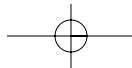
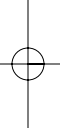
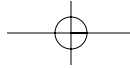


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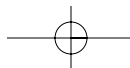
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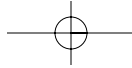
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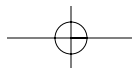
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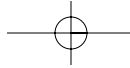
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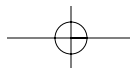
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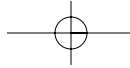
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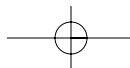
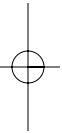


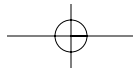
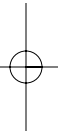
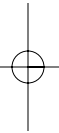
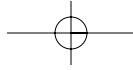


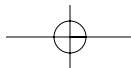
This book is dedicated to all of my former students
who are now managing networks and fixing computers all over the world.
It is also dedicated to all certification exam hopefuls who seek to change
their lives by achieving certification success!

To Amanda and Rachael Hutchinson, Nancy and Ken Crayton, Sean Reilly,
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thank you for your love, guidance, and continuing support.

To the families of Joel Rosenthal and Kevin Irwin-Risë,
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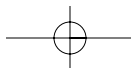
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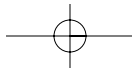
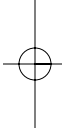
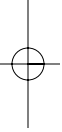
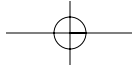
Very special thanks to authors Joel Rosenthal and Kevin Irwin for writing Part I, *PC Repair and Maintenance*. Simply put, never in my life have I seen better training material for those who wish to learn about or pursue a career in computer maintenance and repair. The easy-to-understand diagrams and intuitive video tutorials are superb. This is by far the best “hands-on” learning material available on the market today. From the heart, thanks again, gentlemen.

Joel and Kevin would like to thank Dave Pallai, not the least for suggesting that Joel write Part I of this book. They would also like to thank Bryan Davidson and Beth Roberts for helping get this book out in the form you see it in. Additionally, they thank Max Hersch, Roman Martynenko, Kelman Khersonsky, and Brian O'Connor for technical advice.

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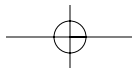
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Preface

Welcome and congratulations! You hold in your hands the most powerful, user-friendly combination PC repair/A+ certification tool available. It is crafted to teach you the basics of PC repair and maintenance as well as prepare you to take and pass the current Computing Technology Industry Association's (CompTIA's) A+ certification computerized exams.

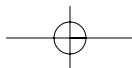
This practical, no-nonsense book focuses on and teaches you specific topics that will prepare you well to fix computers and prepare for a career as a computer technician. It also targets topics that are most likely going to be addressed on the current A+ exams. The authors' main objective is to prepare the reader by isolating and focusing on these specific topics without adding all of the "fluff" found in other books. It is not designed to fill your head with unnecessary information before you fix specific computer-related issues or enter a computerized testing site (this type of preparation is usually accompanied by confusion, lost time, and certification exam failure).

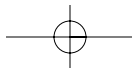
HOW TO USE THIS BOOK

This book is divided into two main parts.

Part I, *PC Repair and Maintenance*, is an easy-to-read "hands-on" approach to learning, repairing, and maintaining PCs. It is loaded with detailed figures and diagrams that make even the most complicated of tasks easy to understand. In Part I, you will learn important industry terminology. You will learn how to install and troubleshoot hardware. You will learn how to solve many of the most common operating system-related problems that occur when you are running Windows 95, 98, Me, 2000, or XP. You will also learn how to acquire computer replacement and expansion components inexpensively.

After every few chapters in Part I, you will notice cumulative A+ Certification Review Questions. These questions are in place to build upon your acquired knowledge of the subject matter discussed and ultimately prepare you for deeper





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discussion of those topics in Part II. The review questions are followed by answers and a cross-reference as to where the topics are located in Part II. It is very likely that you will have to do a little work to find the supporting theory behind the correct answers!

Part II, *The A+ Certification Exams*, is a powerful resource specifically designed to prepare you to ace the current CompTIA A+ certification exams. This section is further separated into two parts: Part II A, which covers A+ Core Hardware Service Technician Study (Exam 220-301), and Part II B, which covers A+ Operating Systems Technologies Study (Exam 220-302). All of the CompTIA A+ certification objectives are covered in detail in Part II of this book. You will be able to reinforce your acquired knowledge of these objectives by answering certification review questions at the end of every chapter.

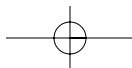
It is important to note that you will see important subject matter in this book covered more than once. Remember that you learn the basics in Part I and build upon that knowledge in Part II. In other words, you will learn to walk before you run.

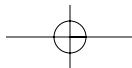
WHAT'S ON THE CD-ROM?

The CD-ROM included with this book features a plethora of video tutorials that will, among other things, show you how to properly open cases and towers, install memory, remove and replace expansion cards, install motherboards and CPUs, and properly maintain your computer.



The CD-ROM also includes A+ practice exams that will prepare you well for the CompTIA A+ Hardware Service Technician and Operating Systems Technologies examinations. There are four practice exams. The first two exams contain practice questions for the A+ Core Hardware Service Technician test (Part II A, Chapters 15 through 22). The second two exams contain practice questions for the Operating Systems Technologies test (Part II B, Chapters 23 through 28). Each exam has 80 questions and has a review feature to identify incorrect answers. It is recommended that you take these tests until you score 100% every time. This will ensure your best chance to score well on the real CompTIA A+ examinations. For more information regarding the CD-ROM, please see the Appendix: About the CD-ROM.



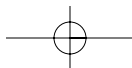


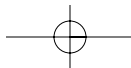
Introduction

Personal computers are, at once, horrendously complicated yet simpler than one might expect. How can this be? Computer professionals spend years working on computers, but never learning all there is to know. There's just too much information for one human being to absorb in a lifetime, especially because the technology changes continually and there are so many different types of each component. However, it is not necessary to know anything close to "everything" to be able to repair or even build computers. Because the parts are all modular, most technicians rarely, if ever, use a soldering iron. When a component such as a modem has a hardware problem, you wouldn't spend hours trying to repair it. You simply replace it—a procedure that normally takes a few minutes. Other problems can be corrected through software. So, while it cannot be said that repairing computers is "simple," it is nowhere near as complicated as the complexity of the computer would suggest.

Part I of this book, *PC Repair and Maintenance*, is designed to enable the reader to repair personal computers running Microsoft® Windows®, primarily Windows 9x (which includes 95, 98, and Millennium Edition, or "Me"), 2000 (mainly 2000 Professional), and XP. This book gives you hints and tricks that few other books provide. Many actions that Microsoft documentation would seem to suggest are impossible are often quite possible with software that is available for download, sometimes even at no charge, from the Internet. These kinds of tips might help you succeed in repairing a computer, or at least saving data, when other technicians might fail.

We don't believe it is necessary to have a deep understanding of every facet of how a computer works in order to diagnose and repair computer problems, so we explain only as much as necessary for each scenario. Furthermore, it is impossible for any book to cover all computer issues. Our goal with this book is to give you the basic information needed to make common repairs and to help you to be able to find information necessary to make other repairs. We decided not to spend much time with monitors, printers, imaging devices, or networking; repairing these devices takes highly specialized skills. Moreover, the software that comes with these devices often modifies the Windows interface from the standard, so configuration screens can differ from one computer to another. Additionally, there are many different types of these devices, each requiring different skill sets. In fact, there are entire books on





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some of these and on networking, so we don't feel that mere chapters can do them justice. We will limit our coverage to some common issues regarding these devices.

One theme evident throughout the book can be summed up in the phrase "Quality in, performance out." We explain how to select quality replacement and expansion components—even some relatively unknown manufacturers make satisfactory components. Moreover, it is often not necessary to pay top dollar to get quality components. Additionally, we want to make it clear that there's no shame in asking for advice from manufacturers and other experts. Getting appropriate advice can prevent serious problems and save huge amounts of time and money.

This book and accompanying CD-ROM contain many photographs, diagrams, and videos showing the right and wrong ways to perform various tasks, even to the level of physically connecting connectors.

SPECIAL NOTES

Here are some things to keep in mind as you use this book:

1. Due to version and configuration differences, some computers might not have items described in tutorials. In this case, please use Windows Help if you can't find what you're looking for.
2. This book often uses greater-than signs (>) to indicate the next step in a software command. For example, Start > Settings > Control Panel > System.
3. Windows versions are usually referred to by the following designations:
 - 9x:** Windows 95, 98, and Me. These versions are sometimes referred to individually.
 - 2000:** Windows 2000 Professional. Much of the information also covers Windows 2000 Server and Advanced Server.
 - XP:** Windows XP Home and Professional Editions. These are also referred to individually in places.
4. We use URLs in this book to direct you to helpful Web sites. In Part I of the book, we leave out the "http://www." from each URL that starts that way. URLs without "www" are shown in full. Please note that just as telephone directories are out of date by the time they are printed, some of these URLs won't be in service by the time you read this book. However, there is little or no exclusivity on this type of information, and we encourage you to look up any information you need.
5. Most changes in 2000 and XP require that the user be logged on as an administrator. We don't point that out in subsequent chapters.