DOS 5 SIMPLIFIED

ROD B. SOUTHWORTH

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PREFACE

DOS 5 Simplified is ideally suited for use in any formal educational or training environment, or for self-study. It was specifically developed with a one- or two-credit DOS course in mind, but it is equally appropriate for use as a supplementary book in any course that introduces DOS commands. Even though no previous experience with DOS is required in order to use this book, students who gain the most from it are those who have already experienced frustration 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 personal computer systems.
- To introduce readers to the concepts of using an operating system.
- To simplify the use of those commands most frequently used and their associated options.
- To show how to use both the command line and the DOS shell to execute DOS commands.
- To improve the reader's overall ability to use personal computers effectively through minimized keystrokes, improved disk and memory management, and customized execution of computer processes.
- To give users the necessary foundation to continue learning DOS on their own.

DISTINGUISHING FEATURES

Simplifies Using DOS

In order to accommodate the different backgrounds and levels of expertice of students using this book, topics in this text are presented in a logical step-by-step manner. A summary of objectives is included at the beginning of each chapter. This text's approach, which builds on students' prior experience and carefully constructed examples of DOS in action, helps readers become more self-sufficient personal computer users.

Focuses on Frequently Used DOS Commands

This textbook features step-by-step instruction on the most frequently used DOS commands and their associated options. It is designed to help readers gain better understanding and control of personal computers through the efficient use of DOS.

Distinguishes Between Internal and External DOS Commands

In the early chapters, internal and external DOS commands are covered separately in order to help readers understand the basic differences between these types of commands. Later in the text, DOS commands are presented by functional use.

Covers Hard Disk versus Floppy Disk Environments

In keeping with the current trend in personal computer instruction, this text emphasizes the hard disk environment, but also addresses the floppy disk environment. Examples of DOS commands and lab exercises are given for both environments. For labs using only floppy disks, the Instructor's Manual provides instructions for configuring a floppy disk to imitate a hard disk environment.

Uses the Command Line and the DOS Shell

Knowing how to enter DOS commands at the system prompt is very helpful and often times a necessity for using the DOS shell. For this reason, primary emphasis is placed on entering commands from the command line. Where applicable, command line examples are followed by examples using the DOS shell for comparison. The shell is introduced early in this text. The reader (or instructor) should determine which approach is preferred. The shell is covered in specific sections that can be easily bypassed, if desired.

Emphasizes DOS Structure

An overall understanding of DOS structure is essential for effective computer use. This text's thorough coverage of disk organization and management teaches readers to effectively use computer systems with increased efficiency.

Covers Advanced DOS Usage

The advanced topics in this text include customizing DOS, memory management, and advanced batch files. The advanced DOS commands covered include FASTOPEN, FDISK, MODE, PRINT, SET, SETVER, and SYS.

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Features Class-tested Exercises for Floppy and Hard Disks

Each chapter includes a substantial set of student-tested exercises. These exercises build on material learned from previous chapters and include new material from each chapter, as well. Some exercises are included in the body of the text for immediate reinforcement, and others are at the end of each chapter. Each chapter contains separate exercises for both floppy and hard disk systems.

Uses Actual Screen Illustrations

DOS commands are illustrated with screen "dumps" that accurately reflect what users' screens will look like as they execute target commands. The screen illustrations provide users with visual verification, which highlights the impact of each operation performed.

Proven Material

This text has evolved from the collective experience of the instructors and students who have shared their comments and suggestions with the author. Every attempt has been made to preserve the integrity of those elements that proved effective and to improve those that did not.

Instructor's Support Materials

An Instructor's Manual featuring additional student exercises, helpful teaching suggestions; answers to chapter review questions; and a large set of class-tested, multiple-choice test questions is available for use by adopters of this text. Instructors should contact South-Western Publishing Company to request this supplementary material.

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Cheyenne, Wyoming
November 1992
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Chapter 1

INTRODUCTION TO PERSONAL COMPUTERS

HARDWARE

- **The Central Processing Unit (CPU)**
- **Primary Storage (RAM)**
- **Input/Output Devices**
- **Secondary Storage**

SOFTWARE

- **Application Software**
- **System Software**

Chapter 1

INTRODUCTION TO PERSONAL COMPUTERS

Chapter 1 gives an overview of the basic components of personal computer systems. The term PC, rather than personal computer, will be used in this text. Students using this text undoubtedly have varying degrees of PC experience and knowledge; this chapter provides a common framework of concepts and terminology related to IBM and IBM-compatible PCs.

This chapter covers the two major parts of all PC systems: hardware and software. Having a good understanding of these basics will simplify the learning of DOS, the Disk Operating System for IBM and IBM-compatible PCs.

When you purchase a PC, you may need to make choices about the power of the CPU and the types of input, output, and storage devices to be attached. The technical knowledge presented in this chapter will aid you in making these choices.

HARDWARE

Hardware refers to the physical components of a computer system. Typically, hardware includes four categories: the Central Processing Unit (CPU), primary storage (RAM), input/output devices, and secondary storage devices. Figure 1.1 summarizes the various PC hardware parts discussed in this chapter.

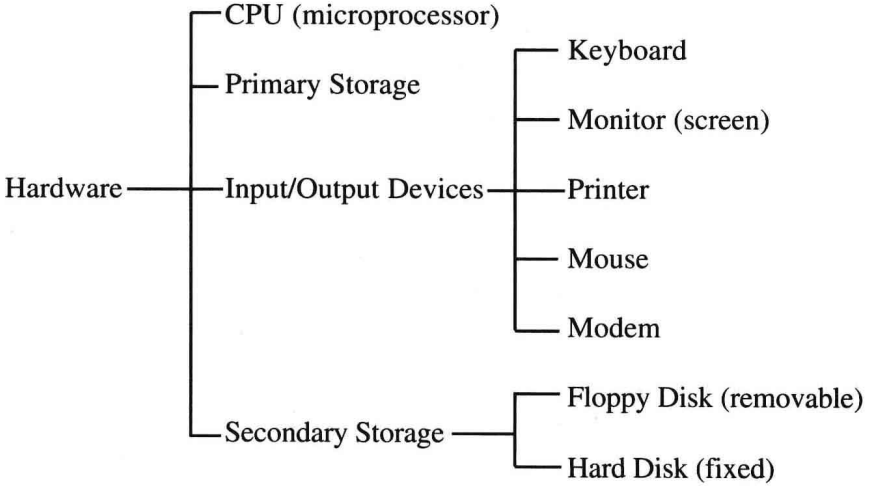

Figure 1.1
PC Hardware

The Central Processing Unit (CPU)

The **central processing unit**, or **CPU**, is often described as the "heart" of a computer system because it controls all activities within the system. The CPU is usually one of four **microprocessor** chips designed by Intel Corporation: the 8088, 80286, 80386, or 80486. Each of these microprocessor chips has different capabilities, related primarily to speed and overall processing power. Future CPUs will use more powerful microprocessors, such as the Intel P5 chip.

All computer circuits, including microprocessors, function in one of two states: on or off. Symbolically, we represent the on condition with the value 1 and the off condition with the value 0. These two values are ***bi*nary digi*ts***, or **bits**. Groups of bits are combined to represent characters that we need to store data on a computer. A character is a number (0-9), alphabetic letter (A-Z), or special symbol such as an asterisk, dollar sign, or decimal point. For example, the bit pattern 01000001 represents the letter A.

A ***bi*nary *ite*m** or **byte** is a group of 8 bits, representing a single character. Many earlier computers were "byte machines." However, it is more efficient to 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 original IBM-PC, which used the 8088 microprocessor chip, had a 16-bit internal word structure with an 8-bit path for transfer of input and output data. All newer microprocessors have data paths that contain more bits (see Figure 1.2).

All microprocessor chips use a **clock rate** that determines the frequency of the internal operations and keeps everything in proper synchronization. The need for an internal clock is analagous to the need for a conductor at a symphony to control the beat. The faster the clock runs, the faster the computer can process data and instructions. Clock rates are measured in units called **megahertz (MHz),** a term for one million cycles per second. The internal clock speed of the 8088 chip is a relatively slow 4.77 MHz. Figure 1.2 identifies the major differences in commonly used microprocessor chips.

The microcomputer's overall processing capability is directly related to the internal clock speed and the width of the data paths. For example, a 33 MHz 80386DX is roughly 10 times more powerful than the original 8088 microprocessor. The 80286 (or 286 for short) microprocessor suffices for many home applications. However, we need at least the

Figure 1.2
Microprocessor Chips in PCs

CHIP TYPE	CLOCK SPEED (MHz)	INTERNAL DATA PATH (bits)	EXTERNAL DATA PATH (bits)
8088	4.77	16	8
80286	8-16	16	16
80386SX	16-25	32	16
80386DX	25-40	32	32
80486SX	20-25	32	32
80486DX	25-66	32	32

processing power of the 80386DX for complex graphics used in desktop publishing or computer-aided design (CAD) applications. Most PC applications are limited not by the speed of the hardware, but rather by the speed of the human sitting at the keyboard. Don't be discouraged if you don't have the latest chip. The 386 and 486 chips, while not as fast and powerful as the P5 chip, are adequate for most applications. Because software continues to make use of faster and more powerful processing capabilities, we recommend that newly purchased systems contain the most advanced hardware the user can afford.

Primary Storage (RAM)

Primary storage is a temporary holding location for both software and the data to be processed. Once software is loaded into primary storage, the programmed instructions can be executed by the CPU. The software tells the CPU the location of the data and the processing steps. The amount of primary storage on PCs typically ranges from 640KB to 4MB. A **kilobyte (KB),** roughly equivalent to 1000 characters, is 1024 bytes. A **megabyte (MB)** is 1 million bytes. Only the 8088 chip in Figure 1.2 is severely limited in memory capacity. Its memory is limited to 1MB.

Because these storage locations are accessible at any time, primary storage is called **RAM (Random Access Memory).** Software and all data must reside in RAM to be processed. Data contained in storage locations remains there until new values replace it, or until the electricity has been turned off. Most RAM chips lose their stored value when power is lost. Thus, primary storage is considered temporary. To permanently save data, you must record it on a **secondary storage device** such as a magnetic disk.

PC users should realize the potential damage that static electricity can do to sensitive electronic circuits. The amount of static electricity that you

sometimes feel when you touch a doorknob or another person is many times greater than the static electricity needed to damage a microprocessor or RAM chip. You can minimize the potential for static electricity damage by using a static mat or static strip to discharge static electricity buildup.

Input/Output Devices

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

The Keyboard

The **keyboard** on a PC is an input device similar to a typewriter keyboard, except it has additional keys. IBM-PC and IBM-compatible keyboards typically have more than 100 keys. The placement of these keys varies somewhat among manufacturers. It is important to understand these keys before working with DOS. The four major areas of the extended keyboard are shown in Figure 1.3.

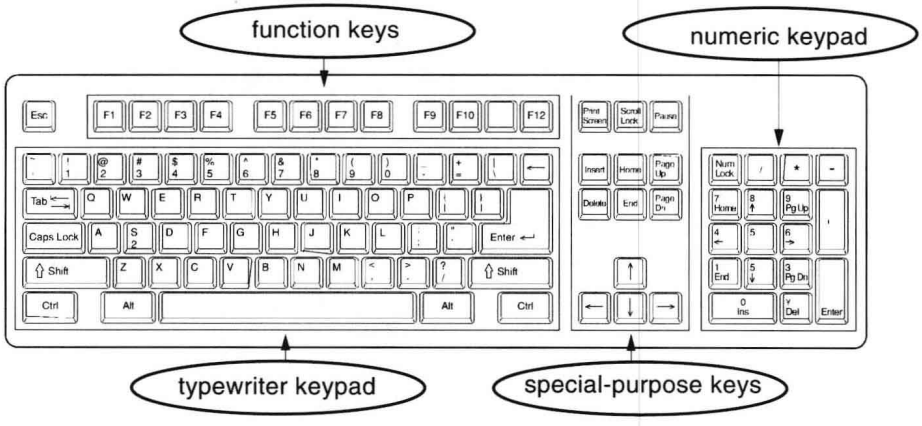

Figure 1.3
Typical Extended Keyboard

Earlier keyboards have a set of 10 special keys, called **function keys.** These keys, labeled F1 through F10, are located on the left side of the keyboard. Today's extended keyboards have 12 or more function keys located on the top row. Function keys are "programmable" in that they serve different functions depending on how each software program defines their use. When we refer to a function key, it will generally be called by the key name, such as the F1 key or the F6 key. Other times it will be shown inside brackets, such as <F1> or <F6>.

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