network" on page 128.)

### Connecting a SCSI CD-ROM Drive

To install the Be operating system from the *BeOS* CD-ROM, you need to connect a SCSI CD-ROM drive to the BeBox's external or internal SCSI port. (IDE CD-ROM drives are not currently supported.) The external SCSI port is just below the On/Off switch on the back panel. Follow the directions that came with the CD-ROM drive to terminate the drive properly (as a rule, terminate the drive if it's the only SCSI device connected to the internal or external SCSI port on the BeBox, or if it's at the end of a chain of SCSI devices). You can set the CD-ROM drive to any SCSI ID, except SCSI ID 7, but remember that if you connect more than one SCSI device to the BeBox, each device must have a unique SCSI ID.

### Connecting Joysticks

You can connect up to 4 standard PC joysticks to the two BeBox joystick ports. You can connect one joystick directly to each port, or use a standard Y connector to connect two joysticks to each port.

### Connecting a Printer

If you have an HP LaserJet IIp or compatible printer, you can connect it to the BeBox parallel port. A few applications in DR8 support basic printing. Look for support for more printers in future releases of the BeOS.

## Finishing Up

Once you've assembled the BeBox, you can install the BeOS on its hard disk. Installing Be software is described in *Installing Developer Release 8 of the BeOS*, the booklet that accompanies this user's guide.

If the BeBox already has DR8 installed, you can simply turn on the power switch and start using it. The next chapter starts with instructions for turning the BeBox on and off safely. Then it shows you the basics of using the BeOS.

# 2 Learning BeOS Basics

This chapter shows you the basics of working with the BeBox and the BeOS: Turning the BeBox on and off, 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.

## Turning the BeBox On and Off

Once you've set up the BeBox and installed the BeOS, you can turn on the BeBox and 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 BeBox's internal clock to the correct time, as described in "Time" on page 140.

### Turning On the BeBox and Starting the BeOS

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

  When you turn on the BeBox, 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 16.

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

3 Turn on the BeBox.

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.

When you turn on the BeBox, the Be logo appears for a moment. Then the BeBox 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 on the BeBox: Arranging and opening files, starting applications, and so on (the Browser is described in detail in “Working with the Browser” on page 41).

When the BeBox is on, two columns of LEDs (Light-Emitting Diodes) become active on the front of the BeBox. 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 LED’s are lit, the harder the PowerPCs are working. (The Pulse application provides a similar display, as described in “Pulse” on page 113.) 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 turn on the BeBox, 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”—a setting stored in a chip on the motherboard—to determine what disk you prefer to use as the boot disk. The BeBox 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 BeBox tries to boot from any other available disk with system software on it.

The boot preference is initially set to the master IDE disk. (If the BeBox comes with the BeOS installed on a SCSI disk, the boot preference is set to that disk.) If you install the BeOS on another 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 119.

Regardless of the boot preference and what disks are inserted or attached, you can select the disk you want to boot from by pressing and holding down any key right after you turn on the BeBox—as soon as you see the Be logo start to appear. The boot selection screen opens, complete with instructions for how to use it:

```
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 205.

For more information about SCSI IDs and IDE disks, see “Adding an Internal Disk Drive” on page 7 and “Connecting a SCSI CD-ROM Drive” on page 13.

## Shutting Down the BeOS and Turning Off the BeBox

Before you turn off the BeBox, 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 BeBox 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 36.

   If you just want to restart the BeBox instead of turning it off, 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 BeBox, turn it off. You can also click the Restart button in the panel (or press the Enter key) to restart the BeBox right away, without turning it off.

4. After you've shut down the BeOS and turned off the BeBox, turn off any peripheral devices that have their own power switches, such as the monitor or external disk drives.

## Resetting the BeBox

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

There are two ways to reset the BeBox. The nostalgic way is to press "Control-Alt-Delete." In other words, to press the following three keys at the same time: 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. (For more information about the keyboard, see "Using the Keyboard" on page 23.) The other way to reset the BeBox is to 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.

**Caution:** If you restart the BeBox 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 205.

## Interrupting the BeBox

**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.

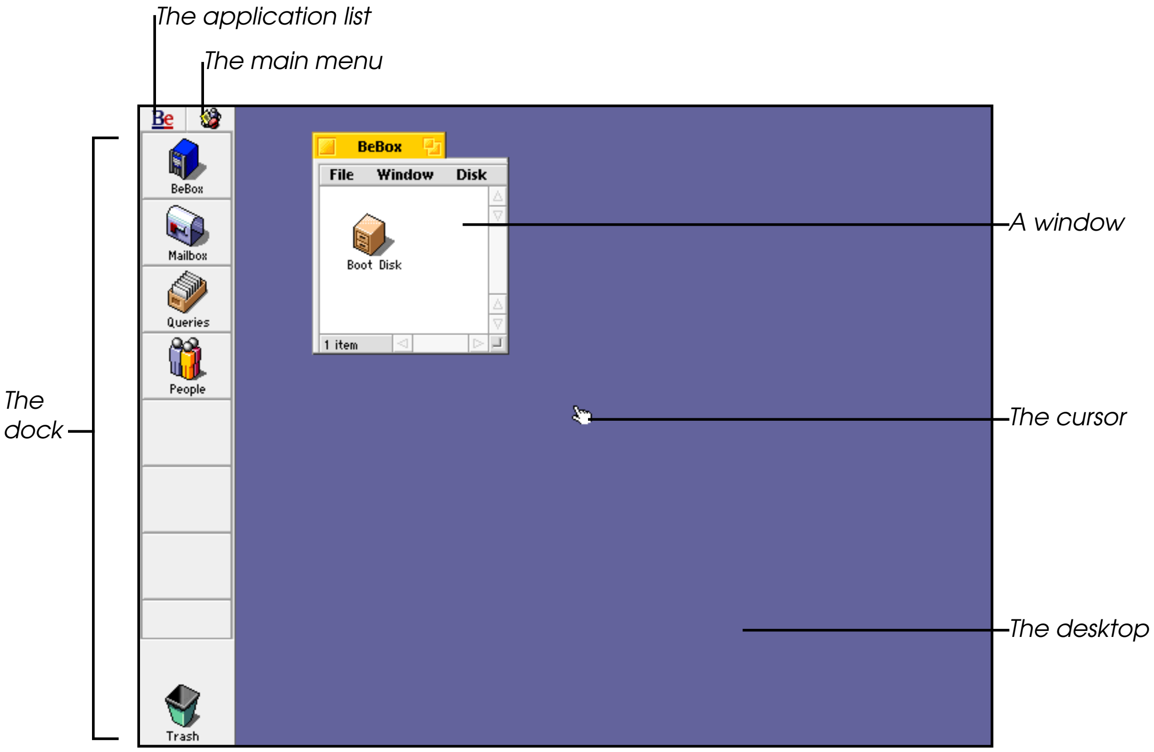
If you're using the Be Debugger, you can interrupt the BeBox and open a debugger window. (Using the Debugger is described in "Using the Be Debugger" on page 167.)

To interrupt the BeBox, press up on the Interrupt button. The Interrupt button is on the horizontal surface underneath the right side of the floppy disk drive, just above the right LED array.

If you press the Interrupt button accidentally, type **g** and press Enter to tell the BeBox 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.


The application list
The main menu
Be
BeBox
File Window Disk
Boot Disk
1 item
BeBox
Mailbox
Queries
People
Trash
The dock
A window
The cursor
The desktop

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 22.
- 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 51.
- The *application list* lists all running applications. You use it to switch applications, as described in “Switching Applications” on page 60.
- 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 36.
- *Windows* are where you view and work with files, text, pictures, and other information. See “Working with Windows” on page 25.
- The BeBox icon*,* at the top of the dock, opens a window that lists mounted disks. See “Working with Disks” on page 45.
- The Mailbox icon opens a window that lists the e-mail you’ve received. For more information, see “BeMail” on page 74.
- The Queries icon opens a window with the Be database queries you’ve created, as described in “Opening a Query” on page 57.
- 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 79.

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 117.

## Using the Mouse

You use the mouse to control the cursor, to select items, to manipulate the controls in windows and panels, to choose menu items, and to perform many other tasks. 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 BeBox 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. For example, if you're left-handed, you can make the right mouse button the primary mouse button. For details, see "Mouse" on page 127.

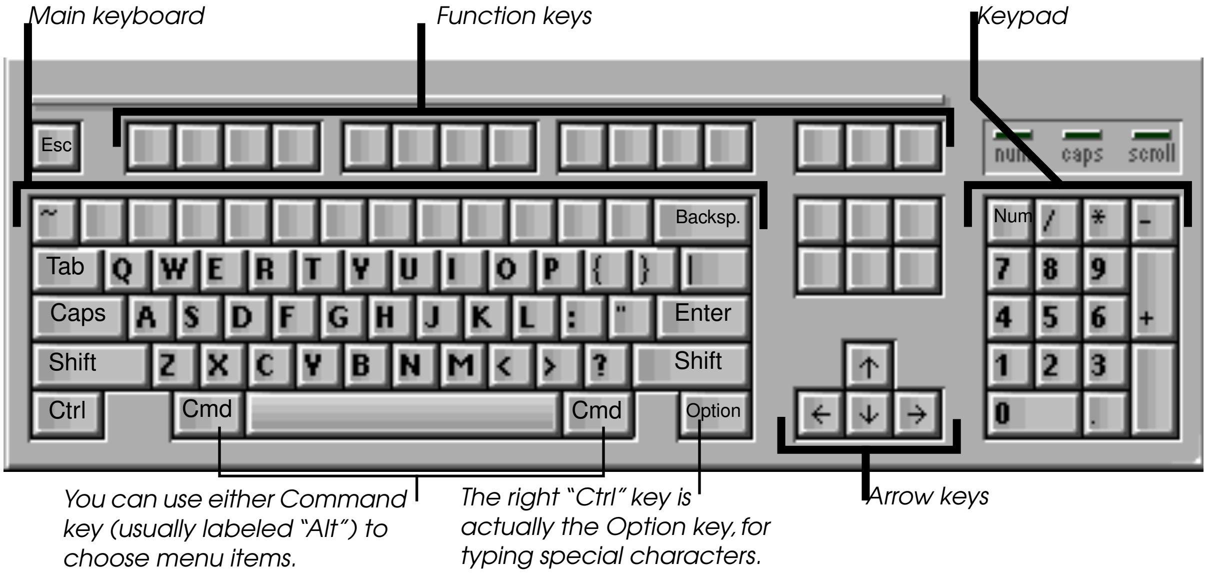
There are a few basic techniques (and terms that describe them) for using the mouse that you should learn before continuing with this guide:

| | |
|---|---|
| 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 quickly 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 127).

# 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.


Main keyboard
Function keys
Keypad
Esc
num
caps
scroll
~
Backsp.
Tab
Q
W
E
R
T
Y
U
I
O
P
{
}
|
Caps
A
S
D
F
G
H
J
K
L
:
"
Enter
Shift
Z
X
C
V
B
N
M
<
>
?
Shift
Ctrl
Cmd
Cmd
Option
Num
/
*
-
7
8
9
+
4
5
6
1
2
3
0
.
↑
←
↓
→
Arrow keys

You can use either Command key (usually labeled "Alt") to choose menu items.

The right "Ctrl" key is actually the Option key, for typing special characters.

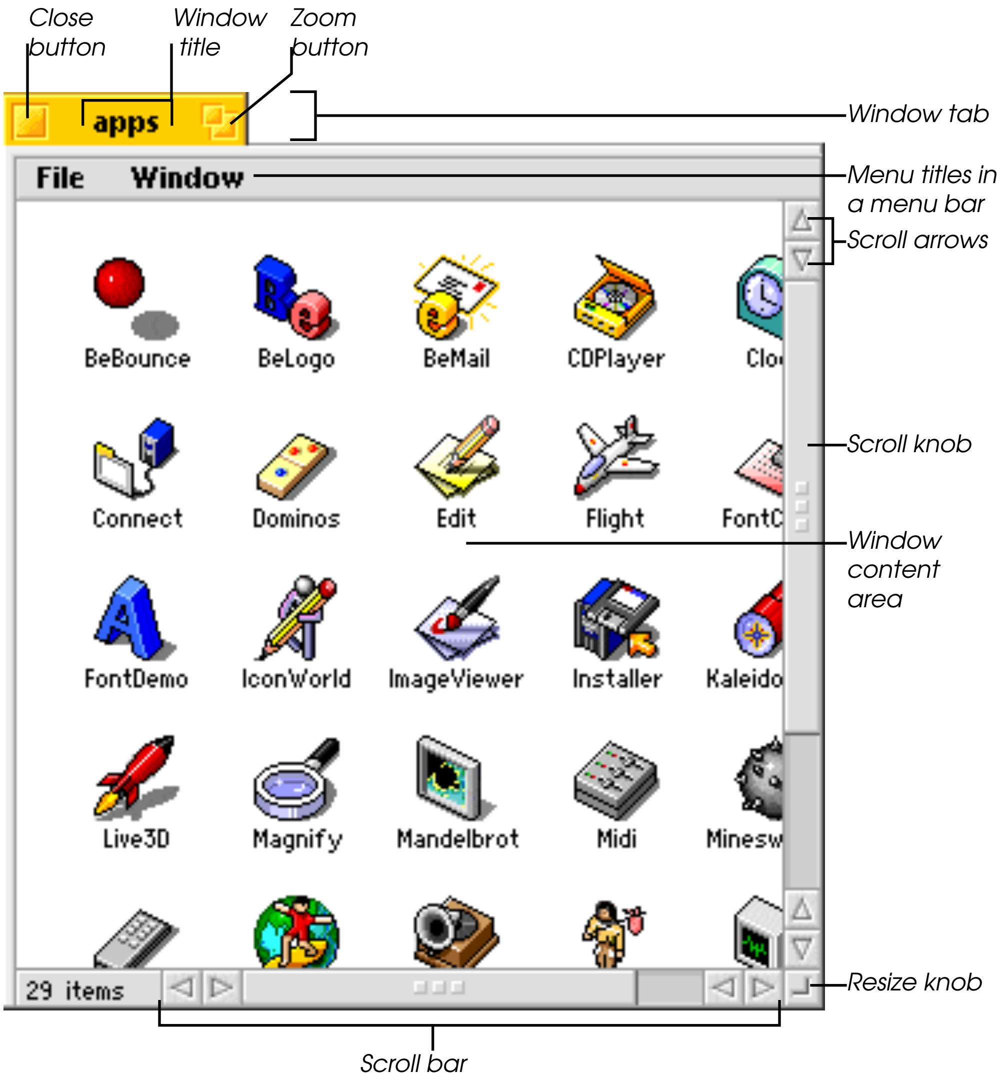
Most of the keyboard keys should be familiar to you from typing class. However, the BeBox uses some of the keys in ways you might not guess:

| Key Label | Key Name | Function |
|---|---|---|
| Alt | Command | Used in conjunction with other keys as a shortcut to choosing menu items. |
| Ctrl (on left) | Control | Used to type special characters, particularly when you're working in the Terminal application. |
| Ctrl (on right) | Option | Used to type special characters, such as symbols and accented characters. |
| Enter (or arrow) | 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 | Escape | Used as a shortcut to clicking Cancel in many panels and to close open menus. |
| 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) | 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 67, "Navigating Menus from the Keyboard" on page 40, and "Navigating Windows and Panels from the Keyboard" on page 70. For information about how the BeBox maps the characters you see on screen to the layout of the keys on the keyboard, see "Keymap" on page 124 and "FontChart" on page 97.

# Working with Windows

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


Close button
Window title
Zoom button
Window tab
apps
File
Window
Menu titles in a menu bar
Scroll arrows
BeBounce
BeLogo
BeMail
CDPlayer
Connect
Dominos
Edit
Flight
Scroll knob
Window content area
FontDemo
IconWorld
ImageViewer
Installer
Live3D
Magnify
Mandelbrot
Midi
29 items
Resize knob
Scroll bar

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 41.)

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 only affects 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.

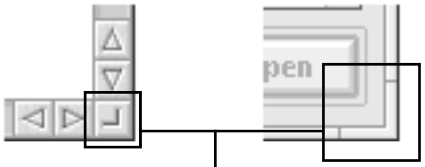
## Moving a Window

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.



*Drag either kind of resize knob to resize a window.*

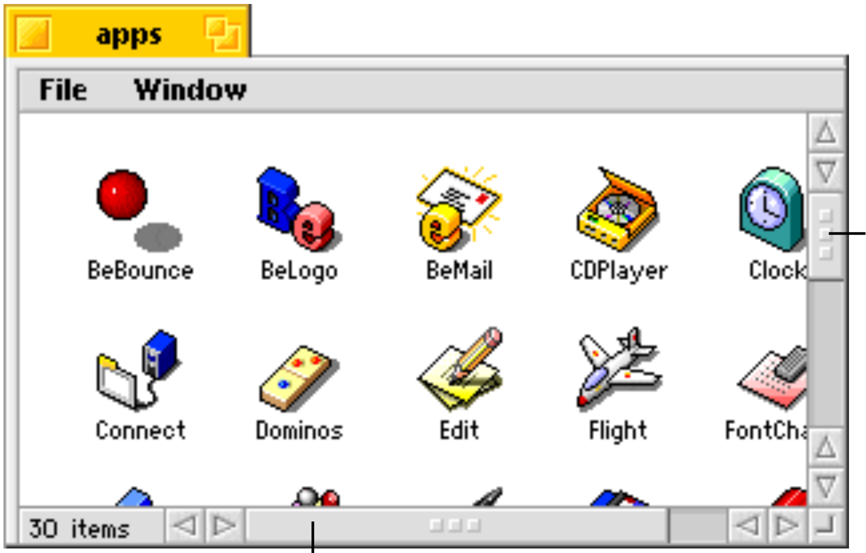
You can also click a window's zoom button (the ⧉ icon the window's title bar) to make it as big as need be to show all that it contains—or at least as big as the screen. Clicking the zoom button again restores the window to its previous size.

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, BeBox windows 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 138.


apps
File
Window
BeBounce
BeLogo
BeMail
CDPlayer
Clock
Connect
Dominos
Edit
Flight
FontCha
30 items

*This scroll knob indicates that about a third of the contents of the window is visible, and about two-thirds of the contents are out of view, below.*

*This scroll knob indicates that only a small portion of the contents of the window is out of sight to the right.*

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

| Do This | To |
|---|---|
| Click a scroll arrow | move the contents of the window a little |
| Press a scroll arrow | keep moving the contents of a window a slowly |
| Drag a scroll knob | scroll the contents of the window quickly |
| Click in a scroll bar | scroll all the way in that direction |

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

| Do This | To |
|---|---|
| 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 |

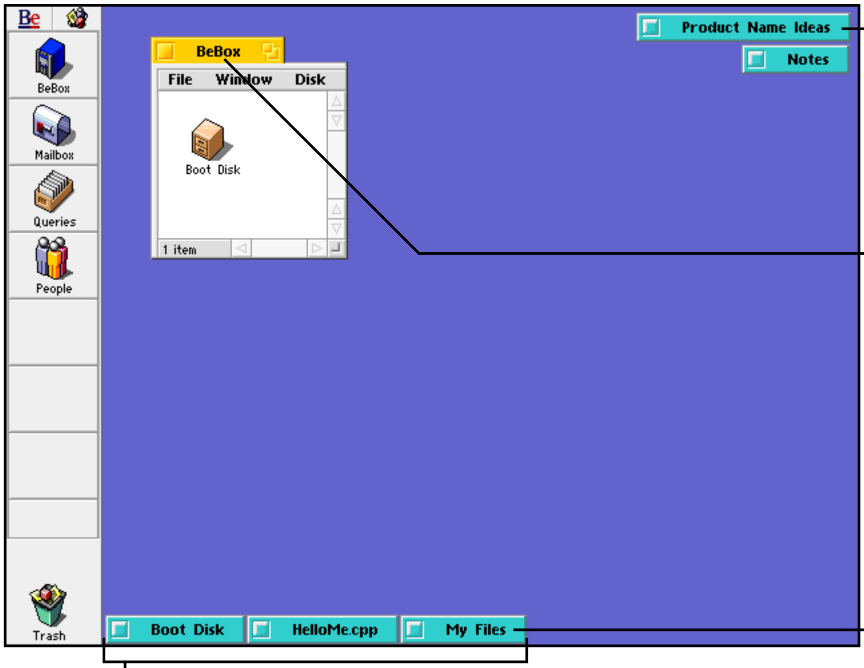
The content of a window also scrolls when you select an item that's not in view, for example, when you use the arrow keys to select items in a Browser window.

## 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 it's 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 it's 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.


Be
BeBox
Mailbox
Queries
People
Trash
BeBox
File
Window
Disk
Boot Disk
1 item
Product Name Ideas
Notes
Boot Disk
HelloMe.cpp
My Files

*You can drag tabs of minimized windows where you want them.*

*Double-click a window's tab to minimize the window.*

*Double-click a minimized window's tab to open the window.*

*Initially, tabs of minimized windows are tiled along the bottom of the desktop.*

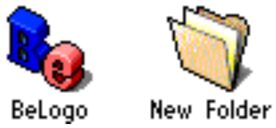
To restore a minimized window to its original size and location, double-click its tab again. Other ways to open minimized windows include:

| 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. |

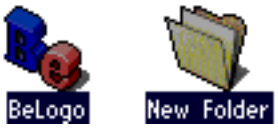
You can click the close button in the tab of a minimized window to close the window. If the window contains changes you haven't saved, you're asked if you want to save the changes before closing the window.

## 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*).



*unselected items*



*selected items*

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.

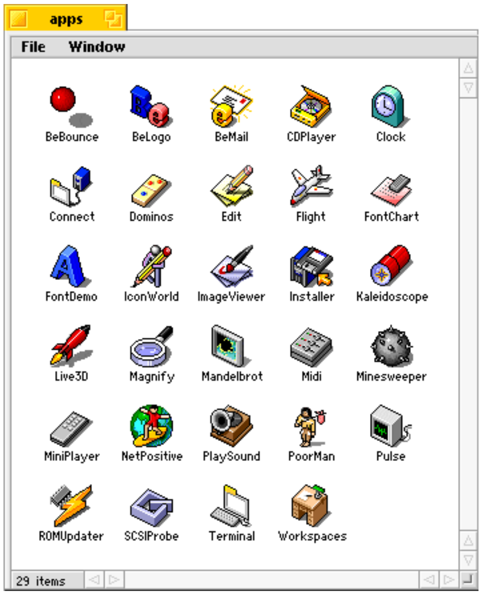
| Do This | To |
|---|---|
| Click an item | Select it |
| Drag from an empty place in a window across one or more items | Select the items you drag across |
| Type one or more letters | Select the item that starts with that letter or letters |
| Press an arrow key | Select the next item, in the direction 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 |
| 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

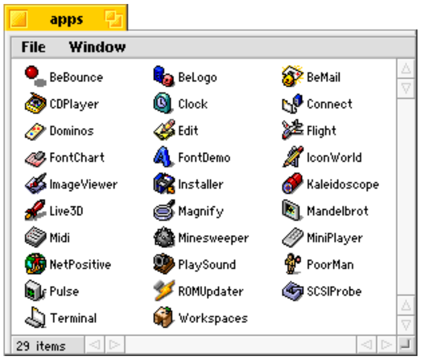
Initially, the items in Browser windows are displayed as large icons with their names underneath them. If you prefer, you can view the items in the window as small icons with their names to the right. You can also view the items in the window in an ordered list view, which can tell you additional information 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


apps
File
Window
BeBounce
BeLogo
BeMail
CDPlayer
Clock
Connect
Dominos
Edit
Flight
FontChart
FontDemo
IconWorld
ImageViewer
Installer
Kaleidoscope
Live3D
Magnify
Mandelbrot
Midi
Minesweeper
MiniPlayer
NetPositive
PlaySound
PoorMan
Pulse
ROMUpdater
SCSIProbe
Terminal
Workspaces
29 items

*Icons are easiest to recognize in icon view.*


apps
File
Window
BeBounce
BeLogo
BeMail
CDPlayer
Clock
Connect
Dominos
Edit
Flight
FontChart
FontDemo
IconWorld
ImageViewer
Installer
Kaleidoscope
Live3D
Magnify
Mandelbrot
Midi
Minesweeper
MiniPlayer
NetPositive
PlaySound
PoorMan
Pulse
ROMUpdater
SCSIProbe
Terminal
Workspaces
29 items

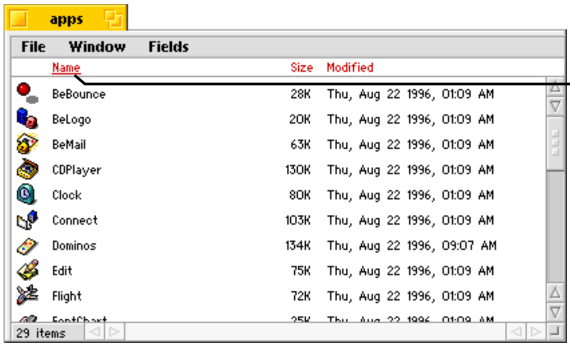
*It's easiest to work with a lot of icons in mini icon view.*

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 (usually labeled "Alt") while you drag icons, they snap to an invisible grid when you release the mouse button—this makes the arrangement of icons in the window more orderly.

**Note:** If you drag one or more items so that the cursor is over a folder icon when you release the mouse button, you copy or move the items to that folder. For more information, see "Moving and Copying Items" on page 48.

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



| Name | Size | Modified |
|---|---|---|
| BeBounce | 28K | Thu, Aug 22 1996, 01:09 AM |
| BeLogo | 20K | Thu, Aug 22 1996, 01:09 AM |
| BeMail | 63K | Thu, Aug 22 1996, 01:09 AM |
| CDPlayer | 130K | Thu, Aug 22 1996, 01:09 AM |
| Clock | 80K | Thu, Aug 22 1996, 01:09 AM |
| Connect | 103K | Thu, Aug 22 1996, 01:09 AM |
| Dominos | 134K | Thu, Aug 22 1996, 09:07 AM |
| Edit | 75K | Thu, Aug 22 1996, 01:09 AM |
| Flight | 72K | Thu, Aug 22 1996, 01:09 AM |

*Click a red field label to sort the list by that field. Shift click it to sort in reverse.*

*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.

## 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 60. 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.

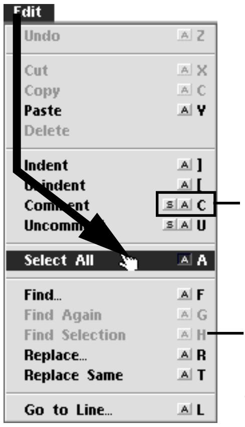
   Pop-up lists and other controls in panels work very much like menus.

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 126.

## 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.


Edit
Undo A Z
Cut A X
Copy A C
Paste A V
Delete
Indent A ]
Unindent A [
Comment S A C
Uncomment S A U
Select All A A
Find... A F
Find Again A G
Find Selection A H
Replace... A R
Replace Same A T
Go to Line... A L

*To choose a menu item by dragging, press the menu title, drag to the item you want, and release the mouse button*

*If a menu item has a keyboard shortcut, it's indicated by icons for the keys you press.*

*You can't choose dimmed items, usually because they're not relevant to what's selected in the window.*

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 A icon represents the Command key (either of the keys labeled "Alt" on either side of the space bar on most PC keyboards). The S icon represents the Shift key. Choosing menu items from the keyboard is described in "Navigating Menus from the Keyboard" on page 40.

## Navigating Context-Sensitive Menus

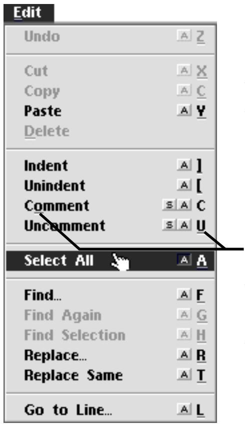
In some applications, such as the Browser, you can open a menu by selecting an item or positioning the cursor over it and then pressing a mouse button. For example in the Browser, if you position the cursor over an icon in the dock and press the secondary mouse button, a menu with items relevant to the 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 127 for more information.

## 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.

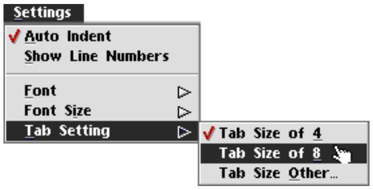

Edit
Undo
Cut
Copy
Paste
Delete
Indent
Unindent
Comment
Uncomment
Select All
Find…
Find Again
Find Selection
Replace…
Replace Same
Go to Line…

*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 40.

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.


Settings
Auto Indent
Show Line Numbers
Font
Font Size
Tab Setting
Tab Size of 4
Tab Size of 8
Tab Size Other…

## Navigating Menus from the Keyboard

You can press and release the Command key (either of the keys labeled “Alt” on either side of the space bar) to display the triggers for the menu titles in the active window. 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.

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 with the Command key or by clicking the menu title, 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-space (that is, press the Command key and the space bar 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, as a shortcut to 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 A icon represents the Command key (either of the keys labeled “Alt” on either side of the space bar on most PC keyboards). The S icon represents the Shift key. Shortcuts are always displayed in menus as uppercase letters, though you only need to press the Shift key along with the Command and letter keys if the shortcut includes the S icon.

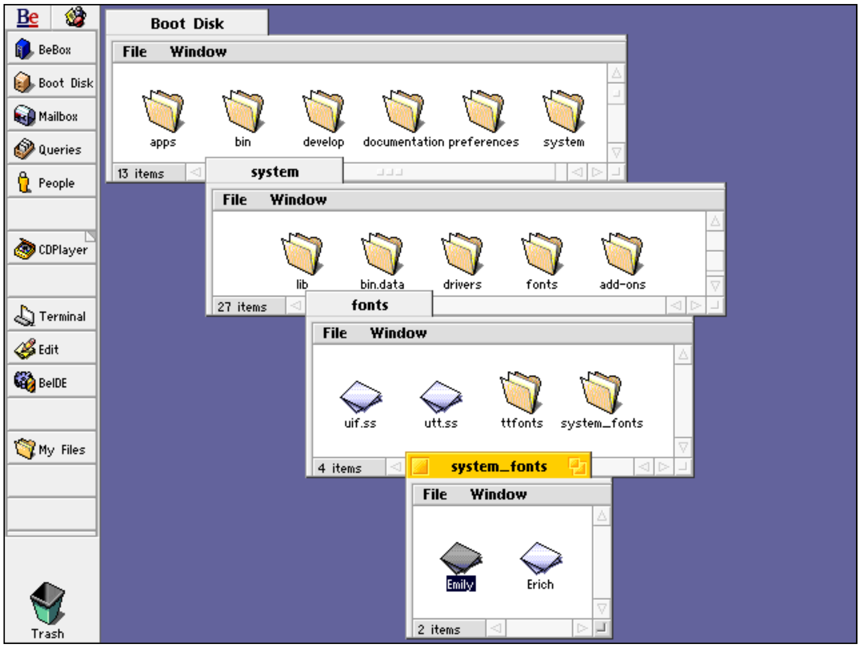
# Working with the Browser

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.)


Be
BeBox
Boot Disk
Mailbox
Queries
People
CDPlayer
Terminal
Edit
BeIDE
My Files
Trash
Boot Disk
File Window
apps
bin
develop
documentation
preferences
system
13 items
system
File Window
lib
bin.data
drivers
fonts
add-ons
27 items
fonts
File Window
uif.ss
utt.ss
ttfonts
system_fonts
4 items
system_fonts
File Window
Emily
Erich
2 items

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 115.

## 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.

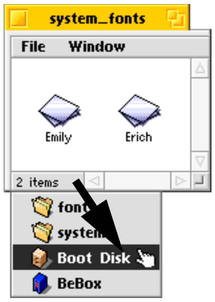
The information you get depends on the item. For disks, you get information about their capacity and free space. For files, you get information about their size, when they were created and modified, and their location in the file system. For applications, you get this same information, plus a version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

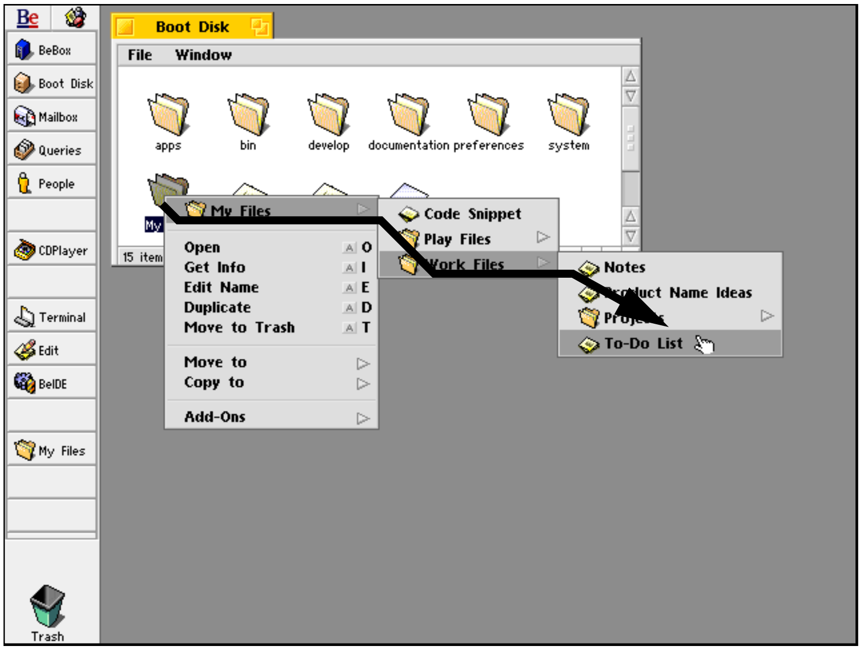
You can also open a folder's parents from the pop-up menu that opens when you press the lower-left edge of a folder window, the area that normally lists the number of items in the window.



*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 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.


Be
BeBox
Boot Disk
Mailbox
Queries
People
CDPlayer
Terminal
Edit
BeIDE
My Files
Trash
Boot Disk
File
Window
apps
bin
develop
documentation
preferences
system
My
15 item
My Files
Open
Get Info
Edit Name
Duplicate
Move to Trash
Move to
Copy to
Add-Ons
O
I
E
D
T
Code Snippet
Play Files
Work Files
Notes
Product Name Ideas
Projects
To-Do List

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 57.)

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 100. You can't mount an uninitialized disk—even if the disk is a hard disk that was connected to the BeBox and turned on when you turned on the BeBox, 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 BeBox—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.

**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 BeBox, 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 66.

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 25.

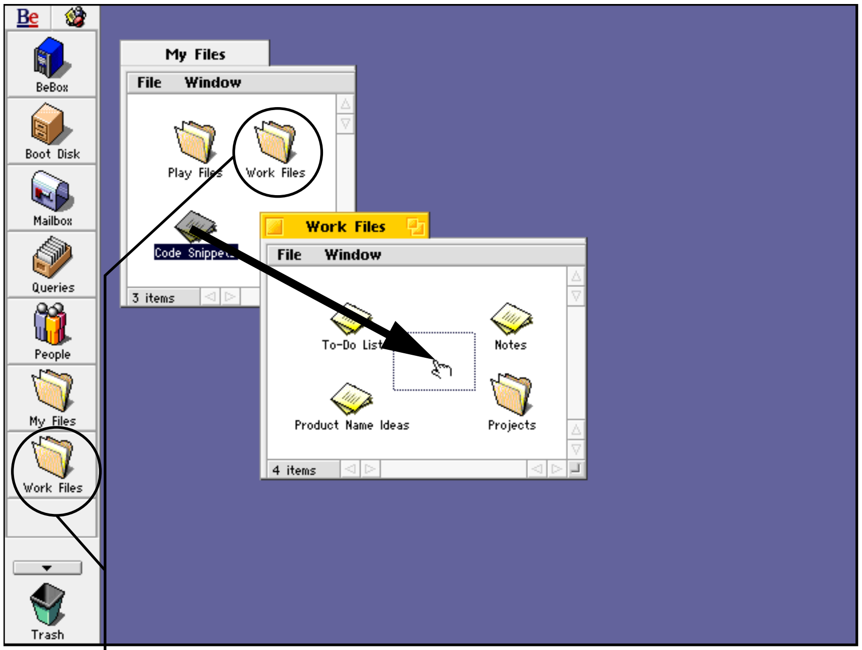
2. Choose New Folder from the folder window's File menu.

   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.


Be
BeBox
Boot Disk
Mailbox
Queries
People
My Files
Work Files
Trash
My Files
File Window
Play Files
Work Files
Code Snippets
3 items
Work Files
File Window
To-Do List
Notes
Product Name Ideas
Projects
4 items

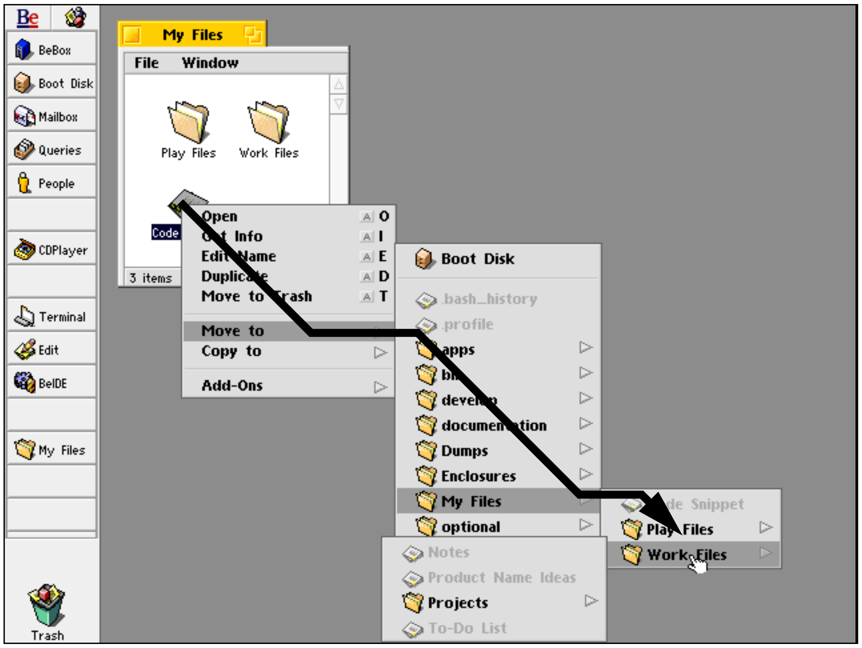
*To move an item, drag it into the window where you want to move it. Or drag it onto a folder icon in a window or a folder icon on the dock.*

*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 where you dragged it from.

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 the keyboard) 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.


Be
BeBox
Boot Disk
Mailbox
Queries
People
CDPlayer
Terminal
Edit
BeIDE
My Files
Trash
My Files
File Window
Play Files
Work Files
Code
3 items
Open O
Get Info I
Edit Name E
Duplicate D
Move to Trash T
Move to
Copy to
Add-Ons
Boot Disk
bash_history
profile
apps
bin
develop
documentation
Dumps
Enclosures
My Files
optional
Notes
Product Name Ideas
Projects
To-Do List
Code Snippet
Play Files
Work Files

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

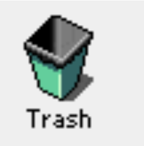
If you're copying or moving a lot of files, a status window opens with updates on the progress of that task. If you're moving or copying more than one set of files or emptying the trash, each such task is listed in the status window. You can click a status bar in the Status window and click Cancel to 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

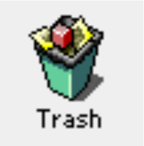
You can create a copy of any item by selecting it and choosing Duplicate from its window's File menu. The duplicate is created in the same folder as the original, and has the same name, with "copy" appended. If you create more than one duplicate of the same item, the duplicates have "copy 2", "copy 3",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

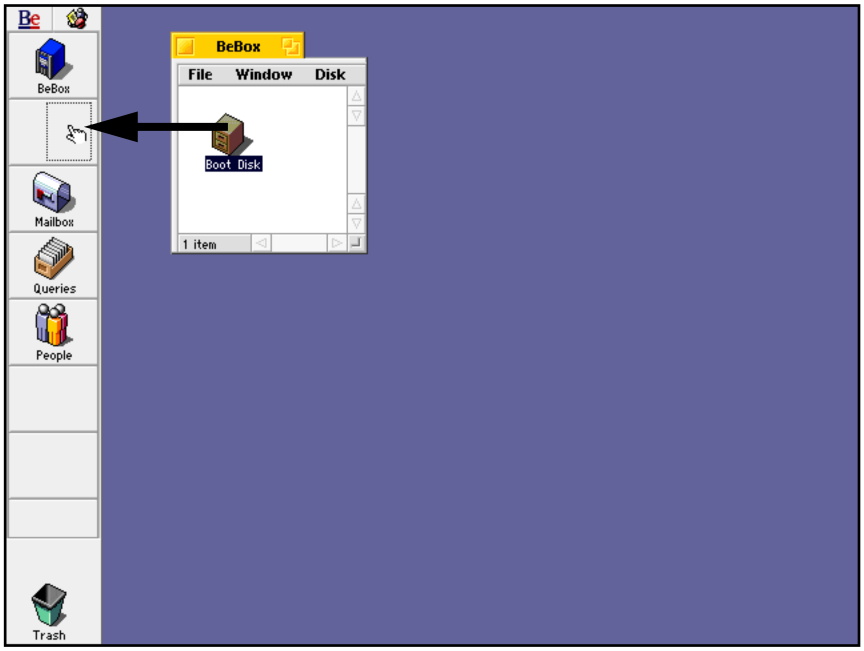
## Working with the Dock

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.

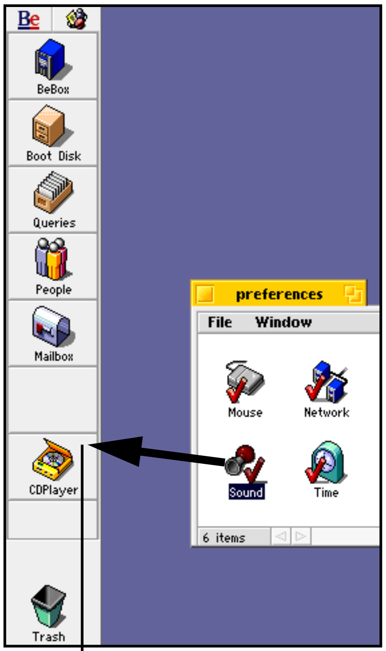
An icon in the dock isn't the real item it represents—the original remains in its folder. If you rename the original, the name changes in the dock. Similarly, if you move the original, the icon in the dock still represents the original, but in its new location. Conversely, you can't rename or destroy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

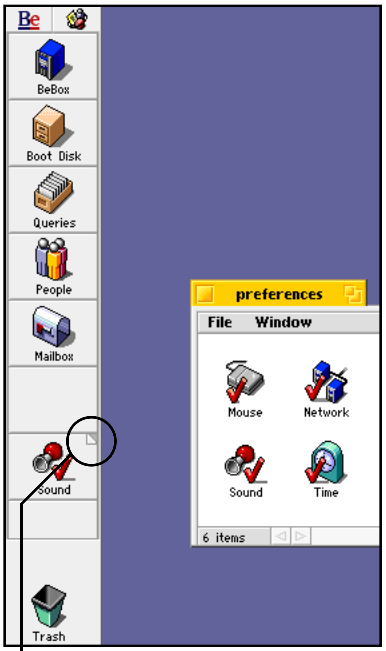
To add an item to the dock, drag it onto one of the dock's slots.


Be
BeBox
Mailbox
Queries
People
Trash
BeBox
File
Window
Disk
Boot Disk
1 item

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 item, 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-eared corner to see the other items in that slot.


Be
BeBox
Boot Disk
Queries
People
Mailbox
CDPlayer
Trash
preferences
File
Window
Mouse
Network
Sound
Time
6 items

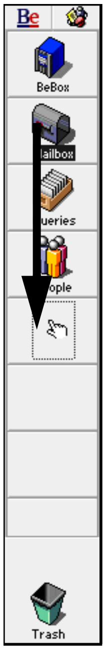
*Drag an icon to the upper-right corner of a slot in the dock (take care not to drag the icon onto the icon that's in the slot already).*


Be
BeBox
Boot Disk
Queries
People
Mailbox
Sound
Trash
preferences
File
Window
Mouse
Network
Sound
Time
6 items

*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.



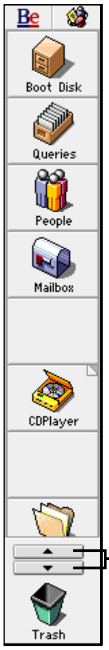
## Removing Items from the Dock

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

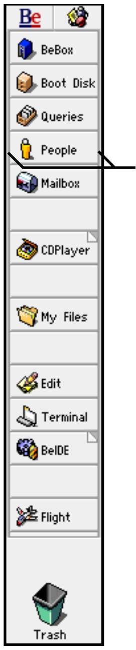
You can change how the dock displays its contents. You can also hide the dock from view.

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.


Be
Boot Disk
Queries
People
Mailbox
CDPlayer
Trash

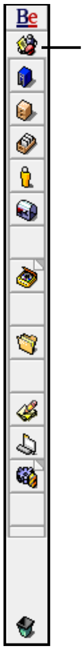
Click a dock scroll button to see icons that don't fit in the current dock display

Icons dock display


Be
BeBox
Boot Disk
Queries
People
Mailbox
CDPlayer
My Files
Edit
Terminal
BeIDE
Flight
Trash

In any dock display, click the left or right border of the dock to hide all of the dock except the border. Click the border again to display the whole dock.

Mini Icons with Names dock display



In Mini Icons dock display, the main menu moves under the application list.

Mini Icons dock display

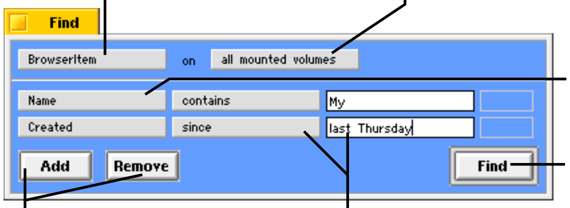
To hide all but a border of the dock from view, click the left or right border. Click the border again to display the whole dock.

# 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.



BrowserItem on all mounted volumes

Name contains My

Created since last Thursday

*Choose the kind of item you want to find.*

*Choose the disk where you want to search, or all disks.*

*Choose an attribute.*

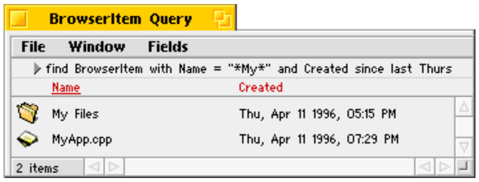
*Click Find when you've specified what you want to find.*

*Click to add or remove attributes for what you want to find.*

*Qualify the attribute.*

**3** Click Find.

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



find BrowserItem with Name = "*My*" and Created since last Thurs

| Name | Created |
|---|---|
| My Files | Thu, Apr 11 1996, 05:15 PM |
| MyApp.cpp | Thu, Apr 11 1996, 07:29 PM |

Query windows are very similar to other Browser windows, except they have a gray background and only work 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.

# 3 Learning Be Application Basics

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

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 4 of this guide; the applications in the **/preferences** folder are described in Chapter 5.

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 have many applications running at once on the BeBox. 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). 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 40.)

## 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 61). 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.

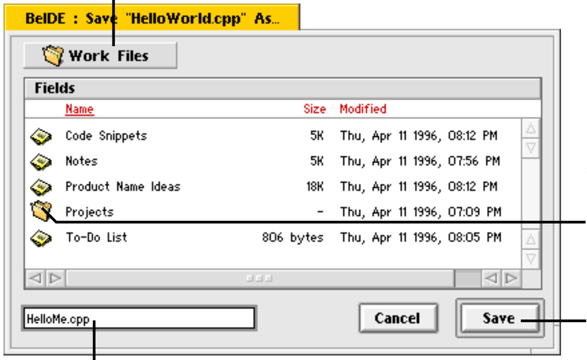
## Saving a File

When you work in a file, your changes aren't stored permanently until you save them. If you experience a power outage, if the BeBox 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.



| Name | Size | Modified |
|---|---|---|
| Code Snippets | 5K | Thu, Apr 11 1996, 08:12 PM |
| Notes | 5K | Thu, Apr 11 1996, 07:56 PM |
| Product Name Ideas | 18K | Thu, Apr 11 1996, 08:12 PM |
| Projects | - | Thu, Apr 11 1996, 07:09 PM |
| To-Do List | 806 bytes | Thu, Apr 11 1996, 08:05 PM |

HelloMe.cpp

*The name of the current folder is the title of this pop-up list. Press it to choose one of the folders that contains the current folder.*

*Double-click a folder icon to view a list of the files and folders it contains.*

*When you've named the file and picked the folder where you want to save it, click Save.*

*Type a name for the file here.*

The central portion of the Save 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 32).

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

You can use the keyboard to navigate the controls in the Save 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 of the keys labeled "Alt" on most PC 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

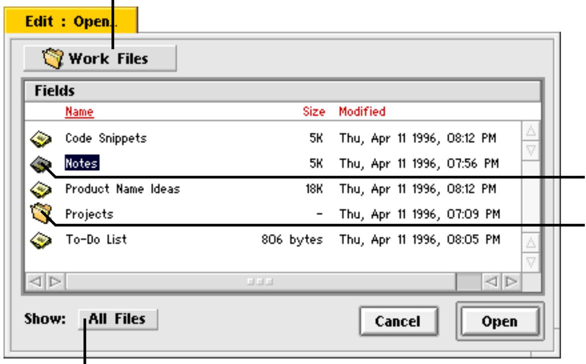
There are many ways to open files. The simplest is to double-click a file's icon. You can also select a file's icon in the Browser or the dock and choose Open from the File menu, or select the file and press Enter.

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 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.



| Name | Size | Modified |
|---|---|---|
| Code Snippets | 5K | Thu, Apr 11 1996, 08:12 PM |
| Notes | 5K | Thu, Apr 11 1996, 07:56 PM |
| Product Name Ideas | 18K | Thu, Apr 11 1996, 08:12 PM |
| Projects | - | Thu, Apr 11 1996, 07:09 PM |
| To-Do List | 806 bytes | Thu, Apr 11 1996, 08:05 PM |

Show: All Files

*The name of the current folder is the title of this pop-up list. Press it to choose one of the folders that contains the current folder.*

*Double-click the file you want to open. Or select it and click Open.*

*Double-click a folder icon to view a list of the files and folders it contains.*

*In some applications, you can choose to view all files, or just the files that are relevant to the application you're working in.*

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 32).

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 of the keys labeled "Alt" on most PC 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.

| Do This | To |
|---|---|
| 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

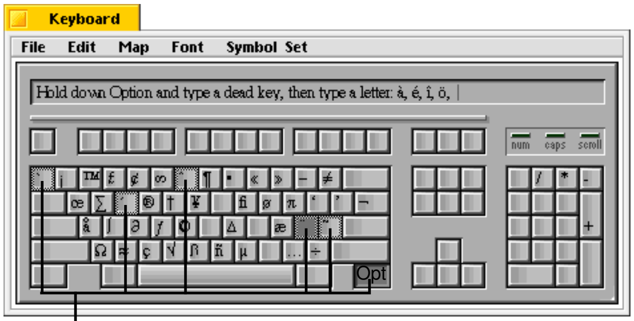
You type text in documents, when you name or rename files in the Browser or the Open and Save panels, and in many other places.

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) 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 124.



Hold down Option and type a dead key, then type a letter: à, é, î, ö,

*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.

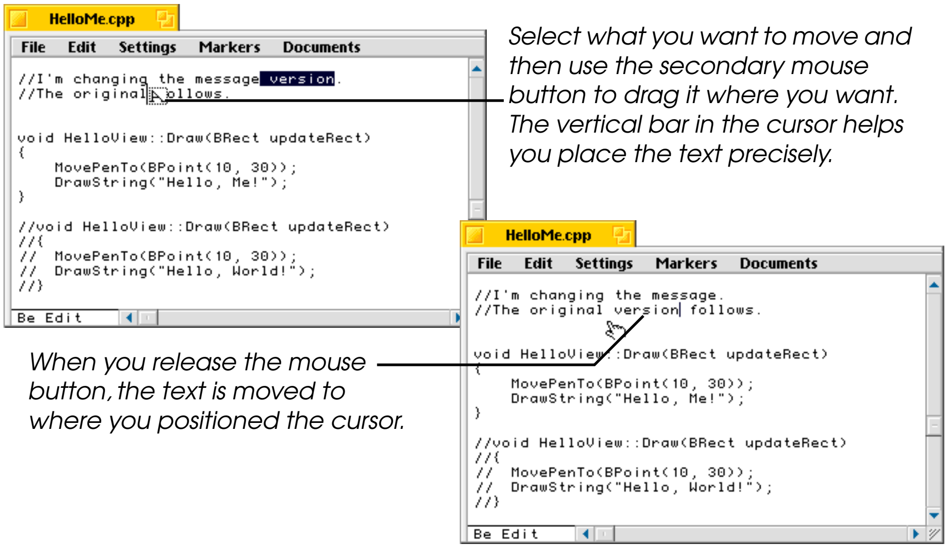
If you want to move text rather than copy it—that is, remove the text you select and paste it elsewhere—choose Cut from the Edit menu instead of Copy.

**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.



```
//I'm changing the message version.
//The original follows.


void HelloView::Draw(BRect updateRect)
{
    MovePenTo(BPoint(10, 30));
    DrawString("Hello, Me!");
}

//void HelloView::Draw(BRect updateRect)
//{
//  MovePenTo(BPoint(10, 30));
//  DrawString("Hello, World!");
//}
```

```
//I'm changing the message.
//The original version follows.


void HelloView::Draw(BRect updateRect)
{
    MovePenTo(BPoint(10, 30));
    DrawString("Hello, Me!");
}

//void HelloView::Draw(BRect updateRect)
//{
//  MovePenTo(BPoint(10, 30));
//  DrawString("Hello, World!");
//}
```

*Select what you want to move and then use the secondary mouse button to drag it where you want. The vertical bar in the cursor helps you place the text precisely.*

*When you release the mouse button, the text is moved to where you positioned the cursor.*

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 127.

## 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 23 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.

## Navigating Windows and Panels from the Keyboard

In DR8, the BeOS adds support for manipulating 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 40). 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 that you need to be able to type a tab character in (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).

# 4 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 BeBox. 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 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 BeBox, 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 103).

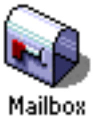
## BeMail

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

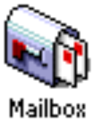
Before you can use BeMail to exchange e-mail with others, you need to use the Network and E-Mail preferences applications to configure the BeOS to communicate with an e-mail server. For more information, see "Network" on page 128, and "E-Mail" on page 121.

### 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:



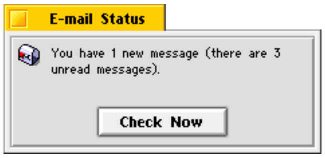
*No unread mail*



*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 121. 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 have 1 new message (there are 3 unread messages).

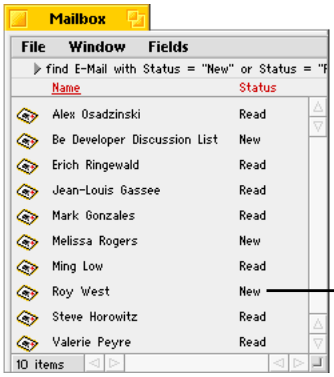
*You’ve received 1 piece of e-mail since you last checked for new mail, and there are three pieces of e-mail you haven’t read yet.*

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 56).

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 Query 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.



find E-Mail with Status = "New" or Status = "

| Name | Status |
|---|---|
| Alex Osadzinski | Read |
| Be Developer Discussion List | New |
| Erich Ringewald | Read |
| Jean-Louis Gassee | Read |
| Mark Gonzales | Read |
| Melissa Rogers | New |
| Ming Low | Read |
| Roy West | New |
| Steve Horowitz | Read |
| Valerie Peyre | Read |

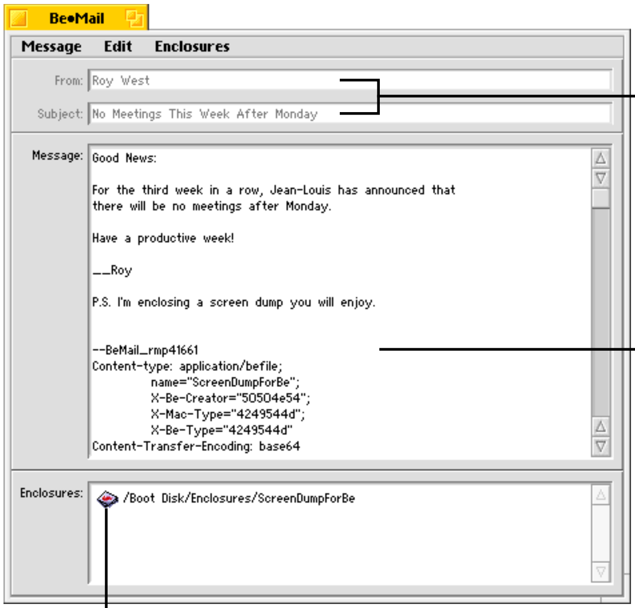
10 items

*E-mail you haven't read has a "New" status.*

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 34 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.



From: Roy West

Subject: No Meetings This Week After Monday

Message:

```
Good News:

For the third week in a row, Jean-Louis has announced that
there will be no meetings after Monday.

Have a productive week!

__Roy

P.S. I'm enclosing a screen dump you will enjoy.


--BeMail_rmp41661
Content-type: application/befile;
          name="ScreenDumpForBe";
          X-Be-Creator="50504e54";
          X-Mac-Type="4249544d";
          X-Be-Type="4249544d"
Content-Transfer-Encoding: base64
```

Enclosures: /Boot Disk/Enclosures/ScreenDumpForBe

*The sender and the Subject of the e-mail are listed here.*

*The body of the message is followed by information about any enclosures.*

*Double-click an enclosure to open it. Or drag it onto the icon of the application you want to use to open it.*

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 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.

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.

You can use the commands in the Message menu to reply to or forward the message in the window. If you choose Reply, a new message window opens with the 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. If you choose Forward, a new message window opens 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 the next section).

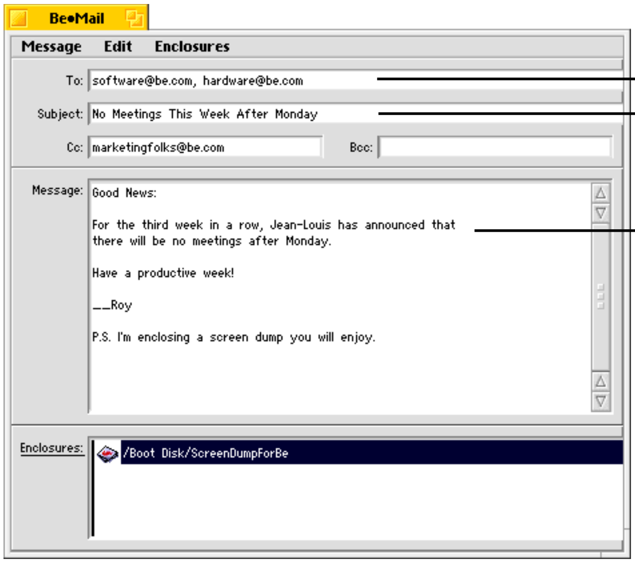
If you have a LaserJet IIp or compatible printer connected to the BeBox's parallel port, you can use the Print command to print the message.

If you want to save the 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 61 for more information on saving files).

When you're done reading the 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."

## 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.



To: software@be.com, hardware@be.com

Subject: No Meetings This Week After Monday

Cc: marketingfolks@be.com

Message:

```
Good News:

For the third week in a row, Jean-Louis has announced that
there will be no meetings after Monday.

Have a productive week!

__Roy

P.S. I'm enclosing a screen dump you will enjoy.
```

Enclosures: /Boot Disk/ScreenDumpForBe

*Enter the e-mail addresses of the people you want to send the message to.*

*Enter a subject.*

*Enter the "body" of the message.*

*If you want to include files with the message, drag them into the Enclosures field.*

You enter the e-mail addresses of the people 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 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.

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, the Info command in the Enclosures menu isn't implemented.)

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 121).

**Note:** Future versions of BeMail will include tools for creating a signature and for adding the signature to a message. 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.) However, in DR8 the Edit Signature and Add Signature commands are always dimmed.

## CDPlayer

If you have a CD-ROM drive connected to the BeBox, 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 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.

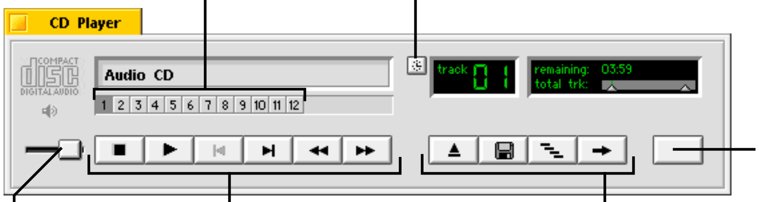
### Playing CDs

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

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 BeBox, as described in "Sound" on page 139.



*Click a track button to jump to that track.*

*Click this button to toggle the time display.*

*Click to display a list of tracks and titles.*

*You can adjust the volume from the CD drive by dragging this slider.*

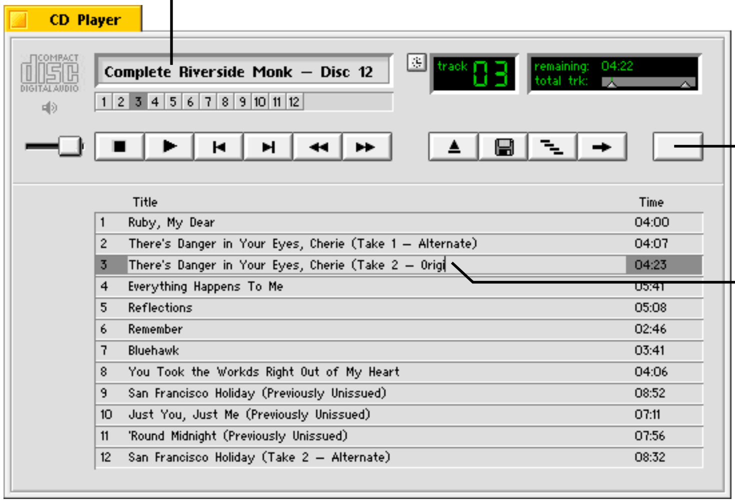
*These buttons are the same as on a home CD deck: Stop, Play (changes to Pause when you click it), Back Track, Forward Track, Fast Reverse, and Fast Forward.*

*These buttons are for ejecting the CD, saving audio data to disk, "shuffle play" (playing tracks in random order), and toggling between playing a CD once or over and over again.*

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

If you click the rightmost button in the CDPlayer 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 56).

*Type the title of the CD here.*



Complete Riverside Monk — Disc 12

| | Title | Time |
|---|---|---|
| 1 | Ruby, My Dear | 04:00 |
| 2 | There's Danger in Your Eyes, Cherie (Take 1 — Alternate) | 04:07 |
| 3 | There's Danger in Your Eyes, Cherie (Take 2 — Origi | 04:23 |
| 4 | Everything Happens To Me | 05:41 |
| 5 | Reflections | 05:08 |
| 6 | Remember | 02:46 |
| 7 | Bluehawk | 03:41 |
| 8 | You Took the Workds Right Out of My Heart | 04:06 |
| 9 | San Francisco Holiday (Previously Unissued) | 08:52 |
| 10 | Just You, Just Me (Previously Unissued) | 07:11 |
| 11 | 'Round Midnight (Previously Unissued) | 07:56 |
| 12 | San Francisco Holiday (Take 2 — Alternate) | 08:32 |

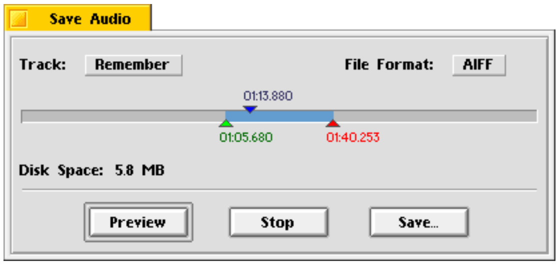
*Click to show and hide the track list.*

*Click in a track to type a title.*

### 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 AIFF (Audio Interchange File Format) are supported now—WAVE (Waveform Audio File Format) files will be supported in the near future.

To save audio data, you need to connect the CD-ROM drive to the BeBox I/O board with a "pass-through cable." For details, see "Connecting a CD-ROM Drive to the I/O Board" on page 9.



Track: Remember

File Format: AIFF

Disk Space: 5.8 MB

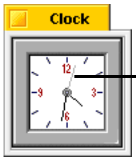
Drag the green start marker and the red end marker to the starting and ending points in the track you want to save. The blue marker shows the current place in the track when you're playing it. The numbers next to the markers indicated the hours, minutes, and seconds from the beginning of the track. When 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 61).

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.

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 connected to the BeBox, you can listen to more than one CD at a time.

# 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 140.

# 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 BeBox 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 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.

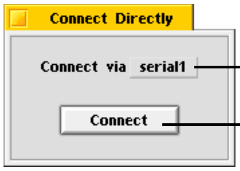
**Note:** Serial ports 1 and 2 are reliable up to 155200 baud. Serial ports 3 and 4 are reliable up to 38400 baud.

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 the BeBox to another device by attaching a cable (typically a "null modem" cable) to a BeBox serial port and to a serial port on the other device, you can use Connect to exchange messages between them.

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



*Choose the BeBox serial port the device is connected to.*

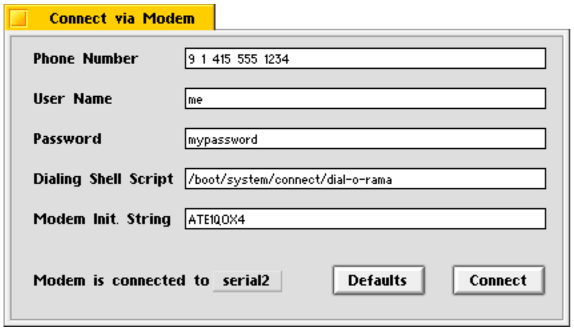
*Then click Connect.*

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 the BeBox 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.



Phone Number: 9 1 415 555 1234
User Name: me
Password: mypassword
Dialing Shell Script: /boot/system/connect/dial-o-rama
Modem Init. String: ATE1Q0X4
Modem is connected to serial2

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, which is new in DR8. 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 117). 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, 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 66.

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 file 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 BeBox, see "Adding Fonts" on page 141.

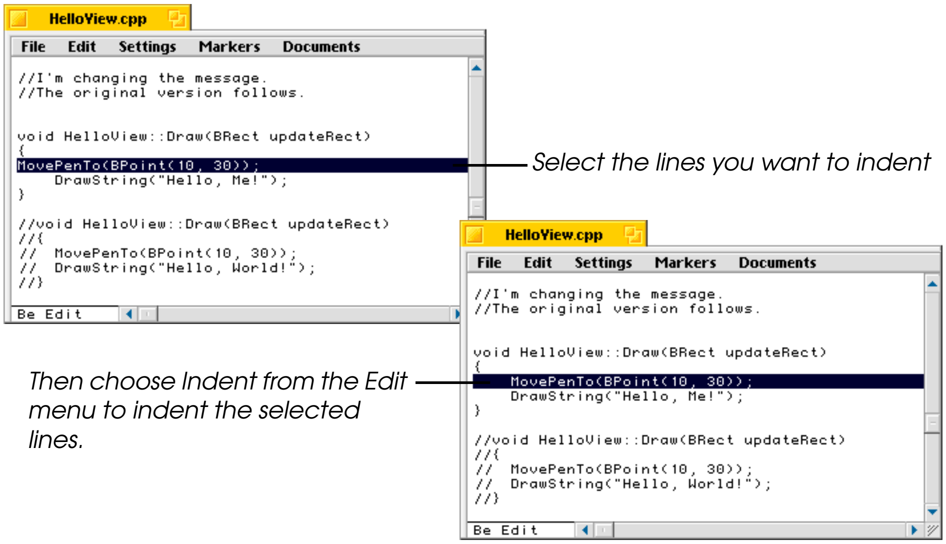
### Automatically Indenting Lines

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 fist 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.



```
//I'm changing the message.
//The original version follows.

void HelloView::Draw(BRect updateRect)
{
MovePenTo(BPoint(10, 30));
    DrawString("Hello, Me!");
}

//void HelloView::Draw(BRect updateRect)
//{
//  MovePenTo(BPoint(10, 30));
//  DrawString("Hello, World!");
//}
```

*Select the lines you want to indent*

```
//I'm changing the message.
//The original version follows.

void HelloView::Draw(BRect updateRect)
{
    MovePenTo(BPoint(10, 30));
    DrawString("Hello, Me!");
}

//void HelloView::Draw(BRect updateRect)
//{
//  MovePenTo(BPoint(10, 30));
//  DrawString("Hello, World!");
//}
```

*Then choose Indent from the Edit menu to indent the selected lines.*

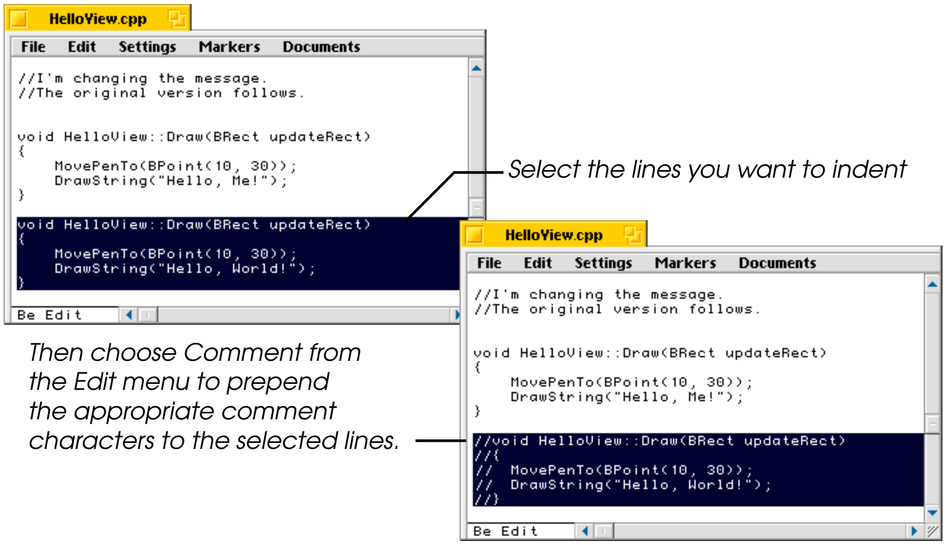
Unindent selected lines by choosing Unindent from the Edit menu.

### 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.


HelloView.cpp
File Edit Settings Markers Documents
Be Edit
HelloView.cpp
File Edit Settings Markers Documents
Be Edit

```
//I'm changing the message.
//The original version follows.


void HelloView::Draw(BRect updateRect)
{
    MovePenTo(BPoint(10, 30));
    DrawString("Hello, Me!");
}
void HelloView::Draw(BRect updateRect)
{
    MovePenTo(BPoint(10, 30));
    DrawString("Hello, World!");
}
```

```
//I'm changing the message.
//The original version follows.


void HelloView::Draw(BRect updateRect)
{
    MovePenTo(BPoint(10, 30));
    DrawString("Hello, Me!");
}
//void HelloView::Draw(BRect updateRect)
//{
//    MovePenTo(BPoint(10, 30));
//    DrawString("Hello, World!");
//}
```

*Select the lines you want to indent*

*Then choose Comment from the Edit menu to prepend the appropriate comment characters to the selected lines.*

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.

| File Extension | Comment Character(s) |
|---|---|
| **.c**, **.h**, or **.cpp** | // |
| **.a** | ; |
| All others | # |

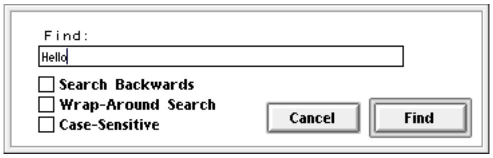
You can remove the comment characters from the beginnings of selected lines by choosing Uncomment from the Edit menu.

### 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.



Find:

Hello

☐ Search Backwards

☐ Wrap-Around Search

☐ Case-Sensitive

**3** Check any Find options.

Check Search Backwards to search for the characters in the file that are 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.

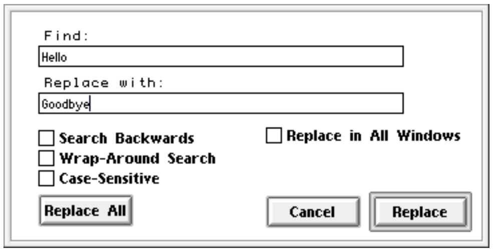
You can choose Find Again from the Edit menu to search for the next occurrence of the characters.

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.



Find: Hello

Replace with: Goodbye

☐ Search Backwards
☐ Wrap-Around Search
☐ Case-Sensitive
☐ Replace in All Windows

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

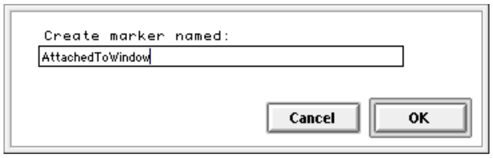
You can create and name markers in your Edit files that make it easy to jump directly to the location of the marker.

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.



Create marker named: AttachedToWindow

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.

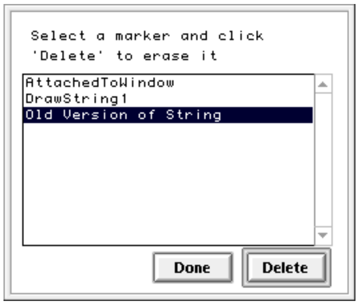
You can choose Alphabetize Markers from the Markers menu to list the names of makers alphabetically, rather than by their order in the file.

### 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.



Select a marker and click 'Delete' to erase it

AttachedToWindow
DrawString1
Old Version of String

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 115.

# 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 team mate (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 135). 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 BeBox, or as 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.

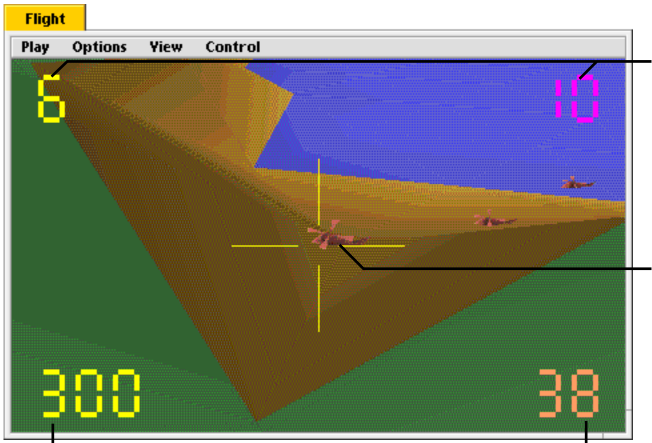
To set up a solo player (or a single entrant in a network game), choose the item from the Control menu that matches whether you’ll control your flight using the keyboard, using a joystick connected to the upper joystick port on the back of the BeBox, or a joystick connected to the lower joystick port. 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 BeBox, 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.



*Yellow and purple team scores.*

*Shoot down an unarmed helicopter for 1 point.*

*Your speed, from 300 to 1500.*

*The number of surviving unarmed helicopters.*

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 Shift key.

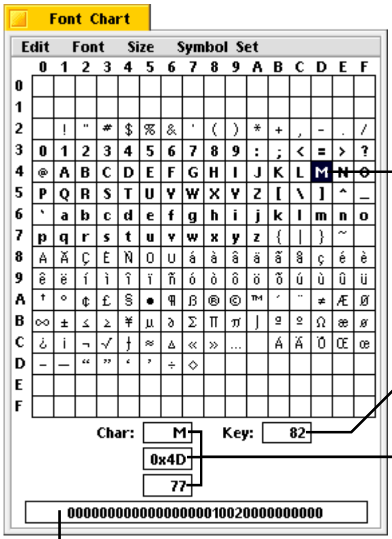
Each player can choose Map from the View menu to open a window that shows his position in the landscape. Yellow and purple team players are represented by crosshairs. Unarmed helicopters are represented by black dots. The other commands in the View menu control how wide a view is displayed in the window.

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.



|   | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | A | B | C | D | E | F |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2 |  | ! | " | # | $ | % | & | ' | ( | ) | * | + | , | - | . | / |
| 3 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | : | ; | < | = | > | ? |
| 4 | @ | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O |
| 5 | P | Q | R | S | T | U | V | W | X | Y | Z | [ | \ | ] | ^ | _ |
| 6 | ` | a | b | c | d | e | f | g | h | i | j | k | l | m | n | o |
| 7 | p | q | r | s | t | u | v | w | x | y | z | { | \| | } | ~ |  |
| 8 | Ä | Å | Ç | É | Ñ | Ö | Ü | á | à | â | ä | ã | å | ç | é | è |
| 9 | ê | ë | í | ì | î | ï | ñ | ó | ò | ô | ö | õ | ú | ù | û | ü |
| A | † | ° | ¢ | £ | § | • | ¶ | ß | ® | © | ™ | ´ | ¨ | ≠ | Æ | Ø |
| B | ∞ | ± | ≤ | ≥ | ¥ | µ | ∂ | Σ | Π | π | ∫ | ª | º | Ω | æ | ø |
| C | ¿ | ¡ | ¬ | √ | ƒ | ≈ | ∆ | « | » | … |  | À | Ã | Õ | Œ | œ |
| D | – | — | “ | ” | ‘ | ’ | ÷ | ◊ |  |  |  |  |  |  |  |  |
| E |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| F |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Char: M
0x4D
77
Key: 82

000000000000000000001002000000000000

*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 key cap in the Keyboard application, or into an Edit document.

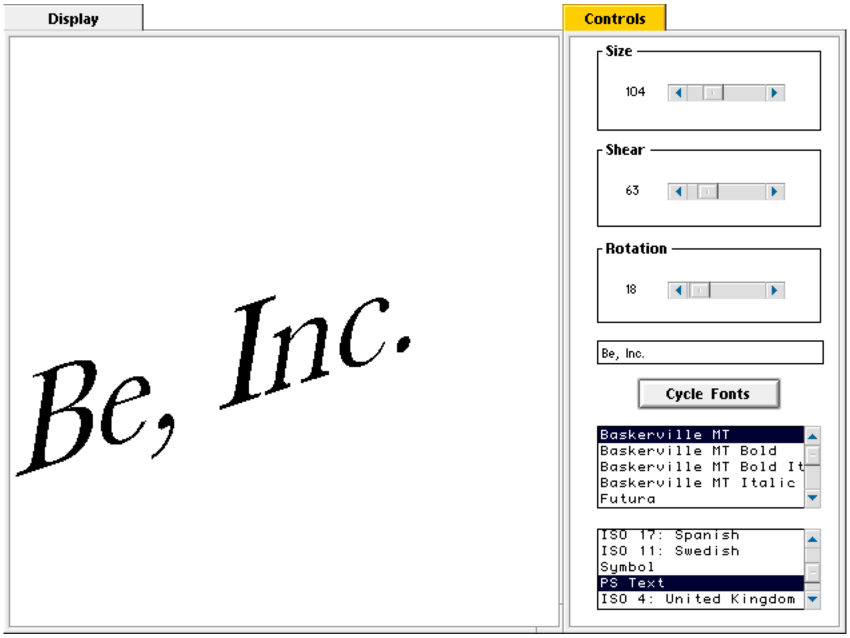
At the bottom of the window, the bit field shows the raw keyboard key number, in binary form, as you press and release keys singly or in combination. This information is useful for game developers and others who rely on raw keyboard data.

You can choose the Keyboard ID command from FontChart's Edit menu to see the ID number of the keyboard connected to the BeBox.

The prerelease version of the Be software uses the same symbol set as the Macintosh operating system. For more information on symbol sets, see "Keymap" on page 124.

## FontDemo

FontDemo shows off the BeBox'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.


Display
Be, Inc.
Controls
Cycle Fonts
Baskerville MT
Baskerville MT Bold
Baskerville MT Bold It
Baskerville MT Italic
Futura
ISO 17: Spanish
ISO 11: Swedish
Symbol
PS Text
ISO 4: United Kingdom

Size 104

Shear 63

Rotation 18

Be, Inc.

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.

## 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 159.

## ImageViewer

You can use ImageViewer to open and view two kinds of image files: Color TIFF (Tagged Image File Format) 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. 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

The Installer application has two purposes: Preparing disks so you can use them with the BeBox and installing the BeOS. Installing the BeOS is described in *Installing Developer Release 8 of the BeOS*, the booklet that accompanies this user's guide.

## Initializing or Formatting a Disk

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

**Note:** The current release of the BeOS only supports 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 only takes 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.

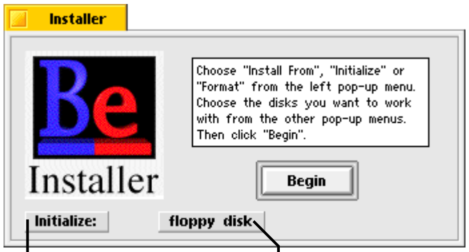
**1** If you’re initializing or formatting a SCSI or IDE disk, make sure it’s connected to the BeBox.

You can connect up to two IDE disk drives to the BeBox and up to seven SCSI disk drives. Depending on the number of disks you connect to the BeBox 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 the owner’s guides that came with the disks and Chapter 1, “Assembling the BeBox.”

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 "Install From", "Initialize" or "Format" from the left pop-up menu. Choose the disks you want to work with from the other pop-up menus. Then click "Begin".

*Choose Initialize (or Format).*

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

If a disk was previously initialized on a BeBox, 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:

| Device Name | Description |
|---|---|
| ide - master | The single IDE disk connected to the 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 *n* | The SCSI drive set to SCSI ID number *n* (*n* 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.

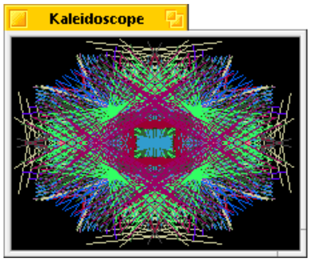
When the disk is initialized, a message informs you that it's now available in the BeBox window. Floppy disks are named "fd" when you format them. Other disks are named "NewDisk."

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 BeBox's performance.



## Live3D

Live3D is an application that offers three demonstrations of the 3D Kit. The 3D Kit makes its debut in a preliminary version in DR8.

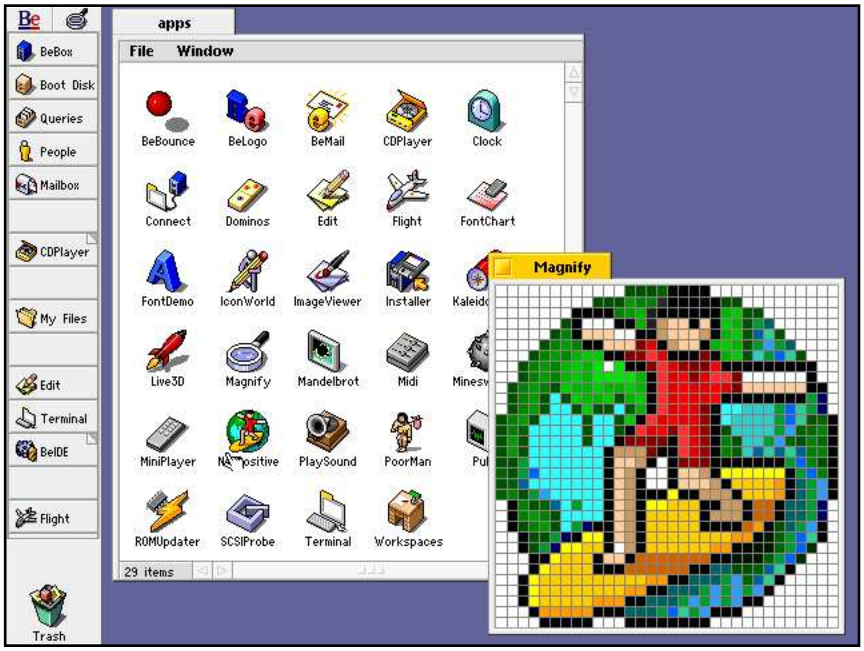
When you start Live3D, a window opens with an image of a spinning spacecraft. This image is a 3D Kit model, which is being rendered in real time, with light sources that move as well. Choose Stellar Pulse or Be Logo II from Live3D's main menu to open a window with one of the other 3D Kit demonstrations.

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, uncheck 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.

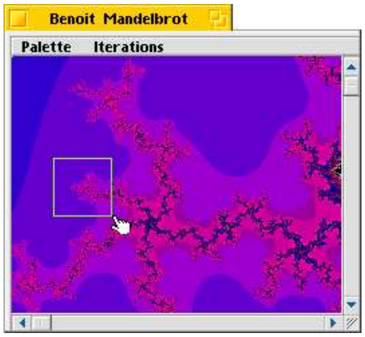

Be
BeBox
Boot Disk
Queries
People
Mailbox
CDPlayer
My Files
Edit
Terminal
BeIDE
Flight
Trash
apps
File
Window
BeBounce
BeLogo
BeMail
CDPlayer
Clock
Connect
Dominos
Edit
Flight
FontChart
FontDemo
IconWorld
ImageViewer
Installer
Kaleid
Live3D
Magnify
Mandelbrot
Midi
Minesw
MiniPlayer
N ositive
PlaySound
PoorMan
Pul
ROMUpdater
SCSIProbe
Terminal
Workspaces
29 items
Magnify

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 BeBox by drawing images based on the “Mandelbrot set,” a set of mathematical formulas invented by Benoît Mandelbrot, the Polish mathematician. Mandelbrot takes advantage of the two PowerPC microprocessors in the BeBox by using 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

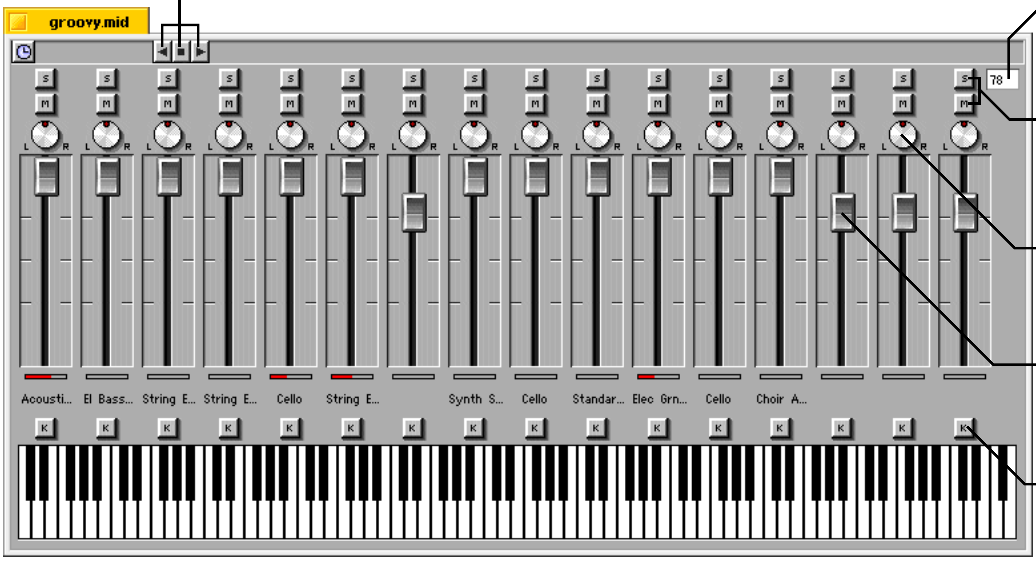
Midi is an application for playing MIDI (Musical Instrument Digital Interface) files on a MIDI synthesizer. (If you don't have a MIDI synthesizer connected to the MIDI-1 Out port on the BeBox, MIDI will play MIDI files, but you won't be able to hear them.) You open a MIDI file by dragging it onto the 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 only visible 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 135.

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

*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.*

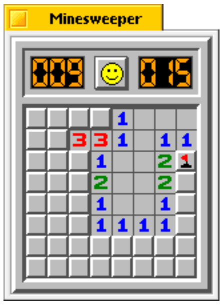
Each track in the MIDI file is represented by a vertical set of controls. You can play a track as a solo, mute the track, pan the track between the left and right audio channels, adjust its volume, and see it play on the keyboard, all by adjusting the controls for that track.

You can synchronize the beginning and end of the MIDI track with other application's 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 on the BeBox without a hardware MIDI synthesizer attached. 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 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 127). 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.

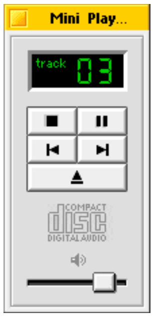
If you flag all the mines, you win. If you had one of the best winning times, a panel prompts you to enter your name. You can choose Best Times from Minesweeper’s main menu to see who the current leaders are and how well they did.

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 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.

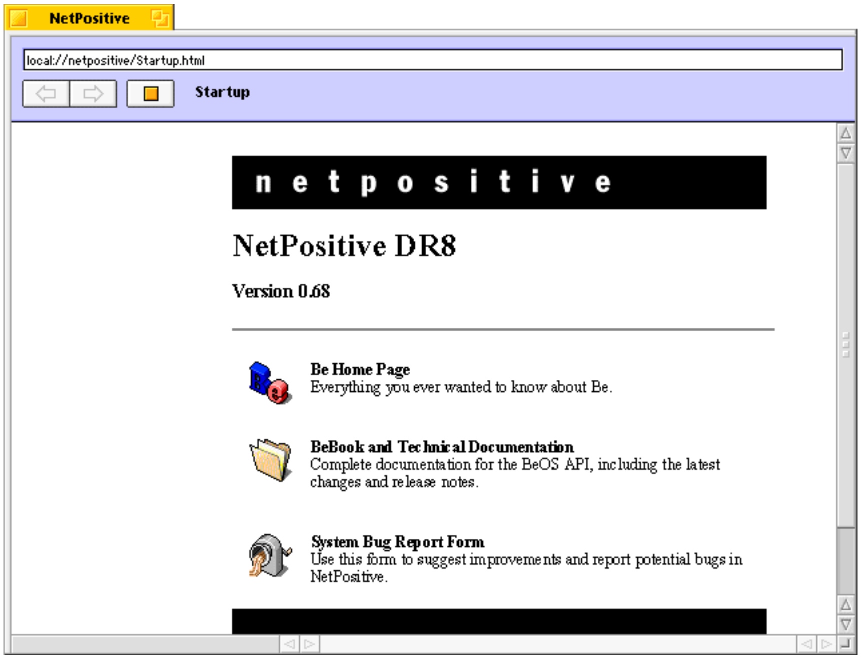


MiniPlayer's controls are a subset of those in the CDPlayer application. For information about MiniPlayer's controls and menu items, see "CDPlayer" on page 80.

## NetPositive

If you've used the Network preferences 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 128). 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 Hyper Text 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.



netpositive

NetPositive DR8

Version 0.68

**Be Home Page**
Everything you ever wanted to know about Be.

**BeBook and Technical Documentation**
Complete documentation for the BeOS API, including the latest changes and release notes.

**System Bug Report Form**
Use this form to suggest improvements and report potential bugs in NetPositive.

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 URL (Universal Resource Locator). These start with **http://** and are followed by the unique address of a page. For example, the

Be, Inc. home page's URL is **http://www.be.com** 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 choosing Open File from NetPositive's main menu. This is how you open the starting pages of the on-line documentation. Another easy way to open an HTML file is to drag it onto NetPositive's icon.

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 world-wide 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.

NetPositive displays parts of icons and other art as it gets them. Initially it draws them with a "venetian blind" effect: Drawing the whole piece of art at increasing resolution as it gets it. But you can uncheck Dither in NetPositive's main menu to have NetPositive draw art at full resolution, starting from the top of the piece of art and moving to the bottom.

## PlaySound

You can listen to an audio file by dragging it onto the PlaySound icon. PlaySound can use the DAC (Digital-to-Audio Converter) circuitry on the BeBox I/O board to play audio files in “raw,” AIFF (Audio Interchange File Format), and WAVE (Waveform Audio File Format) format.

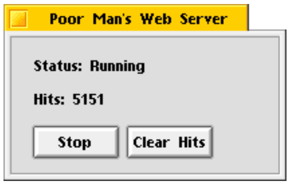
When you drag a sound file onto the PlaySound icon, a small window opens with a Stop button. Click Stop to stop playing the sound. Depending on the Sound preferences application settings and the devices connected to the BeBox, you hear the audio file on the internal BeBox speaker or on a device connected to the line-out ports (see “Sound” on page 139 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 Formatting Language) is the formatting language used for world-wide documents, or “pages.” JPEG and GIF are graphics file formats commonly used for illustrations in world-wide web pages.

When you start 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.



Status: Running

Hits: 5151

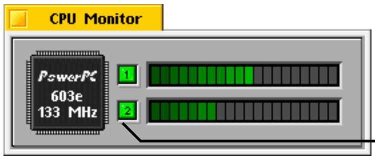
When PoorMan is running, others on your network can use their web browsers to view the pages on your site. Depending on how your network is set up, they may be able to simply type your BeBox's hostname or IP address to open your site's home page (the **/public_html/index.html** file).

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 BeBox (though you can use NetPositive to browse pages PoorMan is serving on other BeBoxes on a network). For more information about NetPositive, see "NetPositive" on page 110.

## Pulse

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



*Click a numbered button to "turn off" one of the CPUs. If you click both buttons, you'll have to restart the BeBox!*

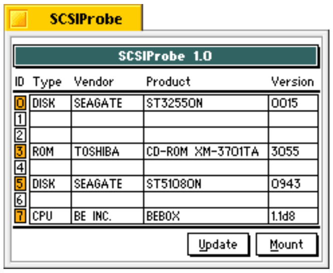
## ROMUpdater

Part of the BeOS system software 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 BeBox. The BeBox itself is always at SCSI ID 7. Other SCISI 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 |
|---|---|---|---|---|
| 0 | DISK | SEAGATE | ST32550N | 0015 |
| 1 | | | | |
| 2 | | | | |
| 3 | ROM | TOSHIBA | CD-ROM XM-3701TA | 3055 |
| 4 | | | | |
| 5 | DISK | SEAGATE | ST51080N | 0943 |
| 6 | | | | |
| 7 | CPU | BE INC. | BEBOX | 1.1d8 |

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 it’s 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. In addition, only the BeBox SCSI bus appears if you press the ID column title.

## 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 in the menu (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 only available 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:

| Press | To scroll |
|---|---|
| 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 book store 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 opening the **index.html** file (it's in the **HTML** folder) with NetPositive's Open File command (for more information on NetPositive, see "NetPositive" on page 110). 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.

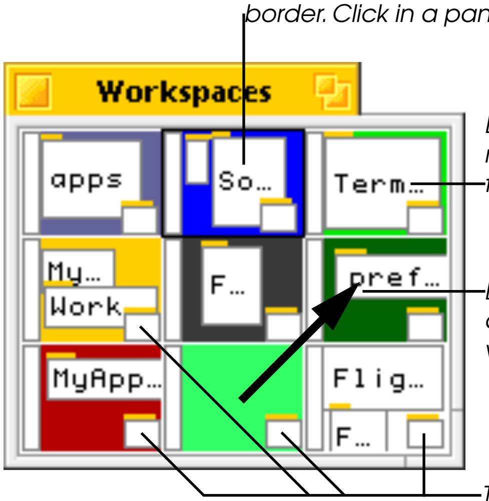
## Workspaces

Workspaces

When you first start working with the BeBox, 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.



*Every workspace is represented by a pane in the Workspaces window. The pane for the active workspace has a black border. Click in a pane to switch to that workspace.*

*Every open window is represented in miniature, with as much of its title as fits.*

*Drag a window from one pane to another to move it to that workspace.*

*The windows for some applications, such as the Workspaces application itself, open in all workspaces.*

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 135 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 applications' 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.

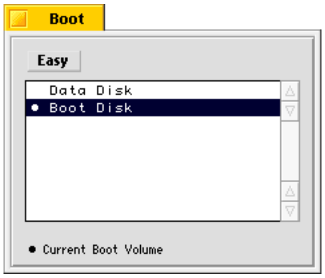
# 5 Customizing the BeOS

The BeOS comes with a number of applications you use to configure and customize the BeOS. 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 shows you how to customize the BeOS by adding fonts, add-ons, and other files.

## Boot

A chip on the BeBox 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 connected to the BeBox, which disk you want the BeBox to try 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 BeBox looks for a boot disk, see “Selecting a Boot Disk” on page 16).

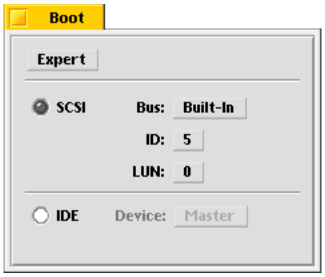
When you start Boot, a window opens that lists each mounted disk by the name (for information on mounting disks, see “Working with Disks” on page 45). The current boot disk is marked with a bullet (●). If the configuration of one of the disks in the list (that is, a master or slave IDE disk or SCSI disk at a specific SCSI ID) matches the current boot 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.



Data Disk
● Boot Disk

● Current Boot Volume

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 on the BeBox motherboard: That is, by SCSI or IDE disk configuration rather than by the name.



● SCSI Bus: Built-In
ID: 5
LUN: 0

○ IDE Device: Master

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.

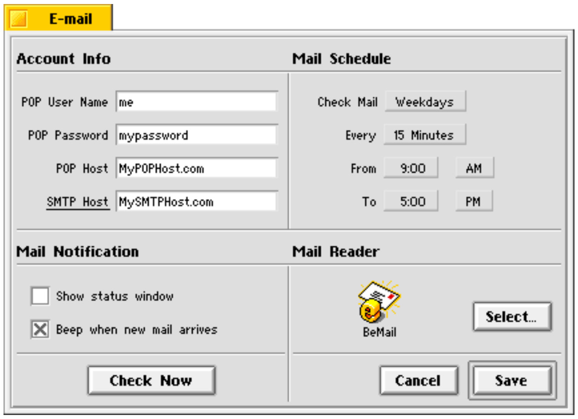
If you change the boot preference, the BeBox will try to boot from the disk you selected the next time you start the BeBox.

To find out the SCSI IDs of SCSI disks connected to the BeBox, you can use the SCSIProbe application, which is described in "SCSIProbe" on page 114.

# E-Mail

You use the E-Mail preferences application to configure the Be software 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 128).

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



E-mail

**Account Info**

POP User Name: me

POP Password: mypassword

POP Host: MyPOPHost.com

SMTP Host: MySMTPHost.com

**Mail Schedule**

Check Mail: Weekdays

Every: 15 Minutes

From: 9:00 AM

To: 5:00 PM

**Mail Notification**

☐ Show status window

☒ Beep when new mail arrives

**Mail Reader**

BeMail

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

4. 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 74. The BeMail application offers basic e-mail features; as third-party developers create more sophisticated e-mail applications, you can use them instead.

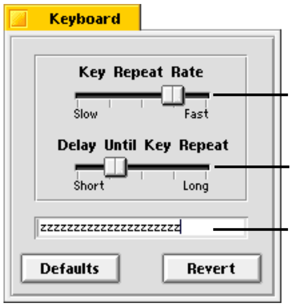
5. Click Save.

   If you checked "Show status window," the E-Mail Status window opens with information about the number of e-mail message 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 74.

# 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 how quickly a key repeats once it starts repeating.



zzzzzzzzzzzzzzzzzzzzz

*Drag to make keys repeat faster or slower.*

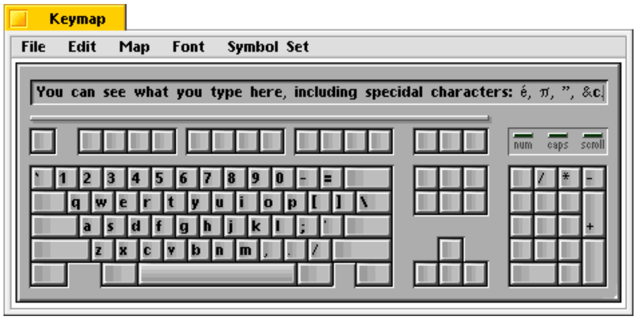
*Drag to make the delay before keys repeat shorter or longer.*

*Test your settings by typing here.*

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.



You can see what you type here, including specidal characters: é, π, ”, &c.

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 U.S.; 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 9 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.

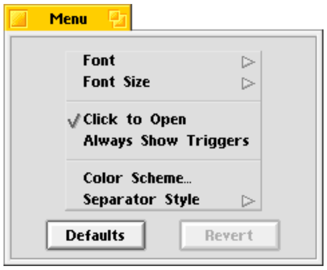
You can revert to the default keymap at any time by choosing System Startup from Keymap's Map menu. If you delete the **/system/settings/key_map** file, you revert to the BeOS's idea of a default keymap the next time you restart the BeOS.

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 36.)

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 36.)

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 setting 8-bit and 32-bit color, see “Screen” on page 135.)

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.

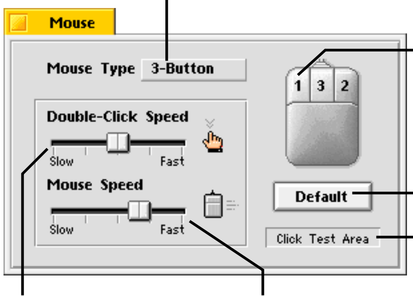
Changes you make in the Menus preferences take effect in other applications the next time you start them (or in the case of the Browser, the next time you start the BeOS).

## Mouse

You can use the Mouse application to set your preference for a number of ways a mouse works with the BeBox. 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 22). You can set how quickly you have to click the mouse button before the BeBox 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.

*Choose the number of buttons on your mouse.*



Mouse Type: 3-Button

*Press a mouse button in the diagram to choose whether you want it to act as a primary (1), secondary (2), or tertiary (3) mouse button*

*Click to revert to the default settings.*

*Use this text to test your double-click setting.*

*Drag this slider to adjust the interval before the BeBox interprets two clicks as a double-click.*

*Drag this slider to adjust how rapidly the cursor moves when you move the mouse.*

# 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 the BeBox. 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.

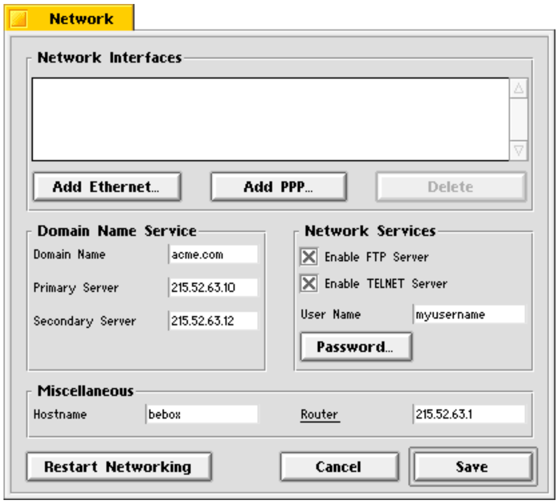
You can configure multiple network interfaces—for example, if you have more than one network adapter installed in the BeBox. However, it's up to the software you're using to know which interface to use.

**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 BeBox, and the network.

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


Network
Network Interfaces
Add Ethernet…
Add PPP…
Delete
Domain Name Service
Network Services
Password…
Miscellaneous
Restart Networking
Cancel
Save

Domain Name: acme.com
Primary Server: 215.52.63.10
Secondary Server: 215.52.63.12
☒ Enable FTP Server
☒ Enable TELNET Server
User Name: myusername
Hostname: bebox
Router: 215.52.63.1

- In the Domain Name field, enter the name of your network domain.
- In the Primary Nameserver 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 Nameserver 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 BeBox (most network administrators let you pick this name).
- If you want to allow users on other computers to use the **ftp** utility to put and get files from your BeBox, check the Enable FTP Server option.
- If you want to allow users on other computers to use the **telnet** utility to connect to the BeBox, check the Enable Telnet Server option.

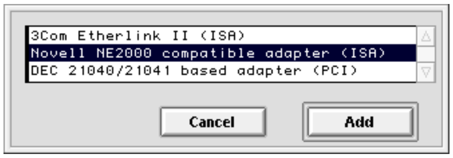
- In the User Name field, enter the name you want to use when connecting to the BeBox from another computer. (You can't use **ftp** or **telnet** to connect to the BeBox from another computer unless you enter a name in the User Name field.) The user name you enter is also used as the default user name when you run **ftp** on the BeBox.
- Click the Password button to open a panel where you enter the password you want to use when connecting to the BeBox 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

If you added an Ethernet network adapter in the BeBox (as described in"Adding a Network Adapter" on page 6), you use the Network application to configure the BeOS to use it.

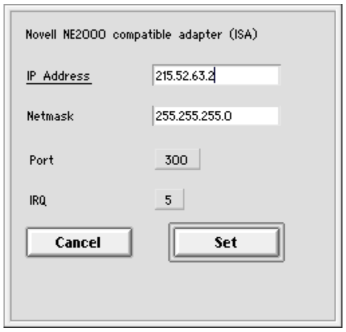
**1** Click Add Ethernet.

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


3Com Etherlink II (ISA)
Novell NE2000 compatible adapter (ISA)
DEC 21040/21041 based adapter (PCI)

**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 installed in the BeBox 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

**3** In the IP Address field, type the IP address of the network adapter card in your BeBox.

This number uniquely identifies the BeBox computer on the network.

**4** In the IP 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 OK.

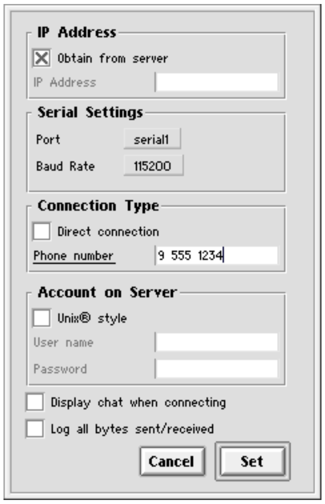
The new network interface is added to the scrolling list at the top of the Network window.

### 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 to communicate directly with a computer that can host a PPP connection, you can also configure the BeBox to communicate with that computer though their serial ports, using a cable called a “null modem cable.”

If you’re setting up the BeBox 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.



☒ Obtain from server

Port: serial1

Baud Rate: 115200

☐ Direct connection

Phone number: 9 555 1234

☐ Unix® style

☐ Display chat when connecting

☐ Log all bytes sent/received

**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:** Serial ports 1 and 2 are reliable up to 155200 baud. Serial ports 3 and 4 are reliable up to 38400 baud.

5 If you’re connecting the BeBox directly to another computer via a null modem cable connected to the two 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 the BeBox 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 OK.

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

### 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 BeBox’s 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).

### 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 the BeBox and the modem
- Determine the serial port rate by the rate of the last AT command
- Enable hardware flow control (CTS and RTS) between the BeBox and the modem
- Disable software flow control between the BeBox and the modem

If you’re using a U.S. Robotics Sportster modem, 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&F&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 will 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 84. 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.

# Screen

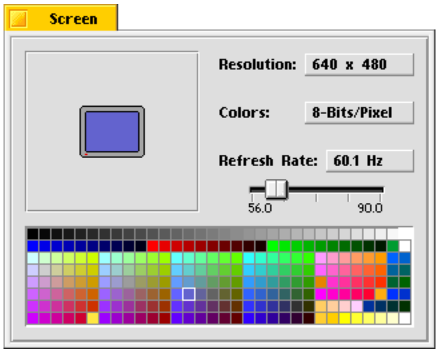
You use the Screen application to set how the BeOS, graphics card, and monitor interact to display the BeOS. You also use Screen to set the color of the desktop.

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

Initially, the BeBox 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 information about what kinds of graphics cards work with the BeBox and DR8, see "Adding a Graphics Card" on page 5 and the Be web site (**http://www.be.com**).

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



Resolution: 640 x 480

Colors: 8-Bits/Pixel

Refresh Rate: 60.1 Hz

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 the monitor and graphics card to find out what combinations of settings are safe for the monitor.

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 only affect the active workspace, so if you're working with more than one workspace (as described in "Workspaces" on page 117), 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 Screens 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 widow offers three sliders, for the red, green, and blue components of the over 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.

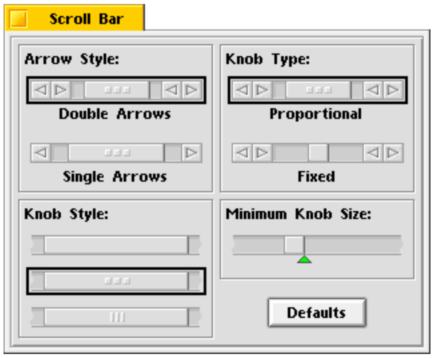
If you're using the Workspaces application to work in more than one workspace (as described in "Workspaces" on page 117), the color you pick only affects the active workspace—the one where you're using Screen—so you can give each workspace a distinct desktop color.

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 143.

# ScrollBar

Initially, many windows in the BeOS use “proportional scroll bars,” as described in “Scrolling the Items in a Window” on page 27.

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.

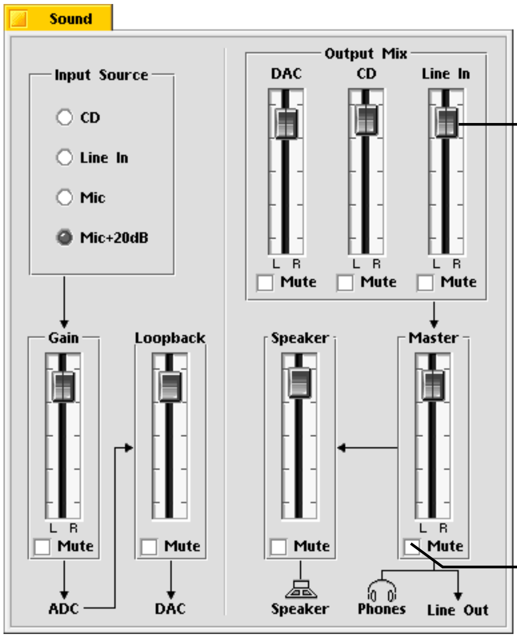

Scroll Bar
Arrow Style:
Double Arrows
Single Arrows
Knob Type:
Proportional
Fixed
Knob Style:
Minimum Knob Size:
Defaults

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 on the BeBox.

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


Sound
Input Source
○ CD
○ Line In
○ Mic
● Mic+20dB
Output Mix
DAC
CD
Line In
L R
☐ Mute
Gain
Loopback
Speaker
Master
ADC
DAC
Speaker
Phones
Line Out

*Drag a slider up or down to increase or decrease volume. Use the secondary mouse button to adjust the volume of the left or right channel independently.*

*Click a mute box to mute that feature.*

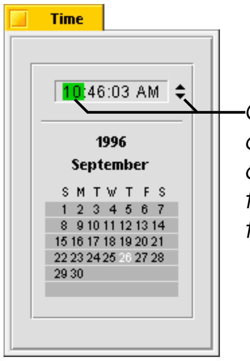
Use the controls on the left side of the Sound window to select an input to the ADC (the Analog-to-Digital Converter circuitry in a chip on the BeBox I/O board), and the "loopback" signal from the ADC to the DAC (the Digital-to-Analog Converter).

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 BeBox motherboard keeps the time, even when the BeBox is turned off. You set the date and time on the BeBox with the Time application. When you start Time, a window opens with the BeBox'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.



10:46:03 AM

1996

September

| S | M | T | W | T | F | S |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 29 | 30 | | | | | |

*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 BeBox 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 install them on the BeBox, so they're available in applications that work with fonts, such as Edit and FontDemo. A few kinds of TrueType fonts don't work on the BeBox, but most do.

1. Copy the TrueType fonts you want to 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 on-line help.

2. Use **ftp** to copy the fonts to the BeBox.

   If you don't have a network set up, you can also use **tar** to copy the fonts to the BeBox 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 BeBox.

4. Make sure the fonts have the **.ttf** extension (uppercase letters don't work).

5. Restart the BeBox.

# Adding Drivers and Add-Ons

You can add software to the BeBox that make 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 BeBox.

**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 BeBox.

Installing a graphics card in the BeBox is described in Chapter 1, "Assembling the BeBox."

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

## 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 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 on the BeBox—such as 640 × 480, 800 × 600, or 1024 × 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 BeBox.

   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 BeBox.

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.

# 6 Developing Be Applications

You have a number of choices for how you develop applications for DR8 of 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 limits your source files to 68K.) Using BeIDE is described in "Developing Applications on the BeBox" on page 147.
- 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 150.
- You can use the Macintosh version of CodeWarrior 9 to develop Be applications on a Macintosh and then move them to the BeOS, as described in "Developing Be Applications on a Macintosh" on page 153.

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 it's 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 154.

- You can use the Be assembly language debugger, **/bin/db**, as described in "Using the Be Debugger" on page 167.

Other applications you use on the BeBox when developing applications are:

- Terminal, the application you use to work with the Be shell, which is described in "Terminal" on page 115.

- Edit, the Be text editor, which is described in "Edit" on page 88.

- AppModeler, the graphical tool for building an application's user interface, which is in **/develop/AppModeler**.

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 110) 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 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 Developer Release 8 of the BeOS,* the booklet that accompanies this user's guide.

# Developing Applications on the BeBox

Developer Release 8 of the BeOS comes with a copy of the Metrowerks development environment for the BeBox. You can use this environment to develop applications in two ways: By using BeIDE, the CodeWarrior Integrated Development Environment for the BeBox, or by using the compiler and linker (**mwcc**, **mwld**) and the **make** command in a Terminal window.

## About the Development Environment on the BeBox

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 are described below:

- **/develop/AppModeler** contains the first version of the AppModeler application, for building an application's user interface.
- **/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, which will not be necessary after DR8.
    - **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 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, use NetPositive's Open File command to open **/documentation/metrowerks/HTMLDocs/index.html**.

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 160). 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 167).

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 159.

## Using the Tools from the Command Line

You can use the Metrowerks tools, **mwcc** and **mwld**, to build applications on the BeBox 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: HelloView.cpp HelloView.h
     $(CC) $(INCLUDES) $(CFLAGS) -o $@ -c HelloView.cpp
  ```

  In general, you create an instruction of this form for each file that you placed 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 159.

# Developing Be Applications on a Macintosh

You can use CodeWarrior 9 on a Macintosh to develop applications for the BeOS. To develop applications for DR8, you also need to install the Macintosh version of the DR8 headers and libraries, as described in *Installing Developer Release 8 of the BeOS*.

## Using the CodeWarrior IDE

The CodeWarrior IDE is documented in *Inside CodeWarrior 9*, 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 on the BeBox 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 on the BeBox (as described in "Using the Be Debugger" on page 167), or the symbol file with the ".xSYM" extension to debug your application with the cross-debugger on the Macintosh (as described in "Using the Cross-Debugger" on page 154).

## Transferring An Application to the BeBox

Once you've built an application, you can transfer it to the BeBox using **ftp** or **tar** (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). If you transfer the files using **ftp** or **tar**, don't forget to transfer 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, you may find it more convenient to use the cross-debugger on the Macintosh. The Macintosh cross-debugger works with a "nub application" on the BeBox to transfer the application you developed on the Macintosh to the BeBox, 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 on the BeBox.

If you're planning to communicate between the Macintosh and the BeBox 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 199.)

**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 BeBox when you try to use the cross-debugger.

### Setting Up the Nub on the BeBox

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 on the BeBox, as described in *Installing Developer Release 8 of 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 Macintosh and BeBox 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 BeBox 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 BeBox 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 on the BeBox, 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 Developer Release 8 of 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 BeBox 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 9*, 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 on the BeBox, as described above.

2. Create a folder for your application on the BeBox. 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 159.

3. Start the nub on the BeBox (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 on the BeBox you specified in the nub, the cross-debugger transfers a copy to the BeBox 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 on the BeBox 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 on the BeBox, 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 on the BeBox 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 on the BeBox, 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 on the BeBox; you can't do it on the 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 standalone file and leave them on the BeBox. 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 165).

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 165.

## Using IconWorld

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

- Drag an application or a standalone 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 standalone 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 standalone 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 standalone 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 world-wide 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.

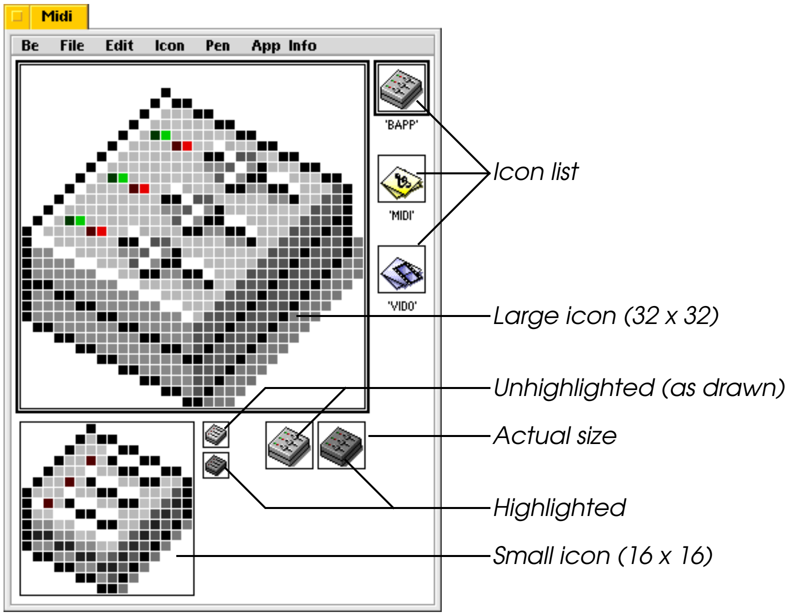
IconWorld assumes the drawing model discussed in "The Interface Kit" chapter of *The Be Book*. It would help to know something about that model—including high and low colors, patterns, and transparent pixels—before proceeding.

### 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.


Midi
Be File Edit Icon Pen App Info
'BAPP'
'MIDI'
'VIDO'
Icon list
Large icon (32 x 32)
Unhighlighted (as drawn)
Actual size
Highlighted
Small icon (16 x 16)

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 127).
- 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 × 32 or a 16 × 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 × 32 bitmap and another for the 16 × 16 bitmap.

After you transport the files to the BeBox (using **ftp** or **tar**, as described in Appendix B, "Transferring Files to and from 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 standalone 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 folder on the BeBox 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 standalone 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 154 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 on the BeBox, 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 **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 team-wide. 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 seperately 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 170.)

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 171 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 0x80003b0.
- Symbols can be used in expressions. **db** performs auto-completion 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: il 80000248 #4
  ...
  db: il . #8
  ...
  db: il . #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 64k 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*

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

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

| Command | Meaning |
|---|---|
| **dm** *address count* | Display *count* bytes of data starting at the given address. |
| **sm** *address value* | Set the data at the given address to *value*. |
| **db** \| **dh** \| **dw** *address* | Display *address* as a byte, half-word, or full-word. |
| **sb** \| **sh** \| **sw** *address value* | Set *address* as the byte, half-word, or full-word given by *value*. |
| **wh** *address* | Tell where *address* is (as an offset into a function or a portion of memory, for example). |
| **regs** | Display the contents of the CPU registers. |
| **set** *symbol value* | Sets the value of *symbol*. You can use this command to create new symbols. |
| **sd** *prefix* | Symbol dump; display the symbols whose names start with *prefix* (case insensitive). |

| | |
|---|---|
| **svd** | Displays all symbols, but in order of their values. |
| **smd** *prefix* | Symbol method dump; display the symbols whose method names start with *prefix*. |

*Displaying Frames and Instructions*

| Command | Meaning |
|---|---|
| **sc** | Stack crawl; list the frames on the stack. |
| **il** *address* [ *count* ] | List *count* instructions starting at *address*; *count* defaults to 5. |
| **ip** [ *address* ] | List a page of instructions starting at *address*; the argument defaults to pc – 20. |

*Stepping and Breaking*

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

*Accessing Other Threads in the Team*

| Command | Meaning |
|---|---|
| **ps** | Display information about the threads in this team. |
| **nx** | Switch to the “next” suspended thread in the team. |
| **stch** | 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. |

# 7 The BeBox Ports

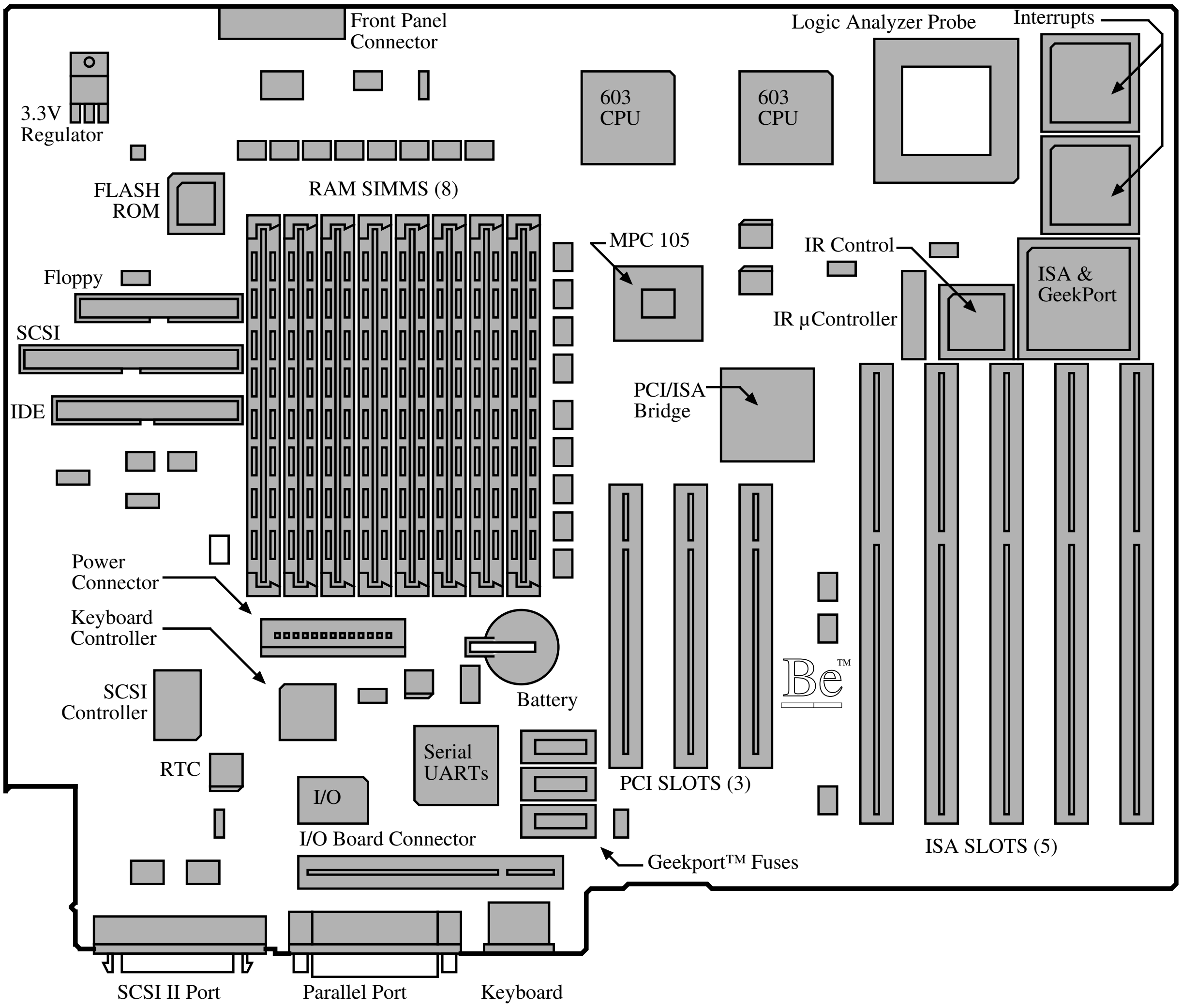
The BeBox is designed to facilitate a wide variety of I/O (input/output) connections. There are industry-standard and custom ports on the motherboard, some accessible on the back panel of the BeBox and some from inside. There are also a number of ports on the Be I/O board, most of which are available from the back panel.

This chapter describes the internal and external BeBox ports. The ports are illustrated from the perspective of a user looking into them. If a port has a label on the motherboard or I/O board, the label is included in parentheses in the title of the section that describes the port.

For information on opening the BeBox to access the internal ports, connecting internal and external devices, and devices that are compatible with the BeBox, see Chapter 1, "Assembling the BeBox."

## Internal Ports

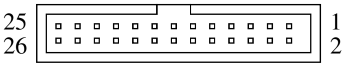
A number of BeBox ports, including those for internal disk drives, are available only by opening the BeBox.


Front Panel Connector
Logic Analyzer Probe
Interrupts
3.3V Regulator
603 CPU
603 CPU
FLASH ROM
RAM SIMMS (8)
MPC 105
IR Control
ISA & GeekPort
Floppy
IR µController
SCSI
PCI/ISA Bridge
IDE
Power Connector
Keyboard Controller
Be™
SCSI Controller
Battery
Serial UARTs
RTC
I/O
PCI SLOTS (3)
I/O Board Connector
ISA SLOTS (5)
Geekport™ Fuses
SCSI II Port
Parallel Port
Keyboard

**The BeBox Motherboard**

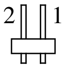
## Internal BeBox Motherboard Ports

### Front Panel Port (J1)



| Pin | I/O | Signal Name | Pin | I/O | Signal Name |
|---|---|---|---|---|---|
| 1 | O | PowerLED+ | 2 | NA | PowerLED– |
| 3 | O | DiskLED+ | 4 | NA | DiskLED– |
| 5 | I | Interrupt SW | 6 | NA | GND |
| 7 | I | Reset SW | 8 | NA | Reset RTN |
| 9 | O | LED_D0 | 10 | NA | +5V |
| 11 | O | LED_D1 | 12 | NA | +5V |
| 13 | O | LED_D2 | 14 | NA | +5V |
| 15 | O | LED_D3 | 16 | NA | GND |
| 17 | O | LED_D4 | 18 | NA | GND |
| 19 | O | LED_D5 | 20 | NA | GND |
| 21 | O | LED_D6 | 22 | NA | GND |
| 23 | O | LED_D7 | 24 | NA | GND |
| 25 | NA | Reserved | 26 | NA | Reserved |

### Speaker Port (J2)



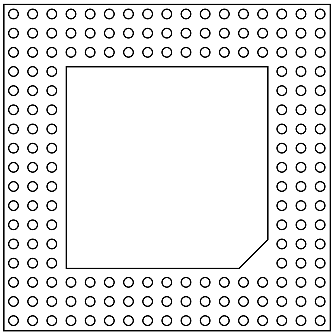
| Pin | I/O | Signal Name | Pin | I/O | Signal Name |
|---|---|---|---|---|---|
| 1 | O | SPEAKER + | 2 | O | SPEAKER – |

### Logic Analyzer Probe Port (J3)

The pin-out for the logic probe interface is available upon request from Be, Inc.

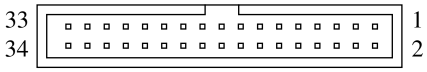
Be can supply a card and analyzer set-up libraries that connect the CPU bus to an HP 1660A.

Please contact Be developer support (e-mail: **devsupport@be.com**) for information on using this port.



### Floppy Disk Drive Connector (J4)

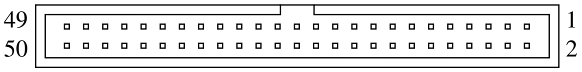
The 32-pin floppy connector is compatible with industry-standard, 3.5-inch floppy disk drives and flat-ribbon cables.



| Pin | I/O | Signal Name | Pin | I/O | Signal Name |
|---|---|---|---|---|---|
| 1 | NA | GND | 2 | O | DEN0 |
| 3 | NA | GND | 4 | NA | N/C |
| 5 | NA | GND | 6 | O | DEN1 |
| 7 | NA | GND | 8 | I | –INDEX |
| 9 | NA | GND | 10 | O | –MTR0 |
| 11 | NA | GND | 12 | O | –DR1 |
| 13 | NA | GND | 14 | O | –DR0 |
| 15 | NA | GND | 16 | O | –MTR1 |
| 17 | NA | GND | 18 | O | –DIR |
| 19 | NA | GND | 20 | O | –STEP |
| 21 | NA | GND | 22 | O | –WDATA |
| 23 | NA | GND | 24 | O | –WGATE |
| 25 | NA | GND | 26 | I | –TRK0 |
| 27 | NA | GND | 28 | I | –WP |
| 29 | NA | GND | 30 | I | –RDATA |
| 31 | NA | GND | 32 | O | –HDSEL |
| 33 | NA | GND | 34 | I | –DSKCHG |

### SCSI-II Connector (J5)

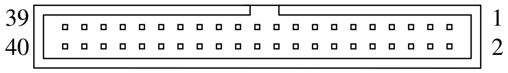
The internal 50-pin SCSI-II connector is compatible with industry-standard SCSI devices and flat-ribbon cables.



| Pin | I/O | Signal Name | Pin | I/O | Signal Name |
|---|---|---|---|---|---|
| 1 | NA | GND | 2 | I/O | SD0– |
| 3 | NA | GND | 4 | I/O | SD1– |
| 5 | NA | GND | 6 | I/O | SD2– |
| 7 | NA | GND | 8 | I/O | SD3– |
| 9 | NA | GND | 10 | I/O | SD4– |
| 11 | NA | GND | 12 | I/O | SD5– |
| 13 | NA | GND | 14 | I/O | SD6– |
| 15 | NA | GND | 16 | I/O | SD7– |
| 17 | NA | GND | 18 | I/O | SDP– |
| 19 | NA | GND | 20 | NA | GND |
| 21 | NA | GND | 22 | NA | GND |
| 23 | NA | Reserved | 24 | NA | Reserved |
| 25 | NA | N/C | 26 | NA | Term Power |
| 27 | NA | Reserved | 28 | NA | Reserved |
| 29 | NA | GND | 30 | NA | GND |
| 31 | NA | GND | 32 | I/O | ATN– |
| 33 | NA | GND | 34 | NA | GND |
| 35 | NA | GND | 36 | I/O | BSY– |
| 37 | NA | GND | 38 | I/O | ACK– |
| 39 | NA | GND | 40 | I/O | RST– |
| 41 | NA | GND | 42 | I/O | MSG– |
| 43 | NA | GND | 44 | I/O | SEL– |
| 45 | NA | GND | 46 | I/O | C/D– |
| 47 | NA | GND | 48 | I/O | REQ– |
| 49 | NA | GND | 50 | I/O | I/O– |

### IDE Connector (J6)

The 40-pin internal IDE connector is compatible with industry-standard IDE devices and flat-ribbon cables.



| Pin | I/O | Signal Name | Pin | I/O | Signal Name |
|---|---|---|---|---|---|
| 1 | O | –RESET | 2 | NA | GND |
| 3 | I/O | D7 | 4 | I/O | D8 |
| 5 | I/O | D6 | 6 | I/O | D9 |
| 7 | I/O | D5 | 8 | I/O | D10 |
| 9 | I/O | D4 | 10 | I/O | D11 |
| 11 | I/O | D3 | 12 | I/O | D12 |
| 13 | I/O | D2 | 14 | I/O | D13 |
| 15 | I/O | D1 | 16 | I/O | D14 |
| 17 | I/O | D0 | 18 | I/O | D15 |
| 19 | NA | GND | 20 | NA | KEY PIN |
| 21 | O | DMARQ [5] | 22 | NA | GND |
| 23 | O | DIOW– | 24 | NA | GND |
| 25 | O | DIOR– | 26 | NA | GND |
| 27 | NA | N/C (IORDY) | 28 | O | BALE– |
| 29 | I | DMACK– [5] | 30 | NA | GND |
| 31 | I | INTRQ (IRQ 14) | 32 | I | IOCS16– |
| 33 | O | DA1 | 34 | NA | N/C (PDIAG) |
| 35 | O | DA0 | 36 | O | DA2 |
| 37 | O | CS1FX– | 38 | O | CS3FX– |
| 39 | I | DASP– | 40 | NA | GND |

### DRAM SIMM Slots (J7 through J14)

The BeBox uses PC-standard, 72-pin, 60-nanosecond, fast-page mode SIMMs.

The BeBox can use SIMMs that are either 32 or 36 bits wide. Though you can use parity SIMMs, parity isn't supported in the current release of the BeOS.

For more information on adding SIMMs to the BeBox, see "Adding Memory" on page 4.

### PCI Slots (J16,17,18)

The BeBox uses PC-standard PCI connectors for a 32-bit, 5V card. 3.3V is supplied to the connector, as per the PCI specification. For more information about the PCI specification, see the *PCI Specification*, revision 2.0 or higher, or *PCI System Architecture* by Tom Shanley and Don Anderson (Mindshare), ISBN 1-881609-08-1.

Interrupts: INT A, B, C, and D are bused together on each slot. Each slot connects to both the legacy interrupt controller (inside the PCI-ISA bridge) and the Be Interrupt Controller.

|  | IDSEL | ISA Interrupt (82378) | Be Interrupt (Master/Slave) |
|---|---|---|---|
| J16 | AD13 | PCI1 | DH11 |
| J17 | AD14 | PCI2 | DH12 |
| J18 | AD15 | PCI3 | DH13 |

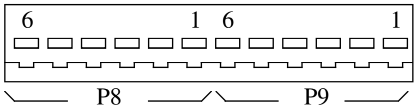
### ISA Slots (J19 through J23)

The BeBox uses PC-standard, 16-bit ISA slots and timing. The timing is generated by the Intel 82378 PCI-ISA bridge. On-board I/O devices are isolated by buffers on the motherboard.

Please refer to the *ISA Specification* or *ISA System Architecture* by Tom Shanley and Don Anderson (Mindshare), ISBN 1-881609-05-7.

### Power Connectors (J15)

The power connectors are compatible with industry-standard PC devices.



### P8 Power Connector:

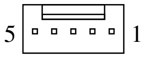
| Pin | Signal Name |
|---|---|
| 1 | GND |
| 2 | GND |
| 3 | –12V |
| 4 | +12V |
| 5 | +5V |
| 6 | Power Good |

### P9 Power Connector:

| Pin | Signal Name |
|---|---|
| 1 | +5V |
| 2 | +5V |
| 3 | +5V |
| 4 | –5V |
| 5 | GND |
| 6 | GND |

## Internal I/O Board Port

### CD-ROM Drive Pass-Through Connector

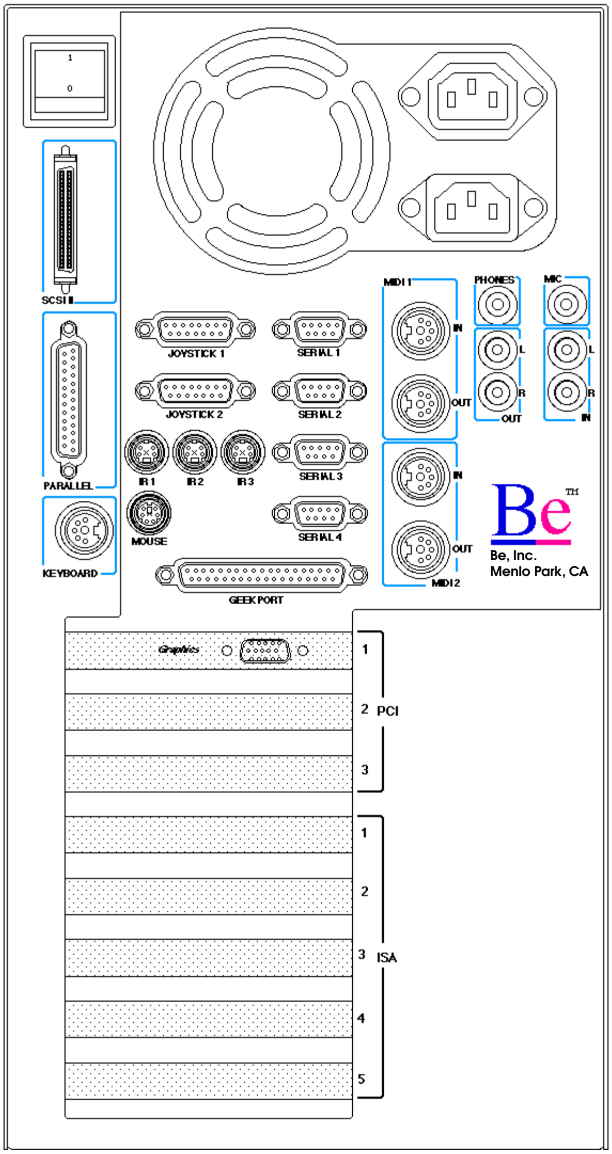


The CD-ROM drive pass-through cable connector on the I/O board is compatible with the pass-though port on a MediaVision ProAudio Spectrum 16 sound card.

| Pin | I/O | Signal Name |
|---|---|---|
| 1 | NA | N/C |
| 2 | I | CD Audio Right |
| 3 | I | CD Audio Shield Return |
| 4 | I | CD Audio Left |
| 5 | NA | N/C |

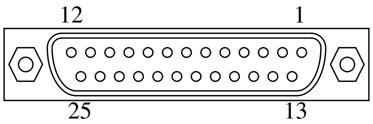
# External BeBox Ports

Many of the BeBox ports are available from the back panel. (In the following illustration, the power supply fan vents and power sockets are rotated 180 degrees.)


1
0
SCSI II
PARALLEL
KEYBOARD
JOYSTICK 1
SERIAL 1
JOYSTICK 2
SERIAL 2
IR 1
IR 2
IR 3
SERIAL 3
MOUSE
SERIAL 4
GEEK PORT
MIDI 1
IN
OUT
IN
OUT
MIDI 2
PHONES
L
R
OUT
MIC
L
R
IN
Be™
Be, Inc.
Menlo Park, CA
Graphics
1
2 PCI
3
1
2
3 ISA
4
5

### Parallel Port (J27)

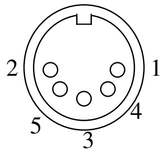
The Be parallel port is a PC-standard parallel port. It supports EPP and ECP modes.



| Pin | I/O | Signal Name | Pin | I/O | Signal Name |
|---|---|---|---|---|---|
| 1 | O | –STB | 14 | O | –AFD |
| 2 | I/O | Data 0 | 15 | I | –ERR |
| 3 | I/O | Data 1 | 16 | O | –INIT |
| 4 | I/O | Data 2 | 17 | O | –SLIN |
| 5 | I/O | Data 3 | 18 | NA | GND |
| 6 | I/O | Data 4 | 19 | NA | GND |
| 7 | I/O | Data 5 | 20 | NA | GND |
| 8 | I/O | Data 6 | 21 | NA | GND |
| 9 | I/O | Data 7 | 22 | NA | GND |
| 10 | I | –ACK | 23 | NA | GND |
| 11 | I | BUSY | 24 | NA | GND |
| 12 | I | PE | 25 | NA | GND |
| 13 | I | SLCT | | | |
| SHELL | NA | Chassis GND | | | |

### Keyboard Connector (J25)

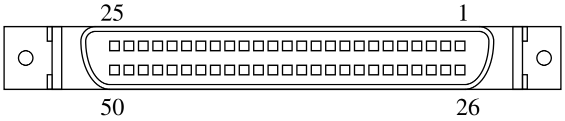
The Be keyboard port is a PC-standard keyboard port.



| Pin | I/O | Signal Name |
|---|---|---|
| 1 | I/O | Clock |
| 2 | I/O | Data |
| 3 | NA | Reserved |
| 4 | NA | GND |
| 5 | NA | +5VDC (Fused) |
| SHELL | NA | Chassis GND |

### External SCSI-II Connector (J26)

The external SCSI-II connector is a PC-standard, compact 50-pin connector.

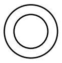


| Pin | I/O | Signal Name | Pin | I/O | Signal Name |
|---|---|---|---|---|---|
| 1 | NA | GND | 26 | I/O | SD0– |
| 2 | NA | GND | 27 | I/O | SD1– |
| 3 | NA | GND | 28 | I/O | SD2– |
| 4 | NA | GND | 29 | I/O | SD3– |
| 5 | NA | GND | 30 | I/O | SD4– |
| 6 | NA | GND | 31 | I/O | SD5– |
| 7 | NA | GND | 32 | I/O | SD6– |
| 8 | NA | GND | 33 | I/O | SD7– |
| 9 | NA | GND | 34 | I/O | SDP– |
| 10 | NA | GND | 35 | NA | GND |
| 11 | NA | GND | 36 | NA | GND Sense* |
| 12 | NA | Reserved | 37 | NA | Reserved |
| 13 | NA | N/C | 38 | O | Term Power |
| 14 | NA | Reserved | 39 | NA | Reserved |
| 15 | NA | GND | 40 | NA | GND |
| 16 | NA | GND | 41 | I/O | ATN– |
| 17 | NA | GND | 42 | NA | GND |
| 18 | NA | GND | 43 | I/O | BSY– |
| 19 | NA | GND | 44 | I/O | ACK– |
| 20 | NA | GND | 45 | I/O | RST– |
| 21 | NA | GND | 46 | I/O | MSG– |
| 22 | NA | GND | 47 | I/O | SEL– |
| 23 | NA | GND | 48 | I/O | C/D– |
| 24 | NA | GND | 49 | I/O | REQ– |
| 25 | NA | GND | 50 | I/O | I/O– |
| SHELL | NA | Chassis GND | | | |

* Pin 36 must be externally connected to ground to disable on-board SCSI termination.

### Headphone Port

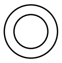
The headphone port is compatible with standard stereo headphones with 3.5 mm jacks.



| Contact | Signal Name |
|---|---|
| Sleeve | Common |
| Ring | Right |
| Tip | Left |

### Microphone Port

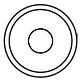
The microphone port is compatible with standard microphones with 3.5 mm jacks.



| Contact | Signal Name |
|---|---|
| Sleeve | Common |
| Ring | Right |
| Tip | Left |

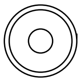
### Line-In Left Port

The four BeBox audio ports are line level, not microphone level; they're compatible with standard audio equipment.



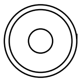
| Contact | Signal Name |
|---|---|
| Sleeve | Common |
| Tip | Left |

### Line-In Right Port



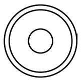
| Contact | Signal Name |
|---|---|
| Sleeve | Common |
| Tip | Right |

### Line-Out Left Port



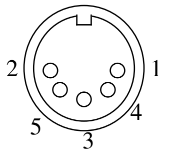
| Contact | Signal Name |
|---|---|
| Sleeve | Common |
| Tip | Left |

### Line-Out Right Port



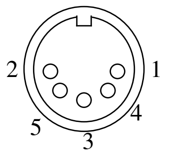
| Contact | Signal Name |
|---|---|
| Sleeve | Common |
| Tip | Right |

## MIDI-In Ports



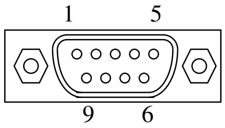
| Pin | I/O | Signal Name |
|---|---|---|
| 1 | NA | N/C |
| 2 | NA | N/C |
| 3 | NA | N/C |
| 4 | I | MIDI RXDAT + |
| 5 | I | MIDI RXDAT – |
| Shell | N/A | N/C |

## MIDI-Out Ports



| Pin | I/O | Signal Name |
|---|---|---|
| 1 | NA | N/C |
| 2 | NA | Cable Shield |
| 3 | NA | N/C |
| 4 | I | MIDI RXDAT + |
| 5 | I | MIDI RXDAT – |
| Shell | N/A | Chassis Ground |

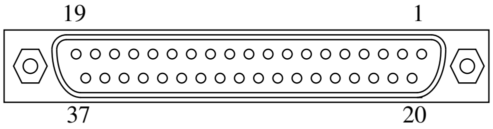
## Serial Ports



| Pin | I/O | Signal Name |
|---|---|---|
| 1 | I | DCD |
| 2 | I | SIN |
| 3 | O | SOUT |
| 4 | O | DTR |
| 5 | NA | Signal GND |
| 6 | I | DSR |
| 7 | O | RTS |
| 8 | I | CTS |
| 9 | I | RI |
| SHELL | NA | Chassis GND |

### GeekPort

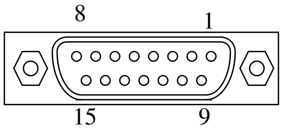
The GeekPort is a custom I/O port designed for the BeBox.



| Pin | I/O | Signal Name | Pin | I/O | Signal Name |
|---|---|---|---|---|---|
| 1 | NA | DGND | 20 | I/O | PA0 |
| 2 | I/O | PA1 | 21 | I/O | PA2 |
| 3 | I/O | PA3 | 22 | I/O | PA4 |
| 4 | I/O | PA5 | 23 | I/O | PA6 |
| 5 | I/O | PA7 | 24 | NA | AGND |
| 6 | NA | DGND | 25 | I | A/D_0 |
| 7 | NA | +5V (Fused) | 26 | I | A/D_1 |
| 8 | NA | Power GND | 27 | I | A/D_2 |
| 9 | NA | +12V (Fused) | 28 | I | A/D_3 |
| 10 | NA | Power GND | 29 | 0 | D/A_0 |
| 11 | NA | –12V (Fused) | 30 | 0 | D/A_1 |
| 12 | NA | Power GND | 31 | 0 | D/A_2 |
| 13 | NA | +5V (Fused) | 32 | 0 | D/A_3 |
| 14 | NA | DGND | 33 | NA | AGND |
| 15 | I/O | PB0 | 34 | I/O | PB1 |
| 16 | I/O | PB2 | 35 | I/O | PB3 |
| 17 | I/O | PB4 | 36 | I/O | PB5 |
| 18 | I/O | PB6 | 37 | I/O | PB7 |
| 19 | NA | DGND | SHELL | NA | Chassis Ground |

### Joystick Ports

The BeBox has two standard PC joystick ports. You can connect a single joystick to each connector, or two joysticks to each connector (for a total of four) using standard Y cables.

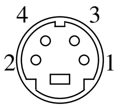


| Pin | I/O | Signal Name | Pin | I/O | Signal Name |
|---|---|---|---|---|---|
| 1 | NA | +5V | 9 | I/O | +5V |
| 2 | I | BTN0_0 | 10 | I | BTN1_0 |
| 3 | I | X_0 | 11 | I | X_1 |
| 4 | NA | GND | 12 | NA | GND |
| 5 | NA | GND | 13 | I | Y_1 |
| 6 | I | Y_0 | 14 | I | BTN1_1 |
| 7 | I | BTN0_1 | 15 | NA | +5V |
| 8 | NA | +5V | SHELL | NA | Chassis Ground |

### IR Ports

The IR (infrared) ports are a new feature of the BeBox. The connector is a 4-pin DIN type.

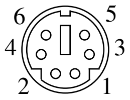
Each IR port supports input, output, or I/O devices. The interface is designed so that a single IR LED may be connected between pin 3 (+5V) and pin 1(IROUT), without additional external components.



| Pin | I/O | Signal Name |
|---|---|---|
| 1 | I/O | IROUT |
| 2 | I | IRIN |
| 3 | NA | +5V(Fused) |
| 4 | NA | GND |
| SHELL | NA | Chassis Ground |

### Mouse Port

The BeBox mouse port is compatible with PC-standard, PS/2 mice.



| Pin | I/O | Signal Name |
|---|---|---|
| 1 | I/O | Data |
| 2 | NA | Reserved |
| 3 | NA | GND |
| 4 | NA | +5V(Fused) |
| 5 | I/O | Clock |
| 6 | NA | Reserved |
| SHELL | NA | Chassis Ground |

# A Creating Screen Dumps

You can capture images of the BeBox 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 on the Macintosh and in other applications.

## Capturing a Screen Dump

To capture a screen dump, press the Print Screen key. 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 135).

## 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.

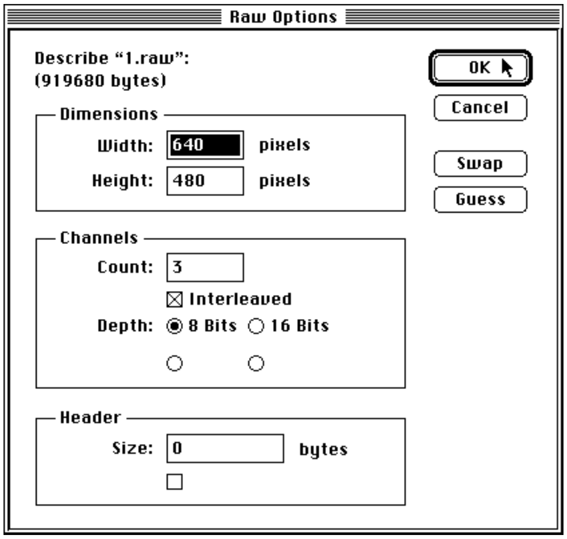
To convert an ImageViewer file, double-click it to open it in the ImageViewer application on the BeBox. Then choose the “Export to 24 Bits” command from the ImageViewer window’s File menu. This saves a raw version of the file in the root folder of your boot disk, with the name **screen.raw**.

## 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 BeBox screen when you created the screen dump: 640 × 480, 800 × 600, and so on. Enter 3 in the Count box and make sure Interleaved is checked and the Depth is set to 8 Bits. Then click OK.



Describe “1.raw”:
(919680 bytes)

Dimensions
Width: 640 pixels
Height: 480 pixels

Channels
Count: 3
☒ Interleaved
Depth: ● 8 Bits ○ 16 Bits
○ ○

Header
Size: 0 bytes
☐

The Be file opens in Photoshop, where you can edit it, save it in other formats, and do any other work you want.

# B Transferring Files to and from the BeOS

There are two ways to transfer files to and from the BeBox and a Macintosh or other computer: Over a network or serial cable with **ftp** or with a floppy disk using **tar**.

## 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 a BeBox. To use **ftp** on a BeBox, you need to install an Ethernet adapter (as described in "Adding a Network Adapter" on page 6) or a null modem cable between the BeBox and another computer. You also need to use Network to configure the BeBox to communicate with the network or null modem cable (as described in "Network" on page 128).

**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, such as the BeBox. 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** on the BeBox 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 BeBox; the *remote* computer is the one on the other end of the Ethernet or serial cable.

Among the most commonly used commands are:

| | |
|---|---|
| **bin** | To transfer files in binary mode (required for the Macintosh) |
| **cd** | To change directories on the remote machine |
| **ls** | To list the contents of remote directories |
| **get** | To retrieve a single file from the remote machine |
| **mget** | To retrieve more than one file |
| **put** | To transfer a file to the remote machine |
| **mput** | To transfer more than one file |
| **prompt** | To use **mget** or **mput** for many files, without approving each file |
| **quit** | To end the **ftp** 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 on the BeBox). 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. On the BeBox, double-click Terminal (in **/apps**), insert the disk, and type:

   ```
   tar xv
   ```

   The files in the archive are copied onto the BeBox.

# C Troubleshooting

If you're having trouble with the BeBox, 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**.

## Trouble Booting

### Utter Darkness

**Check that you have a working power outlet:** Unplug the BeBox 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:** The voltage switch is a small sliding switch next to the BeBox power, as described in "Connecting External Devices" in Chapter 1.

## Sound but No Light, or Vice Versa

**Check that all cables and cards are firmly connected**: Following the instructions in Chapter 1 of this guide, open the BeBox and make sure that all cables, cards, and SIMMs are firmly seated in their connectors and slots. Then reassemble the BeBox and make sure that all external cables and the power cord are securely connected to the correct ports.

**Watch that memory passes the memory test:** When you first turn on the BeBox it performs a memory test: It trys 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.

**Check that all the cards you added are compatible with the BeBox:** Revisit Chapter 1 of this guide and the products are of the Be world-wide web site (**http://www.be.com/products**) to make sure any cards you've added to the BeBox are the exact models supported in DR8.

**Make sure SCSI disks are correctly terminated and don't have ID conflicts:** Review the instructions in Chapter 1, particularly "Adding an Internal Disk Drive" on page 7,"Connecting a SCSI CD-ROM Drive" on page 13, and the SCSI disks' owner's guides, and 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:** If you hold down any key immediately after you turn on the BeBox, the boot selection screen opens, as described in “Selecting a Boot Disk” on page 16. The boot selection screen lists all disks it can find that have a plausible **/system** folder on them.

**Watch for disks to be recognized on a terminal:** Connect a terminal to the BeBox, as described in “Connecting a Terminal” below, and watch for messages about disks being found.

**Check the contents of the floppy and CD-ROM drives:** The BeBox 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 BeBox 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, which opens if you press any key immediately after turning on the BeBox (for more information on the boot selection screen, see “Selecting a Boot Disk” on page 16).

**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 167. 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 by holding down the keys labeled "Ctrl," "Alt," and "Shift" on the right side of the keyboard 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. First try pressing the keys labeled "Ctrl," "Alt," and "Del" at the same time. If that doesn't work, reset the BeBox by pressing the Reset and Interrupt buttons at the same time, as described in "Resetting the BeBox" on page 19.

**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 press Command-Control-Shift-F12, using the modifier keys on the left side of the keyboard, to escape from the game.

## Connecting a Terminal

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. If you have a computer or terminal with a serial port, you can connect it to serial port 4 on the BeBox using a "null modem" cable and see these messages. Set the terminal's communications parameters to 19200 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.