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Personal Computers for the Successful Small Business

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for the Successful
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INTRODUCTION

YOU AND THE PERSONAL COMPUTER

The personal computer market is booming. Walk into a typical computer store and you'll find a bewildering array of computers, software, printers, monitors, disk drives, and modems. To add to the confusion, when you finally find a salesperson, there's a good chance that he won't be able to offer you the advice you need. Computer sales personnel are usually undertrained and work under considerable pressure to make a quick sale. Even if you're fortunate enough to find someone who is knowledgeable, you're likely to hear a lot of jargon. These people love to talk "computerese," and you're not likely to understand much of what they say. So you can't expect to get adequate information to make an intelligent decision. A purchase made under such conditions can end up costing you both dollars and frustration.

The motivation for purchasing a computer is to make your life easier and your business more efficient and profitable. The correct choice will do just that. To make an intelligent decision about what to purchase, it's crucial that you become familiar with a coherent body of essential facts about personal computers. This book is for people who need these facts and want them presented simply, clearly, logically.

If you're already taken the plunge and purchased a personal computer, you'll want to get the most out of your machine. Many owners don't know how to take full advantage of their personal computers and, what's worse, they don't know that they don't know! There are two reasons: First, computer manuals are anything but comprehensive and rarely cover applications, and second, possibilities

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for new and important applications have grown exponentially during the past three years. It's not enough to know what's available; you must also be able to choose intelligently. Often an additional investment in the *right* software or auxiliary hardware may be advisable. If you, as an owner, want to explore the full potential of your personal computer, this is the book for you.

KNOW WHAT YOU'RE BUYING

Everyone who buys a personal computer really buys a **system** consisting of a computer, software, and peripherals. However, people rarely consider what makes a system suitable to their needs before they purchase it. Such an oversight leads to many headaches, wasted hours, and lost dollars. Horror stories abound. This book emphasizes the system. Learning to think of your computing needs in terms of a **personal computer system** will make you an informed purchaser and user.

In a sense, buying a personal computer is no different from buying a family car. When you're thinking about buying a car, for instance, you take it for granted that you must acquaint yourself with its specifications. You want to know about its horsepower, mpg ratings, seating capacity, fuel requirements, transmission, trunk space, and available options. The same applies to personal computers. The difference is that the language of computers is unfamiliar. You will learn about Z80 CPUs, RAM, ROM, double-density disks, Winchesters, buffers, baud rates, pixels, 8- and 16-bit computers, bytes, modems, and a host of other components and their specifications.

It's not enough that you know the essential technical terms and what they mean. You must also be able to relate them to specific tasks you want the computer to accomplish for you. If you can't do this, you aren't prepared to shop for a computer.

In the chapters that follow you'll learn to interpret technical specifications in terms of your needs. You'll become acquainted with accessories that increase the efficiency and enhance the power of the personal computer. We'll also look at office automation and cost-effective ways of achieving it.

The software section will tell you how to determine your software needs, what features to look for in software, and what's available. You'll find information on new integrated, easy-to-use software for business and management, and you'll get a feel for what it's like to use it.

You'll find a logical step-by-step procedure on how to go about purchasing a computer system that satisfies your needs. And finally, you will learn how to avoid the major pitfalls that occur after you've purchased a system and are involved in the installation and phase-in stage.

Throughout the book you'll find guidelines on what features to look for. Appendixes will review popular and proven personal computers, portable computers, and multi-user systems.

This book will give you the confidence to buy what you need. It will also be a useful reference tool when you decide to expand your system or upgrade it.

It's important to keep in mind that personal computers were invented to serve our needs, to make our lives easier and more enjoyable. If we allow them to dominate our lives or multiply our frustrations, we defeat the goal of ownership. The purpose of this book is to help make your life easier through the magic of the personal computer. In the final analysis, *you'll* have to decide whether it makes sense to use a computer to accomplish a particular task. This book will give you the information you need to make your decisions and get the most out of your investment. The rest is up to you.

PART 1

Evaluating Today's Computer Hardware

UNDERSTANDING THE HARDWARE

- *What is a personal computer?*
- *How a personal computer handles information*
- *The main components of a personal computer and how they work, explained in plain English*
- *What it's like to use a personal computer*

You need to know what makes a personal computer tick. You'll find it useful when you talk to salespersons and read instruction manuals. It will also give you a basic understanding of computers that will be valuable to you after you begin to use your system.

A computer system consists of hardware and software. The **hardware** is just what the word suggests—the physical components of the system. **Software** consists of instructions that control the hardware; in other words, the software tells the hardware what to do. Human beings are organized the same way. Our bodies, including our brains, make up our hardware. Human software consists of thoughts, and thoughts control our bodies. With computers the problem is that hardware and software are often incompatible. It's unfortunate, but a fact, and it can lead to expensive mistakes.

Of all the mistakes that purchasers of personal computers make, two can be costly. The first is to give priority to the hardware. No matter how attractive, powerful, or user-friendly a personal computer is, it's not worth a cent to you unless it's compatible with

software that meets your needs. The most frequent complaint I hear from users is that their system won't run software they desperately need.

So follow this rule: ***Put your software needs first.***

As simple as this rule is and no matter how many times it is repeated, people persist in breaking it. Sometimes they get away with it, but that's just pure luck. It's human nature to become fascinated with equipment and give only passing attention to the software, especially when you see a spectacular demonstration or a flashy advertisement.

The second mistake is to do just the opposite: You may understand your needs and select first-rate software but choose the wrong hardware. "How," you may ask, "is that possible if I choose hardware that runs the software I need?"

There is no single answer to this question. Some hardware is much easier to use, contains more memory, and accepts more desirable accessories. What's more, some computers will service several users (multi-user systems). These systems can cut costs, and they allow users to share printers, programs, and data as well as enjoy the benefits of personal computing.

So the second rule is simply this: ***Determine your hardware requirements carefully—after you've selected your software—and know the options.***

These two rules serve as early warnings. You need to know how to implement them. This involves many interconnected considerations, which we'll approach in a logical, step-by-step manner. Shortcuts don't work.

Although a rational selection process demands that priority be given to applications and thus to software, it's desirable to learn about the hardware first. The reason for this is that any useful discussion of software is bound to refer to the hardware required to run it. In this chapter we'll look at what a personal computer is and how it works. The three chapters that follow will deal with specifications and what they mean in terms of your needs, accessories that contribute to efficiency and profits, and office automation.

WHAT IS A PERSONAL COMPUTER?

A computer receives, stores, manipulates, and communicates information. This is a general definition and thus applies to all types of computers.

There are two types of computers: ***analog*** and ***digital***. Our con-

cern is with digital computers. But for the record, *analog computers* are electronic devices that process information about physical variables such as distance, velocity, direction, and weight by using electrical properties such as voltage. These electrical properties are *analogous* to the physical variables they represent—thus the name analog computers.

For example, a speedometer is a simple analog computer. It computes the velocity of an automobile by measuring the voltage produced by a generator attached to a rotating drive shaft. In this case velocity is represented by voltage. A change in velocity corresponds to a change in voltage that is converted to a speedometer reading. Notice that the changes in velocity are continuous. Velocity doesn't jump instantaneously from 50 to 60 miles per hour; an automobile goes through all the intermediate speeds. So we say that the changes are continuous.

All analog computers deal with quantities that vary continuously. They are usually designed to accomplish a single task. For example, analog computers are used to steer rockets, control temperature, aim anti-aircraft guns, and train pilots by simulating the flight of an aircraft. Of course, an analog computer needs a program to tell it what specific job to do, but this program is wired into the machine. It's part of the circuitry and cannot readily be changed.

Digital computers process only numbers or letters that are translated (by the computer) into digits. In contrast to analog computers, they are remarkably versatile. You may think of a digital computer as an electronic servant that will do *exactly* what it is told, but nothing on its own. To tell it to do something, you give it instructions, or a program. It might ask you, or wait for you, to interact with it by feeding it some data or commands. Once it gets the information it needs, it will do its job—that is, execute its program with lightning speed. If it is properly designed, the digital computer never makes a mistake. The errors are almost always in the programs or in the data entered by the operator.

All personal computers are digital computers, but *not* all digital computers are personal computers. There are also digital computers much larger, faster, and more expensive than personal computers, for example, supercomputers, maxicomputers, and minicomputers. You may like the idea of owning the best and the fastest, but be prepared to spend from \$5 million to \$15 million for a supercomputer.

It's difficult to give a precise definition of a personal computer in terms of memory capacity, the amount of information that can be

processed simultaneously, and processing speed. Technology has moved so rapidly that some of today's personal computers rival larger computers. In the next chapter we'll look at key specifications for different classes of personal computers, but at this stage the numbers would be meaningless. For now it is sufficient to think of a personal computer as a small general-purpose digital computer powerful enough to perform many business tasks such as word processing, electronic filing, accounting, and financial forecasting.

The term **personal computer** suggests that these machines are designed to be used by one person. They frequently are. However, thanks to recent developments, a personal computer can also serve as the brain of a network of computers, so the word "personal" can be misleading. Strictly speaking, the less popular name **microcomputer** is more accurate. It's worth noting that personal computers are also called **desktop computers** and **professional computers**.

BASIC COMPONENTS AND WHAT THEY DO

For our purposes it is unnecessary to discuss the details of a personal computer's circuitry. However, it is important to become familiar with the main components of a personal computer system and understand their functions and specifications as they relate to your needs as a user.

Earlier I defined a computer as a device that receives, stores, manipulates, and communicates information. We'll look at the main components of a personal computer system in terms of these categories.

Information

According to the definition, microcomputers deal exclusively with **information**. This information consists of numbers and letters, but to *process* these numbers and letters, the computer automatically translates them into sequences of ones and zeros called **binary notation**.

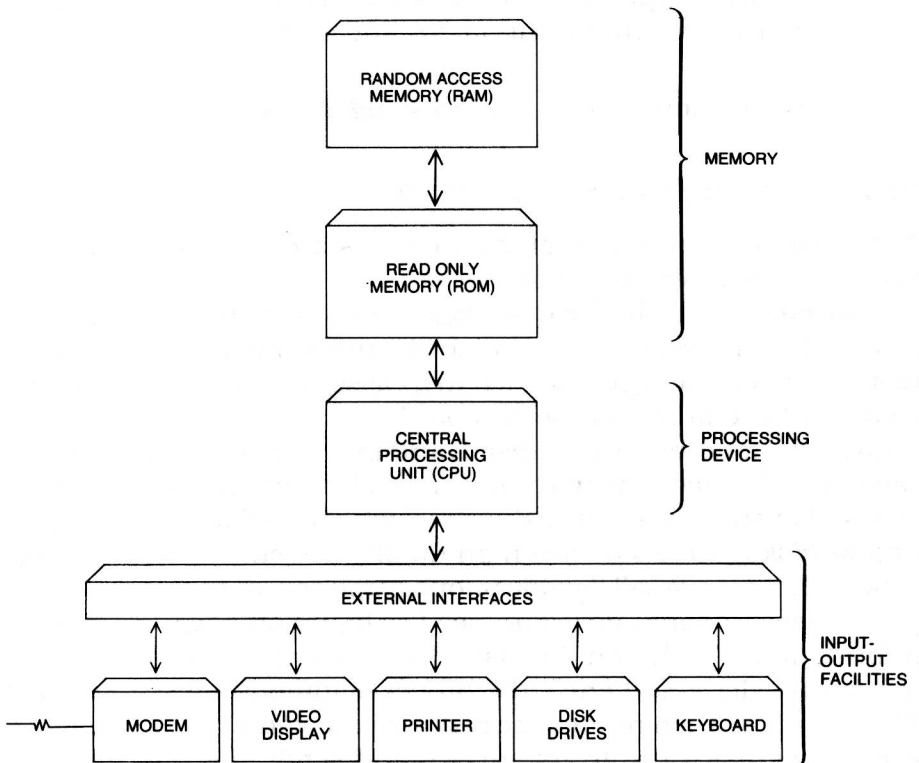
Digital computers process information in binary form because their circuits consist of transistors that act like on/off switches with *on* corresponding to 1 and *off* to 0. So an array of transistors, each of which is on or off, represents a number or an instruction. From this it's clear that the smallest piece of information a computer deals with is either a 1 (a pulse) or a 0 (no pulse). This smallest piece of information is called a **bit**. A string of eight bits is a **byte**.

Perhaps you've heard of 8-bit computers. They process information one byte at a time. The newer 16-bit computers process 16 bits (or two bytes) at a time. It's that simple. If you deduced that the 16-bit computers are twice as powerful, you're partly right. In practice, a 16-bit machine may not be twice as fast as an 8-bit computer at performing computations, and an 8-bit machine may be your best bet. But this is something that we'll look at later.

Input

The figure below shows the main components of a personal computer system. It's divided into three main segments labeled memory, processing device, and input-output facilities.

To understand how a computer receives information, we'll focus on the input facilities. Usually a computer receives information from a keyboard and an information-storage device. Depending on



The main components of a personal computer