Learning To Use SUPERCALC3, dBASE III, and WORDSTAR 3.3:

An Introduction

SHELLY AND CASHMAN

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PREFACE

Many people refer to this era in history as the age of high technology, the age of information processing, or the age of the computer! Whatever term is used, it is now recognized that being able to use a computer as a tool in the home, in school, and in our work environment is a necessary part of the general education for all who live in this information processing age. Today, there are over 10 million personal computers in homes, schools, and businesses throughout the world. To use these computers effectively, a new generation of software, commonly called APPLICATION SOFTWARE, has been developed. Although thousands of products are available, there are three broad categories of software that currently dominate the market. They are: 1) Electronic spreadsheet software; 2) Database management software; and 3) Word processing software. A skill in using these application software packages is becoming essential for students in secondary schools or colleges and for employees in nearly any area of business or government.

Purpose of the textbook

This textbook is designed to be used in the introductory course in personal computer (microcomputer) application software. It provides an introduction to computer concepts and the use of the IBM Personal Computer Disk Operating System (PC-DOS) and detailed instruction in the use of **SuperCalc3** (electronic spreadsheet software), **dBASE III** (database management software), and **WordStar 3.3** (word processing software). Upon completion of this textbook, the student will have the capability of implementing a wide variety of applications using SuperCalc3, dBASE III, and WordStar 3.3.

Free application software

SuperCalc3, dBASE III, and WordStar are industry-leading application software packages. Free educational versions of each of these software packages for use with this textbook are made available to educators by Boyd & Fraser Publishing Company, together with Computer Associates International, Inc., producer of SuperCalc3; Ashton-Tate, producer of dBASE III; and MicroPro International Corporation, producer of WordStar. The contribution these companies are making by allowing their software to be used to further the education of thousands of students is deeply appreciated. They are solving one of the most pressing problems in computer education — providing industry software for use in the classroom. We are confident your students will benefit from the generosity of these forward thinking companies.

Again, these software packages are made available FREE OF CHARGE by Boyd & Fraser Publishing Company. Information concerning how you may receive the free application software may be obtained by writing or calling Boyd & Fraser Publishing Company, 20 Park Plaza, Boston, MA 02116, phone 1-(800)-225-3782. Schools using the textbook may copy the free software as required for classroom use at no charge. The free software is available for IBM Personal Computers and IBM compatible computers. It is important to understand that these are not tutorial software packages but are the actual working application software packages as used in industry.

Teaching computer concepts and PC-DOS

Many students taking a course in the use of personal computer application software will have had little previous experience using personal computers. For this reason, Chapter One contains a discussion of important computer hardware and software concepts. The functions of a computer, the keyboard, the processor unit, the printer, the personal computer display, and a detailed discussion of diskettes as a form of auxiliary storage are included.

To effectively use the computer, a practical knowledge of operating systems is necessary. Therefore, Chapter One also includes a review of widely used PC-DOS commands that an individual should know. Topics such as loading PC-DOS, formatting a diskette, and copying files are covered in this chapter.

Teaching application software

After presenting basic computer concepts and PC-DOS in Chapter One, the remainder of the textbook is devoted to providing detailed instruction on how to use SuperCalc3, dBASE III, and WordStar. The subject matter covered in the chapters devoted to SuperCalc3 includes building a spreadsheet, formatting a spreadsheet, printing the spreadsheet, replication, and what-if questions. dBASE III subject matter includes creating and displaying a database, displaying records in a database, sorting and report preparation, and adding, deleting, and changing records in a database.

The chapters on WordStar 3.3 cover creating and printing a document, modifying a WordStar document, block commands and find/replace, plus additional commands.

These application software packages are taught using the unique Shelly and Cashman problem-oriented approach in which various problems are presented and then are thoroughly explained in a step-by-step manner. Numerous screens illustrate the exact sequence of operations necessary to solve the problems presented. Using this approach, students can easily visualize what is occurring on the computer as the various commands are entered.

An important feature of this textbook is the numerous student assignments provided at the end of each chapter. Typical assignments include True/False and Multiple-Choice Questions to test the students' knowledge; assignments requiring students to write and/or explain various commands; screen displays which contain common errors; and perhaps, most important of all, a series of problems at the end of each chapter which the student is expected to analyze and solve using SuperCalc3, dBASE III, or WordStar 3.3. These problems are real problems that students might encounter on the job or in their personal lives. Upon completion of the assignments at the end of each chapter, students will have gained experience in creating a spreadsheet, creating and manipulating a database, and using a word processing system.

Teaching aids

Accompanying the textbook are a series of free instructor's teaching aides. Transparency masters for each line drawing and screen in the book are provided. These transparency masters provide a convenient way to present the material. Also available is an instructor's guide, answer manual, and a computerized test bank.

Acknowledgements

A project of this size does not happen without the help of many people. Sue Davis and Max Loftin of Quality Graphics were of great help. The crews of R. R. Donnelley and Sons provided their usual professional services. Our colleagues at Boyd & Fraser Publishing Company — Becky Herrington, Marilyn Martin, Michael Broussard, Kenneth Russo, Nancy Eide, Jeanne Black, and Julia Schenden — accepted the challenge of producing a truly unique and exciting book. The quality of their work is reflected in the final product. We would also like to thank Tom Walker of Boyd & Fraser Publishing Company for his faith in the authors and his efforts in obtaining the applications software. This software will greatly influence the quality of education students receive when studying from this textbook.

Gary B. Shelly
Thomas J. Cashman

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CHAPTER ONE – INTRODUCTION TO COMPUTERS AND IBM PC-DOS

The computer is an integral part of the daily lives of most individuals. Small computers, called microcomputers or personal computers (Figure 1–1), have made computing available to almost everyone in society. Students are called upon to use computers in English classes for writing papers, in accounting classes for developing large ledgers and spreadsheets, and in many other classes.

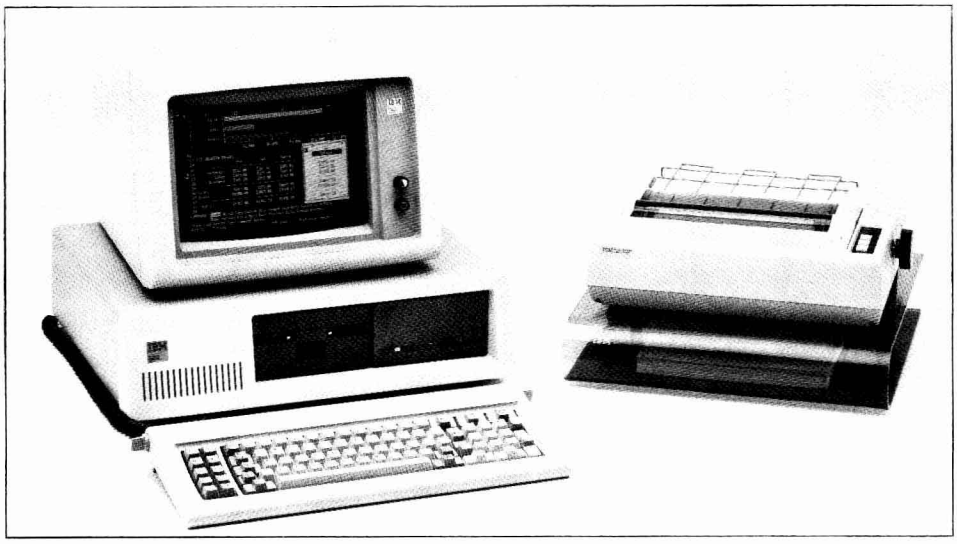

Figure 1–1

Businesses use computers for a variety of reasons as well. Airline reservations are made using computers. A check cashed in a local department store may require verification through the use of a computer. A bank teller is likely to use a computer terminal to find the balance in a customer's account. Few aspects of our daily lives are left untouched by some type of computerized processing.

The ability to understand and use a computer is rapidly becoming an important skill in modern society. This book is intended to be an aid in learning to use a computer by introducing computer use in conjunction with three important application areas — spreadsheets, database management, and word processing. Each of these terms, together with the type of processing associated with them and the method for implementing them on the computer, will be explained throughout this textbook.

Prior to learning about these application areas and the way to use them, however, it is important to gain an understanding of what a computer is, the components of a computer, and the use of an operating system. These topics are explained in this chapter.

What is a computer?

A **computer** may be defined as an electronic device, operating under the control of instructions stored in its own memory unit, which can accept and store data, perform arithmetic and logical operations on that data without human intervention, and produce output from the processing. All computers perform basically the same operations. These operations are:

1. **Input operations,** which allow data to be entered into the computer for processing.
2. **Arithmetic operations,** which involve performing addition, subtraction, multiplication, and division operations.
3. **Logical operations,** which allow the computer to compare data and determine if one value is less than, equal to,

or greater than another value.

4. **Output operations,** which make information generated from the processing on the computer available for use.
5. **Storage operations,** which include electronically storing data for future reference.

Even though these operations are very basic, it is through the ability of the computer to perform them very quickly and reliably that the power of the computer is derived. In the computer, the various operations occur through the use of electronic circuits contained on small silicon chips (Figure 1–2). Since these electronic circuits rarely fail and the data flows along these circuits at close to the speed of light, processing can be accomplished in millionths of a second.

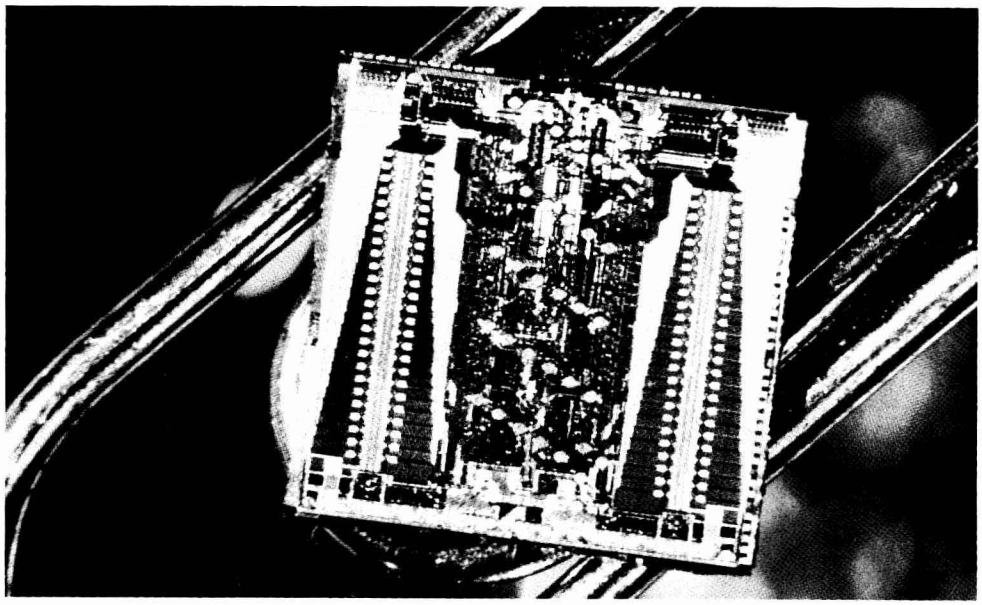

Figure 1–2

What is data?

The five basic operations that can be performed using a computer (input, arithmetic, logical, output, and storage) all require data. **Data** may be defined as the numbers, words, and phrases which are suitable for processing in some manner on a computer to produce information. (The word data can be used either as a singular noun or as a plural noun. In this book it will be used as a singular noun). Examples of data include the quarterly sales results of a company and the words composing a memo to the sales staff. The purpose of a computer is to accept data, process data, and as a result of the processing produce output in the form of useful information.

The production of information by processing data on a computer is called **information processing,** or sometimes **electronic data processing.** With the increased need of business and society for information of all kinds, the use of the computer to produce information is indispensable.

The components of a computer

Computers are capable of processing data at very rapid speeds in order to produce results which are useful to people. In order to understand how computers can do this, it is necessary to examine the primary units of the computer.

The four primary units of a computer are (Figure 1-3):

1. Input units.
2. A processor unit.
3. Output units.
4. Auxiliary storage units.

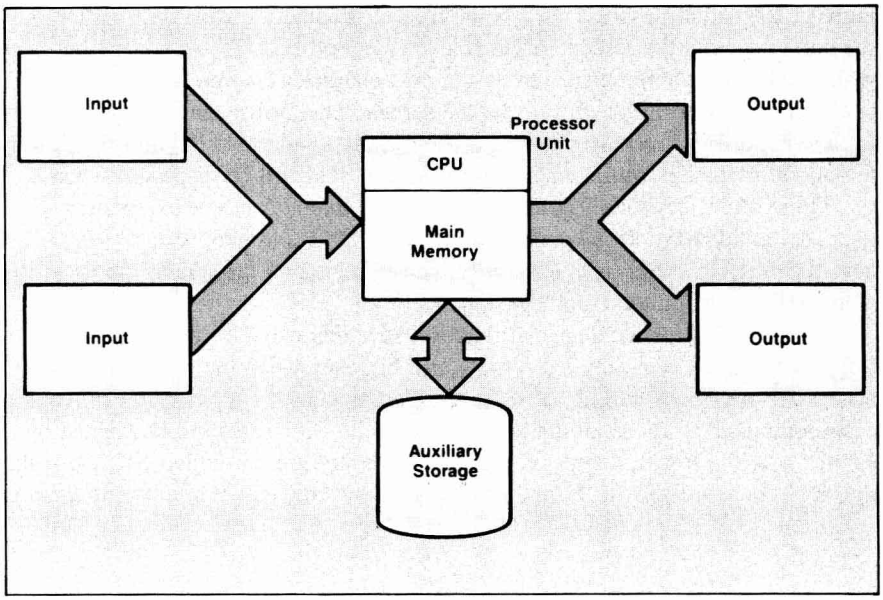

Figure 1-3

The diagram in Figure 1-3 illustrates the relationship of the various units to one another.

Input units

Input units are used to enter data into a computer. A commonly used input unit on most personal computers is the keyboard on which the operator manually keys the input data (Figure 1-4). As the data is keyed, it is placed in the main memory of the computer. The keyboard found on most personal computers is laid out in much the same manner as the familiar office tool, the typewriter. On many keyboards, a special numeric keypad is placed on the righthand side of the keyboard. The numeric keys are arranged in an adding machine or calculator key format. This arrangement of keys allows skilled operators to rapidly enter numeric data. In the IBM keyboard shown in Figure 1-4, the numeric pad is activated when the Num Lock key is depressed to cause the upper case characters on the keys to be used.

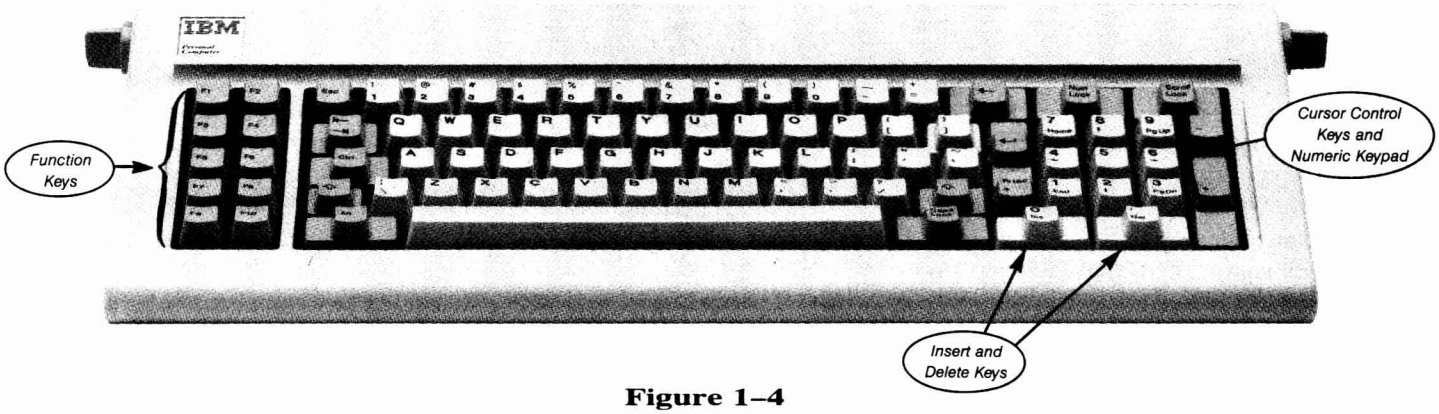

Figure 1-4

Special purpose keys for controlling where data is displayed on the screen are also available on most keyboards. In Figure 1-4 they are located on the right portion of the keyboard. They are activated when the lower case characters on the

numeric keypad are used. This type of control is usually obtained through the use of arrow keys. The arrow keys can move the cursor around the screen. A **cursor** is a symbol, such as a reverse video square character or an underline character, which indicates where on the screen the next character entered will be displayed. Depressing the Up Arrow key(↑) will cause the cursor to move upward on the screen. The Down Arrow key(↓) causes the cursor to move down, while the Left(←) and Right(→) Arrow keys cause the cursor to move left and right on the screen. Through the use of these keys, the operator can determine where on the screen data will be displayed when it is entered.

Quite often, keyboards contain special keys which can be used to alter the text displayed on the screen. For example, most keyboards have keys which will allow characters to be inserted or deleted in the text on the screen (Figure 1–4). Other keys may enable entire lines to be inserted or deleted on the screen. Some keyboards have keys which will erase a character, word, field, or even the complete screen.

Many keyboards have special function keys that can be programmed to accomplish certain tasks. For example, a function key might be programmed for use as a help key when the computer is used for word processing. Whenever the key is depressed, messages will appear that give instructions for a particular function of the word processor. Another key could be programmed to cause all data displayed on the CRT screen to be printed on a printer whenever the key is depressed. In Figure 1–4, the function keys on the IBM keyboard are on the left portion of the keyboard. There are ten function keys on the IBM keyboard shown. Function keys are very convenient and useful when rapid data entry is important.

Processor unit

The **processor unit** is composed of two parts: the central processing unit (CPU) and main computer memory (see the diagram in Figure 1–3 on page 1.3). The **central processing unit** contains the electronic circuits which actually cause processing to occur. The CPU interprets instructions to the computer, performs necessary logical and arithmetic operations, and causes the input and output operations to take place.

Main computer memory consists of electronic components which store numbers, letters of the alphabet, and special characters such as decimal points or dollar signs. Any data to be processed must be stored in main computer memory. The data stored in main computer memory is referenced by the CPU when the data is processed. Main computer memory is also used to store instructions which control the processing of the data.

Typical personal computers contain approximately 256,000 or 512,000 positions in main computer memory. This means that main computer memory can store 256,000 or 512,000 numbers, letters of the alphabet, or special characters. A computer with approximately 256,000 positions of main computer memory is said to contain 256K of memory — the letter K, standing for Kilo, means thousand. IBM Personal Computers are available containing from 128K to 3 megabytes **(one megabyte** is equivalent to 1 million positions of main computer memory).

Output units

Output units make information resulting from processing available for use. Output from personal computers can be presented in many forms, varying from a printed report to color graphics. In those environments where a personal computer is used for business applications or business-related applications such as spreadsheets, database processing, and word processing, the two most commonly found output units are the **printer** (Figure 1–5) and the television-like screen called a **personal computer display** (Figure 1–6).

Printers

Printers used with personal computers can be either impact printers or nonimpact printers. An **impact printer** transfers the image to be printed onto paper by some type of printing mechanism striking the paper, ribbon, and character

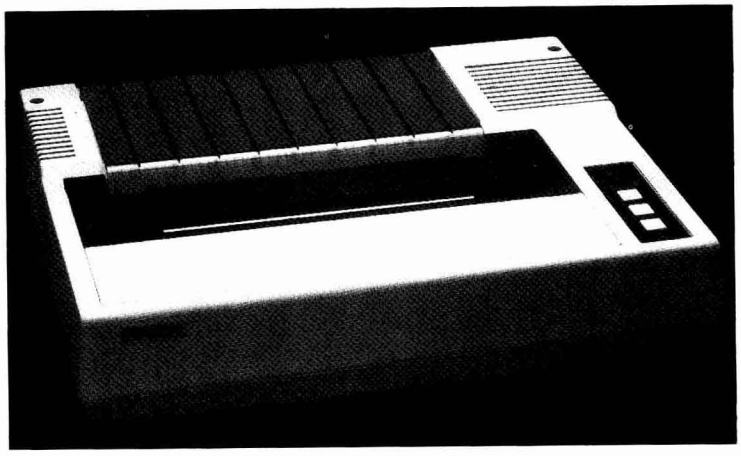

Figure 1–5

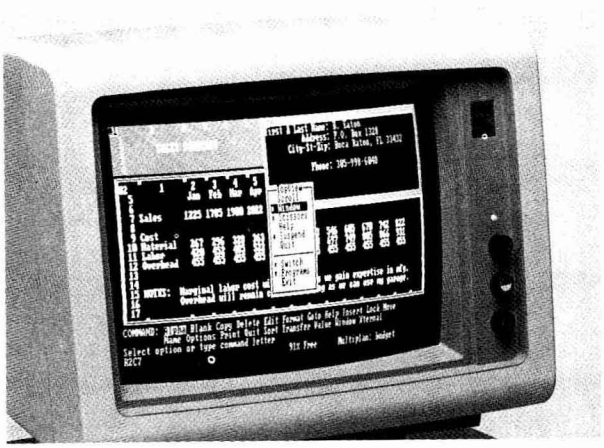

Figure 1–6

together. A **nonimpact printer** means that printing occurs without having characters striking against a sheet of paper.

A widely used impact printer with personal computers is the dot matrix printer. To print a character on a dot matrix printer, the character stored in main computer memory is sent to the printer's electronic circuitry. A dot pattern representing a particular character is generated by the printer. The printer then activates the vertical wires in a print head contained on the printer, causing selected wires to press against the ribbon and paper, creating a character such as illustrated in Figure 1–7. As can be seen from Figure 1–7, the actual character consists of a series of dots caused by the print head wires striking the paper. When viewed in the actual size created on the printer, the characters are clear and easy to read.

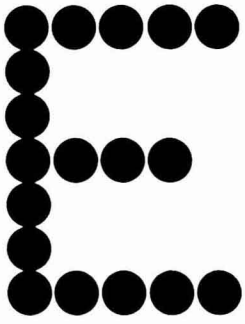

Figure 1–7

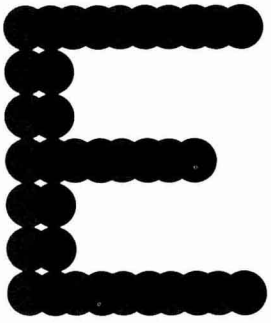

Figure 1–8

Dot matrix printers vary in the speed with which they can print characters. Generally, the higher the speed, the higher the cost. Speeds range from 50 characters per second to over 300 characters per second.

The quality of a dot matrix printer can vary as well. The quality is directly proportional to the number of wires which strike the paper to form an image. The higher the number of dots in a character, the better the quality of the character. The letter E in Figure 1–7 was formed by a printer using a 7 x 9 matrix, meaning there are seven possible horizontal dots and nine possible vertical dots. The character in Figure 1–7 used only five horizontal dots and seven vertical dots so the letter would be formed correctly. Some dot matrix printers make use of up to 24 wires for forming characters. In addition, some printers will print a line twice, shifting the head slightly on the second printing to overprint a character (see Figure 1–8). This has the effect of filling in the spaces between the dots, giving the appearance of a solid character. The disadvantage of this approach is that the printing takes twice as long since each character is printed twice.

Many dot matrix printers also allow the characters to be printed in two or more sizes and densities. Typical sizes include: 1) Condensed print; 2) Standard print; 3) Enlarged print. In addition, each of the three print sizes can be printed

with increased density, or darkness. The chart in Figure 1–9 illustrates examples of some of the various types of output that can be produced from a dot matrix printer.

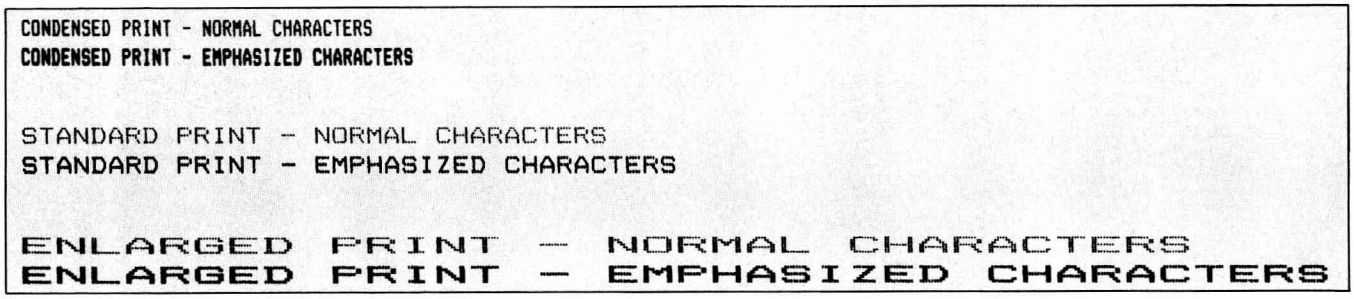

Figure 1–9

Another feature of dot matrix printers is that they can be used to print graphics, meaning that the dots are not printed to form characters but rather to form graphic images. This feature can be especially useful when working with a spreadsheet program such as SuperCalc3, which can produce graphs of the numeric values contained on the spreadsheet.

Several other types of printers are also very important for use with personal computers. These are ink jet printers and laser printers, both of which are nonimpact printers. An **ink jet printer** forms a character by using a nozzle that sprays liquid ink drops onto the page. Ink jet printers produce relatively high quality and print between 150 and 270 characters per second. Some ink jet printers sell for less than $500.00.

Laser printers convert data from the personal computer into a beam of laser light that encodes an organic photo-conductor with the data, forming the images to be printed. The photoconductor then attracts particles of toner. When the toner is brought into contact with the paper, an image is produced on the paper. The toner is fused onto the paper by heat and pressure. An advantage of the laser printer is that numbers and alphabetic data can be printed in varying sizes and type styles. The output produced is of very high quality, with the images resembling professional printing rather than typewritten characters on a page. Laser printers for personal computers print in the range of eight pages per minute. These units can produce both text and graphics. They cost in the $3,000.00 range.

Personal computer display screens

Most personal computers contain a CRT screen display. The screen is used to display the data entered on the keyboard and messages from the computer. The most widely used CRT display screens are equivalent in size to a twelve- or fifteen-inch television screen. These screens can typically display both upper and lower case letters of the alphabet and a variety of special characters.

The maximum number of characters per line on the screen and the number of lines which can be displayed on the screen vary greatly among personal computers. The IBM Personal Computer Display screen can display 80 characters on a single line and a maximum of 25 lines can be displayed on the screen. This means that 2,000 characters can be displayed on the screen at one time. The IBM Personal Computer Display screen contains green characters on a black background. Other personal computer displays use a variety of combinations, including amber on black and white on black.

Color display screens are also available for use with most personal computers, including the IBM Personal Computer. The basic colors provided with color CRT screens include white, yellow, red, blue, green, and black. Some screens provide additional colors such as cyan, magenta, and brown, and allow for controlling the intensity and shade of the color, resulting in numerous color combinations. With special components, some personal computer displays are capable of displaying more than 1,000 separate and distinct colors.

Both monochrome (single color screen) and color displays can be used to display computer graphics. Graphics are often used to assist business executives when analyzing data and to assist individuals in preparing data for analysis and presentation to others. Computer graphics allow information to be displayed in the form of charts, graphs, or pictures so that the information can be easily and quickly understood. SuperCalc3 has the capability of producing color graphs on the display screen which reflect the results obtained from the calculations performed on the spreadsheet.

Auxiliary storage

Main computer memory is used to store instructions and data while the instructions are being executed and the data is being processed. In most applications, however, these instructions and data must be stored elsewhere when they are not being used because main computer memory is not large enough to store the instructions and data for all applications at one time. **Auxiliary storage** units are used to store instructions and data when they are not being used in main computer memory.

Diskettes

One type of auxiliary storage used with personal computers is the **diskette** (sometimes called a **floppy disk).** A diskette stores data as magnetic spots on a circular piece of oxide-coated plastic (Figure 1–10). A diskette is inserted into a diskette drive where a read/write head records data on the diskette or reads data that has been recorded on the diskette (Figure 1–11).

Diskettes are available in a number of different sizes. Most personal computers use a diskette 5 1/4 inches in diameter. Even smaller diskettes (approximately 3 1/2 inches in diameter) are used on some computers. Regardless of the size of the diskette, the data is stored on the diskette in tracks. A **track** is a very narrow recording band forming a full circle around the diskette (Figure 1–12). The width of this recording band depends upon the number of tracks on the diskette. Each recording band is separated by a very narrow blank gap. Tracks are established by the disk drive using the diskette. The tracks are not visible when looking at the diskette.

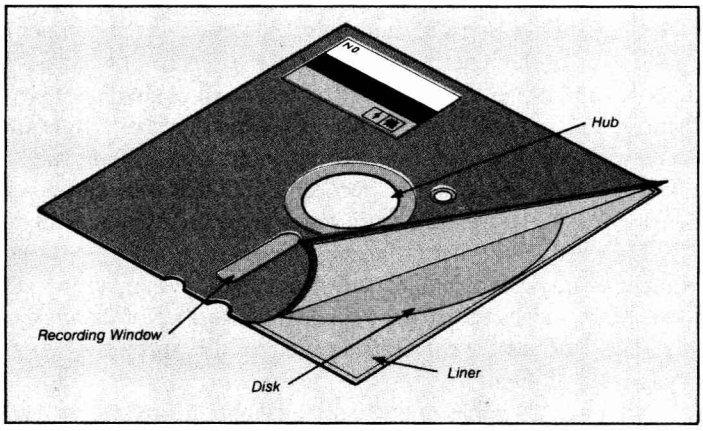

Figure 1–10

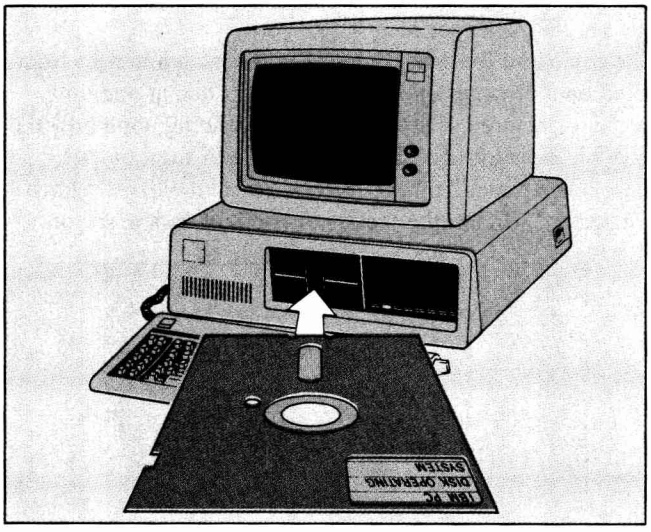

Figure 1–11

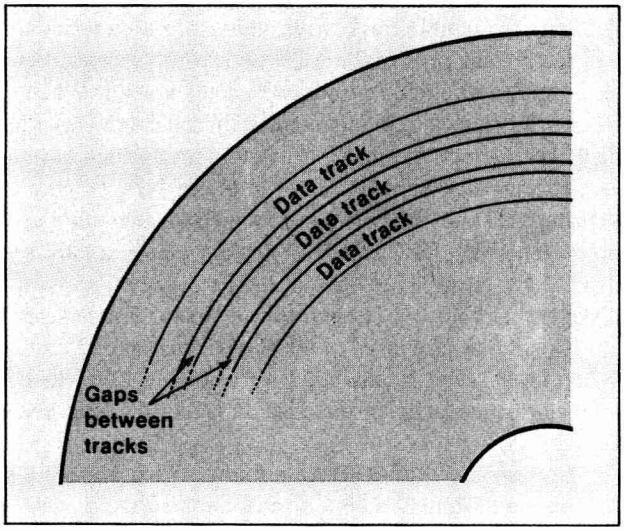

Figure 1–12