Building a PC FOR DUMMIES® 5TH EDITION

by Mark L. Chambers

Wiley Publishing, Inc.

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About the Author

Mark L. Chambers has been an author, a computer consultant, a BBS sysop, a programmer, and a hardware technician for more than twenty years — pushing computers and their uses far beyond normal performance limits for decades now. His first love affair with a computer peripheral blossomed in 1984 when he bought his lightning-fast 300bps modem for his Atari 400. Now he spends entirely too much time on the Internet and drinks far too much caffeine-laden soda.

With a degree in journalism and creative writing from Louisiana State University, Mark took the logical career choice: programming computers. However, after five years as a COBOL programmer for a hospital system, he decided there must be a better way to earn a living, and he became the Documentation Manager for Datastorm Technologies, a well-known communications software developer. Somewhere in between writing software manuals, Mark began writing computer how-to books. His first book, *Running a Perfect BBS*, was published in 1994 — and after a short decade or so of fun (disguised as hard work), Mark is one of the most productive and best-selling technology authors on the planet.

Along with writing several books a year and editing whatever his publishers throw at him, Mark has also branched out into Web-based education, designing and teaching a number of online classes — called *WebClinics* — for Hewlett-Packard.

His favorite pastimes include collecting gargoyles, watching St. Louis Cardinals baseball, playing his three pinball machines and the latest computer games, supercharging computers, and rendering 3-D flights of fancy with TrueSpace — and during all that, he listens to just about every type of music imaginable. Mark's worldwide Internet radio station, *MLC Radio* (at `www.mlcbooks.com`), plays only CD-quality classics from 1970 to 1979, including everything from Rush to Billy Joel to *The Rocky Horror Picture Show.*

Mark's rapidly expanding list of books includes *iMac For Dummies,* 4th Edition; *Mac OS X Tiger All-in-One Desk Reference For Dummies; Scanners For Dummies,* 2nd Edition; *CD & DVD Recording For Dummies,* 2nd Edition; *PCs All-in-One Desk Reference For Dummies,* 2nd Edition; *Mac OS X Tiger: Top 100 Simplified Tips & Tricks; Microsoft Office v. X Power User's Guide; BURN IT! Creating Your Own Great DVDs and CDs; The Hewlett-Packard Official Printer Handbook; The Hewlett-Packard Official Recordable CD Handbook; The Hewlett-Packard Official*

Digital Photography Handbook; Computer Gamer's Bible; Recordable CD Bible; Teach Yourself the iMac Visually; Running a Perfect BBS; Official Netscape Guide to Web Animation; and the *Windows 98 Troubleshooting and Optimizing Little Black Book*.

His books have been translated into fourteen languages so far — his favorites are German, Polish, Dutch, and French. Although he can't read them, he enjoys the pictures a great deal.

Mark welcomes all comments and questions about his books. You can reach him at `mark@mlcbooks.com`, or visit MLC Books Online, his Web site, at `www.mlcbooks.com`.

Dedication

This book is posthumously dedicated to my friend and teacher, LSU journalism professor Jim Featherston. Jim taught me everything I need to know — now I can put ideas to paper.

Author's Acknowledgments

I find that writing the acknowledgments is always the easiest part of any book because there's never a shortage of material. I always have a big group to praise.

First, a well-earned round of thanks to my knowledgeable technical editor, Colin Banfield, who checked every word for accuracy (while enduring every bad joke and pun).

I'd like to thank my old friend Jody Cooper for his excellent color photography — a picture is worth a thousand words, so I figure the brand-new 16-page color insert in this edition ought to roughly double our page count!

As with every book I've written, I'd like to thank my wife, Anne, and my children, Erin, Chelsea, and Rose, for their support and love — and for letting me follow my dream!

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Contents at a Glance

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Introduction

You've decided to build your own computer. Congratulations! That statement might seem a little like "You've decided to fly a 747" or "You've decided to teach yourself accounting" — but I'm here to tell you that this book was especially written to make it both *easy* and (believe it or not) *fun* to build your own multimedia computer with an Intel Pentium or AMD processor. (Oh, and don't forget that you're likely to save a significant chunk of cash as well, especially if you're building a powerful PC for applications such as gaming and video editing.)

To sum up, I explain the mysterious parts in the box in honest-to-goodness English, with a little humor and without the jargon — and then help you build the PC that's perfect for you!

About This Book

You'll find that each chapter in this book acts as a reference for each type of computer hardware that you can add to your computer; some are required components, and others are optional devices that add extra functionality to your PC. You can start at any point — each chapter is self-contained — although the chapters are arranged in a somewhat linear order that I recommend that you follow. The book also includes a glossary of computer terms and an appendix with information about the various operating systems available for the PC, which comes in handy if you haven't decided on an operating system to run.

Each chapter also provides the general information you need to make a buying decision between different flavors of the same component. For example, in Chapter 9, I discuss both bare-bones and advanced sound cards (without resorting to engineer-speak).

Conventions Used in This Book

From time to time, I might ask you to type a command within Windows (or whatever operating system you're using). That text often appears in bold like this: **Type me**. Press the Enter key to process the command.

I list menu commands with this format: File➪Open. For example, this shorthand indicates that you should click the File menu and then choose the Open menu item.

From time to time, I mention messages you should see displayed onscreen by an application or the operating system. Those messages look like this: `This is a message displayed by an application`.

Although you don't really need to know a great deal of technical information to build a computer, you might be curious about the technical details that surround computers and the components that you're using. This technical information is usually formatted as a sidebar (in a separate box) to separate it from the stuff that you really *have* to know.

What You're Not to Read

If you're interested in buying and installing a particular component, such as a DVD drive or a video adapter card, you can jump directly to the chapter that describes the device and start reading. Most chapters end with general installation instructions that familiarize you with the installation process. (They don't replace the specific documentation that accompanies each component, although the generic steps that I provide give you an idea of what's involved.)

On the other hand, if you're interested in building a computer from scratch, start with Chapter 1 and follow the chapters in order; you can also skip to other chapters whenever necessary for information that you might need.

Foolish Assumptions

Here's a friendly warning: You might run across one or two doubting Thomases when you announce that you're building your own PC. Those folks probably make lots of foolish assumptions about what's involved in building a PC, and you just might want to burst their bubble by telling them the following truths:

- You *don't* have to be a computer technician with years of training, and you don't need a workshop full of expensive tools. In this book, no assumptions are made about your previous knowledge of computers, the Internet, programming your DVD player, or long division.
- No experience? Don't let that stop you! I introduce you to each of the systems in your computer, what they do, and how you install them, including advanced technology that would make a technoid green with envy. (I can't fix spaghetti by myself, so you know that building a PC must be easier than it first appears!)
- Some people still think that you don't save a dime by building your own PC. If that's the case, why is it still such a booming business? By assembling your own computer, you can save hundreds of dollars (and take advantage of used parts from an older computer).
- Finally, some people might ask you what you plan to learn by building your own PC — and that's an easy one! By the time that you're finished, you'll be ready to add and upgrade parts yourself so that you'll save money in the future — and computer-repair techs will growl when you meet them.

Now that I've put those myths to rest, it's time for the good stuff!

How This Book Is Organized

I've divided this book into six major parts. The first five are made up of a number of chapters, and each chapter is further divided into sections. You'll find all the nasty acronyms and abbreviations, part names, and relevant items in the index; important topics and information that appear elsewhere in the book are cross referenced to make them easier to find. The book also has a spiffy full-color photo shoot of a PC assembly that would please even the pickiest supermodel.

Part 1: Can I Really Do This?

In Part I, I introduce you to the tool (yes, only one tool) of the PC assembly trade (a screwdriver, which tells you how complex the hardware *really* is), what components make up a PC, and how they work together within your computer. You also determine what type of computer you should build by examining your current and future needs.

Part II: Building Your PC

In Part II, you assemble the required components to build a bare-bones PC — it won't play the latest 3-D shoot-'em-up game with all the visual bells and whistles, but it will have all the basic features that you need. You'll be able to load your choice of operating system after you've finished this part.

Part III: Adding the Fun Stuff

In Part III, I cover the addition of hardware that makes a multimedia PC fun to use — such as a digital stereo sound card, a DVD drive, and a dial-up modem. After you've completed this part, you can use your new PC to access the Internet or watch a DVD movie while you work. Or you can finally play that latest 3-D shoot-'em-up game with every last visual bell and whistle turned on.

Part IV: Adding the Advanced Stuff

In Part IV, I introduce you to advanced hardware that pumps up the performance of your PC, including home networking (both the wired and the wireless type), cable and DSL Internet connections, digital scanners, and SCSI devices. (If the acronyms sound like Egyptian hieroglyphics, read all about them here.) Not every computer owner needs the technology found in this part, but after you've read these chapters, you'll be familiar with the enhancements that you can add to create a power user's PC.

Part V: The Part of Tens

The five chapters in Part V are a quick reference of tips and advice on several topics related to the assembly of PCs. For example, you'll find a chapter devoted to potential problems and a chapter to help you speed up your new computer.

Part VI: Appendixes

The first appendix features a comparison of the different operating systems typically used on today's PCs. If you haven't considered what type of operating system that you'll use, this information can be very helpful to you. The second appendix is a glossary of computer components, terms, abbreviations, and acronyms.

Icons Used in This Book

Some things that you encounter while building your PC are just too important to miss. To make sure that you see certain paragraphs, they're marked with one of the following icons.

This icon marks the hardware you're likely to find in a power user or gamer's PC: the latest, the fastest, or the most powerful components at the time this book was written. You may have to pay more for hot hardware, but the performance you'll get is usually worth the extra coinage.

These are important. Consider my maxims to be the stuff you'd highlight in a college textbook — these facts and recommendations that would make a good tattoo, because they're universal and timeless in scope. (You'll see!)

Information marked with this icon is the printed equivalent of those sticky notes that decorate the front of some PCs. You might already know this stuff, but a reminder never hurts.

Are you thinking of adding hardware from an older computer or used hardware that you've bought or been given? If so, stay on the lookout for the Scavenger icon; it highlights information and recommendations on using older hardware. (Remember, though, that scavenged parts won't have a warranty like new components — or perform as well as new hardware, either.)

The Tip icon makes it easy to spot information that will save you time and trouble (and sometimes even money).

If you're like me and you're curious about what's happening behind the scenes — you know, if you're the kind of person who disassembled alarm clocks as a kid — this icon is for you. The Technical Stuff icon highlights information that you don't really need for assembling your PC but which you might find interesting. This information can also be blissfully ignored.

As you can imagine, the Warning icon steers you clear of potential disaster. Always read the information under this icon first!

Where to Go from Here

Before you turn the page, grab yourself a pencil and some scratch paper for taking notes — or throw caution to the wind and write directly in the book. If

you need help on a particular component, jump to the right chapter; if you need to start from the beginning, start with Part I.

Enjoy yourself and *take your time.* Remember Mark's First Maxim of PC Assembly:

You're not running a race!

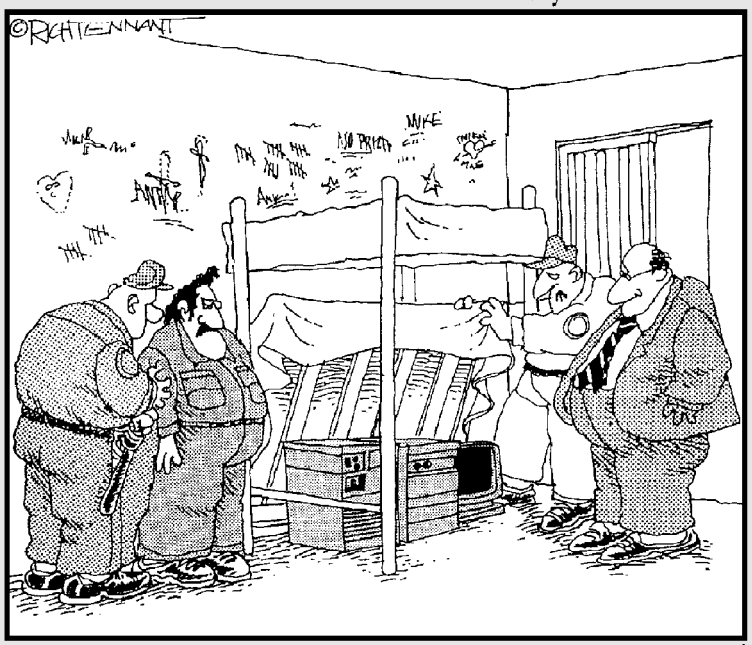
(I told you that maxims were universal and timeless, didn't I?) Although the process of building your own PC might seem a little daunting now, it *really is* easy. Plus, nothing is more satisfying than using a computer that you built yourself or answering PC questions from friends and relatives because "you're the computer expert!"

Part I

Can I Really Do This?

The 5th Wave

By Rich Tennant



"It's all here, Warden. Routers, hubs, switches, all pieced together from scraps found in the machine shop. I guess the prospect of unregulated telecommunications was just too sweet to pass up."

In this part . . .

I introduce you to the various components used to build a computer, and you find out what task each part performs. I also cover some of the basic rules of computer assembly, and I explain how you can use scavenged parts from an older computer to help cut the cost of your new PC. Finally, you act as your own consultant and determine which type of custom computer you should build to fit your needs.

Chapter 1

What's in a Computer, Anyway?

In This Chapter

- Discovering how simple PCs really are
- Using commonsense assembly (CA)
- Understanding standard PC components
- Connecting components

Ask most people what they know about computers, and they'll tell you that a PC is a complex, sealed box full of confusing parts that you need an engineering degree to understand — something like a cross between an unopened Egyptian pyramid and a rocket engine. Ask those same people whether they want to try their hand at actually *building* a computer, and they'll probably laugh out loud. Even if you did buy all the mysterious electronic parts (which techno-types affectionately refer to as computer *components*), where would you start? Where do you buy everything? How do you fit the components together? Nobody but an honest-to-goodness computer nerd could possibly put a computer together!

Well, ladies and gentlemen, I have great news: If you can handle the tool shown in Figure 1-1 — yes, the humble Phillips screwdriver — you can safely assemble your own computer (and even enjoy doing it!). After you discover how to build your own computer and start to use it, you'll probably agree with me: Building a computer is easier than figuring out how to use some of the complicated software that the computer can run. The idea that building a computer is as difficult as building or repairing a car is just a myth (probably encouraged by computer salespeople).

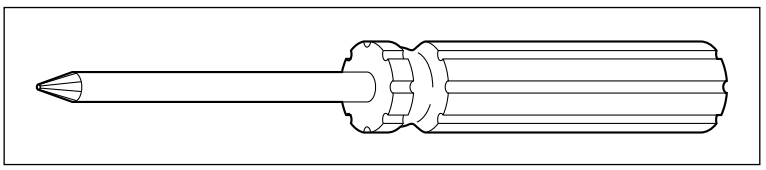


Figure 1-1: The tool of choice for computer builders.

In this chapter, I introduce you to the standard electronics and peripherals that you can use to build your computer, and then I show you how they fit together. (And after you've successfully built your first computer, drop me an e-mail at mark@mlcbooks.com, and I can congratulate you personally!)

Anyone Can Assemble a PC

You might have heard a horror story or two about someone who tried to upgrade a PC and ended up being sucked through a black hole into another dimension. When you announce to the world that you're going to build your own computer, you're likely to face a number of common myths:

- **"Why, you have to be practically psychic about how machinery works to stick your hands inside a computer!"** Wrong. In fact, you don't have to know how any of the components work, so you don't have to be an expert in laser optics, magnetism, or electronic theory. You just need to connect the parts together correctly and attach them to the motherboard and computer case.
- **"You can't build a computer on a card table, you know. You're going to need an airstrip, a complete toolkit, and a warehouse full of parts."** Nope. You can not only assemble a computer on your dining room table but also do so with no special tools. Find your favorite screwdriver, and you're a lean, mean, computer-assembling machine.
- **"It's going to take you years to put together a computer. Heck, by the time you're finished, your computer will already be out of date."** Depends on how long it takes. No, no — just kidding! This myth is *definitely* false. If you have all your components ready to go, assembling a PC is a first-time project that you can easily finish during a long weekend.
- **"Something's not going to work with something else. You'll see."** Wrong again. (Geez, who *are* these people? They probably still think that airplanes will never get off the ground.) Today's computer components are designed to work with each other. Regardless of what brand name you buy or how much you spend, if you buy a standard computer device, it should join in that big cooperative team effort that makes a working computer.

What's the secret to building a PC? Time for the first Mark's Maxim for this book:

There really isn't a secret to building a PC.

That's why many people have started their own home businesses building custom computers in their spare time — and why thousands of my readers have built their own computers using this book. Building a computer is fun — that is, after you conquer your initial fear. Plus, you get a big ego boost after