

On, Off, and Everything in Between

IN THIS CHAPTER:

- What happens when you press the power button
- The startup sequence: the ROMs, the System file, loading extensions
- The complete list of startup keystrokes and what they do
- What happens when you shut down
- The inside story on the Reset and Interrupt switches
- Sleep modes

POWER ON

Apple has created hundreds of design elements that are consistent from one Mac model to the next. But the method of turning them on isn't one of them. Your Mac's power switch may be (a) a rocker switch on the back panel (as on one-piece Macs and LCs); (b) a key on the keyboard (as on most Quadras and most Power Macs); (c) a round nubby button on the front panel (as on 610- and 6100-shaped models); or even (d) a half-inch long, capsule-shaped button on the top surface (as on a PowerBook Duo).

THE ADB BUS

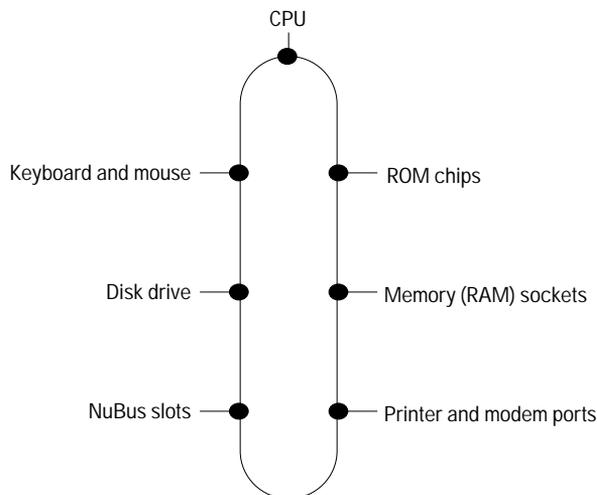
The term *bus*, as it applies to the Mac, makes much more sense if you imagine the stream of electricity that courses through the computer's veins. It streams along specific pathways — wires and circuits — much like, well, a bus route

in a *very* congested city. Along the way, this stream of electricity makes regularly scheduled stops, checking to see if there's any new information to pick up (see Figure 7-1).

The term *Apple Desktop Bus*, or, redundantly, the ADB bus, is the official name for one particular loop of the bus route: the one that includes the keyboard and mouse. As you probably know, some Macs have two ADB jacks in the back, one each for the keyboard and the mouse. (You can plug either into either jack.) But most recent models include only one ADB jack, requiring you to plug the mouse *into* the keyboard, which in turn is plugged into the Mac.

Figure 7-1

A bus map for your computer, showing all regularly scheduled stops to pick up and discharge messages: the keyboard jack (have you typed anything?), the mouse plug (are you clicking?), and, eventually, the Grand Central Station of the Mac — the Motorola central processor chip (CPU) that serves as your computer's actual brain.



THE STARTUP SEQUENCE

All right, juice is flowing. You hear the startup chime (see Figure 7-2).

Figure 7-2

From left to right: The Quadras and PowerBooks play the breathy C-chord sound. The Mac II startup sound is an open fifth: F and C. The AV Macs start up with a majestic G chord. Interestingly, these three startup chords, played in sequence, form the harmonies for "La Bamba."



▶ POWERING-UP SECRETS ■

How to turn on the Mac when there's no keyboard

If you turn on your computer by pressing your keyboard's power-on key, it's useful to know about the alternative method (for when you have a broken or missing keyboard, for example). The alternate method: Press the small, round, slotted button in back of the computer. It's about the size of a pea, usually in the lower-left corner of the back panel as you look at it. On some models (such as the tower-style Quadras, the 630-series and Power Macs), it's at the *top* left — and on recent Power Macs and Power Computing machines, it's on the *front* panel. (The 630's button isn't slotted, though; it's a barely-noticeable round nub that protrudes from the plastic case, just next to the monitor port.) In a pinch, such as when the system has crashed, you can turn the Mac off using this button.

Trivia: In all of Mac history, only a couple of models had *no* power button. Can you name the first? (Hint: It's the Quadra 840AV.)

A Mac you can't turn off

If you use a particular Mac as a *network server* (a central holding tank for files shared by all Macs on a network), you may wish that it would *never* turn off. Yet in real life, fuses blow, blackouts occur, and janitors unplug power strips in order to vacuum.

Look at the back panel of your Mac. Do you have a small round power button (see the previous Secret)? If so, use a screwdriver to turn that button a quarter turn, so that the slot is vertical, and the entire button is flush with the back of the computer. It's now in permanent On position. If the power goes out for any reason, the Mac restarts itself automatically.

On the one-piece Macs, it's a single ding (a ninth above middle C). On the Quadras and PowerBooks, you hear a second-inversion C chord played by a synthesizer. The AV Macs play a straight-ahead, root-position G triad. On a few Performas, such as the 6290, it's an open fifth — D and A. In fact, Apple's startup harmonies — from the single note of the Mac Plus to the five-note chords of the Power Macs — are growing ever more complex. The Power Macintosh startup chord is a complex E V11 chord, strummed as a harmonic on a jazz guitar.

In any case, you may have wondered: What the heck *takes* so long for the computer to come to life?

The answer is that the Mac is busily running programs without your even knowing about it. These programs are normal Mac software, but they're not sold in any store, and they don't come on any disks. They come "hardwired" into the permanent silicon memory of your Mac — the ROM chips.

ROM: the hidden software

ROM stands for *read-only memory*; the implication is that you, O user, may not store (write) anything in this kind of memory. It's *read-only*.

Every Mac has ROM chips. Indeed, the ROM chips are what makes a Mac a Mac. Some of the "programs" (more accurately, *code libraries*) stored on the ROM chips are QuickDraw, the software that draws lines and colors on your screen; the Window Manager, responsible for drawing and manipulating the familiar Macintosh windows; and the Menu Manager, which creates the menus at the top of your screen.

Because these programs are built into the Mac, people who write Mac programs are spared the time and headache of writing lines of menu-handling code, or window-handling code, and so on. They just write references ("calls") to the Mac's ROM, which takes it from there. No wonder most Mac programs work alike — they all rely on the same chunks of interface code.

Why the Mac needs a System file

So, if the Mac operating system is stored in ROM, why do you need a System Folder?

Actually, the System file and the ROM work together to create an operating system. The System either *adds to* or *replaces* parts of the ROM. Apple, for example, improves or enhances its system software at least twice a year — and sometimes more often than that. (In a period of two years, Apple managed to release System 7.5, 7.5.1, 7.5.2, 7.5.3, 7.5.5, and 7.6.) You can imagine what a mess you'd have if Apple had to replace your Mac's ROM chips twice each year! As it is, the company just creates a new software-only System Folder with programming that supersedes or adds onto what's in ROM.

The second reason for a System file: As in any software, the code in the ROM chips is sometimes buggy. What do programmers do when their code has been permanently etched into silicon and they discover a mistake? Simple: Write a fix for the bug in the System file (the part that comes on a disk), which forms a computer-code detour around the problem in ROM.

The startup continues

Back to our story in progress. The electricity sparks the ROM chips' programs into life. These startup programs are instructed, first of all, to check out the machine. The computer sends electronic feelers into its own circuitry, making sure that everything is as it should be. The Mac inspects the chips that control the keyboard jack, the SCSI port, and so on, restoring them to their "ready-for-action" settings.

One familiar example is the memory (RAM) checkup: The ROM programs test the health of your RAM chips every time you turn on the computer. If even *one pin* of a memory board (each has dozens of pins) isn't solidly seated in its slot, the ROM program reports the bad news to you. Instead of playing the usual chime, it plays a Chime of Death.

The Chime of Death is four single arpeggiated notes (Mac II's), the first strain of the *Twilight Zone* theme (Quadra or Centris), a drum solo (Quadra AVs), a flute series (LC models), or a car-crash recording (Power Macintosh). (See Chapter 33 for troubleshooting tips.)

That's why the more memory your Mac has, the longer it takes to start up — because there are more RAM chips to inspect. You particularly notice the longer delay after you install more memory.

The ROM chips' diagnostic report can show up in several forms, both audio (as we noted) and visual. If something is drastically wrong inside, you may see the "sad Mac" icon on a dark screen. See Chapter 33 for details.

The Power Mac, by the way, occasionally takes especially long to start up — for your own protection. If the Mac wasn't shut down properly last time — for example, if you had a system freeze and had to restart — the Power Mac ROMs perform an additional test, a scan of the hard-drive to confirm the integrity of the disk file structures, during the appearance of the happy Mac icon.

How does it know that you crashed the last time? During a normal shut-down, the Finder clears vulnerable file-directory information out of RAM first and then resets a system flag — a tiny invisible software "switch" — signaling that all is OK on your hard drive. When you shut down after a crash, however, without using the Shut Down command, that flag never gets reset. When the Mac restarts, the ROM encounters the "file system dirty" flag and assumes the

TRUE FACT

HOW BIG IS YOUR ROM?

The Mac's ROM chips are growing.

As each successive Mac model becomes more complicated, more and more of the computer's Notes to Itself must be crammed onto its chips. The original Macintosh, for example, fit all of its identity into 64K of silicon. When the faster Mac Plus came along, the ROM chips grew to 128K. Color-processing instructions bloated the Mac II's ROMs to 256K; the complex 68030 CPU chip used in the IIfx and most of the II series required 512K ROMs.

Today, the awesome power of the Power Macintosh calls for 4MB of ROM instructions — that's 32 times more ROM than the first Mac had RAM!

Finder *didn't* safely clear all the file info out of RAM the last time you shut down. That's what triggers it to (a) spend a little extra time checking the drive's data to make sure they survived the abrupt shutdown, and (b) brings up the "This Mac wasn't shut down properly" message (if that option is turned on in the General control panel; see Chapter 4).

The larger your hard drive — and the more files you have stored on it — the longer this extra integrity test takes.

The search for a good system

When the hardware checks out as OK, the ROM hands off to your System file — or tries to. It seeks a System Folder in the following order:

- On the floppy disk in the main floppy drive
- On the floppy disk in an external drive (if any)
- On the hard disk you selected (if any) using the Startup Disk control panel
- On the internal hard drive (whose SCSI ID number is always 0; see Chapter 30 for a discussion of SCSI ID numbers)
- On an external hard drive with ID number 6, and then 5, and then 4, and so on

If the Mac doesn't find a *startup disk* (a disk with a System Folder), it checks the internal hard drive again, and then waits for you to insert a floppy disk with a System Folder on it. (That's when the blinking question mark appears.) In that event, go find your system disks or startup CD-ROM. Insert Disk Tools if you want to find out if anything's wrong with your hard disk, or insert the Install disk (or CD-ROM) if you want to reinstall the System Folder.

The first programs to run: enablers

The Mac is now turned on. It's passed its own checkup, and it's found a working System Folder. If it's a System 7.1 (or later) Mac, the first programs to run are the enablers, if any. (As described in Chapter 5, an enabler is a file that updates or enhances the regular Mac System software.)

If the enabler is missing from the System Folder on your designated startup drive, that's the end of the startup sequence — even if there's a perfectly good System Folder on another disk. The Mac displays an error message ("This model Macintosh requires a newer version of the System software") and sits there until you turn it off or the warranty expires.

Get out your original System disks (or CD-ROM) and get busy reinstalling the System software.

More startup software: extensions and control panels

After owning a Mac for a while, most people begin to tailor its startup sequence to their specific needs. You do this by adding extensions and control panels to your System Folder (see Chapter 4). Your Mac runs these programs after the enablers, but before it gets to the Finder.

Normal programs run (get loaded into memory) only when summoned with a double-click. Extensions and some control panels, on the other hand, load at startup. Then they lurk, doing their pre-programmed magic, in the Mac's memory for as long as the computer is turned on. For this reason, they're ideal for — and designed for — customizing the Mac's overall behavior. America's favorite add-on control panels include screen savers (After Dark, for example), Adobe Type Manager, fax software; and so on.

Extensions and control panels: how they load

Extensions and control panels load separately according to the folder they're in, in the following order:

- **System file.** Few people realize it, but some extensions are actually installed into the System file itself, just like a sound or a keyboard layout. You can't put one there — only certain Apple extensions (invisible to you) are stored there.

One example: Tuna Helper (System 7.0 or 7.0.1). The System 7 Tuner extension, which you *can* see, installs Tuna Helper into your System file without your even knowing it. (You can see Tuna Helper if you open up your tuned-up System 7.0 or 7.0.1 file with ResEdit. See Chapter 21 for details.)

MACINTOSH SECRET THE POWER OF SHIFT

The Shift key plays a critical role in the startup process. If you press and hold Shift before the "Welcome to Macintosh" message appears on the screen, you prevent your extensions, control panels, and startup items from loading. This, of course, is one of the most important tools in the arsenal of anyone trying to solve a mysterious system-crash problem.

The Shift key also prevents such Apple add-on extensions as System Updates and Tuners from loading. It also prevents Mode32 from loading and reduces your Disk Cache setting to a bare-bones minimum (see Chapter 9). Pressing Shift also turns off virtual memory on most Macs.

The Shift key, however, doesn't prevent *all* extensions from loading. It certainly doesn't block an enabler that your Mac requires to run, for example. Nor does it turn off any printer drivers that you need to print.

A single, very sound principle governs Apple's programming in every case: The Shift key turns off all software that isn't *required* for the Mac to start up with its basic functions intact. That's why model-specific enablers are permitted to run, but not System Updates that aren't actually required for the Mac's operation.

Remember that the Shift key is designed for helping you troubleshoot. It's designed to assist in your process of elimination as you attempt to rule out extraneous software influences on your Mac's behavior.

- The contents of the ***Extensions folder***, in alphabetical order.
- The contents of the ***Control Panels folder***, in alphabetical order. In other words, an extension in the *Extensions* folder called Zipper actually loads before one in the Control Panels folder called Alpha. It's okay to put extensions in the Control Panels folder and vice versa, by the way. These folder names are just for convenience; technically, you don't have to put anything particular in one or the other.
- The contents of the *System Folder's* main level, in alphabetical order. Yes, it's fine to put extensions and control panels loose in the System Folder.

Your personalized loading order

Armed with this information, you have complete control over the loading order of your extensions and control panels. That's good, because some extensions (such as hard disk or optical-disk drivers, virus checkers, and extension managers) only work if loaded first. Loading order is also important when you're trying to troubleshoot a recurrent system crash or freeze, since the order in which extensions load is often responsible. (More about solving extension conflicts in Chapter 32.)

Here are some examples of things you can do:

- Make one control panel load before all the others by putting its alias into the Extensions folder. (But leave the original in the Control Panels folder so it'll be there when you need to change its settings.)
- Take an extension that's supposed to load before all the others and put a space in front of its name. Leave it in the Extensions folder. It loads first because it's first alphabetically *and* in the first folder the Mac looks at.
- Use Conflict Catcher (or Now Startup Manager) to simply drag startup files into the order you want.
- Take an extension that's supposed to load *after* all other extensions and control panels. Put a Z at the beginning of its name and then put it loose in the System Folder.



Drivers: sometimes invisible, always vital

Among your now-loading extensions, by the way, are the *drivers* for your equipment. Simply stated, a driver is a piece of software that teaches the Mac all it needs to know about a piece of peripheral equipment. Almost *every* Mac

add-on gadget — printer, CD-ROM drive, SyQuest cartridge drive, modem — comes with a driver you put into your System Folder. (On Power Macs, the driver for the built-in Apple CD-ROM drive doesn't get dropped into the System Folder; it's built into the ROM.)

Most critical of all, of course, is your hard disk driver. (This particular set of software is on its own invisible partition.) It's important because you use your hard disk more than any Mac add-on — constantly, in fact.

When you upgrade to a new system version and get random error messages and system crashes, your first suspect should be a damaged or out-of-date hard disk driver. Now you understand why there are a half-dozen *commercial* hard disk driver programs on the market. Each is supposed to work with most brands of hard drives and is supposed to be extra-safe. See Chapter 8 for details.

Icon row

As each extension and control panel is loaded, its icon usually appears on the bottom of your screen. We say *usually*, because many control panels have a check box that lets you eliminate the appearance of the startup icon — and some Apple extensions are programmed not to display a startup icon at all. (Control-freak notice: You can use Conflict Catcher to force them to appear; see Chapter 34.)

The icons appear one-by-one in a horizontal row. Depending on whether or not there's a tiny piece of “wrap the icons!” code in any of the extensions, these icons may even wrap upward to start a second row above the first — and a third, and a fourth, and so on. (One extension freak boasts that he regularly runs 120 system extensions without crashing. We'd like to see it.)

This is worth mentioning, only because it can be a clue when you're in extension-conflict hell. If you're suffering from startup-crash blues and having trouble figuring out which extension is crashing your Mac, watch those icons as they appear. Often one particular icon pops up just before the crash, each time you restart. That icon may represent either the extension that's causing the crash or the one just after it. (For much more on extension conflicts and how to solve them, see Chapter 33.)

CASE HISTORY

THE NEW JERSEY COMPUTER WIDOW

The owner of Atlantic Computer Systems, a wonderful Mac dealer in New Jersey, told us about one Mac widow who took things into her own hands. (A Mac widow, of course, is a woman whose husband spends more time with his computer than with his spouse. We know a Mac widower or two, too.)

Anyway, this particular woman took a low-tech approach to solving a high-tech problem. She grabbed a hammer and smashed in her husband's Apple 14-inch color monitor.

No report on whether that New Jersey couple now spends more time together.

STARTUP KEYS

Mac lore is filled with tales of little-known stunts your computer performs if you press certain mysterious key combinations while the computer is starting up. Here, together at last, are all the different startup key combos. We threw in a couple of other miscellaneous startup Secrets while we're at it.

STARTUP SECRETS ■

The Shift key (no extensions)

Hold down your Shift key, beginning no later than the appearance of the smiling-Macintosh icon. Release it when you see the words "Extensions off." You've just started up the Mac without any extensions or control panels (except for invisible, Apple-installed extensions that live in the System file itself). You also prevented anything in the Startup Items and Shutdown Items folders from launching, and prevented File Sharing from turning on.

You also made some changes to the Memory control-panel settings: You set the Disk Cache to 96K (System 7.5 and later) or 64K (before System 7.5) and turned off virtual memory. You may find it confusing that, when you actually *look* at the Memory control panel, all settings seem to be where they normally are. That's because the Mac treats its special Shift-key settings as temporary, and your regularly-scheduled settings are restored the next time you start up the Mac.

The Shift key (no Startup Items)

If you wait to press Shift until *after* your extension icons have finished appearing on the screen — but before the Desktop appears — then you prevent the contents of your System Folder's Startup Items folder without turning off your extensions.



Interestingly, the Shift key — if it's still being pressed as the Desktop appears — performs one undocumented additional function: It prevents any windows from opening upon your arrival at the Desktop. (See the next Secret for a strange coincidence.)

Option (all windows closed)

There's no end to the secret key combinations that do things when you start up the machine. Press Option, for example, if you want to be greeted by a clean, neat Desktop, with no windows or folders open. (Normally, the Mac

always reopens whichever windows were open when you last shut down.) As noted earlier, the Shift key also performs this function, but Option performs *only* this function.

Technically, you only need to press Option at the end of the startup process — from the end of the extension-loading phase to the appearance of the Trash can, for example.

⌘-Option (rebuild the invisible Desktop file)

As you read in Chapter 1, there's an invisible Desktop file on every disk. Over time, the Desktop file becomes bloated with icons belonging to files and programs you've long since taken off your disk.

To make the Mac “forget” all superfluous icons (and, in a System prior to 7.5.3, all Get Info comments) from your current Desktop file, press and hold the ⌘ and Option keys when the Mac is starting up. You don't need to press them right away — technically, the critical moment is just after your extensions have all loaded). You can let go of the keys when the Mac asks you specifically if you want to rebuild the Desktop file (see Figure 7-3).

If you click OK, the Mac takes a minute or so to cleanse its Desktop file, resulting in a slimmer, quicker, invisible database (see Figure 7-4). You get a separate message for each disk that's attached to the Mac.

We should point out that Apple's official recommendation is that you rebuild the Desktop only *after* you've turned off all your extensions and control panels; certain system extensions can interfere with the Desktop rebuilding process. (Frankly, though, we've rebuilt the Desktop plenty of times without turning off other extensions and it's never been a problem.) If you're running any version of System 7 prior to 7.5, the Apple-sanctioned procedure, then, is to *first* restart with the Shift key held down (as described earlier in our first Secret), wait until you see the words “Extensions off” and *then* switch to the ⌘ and Option keys. See “Desktop File Secrets” in Chapter 2 for details.

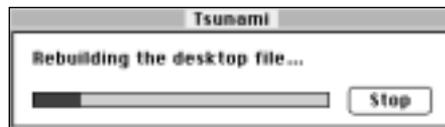
⌘ key (turn off virtual memory)

If you press the ⌘ key during startup, the Mac will turn virtual memory off (if it had been on). Virtual memory will be on again the next time the Mac starts up. (See Chapter 9 for details on virtual memory.)

Figure 7-3
The Mac asks if you're sure you want to wipe out your old, invisible Desktop file.



Figure 7-4
The Mac rebuilds the Desktop file. If you grow impatient, click Stop; no harm done. Your old Desktop files will remain in force.



C to startup from Power Mac CD-ROM

When you start a Power Mac with a startup CD-ROM in the drive, hold down the C key to force the Mac to load from the CD-ROM's System Folder instead of your hard drive — a very handy troubleshooting tip! (This trick also works with some CD-equipped *non*-Power Mac models, such as the Performa 630/640 series.)

⌘-Option-P-R (zap the PRAM)

Your Mac has a tiny chunk of memory called parameter RAM or PRAM (pronounced *pea*-ram). This smidgen of memory is where the Mac stores settings it's supposed to retain even when the computer is turned off — like the settings you make using the Control Panels (mouse speed, keyboard settings, monitor color setting, Desktop pattern, choice of startup disk, and so on).

In times of trouble, you may need to flush this bit of RAM and start over. To do this with System 7 and later, you use another hidden key combination at startup: ⌘, Option, letter P, and letter R keys. Keep them pressed until you hear a second startup chime. (On a PCI Mac, you can't zap the PRAM with a restart; you have to turn the computer completely off, press the keys, and then turn the computer on.)

Then use your control panels to reset your settings.

⌘-Option-Shift-Delete (ignore internal drive)

If, just after you turn on the Mac, you hold down ⌘, Option, Shift, and the Delete key, your Mac completely ignores its internal hard drive (if any). This is a good way to force your Mac to use a different startup disk, such as an external hard drive that you loaded with a different System version. (This is also a good way to sprain your hand.)

⌘-Option-T-V (use the TV for a monitor)

Hold down ⌘-Option-T-V during startup to make an AV-style Quadra use an attached TV as a monitor. (See Chapter 23 for details.)

Interrupt switch (to hear the Chimes of Death)

On a Power Mac, you can hear the "Chimes of Death" car-crash sound whenever you want. *Just* after you turn on the Mac — while the monitor is still black — press the Interrupt switch (see "The Interrupt Switch" sidebar later in this chapter). Yikes, what a grisly sound!

Mouse down (eject a floppy)

Suppose that you accidentally left a floppy disk (with a System on it) in your disk drive, but you don't want to boot from it. Are you condemned to wait for the startup sequence to finish so that you can eject the disk and restart from your hard drive?

Nope. As soon as you realize your mistake (or sooner, since this has to happen before the floppy's System displays the smiling Mac), press and hold down the mouse button. The floppy ejects itself, and the startup process begins with the hard drive's System Folder.

Startup screens

You can display a picture of your choice when the Mac starts up in place of the usual "Welcome to Macintosh" screen. See Chapter 21 for instructions on creating your own.

Startup movies

If you have the QuickTime extension installed (see Chapter 23), there's a special treat in store. You can designate a particular QuickTime movie to play in the middle of your screen when you start up the Mac!

To do this, rename the movie *Startup Movie*. Put it loose in your System Folder. Then restart the Mac and watch the fun. (Of course, your movie won't *start* playing back until the QuickTime extension itself loads. And once it does start playing, the remainder of your Mac's startup sequence gets put on hold until the movie ends. You can interrupt the flick, though, by pressing the spacebar.)

You can even combine a movie with a still picture, creating a theatrical "stage" for your movie. Create a startup *screen*, as described in the previous Secret. Create it, though, so that it has a nice central hole in which your movie can play (see Figure 7-5). When you restart, the still picture appears first, and then the movie plays in the center of it! Handily, the startup movie always stops on its last frame, where it stays until the Mac is finished starting up.



Figure 7-5
Create a startup screen/frame (left). When the startup movie plays, it neatly fills the hollow part of the frame, if you've set it up right (right).

Startup at a specified time

Your Mac gets along perfectly well without you — or at least it can turn itself on without you.

If you have a recent Mac, one that can be turned on by pressing a keyboard key (such as a Power Mac or even late-model Quadra), use the Auto Power On/Off control panel, or the new-style Energy Saver control panel as described in Chapter 4. It will turn on the Mac at a specified time — one day, or every day.

Most PowerBooks can do this, too. It's an option in the PowerBook control panel (with System 7.1 and later) that lets you make the computer wake itself up at a specified time.

If you have any other Mac, buy a PowerKey (Sophisticated Circuits, 206-485-7979). It's a surge-protected power strip that turns on all your Mac gear with a touch on the keyboard power key (even compact and LC Macs). It comes with a little software doodad that lets you schedule the Mac's turning itself on and off unattended.

Startup Items to the background

Many people stick an alias of their word processor into the Startup Items folder, so that a blank word-processing screen awaits them shortly after they turn on the Mac. Nothing wrong with that.

Sometimes, however, the program in your Startup Items folder is designed to be a *background* program. Speech-recognition software (such as Power Secretary), answering-machine programs (such as MegaPhone), and many screen-saver programs fall into this category. Unfortunately, these programs wind up being the frontmost application when the startup process is complete.

Not, however, if you put an alias of your *hard drive* into the Startup Items folder, too. Doing so will bring the Finder to the front (at the end of the startup process) and open its window automatically. Just make sure that the item you want to end up in front is the last in alphabetical order (begin its name with a Z, for example).



BEYOND THE STARTUP SEQUENCE

Now you know why starting up the Mac takes so long — between checking the hardware and loading the software, some Macs take several minutes to get ready for action.

The Mac's next step is to launch the Finder program. Your Finder menu bar (File, Edit, View, Label, Special) appears. Then the computer consults an important, though invisible, file on each disk: the Desktop file. As described in Chapter 1, the Desktop file stores all kinds of information about your disks, folders, files, and their icons. When the Mac knows (from the Desktop file) which icons you have and where they should appear, they start popping onto the screen. Then the Mac looks for disks (such as your hard drive), whose icons it now draws in the upper-right corner of your screen.

Startup Items

Inside the System 7 System Folder is a folder called Startup Items. Just after the Desktop appears, the Mac opens anything you had put into this folder, as described in Chapter 4.

The Mac launches the items in the Startup Items folder in this order: applications, documents, and then aliases — and alphabetically among each category. You can use this fact to your advantage; by renaming the items in this folder, you control which programs load first for the day. As you'll find out in Chapter 9, controlling the loading order of multiple programs is one weapon you have against *memory fragmentation*.

Here's a nice trick for the Startup Items folder: Make an alias of it. Put the alias at the lower-left corner of your screen. At the end of each workday, drag an alias of the document you're working on into the Startup Items folder alias. Next morning, you'll turn on your Mac and be immersed in exactly the same documents, ready to go.

SHUTTING DOWN

As you know, Apple strenuously suggests that you never turn your Mac off by cutting off power using the power switch. Instead, you're always supposed to use the Shut Down command.

CASE HISTORY STARTUP ITEMS, RIGHT?

In our work as roving Mac tutors and observers, we sometimes think we've seen it all. But then there was the call from a hysterical, new Mac owner. He claimed that "all Hell" kept breaking loose every time he turned on his Mac.

A little visit solved the mystery. As a perfectly logical human being, he had filled his Startup Items folder with, yes, *startup items* — namely, all his control panels and extensions. (Of course, they actually belong in the Control Panels and Extensions folders.) So each day when he turned on the Mac, he got a screen full of error messages (as the Mac "double-clicked" each extension) and control panel windows (as they opened by themselves).

We doubt he was the first.

The rationale is that the Mac needs to do some “housekeeping” before turning off the machine. The examples usually cited include:

- Updating your invisible Desktop file with your current icon and window positions
- Offering you the chance to save your work in any documents still open
- Correctly quitting any open programs, deleting any “temp files” in the process
- Ejecting any floppy disks

We can think of plenty of times when you can’t get to the Shut Down command, however. Imagine a system crash or a freeze, for example. In those instances, you have no choice but to cut power to the computer.

We suggest that you use the Shut Down command as recommended by Apple. We do not, however, endorse the wide-eyed, paranoiac approach of many books and magazines. Use Shut Down when you can, but don’t waste a milliliter of adrenaline if you do have to shut the Mac off abruptly.

Anyway, today’s Mac offers you a number of ways to shut down. Every Mac, of course, has a Shut Down command in the Finder’s Special menu. System 7.5 (and later) also offers a Shut Down command in the  menu, meaning that you don’t have to switch to the Finder to get at it.

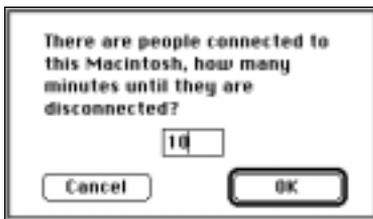
System 7.5 or later offers an even handier option: You can press the power key on your keyboard. You’re shown a dialog box with three options: Restart, Cancel, or Shut Down. (On PCI-slotted Power Macs and PowerBooks, you get a fourth option — Sleep. Clicking the Sleep button leaves your computer on, but cuts the video signal to the monitor, causing the screen to go black. See “Sleep Modes” later in this chapter.)

The cycle of last chances

The Mac follows a specific series of steps when you’ve chosen the Shut Down command.

If any programs are open, the Mac quits them automatically, first offering you the chance to save your work in any unsaved documents. If you’re connected to a network and other Macs are sharing some of your files, you’re warned that you’re about to slam the door in their faces (see Figure 7-6). If you click Cancel in any of the dialog boxes that appear during the shutdown process, the entire shutdown cycle is derailed; the Mac stays on.

Figure 7-6
About that run-on sentence: You don’t suppose Apple could afford a proofreader, do you?



▶ SHUT DOWN SECRETS ■

Shut down from the keyboard — for all

When Apple designed System 7.5.1, which lets you shut down by pressing the power key on the keyboard, it hit upon a good idea. It makes no particular sense for you to go to the Finder and choose a specific command just to turn off your computer.

If you don't feel like upgrading to that system version, you can still shut down safely by pressing a key (and without returning to the Finder). Just use *QuickKeys* or *KeyQuencer*, included with this book; define a Shut Down extension macro (one of the *Specials*). See Chapter 34 for details on *KeyQuencer*.

Automatic shutdown at midnight

Suppose you're downloading some huge file from America Online. Your Mac tells you that it's going to keep downloading until, say, 3 a.m. You want to go to bed, but you don't want to leave your system on all night.

Most recent Macs let you use the Energy Saver control panel (described in Chapter 4) to turn off your Mac automatically — at a certain time, or after a specified amount of idle time. (A dialog box appears five minutes before shutdown, offering you the chance to postpone the shutdown for another hour — or to cancel the shutdown entirely. And if you're actually using the Mac at the time of scheduled shutdown — even downloading — the shutdown doesn't take place.)

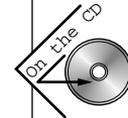
If you'd prefer your entire system to shut down — printers, CD-ROM drives, everything — then you need a *PowerKey* from *Sophisticated Circuits*. Its four grounded outlets all cut off at the same time whenever the Mac shuts down.

Canceling a Shut Down or Restart command

Suppose you choose the Shut Down command, only to realize three nanoseconds later that you forgot to copy a batch of important files to your backup disk. Any chance you can stop your Mac from shutting down once it begins the process of closing up shop?

Yes! The moment you realize you don't really want to shut down, quickly launch another application — *SimpleText*, the *Calculator*, anything! Simply launching a program forces the Mac to abort its shutdown. (Our suggestion: use *KeyQuencer* or another macro program. At moments like these, you can simply slap the key corresponding to some "launch a program" macro.)

And if you have a screen saver, you can activate *that* to bail out of the shutdown, too.



THE RESTART (RESET) SWITCH

What it's *called* is the Reset switch. But what it *does* is restart the Mac. Every Mac model has a pair of these funny little switches. One of them, the Interrupt switch, is fairly useless unless you're a programmer. But its twin, Reset, is wonderfully useful.

Where is it?

Before we tell you how handy they are, we'll help you figure out *where* your switches are. On any **SE**, **Mac II**, **IIx**, or **IIx**, you got a connected pair of flat, one-inch-square, plastic buttons that you were supposed to install by snapping onto the outside of the Mac's case. On other **Mac II**-series machines (**IIcx**, **IIci**, **IIvx**), you install the plastic piece on the *inside*.

More recent desktop Macs have special buttons for the Interrupt and Reset functions; there's nothing to install. They're located on the front of the **7100**, **8100**, most **Quadras**, most **Power Computing clones**, and the **Centris (Quadra) 650** — and on the back of the **Centris (Quadra) 610** and **6100** (on the right as you look at the back).

If you have a **PowerBook 140** through **180**, your Interrupt and Reset switches aren't on a separate piece. Open the back panel, and you'll see two tiny holes on the right as you look at the back. You're supposed to "push the button" by inserting a straightened paper clip into one of these holes.

Virtually **all other Macs** have *hidden* Reset and Interrupt switches. Or, to be perfectly accurate, they don't have switches at all. Instead, you're supposed to press **⌘**, **Control**, and the **power button** all at the same time. (That's to restart. For the Interrupt function, it's **⌘**-power button.)

If your model has an actual button, switch, or hole (for a straightened paper clip), please note: The Interrupt switch is usually marked by a circle. The Reset switch — the one we want you to notice — has a left-pointing triangle. It matches the left-pointing triangle on the power key on your keyboard. Both have to do with *starting* the computer, get it?

Please note also that even if your Mac does have physical Restart and Interrupt switches or buttons, those magic Apple keystrokes — such as **⌘**-Control-Power button — may also work. Try it on yours and see!

What is it?

The reset switch is a great feature for two important reasons:

- When your Mac has hung or crashed, you can't do anything except restart it. Restarting by pressing the Reset switch is much better for the circuitry

than turning the power off and then on again; every time you power up your Mac, a tidal wave of surging electricity smashes through its circuits. Using the Reset switch prompts your Mac to go through its startup routine, *without* forcing it to power up from a cold state all over again. It also takes less time.

- If you're using the built-in RAM disk feature, as described in Chapter 8, restarting the Mac using the Reset switch *preserves* the contents of the RAM disk. Don't ask us how that happens; it's something to do with the fact that restarting the Mac doesn't interrupt the current. In any case, turning the computer off *does* wipe out everything on the RAM disk.

We really want to impress upon you the convenience and simplicity of the Reset switch. If you're not using it whenever you have a system bomb or your cursor freezes on the screen, you're missing a great thing.

SLEEP MODES

In the name of conserving electricity, Apple seems to enjoy defining new variations of On and Off. There's the Sleep mode on PowerBooks, for example (see Chapter 14). Then there's the Color Classic, the LC 520, and so on, which do something alarming but useful. After a certain amount of time has passed since you last used your mouse or keyboard, the *monitor* turns itself off. (You determine how much time should elapse by using the Monitors control panel; the longest time is one hour.) The computer itself stays on, and everything you were working on is perfectly safe. Your only indication that the Mac is not, in fact, *off* is the power light that glows on the front of the machine.

To "wake up" one of these Macs, click the mouse. The monitor can take up to a minute to warm up again. During this time, the screen remains dark. To let you know that the Mac has noticed your mouse-click, it emits a little low boop sound, every second or so, from the speaker.

Power Macs with PCI slots (the 7200-7600, 8500, and so on) introduce an even more radical concept: *desktop Macs* that go to sleep, just like PowerBooks.

TRUE FACT

THE INTERRUPT SWITCH

We don't use the Interrupt switch (the half of the programmer-switch pair marked by the dot). But we're told that it can occasionally get you out of a system crash.

When the system crashes, press the Interrupt switch. A special empty dialog box appears on the screen, containing nothing but a > symbol. Here are the various things you can type at this point, and what they're supposed to do.

G FINDER (then press Return) is supposed to get you back to the Finder safely.

SMO A9F4 (then press Return)
PCFA700 (Return, again) G
(Return, again) is another Return-to-Finder sequence. Those are zeros, by the way, not letter "Os."

SM A78 3F3C 0002 A895 (press Return, then) G A78 (and another Return) shuts your Mac down.

Honestly, we've found that these codes rarely work. On the other hand, when the system crashes and we've got important unsaved work on the screen, we'd jump up and down and say "gigabyte" ten times backward if we thought it would help.

DIALOGUE**Leaving your Mac on all the time**

DP: JS, exactly why do we require an entire topic for Shutting Down in our outline?

JS: What do you mean? It's something you do every day. It's worth a topic.

DP: Well, I know plenty of people who don't.

JS: What?

DP: Sure. Lots of people never shut their Macs down.

JS: What? They leave their Macs on all the time?

DP: Don't go ballistic. Everybody knows it's better for your Mac's internal circuitry not to be turned on and off all the time. Every time you switch on the power, it's like sending a solid brick wall of electrons smashing through your computer's fragile veins. If you turn your machine on and off all the time, you're going to shorten its life.

JS: That is the biggest old wives' tale! Have you ever in your life heard of somebody's Mac going in for repairs, where the repair person announces that you did your computer in by turning it on too much?

DP: Well, no.

JS: It's a myth fabricated by the electric companies. They want you to leave it on all the time so that you run up your utility bills.

DP: Talk about old wives' tales!

In fact, these Macs take the whole sleep concept a step further, providing independent controls for the sleep behavior of the monitor and the hard disk (via an enhanced Energy Saver control panel). In other words, you can have the monitor blink off after 30 minutes, whereas the hard drive waits a full hour before spinning down into low-power mode. To wake the sleeping Macs up, press a key or click the mouse.

MACINTOSH SECRET**YOU HAVEN'T GOT TIME FOR THE PAIN**

Conflict Catcher, a demo of which is included with this book, does much more than catch conflicts. We stumbled onto a little-known feature in version 4 the other day that made us gasp in amazement. (The demo of version 4 wasn't available when we prepared the *Secrets* CD-ROM, but it's available now; you can download it from America Online or our Web page, <http://www.idgbooks.com/idgbooksonline/macsecrets>.)

With the control panel open, choose "by Load Time" from the right-hand pop-up menu. You'll be shown exactly how long each extension and control panel takes to load as your Mac starts up! Some of this information will shock you: you've been waiting *four seconds* every single morning for Apple Guide to load into memory? It scarcely seems worth it.

This exercise may convince you that some of your extensions aren't worth leaving installed for everyday use. Cumulatively, over the many startups of your Mac, the time you'll save could be substantial.

MACINTOSH SECRET

OUR FAVORITE ACRONYM

"Most applications crash — if not, the operating system hangs."

You may shudder at the cold, stark reality of this statement — but this is more than a Mac truism; some people believe it's how the Macintosh got its name. Just put together the first letters from each of the words in the sentence and you'll see what we mean. This fanciful bit of etymology was suggested by one of our readers who, at the age of 13, has evidently already experienced his share of system bombs, crashes, and hangs.

JS: It's not! Look, do the math. I called up the electric company -

DP: You called up your electric company!?

JS: Hey, I happen to care about the environment. Anyway, you look at your electric bill to see what a kilowatt-hour of juice costs. Mine says 13 cents. Then you figure out how much power your Mac uses — to do that, you multiply Amps by Volts. So, a Power Mac 8500 is 9 amps, 110 volts; monitor is 1.0 amps. That's 1,100 watts an hour. You're paying about 14 cents an hour to leave your Mac on.

DP: Yeah, yeah, so what's the bottom line?

JS: In a year, that's \$1,226 down the sewer. Whereas, if I turned the thing off at night (and I work eight-hour days), I only pay \$324 a year.

DP: But the wall of electrons...

JS: Furthermore, do you realize that the production of electricity in this country is responsible for 35 percent of the carbon dioxide in the atmosphere? Do you understand that New York City is going to be underwater in 150 years?

DP: Under —

JS: From global warming.

DP: New York is...?

JS: Common knowledge.

DP: I stand enlightened.

JS: You see?

DP: From now on, I'll turn off the monitor at night.

