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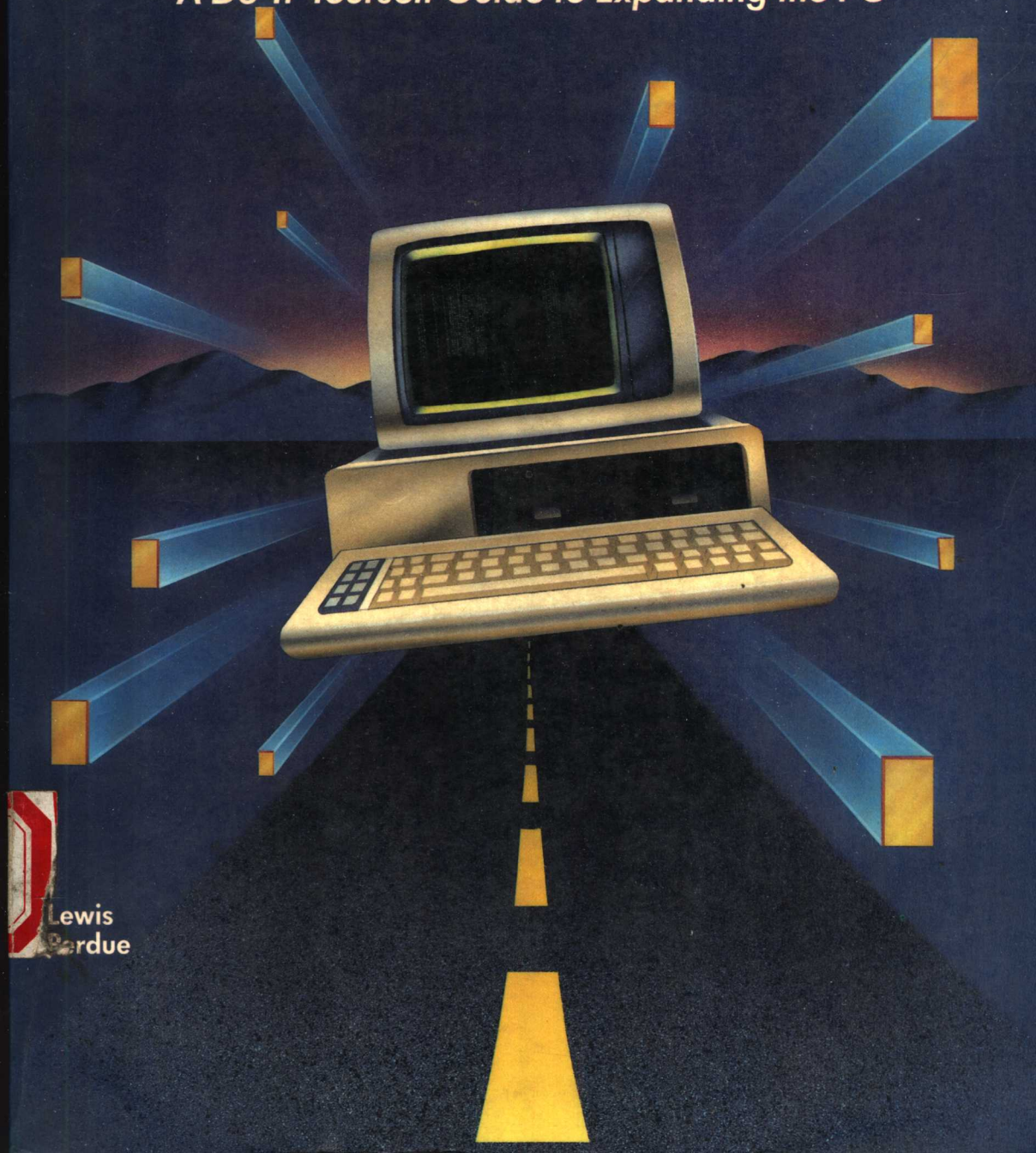
SUPERCHARGING YOUR PC

A Do-It-Yourself Guide to Expanding the PC



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Supercharging Your PC

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Supercharging Your PC

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To David Simon and Marlane McGarry, who gave me my first chance to get involved with computers

Introduction

This book is for people who want to get the most from their IBM PC or PC-compatible computers. This book is also for those who want up-to-date, IBM PC AT-like performance without having to retire their old PCs and pay thousands of dollars for a new system.

To profit most from this book, you must have a computer based on the Intel 8088 chip. The information contained here will not be appropriate for machines based on Intel 8086 (used in the AT&T 6300 PC) or the Intel 80286 (used in the PC AT). These chips, which are the heart and brain of their respective computers, are designed to process information and respond to software and circuits differently than the 8088. These differences can make for incompatibilities with both software and hardware.

Apart from knowing what chip it has, you do not need

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a technical grasp of your computer to understand this book or use the products and techniques described here. Opening up your computer and installing expansion boards is neither as difficult nor as risky as some people believe. Still, it requires some knowledge and technique which, one hopes, you will gain from the chapters that follow.

A major aim of this book is to save you or your business money by dispelling a widespread notion that the demise of the 8088-based PC is imminent. Reports that the PC is dead and that ATs and newer machines are the way to go are at best premature. By spending as little as $500 to $1000, most owners of 8088-based machines can upgrade to a machine that equals or even surpasses the AT—without some of the software incompatibilities that often afflict AT-type machines.

What Does This Book Include?

Software, peripherals, expansion boards, and some accessories are included here if they'll *enhance* your use of the computer. I have approached the book from a problem-solving standpoint. Rather than doing a book on expansion boards, for instance, I've addressed specific problems. For example, you constantly get "memory full" messages when you build a Lotus spreadsheet. If you have streamlined your spreadsheet to take as little memory as possible, then the best solution is more RAM. Or perhaps you've added more RAM and now you have a file that is too big to save to a floppy. The answer is to add a hard disk. Likewise, the problems of speedy backup of hard disks and recovery of files accidentally deleted are discussed.

How and Why Was This Book Written?

I wrote this book to save people from some of the problems I confronted as both a computer user and as director of information systems for a large public relations company. Some of my mistakes have been costly, and all of them have wasted extravagant amounts of time.

Addressed in this book are some of the most common problems experienced with 8088-based machines. In addition, I've tried to add a sampling of new products and techniques to make life with your PC easier and more efficient. Scores of products are mentioned by name throughout the following pages. However, a mention does not necessarily imply an endorsement; nor does the absence of mention imply disapproval—some companies are mentioned simply because they have a unique product or a leadership position. I have not evaluated the products from every company mentioned; however, there is a product snapshot at the end of each chapter of the book. For these reviews, I personally evaluated the product and found it useful *for the application mentioned.* I chose to report on the good products only, for the simple reason that people want to know what to buy rather than what not to buy.

Moreover, practical considerations prevented me from reviewing every appropriate product. Instead, I concentrated on those that seemed to have a unique characteristic that would contribute to daily life with your PC. I've received no outside compensation for any of my product reviews.

Conflicts of Interest

"Objective journalism" is a figment of the imagination of academicians who teach mass communications at colleges

and universities. All observers have biases that affect their judgment, no matter how hard they try to avoid them. Therefore, instead of professing objectivity, I'll try right off the bat to let you know where my biases and blind spots are.

First, I like the underdog. I'll try as hard as possible to see the little start-up company in the best light.

Second, over the years I have done work for a number of companies that make some of the products mentioned in this book. Those companies are Univation, AST Research, and Hewlett-Packard. I like their products, but I promise you that I will do my best to portray them with the same eye as those from other companies.

Third, my very first computer, back in 1982, was the old Kaypro II. I have a soft spot for Kaypro.

There must be a few other blind spots, but nobody's told me about them yet. If you notice any, please write to me in care of Osborne/McGraw-Hill. For that matter, please write if you feel an evaluation was not accurate, if you know of a product that should have been included, or if you encounter a problem that was not addressed. I can't promise to answer every letter, but I'll try.

I will be offering quarterly updates that will include current evaluations of products mentioned in this book, and evaluations of new products and how to apply them to your computing. To receive your first update free, please fill out and mail the order form provided here.

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Contents

1 The Evolution of the PC 1

Open Architecture
An Incomplete Solution
Inside the Beast
What Can You Plug into the Bus?

2 Inside Information 23

Inserting an Expansion Board
In the Chips
When You're Finished

3 Adding Disk Storage 51

Taking Control
Gathering Power
What Is a Hard Disk?
The Dark Side
Hard Choices
Installing a Drive

4 Expanding Memory 75
Buying RAM Chips
Installing RAM Chips
Choosing a RAM Expansion Board
Beyond 640K
So What Can You Do with 8MB?

5 A Matter of Time 99
Increasing Hard Disk Performance

6 Input/Output Interfaces 115
Serial Ports
Parallel Ports

7 Instant Information—Using Modems 131
What Does Modem Mean?
Communications Parameters
Selecting a Modem
Communications Software
Electronic Mail
Traveling with a Modem

8 Graphics 163
Development of PC Displays
Choosing an EGA Board
Choosing a Monitor

9 Space: The Final Frontier 181

10 Power: How to Get It, How to Use It 193
Do You Need a Bigger Power Supply?
Replacing the Power Unit
Solving Power-Related Heat Problems
Being Your Own Power Utility

11 Data Security 217
Back It Up—Back It All Up
Which Backup Medium Should You Use?
Recovering From Your Mistakes
Protecting Data From Others
Remote Security

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12 Send in the Clones 237
Who Should Buy a Clone?
How to Buy a Clone
Technical Considerations
Sorting Out the Best
To Build, or Not to Build?

13 Of Mice, Computers, and Alternate Input Devices 253
Board Conflicts
Device Drivers
The Mouse
The Light Pen
The Penmouse+
Bar Code Readers
Optical Scanners
Voice-Input Devices
ScriptWriter
The Bee Card

14 The Well-Connected PC 297
Electronic Switches
Sub-LANs
Multiuser Systems
Local-Area Networks
The Network Operating System
File Servers
Network Standards
Making Connections
Buying a LAN

15 Odds and Ends 337
Pop-Up Software
AUTOEXEC.BAT
Cleaning and Maintenance
Printers

16 Plus ça change.... 353
Optical Disks
High-Capacity Disks-on-a-Card
80386 Accelerator Boards

AT Emulation
Modem Speed
PC Telex Adapter

Index 363

1 The Evolution of the PC

When IBM introduced its PC on August 12, 1981, it brought to market a product completely unlike any other it had ever produced: a flexible, adaptable system capable of accepting both software and hardware developed by vendors other than IBM (see Figure 1-1). Previously, IBM had built its success on proprietary hardware and software that made it difficult—and sometimes impossible—for third-party vendors to enter the market. But the short development time—the PC was developed in about one year—made it necessary for IBM to obtain major parts of its system from outside sources: the operating system, PC-DOS, was developed by Microsoft Corporation, the disk drives came from Tandon, and so on.

IBM also built a number of "expansion slots" into the PC, which allowed users to increase the computer's usefulness by simply plugging in a circuit board. This ability is

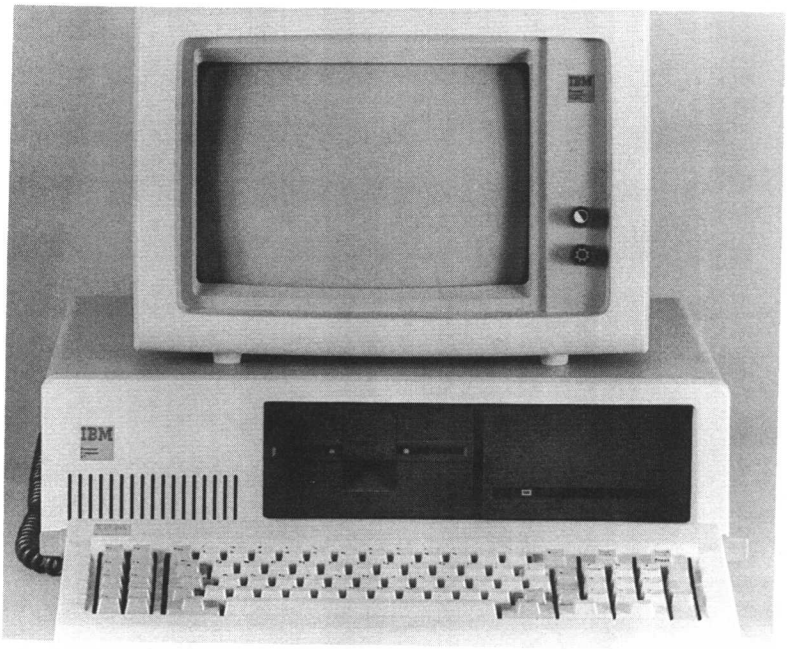

Figure 1-1. *The IBM PC was a departure for both IBM and the microcomputer market*

a key element in the concept referred to as "open architecture."

Open Architecture

Until IBM introduced the PC, most microcomputers, such as the Tandy TRS-80 line, used a closed architecture; there was no way to enhance the hardware without exten-

sive soldering and tinkering—a task reserved for experts.

IBM's decision to use open architecture in the PC probably contributed more to the personal computer boom than any other factor because it encouraged independent companies to develop products—expansion boards, software, and peripherals—that would run with the PC.

It's no exaggeration to say that without the open architecture of the IBM PC, the explosion of the microcomputer market might never have happened. By mid-1986 (according to Infocorp, a Silicon Valley market research firm), 14 percent of American homes had a microcomputer; 29 percent had either a microcomputer or a household member who used one at work.

In addition to helping create and drive the market for personal computers, IBM's entry into the field helped bring order and some semblance of a standard to the microcomputer industry.

In fact, the strategy succeeded almost too well. Although almost from the beginning there had been scores of computers that were IBM-compatible, 1986 saw a flood of inexpensive PC clones—computers built to work and look almost exactly like an IBM PC—selling for less than $1000; in some cases, for less than $500. The PC had become a commodity like the floppy disk, and that hurt IBM's sales dramatically.

By mid-1986, the tidal wave of PC clones flooding the American market had made IBM strategists begin to think they perhaps had made a mistake with the open architecture concept.

In retrospect, however, IBM's initial decision to employ open architecture was doubtless the correct one. Without the enthusiasm generated by open architecture and the thousands of companies that started up to satisfy the needs of the market, IBM might have sold many fewer units

than it has to date. And without the PC's open architecture, the market would probably have been stymied by a lack of standards, frustrated by high prices, and limited by a shortage of applications software.

An Incomplete Solution

First-time buyers are always dismayed to find their computer system costing hundreds, sometimes thousands more than the advertised price. There are graphics boards, disk drives, I/O (input/output) boards, extra RAM (random-access memory), and a score of other items that frequently must be purchased to make the system perform to the user's demands. This is the downside of open architecture.

Some users in search of a "complete" system have purchased "closed-architecture" computers like the Apple IIc or Kaypro II and have been satisfied for years. However, in one sense, a closed system is obsolete from the moment the case is finally screwed shut. New features are difficult or impossible to add; there is no way to update the computer with new boards or technology. Users who continue to progress and gain experience in microcomputing will eventually outgrow the capabilities of a closed-architecture system. Open architecture, while initially more demanding, allows a system to grow with the user and with technology.

Inside the Beast

To understand how open architecture works, we need to look inside the computer to see how it is wired together. Although the innards look complicated at first, there are

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