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Hard Disk Management

For IBM PC XT, AT, And Compatible Systems

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Hard Disk Management for the IBM PC XT, AT and Compatible Systems

Thomas Cain

The Dun & Bradstreet Corporation

Nancy Woodard Cain

Morgan Guaranty Trust Company

A Brady Book
Published by Prentice Hall Press
New York, New York 10023

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A Brady Book
Published by Prentice Hall Press
A Division of Simon & Schuster, Inc.
Gulf + Western Building
One Gulf + Western Plaza
New York, New York 10023

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Designed by Michael O'Brien
Manufactured in the United States of America

2 3 4 5 6 7 8 9 10

Library of Congress Cataloging-in-Publication Data

Cain, Thomas.
Hard disk management.

Includes index.
1. IBM microcomputers—Programming. 2. File organization (Computer science) 3. Magnetic disks.
I. Cain, Nancy Woodard. II. Title.
QA76.8.I2594C34 1986 005.74 85-28672

ISBN 0-89303-669-2 (Paper Edition)

Hard Disk Management for the IBM PC XT, AT, and Compatible Systems

To Our Mothers

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Preface

This book is a guide to managing fixed disk systems. Three categories of end-users will find it particularly useful:

1. The first-time XT or AT user.
2. The experienced PC user who is a first-time XT or AT user.
3. The experienced XT or AT user who wants to better manage his/her resource.

This book draws upon the authors' experiences as end-user computing professionals. The perspective taken throughout this book reflects the authors' managerial concerns as non-programming users of hard disk systems.

For the first-time XT or AT user, this book provides an introduction to the XT/AT hardware and operating system. It then takes the user through the essentials of DOS, demonstrating the usefulness of DOS's commands to users of all levels.

Experienced XT and AT users will find numerous ideas and examples to make their systems more efficient and secure. These include an introduction to filenaming conventions; the advantages of and techniques for creating a menu system; a discussion of security-related procedures and options; and issues that one must address when looking ahead to networking.

Many individuals provided ideas and the motivation required to produce a book such as this. The authors particularly would like to thank Bill Carpenter, Mike Miller of DunsNet, and Marcel Malenfant of Morgan for their critical reviews and commentary on the manuscript. Erika Cowan of Morgan deserves special mention for contributing many ideas and, in particular, for her insight into the world of filenaming conventions. Daniel Woodard has provided expert financial advice for several of our adventures.

Other individuals at D&B and Morgan deserve thanks as well: Jim Hanley, David Katz, Andy Lippa, Leonor Lopez, Judy Martin, and Michael Shipe.

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1.

Introduction

A microcomputer, like any other business resource, needs to be managed. This is particularly true for the XT, AT, and other hard disk systems. Armed with some basic knowledge of the system and DOS commands, routines can be developed that allow the *user* to control the system. For example, one can "paint" colored logo screens, automate the backing up of a data-filled disk, and create a menu system that organizes information on the disk—all using DOS. One does not have to be a programmer to access DOS's hidden powers, nor does one have to invest a penny—just a little time and patience.

This chapter describes the approach that this book takes to presenting DOS, emphasizing the user's perspective. It also discusses what is meant by "managing" a hard disk system and why a hard disk system must be managed. Both topics set the scene for the remainder of the book: How various techniques can be applied to get the most out of an XT or AT system. This information is followed by a brief description of each chapter.

1.1. DOS through the Eyes of the User

To the non-programmer, DOS seems vast. It comes with a fat, mysteriously organized manual that appears to contain trillions of commands. One wonders what the connection is between all of this information and the daily operation of the XT or AT. On the other hand, the user of a hard disk system finds it difficult (if not impossible) to ignore DOS. The very nature of a hard disk system forces the user into some acknowledgement of DOS.

This book does not take the approach that the AT or XT user must know everything about DOS. For business users, knowing DOS should not be simply an end in itself; having a knowledge of DOS simply for the sake of that knowledge is for hackers, tinkerers, and other individuals whose job it is to discover how things work. This book presents only those aspects of DOS that are useful in running an XT or AT system on a day-to-day basis. Information about DOS is presented in a context that clarifies both its significance and its utility for the hard disk user.

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The DOS Information in This Book

The information about DOS in this book falls into two general categories: 1) information about specific DOS commands, and 2) techniques and circumstances for using these commands. The DOS commands that are discussed relate to the organization, storage, retrieval, and protection of data stored on a hard disk system. The commands are presented from a user perspective, with specific situations describing how and why the command is used.

The user also will find that the DOS-related techniques described in this book will make life with an XT or an AT considerably easier. Specific routines are described that allow a user to automate DOS operations. This automated processing of DOS operations can be of immense value:

- Automated routines can simplify complicated processes for the less knowledgeable
- Repetitive tasks can be done by the system instead of the user
- Multiple tasks can be accomplished in one operation

This automated processing can be taken one step further. Techniques for developing a menu-driven system for DOS functions are described in detail.

In describing a particular command or DOS routine, a step-by-step approach is taken. There is a generous use of example screens for each given situation.

The DOS information explored in this book ranges from basic to reasonably sophisticated. However, at all levels, the intent is to present the non-programming reader with DOS information that can be of use in managing a hard disk system.

1.2. Why Manage a Hard Disk System?

Managing a hard disk system means *PLANNING* for its use, *CONTROLLING* the integrity of the system, and *ORGANIZING* the structure of its storage media. As such, a hard disk system is just another tool used by the business manager. It allows the manager to perform a number of manual tasks more accurately and efficiently. When managed well, a hard disk system can result in substantial cost savings and higher quality services.

Hard disk systems such as the XT and the AT allow the user to electronically store massive amounts of information and to retrieve that information in a matter of seconds. In addition, large complex applications that were too large or cumbersome for the PC can be handled with ease by the XT or AT.

Thus, more and more PC users are finding that they require the increased capacity of a hard disk system.

A hard disk system must be managed carefully. For example, a disorganized system can make a poorly labeled file extraordinarily difficult to find. Failure to backup the hard disk can mean the potential loss of thousands of files and thousands of hours lost in recovery time. Or a system that is understandable to only one individual can produce a severe bottleneck in processing time. Managing a hard disk system is *making it work for the user*—gaining control over the system rather than being at its mercy.

Planning a Hard Disk System

Planning a hard disk system means establishing a system that can be accessed by users of all skill levels. It also means establishing a system that allows new applications to be added, and one that anticipates the need to proactively organize data files. Planning a hard disk system, therefore, is not unlike establishing a library: It must be layed out in a logical and consistent fashion; it must be designed with enough space to grow (and potentially diversify); and it must have a filing scheme that permits librarians to shelve new or returned books into preestablished places (e.g., the Dewey Decimal system).

Imagine how frustrating it would be to look for a book in a library that permitted borrowers to develop their own methods for filing titles. The same holds true for a hard disk system (even though microcomputer users seem to be a bit more tolerant). There is no doubt that the true efficiency and cost-effectiveness of microcomputer-based applications reside in the upfront planning of both the system *and* the applications.

Controlling the Integrity of a Hard Disk System

Controlling has two meanings to the hard disk system user: It means 1) ensuring that operations are performed correctly by authorized individuals, and 2) that the data in the system are securely maintained. Every hard disk user has his or her horror story about losing massive amounts of data to a slip of the fingers, a power outage, or to a malfunctioning hard disk. Possibly the worst story was that of the dentist who returned to his office to find that a thief had made off with his entire XT system (... and obviously the thief hadn't bothered to leave a copy of the data files).

Despite these stories, people are surprisingly lax about backing up their systems. One of the primary reasons is that the user is required to interact with DOS in order to back the system up efficiently. A well-managed hard disk system eliminates this excuse. No matter how well one has designed a spreadsheet application, it is only as good as the reliability of the data.

Organizing a Hard Disk System

Organizing a hard disk means establishing a logical framework within which to catalogue files. It also means ensuring that mechanisms are in place to keep this information neatly organized. Both elements of organization are essential components of the planning process described above.

Thousands of files may be stored on the XT or AT's hard disk. The user's ability to both identify the subjects of and easily retrieve these files depends on how well the fixed disk is organized. Files on a well-organized hard disk are grouped by application, by type, by user, and so on—by whatever structure makes the most sense in a particular organization. Logical groupings make life a lot easier when it comes time to "clean up" the hard disk.

The typical hard disk system user spends the majority of his or her time building files and manipulating data within files. However, a substantial portion of time also must be spent on housekeeping (i.e., moving files from one area of the disk to another, renaming files, combining files, and so on). Since the user is dealing with a fixed-capacity disk, he or she will periodically want to weed out seldom-used or duplicate files. If the user must examine each file to determine its contents and to whom it belongs, this process is even more inefficient. A well-organized hard disk permits users to identify the contents of files by their *filenames*. It also permits users to perform an operation on a number of files at the same time. The key to such efficiency is the proactive organization of data files.

1.3. Why Every Hard Disk System User Needs This Book

Managing a hard disk system is not an easy task. However, it is the key to making a microcomputer a truly efficient and reliable business resource.

A number of disk management techniques can be applied to hard disk systems. Conceptually, they are not difficult to apply. However, for the first-time XT or AT user the complexities of a hard disk system can be overwhelming. Even for an experienced PC user the conversion to a hard disk system can be difficult. This book does two things for these users: 1) It provides them with a thorough understanding of the system's capabilities, and 2) it introduces the user to various disk management concepts, while providing step-by-step, tested techniques for dealing with them.

By the time the user finishes with this book, DOS will no longer be a mystery. More importantly, the user will understand how DOS may be applied to better manage a hard disk system—how to make the system work for the user.

1.4. How This Book Is Organized

Much can be said about the management of a hard disk system. It can be a highly effective business tool for those who know how to tap its full capabilities. It is from this perspective that this book is written. The purpose of this book is twofold: 1) To familiarize the user with the operation of the XT and the AT, and 2) to raise managerial issues while providing creative solutions for them.

Chapter 2 describes the basics of the hardware and the operating system. Chapter 3 is an overview of disks, disk drives, and disk-related commands. Chapter 4 discusses all aspects of using a hierarchical directory system. Chapter 5 introduces the concepts of file management and maintenance.

Chapter 6, on filenaming conventions, provides the user with a tool for managing files efficiently. Chapters 7 and 8 discuss all aspects of batch files and what they can do for the user. Chapter 9 demonstrates the techniques required for creating a menu system and the rationale behind the techniques. Chapter 10 addresses the issue of data security and the options available to the user. Chapter 11, on PC networks, presents some information and terminology on networking, and the decision issues involved in selecting a PC network.

Chapter 12 ends the book by integrating these topics in a sample Menu Management System. Facts presented throughout the book come together to create some powerful tools that can be used to effectively manage your XT or AT System.

The Appendices contain the following information: How to enhance the system memory of an XT or AT (Appendix A); How to relocate an XT or AT (Appendix B); and a summary of EDLIN's basic commands (Appendix C).

2.

Hardware and Operating System Basics

This chapter introduces the reader to some fundamental terminology and information about the hardware and operating systems of the AT and XT. While going through this book, this information should give the reader the necessary framework with which to recognize the full potential of his or her system.

2.1. Some Basic Terminology

Data Storage

Information is stored by the computer in several different ways. One form of storage uses magnetic disks such as floppy diskettes and fixed disks. Both of these are for permanent data storage. (This subject is discussed separately in the next chapter.) Information also is stored in the computer in integrated circuits. Integrated circuits are used to store data on both a temporary and permanent basis. It is these integrated circuits that represent the computer's memory.

The integrated circuits that contain permanently stored data are known as ROM, which stands for *Read Only Memory*. ROM generally contains certain fundamental information that is used to run the computer. In the XT and AT, the BASIC interpreter is stored in ROM. The information stored in ROM can only be read by the computer; it cannot be changed.

The integrated circuits used for storing data on a temporary basis are known as *Random Access Memory*, which is abbreviated as RAM. RAM is used to store computer programs while they are being run, as well as other data used and created by the program or the user while the program is operating. RAM is available for data storage on a temporary basis (only while the computer is turned on). In order for the information stored in RAM

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