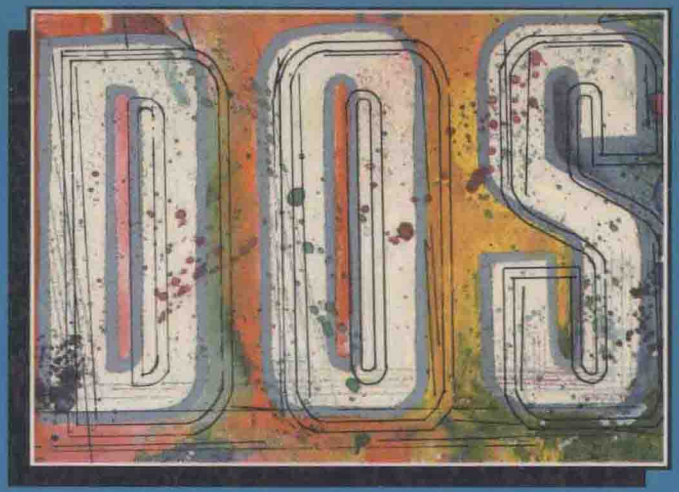

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ROD B. SOUTHWORTH

DOS

Complete Simplified

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PREFACE

DOS: Complete and Simplified is ideally suited for use in any formal educational or training environment, or for self-study. It was developed with a two-credit PC-DOS/MS-DOS course in mind, but is appropriate for use as a supplementary text in any microcomputer course. This text is an excellent reference book for anyone using a microcomputer, be it in the classroom, in the office, or at home. Even though no previous experience with computers is required to use this book, students who typically gain the most from it are those who have already experienced frustrations when trying to use DOS effectively.

OBJECTIVES OF THIS BOOK

The objectives of this book are as follows:

- To provide readers with a fundamental overview of the components of microcomputer systems.
- To introduce readers to the concepts of using an operating system.
- To simplify the use of high-frequency DOS commands and associated options.
- To improve readers' overall ability to use microcomputers effectively through minimized keystrokes, improved disk management, and customized execution of computer processes.
- To acquaint readers with the vast number of utility support programs available to supplement DOS and give more power and control to the user.

DISTINGUISHING FEATURES

Simplifies Using DOS

To accommodate the different backgrounds and levels of expertise of students using this book, topics in this text are developed in a logical step-by-step manner. By building on students' prior experience and carefully constructed examples of DOS in action, this simplified approach helps readers become self-sufficient microcomputer users.

Focus on High-Frequency DOS Commands

This textbook features step-by-step instruction in using the DOS 3.3 commands and associated options that are most frequently required by microcomputer users. It is designed to help readers gain better understanding and control of microcomputers through efficient use of DOS.

Free Automenu and Treeview Software

Free copies of Automenu, the de facto standard for menu systems; and Treeview, a file management utility program for hard disk systems, are included in the Instructor's Manual. This software may be copied by the instructor for use by students in any course where *DOS: Complete and Simplified* is the adopted text. Any adopter choosing to register their copies of Automenu and Treeview are eligible for software support and actual documentations from Magee Enterprises, Inc., manufacturers of the software.

Floppy Disk vs. Hard Disk Environments

In keeping with the current trend in microcomputer instruction, this book consistently addresses the use of DOS in both floppy and hard disk environments. Exercises in the text are designed for floppy disk environments, but are modified for hard disk environments in the Instructor's Manual.

Creation of Effective Batch Files and Customizing DOS

The text extensively covers the creation of effective batch files and the customization of DOS, thus making students more efficient and advanced DOS users.

Class-Tested Exercises

Each chapter includes a substantial set of student exercises that have been class-tested over the last three years. These exercises build on material learned from previous chapters, as well as reinforcing the new material contained in each chapter. These exercises are specifically designed for floppy disk systems, but are modified for hard disk systems in the Instructor's Manual.

Actual Screen Illustrations

Each DOS instruction is fully supported with screen "dumps" that accurately reflect what users' screens will look like as they execute each target command. The screen illustrations provide users with visual verification, which highlights the impact of each operation performed.

Proven Material

This text is based on many semesters of teaching this course and on the collective experience of the instructors and students who have shared their comments and suggestions. Every attempt has been made to preserve the integrity of those elements that proved effective and to improve on those that did not.

Instructor's Support Material

An Instructor's Manual featuring additional student exercises, helpful teaching suggestions, answers to chapter review questions, a selection of class-tested, multiple choice test questions, and transparency masters is available at no charge for adopters of this text. Instructors may contact South-Western Publishing Company to obtain this supplementary material.

ACKNOWLEDGMENTS

This book would not have been possible without the guidance, help, and advice of many supportive individuals. I would like to offer my sincere thanks to the students and instructors at Laramie County Community College who had faith in my material and never failed to make valuable comments about whatever they did and did not like.

I would also like to offer my gratitude to the following individuals who provided valuable suggestions during the development of this text: Bill Gardner, Southern Technical College; Jean E. Gutman, University of Southern Maine; Michael Michaelson, Palomar College; and Paul Ross, Millersville University.

The entire staff at boyd & fraser, especially Pat Donegan and Jim Edwards, did a remarkable job of editing and producing this text. To all of these people, I remain indebted for their efforts on my behalf. A special thanks goes to my wife Patrice, whose constant encouragement and proofreading assistance was a tremendous help.

Rod B. Southworth
Cheyenne, Wyoming

January 3, 1990
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Chapter

1

INTRODUCTION TO MICROCOMPUTERS

HARDWARE

- ☐ The Central Processing Unit (CPU)
  Bits, Bytes, and Words
  Input/Output Devices
  Secondary Storage

SOFTWARE

- ☐ Application Software
  System Software

Chapter

1

INTRODUCTION TO MICROCOMPUTERS

After reading this chapter, you should understand the major components of microcomputer systems. Because students using this text undoubtedly have varying degrees of computer experience and knowledge, this chapter provides a common framework of microcomputer concepts and terminology.

All microcomputer systems are comprised of two major parts: hardware and software. This chapter discusses each of these parts to bring students to a minimal level of understanding about microcomputer systems. This basic system knowledge should greatly facilitate both the learning and understanding of either PC-DOS or MS-DOS.

When you purchase a microcomputer system, you may need to make choices about the power of the CPU and the types of input, output, and storage devices you will want to attach. The level of technical knowledge presented in this chapter will assist you in making the right choices.

HARDWARE

Typically, discussion of **hardware** involves three categories: the central processing unit (CPU), the various input/output (I/O) devices, and storage devices. Figure 1-1 summarizes the various hardware parts and categories of microcomputer systems discussed in this chapter.

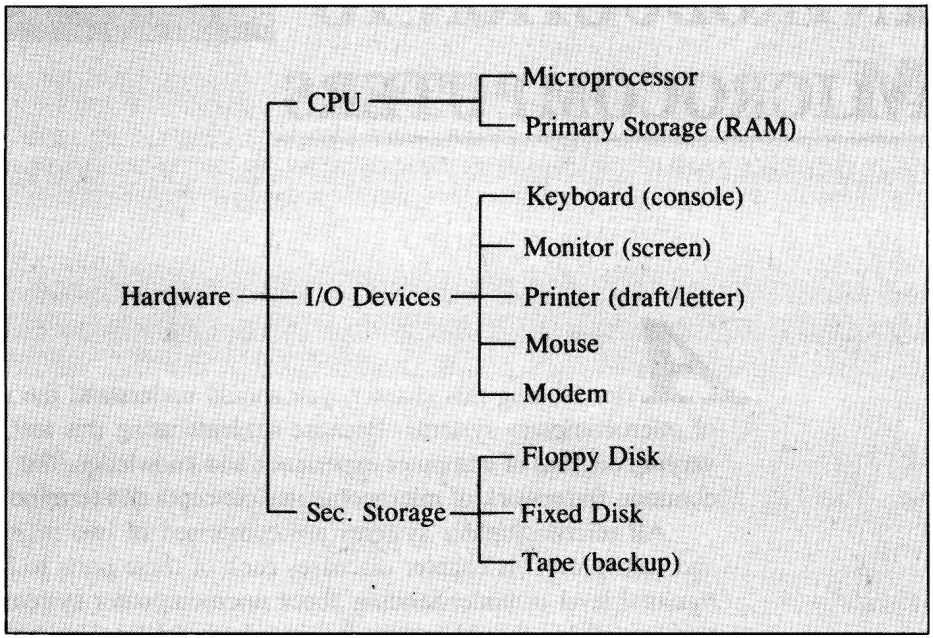

Figure 1-1
Microcomputer Hardware

The Central Processing Unit (CPU)

The **central processing unit**, or **CPU**, has often been described as the "heart" of a computer system. It is comprised of a **microprocessor** and a varying amount of temporary storage locations referred to as **primary storage**. The CPU is typically organized around one of four microprocessor chips designed by Intel Corporation: the 8088, 8086, 80286, and 80386. Each of these microprocessor chips has different capabilities, related primarily to speed and overall processing power. Soon, microcomputers will utilize the most powerful microprocessor chip, the Intel 80486.

Bits, Bytes, and Words

All computer circuits, including microprocessors, function in one of two states: on or off. Symbolically, we represent the on condition by the value 1 and the off condition by the value 0. These two values are binary digits, or **bits**. A grouping of bits can be combined to represent characters that we need to store data on a computer. Eight bits are typically grouped together to represent characters, where a character is a number (0–9), alphabetic letter (A–Z), or special symbol such as an asterisk, dollar sign, decimal point, and so on. For example, the bit pattern 10000001 might represent the letter A.

When each group of 8 bits is individually addressable it is called a **byte**. Most of the earlier computers were "byte machines." However, it is generally more efficient to access and work with more than one character at a time. When bytes are grouped (always in multiples of 2), the addressable groups are called **words**. A 16-bit word represents 2 characters, a 32-bit word represents 4 characters, and so on. Word machines access and transfer characters faster than byte machines.

The 8088 microprocessor is the most common of the four chips. It has a 16-bit internal word structure with an 8-bit path for transfer of input and output data. The 8086 is a similar chip, but with a 16-bit path for input and output, which allows for faster transfer of data between the CPU and I/O devices.

All microprocessor chips use a **clock rate** that determines the frequency of the internal operations and keeps everything in proper synchronization. The faster the clock runs, the faster the computer can process data and instructions. Clock rates are measured in units called **megahertz**, a term for one million cycles per second. The internal clock speed of both the 8088 and 8086 chips is 4.77 megahertz (MHz).

The 80286 microprocessor has a 32-bit internal word length with a 16-bit I/O path. Its internal clock is rated at 8–12 MHz, making it at least twice as powerful as the older, more common chips previously mentioned. The 80386 microprocessor is at least twice as fast as the 80286 with an internal clock speed of 16–33 MHz. The processing power of the 80386 is often required for the high-powered graphics used in desktop publishing or computer-aided design (CAD) applications. But don't get discouraged if you don't have the latest chip. The more common chips used today, while not as fast and powerful as the 80386, are more than adequate for most applications. As my dad once told me, "When the speed limit is only 55 MPH, a VW bug can be as effective as a fancy sports car."

Primary storage, the second major part of a CPU, is a temporary holding location for both programmed instructions (software) and data to be processed.

The number of primary storage locations on microcomputers typically ranges from 256KB to 768KB, where KB is roughly equivalent to a **kilobyte**, or 1000 characters. Actually, one KB of storage is 1024 bytes, but it is a lot simpler to work in units of 1000. The microprocessor is responsible for executing software instructions that tell the computer how to process the data in primary storage. These instructions also tell the microprocessor when and where to send data to an output device, such as a printer, as well as when and where to get additional data to be processed.

Primary storage is generally referred to as **RAM (Random Access Memory)** because the storing of data causes the affected storage locations to be changed and allows for any storage location to be accessed at any time. Characters are stored in a given storage location and remain there until new characters have replaced them, or until the electricity has been turned off. Because most RAM chips lose their "memory" when the power is discontinued, primary storage is considered temporary. If you want to permanently save data, you must save it to a secondary storage device such as magnetic tape or disk.

It is important for microcomputer users to realize the potential damage that static electricity can do to the sensitive electronic circuits in the CPU. The amount of static electricity that you sometimes feel when you touch a doorknob or another person is hundreds of times greater than the static electricity needed to permanently damage a microprocessor or RAM chip. For this reason, take precautions to minimize the potential for static electricity around your microcomputer. Protest the computer or computer area by the following techniques:

- Place the computer system in a noncarpeted area. Keep the computer area at a relative humidity of about 45% or more.
- Use a static spray on fabrics.
- Use a static mat and good grounding to discharge static electricity.

Input/Output Devices

Input/output devices are the means by which you enter data into the computer (input) or view data you have previously saved (output). This chapter discusses the most common devices: keyboard, monitor, printer, mouse, and modem.