THE A+ CERTIFICATION AND PC REPAIR HANDBOOK
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THE A+ CERTIFICATION AND PC REPAIR HANDBOOK

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CHARLES RIVER MEDIA, INC.

Hingham, Massachusetts
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, Rickey Johnson, Scott Barr, Jim Krick, Jerry Adams, and Rob Metty (Hawkeye)—thank you for your love, guidance, and continuing support.

To the families of Joel Rosenthal and Kevin Irwin-Risë, Laura, Karen, Olivia, and Lincoln.
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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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Contents

Dedication v
Acknowledgments vii
Preface xvii
Introduction xix

Part I PC Repair and Maintenance 1

1 Overview 3
   The PC 3
   Computer Repair Tools 6
   General Advice 9
   It’s No Shame to Seek Assistance 11

2 System Configuration and Computer Hygiene 13
   BIOS Overview 13
   Windows Control Panel 18
   Device Drivers (Drivers) Overview 30
   Windows Performance 47
   System Tools 55
   Windows Update 57
   MS-DOS (DOS) and the 2000/XP Command Prompt 58
   Overview of Viruses and Other Hazardous Programs 61
   Surge Suppressors and UPSs 64
   Hardware Hygiene 65

3 Motherboards and Their Components 67
   Motherboard (Main Board, System Board, Desktop Board) Overview 67
   Removal and Replacement of Motherboards 77
   Diagnosing Motherboard Problems 80
   BIOS Overview 82
   Central Processing Units (CPUs, Processors) 85
   Some Cool-looking Fans Don’t Cool Any Better 91
   Expansion Slots 91
   Ports (Input/Output, or I/O) Overview 92
Contents

4 Cases and Power Supplies 95
   Cases 95
   Power Supplies 100

   Chapters 1–4 A+ Certification Review Questions 105

5 Memory (RAM) 115
   Memory Overview 115
   Memory Installation 121
   Troubleshooting Memory Problems 123
   BIOS Memory Settings 126

6 Magnetic Disk Drives 129
   Overview of Hard Drives (Hard Disk Drives, HDDs) 129
   Selecting a Hard Drive 131
   Hard Drives and Operating Systems 133
   Hard Drives and Motherboards 139
   Hard Drive Removal and Installation 139
   Troubleshooting Hard Drives 147
   Saving Data 151
   RAID 152
   Removable Storage Devices 153
   Floppy Disk Drives (Diskette) Overview 155
   Zip and Jaz Removable Disk Drives 160

7 CD and DVD Drives 161
   CD/DVD Drive Overview 161
   Selecting Optical Drives 162
   Removal and Installation 163
   Backups onto Optical Discs 167
   Maintenance of Optical Disc Drives and Discs 168
   Diagnosing Optical Disc Problems 168
   Booting from a CD-ROM 171

8 Video, Sound, Modems, and Network Adapters 173
   Video Overview 173
   Sound Overview 184
   Modem Overview 187
   Network Adapters (Network Cards, Network Boards, Network Interface
   Cards, NICs, Ethernet Adapters) 194

   Chapters 5–8 A+ Certification Review Questions 197

9 Input Devices 207
   Pointing Devices 207
   Keyboard Overview 214
10 Troubleshooting Internet Connections
   Internet Connection Problem Overview 221
   Dial-Up Connections 222
   You Can Connect, but You Can’t Open Web Pages 236
   Data Transfer Speed Issues 241
   Firewalls 243
   Troubleshooting E-Mail 243
   Troubleshooting AOL Connections 249
   Miscellaneous Items 251

11 Troubleshooting 253
   Troubleshooting Overview 253
   Obtaining Assistance 259
   Boot Floppies 262
   Basic Repairs that Might Help (and Couldn’t Hurt) 264
   Diagnosing System Crashes and Lockups 265
   Remote Troubleshooting 265
   Troubleshooting Printing Problems 266
   Access Denied (2000 and XP only) 268
   The Windows Registry 269
   Windows Repair Utilities and Procedures 274
   Rescuing a Wet Laptop 284
   A Final Comment 284
   Practical Troubleshooting Tables 285

12 Things Not to Do with a Computer 301

13 Command-line Tutorial: MS-DOS and 32-Bit Commands:
   A Practical Tutorial and Reference 305
      Overview 305
      Using Commands 306
      Command List 309

Chapters 9–13 A+ Certification Review Questions 343

Part II The A+ Certification Exams 357

14 Introduction to the A+ Certification Exams 359
   The CompTIA A+ Certification 2003 Exam Objectives 360
   Registering for the A+ Tests 385
   Test Site Requirements and a Little Advice 386
   How Computerized Testing Works 387
   Your State of Mind 388
   Useful Tools, Tips, and Study Techniques 389
   Book Structure and Sample Review Questions 390
   Chapter Summary 391
   References 392
Part II A  A+ Core Hardware Service Technician Study  
(Exam 220-301)  
15  Motherboards, Power, BIOS, and Expansion Buses  
   Motherboards and Form Factors  
   Slots and Sockets  
   Electricity and the Power Supply  
   Preventive Maintenance and Safety  
   Complementary Metal Oxide Semiconductor (CMOS)  
   The System Basic Input/Output Services  
   Plug and Play  
   Power-On Self-Test (POST) and Error Codes  
   Expansion Bus Architecture  
   PCMCIA (PC Cards)  
   Chapter Summary  
   Review Questions  
   References  
16  Processors and Cache  
   CPU Defined  
   Clock and Bus Speeds  
   Cache Levels 1, 2, and 3  
   Chipsets and Controllers  
   SEC and SEP  
   PGA and SPGA  
   Processors and Modes  
   Cooling Fans and Heat Sinks  
   Liquid Cooling  
   Thermal Compounds  
   VRM (Voltage Regulator Module)  
   Chapter Summary  
   Review Questions  
   References  
17  Understanding Memory  
   Memory Defined  
   Random Access Memory  
   Memory Types and Characteristics  
   Popular Dram Advances and Technologies  
   Memory Packaging  
   Memory Parity and ECC  
   Logical Memory  
   Chapter Summary  
   Review Questions  
   References  
18  System Resources and Input Devices  
   Binary  
   Hexadecimal
xiv  Contents

21  Cables, Connectors, and Ports 549
   External Ports 550
   Asynchronous and Synchronous Transmission 551
   Parallel Ports and Connectors 552
   Serial Ports and Connectors 553
   Keyboard and Mouse Connectors 554
   Video Connectors 555
   USB Connections 557
   FireWire (IEEE 1394) 558
   SCSI Connectors 559
   Networking Connectors and Cables 560
   Wireless Connectivity 566
   Chapter Summary 573
   Review Questions 573
   References 580

22  Basic Networking 581
   IEEE 802 Specifications 582
   OSI Reference Model 583
   Network Categories 585
   Network Topology 588
   Protocols 591
   Bridges, Routers, Switches, and Hubs 593
   Network Interface Cards 595
   The Internet and Viruses 596
   Cable, ISDN, DSL, and Satellite 599
   Firewalls 602
   Troubleshooting and Basic Networking Test Tips 603
   Chapter Summary 604
   Review Questions 605
   References 610

Part II B  A+ Operating Systems Technologies Study (Exam 220-302) 611

23  Operating System Fundamentals and DOS 613
   Operating System Fundamentals 614
   Introduction to DOS 619
   DOS System and Configuration Files 620
   DOS File Name Structure 625
   DOS Commands, Switches, and Wildcards 629
   DOS Windows Utilities 632
   Memory Management Utilities 635
   Windows Initialization Files 638
   Operating System Fundamentals Test Tips 640
   Chapter Summary 642
   Review Questions 642
   References 646
## Contents

<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>24</td>
<td>Windows 9x</td>
<td>647</td>
</tr>
<tr>
<td></td>
<td>Overview of Windows 9x</td>
<td>647</td>
</tr>
<tr>
<td></td>
<td>Installation and Upgrading</td>
<td>648</td>
</tr>
<tr>
<td></td>
<td>The Windows 9x Start-Up Process</td>
<td>651</td>
</tr>
<tr>
<td></td>
<td>The Windows 9x Registry</td>
<td>654</td>
</tr>
<tr>
<td></td>
<td>Utilities and Settings</td>
<td>656</td>
</tr>
<tr>
<td></td>
<td>Printers</td>
<td>667</td>
</tr>
<tr>
<td></td>
<td>Windows 9x Networking</td>
<td>668</td>
</tr>
<tr>
<td></td>
<td>Diagnosing and Troubleshooting Test Tips</td>
<td>670</td>
</tr>
<tr>
<td></td>
<td>Chapter Summary</td>
<td>674</td>
</tr>
<tr>
<td></td>
<td>Review Questions</td>
<td>674</td>
</tr>
<tr>
<td></td>
<td>References</td>
<td>678</td>
</tr>
<tr>
<td>25</td>
<td>Windows NT</td>
<td>679</td>
</tr>
<tr>
<td></td>
<td>Overview of Windows NT</td>
<td>679</td>
</tr>
<tr>
<td></td>
<td>NT Server vs. NT Workstation</td>
<td>680</td>
</tr>
<tr>
<td></td>
<td>Installation and Upgrading</td>
<td>683</td>
</tr>
<tr>
<td></td>
<td>The Windows NT Start-Up Process</td>
<td>689</td>
</tr>
<tr>
<td></td>
<td>The Windows NT Registry</td>
<td>691</td>
</tr>
<tr>
<td></td>
<td>Windows NT Networking and Administration</td>
<td>692</td>
</tr>
<tr>
<td></td>
<td>Resource Sharing and Drive Mapping</td>
<td>697</td>
</tr>
<tr>
<td></td>
<td>Utilities and Settings</td>
<td>699</td>
</tr>
<tr>
<td></td>
<td>Printers</td>
<td>706</td>
</tr>
<tr>
<td></td>
<td>Diagnosing and Troubleshooting Test Tips</td>
<td>707</td>
</tr>
<tr>
<td></td>
<td>Chapter Summary</td>
<td>709</td>
</tr>
<tr>
<td></td>
<td>Review Questions</td>
<td>710</td>
</tr>
<tr>
<td></td>
<td>References</td>
<td>714</td>
</tr>
<tr>
<td>26</td>
<td>Windows 2000</td>
<td>715</td>
</tr>
<tr>
<td></td>
<td>Overview of Windows 2000</td>
<td>715</td>
</tr>
<tr>
<td></td>
<td>Windows 2000 Installation Process</td>
<td>717</td>
</tr>
<tr>
<td></td>
<td>Windows 2000 Upgrade Procedures</td>
<td>720</td>
</tr>
<tr>
<td></td>
<td>Windows 2000 Start-Up Process</td>
<td>722</td>
</tr>
<tr>
<td></td>
<td>Windows 2000 Tools and Utilities</td>
<td>726</td>
</tr>
<tr>
<td></td>
<td>Profiles</td>
<td>735</td>
</tr>
<tr>
<td></td>
<td>Printers</td>
<td>736</td>
</tr>
<tr>
<td></td>
<td>Windows 2000 Networking and the Internet</td>
<td>737</td>
</tr>
<tr>
<td></td>
<td>Diagnosing and Troubleshooting Test Tips</td>
<td>743</td>
</tr>
<tr>
<td></td>
<td>Chapter Summary</td>
<td>745</td>
</tr>
<tr>
<td></td>
<td>Review Questions</td>
<td>746</td>
</tr>
<tr>
<td></td>
<td>References</td>
<td>752</td>
</tr>
<tr>
<td>27</td>
<td>Windows Me</td>
<td>753</td>
</tr>
<tr>
<td></td>
<td>Overview of Windows Me</td>
<td>753</td>
</tr>
<tr>
<td></td>
<td>Windows Me Installation Process</td>
<td>755</td>
</tr>
<tr>
<td></td>
<td>Windows Me Upgrade Process</td>
<td>756</td>
</tr>
<tr>
<td></td>
<td>Windows Me Start-Up Process</td>
<td>760</td>
</tr>
<tr>
<td></td>
<td>Windows Me Tools and Utilities</td>
<td>760</td>
</tr>
</tbody>
</table>
## Contents

Profiles 767  
Printers 771  
Windows Me Networking and the Internet 773  
Diagnosing and Troubleshooting Test Tips 784  
Chapter Summary 787  
Review Questions 788  
References 791

### Windows XP 793

Overview of Windows XP 793  
Windows XP Installation Process 795  
Windows XP Upgrade Procedures 797  
Windows XP Start-Up Process 803  
Windows XP Tools and Utilities 805  
Profiles 815  
Printers 816  
Windows XP Networking and the Internet 818  
Diagnosing and Troubleshooting Test Tips 823  
Chapter Summary 824  
Review Questions 825  
References 828

About the CD-ROM 829

Glossary 833

Index 861
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...
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.
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
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.
   - **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.