# COMPUTER SECURITY HANDBOOK

• SECOND EDITION •

RICHARD
H. BAKER

# Computer Security Handbook

2nd Edition

Richard H. Baker


TAB Professional and Reference Books

Division of TAB BOOKS

Blue Ridge Summit, PA

SECOND EDITION
FIRST PRINTING



**Library of Congress Cataloging-in-Publication Data**

Baker, Richard H.
Computer security handbook / by Richard H. Baker. — 2nd ed.
p. cm.
Includes index.
ISBN 0-8306-7592-2 ISBN 0-8306-3592-0 (pbk.)
1. Computer security. 2. Electronic data processing departments--Security measures. I. Title.
QA76.9.A25B35 1991
005.8—dc20 90-24383
CIP

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# Introduction

In 1983, a Milwaukee-based group of young computer hackers managed to find their way into the data banks of a hospital, a bank, the Los Alamos National Laboratory, and several other computers loaded with sensitive programs and data. Thanks to their efforts, the term *hacker*, previously applied to a rough-and-ready breed of computer enthusiasts, became synonymous with computer crime.

In 1988, a college student managed to invade a U.S. Defense Department communication network. A *worm* implanted in the system repeatedly multiplied itself and brought thousands of computers to a standstill.

Computer security experts pointed to these incidents to demonstrate that too few computer users were adequately concerned about the security of their systems.

In 1989, computer owners braced for the infectious outbreak of a "Columbus day" virus that was set to do its dirty work on a Friday the Thirteenth. It would attack the hard disks of unprotected personal computers, erasing crucial elements that could be restored only by a process that would erase everything else on the disk. This incident proved not to be as serious as was feared earlier, partly because many wary computer owners had sensibly backed up their files and had taken other steps to protect themselves.

Perhaps you can indeed learn from history—if the lesson is repeated often enough. Many computer security experts pointed to this incident to demonstrate that at least some computer users were adequately concerned about the security of their systems and had acted to protect themselves.

A succession of highly publicized security breaches has indeed made some managers more security conscious. The *Los Angeles Times* has gone so far as to proclaim that "the corporate war against computer crime has come out into the open."

Still, the long-standing pattern of poor computer security prevails in many places. The computers in thousands of American businesses are highly vulnerable to the loss and corruption of their data. This risk is not to be taken lightly. In many companies, existing protection is far from adequate for several reasons:

- Security is inconvenient. Most techniques that deter illegitimate users are equally effective at hindering legitimate users.
- Companies want to be seen as secure. Many computer crimes have gone unreported because executives worry about what would happen to their company's image should they acknowledge that they were a victim. That attitude is diminishing, but it still prevails among the more fearful souls in many corporate headquarters.
- You cannot just throw technology at a security problem. Although this book will discuss the technical aspects of computer security, you must always be aware that security is primarily a human problem, not a technical one.
- The greatest threat to your computers and data comes from inside your company, not outside. The person most likely to invade your computer is not a gawky youngster in some other part of the country but an employee who is currently on your payroll.
- The next most likely threat is an employee who until recently was on your payroll. That means the best security techniques are not usually those that rely on technology, but those that concentrate on the human element.
- Awareness of the problem is not enough. As always, it is a necessary first step toward a solution, but it is not the final step.
- There are those who believe that there is no security problem. One expert has gone so far as to suggest it is all some kind of media plot, perpetuated by the computer trade press.

In spite of all this, the *Los Angeles Times* cites several developments to support its optimistic statement:

- The fear of bad publicity is being supplanted by the fear of big losses.
- The federal government is promoting private-sector security to the point of requiring that defense contractors and regulated businesses increase their security over all sensitive information—both classified national defense information and sensitive nonclassified data.
- Although hackers get the publicity and insiders are the greatest danger, business has increasingly become aware of other threats as well. For example, industrial spying by computer has now been identified as a major threat.

The result has been an increased emphasis on computer security. It also means that security is increasingly the responsibility of all managers, not just

those who have direct charge of computer systems. As personal computers proliferate, so do the security risks, not only from the machines but from their operators.

This book is written for business managers at all levels who are responsible in any way for computer operations and who need the knowledge to meet that responsibiity. In particular, it is written for those whose companies and departments make widespread use of personal computers, often hooked into networks and linked to corporate mainframes. You need not have a great deal of technical knowledge to be responsible for the security of a computer system. Happily, you need not have a great deal of technical knowledge, either, to discharge that responsibility.

## ABOUT THIS BOOK

This book will discuss a wide range of security techniques, both technical and nontechnical. Much of it is derived from the experience and publications of the federal government, which became active in computer security long before the problem became a major concern for the private sector. You'll see techniques developed for federal installations that you can adopt or adapt to your situation.

You might notice that much of this federal material seems rather old by computer industry standards. Much of it predates even the advent of personal computers, and it is generally well known to computer security professionals. The information is still valid, however, and its age merely demonstrates how far the private sector has lagged behind federal efforts in this area. In addition, it is important that all managers become familiar with the basic techniques of computer security. The job can no longer be left to specialists alone.

Part I of this book will present an overview of the modern need for security, a framework for security management and planning, and a special discussion of two late-developing threats: computer viruses and radio wave interception.

Part II outlines a basic management approach, including ways to assess threats, identify computer criminals, and build the framework of a security policy.

Part III describes particular types of security, including passwords, physical access control, procedural safeguards, and technical measures.

Part IV tells how to apply these measures to specific security needs, including personal computers, networks, and disaster control. There also is a chapter on the legal requirements your security program should meet and another on security auditing.

Because this book is directed primarily at nontechnical managers, it will emphasize the information that is of greatest value to this group. Several chapters also include material that is more technically oriented. This material is presented at the end of the appropriate chapter, so you can read as far and in as much detail as your situation requires.

You also will find lists of security techniques you can apply to specific needs

and situations. A complete alphabetical listing of all these techniques is in appendix A. Appendix B discusses an analytical approach to security planning and implementation. A technical discussion of a high-security encryption system is included in appendix C.

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