

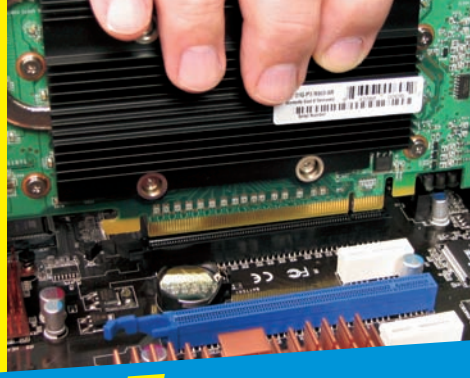

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FOR DUMMIES®

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- Choose and install the components that fit your needs
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Mark L. Chambers
Author of PCs All-In-One Desk Reference For Dummies

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Build Your Own PC FOR DUMMIES®

by Mark L. Chambers

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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 20 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 *MacBook For Dummies; iMac For Dummies*; *Mac OS X Leopard All-in-One Desk Reference For Dummies; Scanners For Dummies*; *CD & DVD Recording For Dummies*; *PCs All-in-One Desk Reference For Dummies*; *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 14 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 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, Jim Kelly, who checked every word for accuracy (while enduring every bad joke and pun).

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!

Finally, I send my heartfelt appreciation to the hard-working editors at Wiley Publishing, Inc., who were responsible for the launch and completion of this new *Do-It-Yourself* edition — it takes a ton of work to produce a completely new edition, and they did an incredible job. Thanks are due to my project editor, Mark Enochs, my copy editor, Teresa Artman, and my acquisitions editor, Bob Woerner. They're talented, dedicated people, and I count myself very lucky that I had their assistance for this project — and many to come, I hope!

Publisher's Acknowledgments

We're proud of this book; please send us your comments through our online registration form located at http://dummies.custhelp.com. For other comments, please contact our Customer Care Department within the U.S. at 877-762-2974, outside the U.S. at 317-572-3993, or fax 317-572-4002.

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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 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!

Why Build Your Own?

Buying a PC from a retail computer store or a big mail-order company is easy: Out comes the credit card, the boxes arrive at your house, and installation is as simple as plugging in the keyboard, mouse, speakers, and monitor. Even the most experienced PC hardware junkie will have to admit that a novice can save time and potential headaches by buying a retail PC.

Therefore, you might be asking yourself, "Why don't I just travel the retail PC route like most people? Why go to the trouble of building my own computer?" There are several doggone good reasons why you should assemble your own machine:

It just plain costs less to build your own PC!

The first reason — and, for some people, the most important reason — for building a computer is to save as much money as possible over the cost of a retail PC (especially if you're buying a PC from a local retail store, or if you're building a super-fast gaming system). When you build your own computer, you're not paying for all the overhead tacked on to the original price of a computer, including a storefront, advertising, and a salesperson's paycheck.

Many retail PC packages don't include a monitor, so often the price that you see isn't for a complete system. And yes, you can save a hundred dollars or more over the price of a complete PC offered by a big mail-order company. It's simply a matter of searching for the right companies that sell computer components at rock-bottom prices. Remember, using a Web site such as `www.pricewatch.com` can bring you — in just a few seconds — the best prices available *anywhere*!

Even if you have to buy every single component from your computer case to your mousepad, you're still likely to save a considerable amount of cash by assembling your own computer.

Exercise your freedom of choice!

When you build your own computer, you can select special components that don't kowtow to the cookie-cutter mold of retail PCs. For example, don't expect to find specialized pointing devices (such as trackballs) on most retail PCs at your local computer store. If you buy a retail PC and you want to use a trackball rather than a mouse, you'll have to buy one separately (and then you're stuck with a mouse that you don't need). That might not seem like much of a hassle, but consider other specialized components, such as a high-end sound card with Dolby Digital support, a gamer's 3-D video card with 1GB of video RAM, or a TV/video capture card. Buying one of these adapter cards, removing the case, and substituting the adapter card that you *really* wanted in the first place becomes a big deal.

When you design and assemble your own computer, you buy precisely what you need, including any specialized hardware or peripherals. Even if the perfect computer that you were considering at the computer store doesn't have a FireWire port and a Blu-ray recorder, you can certainly build a computer that does have these extras! If you're considering buying a PC from a direct vendor (such as Dell or Gateway) and you need special hardware, the vendor can usually supply it — although you'll pay substantially more for the vendor's version of the part than you would have paid for the part through a mail-order catalog. Having a custom PC is nice, but unless you build it yourself, you'll *always* pay more.

Enjoy the learning experience

What do you learn when you buy a retail PC? The answer: Not much. Sure, you get a crash course in removing Styrofoam and plugging in cables, but most owners of a retail PC are still afraid to remove the case from their computer. If you buy a retail PC, you'll be left in the dark when the time comes to upgrade your system to extend its useful life or replace a broken component. (And you're likely to invalidate what's left of your warranty if you crack the case.)

On the other hand, when you build your own computer, you *know* what makes it tick. You'll blossom into a bona fide techno-wizard! With your assembly experience and your knowledge of PC hardware, you'll be better prepared to fix problems and upgrade hardware and peripherals. The technicians at your local PC repair shop will wonder what happened to you; perhaps you should visit them from time to time just to swap hard drive specifications.

Spare yourself the shipping and repair hassles

When you buy a retail PC from a store (or even from one of the big-name mail-order companies), you'll probably be presented with a technical support number and assurances that your computer will be promptly repaired if it breaks. You'll find that the word *promptly* has many meanings: waiting several minutes (or even an hour) to speak to a technical support representative, finding out that you'll be without your PC and the data that you need for several weeks, or making an appointment with a service representative to eventually drop by your house and bring a replacement part. Oh, and don't forget that this coverage usually lasts for only a year, unless you paid big bucks for the extended service contract when you bought your PC.

When you build your own PC, you can buy parts locally. And, if a part breaks, you don't have to pick up the telephone and start waiting. You'll never find yourself repacking your computer to send it halfway across the country. Instead, you can bring the faulty component back to the store for an immediate replacement.

Dodge bundled software costs and get what you want

Retail PC salespeople like to crow about the cool software that's included with their computers. You usually get a productivity suite (which includes a word processor, some sort of database application, and a spreadsheet program), a few Internet applications, and free hours on an online service. If you're lucky, you might also get a year-old game or two with your computer. Generally, these programs are stripped-down versions of larger packages.

Read between the lines when a PC manufacturer touts its bundled software. For example, you might get baby sister Microsoft Works preloaded instead of its full-featured, big sister Microsoft Office, which most retail PCs sold in stores don't include — unless you pay more for it.

Unfortunately, bundled software isn't free at all: You pay for it along with your hardware, the documentation is usually sparse, it's rarely exactly what you need, and you usually can't subtract it from the total price of your computer if you don't want it. Often, you won't even receive the original program installation discs, so you can't reinstall the software. In fact, many new computer owners end up uninstalling the bundled software to make room for the programs that they really want to run. If you build your own PC, you can select your own full versions of your favorite applications later and save additional money.

Avoid the computer sales experience

Although used-car salespeople seem to rank the lowest on the social totem pole, computer salespeople aren't much better. Many salespeople who I've encountered in retail computer stores either consider the customer an idiot or have little idea of exactly what they're selling (making them the perfect target for a few well-placed techno-questions — nothing's funnier than an embarrassed clueless salesperson who treated you like a computer novice just a few seconds before)! Others try to pass off a computer that's been returned as near the quality of a brand-new machine. (Look closely for the word *refurbished* the next time you shop for a computer, and you might see this technique in action.)

By building your own PC, you can circumvent your computer retail store and all the techniques that salespeople use to try to talk you into a specific computer. You end up with a better computer that is less expensive and *perfectly* suits your needs.

Select the brands that you prefer

Are you looking for specific brand-name components in your computer, such as a Western Digital Raptor SATA hard drive or a Sound Blaster X-Fi Titanium sound card

from Creative Labs? If you buy a retail PC, you end up with whatever hardware the manufacturer deems satisfactory (and you'd be surprised by how many big-name manufacturers of retail PCs use no-name parts). Often the only way that you can determine what you're getting is to open the computer's case on the sales floor (or, if you used a mail-order shop, when you receive it).

Even if you're buying a computer from a direct vendor that offers customized PCs, it's unlikely that you'll be able to ask for a specific brand for most of the components used to assemble your computer. Typically, these vendors do use brand-name parts but only those brands and models the vendor prefers. If you need a different model, you're no better off than you would be buying a computer in a chain store.

When you build your own computer, *you* select the parts required to build it, including any specific brand-name preferences.

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. The book also includes a glossary of computer terms and an appendix about what's on the DVD in the back of this book.

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 10, I discuss both bare-bones and advanced sound cards (without resorting to engineer-speak).

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 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.

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.

Introducing Colossus

Throughout this book, I recommend a number of specific components by brand and model number. If I were building my own PC at the time of this writing (and I actually do build this PC on the companion DVD), I'd pick these parts, and I'll always let you know why I chose them.

I should note, however, that time marches on, as does computer technology. The components I name in this edition will (of course) be supplanted soon enough with newer models, so make sure you check the manufacturer's Web site to see whether a new device with more features or better performance is available.

I named my dream PC *Colossus,* after the truly awesome sentient supercomputer that takes over the world in the cult 1970 film *Colossus: The Forbin Project*. (If you don't name your PC while building it, I strongly urge that you name it after it's completed. Consider it the human side of the assembly process!) This outstanding movie has a sizable following among techno-types. If you enjoy a good science fiction film about artificial intelligence, don't miss this flick.

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 are there locally owned computer stores in your town building custom PCs? By assembling your own computer, you can save hundreds of dollars (and take advantage of used parts like a keyboard or modem 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 divided this book into five major parts, all 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. And do not overlook the companion DVD at the back of the book!

Part I: Preparations and Planning

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: Assembling the Basics

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 finish 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 DSL/cable 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 audio-visual bell and whistle turned on.

Part IV: Advanced PC Options

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), digital scanners, and USB 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 — including the ultimate gaming PC, which I cover in Chapter 14.

Part V: The Part of Tens

The four 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.

Appendixes: About the DVD and the PC Builder's Glossary

Read about the companion DVD in the first Appendix. Then, the glossary lists all the computer components, terms, abbreviations, and acronyms you need to know about.

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.

These are important. Consider my maxims to be the stuff you'd highlight in a college textbook — these facts and recommendations 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.

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

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. And check out the DVD if you want to see me install a component.

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!"