Chapter 1

A Painless Introduction to Computers

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In This Chapter

▶ Understanding computer basics

▶ Admiring input and output

▶ Knowing about hardware and software

▶ Discovering the PC

▶ Realizing that your PC is actually quite dumb

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*J*ust because you can buy a complete computer straight off the shelf, right down the aisle from the diapers, canned peas, and frozen burritos, doesn't imply that using a computer will be any easier to use today than it was 20 years ago. Don't believe the hype.

Yeah, I know: The advertisement said that you'd be up on the Internet in no time. The text on the side of the box promised that you could put your complete library of music and movies on the computer with less effort than it takes to make toast. And, naturally, everyone tells you how easy the programs are to use and how helpful and *user-friendly* the whole thing is. Yeah. And if you believe that, then you'll get out of bed tomorrow with tweeting birds and animated forest creatures helping you to get dressed.

You probably paid a pretty penny for your computer, so why not try to use the thing at more than a superficial level? It's not that difficult. All you need to do to have a friendly, productive, and long-term relationship with your computer is to *understand* it. No, this doesn't mean you need to do math. Nor do you need to have Einstein's IQ or Mr. Spock's pointy ears. Just a modicum of knowledge is all you need to overcome the computer's complexity and stop that cold intimidation that makes you feel like a dummy. That's what you'll find in this chapter.
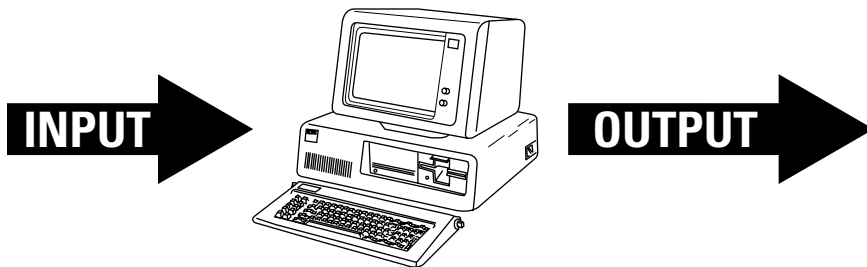
Simple Computer Concepts

Most gizmos are rather simple: The coffee maker supplies you with delicious, hot, legal stimulant; the TV remote saves you the labor of walking a short distance to work the knobs on the television set; the lawn mower keeps the grass short and the gophers paranoid; and an ice tea spoon allows you to blissfully scratch inside a five-week-old arm cast. Despite any advanced features you may not use, the purpose of just about any device can be boiled down to the simplest description.

For the longest time, computers lacked a simple description. At one time, the computer was considered the ultimate solution for which there was no problem. That description, however, was based on too much focus. The computer isn't a single solution to anything but rather multiple solutions to many things. It's the world's most flexible device, versatile and almost indispensable.

Rather than clog your brain pipes with technical nonsense about the computer, it helps to understand how the thing works at the most basic, simple level. When you peel back all the mumbo jumbo, the computer is nothing more than a gadget that takes input and then modifies that input to create some form of output (see Figure 1-1). The enormous potential of that simple activity is what makes the computer capable of so many things.

Figure 1-1:
What a computer does at its simplest level.

The act of taking input, modifying it, and then producing output involves three basic computer concepts:

- ✔ I/O
- ✔ Processing
- ✔ Storage

The following sections expand on these ideas, distilling for you what you could have learned in a computer science class, had you bothered to take one.

I/O

No one would accuse a computer of being a reliable moocher, but it's obsessed over the two letters *I* and *O*. It's *IO* as in "I owe," not as in Io, the third-largest moon of Jupiter.

IO stands for Input and Output. It's commonly written as I/O, which are the two things a computer does best. In fact, I/O is pretty much the *only* thing a computer does. Consider the popular nursery song:

Old MacDonald had a Dell,
E-E-E I/O

You get this whole I/O concept down and you've tackled the essence of what a computer is and what it can do.

✔ The devices connected to your computer are divided into input and output camps. There are input devices, there are output devices.

✔ The computer receives information from *input* devices. The keyboard and mouse are two input devices, as are a scanner and a digital camera. They all send information to the computer.

✔ The computer sends information from output devices. *Output* is simply anything the computer produces. The stuff displayed on the monitor is output, sound is output, and the pages the computer prints are output. The monitor, speakers, and printer are all output devices.

✔ Some devices can do both input and output. For example, a disk drive can supply input to the computer as well as store output. A modem both sends and receives information.

✔ Don't let terms like *disk drive* and *modem* bother you! If you're curious, you can look them up in the index. Otherwise, keep reading and nod occasionally, like you really get it. If anything, that will impress someone else who's watching.

Processing

What the computer does between input and output is *processing*. The computer processes input and produces output.

Without processing, the computer's output would be the same as its input — kind of like plumbing: Water goes into the pipe, and water comes out of the pipe. The water is the same before, during, and after the journey. With a computer, you have the added element of *processing,* which means doing something to the input so that you get something else as output. To continue the plumbing example, turning dirty water into clean water would be a type of processing.

✔ Processing is handled by a gizmo inside the computer called (logically enough) a *processor*.

✔ By itself, the processor doesn't know what to do with input. No, the processor relies on *instructions* to tell it what to do. Those instructions are referred to as *software*. The topic of software is covered later in this chapter.

✔ It's amazing when you think of it: Computer input is all digital. Yet with the proper processing, the output can be anything from a poem to a graphical image to a symphony. That's all thanks to the power of processing.

Storage

The final part of the basic computer equation is storage. The storage is necessary because the processor needs a place to perform its magic — a scratchpad for mad doodles, if you will.

On a modern computer, storage comes in two forms: temporary and long-term.

Temporary storage is supplied as memory, or RAM. *Memory* is where the processor does its work, where programs run, and where information is stored while it's being worked on. *RAM* is the microprocessor's playground, its workshop, its den.

Long-term storage in a modern computer is provided by storage media. Storage media includes disk drives, flash drives, media cards, and CDs and DVDs. Long-term storage allows information to be saved and recalled for later use — like putting clothes in a closet or all your junk in a storage unit. Media storage is the place where things go when the microprocessor isn't directly working on them — but from where stuff can be retrieved later, if need be.

✔ All computers need storage.

✔ RAM is an acronym for *r*andom *a*ccess *m*emory. It's often just called *memory*.

✔ The most popular form of long-term storage is the disk drive, primarily the computer's hard drive (or drives).

✔ Another term for disk drives is *disk memory,* although I don't prefer that term because it's easy to confuse it with RAM.

✔ Don't get all hung up on these terms. Computer jargon, such as *RAM* and *disk drive,* is explained later in this book.

✔ The computers on the Apollo moon missions had lots of storage for their day. This was so that the astronauts wouldn't have to manually type the programs the computer needed to run. Even so, a lot more typing and programming were going on in the capsule than you would imagine.

Hardware and Software

A computer system is a blend of two different things: hardware and software. Like other famous pairs — Astaire and Rogers, sweet and sour, bug and windshield — hardware and software must go well together to create the full computer system.

Hardware is the physical part of a computer — anything you can touch and anything you can see. The computer console, the monitor, the keyboard, the mouse — that physical stuff is hardware.

Software is the brains of the computer. It tells the hardware what to do.

In a way, it helps to think of hardware and software as a symphony orchestra. For hardware, you have the musicians and their instruments. The software is the music. As with a computer, the music (software) tells the musicians and their instruments (hardware) what to do.

Without software, hardware just sits around and looks pretty. It can't do anything because it has no instructions and nothing telling it what to do next. And, like a symphony orchestra without music, that can be an expensive waste of time (especially at union scale).

No, you must have software to make the computer go and complete the computer system. In fact, it's software that determines your computer's personality.

- ✔ If you can throw it out a window, it's hardware.
- ✔ If you can throw it out a window and it comes back, it's a cat.
- ✔ Computer software is nothing more than instructions that tell the hardware what to do, how to act, or when to lose your data.
- ✔ Contrary to what most people think, between hardware and software, it's the software that's more important. Just as a director tells actors what to do in a play, software directs the hardware, telling it what to do, where to go, and how best to convey the emotional context of the scene. Software's importance is especially valuable to note when first buying a computer because most people dwell on the new computer's hardware rather than on the software controlling that hardware.
- ✔ Without the proper software, your computer's hardware has nothing to do. That's when the computer magically transforms into a swell-looking paperweight.

The computer's operating system

The most important piece of software inside a computer is its *operating system*. It has several duties:

- ✔ Control the computer's hardware.
- ✔ Manage all the computer software.
- ✔ Organize the files and stuff you create on the computer.
- ✔ Interface with you, the human.

Doing all these things is a major task. Be thankful that computer designers have seen to it that only one program does all these things! The operating system is no slacker.

On PCs, the most common operating system is Windows. Other operating systems are available, all of which do the things just listed and can handily control the PC's hardware, but Windows dominates the marketplace. This book assumes that Windows is your PC's operating system.

How the operating system does its various jobs is covered elsewhere in this book.

REMEMBER

- ✔ The big bully among all the software programs is the operating system. It's the most important piece of software, the computer's number-one program — the head honcho, the big cheese, Mr. In Charge, Fearless Leader, *le roi.*
- ✔ The computer hardware surrenders control of itself to the operating system mere moments after you turn on the computer. See Chapter 4 for information on turning the computer on and off.
- ✔ The operating system typically comes with the computer when you buy it. You never need to add a second operating system, although operating systems get updated and improved from time to time.
- ✔ When you buy software, you buy it for an operating system, not for your brand of computer. So, rather than buy software for your Dell, Compaq, or Crazy Larry's PC, you look in the Windows section of the software store.

Other software

The operating system isn't the only software you use on your computer. If you're a typical computer user, you'll most likely obtain dozens, if not hundreds, of other programs, or computer software, to help customize your computer and get it to do those things you want it to do.

Computer software is known by several different names. In addition to software, you find

Applications: This category of software is used for productivity or to create things. Applications are the software that does the work.

Programs: Anything that's a "computer program" is also software, but this category includes software that may or may not be used for productivity or to produce output, such as a computer game or a video editing program.

Utilities or tools: These programs are designed to help you manage the computer or diagnose or fix problems. For example, you may use a tool to optimize the performance of your computer's disk drives.

Drivers: A special type of program that allows specific hardware to work. For example, a *video driver* program is required for the operating system to use your PC's specific graphics hardware. This type of software comes with the hardware it supports.

Part V of this book goes into more detail on computer software.

The stuff you make (files)

When you use your computer to create things, those things are stored in units of information called *files*. A computer file can be a document you write with your word processor, a graphical image from a digital camera or an image you create with a digital paintbrush, a piece of music, a video, or just about anything. Whatever it is, the computer stores that information as a file.

The operating system manages files for you. It helps your programs *save* information from temporary storage (memory) to long-term storage (the hard drive). Further, when you need to work on the file later, you can *open* the file from disk; by opening the file, the operating system transfers the file's information into memory, where you can view, modify, print, or continue to work on the file.

Understanding files is *vital* to using a computer. Be sure to check out Chapter 24 for more detailed information on the useful topic of computer files.

The PC (As in PCs For Dummies)

The kind of computer you have, or will soon have, is a PC, which is why this book is titled *PCs For Dummies.* There are many varieties of computers, from large supercomputers to small handheld gizmos. The largest category by far, however, is the PC.

PC stands for *p*ersonal *c*omputer. The design of the PC is based on its most ancient ancestor, the IBM PC, introduced in 1981. Back then, PCs were referred to as *microcomputers*. And although many, many microcomputers were available, the IBM PC proved the most popular and successful.

Now the term *PC* is used to refer to any computer that can run the Windows operating system. There are subtle differences between the PC's hardware from one manufacturer to the next, but, universally, if the computer runs Windows, it's a PC. (Note that this doesn't include cars, sewing machines, or heart–lung machines that also may run Windows.)

- ✔ The only thing not officially considered a PC is Apple's Macintosh computer. Although the Mac is a *personal* computer, Mac users get fussy about calling it a PC.

- ✔ Today's Macintosh can run Windows. In that mode of operation, this book and its contents apply. But to best understand the Mac, I recommend getting the book *Macs For Dummies,* 9th Edition (Wiley Publishing, Inc.), written by the average-looking guy Edward Baig.

- ✔ If you have a laptop PC, I highly recommend getting the book *Laptops For Dummies* (Wiley Publishing, Inc.), a well-written tome by the good-looking guy Dan Gookin.

"Uh, About That Exploding Thing"

Anyone who has ever seen an old episode of TV's *Star Trek* or any Irwin Allen television show from the 1960s knows that computers are capable of exploding, and doing so in a quite dramatic fashion. When given the most subtle yet illogical directions, the televised computer fidgets and heats up and eventually explodes in a shower of sparks and chunky debris.

In real life, computers die a much more silent death. The typical dead PC simply refuses to turn on when the switch is thrown. Oh, sure, sometimes the power supply may go "poof!" But that is so nondramatic compared to the exploding war computers of Eminiar VII in *Star Trek* Episode 23 or the perilously wimpy way the Landru computer deep-sixes itself in Episode 21.

Computers aren't evil. They harbor no sinister intelligence. In fact, when you get to know them, they're rather dumb.