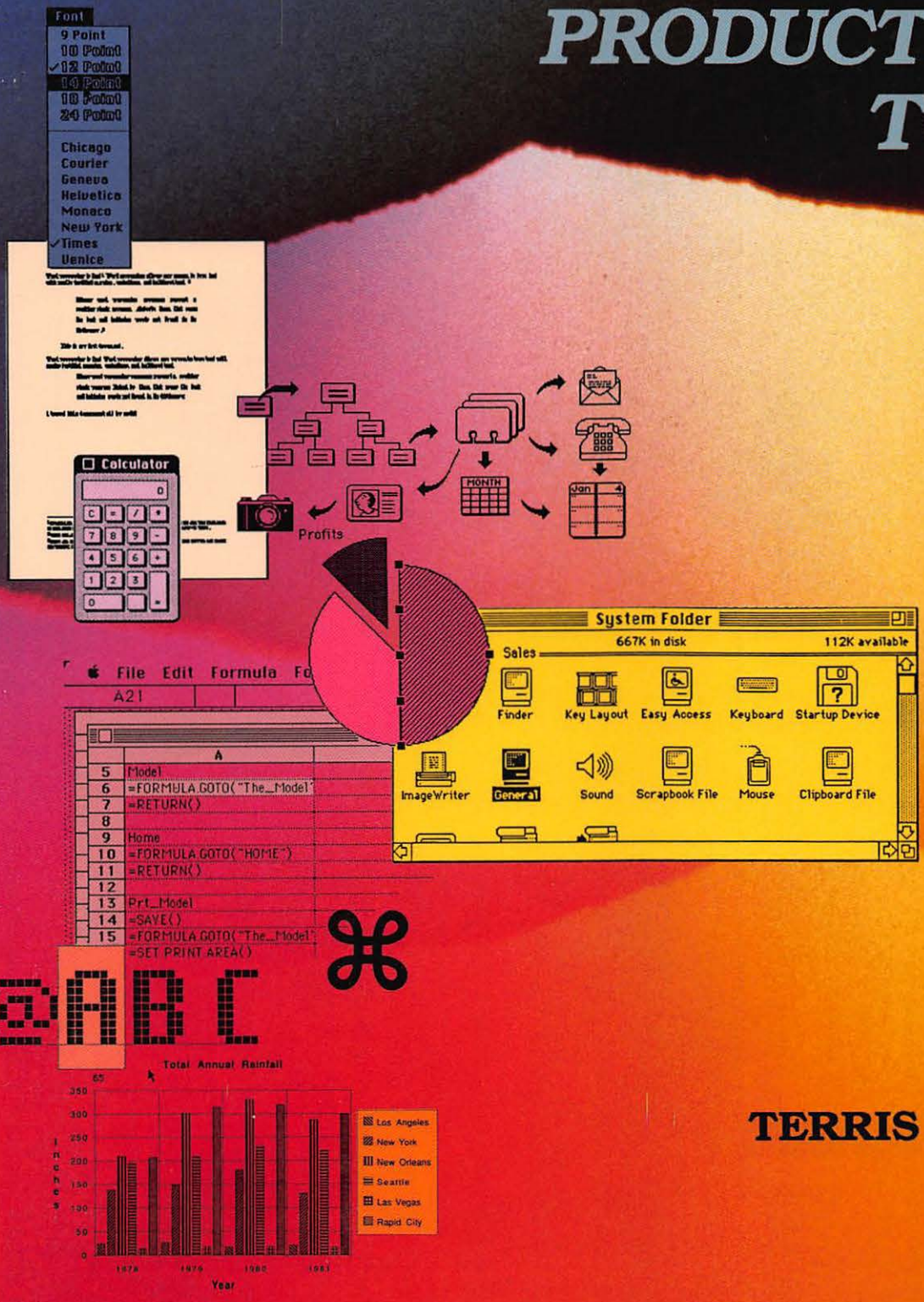
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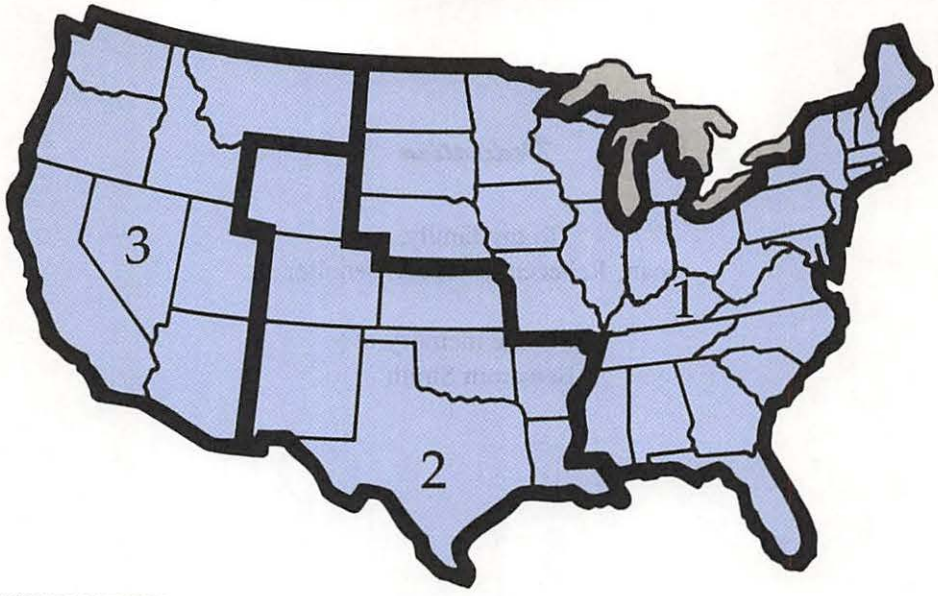
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Joan, Rebecca, Michael, Jennifer

and to the memory of
Benjamin Smith

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PREFACE

OBJECTIVES OF THIS BOOK

This text was developed for use in any Introductory Computer course, or Microcomputer Applications course, which focuses on **using microcomputers and applications software.** The text is designed to capitalize on the advantages of working in a hands-on, laboratory environment. The objectives of this book are:

- To provide students with hands-on, practical experience using the Apple Macintosh, as opposed to merely discussing possible applications.
- To teach students the concepts of how to use the Apple Macintosh operating environment, and the major applications including:
    - Word processing
    - Electronic spreadsheets
    - Database management systems
    - Business graphics
    - HyperCard
- To feature instruction in using today's most widely used commercial applications software packages including MS-Word 4.0, MS-Excel 2.2, File Maker II and HyperCard.
- To provide students with experience in solving the kinds of problems they're likely to encounter in today's work environments.

LEVEL OF INSTRUCTION

This book is recommended for use in any educational or training environment, or for self-study. It was developed with the one-semester Microcomputer Applications course in mind, but is equally appropriate for use in any introductory course in computers. No previous experience with computers or programming is required in order to use this book.

MAXIMUM FLEXIBILITY

This text offers coverage of the software packages which have emerged as the market leaders in their respective applications area. I have written the book to allow flexibility with respect to the order of presentation. You may wish to present applications areas in a different sequence. For example, you may wish to introduce electronic spreadsheets before word processing. This can be done without sacrificing continuity.

DISTINGUISHING FEATURES

A Proven Book

The evolution of this text is based on my experience teaching this course, and on the collective experience of many instructors who have used my other books, and have shared with me their comments and suggested improvements. I have made every effort to preserve the integrity of those elements which proved effective in my other publications, and to improve upon those which did not.

Disk Included

We are pleased to include a disk which contains the work created in each chapter as it should be when the student completes the chapter. With these files available, those students who, for some reason, diverge from the material, will be able to start a new chapter in sync with the text. This disk also holds the stories and scrapbook files needed for the desktop publishing and database chapters.

Extensive Actual Screen Illustrations

The instructions for using each specific software package are fully supported with screen "dumps" which exactly reflect what the students' screen will look like as they execute each target command. The book includes hundreds of these actual screen illustrations, which clarify in detail the impact of each operation that the student performs.

Project-Driven Approach

The presentation of concepts unfolds at a measured pace, mixing conceptual material with reinforcement through hands-on sessions at the computer. Lasting learning correlates directly with the amount of time spent using microcomputers in the laboratory environment. Consequently, each chapter is built around a project which serves as the vehicle for mastery. My experience has been that most students will find these projects quite time-consuming. For students who move through this material quickly, you may wish to assign exercises in addition to the project developed in the chapter. There is a wide variety of exercises at the end of every chapter for this purpose.

Business Problem Solving

In virtually every discipline, students need to learn how to apply the microcomputer in order to solve problems. My experience has been that students typically need to know how they would use microcomputers, and applications software, in a business environment. For this reason, most projects and exercises challenge students to solve problems from a business applications perspective.

What To Do—Why You Are Doing It

In contributing to the students' overall comprehension of using microcomputers and applications software, this format helps students understand what actions to take in order to perform the target function, and the reasons why.

ANCILLARY MATERIALS

A comprehensive instructor's resource package accompanies *Macintosh Productivity Tools*. These ancillary materials are available upon request from Boyd & Fraser:

Instructor's Manual

Featuring:

- Lecture outlines for each chapter
- Chapter-by-chapter objectives and vocabulary lists
- Answers to end-of-chapter student exercises

A FINAL NOTE

I drew upon my personal resources and those of my colleagues in the search for the best approach to the design of the text, the software to work with, and the information presented for each program. While I am satisfied with the result of this effort, there is always room for improvement. As you use this book, you will undoubtedly become aware of its strengths and weaknesses. Please do not keep these observations to yourself. It would be greatly appreciated if you would write to me with your experiences in care of Boyd & Fraser Publishing Company. Thank you for your help, and I am looking forward to hearing from you.

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In addition, I would be remiss if I did not thank the production crew at Boyd & Fraser's Brea, California facility. Becky Herrington created a masterful text layout. In addition, working many late hours doing typesetting, paste-up and the multitude of tasks required to put this book together were: Ken Russo, Mike Broussard, Anne Craig, Jeanne Huntington, Ginny Harvey and Sherry Faust.

The text could not have been revised without the software. My thanks to all the software vendors who supplied me with programs, updates and periodic support when needed. They are: Microsoft, Claris and Apple Computer, Inc.

Last, and possibly most important, Joan Wolff, my ever-patient and loving wife, deserves special thanks for her help and support throughout this project, and for preparing the book's index. I could not have done it without her.

To all these people and organizations, I am forever indebted for their efforts on my behalf. However, I take full responsibility for the contents and accuracy of this book.

Terris B. Wolff
Los Angeles
January, 1990

CHAPTER

THE COMPUTER

1

CHAPTER OBJECTIVES

Upon completion of this chapter, the student will:

- **Be familiar with the history and development of computers.**
- **Understand the input-process-output model of a computer.**
- **Understand the major differences among the three classes of computer:**
  the mainframe computer
  the minicomputer
  the microcomputer.
- **Know what a Local Area Network is and why it can be useful.**
- **Know what an input device is and be able to give examples of several devices in common use.**
- **Know what an output device is and be able to give examples of several devices in common use.**
- **Know what mass storage devices are and be able to give examples of several devices in common use.**

1.1 EARLY COMPUTING

Since no written or archaeological proof has been uncovered to show otherwise, it is safe to assume that the abacus was probably the first mechanical computational device employed by mankind. The abacus was so easy to use that it is still in use today in some parts of the world. However, using the abacus to perform arithmetic suffers from a major lack, the inability of the device to store intermediate results of complex computations.

The next major step toward the modern digital computer was taken by the French scientist and philosopher, Blaise Pascal. Pascal invented a mechanical adding machine. What made his machine unique

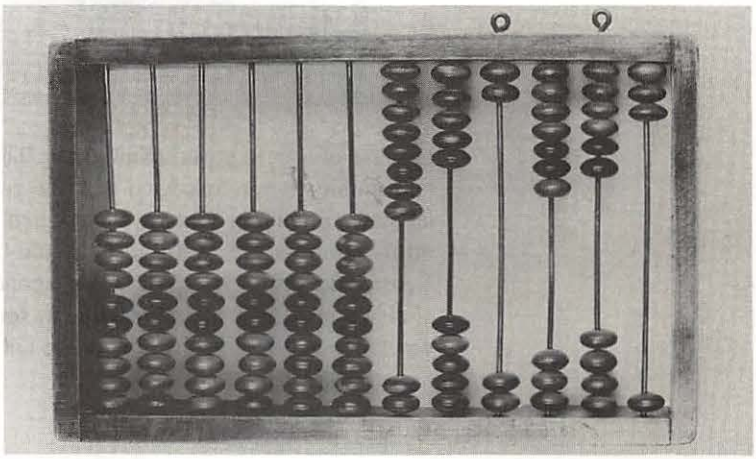
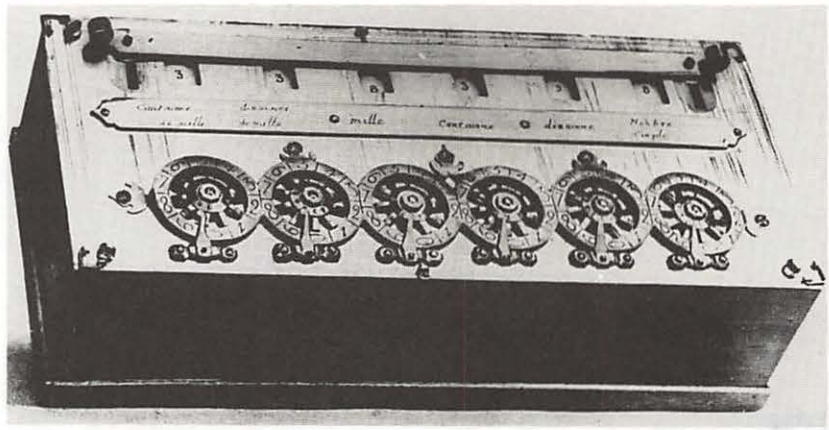


Figure 1.1
An abacus.

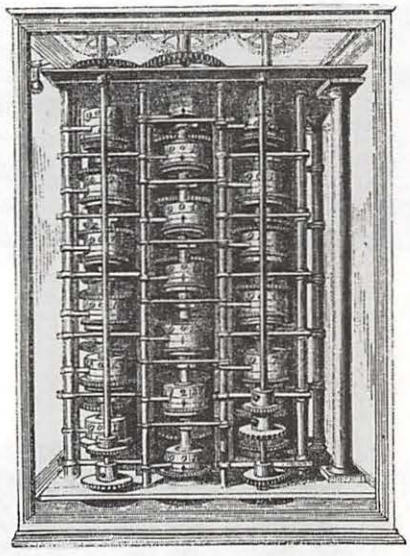
was that it used rotating geared wheels to perform the computations, with the results appearing in a series of windows on the device.

Figure 1.2
Pascal's adding machine.



The development of the computer then languished for 200 years until Charles Babbage arrived on the scene. Babbage was a professor of mathematics at Cambridge University in England who wanted to produce mathematical tables more accurate than those available at the time. In 1822 he began building a device which he called the Difference Engine, and then in 1834 Babbage began work on an Analytic Engine.

Figure 1.3
The Difference Engine.



The purpose of the Analytic Engine was to compute any mathematical function. Babbage's design for the Analytic Engine embodied many of the aspects now found in modern computers, such as memory for variables, a unit for performing computations, a method for inputting programs and for outputting the results. Although neither the Difference nor Analytic Engines were ever completed in his time (the manufacturing technology of the 1830s could not machine parts to the tolerances he required), many consider Babbage to be the father of modern computing because of the ideas he proposed to use in his inventions.

The next major development in the history of computing came about because of a U.S. government crisis. The results of the 1880 census required almost eight years to compile. It was expected that the census of 1890 would take more than ten years to hand tabulate, providing useless information since the 1900 census would be underway before the information for the 1890 census would be available. Herman Hollerith was an agent of the U.S. Census Bureau at the time and responded to this crisis by inventing a code which could be punched into cards and a machine to sort and count the cards using this code. The 1890 census was tabulated in three years with the aid of Hollerith's machines and the Hollerith code.

Hollerith eventually left the Census Bureau to form a company to manufacture and sell his tabulating machines. After merging with two other companies, Hollerith's tabulating company changed its name in 1924 to the International Business Machines Corporation.



Figure 1.4
Hollerith's tabulating machine.

1.2 ELECTRONIC COMPUTING

In the late 1930s people started working on computing machines which made use of electrical devices rather than purely mechanical ones. The first electronic machine was built by John Atanasoff and Clifford Berry, called the ABC, for Atanasoff-Berry-Computer. The ABC was followed by Howard Aiken's computer in 1944, the Mark I, which used electromagnetic relays and was a fairly slow machine.

With the outbreak of the Second World War, the military had the need for calculating ballistic tables for artillery bombardments. John Mauchly and J. Presper Eckert, Jr., proposed, then built with Army funding, the Electronic Numerical Integrator and Calculator, called the ENIAC. The ENIAC contained 18,000 vacuum tubes. In relation to the Mark I, it was fast because it had no moving parts. It could multiply two numbers in about three one-thousandths of a second, or about 300 multiplications per second. The ENIAC did, however, weigh approximately 30 tons; it took up about 3,000 cubic feet of space, and it drew 140,000 watts of power when in operation.

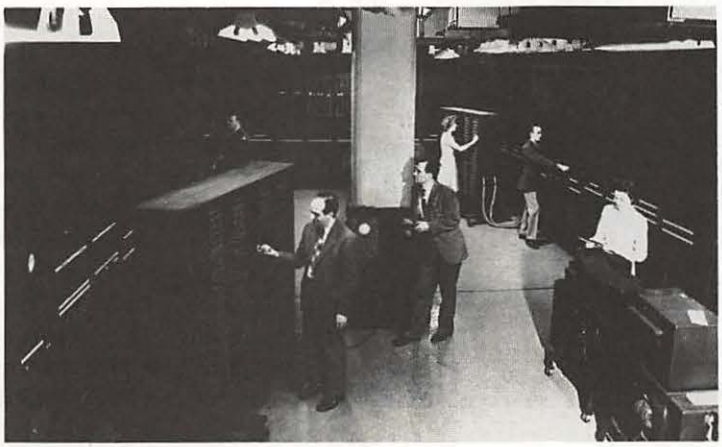


Figure 1.5
The ENIAC computer.

The major drawback of the ENIAC was that programs were hardwired in. Thus to change a program, a worker would have to rewire the computer.

1.3 THE ELECTRONIC STORED PROGRAM

The next major breakthrough in computing came from John von Neumann. Von Neumann developed the concept of the internally stored program. Programs became a pattern of zeros and ones which could be loaded into the computer's memory by using punched cards. The advantage of this type of computer should be obvious. The computer could be reprogrammed by reentering the punched cards, rather than rewiring the machine. This made program modification faster and easier. The computer von Neumann built was called the Electronic Discrete Variable Automatic Computer, or EDVAC, and became operational in 1951.

While von Neumann worked on his machine, Maurice Wilkes developed the Electronic Delay Storage Automatic Calculator, or EDSAC, at Cambridge University, England. The EDSAC was actually operational in 1949, before von Neumann's computer, even though it was built based on von Neumann's principle of the stored program.

1.4 COMMERCIAL COMPUTING

While the ENIAC, EDVAC and EDSAC computers served definite purposes, they were essentially experimental machines. After successfully completing the ENIAC, Mauchly and Eckert formed their own company and designed and developed the first commercial computer, the Universal Automatic Computer, the UNIVAC I. The UNIVAC I was placed in the U.S. Census Bureau in 1951.

The UNIVAC I was the first of what are now considered to be "first generation" computers. Programs and data were stored in such computers' main storage and accessed in milliseconds, or thousandths of a second. These computers also required air conditioning and lots of electricity. Members of this generation of computers were programmed in their own language, called machine language. They were difficult to program. Most "knowledgeable" people of the early 1950s felt that the total demand for computers in the United States would not exceed ten machines similar to the UNIVAC I.

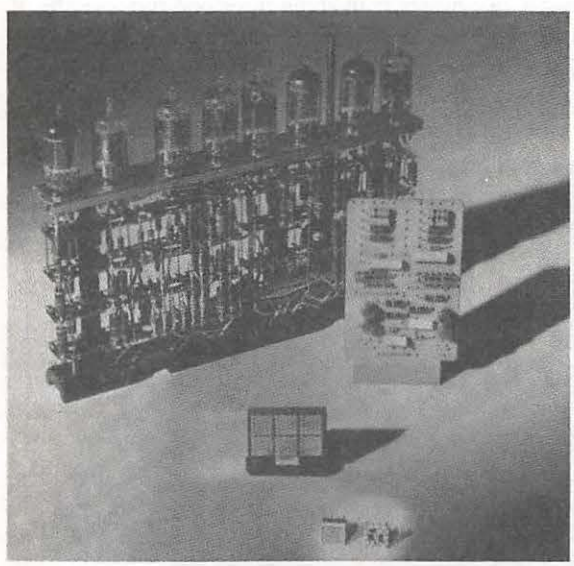


Figure 1.6
A Relay, a Vacuum Tube, a Transistor and an Integrated Circuit chip (IC).

It was not until the late 1950s that the transistor replaced the vacuum tube in the computer, and the second generation of computers was introduced. Because the transistor is smaller, runs cooler, and has lower power consumption than the vacuum tube, the second generation computers were smaller. They ran cooler and consumed less electricity than the first generation machines. The transistor was much more reliable than the vacuum tube, so the computers were less likely to break

down. In addition, the time required by the computer to access information in its memory dropped from milliseconds to microseconds, or millionths of a second.

During this time, the programming languages FORTRAN (**FOR**mula **TRAN**slation) and COBOL (**CO**mmon **B**usiness **O**riented **L**anguage) were developed. These languages were a major breakthrough in that they greatly simplified the task of the programmer and reduced the time required to write and debug a program. The programs in these languages were run through a special program, called a **compiler**, which turned what the programmer wrote into the machine language required by the computer. The third generation of computers became available in the mid-1960s with the introduction of the integrated circuit. The integrated circuit replaced transistors in the computer. Again the size, power requirements and heat generated by the computer dropped. At the same time, hardware reliability and speed increased. Information access time for the computers using integrated circuits dropped to nanoseconds, or billionths of a second.

1.5 THE MICROCOMPUTER

The fourth generation of computers was spawned by the introduction of the Large-Scale Integrated circuit, or LSI. This electronic advance was followed by the Very Large-Scale Integrated circuit, or VLSI. LSI and VLSI make it possible for a chip manufacturer to put hundreds of circuits into the space of a few square inches.

In early 1975, the first commercially available microcomputer was announced. It was a hobbyist kit built around the Intel 8080 microprocessor. Programs were loaded with switches on the front panel of the machine. The computer used an audio cassette recorder as its auxiliary storage.

In 1977, Steve Jobs and Steve Wozniak put together the first Apple computer. They were soon followed by the Commodore PET computer and the Tandy-Radio Shack TRS-80. Today, microcomputers are available from several major manufacturers, such as Apple, IBM, Wang, NCR, and Zenith. The capabilities of these machines are beginning to rival those of medium and large size computers at a price a small business or the typical household can now afford.







Figure 1.7
Different types of Apple Macintosh computers.

1.6 WHAT IS A COMPUTER?

A computer is essentially a very simple device—a machine designed to follow instructions mindlessly. In doing this, the computer rapidly performs tasks in a tireless fashion by manipulating bits of information. A **BIT** is a **binary digit**, the most fundamental unit of information dealt with by the computer. You can compare it to an on-off switch. Either a bit is **ON** or it is **OFF**. By combining bits, any information can be represented.

The tasks a computer performs while manipulating these basic units of information may be simple, such as adding two numbers together, or the tasks may be complex, such as monitoring and controlling an oil refinery, or in between, such as computing a company's payroll and all the required taxes.

1.7 THE INPUT-PROCESS-OUTPUT MODEL

Whether a computer adds two numbers together, monitors an oil refinery, or computes payroll checks, the same elementary three-step process occurs:

1. Information is **input** into the computer.
2. The computer **processes** the information.
3. Results of the processing are **output**.

Figure 1.8 illustrates this basic input-process-output model.

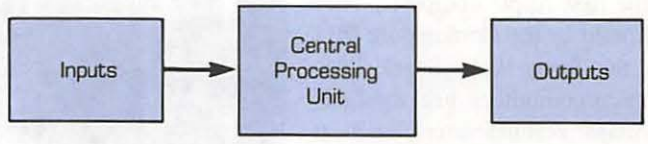


Figure 1.8
Input-process-output model.

If you want your computer to solve the addition problem 2 + 4 = 6, the inputs to the computer are the two numbers 2 and 4, the process performed is adding these two numbers, and the output is 6, the result of the addition.

The refinery computer has more complex inputs, such as temperatures and rates of flow. The process step is much more complicated than a simple addition, involving such activities as the analysis of the temperatures and rates of flow, and making decisions based upon this analysis. The computer's outputs are the actions to be taken resulting from the various decisions at which the machine has arrived.

1.8 COMPUTING POWER

The computer needed to monitor the oil refinery must perform far more complex processing tasks than the one used to add two numbers. It is, thus, a more powerful computer. But what is a powerful computer? For our purposes we will define the power of a computer as being measured by three things:

1. how fast it performs computations,
2. the memory capacity of the machine, and
3. its computational accuracy.

In discussing computer power, we'll be focusing on processing, the second part of the input-process-output model.

There are three classes of computer in use today, each with different, overlapping ranges of power. As technology advances, it is becoming more and more difficult to distinguish among the three classes of computers. These classes are mainframe computers, minicomputers, and microcomputers.

1.9 MAINFRAME COMPUTERS

Mainframe computers are the most powerful machines available. They are capable of processing large amounts of information in a very short time. The internal clock of these machines—which is somewhat like a metronome in that it gives the computer a beat to operate to—runs very fast. Not only does a mainframe computer operate quickly, it also usually has a large amount of internal memory, called **Random Access Memory**, or **RAM**, for storage of programs and data.



Figure 1.9
A Cray mainframe computer.

A mainframe computer is usually capable of performing arithmetic computations with a great degree of accuracy. This accuracy is a reflection of the large "word" size of the computer. A computer **word** is made up of **bits**. The more bits in a computer's word, the more accurate the machine is capable of being in its arithmetic operations. Thus, a sixteen-bit word computer is capable of more accuracy than an eight-bit word computer, but not as much as a thirty-two-bit word computer. The mainframe computer is also able to service the needs of several programs running at the same time without a serious drop in overall performance.

Although mainframe computers are fast and have large internal memories, they are also very expensive. Not only do they cost in the millions of dollars, but they require extensive, and sometimes very expensive, preparation of the facilities in which they are to be housed. In addition to these "startup" costs, mainframes require relatively large, ongoing expenses for maintenance and a full-time staff to keep the machine running.

1.10 MINICOMPUTERS

Not every organization needs, wants, or can afford to install and own a mainframe computer. Nonetheless, many companies still need a fair amount of power in their computer. However, they may not need all the speed, random access memory, or accuracy provided by a mainframe.

A computer that draws engineering blueprints needs to work quickly because the volume of computations required to draw a blueprint is very large. On the other hand, the computer that maintains a company's accounting records must have arithmetic accuracy—everything must balance to the penny. Speed is not a big need; the computer can post accounting entries to its ledger, or compute payroll, overnight.

Minicomputers cost less than mainframes—typically in the tens to hundreds of thousands of dollars. These computers may require some special facilities preparation and usually have an ongoing maintenance expense. They often do not require full-time operations personnel or the technical knowledge that keeping a mainframe computer going may require. The trade-off for these savings in cost and maintenance expense is a drop in the power of the computer. This can be reflected by a slower rate of computation, a smaller memory, and a noticeable degradation in performance when too many tasks are simultaneously running on this machine.

1.11 MICROCOMPUTERS

Microcomputers are the least expensive source of computing power. They are also the least powerful type of computer as a class. The cost of a microcomputer system is usually in the thousands of dollars range.

Microcomputers are relatively slow computers, with more limited memory capacity and fair arithmetic accuracy. However, recent technological advances have increased the power of these computers to the point that some are almost as powerful as minicomputers. For the most part, however, the typical microcomputer user will not need this kind of power.

In addition to being inexpensive, microcomputers offer some advantages over the mainframe computer and minicomputer. To make mainframes cost-effective to operate, many people use the large computers, frequently at the same time. Airlines, for example, use mainframes to handle passenger reservations. If something goes wrong with the mainframe, agents cannot reserve space, and passengers are out of luck until the problem is diagnosed and the machine put back into service.



Figure 1.10
A Macintosh microcomputer.

With a microcomputer, only one or two users are affected by a hardware failure. The seriousness of the problem may be minimized if these people have access to other computers while their computers are being repaired. All they need to do is take their data down the hall or next door, and they are back in business. This is not possible with larger computers, as most companies do not have several of the same, very costly machines available. If a corporation does have several mainframes or minicomputers, computer time probably will not be available on them, as they must continually be in use to justify their expense.

1.12 LOCAL AREA NETWORKS

While microcomputers are relatively inexpensive, the cost of adding on input and output devices, or **peripherals**, can be great. In fact, some peripherals such as laser printers or high capacity hard disk drives can cost more than the microcomputer with which they are used.

This situation cannot be avoided for the individual user or group of users in a single company spread throughout several cities or states. Each location will have to purchase the expensive peripheral devices needed. However, if the users are all in the same building, or even in two or three buildings that are physically close together, the **local area network**, or **LAN**, may solve this resource cost problem.

The purpose of a LAN is to provide a physical link between two or more microcomputers that allows the users of these machines to have access to the expensive resources found on a single machine. Through this link, the computers may communicate with one another and thus share data. One location or computer attached to the network may then be "loaded" with the peripheral equipment. Information may be sent to this machine, which then sends it to the peripheral devices connected to it.

Some network systems use a special device called a server to help them operate the various input/output devices for the network. The server is attached to the network just as the other computers are attached. Most LANs make use of a disk, or file server, which not only controls the network's communication to the information storage devices, but frequently controls the complete network.

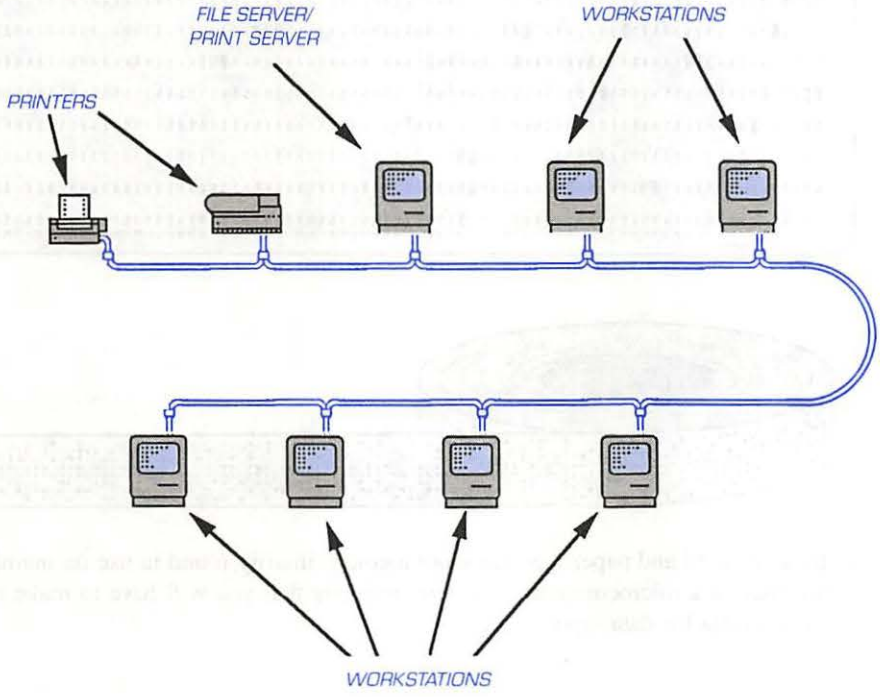


Figure 1.11
A LAN configuration.

1.13 INPUT DEVICES

So far, we have looked at the capabilities of the three different sizes of computer in processing information. Now that we've seen how the process part of the input-process-output model works, let's explore how information gets into the computer so that it can be processed.

1.14 PUNCHED CARDS AND PAPER TAPE

One method of supplying information to the computer is through the punched card. You, as a programmer or computer user, punch holes into the cards with a keypunch machine. The cards are then input into the computer for processing with a card reader and the computer interprets the pattern of holes in each card and acts on the instructions coded into the pattern. The code used on punched cards today is the same code invented in the 1880s by Herman Hollerith, the Hollerith code.

Punched paper tape is a similar method for inputting information for processing. Paper tape is not as bulky as punched cards, but it is almost impossible to make changes in the tape. The punched paper tape, unlike the punched card, cannot have the letters corresponding to the coded holes printed on it, which makes it almost impossible to read the tape by eye. To make changes, you must punch a corrected portion of tape, cut the incorrect portion out of the original paper tape, then patch the three segments back together. Paper tape is rarely used for inputting information into computers today.

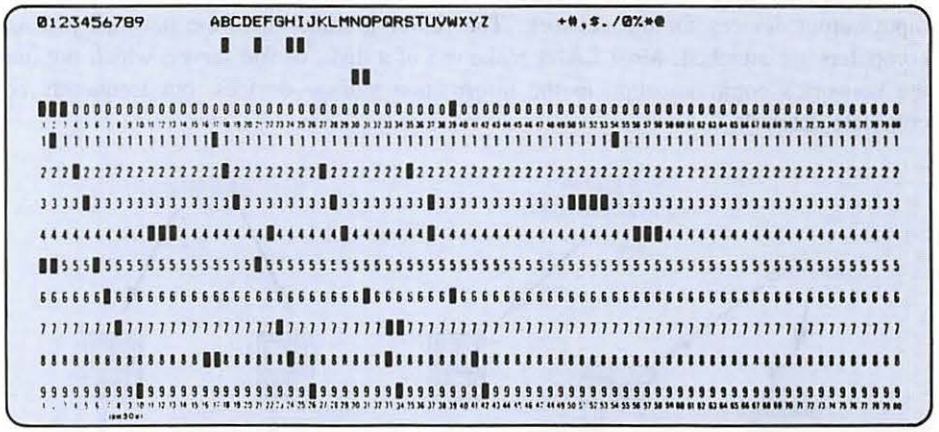


Figure 1.12
A punched card.

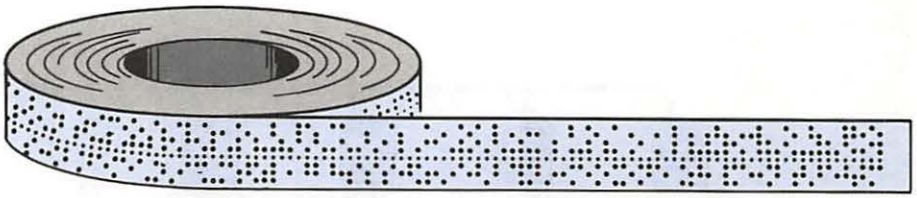


Figure 1.13
Punched paper tape.

Both the punched card and paper tape are input media primarily found in use on mainframe computers. As a user of a microcomputer, it is very unlikely that you will have to make use of either of these two media for data input.

1.15 THE LIGHT PEN

The light pen is a method of entering information frequently used by people working with graphic images on the computer. The pen is used to point to a spot on the monitor. It may then "drag" a line connected like a rubber band from that point to another. Or, a line may be added

between the first point touched by the light pen and a second point. The light pen may also be used to point to options from a list of choices, much like checking a box on a questionnaire.

A bar code reader is a special type of light pen. It uses reflected light to scan the bars of black and white lines comprising the code. Bar codes may be found on many items. You see them on products in grocery stores. They are in use on production lines to help track where units are in the manufacturing cycle. Some airports now put bar codes onto luggage; this allows automatic equipment to send the articles to their proper destination in the airport from the passenger check-in point.

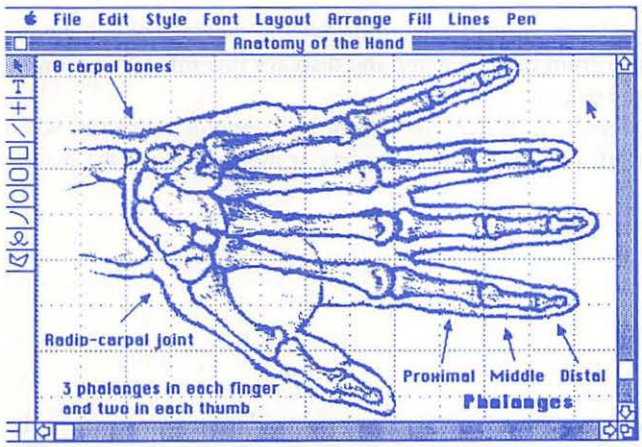


Figure 1.14
A bar code.

1.16 OPTICAL SCANNERS

An optical scanner looks at the information on a piece of paper and translates it into information which can be stored by the computer. Some optical scanners are designed to look at photographic, pictorial, or other graphic information and to send that information to the computer. This is how the bar codes found on packages are interpreted by computers at many supermarkets.

A specialized form of scanner is the Optical Character Reader. This specialized scanner is designed to read typed or printed letters, such as a page of typed text. The scanner is "taught" the shape of letters so that they can be correctly sent to a computer.



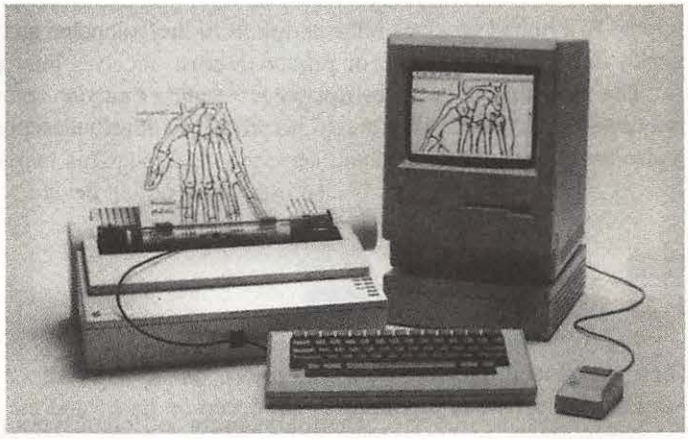


Figure 1.15
ThunderScan for the Macintosh.

1.17 TERMINALS

Today the predominant method of communicating with a large computer in the business setting is via a terminal. You may use either a video display terminal (VDT) or a paper copy terminal. Both terminal types have typewriter-like keyboards that the computer operator uses to enter data into the computer.

When using a terminal, the user simply types information into the computer for processing. This information includes commands to the computer's control program (called an operating system), lines of a program, or data for a pre-existing program to process.



Figure 1.16
A computer in use.

When you are using a microcomputer, you will in effect be using a terminal for data input. There is a minor difference between your "terminal" and the terminal attached to a mainframe or minicomputer. Those terminals attached to larger computers are connected via a cable to a machine which is physically distant from the terminal — a room, floor or building away. The computer portion of the microcomputer "terminal" is generally within a few feet, if not inches, of where you are working.

1.18 OUTPUT DEVICES

After you have input information and the computer has processed the information, the results must be output, the third step in the input-process-output model. The computer can output the results of the processing operations in several fashions.

1.19 OUTPUT TERMINALS

The terminal, as well as being an input device, is also a major device for viewing the computer's output. A terminal receives information from the computer and displays this information on its display device, either a video or printed display.

The problem with a video display terminal is that you cannot take anything with you when you leave the machine. This makes it difficult to distribute reports or memos. Thus, the printer is also used as an output device.

1.20 PRINTERS

There are several different types of printer; the selection of any particular one depends on the volume of information that must be produced on paper and the quality of printing needed. The letter-quality printer produces type much like that of a typewriter, but the printer is relatively slow. The dot-matrix printer produces output that many people consider marginally acceptable at best for business correspondence, but the printers work at medium to high speed. For extremely high volume printing, there are printers that print a complete 132-character line of text in under one second. There are even laser printers that can produce a full page of printed output of very high quality in seconds.

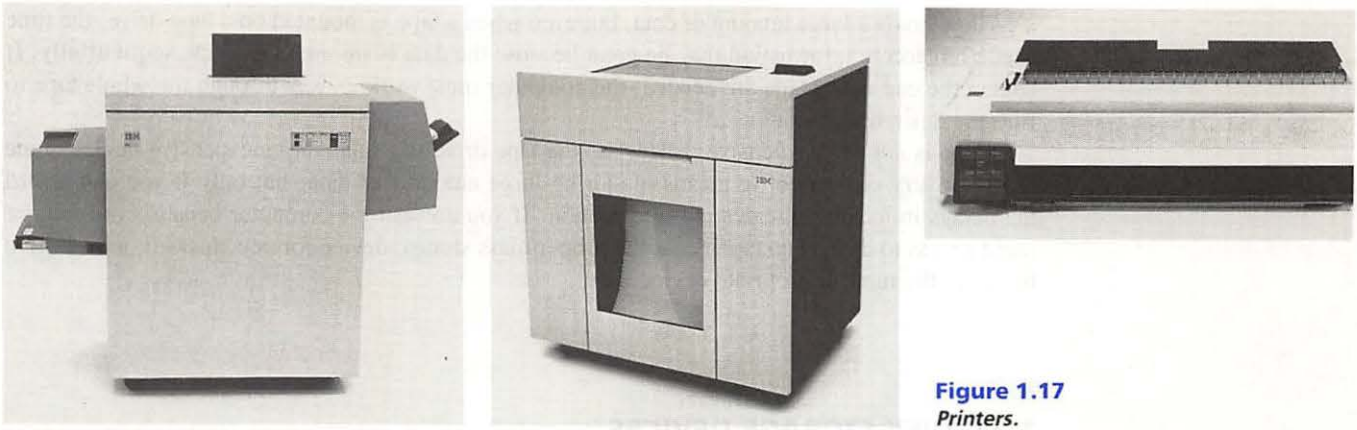


Figure 1.17
Printers.

1.21 MASS STORAGE DEVICES

Not all computer output goes to a terminal or a printer. Much of the output from many programs or processes is later used as input by other programs. It makes little sense to output this information to a terminal and then have a person reinput the data. It does make sense for the computer to retain the information in some fashion. Many computers use the **mass storage device**, a device for storing both programs and the outputs generated by those programs.

There are many different types of mass storage devices. The characteristics of the devices differ, as do the costs. For example, you may find an inexpensive device that can hold large amounts of information, but which takes a long time to access the information.

1.22 MASS STORAGE UNITS

Mass storage units are a type of storage device that gives the computer extremely large amounts of data storage. Only a small amount of the data is **on line** (that is, available to the computer) at any given moment. This means that if you need information found in one of the data cells not presently in use, there will be a long delay before the information is ready to be used.

The chief advantage of this type of data storage device is not the speed of access but rather the volume of information that can be stored. This type of device is capable of storing such large amounts of data that the cost of storage per character stored is small.

1.23 TAPE STORAGE

Magnetic tape is similar in some aspects to mass storage units. The information is stored on tape and available to the computer only when the tape is placed on a **tape drive**, a piece of hardware that enables the computer to read computer tapes.

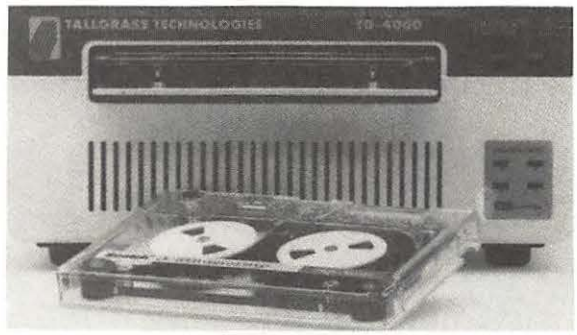


Figure 1.18
A cartridge tape drive.

Tape holds a large amount of data, but even when a tape is mounted on a tape drive, the time needed to access information may be great because the data is stored on the tape **sequentially**. If data at the end of the tape are needed, the computer must work its way through the whole tape to find the desired information.

Tape is not very expensive. Likewise, the tape drive is a relatively inexpensive device. Tape can be a very cost-effective means of storing large amounts of data, but only if you can afford the delays in locating the desired information. If you are using a computer because you require rapid access to data, then tape is not the proper mass storage device for you. Instead, a disk drive becomes the most appropriate device.

1.24 DISK STORAGE DEVICES

Two types of disk storage units are available—**hard disks** and **floppy disks**. The hard disk is a rigid plate that has been magnetically coated to store data. The floppy disk is a flexible, portable piece of plastic that has also been magnetically coated but which holds far less data than the hard disk. Both are used in conjunction with a disk drive, which reads and stores information on the disk.

Hard disks are capable of storing large amounts of data (millions of characters per disk), and they provide the computer with rapid access to the information stored on them because the information is not stored sequentially, as with tape. It can be **accessed randomly**. In relation to tape, however, the hard disk is expensive.

There are several different types of hard disk available. Some are removable, such as the hard disk shown in Figure 1.19. There are also removable **disk cartridges.** Some disk drives use a **fixed disk**, and the disk drive itself is a sealed unit.

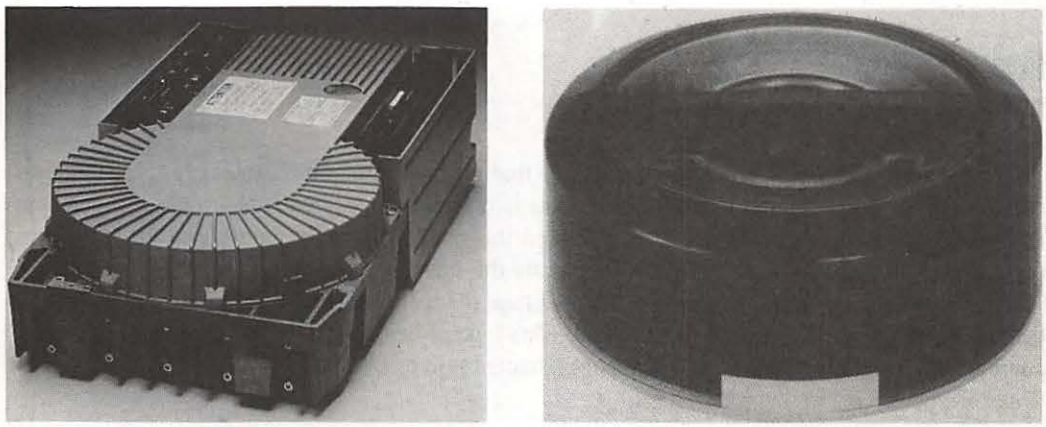


Figure 1.19
A sealed Winchester drive (left) and a removable disk pack (right).

The floppy disk strikes a balance between all the mass storage devices. It can store an acceptable amount of information, ranging from 80,000 characters to 1.4 million characters depending upon the particular computer system and the capabilities of the disk drive itself. The time used by the computer to access the data stored on a floppy disk is relatively short. While a computer cannot read information from a floppy disk as quickly as from a hard disk, floppies are significantly faster than tape. Finally, the cost of the floppy disk is nominal, and the cost of the disk drive is also low in relation to that of the other mass storage devices.

The problem with the floppy disk is its vulnerability to physical damage and to data loss. We'll cover more about floppy diskettes in a later chapter.

EXERCISES

1. What was Blaise Pascal's contribution to the development of the modern digital computer?
2. What are four components of Babbage's design for his Analytic Engine that are found in the modern digital computer?
3. What invention of Herman Hollerith is still in use today?
4. Who built the first machine using electrical rather than purely mechanical devices to perform computations?
5. What is the name of the computer built by Mauchly and Eckert?
6. What was John von Neumann's contribution to the development of the modern digital computer?
7. Which computer was the first of the "first generation" computers?
8. What technological development replaced the vacuum tube and led to the development of "second generation" computers?
9. What technological development replaced the transistor and led to the development of "third generation" computers?
10. What portion of a second is a millisecond? A microsecond? A nanosecond?
11. What do LSI and VLSI stand for?
12. What are the three general classes of computers in use today?
13. What are the criteria used to define computer "power"?
14. What class of computer would you expect to use to analyze the data collected in a census? Why?
15. Which peripheral devices may serve as both input and output devices? Why?
16. Which mass storage device provides for the fastest access to the information stored on it? Why?
17. Which mass storage device provides for the slowest access to the information stored on it? Why?

CHAPTER

SOFTWARE...GETTING THE COMPUTER TO DO SOMETHING

2

CHAPTER OBJECTIVES

Upon completion of this chapter, the student will:

- **Be able to outline the differences among systems software, development software, and applications software, and to give examples of each.**
- **Be able to explain the function of an operating system.**
- **Be able to explain the difference between interpreted and compiled computer languages.**
- **Understand the advantages and disadvantages associated with both interpreted and compiled computer languages.**

2.1 SOFTWARE

Despite marvelous technical advances, the computer is not capable of performing a single process without a set of instructions telling it what to do. Individually, these sets of instructions are called **programs**. Programs generically are referred to as **software**.

Pascal Program

```
program Color_TV (output);
var Price,Rate:real;
    Year:1..10;
begin
        Price:=469.0;
        Rate:=0.09;
        for Year:=1 to 10 do
        begin
            Price:=Price*(1+Rate);
            writeln(Year,Price);
        end
end.
```

BASIC Program

```
100  LET P = 469
110  LET R = 0.09
120  LET Y = 1
130  LET P = P * (1 + R)
140  PRINT Y,P
150  IF Y >= 10 THEN 180
160  LET Y = Y + 1
170  GOTO 130
180  END
```

FORTRAN Program

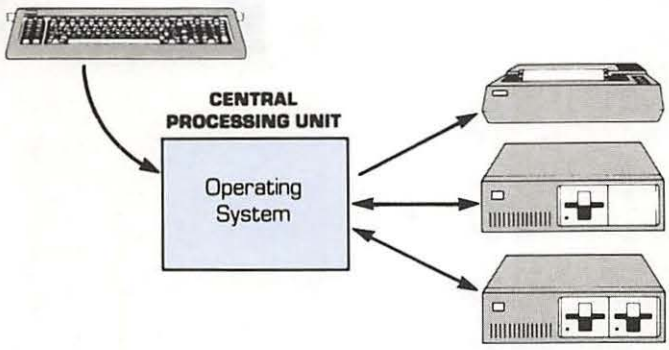
```
      R = 469.00
      R = 0.09
      DO 20 J=1,9
      WRITE (3,10)J,P
10 FORMAT (1X,1T,2X,F7.2)
20 CONTINUE
      STOP
```

Figure 2.1
Pascal, BASIC, and FORTRAN programs.

For our purposes, we can define three classes of software, just as there are three kinds of computers, as we saw in Chapter 1. These classes of software are not related to computer type; versions of each can be found on mainframes, minicomputers, and microcomputers. The classes of software are **systems software**, **development software**, and **applications software**.

2.2 SYSTEMS SOFTWARE

Figure 2.2
Users communicate to the computer through the operating system.



Systems software is the class of programs that allows us to use a computer. In short, people communicate with the computer, and the computer with people, through systems software.

Systems software is comprised mainly of **operating systems**, which supervise the overall operations of the computer including such activities as controlling the input and output processes. On mainframes and minicomputers, which may perform several tasks simultaneously, the operating system controls which particular task has access to the various resources of the computer. At the same time the operating system controls the overall flow of information within the computer. On a microcomputer, the operating system controls the computer's communication with its display, printer, and mass storage devices, as well as receiving and directing the inputs from the keyboard and other data sources.

2.3 THE OPERATING SYSTEM

There are a variety of operating systems in use on computers today. Each has its own advantages and disadvantages, its own proponents and opponents. The operating system used on IBM-PC computers and compatibles is referred to as DOS. **DOS** stands for **Disk Operating System**. On the Macintosh, the operating system is simply referred to as "The System." You interact with the System through a program called "The Finder." The Finder lets you move objects on the Macintosh's desktop, eject disks from the disk drives, delete files and start programs running.

2.4 DEVELOPMENT SOFTWARE

Development software is made up of programs used to create and maintain programs for general and/or specific purposes. The programs created with development software are referred to as applications software. Programming languages such as BASIC, FORTRAN, COBOL, Pascal and C are examples of development software.

Some people regard certain general purpose software, such as database managers, as development software. This is because applications are written using the programming language which is an integral part of the general purpose program. It is not at all unusual to find accounting applications and other business applications created by using a database management program!

Languages range from "low-level" (very detailed and concrete) to "high-level." The lowest level computer language is machine code, the actual code understood by the computer. Writing programs in this language is very difficult and time-consuming. High-level computer languages are easier to understand and work with because they look and sound more like ordinary English. High-level languages are translated into machine code by systems software programs called **interpreters** and **compilers**. Once the program is translated, the computer is able to execute the program instructions.

Some languages may be both interpreted and compiled, depending on the particular computer in use, and on the availability of interpreters and compilers for that language. For example, there are interpreters and compilers for BASIC available for a variety of computers, including the microcomputer.

2.5 INTERPRETED LANGUAGES

An interpreted language operates through a program (the interpreter) which translates each line of a program into machine language. Unfortunately, the computer does not remember a line that has been translated, so the interpreter must retranslate lines of the program which are performed more than one time. In addition, each line of the program must be retranslated each time the user asks the computer to execute the program! An example of a common interpreted language that you may encounter on your Macintosh is HyperTalk. HyperTalk is the built-in language of HyperCard, which will be discussed in a later chapter.

The constant translation and retranslation of program lines slows the process of executing the program because some of the computer's processing time must be spent performing this translation. The translation process also combines with other factors which contribute to the **relatively** (in relation to compiled programs) slow execution speed of an interpreted program.

If an interpreted program runs slowly, why have interpreted languages? Interpreted languages can be less frustrating to work with during the program writing process than a compiled language, especially for the novice programmer. The interpreter can detect syntax errors (incorrectly entered program statements) when the program is executing, and give immediate feedback to the user. The user can then easily make corrections to the program, and try to execute it another time, without the need to "recompile" the program.

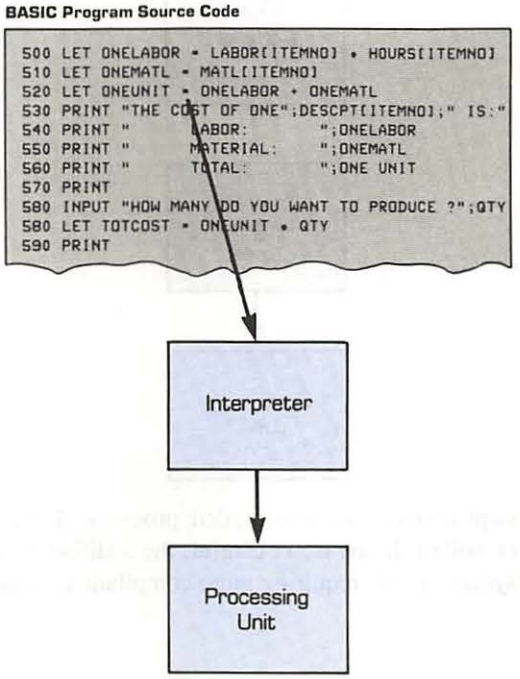


Figure 2.3
The interpreter passes each instruction one at a time to the processing unit for the computer to carry out.

This is also true when **debugging** (the process of correcting logic errors) the program. If the program is not giving the correct results, or is generally flawed, most interpreted languages in use today will let you display values presently stored in the computer's memory. This is a major aid when debugging complex programs. One can often determine the location of an error in the program logic through inspecting the values in the computer's memory. It is simple to make corrections, and then have the computer try again. This type of asking the computer for information is not possible with a compiled language.

2.6 COMPILED LANGUAGES

A compiled language requires that the program be translated into a permanent machine code version, called an **object code**, before the program is actually executed by the computer. This is done with a special program called a **compiler**.

The compiler translates the original program only **one** time as compared to the continuous translation and retranslation process of an interpreter. The completed stored translation is loaded into the computer only one time in a form that is ready for use. This speeds the execution of the program, as the computer is no longer busy performing the translations while the program is running. Combined with other factors, the overall speed of execution of a compiled program may be 3 to 10 to 20 times faster than the same program when run by an interpreter.

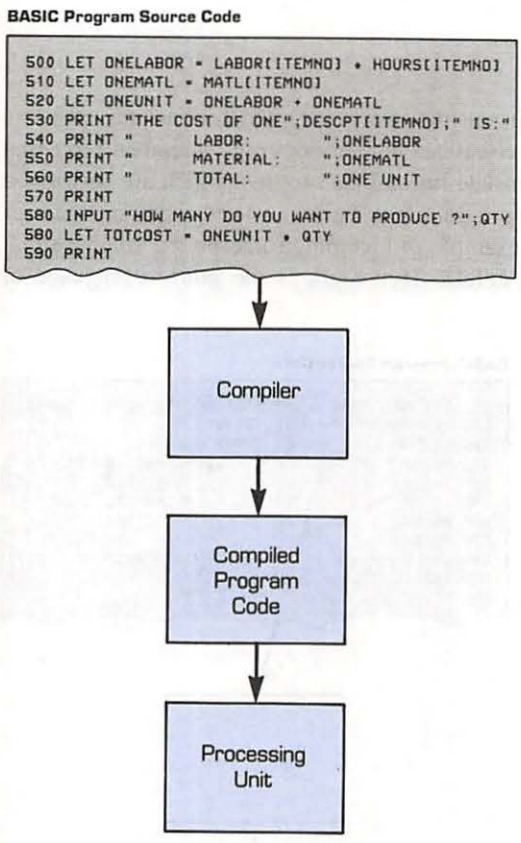


Figure 2.4
The compiler creates the compiled program, which is executed as a unit by the computer.

Unfortunately, to compile a program successfully one must eliminate all the syntax errors in the program statements. Some compilers, when an error is detected, will immediately stop the compilation process, while others generate a list of all the errors located.

Regardless, when errors are detected, you must fix each error, and again begin the compilation process. The compiler does **not** pick up where it left off or at the first error. Rather, it starts compiling the program from the beginning as if it had never seen the program before. If a syntax error is in the last line of a 5,000 line program, there is nothing to be done but fix the mistake and restart the compiler, from the first line of the program. As a result of this type of problem, compilation can be a tedious process for the novice as syntax errors are found and the compilation interrupted.

Once all the syntax problems are fixed, the programmer is still faced with debugging the program so it runs correctly and provides the users with the correct information. This can lead to more compilations as changes made in the original program, the **source code**, must then be implemented in the compiled program. This, of course, requires that the program again be compiled. If one is not careful, the addition of two or three lines to a program may result in new syntax errors, requiring more compilations, and adding to the tedium of the process.

2.7 PROGRAM DEVELOPMENT AIDS AND UTILITIES

While the programming languages form the larger part of the development software class, there are also other kinds of developmental software. These are programs that have been created to assist, simplify and speed up the development of programs. They are frequently referred to as **utility software** because they are designed to perform utilitarian tasks.

One useful development aid is the screen designer program. All the programmer has to do is place text on the computer's screen and define spaces for user-computer interactions to take place. Once this is done, the screen designer program will write the programming lines needed in the language of choice, such as BASIC. This speeds development of a program because much tedious typing can be eliminated, as well as the need to determine manually the location of text on the screen, and to write the lines of the program to place the text properly!

Another program which is frequently classified as a development aid is the **stream editor**. This type of program scans through a file and replaces all instances of a given combination of letters with a new combination of letters. For example, a stream editor can be used to change the name of a data element, or variable, throughout a complete program.

Sophisticated stream editors will let the user perform this type of operation on character combinations located in a specific part of each line. For example, you may have a file containing the results of a consumer survey. A preliminary analysis indicates that you will obtain more meaningful results if you regroup all the answers for the third question. This, let us say, requires that you change all the responses for this question which are entered as an "X" into a "Z." The responses to this question are the third character from the beginning of each line in the data. The stream editor can change all *X*s that appear in that spot to *Z*s without changing any other "X" responses found elsewhere in the survey responses.

2.8 OPERATING SYSTEM UTILITIES

An **operating system utility** is used to help you manage the operations of the computer and your information.

A typical operating system utility program is one used to make backup copies of programs, tapes, or disks. Related to this program is one that compares the original copy of a disk or tape with the backup copy to ensure the accuracy of the backup.

Other operating system utilities may be used to manage the space on disk drives or to control how the computer sends information to a printer.

There are utilities which let you recover information from damaged disks, or even to recover programs which have been erased from the disk! These types of utilities are sometimes classified as **development aids**, and are in fact in that gray area between operating system utilities and development aids.

2.9 APPLICATIONS SOFTWARE

Applications software consists of programs that have been developed to perform specific tasks. Such tasks include formatting the text of a document (i.e., word processing), computing and printing a company's payroll checks, simulating the flying of an airplane, creating monthly phone bills or credit card bills, or monitoring the refining of oil. In each case, the computer has a specific set of tasks to perform.

There are also general-purpose application programs. These programs, such as an electronic spreadsheet or database management system, have specific capabilities that can be applied to a wide variety of fields of human endeavor. The user of the general-purpose application program selects and applies those capabilities of the program that fit his or her specific needs. As mentioned earlier, some general-purpose application programs are used to create other application programs, and are, therefore, sometimes classified as development software.

EXERCISES

1. What are the three classes of software defined in the text?
2. What major purpose does systems software serve in the computing environment?
3. What is the purpose of an operating system?
4. What purpose does development software serve in the computing environment?
5. Why are some application software programs considered by some people to be development software?
6. What feature of an interpreted language contributes to slowing down the execution of a program?
7. What is an advantage of programming with an interpreted language?
8. Why will a compiled program usually execute faster than an interpreted program?
9. If you execute a bug-free interpreted program five times, how many times will the computer interpret the lines of the program?
10. If you execute a bug-free compiled program five times, how many times will the computer compile the lines of the program?
11. What is the purpose of using a program development aid?
12. What is one type of program development aid mentioned in the text, and how does it help the user?
13. What is the primary purpose of an operating system utility?
14. What purpose does applications software serve in the computing environment?
15. What are some typical software applications?

CHAPTER

USING THE FINDER



CHAPTER OBJECTIVES

Upon completion of this chapter, the student will:

- **Properly handle a Macintosh diskette.**
- **Explain the need for the Finder/Operating System.**
- **Start the Macintosh running.**
- **Explain the concept of the Macintosh Desktop.**
- **Explain the concept of an icon.**
- **Explain the concept of a folder.**
- **Move the mouse pointer on the Macintosh screen.**
- **Click the mouse button to select/highlight information on the desktop.**
- **Use the shift-click to select multiple items on the desktop.**
- **Drag (that is, move) items on the desktop.**
- **Pull down a menu and select a menu item.**
- **Explain how to use the Command Key (⌘) menu equivalents.**
- **Explain how to eject disks from a floppy disk drive.**
- **Use the menu to open or close an icon.**
- **Double-click the mouse button to open an icon.**
- **Use the close and zoom boxes on a window's title bar.**
- **Change the location of a window on the desktop.**
- **Use the size box to change the size of a window on the desktop.**
- **Use a window's horizontal and vertical scroll bars and explain why they are not always active.**
- **Initialize a new disk.**
- **Create a new folder.**
- **Rename a document or folder.**
- **Copy documents or folders between two disks.**
- **Move documents into and out of folders.**
- **Make a duplicate of an item on the same disk.**
- **Copy a complete disk.**
- **Move items to the trash to delete them from a disk.**

3.1 BEFORE YOU BEGIN—THE DISK

Before you begin work on the computer, pick up one of your Macintosh diskettes. These disks have a top and a bottom. The disk at the left in Figure 3.1 is a top view of a disk, while the one at the right is a bottom view.

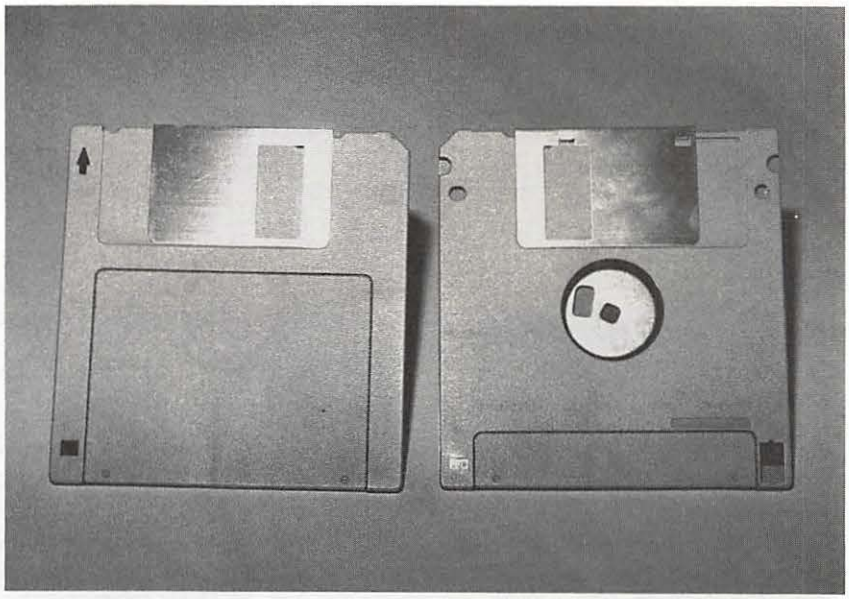


Figure 3.1
The Macintosh 3.5 inch micro-disks.

Look at the top view of the Macintosh disk. This is the label side. Program disks you purchase will have a label on this side. New disks usually do not have a label on them. There is, however, an indentation in the plastic cover of the disk to guide you for the proper placement of labels. There is also a metal slide on one end of the disk. It wraps around to the bottom side of the disk. This slide covers the disk media itself. You should avoid sliding the slide and thereby exposing the disk media, risking damage to the disk. Under no circumstances should you touch the disk media. Likewise, never affix a label onto the disk in a fashion that prevents the slide from freely moving back and forth.

The slide end is the side of the disk that is inserted into the disk drive first (Figure 3.2). On the edge of the disk is an arrow stamped in the plastic to remind you of the proper way to insert the disk into the disk drive.

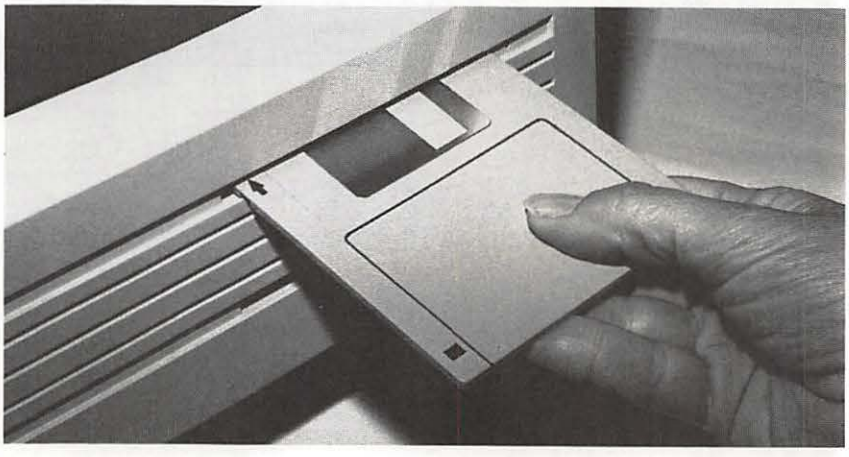


Figure 3.2
The proper way to insert a disk into a Macintosh disk drive.

Now look at the bottom view of the disk. Again, note that the metal slide is present. At the bottom right corner is the write-protect tab. With the tab in the position shown in the photograph, the tab is covering the write-protect hole and the disk is unlocked, or write enabled. This means that the existing information on the disk can be changed, new information can be added and old information removed. If the tab is moved to the opposite position, the write-protect hole will be exposed and the disk will be locked, or write protected, so that no information can be changed. When looking at a locked disk, you will be able to see through the write-protect hole in the disk cover. This is not possible with a write enabled disk. Before continuing, make sure that the disk you are going to use is write enabled.

3.2 THE PURPOSE OF AN OPERATING SYSTEM

Regardless of the purpose of the particular application or software in use, you must have a way to communicate with the computer. This is done through the computer's operating system. An operating system is a program that controls the overall operations of the computer. It accepts commands you give it and carries them out. It receives all inputs from the input devices and routes them to their destinations. It receives all outputs from the processors and routes them to their designated output devices.

For our purposes, the most important part of the operating system is the section that assists you and your programs in communicating with, and giving commands to, your computer's disk drives. Consequently, the computer's operating system is frequently referred to as a Disk Operating System, or **DOS**.

The Macintosh operating system that most users are familiar with is found in two programs on a System Disk. One part is called "System," and the other is called "Finder." The System is the Macintosh equivalent of a DOS. The Finder is a special user interface program that lets you manipulate disks and the information found on them. Technically, a boot disk needs only the System file and a program that has been installed to run automatically (such as the Finder) to be a boot disk.

For our purposes, we will define a System Start-up disk (or boot disk) to be one that contains both the System and the Finder files and thereby allows the computer to begin operations and to let you, the user, communicate with the computer. (NOTE: Depending on the version of the Macintosh System and Finder files you are using, the exact dialogs and order in which the computer presents them may differ slightly for you throughout this text. The System and Finder Files in use for this text are System Version 6.0.3.) Remember that there are exceptions to this rule. It is possible to have the System and another application program, rather than the Finder, be on a start-up disk. You will not, however, be able to load the Finder and interact with the disk if this is the case. Rather, the application program will start running when the computer boots-up.

3.3 HOW TO START THE MACINTOSH

The process of turning on your computer, loading the System, and starting the Finder executing is frequently called **booting-up** the computer. The term comes from the concept of pulling oneself up by one's bootstraps. There is a small program in the computer's Read Only Memory (**ROM**) which initiates the loading of the System file from the boot disk and starts it running.

The System, when loaded, begins execution of the Finder. In effect, the Macintosh is pulling itself up by loading the necessary programs to be able to operate. A System disk is sometimes referred to as a boot disk because it can be used to get the computer operating when it is first turned on in this fashion.

What To Do	*Why You Are Doing It*
Turn on the Macintosh. Do NOT yet insert a disk into the disk drive. After a brief pause, you will see a grey screen with a picture of a diskette in the middle. This picture will have a large question mark blinking on it. This means that the computer is waiting for a boot disk. If you are using a computer with a hard disk, the disk will soon be replaced by a smiling disk, and the computer will "boot-up."	
Insert a boot disk into one of the computer's floppy disk drives. Do this by inserting the metal slide end of the disk into the drive first, label side up (see Figure 3.2 if you are not sure), then pushing in the disk until it is grabbed by the disk drive and disappears completely into the disk drive. **Under no circumstances should you force a disk into a disk drive**. It should enter the computer's disk drive with a gentle push.	You are booting-up the computer.

If you have two or more floppy disk drives attached to your Macintosh, you may insert the boot disk into any drive. The computer will boot from a system disk regardless of which disk drive you put it in, the Macintosh does not care. However, it is best to boot from the computer's internal drive (if it has one built-in disk drive and one attached by a cable), or from the lower internal drive (if it has two built-in disk drives).

If the Macintosh you are using has a hard disk, it is most likely that the necessary System and Finder files are already on the hard disk. After the hard disk reaches its necessary rate of spin, the Macintosh will automatically boot-up, you will not have to insert any disk. However, if you do insert a disk into the floppy drive before the hard disk is ready, the Macintosh will boot from the floppy disk rather than the hard disk. This is important. There may be times when you will want to take advantage of particular resources found in the System file of a floppy disk (you will see in the next chapter that the type fonts available to you, and special programs called DAs, are attached to the System file on the start-up disk), but you do not want to load them permanently onto your hard disk.

Once the Macintosh has loaded the operating system (the System file from the boot disk), it starts executing the program called the Finder. The Finder is a special program that allows the user to interact with the Macintosh desktop. It is possible, using a special menu option, to tell the Macintosh to start a different program, rather than the Finder. This is sometimes the case with commercially distributed software, which are common instances of when the start-up disk contains the System file and a second program other than the Finder.

3.4 THE DESKTOP AND ICONS

You, the user of the Macintosh, are able to interact with the computer by manipulating objects you see on the computer's display using the mouse. The Macintosh's screen display is usually called the desktop. The analogy that is being created is that when you work with the Macintosh, you will work as you normally would at a desk. At your traditional desk or work area you have a trash can for things you want to dispose of, and a filing system or drawers for things you want to keep. You have file folders for keeping documents organized, and information is either put away in a folder or drawer, or it is sitting open on your desk top.

The same is true of the Macintosh. Look at Figures 3.3 and 3.4. These are the Macintosh desktop after the computer has completed the boot-up process. At the top right of each is a drawing of a disk. This drawing is called an **icon**. Icons are graphic representations of objects on your desktop. This particular one represents your information storage system, the disk drive. If you are trying to think of the equivalent item in your traditional office, then the disk icon can be thought of as either a desk drawer, or better than that, a file cabinet. In Figure 3.3 the disk is a micro-floppy, and in Figure 3.4 the disk is a hard disk.

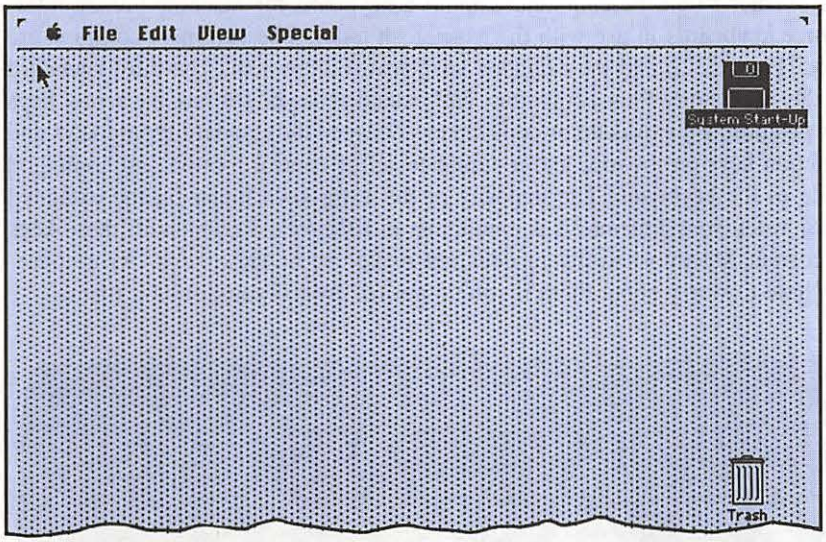


Figure 3.3
The Macintosh desktop after you boot with a floppy disk. Notice the icon of the floppy disk at the top right corner of the display.

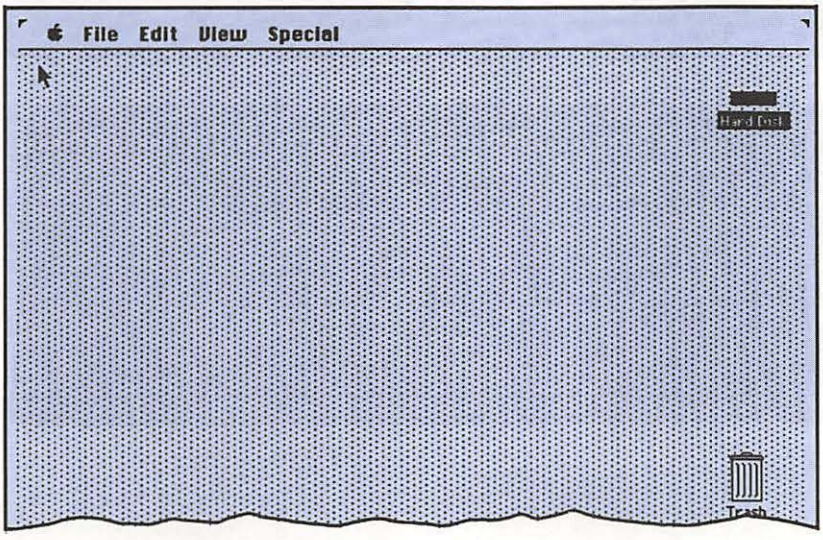


Figure 3.4
The Macintosh desktop after you boot with a hard disk. Notice the icon of the hard disk at the top right corner of the display.

Other icons will appear on your desktop over time to represent other aspects of the Macintosh/human interface. For example, another icon presently on the desktop is a trash can at the bottom right. Things you no longer want to keep on your disk are moved to the trash can to be disposed of. When you have created a document with the word processing program, the stored document, sometimes called a **file**, will appear as an icon on the desktop.

As you continue to use the Macintosh, you will see that *everything* related to it is in some way graphically represented through an icon. Every application program has a distinct icon, as does every data file created by that program. These icons, and manipulating them with the mouse, form the core of all Macintosh activities.

The final major feature that you will see appear on the desktop are windows. These are viewports into a disk or document. They can be moved around on the desktop, as well as have their size changed. More will be discussed about windows when you have some open on your Macintosh desktop.

The mouse is the main tool you have for working with the icons and information on the Macintosh desktop. It is sometimes called a pointing device, because that is what you do with it. Notice the arrow near the top left corner of the desktop. This is the mouse pointer. The movements of the physical mouse on the desktop will move the mouse pointer on the Macintosh desktop. You will spend much time later in this chapter becoming more familiar with the mouse and its operation.

Of course, no computer would be complete without a keyboard for machine/human interactions. There are three keyboards in use with the Macintosh today. The two most common are the standard keyboard (Figure 3.5) and the extended keyboard (Figure 3.6). The third keyboard is found in use on the Macintosh Plus computer. The extended keyboard has its arrow keys located in a different position, six extra cursor control keys between the standard typing keys and the number pad, function keys on the top, and a duplicate set of control, option and command keys on the right side of the keyboard. The majority of the extra keys found on the extended keyboard are there for when your Macintosh is emulating an IBM-PC, on which all these keys are standard. Most current Macintosh software does not make use of these keys. As a consequence, you will not have to worry about them if you do not (or even if you do) have them.



Figure 3.5
The Standard Macintosh keyboard.



Figure 3.6
The Extended Macintosh keyboard.

3.5 EXPLORING THE DESKTOP

On the desktop you presently can see the disk icon representing your start-up disk. The name of your start-up disk may be different than that shown in Figures 3.3 or 3.4. If you have a Macintosh with a hard disk, the actual shape of the icon as well as the name of the disk may be different than what is seen in Figure 3.4 (Different hard disk manufacturers each use a different icon to represent their brand of hardware on the desktop.). It is also possible for the disk icon to be open. Thus, the icon itself will have a totally different appearance, and a window will be open on the screen displaying the contents of the disk (Figure 3.7). You should also have a trash can at the bottom right of the desktop. This is a good, out of the way, area of the desk.

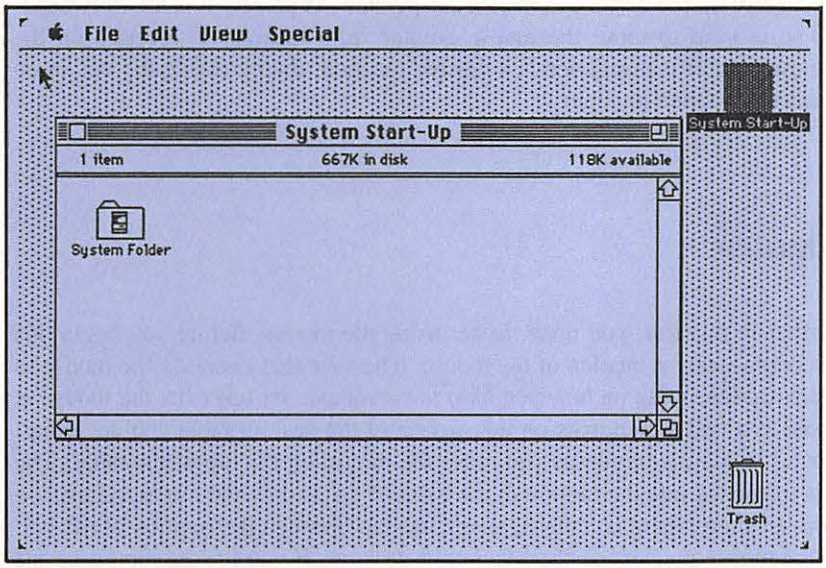


Figure 3.7
The Macintosh desktop after you boot with a floppy disk. This disk is open. Notice the appearance of the icon of the open floppy disk at the top right corner of the display. This is called a hollow icon.

Notice that there is a difference between the icon for an open disk and the icon for a closed disk. The closed disk icon has lines drawn on it so that it looks like a disk. The open disk icon is shaded in appearance. This will be true of other icons that can be open or closed while sitting on the desktop. Closed icons are clear diagrams of the item, open icons are shaded outlines of the item.

Look at Figure 3.8. Notice that this desktop has located on it two disk icons. This was accomplished by placing a disk into each of the two floppy disk drives attached to the Macintosh. The top disk is white, while the bottom one is black, or in inverse. The bottom disk is the currently **selected** disk because it is displayed in inverse. If an action that effects a disk is taken, such as an open or disk eject command, then the selected disk is the one effected. The unselected disk will remain unchanged in the computer's disk drive.

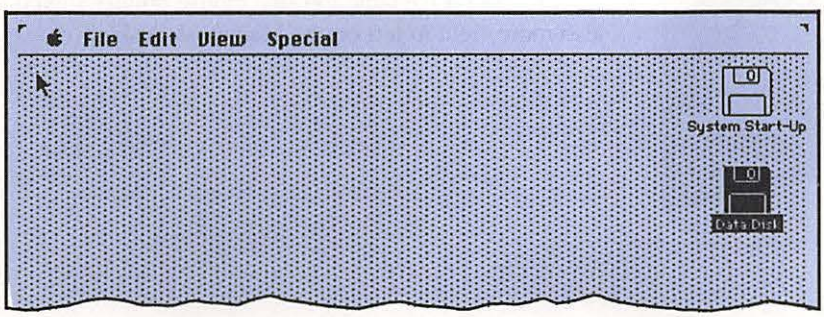


Figure 3.8
The disk called "System Start-Up" is de-selected, while the disk called "Data Disk" has been selected. Disks, or text, that have been selected will appear in inverse on the Macintosh display.

Figure 3.9
The Macintosh Mouse



As you work with the Macintosh, you will see that any selected item will be highlighted in a fashion similar to the way the lower disk is in Figure 3.8. **If an item, such as an icon on the desktop, a word with a word processor, or a group of cells with a spreadsheet, is selected, it will be displayed in inverse.** If the item is not selected, it will appear in its normal display mode.

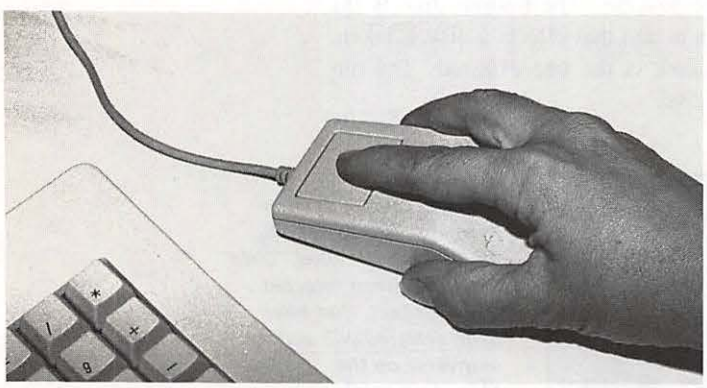
There are two other items to notice on the desktop. Across the top of the Macintosh desktop is a list of words. At the left of this list is a miniature icon of the Apple logo. This list is the menu bar. The Apple logo is a special menu item and will be discussed in more detail later in the text when Desk Accessories are discussed. Depending on what you are doing at any given moment, the word options displayed on the menu bar vary. That is, when you are using a program, such as a word processing program, the menu bar will include different, and probably more, options than the ones you see displayed by the Finder. More will be said about how to select items from the menu bar a little bit later in this chapter.

The final item to observe on the desktop is the mouse pointer. At present it is an arrowhead. The mouse (Figure 3.9) is used to move the mouse pointer from location to location on the desktop. When the mouse pointer is positioned at a desired location, then pressing the button on the mouse itself will cause an action to occur.

3.6 USING THE MOUSE

Before you go any further in this text, you must master using the mouse. Before you begin this process, note the correct physical orientation of the mouse. The wire that connects the mouse to the computer (or keyboard, depending on how you have the computer set up) exits the mouse at its top. Inside the mouse is a ball which rests on the surface of the desk or table you are using. This ball is rolled around inside the mouse as you move the mouse on the top of the table. The motion of the mouse is translated into the motion of the ball and tracked by the mouse pointer on the computer's desktop. In short, there is a physical relationship between the rotation of the ball and the movement of the mouse pointer on the Macintosh desktop. If you lift the mouse up off the surface of the table, the mouse pointer will no longer move on the computer's desktop because the ball will not be turning as you move the mouse. If you run out of room on the surface of your table to complete a movement of the mouse, it is OK to lift the mouse, move it in the air, return the mouse to the table top, and then continue moving the mouse to move the mouse pointer. Because you can lift the mouse off the table top and re-position it, the mouse does not require a large amount of space on your table top. You simply lift it up, re-position it, then return it to the table surface to continue the motion of the mouse pointer.

Figure 3.10
The proper way to hold the Mouse.



When you hold the mouse, you should hold it with the connecting wire exiting the mouse away from you (Figure 3.10). Your index finger will then be in position to press the mouse button. The motion of the mouse pointer on the screen will match the motion of the mouse on the table surface. If you move the mouse right to left on the table top, the mouse pointer should also move right to left on the Macintosh desktop.

It is important to keep in mind that the motion of the mouse pointer will be relative to the top of the mouse where the wire exits to attach the mouse to the computer, and not necessarily relative to the computer itself. For example, if you hold the mouse with its top at a 45-degree angle to the base of the computer (this being a comfortable way to hold the mouse without the need to twist your hand at the wrist), and then move it left and right parallel to the base of the computer, the mouse pointer will move at a diagonal on the Macintosh's desktop (Figure 3.11).

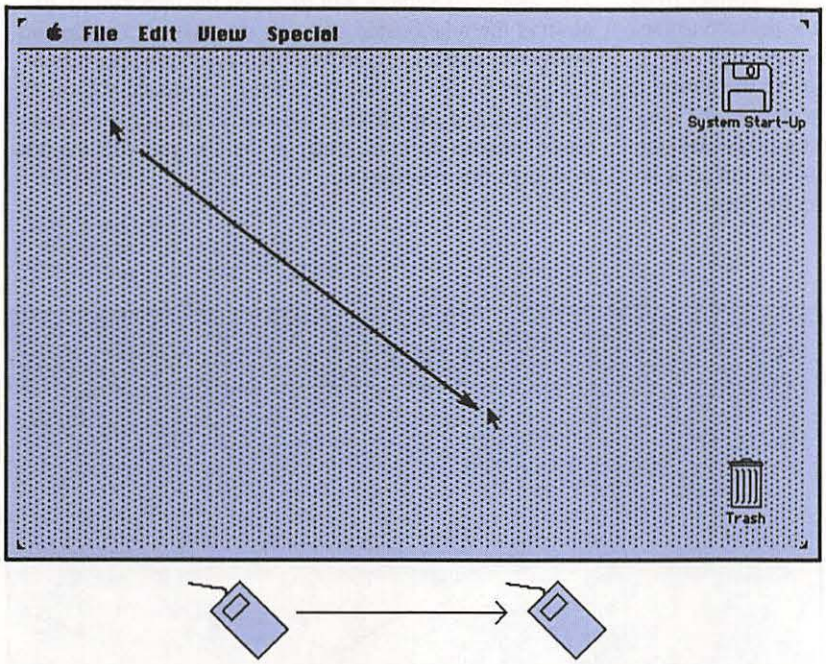


Figure 3.11
Moving the mouse when it is held at an angle will cause the mouse pointer to move at a diagonal.

In a similar fashion, if the mouse is held so that its top is parallel to the base of the computer and again moved left to right, the mouse pointer will move on a horizontal line across the desktop (Figure 3.12).

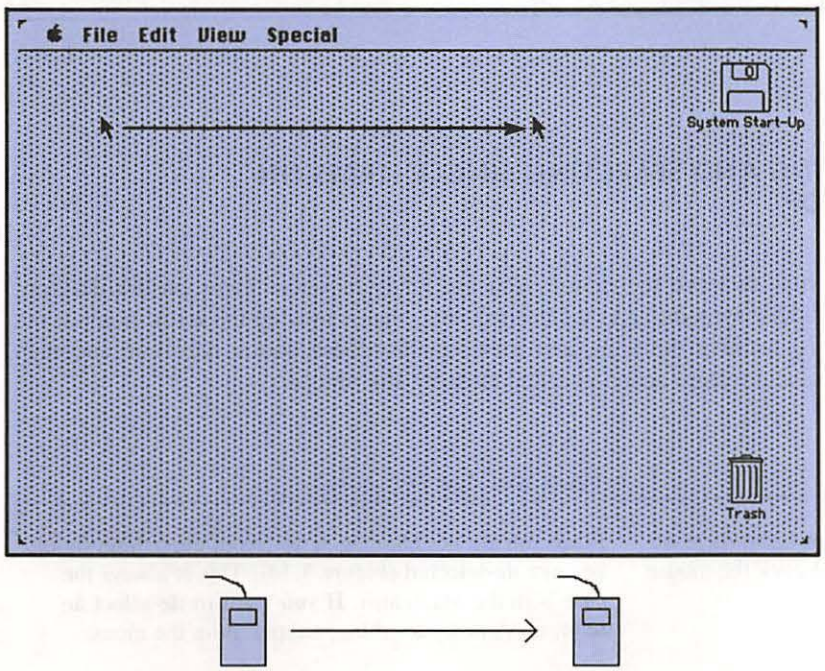


Figure 3.12
Moving the mouse when it is held straight will move the mouse pointer where you want it to go!

When you first turned on the Macintosh, if you did not touch anything, the mouse pointer appeared at the top left corner of the desktop. Take a moment now to try moving the mouse pointer on the desktop.

What To Do	*Why You Are Doing It*
Start by moving the mouse pointer from the top left corner of the desktop to the trash can icon at the bottom right of the desktop. From there, move the mouse to the disk icon at the top right of the desktop. Complete the circuit of the desktop by moving the mouse to the left so it is pointing to the apple on the menu bar (Figure 3.13).	This mouse movement will give you the opportunity to observe the relationship between the physical mouse and the mouse pointer on the Macintosh desktop. Be sure to get a feel for the relation between the distance you move the mouse and the distance the mouse pointer travels on the Macintosh desktop. Later in the text you will see how to change this relationship.

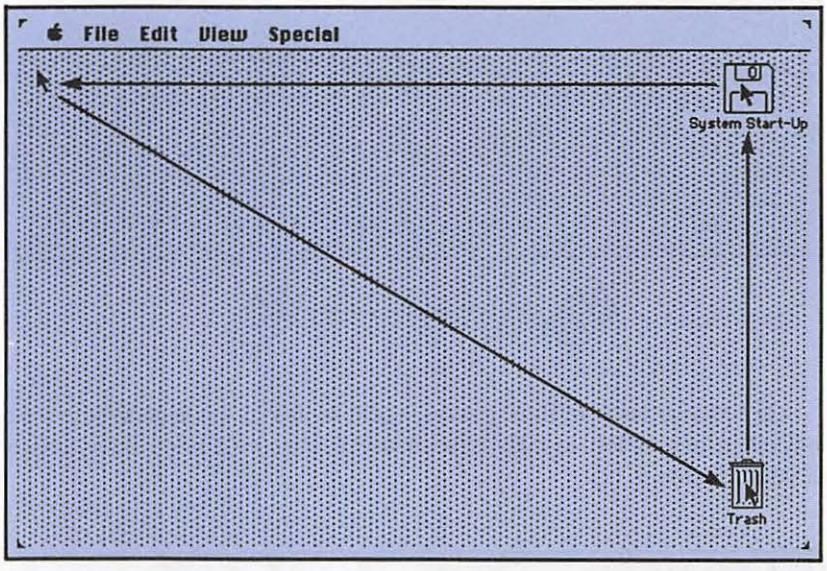


Figure 3.13
This is the path you should follow as your are moving the mouse.

3.7 DE-SELECTING AND SELECTING SINGLE ITEMS ON THE DESKTOP

Now that you know how to move the mouse, you are ready to select items on the desktop. Selection of an icon is done by pointing to the desired item, that is moving the arrow point of the mouse pointer so it is touching the item, and pressing the mouse button one time and then releasing it. This press and release action is called **clicking the mouse**.

What To Do	*Why You Are Doing It*
Place the mouse pointer somewhere on the desktop pattern and click the mouse button once.	Since you are not pointing at any icon, everything should become **de-selected** (Figure 3.14). This is always the case with the Macintosh. **If you want to de-select an icon**, or virtually anything, simply move the mouse

pointer to a different location on the desktop or within the current window and click the mouse button once.

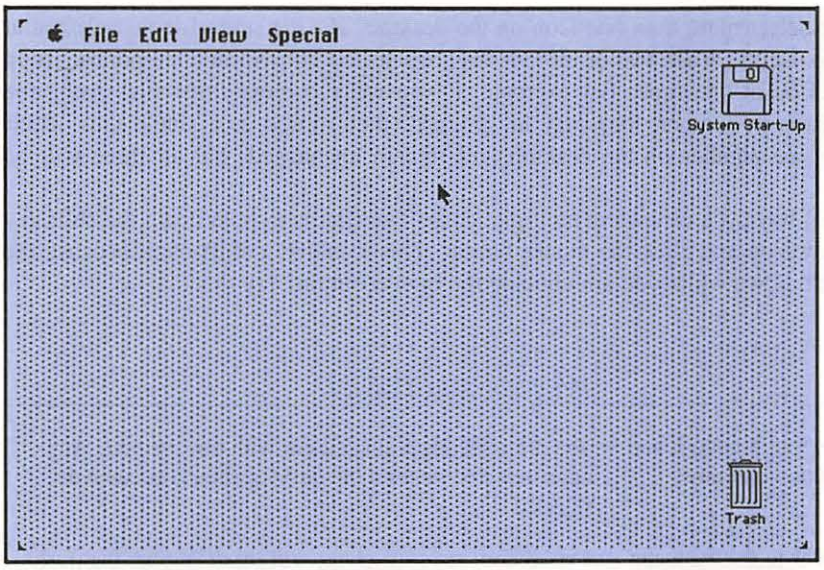


Figure 3.14
By clicking the mouse in the middle of the desktop pattern, everything on the desktop is de-selected.

Move the mouse pointer so that its point is touching the trash can, then click the mouse (Figure 3.15).

Select, the trash can icon. This method of selecting icons (pointing at one then clicking the mouse) causes only one icon to be selected at any given time.

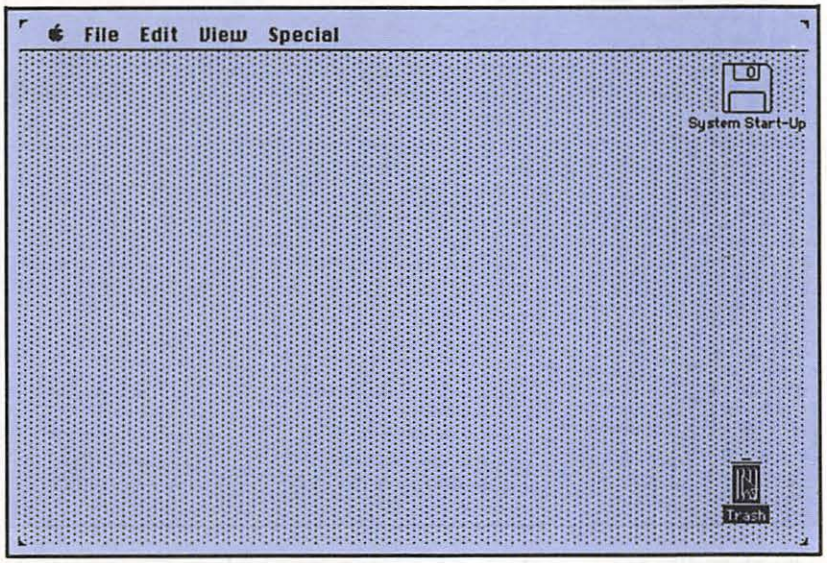


Figure 3.15
With the mouse pointer on the trash can, clicking the mouse button once will select the trash can. If something else had been selected, it would have been de-selected by this action.

Now select the disk icon at the top right corner of the desktop. Start by moving the mouse pointer so that it is touching the icon, then click the mouse button one time.

The disk icon will become selected. When you selected the disk icon, the trash can icon became de-selected. In fact, **any other icon on the desktop would have become de-selected.** As stated above, this method of selecting icons causes only one to be selected at any given moment.

3.8 SELECTING MULTIPLE ICONS ON THE DESKTOP

It is also possible to select more than one icon on the desktop. Having several icons selected at the same time can be useful. When two or more icons are selected, they form a temporary group that can be operated on at one time. For example, if you want to move three files from one location on the desktop to another, they may be grouped, then moved as a single unit. Their positions relative to one another on the desktop will remain unchanged, but all three will be moved at once.

There are several ways you can select multiple icons. The first is to hold down the shift key as you point to a new icon and click the mouse button. This is called a **shift-click** because the shift key is being held down while you are clicking the mouse button. Try this.

What To Do	*Why You Are Doing It*
Select the disk icon by pointing to it and clicking the mouse button one time.	You are selecting a single item with this method. Any other selected item on the desktop should become de-selected.
Move the mouse pointer to the trash can icon. Before you click the mouse button, press and hold down the shift key on the Macintosh keyboard. While holding down the shift key, click the mouse button again.	This action, the shift-click, will result in both the trash can and disk icons being selected (Figure 3.16).

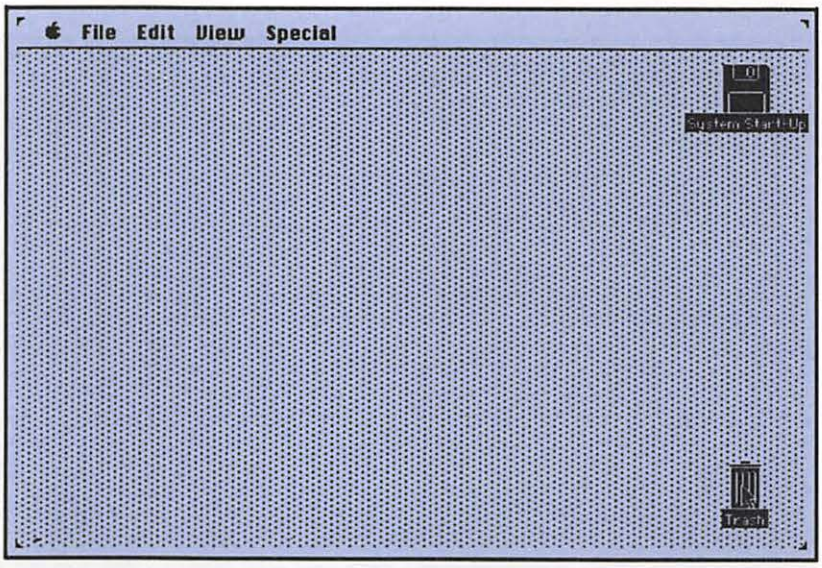


Figure 3.16
When using the shift-click, a previously selected item will remain selected. Thus, multiple items can be selected on the desktop.

You may also use the shift-click to selectively de-select icons. If multiple icons are selected, and you want to de-select only one, shift-click the icon you want to de-select. The other icons will remain selected!

Another method of selecting multiple icons does not involve the keyboard, but only the mouse. To use the mouse for this purpose you must move it with the mouse button depressed. Moving the mouse with the mouse button held down is called **dragging** the mouse. If you are moving the mouse without the mouse button held down you are **not** dragging it, but simply moving it! The term "drag" is always used to indicate that the mouse button is depressed while moving the mouse. When you use the mouse to move something on the desktop, you are dragging the icon with the mouse.

Dragging the mouse to select multiple icons is a simple process. You start by positioning the mouse pointer above (or below) and to the left (or right, it really does not matter) of one of the icons to be selected. Then you push and hold the mouse button. While holding the mouse button, you drag the mouse pointer. This will create a box on the Desktop. Any icon touched or enclosed by the box when the mouse button is released will become selected. Try selecting both the disk and trash icons with this method.

What To Do	*Why You Are Doing It*
Place the mouse pointer above and to the left of the disk icon.	This positions the mouse pointer for the beginning of the selection process.
Push and hold the mouse button.	When you do this, anything that was selected on the desktop will become de-selected. This is alright.
With the mouse button still pressed, drag the mouse pointer down toward the bottom of the desktop.	As you drag the mouse, you will notice that the outline of a rectangle will begin to form on the desktop (the left half of Figure 3.17). One corner of the box is anchored at the location where you started the mouse movement. The other corner corresponds to the current location of the mouse pointer. You want to create a rectangle that touches all the icons you want to select.
Continue dragging the mouse until the box touches or encloses both the disk and trash can icons (the right half of Figure 3.17).	

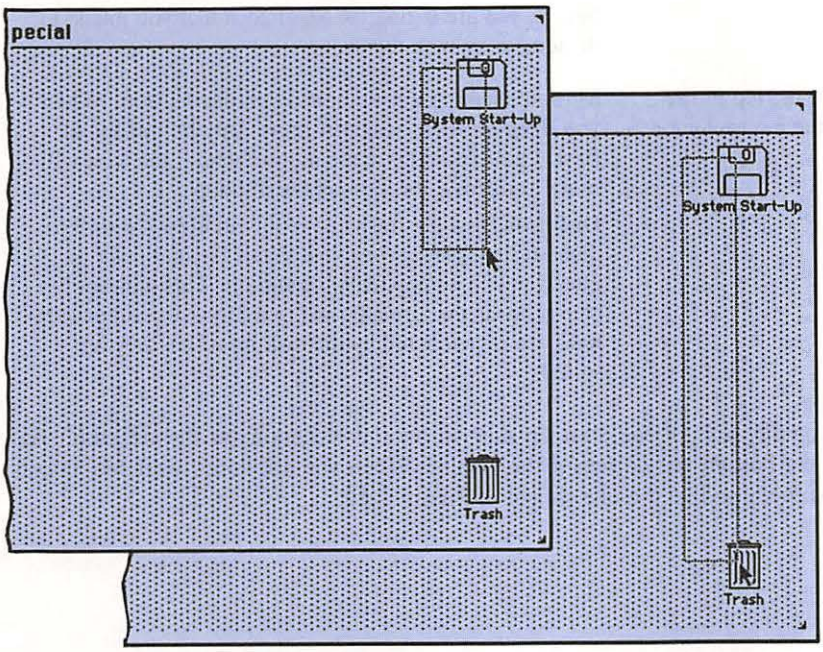


Figure 3.17
The left portion of this figure shows the beginning of the selection box being formed as the mouse is dragged. Continue dragging your mouse so that the selection box touches both icons on your desktop, as shown on the right side of the figure.

Now release the mouse button.	Both the disk and trash can icons will become selected.

As you use the Macintosh, you will discover that you will use both of these two methods of multiple icon selection. Unfortunately, the desired icons sometimes have other, un-desired icons in between. The dragging mouse method will select the un-desired icons, and you must use the shift-click method. Recall, that the shift-click method can also selectively de-select icons from a group of selected icons. That is, if you have selected five icons on the desktop, and want only four of the five, hold down the shift key and click the mouse pointer on the icon you want to de-select. That one icon will become de-selected, while the remaining four will stay selected.

3.9 DRAGGING (MOVING) ITEMS ON THE DESKTOP

Now that you know how to drag the mouse, it is a simple process to learn how to drag an icon on the desktop to change its position.

To drag an icon, point to it, then press and hold the mouse button, then drag the mouse. An outline of the icon will move with the mouse pointer. When you release the mouse button, the icon itself will move to the new position on the desktop.

Try this by dragging the trash can icon to the top of the desktop.

What To Do	*Why You Are Doing It*
Place the mouse pointer on the trash can.	Position the mouse in preparation to moving the icon.
Press and hold the mouse button.	"Grab" the trash can icon. The click will cause it to become selected. Since you have not let go of the mouse button, you are telling the Macintosh that you intend to do something with this icon.
Drag the mouse toward the top of the desktop, then release the mouse button (Figure 3.18).	Move the icon to a new location on the desktop. **When you drag an icon, you will move only its outline at first.** Once you release the mouse button, the icon will move to the new location on the desktop. Disk icons and the trash can icon will always return to their starting place when you restart the computer, or after you exit an application program. This will not be true of icons that are attached to a disk, since their locations are remembered by the disk on which they are stored.

You can also drag the icon of the start-up disk to another location on the desktop. Try dragging this icon to the bottom left corner of the display. When you are done, your Macintosh desktop should look something like the one shown in Figure 3.19.

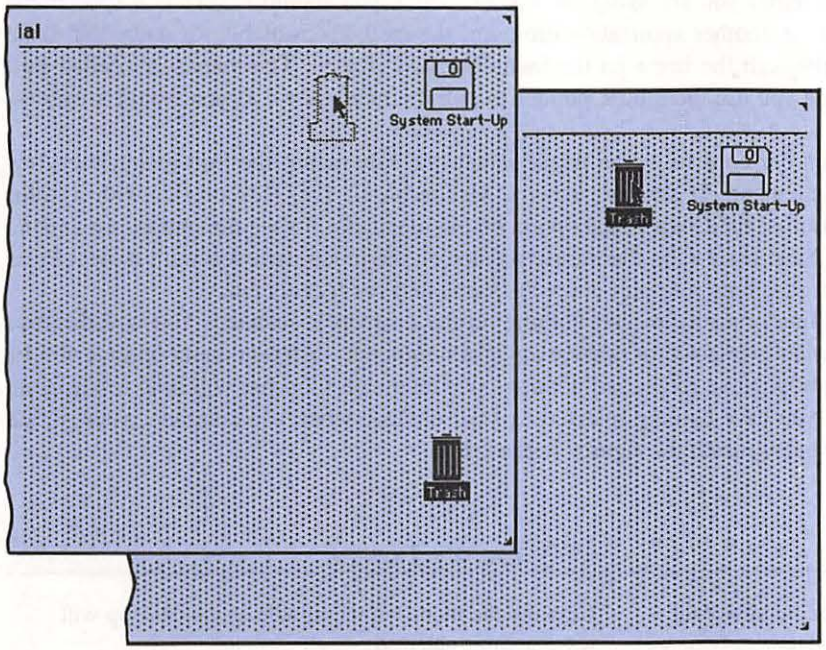


Figure 3.18
The trash can, which is the selected icon, is being moved. Note that when moving the icon, only its outline is moved while you are holding the mouse button down. The icon itself moves when the mouse button is released.

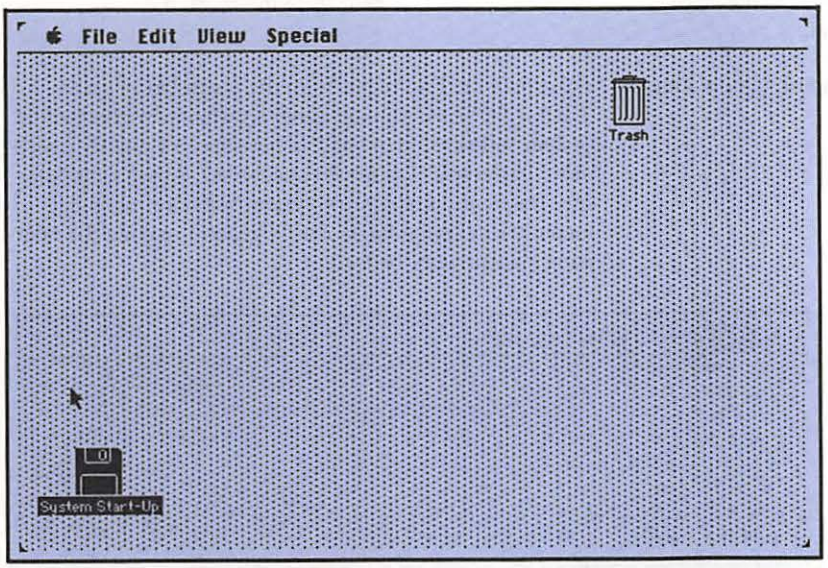


Figure 3.19
The icon of the start-up disk has been moved to the lower left corner of the display.

3.10 USING THE MENU BAR

The menu bar is located on the top of the display. Virtually every Macintosh program has a menu bar also appearing at the top of the desktop. The menu bar is used to select various options as you are using an application program.

Regardless of whether you are using the Finder, which you should realize is a specialized application program, or another application program, the methods available for using the menu bar never change, although the items on the menu bar will change. The menus are called **pull down menus** because you use the mouse pointer to pull the menu down as you would a window shade.

The Finder menu bar consists of the Apple menu, the File menu, the Edit menu, the View menu and the Special menu. If you are using a Macintosh II, IIx, IIcx or IIci with a color monitor, you may also see the Color menu option on the menu bar. To see the options on a menu is a simple process. Start by placing the mouse pointer on the menu item you want to see. Press and hold down the mouse button to pull down the menu and see its contents.

Before you continue, make sure that nothing on the desktop is selected. You will discover that, depending on what is selected or open at any given moment, different menu options will be available. By having nothing selected, and nothing open on the desktop you will have fewer menu options available. If you have nothing selected on your desktop when you continue, your screen and menus should closely match the figures in the text.

What To Do	*Why You Are Doing It*
Place the mouse in the middle of the desktop and click it once.	Clicking the mouse in the middle of the desktop will leave nothing selected.
Move the mouse pointer to the word FILE on the menu bar.	Prepare to select an item from the menu bar.
Press and hold the mouse button without dragging the mouse.	Pull down the File menu from the menu bar (Figure 3.20). (NOTE: If you are using a different version of the system software, then your menus may not exactly match those in the text. Do not be concerned. Apple Computer Inc. frequently updates the system software, changing menu items, fixing bugs, and in general making the operating system work better.)

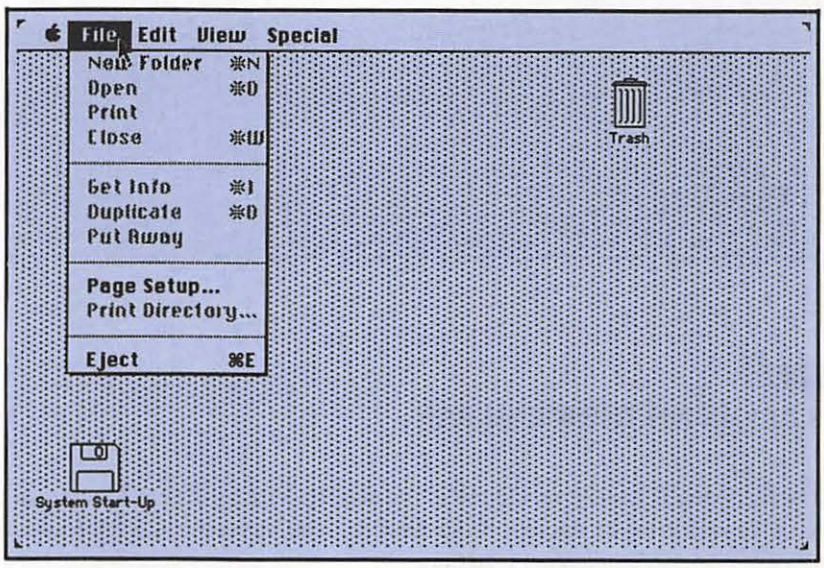


Figure 3.20
The Finder's File menu as it appears when you have nothing selected on your desktop.

This type of menu is called a **pull down menu**, because the menu appears to be pulled down from the top of the screen. You have just pulled down the file menu.

Note that most of the items on the File menu appear to be "faded," while only two, Page Setup and Eject, are completely black. Because you have nothing selected on the desktop at this time, the Macintosh realizes that most of the menu options available on the File menu would have nothing on which to operate. Thus, most of the File menu items are unavailable at this time. These faded out items are called **dimmed**. Dimmed items cannot be selected.

The two menu items that are currently available are Page Setup, which lets you tell the computer how it is supposed to talk to the printer, and Eject, which lets you remove the disk from the disk drive.

Keep the mouse button pressed. Drag the mouse pointer right to the word EDIT.

The File menu will disappear and the Edit menu will now be the pulled down menu (Figure 3.21).

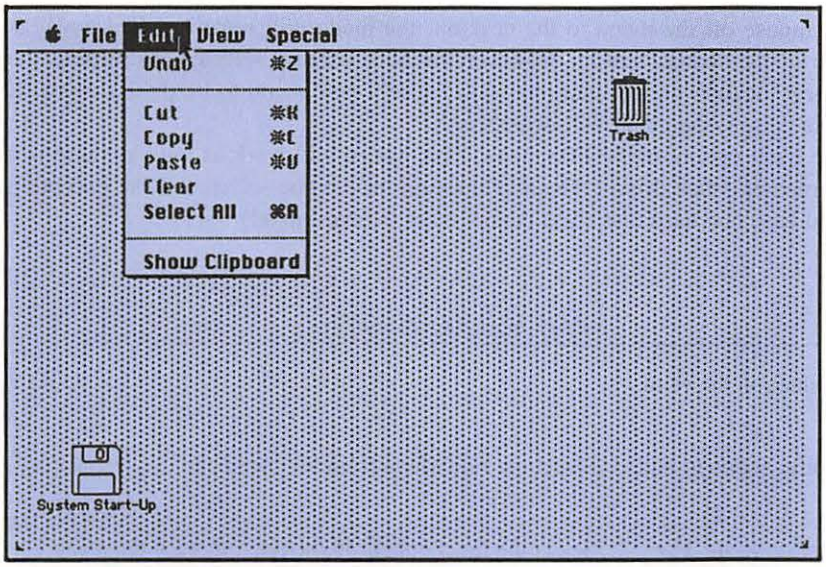


Figure 3.21
The Finder's Edit menu.

Drag the mouse pointer left back to the File menu.

Once again the file menu will be pulled down.

Release the mouse button.

The File menu will disappear from the desktop.

By releasing the mouse button with the mouse pointer in the menu bar, no menu item will be selected, and thus no action will be taken. You could also have moved the mouse pointer completely out of the menu onto the desktop to release the button without selecting an action.

In the above exercise, you dragged the mouse pointer across the menu bar with the mouse button depressed. You saw that as the mouse pointer moved from one menu name to the next, the menu that was pulled down changed. You do not have to start at the File menu and drag the mouse pointer across the menu bar to select a different menu option. For example, to see the items on the Special menu, place the mouse pointer on the word Special in the menu bar and press the mouse button. The Special menu will be pulled down.

3.11 PICKING MENU ITEMS

Now that you know how to pull down a menu, you are ready to use some of the options on the various Finder menus. Every application program creates its own menu bar. The Finder, being an application, has its own menu bar like any other application program.

To select an option from a pull down menu, start by moving the mouse pointer to the menu name and pressing the mouse button. This will pull down the menu. With the mouse button held down, drag the mouse pointer down toward the bottom of the screen so that it passes over the options on the pulled down menu. As the mouse pointer passes over dimmed menu items, nothing will happen. However, when it reaches an available item, that item will become selected. The highlight in this instance is called the **selection bar**. Once an item is selected, all you need do is release the mouse button. The selected menu option will activate.

On the other hand, if you continue to drag the mouse to the next menu item without releasing the mouse button, the selection bar will change with the location of the mouse pointer. Thus if you miss the desired menu item, simply move the mouse pointer back up the menu list to the desired item.

If you move the mouse off the menu to the desktop, the menu will remain pulled down as long as you hold down the mouse button. However, nothing will be selected. Returning the mouse pointer to a new location on the menu bar will cause a new menu to be pulled down. If you release the mouse button, the menu will disappear.

Try selecting the Eject option on the File menu. This option will work as long as there is a disk in one of the computer's disk drives. The disk does not have to be selected. (The exception is if the only disk you have is a hard disk. You cannot eject the hard disk!)

What To Do	*Why You Are Doing It*
Position the mouse pointer on the word File in the menu bar.	
Press and hold the mouse button to pull down the File menu.	Select the File Menu from the menu bar.
Drag the mouse pointer down the File menu to the word **Eject** at the bottom of the menu.	Select the Eject option. Remember, to keep the menu pulled down you must keep the mouse button pressed.
With the selection bar on the Eject option (Figure 3.22), release the mouse button.	After some brief activity on the disk, the Macintosh will eject it from the disk drive. The Macintosh is updating the portion of the disk that tells it which icons are open and where they are located on the desktop. This will happen with **any** disk that you eject.

Notice that when you ejected the disk, its icon on the desktop became dimmed. This tells you that the Macintosh remembers that the disk exists, but that it is not available because it has been ejected from the disk drive.

Remember that the technique used to pull down menus and select menu options is a constant, regardless of which Macintosh program you may be using. The menu options might change, but the method for using a menu remains the same.

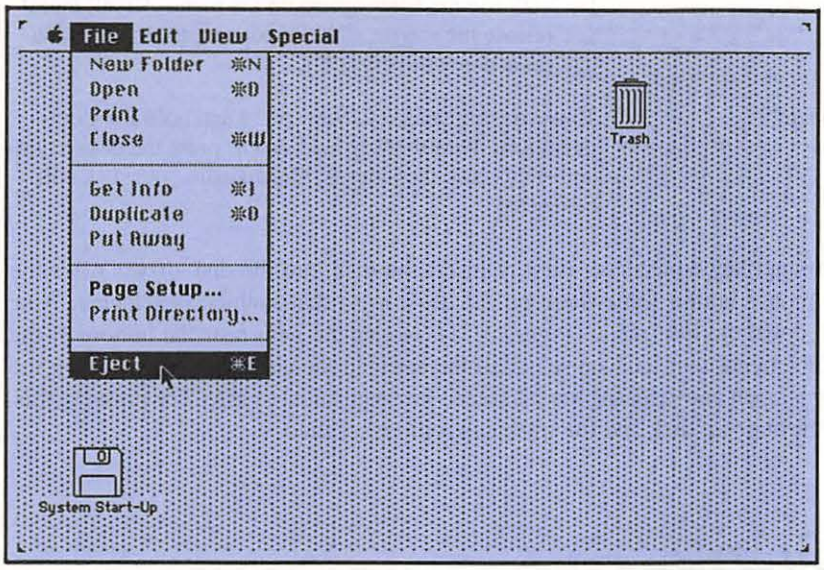


Figure 3.22
Using the mouse to select the Eject option on the File menu.

3.12 COMMAND KEY MENU EQUIVALENTS

Figure 3.23
The Command Key symbol.



When you pull down some menus you should notice that some of the menu options have a symbol and letter to their right, while others do not. For example, you can see that this is the case on the File and Edit menus for many of the options. They do not exist at all on the View or Special menu. This symbol (Figure 3.23), which looks somewhat like a four-leaf clover, is called the Command Key symbol. If you look at your Macintosh's keyboard, you will see this symbol on a key next to the space bar. This key is called the Command Key. Remember that there are different Macintosh keyboards. If you are using the standard keyboard you will find only one Command Key, to the left of the space bar. There is an extra key separating it from the space bar, the tilde (~)/accent grave (') key. If you are using the extended keyboard you will find two Command Keys, one on each side of the space bar. They are interchangeable.

The Command Key works in conjunction with other keys on the computer's keyboard. They are keyboard short-cuts to many menu commands. With them, you can execute a menu command without having to move your hands from the keyboard to the mouse. For the practiced Macintosh user, this makes using the functions of many program even easier.

To use one of these menu short-cuts, you hold down the Command Key, and **while you are holding it down**, press the letter for the desired option.

What To Do	*Why You Are Doing It*
Push the disk you just ejected from the disk drive back into the same disk drive.	The disk icon on the desktop will become selected. Since the disk is back in the disk drive, it will no longer be dimmed.
Pull down the File menu.	Notice that next to the Eject option is the symbol for Command-E, ⌘E. This means that you do not have to pull down the File menu and drag the mouse pointer down to the Eject option to retrieve your disk from the computer. All you need to do is hold down the Command Key and press the letter E.

Release the mouse button.	Do NOT use the Eject option on the menu. Recall that if you release the mouse with the pointer still in the menu bar, no action will be taken.
Press ⌘E on the keyboard.	To use a command key letter, press and hold the Command Key. With this key held down, press the desired letter, in this case the letter E. Once again, your disk will be ejected.

Try another command key equivalent. First re-insert the disk into the disk drive. After the disk stops, click the mouse button somewhere on the desktop so that nothing is selected. Now use the mouse to pull down the Edit menu (Figure 3.21). Notice the item near the bottom of the menu—Select All. This menu item lets you select all the icons in the current window, or on the desktop if no window is open and selected. Its command key equivalent is ⌘A. Try pressing this command key. Both the start-up disk and the trash can will be selected.

3.13 MORE WAYS TO EJECT A DISK

You now know two ways to tell the Macintosh to eject a disk from the disk drive. They are essentially the same, since they both make use of the same option found on the File menu. Select the disk with the mouse pointer, then use the Eject command on the File menu.

There is another way to eject a disk. You may eject the disk in the internal disk drive by holding the command and shift keys, and pressing the numeral 1. The disk in the external Macintosh disk drive is ejected with command-shift-2. If you are using a Macintosh with two built-in disk drives, the internal disk drive is the one on the bottom, while the "external" disk drive is the one on the top!

The above methods, as you will see when you use them, all leave the disk icon on the desktop. The Macintosh will therefore remember that the disk exists. This is an advantage if you want to copy items from one disk to another when you have only a single disk drive. The computer will automatically eject a disk and ask for another when it is needed.

You may also eject a disk by dragging its icon to the trash can. When you do this, after the disk is ejected, its icon will disappear from the desktop. This means that the Macintosh no longer knows that the disk exists. If you are not expecting to make further use of a disk during a work session, this is the preferred method of getting your disk out of the computer. If you leave the disk's icon on the desktop, it is possible to do something that will cause the computer to want it back. For example, if you eject a disk containing an open window, then you close the window and finally start a program running found on a second disk, the Macintosh will want the ejected disk back to update the status of the window you closed.

There is, of course, a small exception to the rule of how you may eject disks. You cannot "trash" a start-up disk to eject it. The disk will be ejected, but its dimmed icon will remain on the desktop. The Macintosh needs to remember the start-up disk at all times. After you have more disks in the computer, you can try ejecting a disk by dragging its icon to the trash.

If you are using a shared computer, "trashing" the disk is the preferred way of removing a disk before you leave the machine. This way, the computer has forgotten about the disk and will not ask for it back when the next user attempts to do something with the computer.

3.14 MORE USES OF THE FILE MENU

So far we have been working with closed icons on the Macintosh desktop. To locate application programs on disks we must open up the disk. Recall the analogy that the disk icon represents a file cabinet in an office. To use a document stored in the file cabinet, the cabinet must first be opened so that the document can be located. The same is true of the disk icon. It must be opened so that we can find application programs stored on the disk.

There is more than one way to open an icon. First, try opening the disk icon by using the File menu.

What To Do	*Why You Are Doing It*
Select the disk icon on the desktop by pointing to it and clicking the mouse button once.	You are selecting this icon because this is the one you want to work with at this time.
Pull down the File menu.	One of the commands on the File menu is Open. Notice that the Open command also has a command key equivalent, ⌘O.
Use the mouse pointer to select the Open command (Figure 3.24).	You want the Macintosh to Open the currently selected item on the desktop.

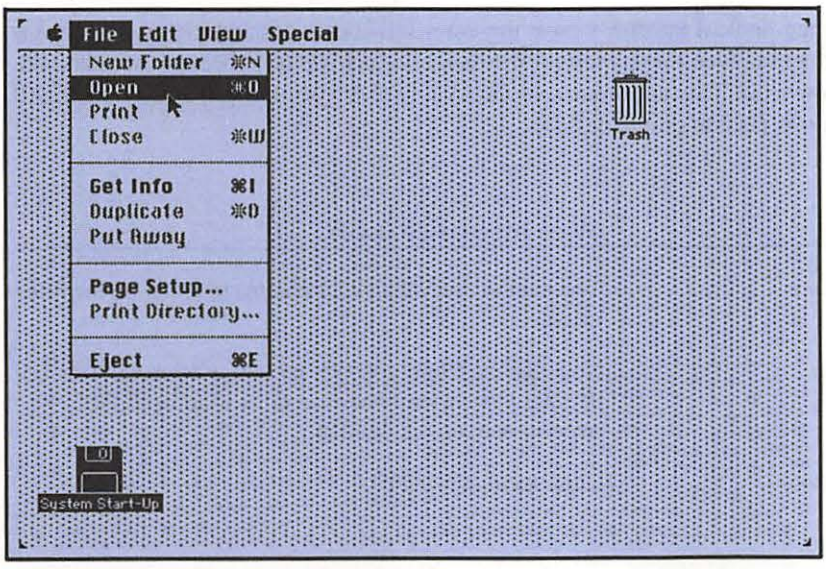


Figure 3.24
Using the File menu to Open the disk icon.

Release the mouse button.	Recall that you execute a menu command by selecting it and then releasing the mouse button. If you want, use the ⌘O to open the disk, rather than pulling down the menu. The result will be the same.

The disk icon will open on the desktop into what is called a window (Figure 3.25). There should be at least one closed icon on the start-up disk. This icon is called a **folder** because of its shape and function. More will be said about folders later in this chapter. **An open icon on the desktop of any type is called a window.**

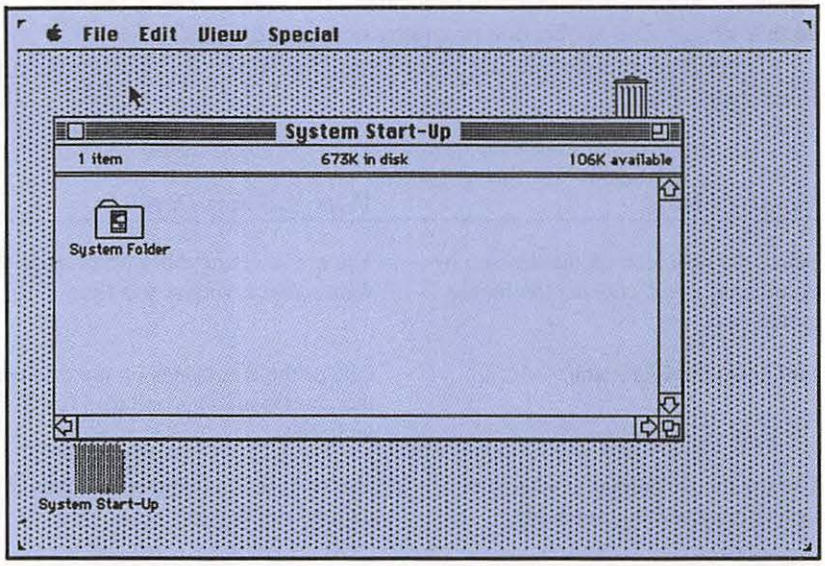


Figure 3.25
A typical open window on the Macintosh desktop.

Before you continue, look at the disk icon at the lower left corner of the desktop. The icon is now shaded, rather than the nice line picture of the disk to which we have become accustomed. This is called a **hollow** icon. This appearance of the icon is to let you know that it is open! All open icons appear in this fashion on the desktop.

What To Do	*Why You Are Doing It*
Pull down the File menu.	You want to execute another command found on the File menu.
Select the Close option.	Note that the Close option is no longer dimmed. This is because you currently have an open window as the selected item on the desktop.
Release the mouse button.	Close the disk window.

3.15 OPENING ICONS WITH THE DOUBLE-CLICK

A second method that may be used to open an icon is called **double-clicking**. This technique requires that you have a nimble mouse button finger. It is a technique well worth mastering, since many Macintosh activities are made simpler by the double-click.

The easiest way to double-click the mouse button is to minimize the up and down motion of your mouse button finger. In fact, your finger need never actually leave the surface of the mouse. Just press the mouse button, then release your finger pressure on it so that the button clicks up, and with as little delay as physically possible, press and release the button a second time. In

short, to double-click, you must click the mouse button two times as fast as possible. Remember that **clicking the mouse means to press and release the mouse button**, and not just to press and hold it, which is the technique used when you want to drag the mouse or an object.

Try using the double-click to open the disk icon. First, position the mouse pointer on the disk icon, then double-click the mouse. If you have double-clicked fast enough, the disk icon will open. If the icon does not open, then try again. Remember, it is not how HARD you press the mouse button, but rather how FAST you click it that counts. Additionally, you must not drag the mouse while trying to double-click.

As you continue to use the Macintosh, you will discover that the double-click is a very useful technique. It allows you to select and open an item, or activate an option, quickly, with one motion. You do not have to spend time moving the mouse to an open button on the screen, or pulling down a menu to select a menu option. In addition, many options can be activated with the double-click. Overall, your interactions with the computer will be speeded by the use of the double-click and you are strongly encouraged to master the technique.

3.16 THE WINDOW

The window is the fundamental view port into the Macintosh. You should now have the disk icon open, so that you are looking at the contents of the disk through a window on the screen. (If the disk icon is not open, place the mouse pointer on the icon and double-click the mouse to open it. Remember to practice the double-click as much as possible.)

You should start by observing the following features of the open window. At the top of the window is the **title bar**. The name of the window is displayed in the window's title bar at all times. At present, the title bar is filled with horizontal lines. This indicates that the window is selected. At the left side of the title bar is a small box. This is the **close box**, and it may be used to close a window. (Just as you can use either the menu or the double-click to open an icon, you may use either the menu or the close box to close it.) At the right side of the title bar is the **zoom box**. It is used to change the size of the window to fill the desktop, or to return it to its original size. The title bar, close and zoom boxes appear on most Macintosh windows.

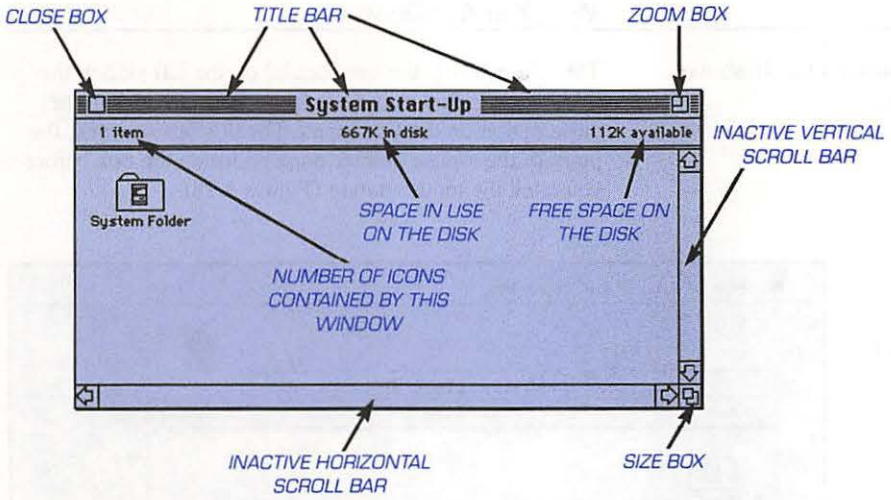


Figure 3.26
The features of a typical Macintosh window.

Directly below the title bar on this window is a statistics line. It tells you how many documents are contained by the current window, how much space on the disk is in use, and how much is still free.

What To Do	*Why You Are Doing It*
Select the trash can.	You want to do something with the trash, so it must be selected.
Double-click the trash can.	Open the trash can icon on the desktop. Notice that the title bar of the disk window (the one called System Start-Up) becomes clear, except for the title of the window, indicating that the window is no longer selected. The trash is now the selected window and its title bar has the close box, the zoom box and horizontal lines (Figure 3.27).

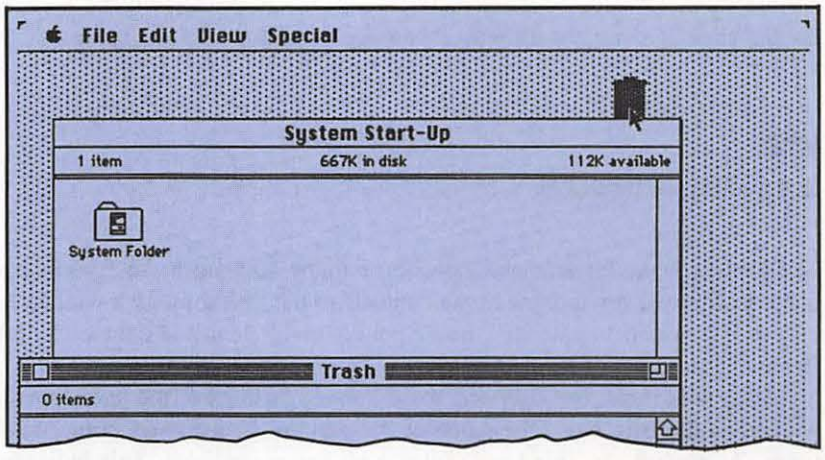


Figure 3.27
The Trash is now the selected window. The title bar of the System Start-Up window is clear, indicating that it is de-selected.

To **re-select the disk window**, all you need to do is click the mouse pointer anywhere in it. Try this now. You may also re-select a window by **double-clicking its icon**, even if it is a hollow icon. This is a useful technique in the event that the desired window is completely hidden by another window. Double-click the trash can icon to re-select the trash window.

What To Do	*Why You Are Doing It*
Position the mouse on the Trash window's close box.	The Close Box is the one located on the left side of the title bar. We want to use the Close Box rather than the close option on the File menu. For this box to work, the point of the mouse pointer must be inside the box before you click the mouse button (Figure 3.28).

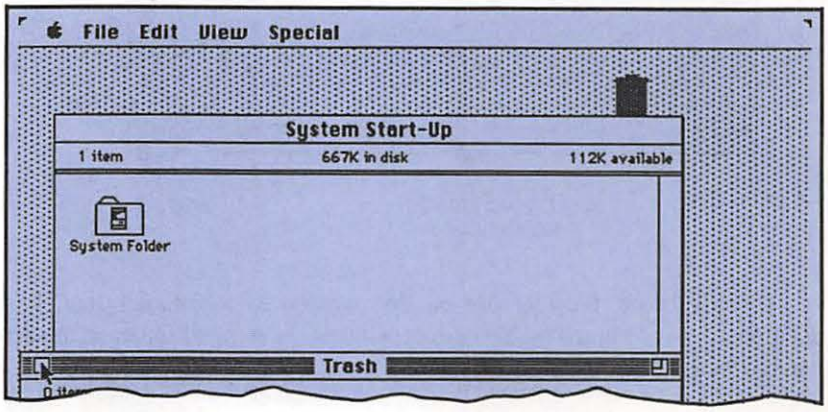


Figure 3.28
Note that the point of the mouse pointer is in the close box. It is the point of the mouse pointer arrow that is active.

Click the mouse button once.	The single click will close the window. When you close the trash, the open disk window will become selected.
Position the mouse on the Zoom Box of the open disk window.	The Zoom Box is the one located on the right side of the title bar. It opens the window so that it covers almost the complete desktop.
Click the mouse once on the zoom box of the disk window.	The disk window will fully open and your desktop should look somewhat like Figure 3.29.

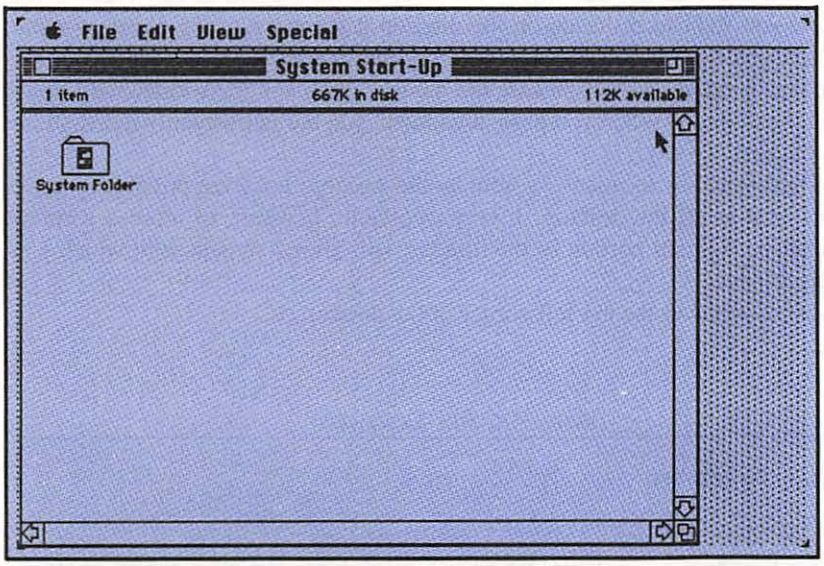


Figure 3.29
The zoom box has been clicked, causing the System Start-Up window to fill the desktop.

Position the mouse pointer on the zoom box again.	
Click the zoom box.	The window should return to the size and location it was in before you zoomed it.

This last point should be remembered. You will see in the next sections that the size, shape and location of windows can be changed in another fashion. When you use the zoom box to change the window size, it is not permanent. The window will always return to the size, shape and location it had on the desktop prior to being zoomed.

Let's prove this.

What To Do	*Why You Are Doing It*
Click the zoom box on the disk window.	Make the disk window fill the desktop.
Click the window's close box.	Close the window.
Re-open the disk icon by using the double-click method.	This window will open to its original location, size and shape.

3.17 MOVING A WINDOW

The title bar is used to move the location of the window on the desktop. Recall that to move an icon on the desktop you had to point to the icon, press and hold the mouse button, drag the mouse to the new location, then release the button. While you were dragging the icon, you only moved an outline of the icon. It was not until the mouse button was released that the icon itself moved to the new location.

You move a window using a similar technique. You place the mouse pointer anywhere in the title bar of the window you want to re-locate on the desktop (except for in the close or zoom boxes, of course). Click and hold the mouse button. Drag the mouse to see the outline of the window moved to the new location. Finally release the mouse button and the window will move to the new location on the desktop. When you move a window, you are permanently doing so, at least until you move it again!

You may move a window to any location you want on the desktop. It is even possible to move a window so that part of it is off the desktop. It is not possible, however, to move a window completely off the desktop. A small portion of the title bar will always remain with which you can select and drag the window.

Try moving the disk window to the top left corner of the desktop.

What To Do	*Why You Are Doing It*
Move the mouse pointer to the title bar of the disk window.	
Press and hold the mouse button.	Select the current window. By holding down the mouse button, you are telling the Macintosh that you plan to do something with the window.
Drag the pointer toward the top left corner of the desktop (Figure 3.30).	Change the location of the open window on the desktop. Note that, just as when you moved an icon, **only an outline** of the window moves at this time.

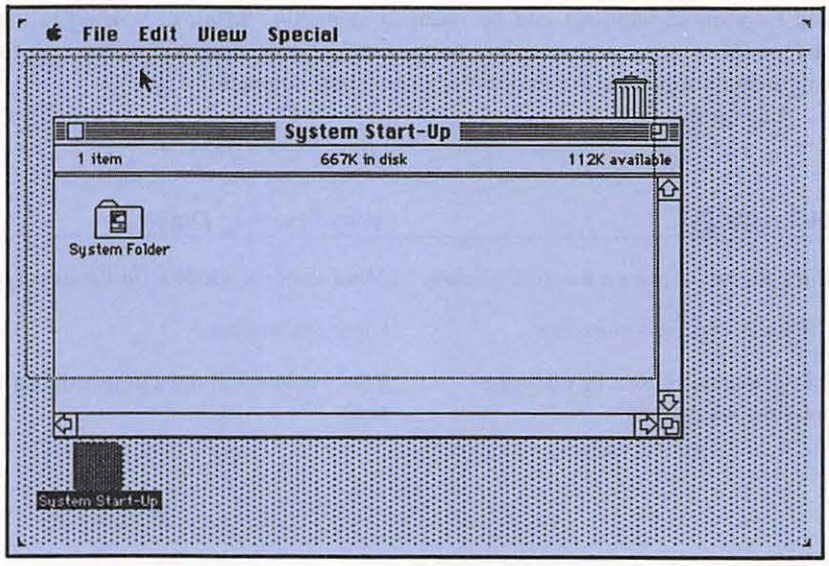


Figure 3.30
Notice the outline of the window as it is being dragged.

Release the mouse button.	Releasing the mouse button tells the Macintosh that you have completed the move. The window will move to the new location (Figure 3.31).

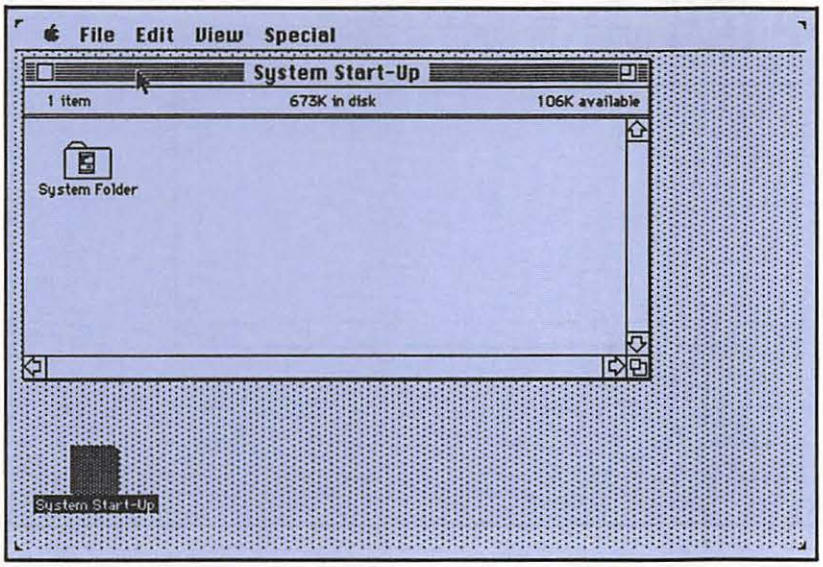


Figure 3.31
After releasing the mouse button, the outline of the window disappears and the complete window moves.

3.18 CHANGING THE SIZE OF A WINDOW

The lower right corner of the window contains the size box. With this box you can make the window permanently larger or smaller. Generally, you may open a window to as large as you want, even covering the disk and trash icons. This is larger than the zoom box goes, which leaves space at the right of the desktop to display the disk and trash icons. If you are using a full page display on your Macintosh, or the larger display of the Macintosh II, IIx, IIcx or IIci, you will find that some application programs will not let you make their window large enough to cover the complete desktop. This is application specific, however. The smallest you can make a window on the desktop is approximately one inch square. Again, different applications may not let you make their active window that small.

Try using the size box to change the size of the disk window.

What To Do	*Why You Are Doing It*
Place the mouse pointer into the size box at the lower right corner of the disk window.	
Press and hold the mouse button.	Select the size box as the desired activity.

Drag the mouse down and to the left (Figure 3.32).

You are going to make the window tall and skinny.

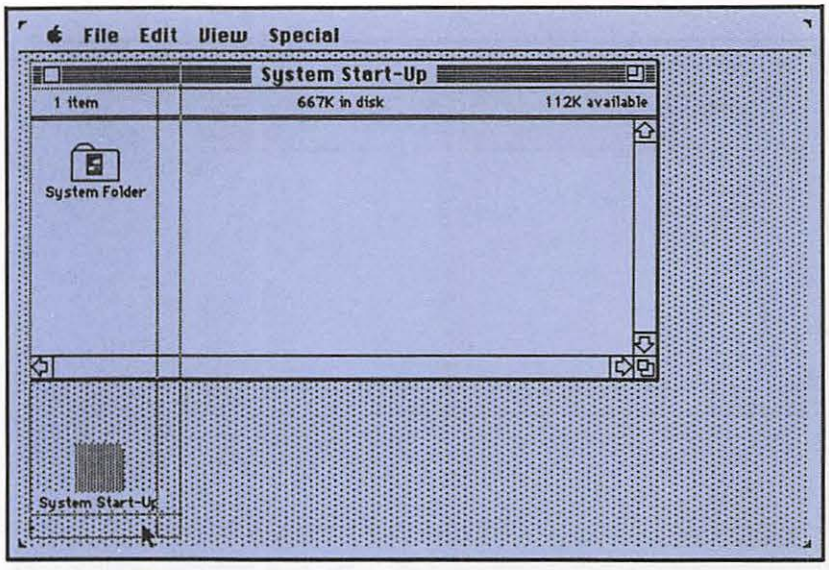


Figure 3.32
The size box at the lower right corner of the window is used to change the shape of the current window.

Release the mouse button.

Complete the re-sizing of the window. It should now be tall and skinny (Figure 3.33).

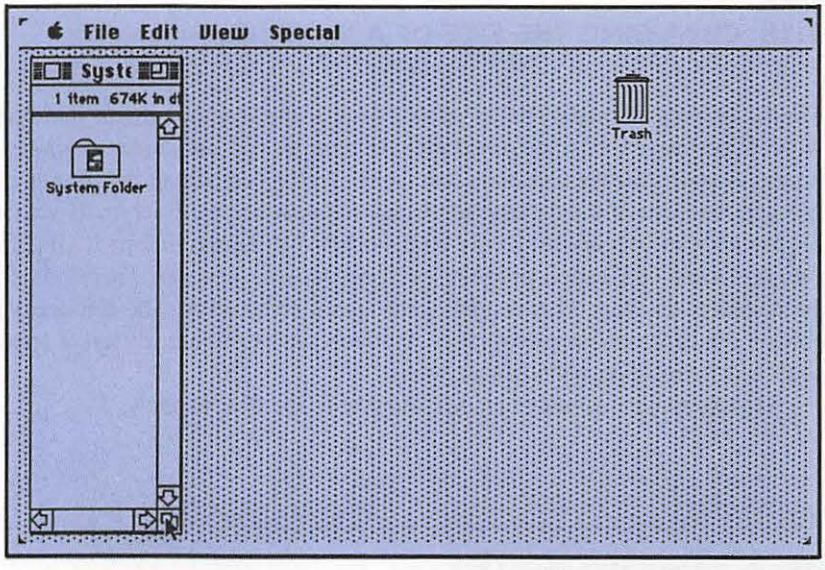


Figure 3.33
The window will change its shape after you release the mouse button. You can see the mouse pointer in the size box.

Once again, place the mouse into the size box.

Press and hold the mouse button.

You are again selecting the size box.

Drag the corner of the window toward the top right corner of the desktop (Figure 3.34).

You are going to make the window short and fat.

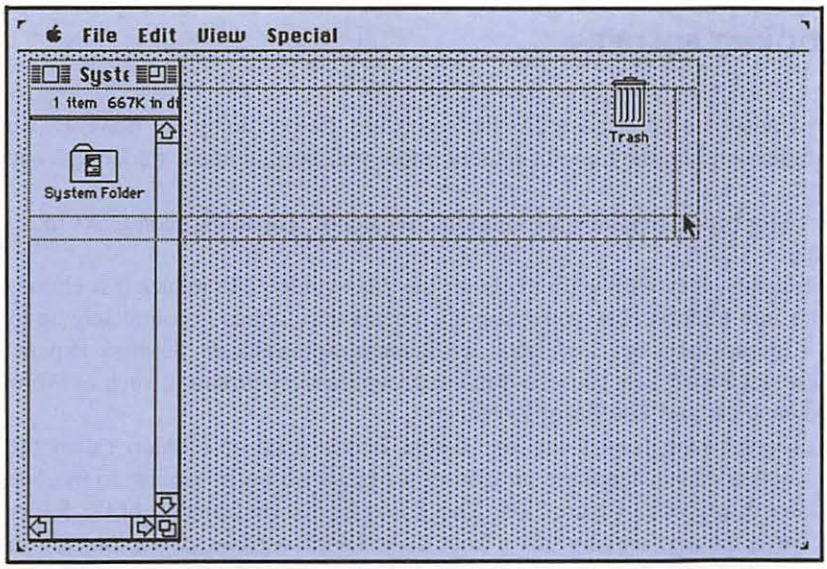


Figure 3.34

Release the mouse button. Complete re-sizing the window. It should now be short and fat.

Now make the window as small as you can. Drag the size box as far to the left and up as it will go (Figure 3.35), then release the mouse button. Complete this section by making the window large enough so that you can see the icon called System Folder in the window.

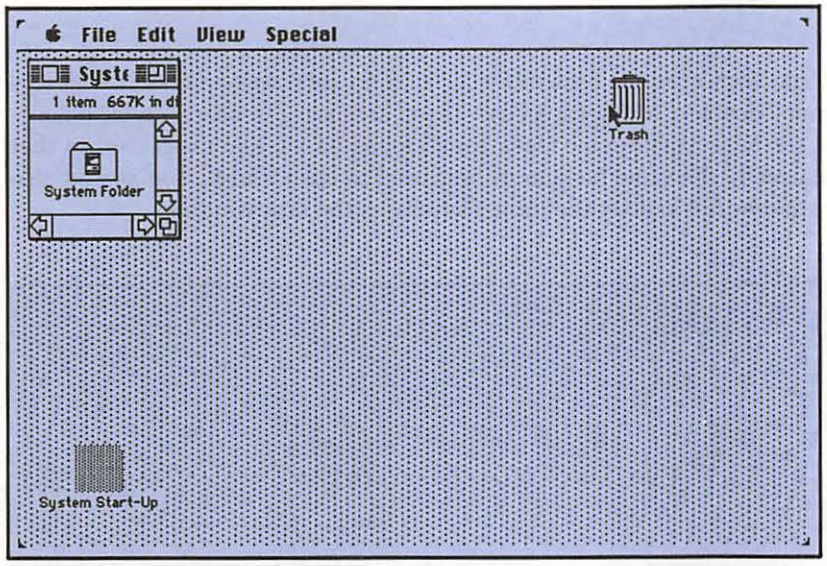


Figure 3.35
Windows may be made tall and skinny, short and fat, large or small.

3.19 A BRIEF LOOK AT FOLDERS

One more feature of windows to be discussed is the scroll bar. Before doing so, however, we must make a minor digression into the topic of folders (more will be said about folders later in this chapter).

A folder is a device for organizing information stored on a disk. The folder icon looks like a miniature manila folder.

As you create documents, they will begin to clutter the disk window. To reduce this clutter, you may put documents into folders. How you group documents into folders is completely up to you. You may want to group them by class, such as Business Spreadsheets, English Papers, History Papers, and Physics Papers. Or you may want to group them by program, such as Word Documents, Excel Documents, and FileMaker Documents.

On the start-up disk you have been using you should find at least one folder, called the System Folder. (Your system folder may have an icon of a Macintosh on it, similar to the one seen on the system folder displayed in Figure 3.35. This indicates that the contents of the folder can be used to boot the computer, making this a boot disk. Older versions of the Macintosh System software do not include this feature.) The System Folder contains the System and Finder files needed to start the Macintosh, along with a variety of other system-related documents. The number of documents found in the System Folder can be anywhere from the minimum of two, to well over one hundred. Depending on the source of the start-up disk, the System Folder generally holds between ten and thirty-five documents.

3.20 THE SCROLL BARS

Use the mouse to select, then open the System Folder icon on your start-up disk. Do this by pointing to the folder and double-clicking the mouse. If you are having trouble with the double-click, you may select the folder and use the Open option found on the File menu. **Notice that you open a folder in exactly the same fashion as that used to open a disk. You should also notice that a folder window has exactly the same features as the disk window.**

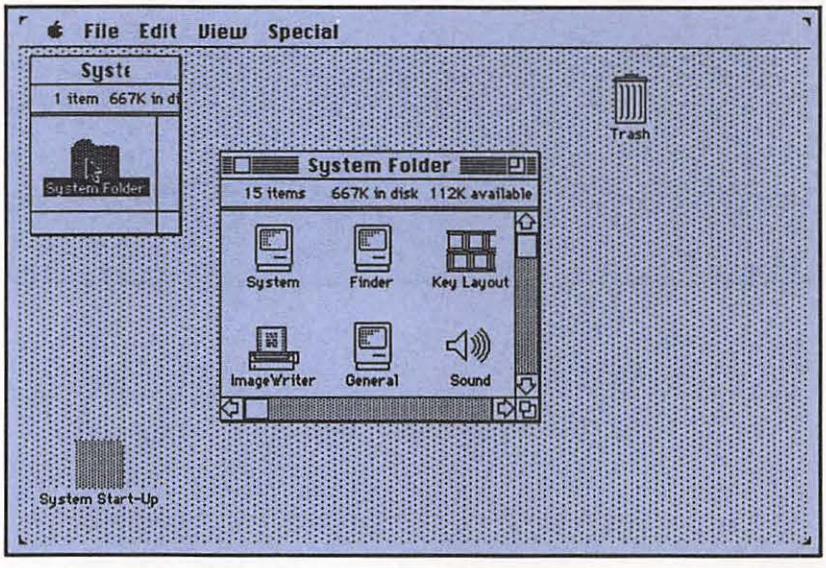


Figure 3.36
The system folder is typical of an open folder. The fundamental items making up this window are the same as those which made up the disk window.

Look below the left end of the title bar to determine the number of items that the folder contains. In Figure 3.36, the System Folder contains 15 items. You are able to see, however, only six of these items. Notice that the bars at the right and below the window are now shaded. These bars are called **scroll bars**. They let you move (that is, scroll) the information displayed through the window.

The scroll bars become active only when there is information belonging to the current folder (or disk) that is outside the opening of the current window and therefore not being displayed. That is, there is more in the window than can presently be seen! If the window is large enough to display the complete contents of the folder (or disk), then the scroll bars are clear.

It is also possible for only one of the two scroll bars to be active. For example, if the window is sized to the complete width of the desktop, but only one inch high, you might see the vertical scroll bar on the right of the window, but not the horizontal one below the window. This means that there are more icons "hiding" above or below the current window opening, but not to the left or right of the current window opening. (If your System Folder does not display active scroll bars at this time, use the size box to make the window as small as possible. The scroll bars should then appear.)

Almost every program that uses documents larger than the size of the Macintosh screen uses scroll bars to let you position the desired portion of the document into the active work window. Because of this, it is important that you understand the functioning of the scroll bars, and the various ways in which they can be used.

Think of the scroll bar itself as representing the total possible size of the open document (right now, this is a folder or disk). Depending on the amount of information not displayed in the window, the total size represented can be a large or small amount. For example, consider the vertical scroll bar of a word processor. It represents the total length of the document. If the document is two pages long, then the scroll bar represents two pages. The middle of the scroll bar is the position of the page break between the first and second pages. However, if the document is one hundred pages, this same scroll bar is divided into 100 equal positions. One quarter of the way down from the top is page 25, while the middle is page 50. You will have the opportunity to experiment with the word processor's scroll bar later in this text.

The scroll bar on the right of the window, the vertical scroll bar, represents the total possible height of the item. The one on the bottom, the horizontal scroll bar, represents the total possible width of the item. The small box, which will be referred to as the scroll box, located on each scroll bar represents the vertical and horizontal portions of the item that are currently displayed in the open window.

By looking at the position of the scroll box on the scroll bar, you are able to tell if there is more of the current item above, below, left or right of the open window. If the scroll box is approximately centered on the vertical scroll bar, then the window is displaying the middle of the document. If the scroll box is at the bottom of the vertical scroll bar, then the window is displaying the bottom or end of the document.

To see another portion of the item in the window, you use the scroll bars. There are three ways to use the scroll bars. You may click on one of the arrows located at the ends of the scroll bars. If you click and hold the mouse button, the scroll box will gradually move all the way from one end of the scroll bar to the other. As it scrolls, you will see the contents of the window pass by. When you see the item you want appear in the window, simply release the mouse button to stop the scrolling.

The second method for using the scroll bars is to click on the shaded scroll bar itself. This will cause the contents of the window to jump, rather than to scroll. Depending on the application program in use, you will see that the actual location of the mouse pointer on the scroll bar can effect the amount of the jump. For example, if you are using a word processing program or electronic spreadsheet, the amount the window scrolls when clicking the scroll bar is usually a screen's worth of information.

The final way to use the scroll bar is to drag the scroll box to the desired location on the scroll bar. To do this, move the mouse pointer to one of the scroll boxes, click and hold the mouse button, drag the scroll box to the desired location on the scroll bar, and release the mouse button.

You should be getting fairly good with the mouse by now. Before you continue, try using these three methods of scrolling the System Folder window. If you are using the arrows at the ends of the scroll bars, you will notice that as the contents of the window scroll, the scroll boxes change their position on the scroll bar. In Figure 3.37, the vertical scroll box is near the bottom of the vertical scroll bar, indicating that we are looking at the bottom of the window. From this it can be concluded that there are no more icons below the ones displayed. The horizontal scroll box, however, is only about one-third of the way across the horizontal scroll bar. This suggests that there are more icons to the right of the open window.

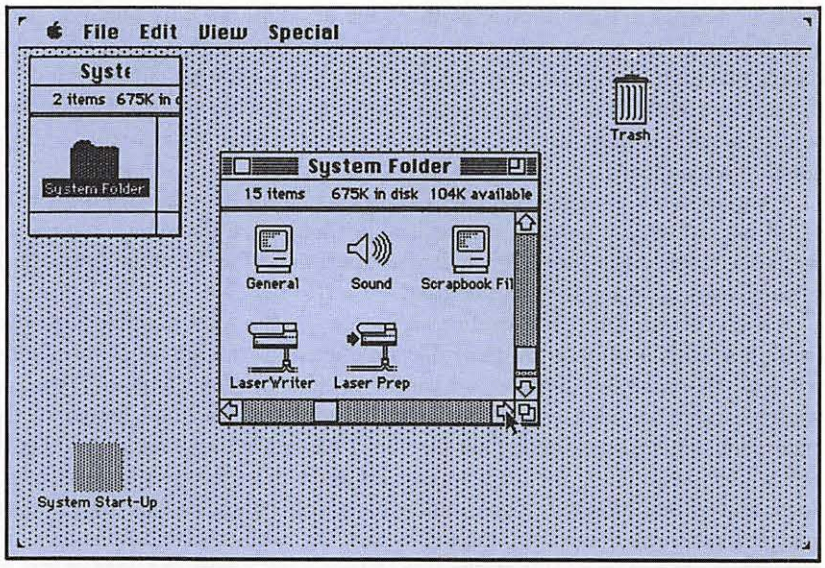


Figure 3.37
The right horizontal scroll arrow is being used.

3.21 INITIALIZING A DISK

When you purchase a disk it has no information on it. For the Macintosh to be able to use the disk it must be initialized. This process puts information onto the disk that makes it usable. It defines the locations on the disk that information can be stored, and creates a special area on the disk, called the **Desktop**. The Desktop is a file that contains the names of all the other files and folders on the disk. In essence, it acts like a table of contents, or directory, for the computer, letting it locate the information stored on the disk. It includes information about whether a folder is open or closed, and its size when open, and the location of any icons contained by the folder. This file is updated every time you eject a disk. Because the Desktop file is really the concern of the Macintosh, it is never actually displayed when the disk is loaded into the computer. It is an invisible file.

To initialize a disk is a simple procedure. Insert a new disk into one of the Macintosh's disk drives and wait a few seconds. Whenever you insert a disk into a Macintosh disk drive, the computer tries to read the Desktop file. When it fails at this task, a **dialog box** appears. The dialog box, sometimes called an alert box depending on its contents, is the Macintosh's main method of communicating with you when it wants your attention, when it needs information from you, when it wants to give you a warning, or when it wants you to perform a task. You will see them frequently when working with the computer. This particular dialog box is asking if you want to initialize the disk (Figure 3.38).

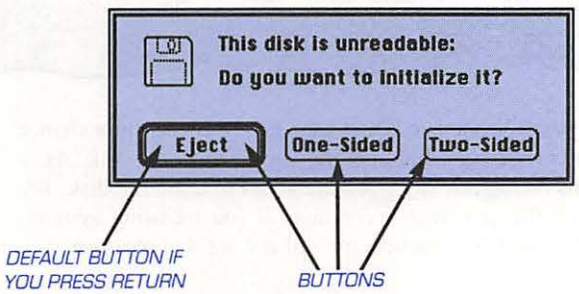


Figure 3.38
Do not initialize a disk if you think it is supposed to already have information saved on it.

As you can see, this dialog box presents you with three options. Each option is enclosed in a box, and is called a **button**. Almost every dialog box you see will have at least one button, an OK or Continue button. To select an action, move the mouse pointer to the desired button and click the mouse. Also notice that, in this dialog box, the Eject button has an extra outline. Buttons that are highlighted in this fashion can be activated by pressing the Return key on the keyboard, in addition to clicking on them with the mouse. This is a style of button that you will see with many Macintosh applications.

Try initializing a disk now.

What To Do	*Why You Are Doing It*
Insert a brand new disk into a disk drive. If you have only one disk drive available, use the Eject command to eject the Start-up disk from the disk drive, then insert the new disk into the disk drive. The Macintosh will then tell you when it wants you to insert the start-up disk.	After a brief pause, the first dialog box will appear. If you are not using a new disk, you will not see this dialog box. In some cases the computer will recognize that the disk has been formatted, but for a computer other than the Macintosh. When this occurs, the message will read "This is not a Macintosh disk:", rather than the message "This disk is unreadable:".
Move the mouse pointer to the button labelled "Two-sided" and click the button.	Tell the Macintosh that you want to initialize this disk. Do this ONLY if you really want to initialize this disk. If you think that there may be other information on this disk, either for a Macintosh or another computer, then click the Eject button in the dialog box and do not initialize the disk. (NOTE: If you are going to use this disk in a Macintosh that has only 400K disk drives, click the mouse on the one-sided button.)



Figure 3.39
This disk is going to be initialized double-sided.

Move the mouse pointer to the Erase button and click the button.

System Versions 6.0 and later give you one more chance to change your mind before you initialize the disk. As this dialog box says, you are about to erase the disk. Be sure that you want to continue. If you are using System Version 5.0 or earlier you will not see this message.

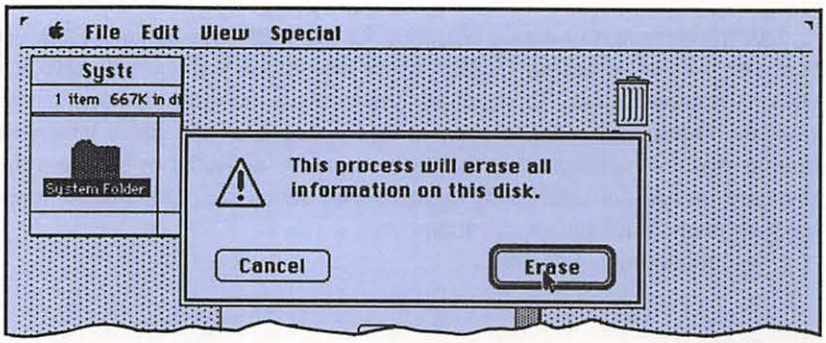


Figure 3.40
Confirm that you want to erase the disk.

MY DISK

Type the words MY DISK at the keyboard to replace the default (preassigned) name "Untitled". This will assign a name to this disk. A disk name may be from 1 to 27 characters in length.

The Macintosh identifies all disks by the name that you give the disk. The disk name lets the computer keep track of more disks than you have disk drives. This lets you easily copy complete disks when you have only one disk drive, or copy documents and folders between disks when you have only one disk drive. You will also find it is a convenient way to keep track of your disks. If you are using System Version 5.0 or earlier you will not see this dialog box at this time. It will appear after the formatting process is complete.



Figure 3.41
Be sure to change the name you intend to assign this disk from Untitled to MY DISK.

Move the mouse pointer to the OK button on the desktop and press the mouse button.

Tell the Macintosh that you will keep the name MY DISK for this disk. Notice that the OK button is highlighted with the extra outline. Remember, you can activate this button by pressing the Return key. You do not have to click it with the mouse.

The dialog box will now tell you that the computer is formatting the disk. With older System Versions, the "name your disk" dialog box follows the formatting process, rather than preceding it.



Figure 3.42
Begin the initialization process by clicking the mouse pointer on the OK button.

After the disk has been formatted and named, it will appear on the Macintosh's desktop, ready for use. If you open the disk icon, you will see that it contains no items, but that some of its space is already in use (Figure 3.43). This occupied space is taken up by the invisible Desktop file.

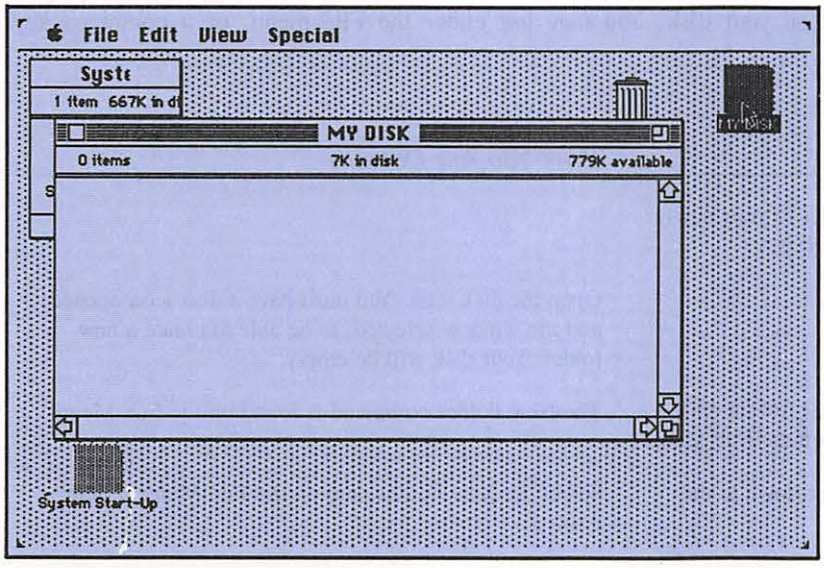


Figure 3.43
The newly initialized disk is empty. Note that 7K is already in use in this disk, occupied by the invisible Desktop file.

A nice feature of most Macintosh programs is that they are able to recognize an uninitialized, or un-formatted, disk when it is inserted into a disk drive. When this happens, the program will interrupt its current task to let the Macintosh carry out the disk initialization process that you just completed. To you, the user, this means that if your data disk fills up, you will not be faced with the loss of data if you do not have to have a pre-initialized disk available. A disk may almost always be initialized when you need it.

A final reminder about initializing disks. This process **erases anything** already on the disk. Permanently! In the normal course of affairs, you need to initialize a disk only one time. The Finder's Special menu contains an "erase disk" option (made available by first selecting a disk icon on the desktop) that lets you re-initialize a disk, and completely erase its contents. Use this option with care, and only when you are sure that you want to throw away the complete contents of the disk.

3.22 FOLDERS

Recall that a folder is a device used for organizing and containing the information on a disk, just as you use a manila folder to organize and contain information in your office or work area. A folder will hold whatever you place into it. In fact, you may place folders inside of folders! With this technique, you can organize your information in any fashion desired.

Once you have a folder, putting documents or programs into it is very easy. All you do is drag the desired item from its current location to the folder. When the icon of the destination folder becomes selected, release the mouse button to "drop" the selected item into the folder. You will do this later in the chapter. First, however, you must start by creating new folders.

3.23 CREATING AND NAMING A NEW FOLDER

As with everything else you have been doing, there is more than one method you can employ to create a new folder on your disk. You may use either the File menu, or a command key equivalent.

What To Do	*Why You Are Doing It*
Move the mouse pointer to your newly initialized disk, MY DISK.	
Double-click the mouse.	Open the disk icon. You must have a disk icon opened, and the window selected, to be able to create a new folder. Your disk will be empty.
Move the mouse pointer to File on the menu bar and pull down the File Menu.	The New Folder command is found on the File Menu.
Drag the mouse pointer down to the New Folder item.	Select the New Folder item on the File Menu (Figure 3.44).

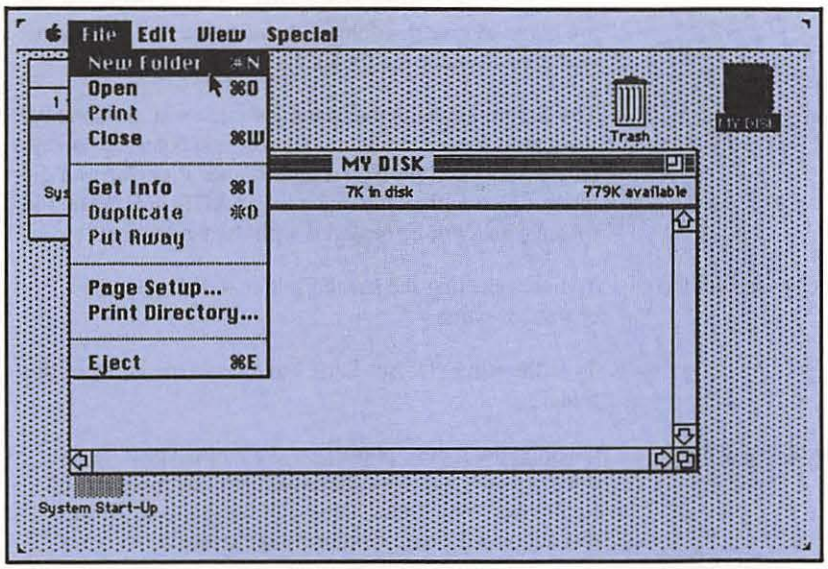


Figure 3.44
The New Folder command is located on the File Menu.

Release the mouse button.

A new folder, called Empty Folder, will appear in the window of MY DISK (Figure 3.45). Note that the New Folder item may be selected by using ⌘N.

⌘N

Press the ⌘N and create a second new folder. This folder is called Copy of Empty Folder.

The Macintosh will NOT let you use the same name for two items (folder, document, or application program) in the same window or folder. You cannot have two folders called "Empty Folder" existing in the disk's window. You cannot put two word processing documents called "Term Paper" into the same folder! Clearly, the answer is to change the name of one of the items.

Select the first folder you created (the one called Empty Folder) by clicking the mouse pointer on the folder icon.

You are going to change the name of this folder.

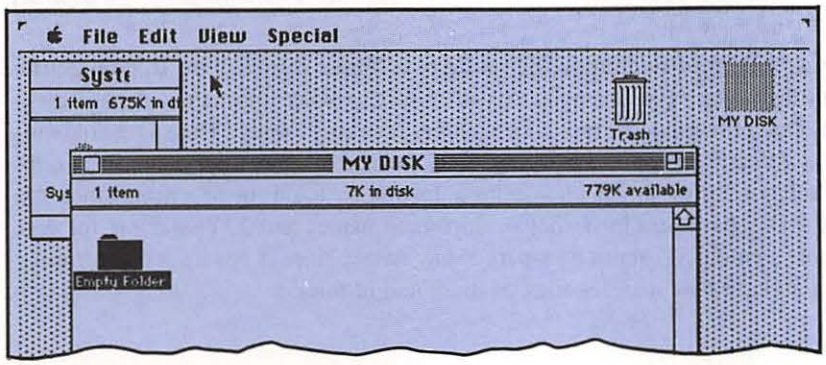


Figure 3.45
An empty folder has been created on the disk.

Word Processing	Type the name "Word Processing." This is the name you are going to give this folder. As you type, the new name will appear under the folder.
Press the RETURN key.	The Return key tells the Macintosh that you are done typing and to record the name. (If your keyboard has a key labeled ENTER, do NOT press it since it performs a different function than the one marked RETURN.) The old folder name will be replaced with the new name.
Click the mouse on the second folder.	You are selecting the second folder so that you can change its name.
Misc. Stuff	Type the name "Misc. Stuff" to change the name of this folder.
Click the mouse in the disk window.	Clicking the mouse pointer on the empty space of the open window will have the same effect as pressing the Return key. The folder name will be changed. However, this action will leave neither folder selected.

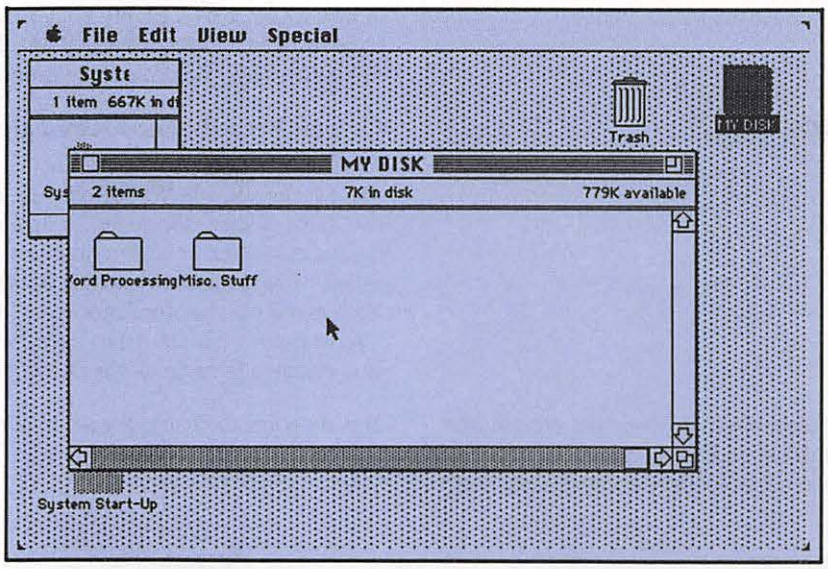


Figure 3.46
The two folders have been re-named.

The technique you just used to change the name of a folder can be used to change the name of ANY Macintosh icon. For example, if you want to change the name of your disk, select it with a single click of the mouse, type a new name, then press enter. The same holds for changing the name of a document on the disk, or even the name of an application program! There are very few limitations on what you choose for a document, folder or program name. You are, however, limited to 31 characters for folder or document names and 27 characters for disk names. Most important, a colon (:) cannot be a part of any name, since it has a special meaning to the Macintosh in relation to how it stores files on disks and in folders.

3.24 COPYING DOCUMENTS/ITEMS BETWEEN TWO DISKS

Now that you have a second disk initialized and some folders ready, you are able to make back-up copies of your documents. **You should always make a second copy of any document on which you are working ON A SEPARATE DISK before you leave the computer.** It is a well known fact that disks fail at the most inopportune moment, such as when you are about to print the final copy of a project you have been working on for the past eight weeks. If you always have at least two copies of a document on two separate disks you will have a better chance of recovering your work when this happens to you.

When you copy a document onto a second disk, you may place it on the disk at the "top" level (that is, it will appear with any folders you may have on the disk), or you may place it directly into an existing folder. If you have folders inside folders, and they are open or visible in some way, you may even place the document into these inner folders. In fact, you may place the document into any folder icon that is visible on the Macintosh desktop.

What To Do	*Why You Are Doing It*
Click the mouse pointer on the disk icon for MY DISK.	Make sure that your disk is currently selected.
Drag the disk window's size box until only the two new folders are showing in the disk window.	You will be working with multiple windows open in this section, and to be able to see their contents at the same time, they must be sized down.
Drag the window for MY DISK to the bottom of the desktop.	You are placing this open window at the bottom of the desktop to make room for the other window that you will open. Remember, to move a window, put the mouse pointer on the window's title bar, press and hold the mouse button, then drag the outline of the window to its new location on the desktop. Complete the move by releasing the mouse (Figure 3.47).

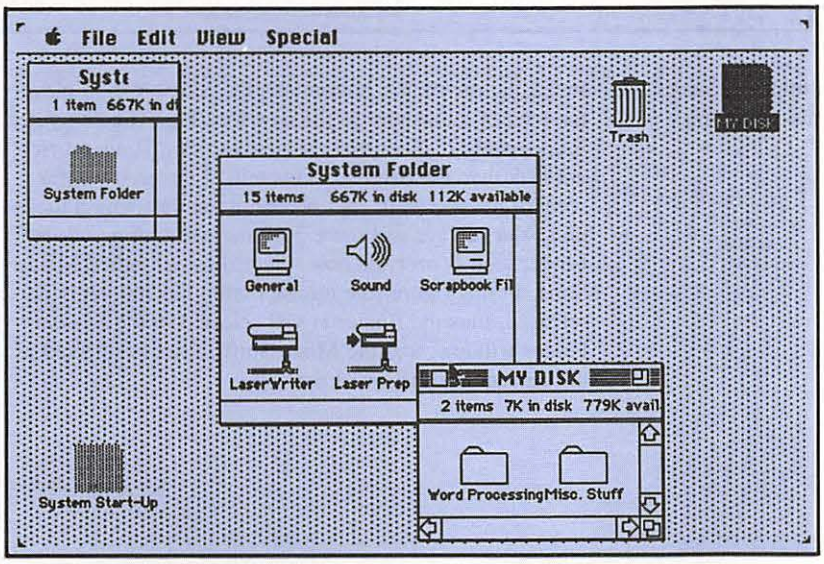
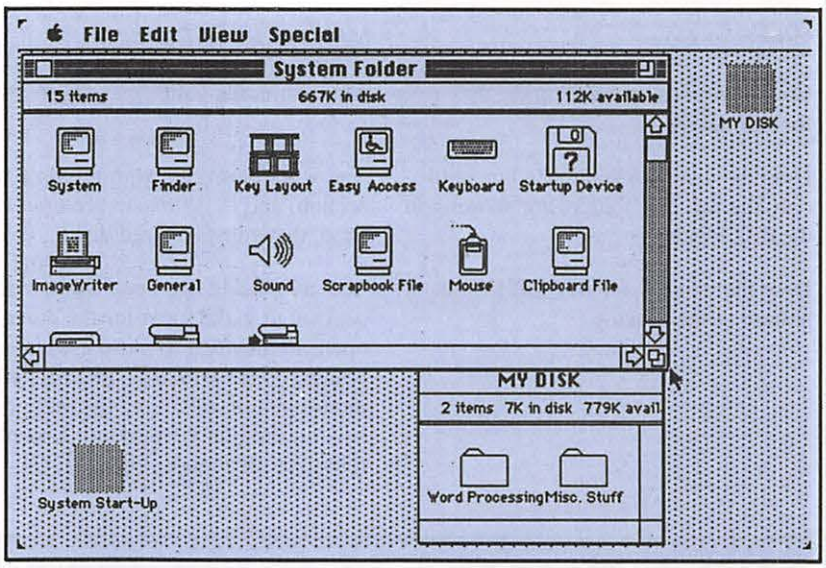


Figure 3.47
Your desktop should look similar to this.

Click on the title bar of the System Folder, found on the start-up disk.	Make the System Folder active.
Click the zoom box on the System Folder.	Make the System Folder fill the desktop.
Use the size box to shorten the System Folder window enough so that you can see the window for MY DISK.	You want to be able to see both windows. The first item you will copy will be placed directly into a folder on MY DISK. To be able to do this you must be able to see the destination folder on the desktop.
Locate the icon labelled "Finder" in the System Folder. Click it once, and hold the mouse button down.	You are going to copy the Finder from the System Folder on your start-up disk to the Misc. Stuff folder on MY DISK. You have now selected the Finder, and you are ready to do something with it since you have not yet released the mouse button.
Drag the outline of the Finder icon to the folder called Misc. Stuff.	When the Finder outline is in the proper location, the Misc. Stuff folder will become selected.

Figure 3.48
With both windows visible on the desktop, you are ready to copy information from one disk to another.



When the destination folder becomes selected, release the mouse button.	Releasing the mouse button tells the Macintosh to move the icon of the Finder to the new location. The computer immediately realizes that the new location is on a different disk than the original. This tells it that you want a copy of the file made and placed at the destination location. You can see in Figure 3.49 that the outline of the Finder icon is over the now selected folder called Misc. Stuff. In this figure, the mouse button has not yet been released, thus the Finder is still selected in the System Folder window, and the Misc. Stuff folder is selected as the current destination of the copy.

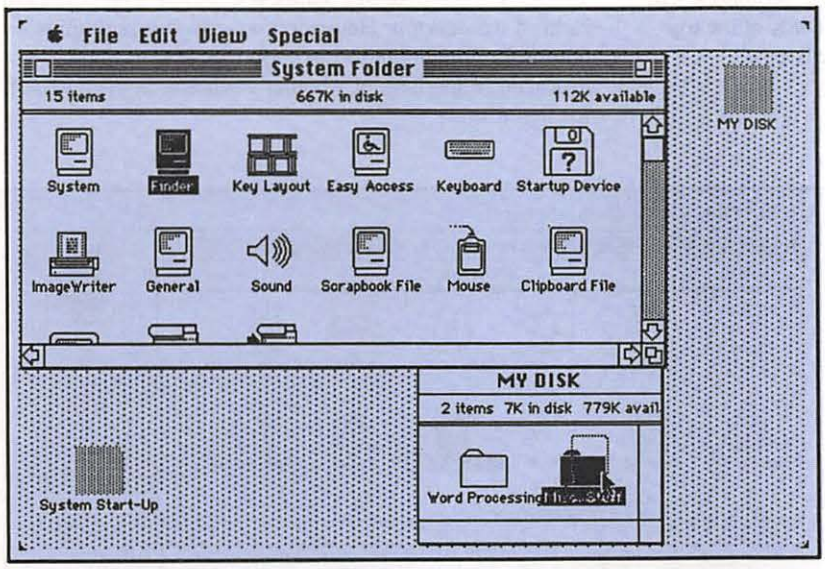


Figure 3.49
The Misc. Stuff folder is selected as the destination location of the copy.

When you release the mouse, a dialog box will appear to let you know how many documents are to be copied. Newer versions of the System file will also give you a bar chart indicating the progress of the copy.

When the copy is completed, you will notice that the Finder file is still in the System Folder on the disk System Start-Up. **Moving a document or application program between two disks always copies it** (except in those instances where the document is copy protected in some way), leaving the original copy at its starting location on the source disk.

Double-click the Misc. Stuff folder.

Open the Misc. Stuff folder on the disk MY DISK. Observe that this folder now contains a copy of the Finder.

Click the Close box on the Misc. Stuff folder.

Close this folder, it is in the way.

Click on the file called "Scrapbook File" found in the System Folder. Hold the mouse button down.

This time you will copy the Scrapbook file.

Drag the outline of the Scrapbook File to the ICON of MY DISK at the top right corner of the desktop.

The icon of the disk MY DISK is a hollow icon at the top right of the desktop. However, you may still put things onto it for copying purposes. You may always copy to a disk icon, regardless of whether a window is open or not for that disk.

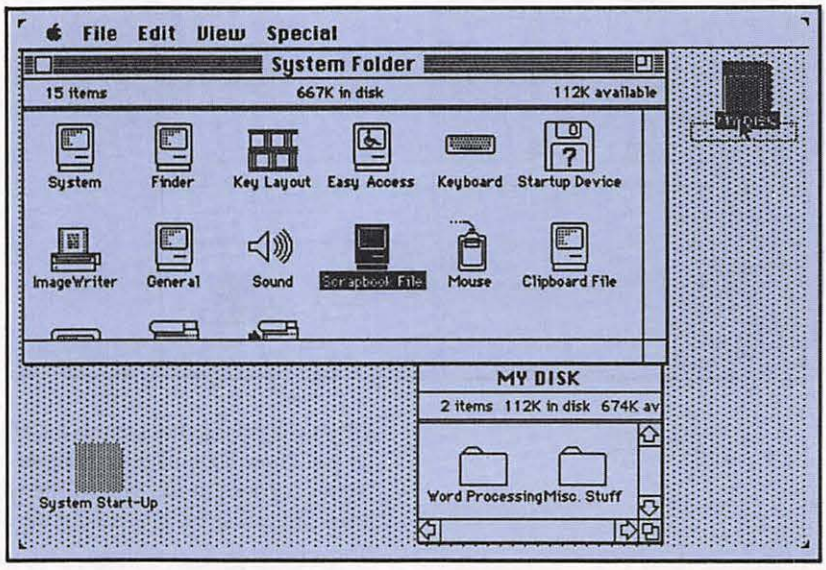


Figure 3.50
Copy the Scrapbook File to the icon of the disk. Note that the hollow icon for MY DISK is selected in this figure as the destination of the copy.

Click on the MY DISK window title bar.

When the copy is done, make MY DISK the active window. One of the scroll bars should now become active. A new document has been placed on the disk at the level of the current window, but it could not be displayed in the small opening.

You may copy anything you want between two disks in this fashion. Simply drag the desired icon from one disk to another. You may copy documents and applications one at a time, or you may copy a folder, which will cause all the documents contained in that folder to be copied with it. If you have selected several icons, then they will all be copied at the same time. You will see that the outlines of the icons move together in a temporary group, and will appear on the destination disk after the copy in the same relative positions if you are copying to an open window.

An important thing to remember about copying files in this fashion is that the **files are added** to the already existing contents of the destination disk. If a document **name** already exists in the destination window, a dialog box will appear (Figure 3.51) asking you to confirm that you want the item on the destination disk erased before the new copy is placed there in its stead. It is important to remember that the computer is looking at just the names of the two documents. Thus, even though one may be an Excel worksheet and the other a Word text document, the computer will still give you this warning. All other information on the destination disk will remain unchanged when you copy documents in this fashion.

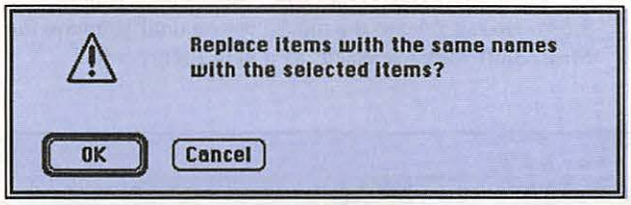


Figure 3.51
You will see this dialog box if the destination of a copy contains any document of the same name as one being copied.

3.25 MOVING DOCUMENTS INTO AND OUT OF FOLDERS

To move an item into a folder involves the same basic process you have used to copy an item between two disks. The difference is that when you move an icon into a folder, or between two folders, on the same disk, the document is not copied. You are only changing the window in which it will appear.

To place an icon or document into a folder, all you need to do is drag it from its current location to the desired folder. To remove the icon from the folder, drag it out of the folder to the disk window or to another folder or window. The destination folder may either be closed or open.

What To Do	*Why You Are Doing It*
Click on the Zoom box of MY DISK.	Open the disk window. You should now be able to see all the icons on this disk. There are the two folders and the Scrapbook file that you just copied from the System Folder on the start-up disk (Figure 3.52).
Point the mouse at the Scrapbook file and click and hold the mouse button.	You are going to move the Scrapbook to a new location on this disk.

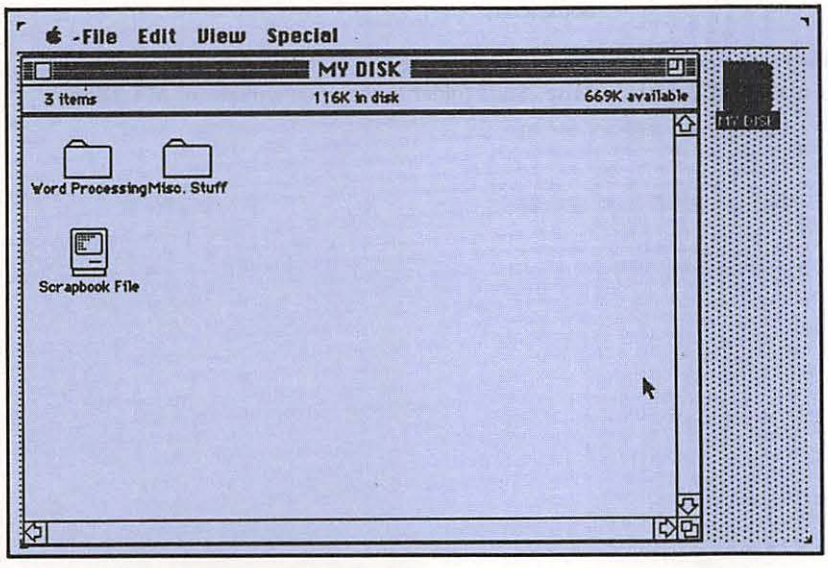


Figure 3.52
There are three items in this window. The two folders and the Scrapbook File that was copied to the icon of MY DISK.

Drag the Scrapbook to the Misc. Stuff folder and release the mouse button.

Move the scrapbook to the Misc. Stuff folder (Figure 3.53). Do not release the mouse button until you have the Misc. Stuff folder selected, as it is in Figure 3.53.

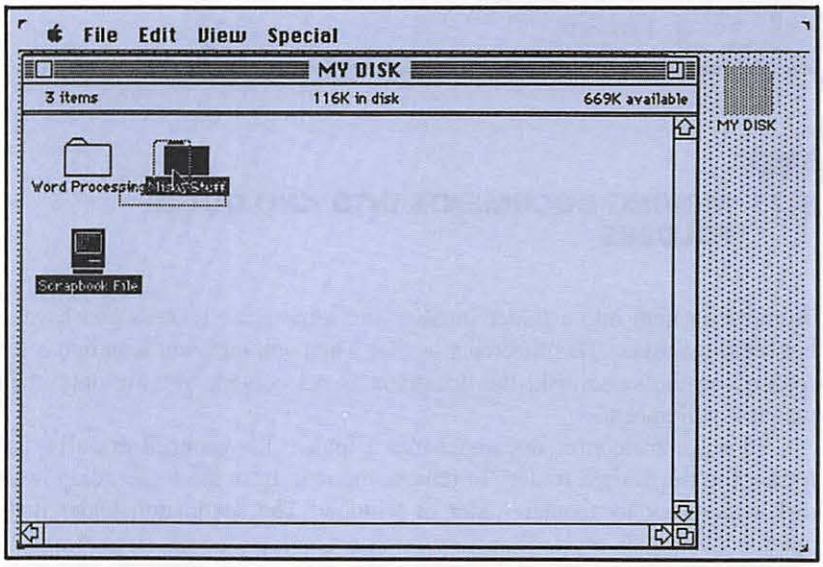


Figure 3.53
Note the outline of the Scrapbook File has been moved to the Misc. Stuff folder. When you release the mouse button, the Scrapbook icon will disappear from the current window.

Double-click on the Misc. Stuff folder icon.

Open the Misc. Stuff folder. You can see that the Scrapbook has been added to the contents of this folder.

Select both the Finder and Scrapbook documents.

Now you are going to move both of these documents out of the folder. Remember that you can select two or more icons by the shift-click method or by dragging the mouse over both icons while holding down the mouse button.

With both icons selected, point to the Scrapbook then click and hold the mouse button.

You move two or more icons by moving just one of the selected icons. Other icons in the selected group will move with the icon you are dragging. In this case, you have decided to move both icons by moving the Scrapbook icon.

Drag the outlines of the two icons out of the Misc. Stuff folder to the disk folder.

You are moving the two icons (Figure 3.55) out of the Misc. Stuff folder to the open window of MY DISK.

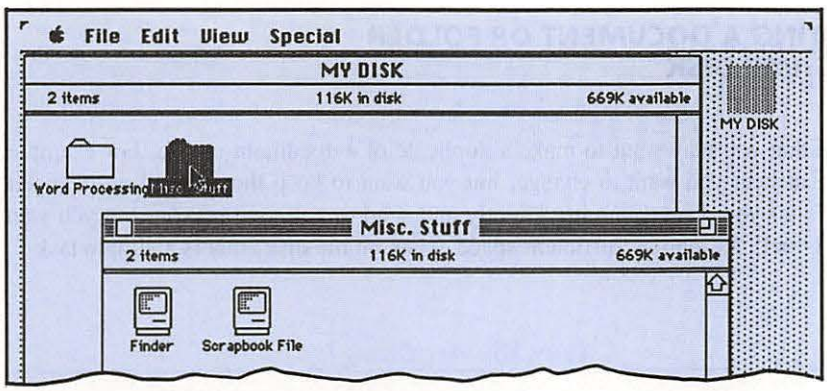


Figure 3.54
The current content of the Misc. Stuff folder.

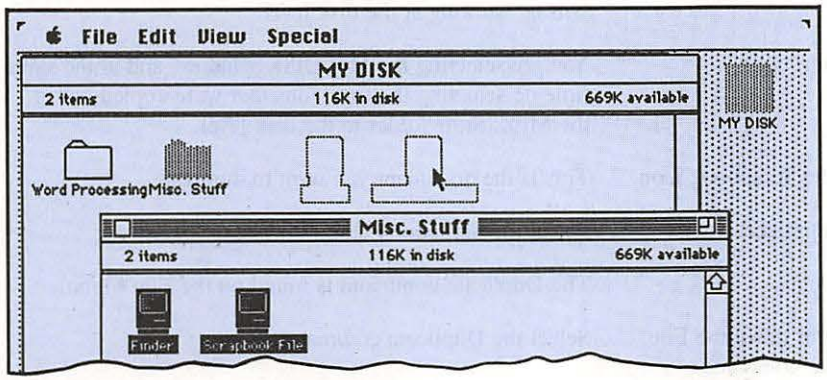


Figure 3.55
Since both icons in the Misc. Stuff folder are selected, moving one icon will move both.

Release the mouse button. Complete the move of the two icons (Figure 3.56).

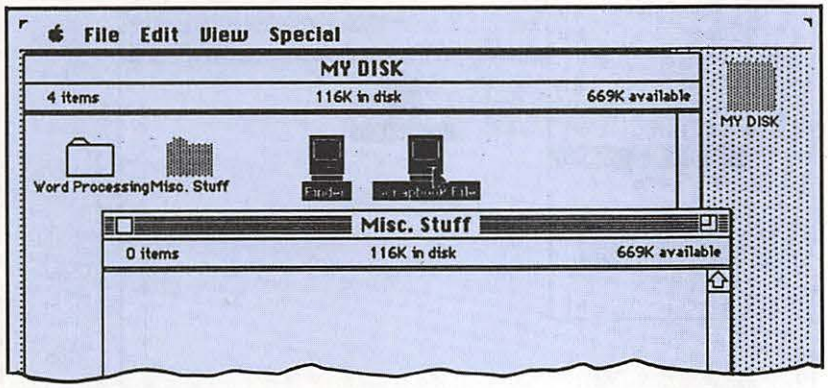


Figure 3.56
After releasing the mouse button, both icons are moved out of the Misc. Stuff folder. Note that for the time being, they remain selected.

3.26 DUPLICATING A DOCUMENT OR FOLDER ON THE SAME DISK

It is always possible that you may want to make a duplicate of a document or file. For example, you may have a spreadsheet you want to change, but you want to keep the original un-changed. Or you may have a letter you want to modify slightly and send to a second person, but you want to also retain the original. As long as sufficient space exists on the disk, this is a simple task.

What To Do	*Why You Are Doing It*
Move the mouse to the window for MY DISK.	You are finished working in the Misc. Stuff folder, and will be working at the disk level.
Click the mouse button once.	You are selecting the MY DISK window, and at the same time de-selecting the two icons that were copied out of the Misc. Stuff folder to the disk level.
Move the mouse to the Scrapbook icon.	This is the document you want to duplicate.
Click the mouse button once.	Select the Scrapbook icon.
Pull down the File menu.	The Duplicate command is found on the File Menu.
Drag the mouse pointer down the File Menu to the Duplicate command.	Select the Duplicate command.

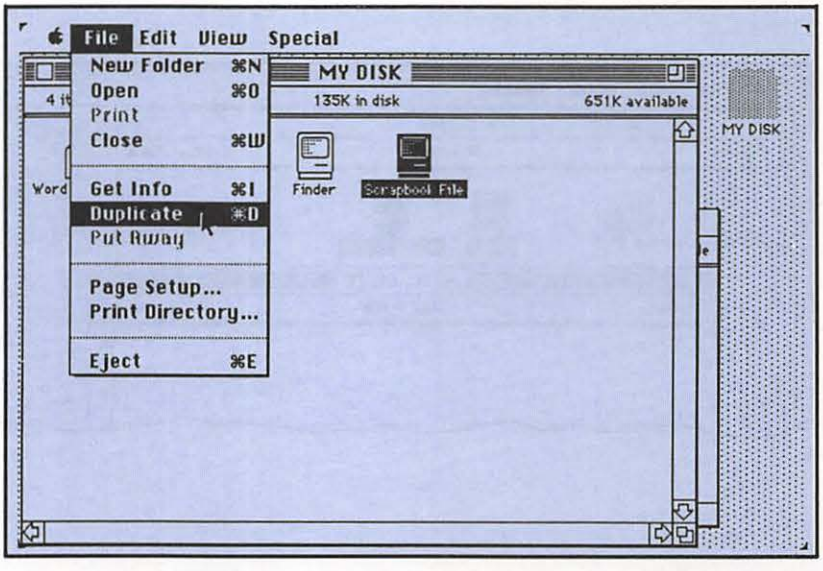


Figure 3.57
Note that you may also use the ⌘D key to duplicate a selected icon.

Release the mouse button.	A duplicate of the Scrapbook file, called Copy of Scrapbook File, will appear on the desktop.

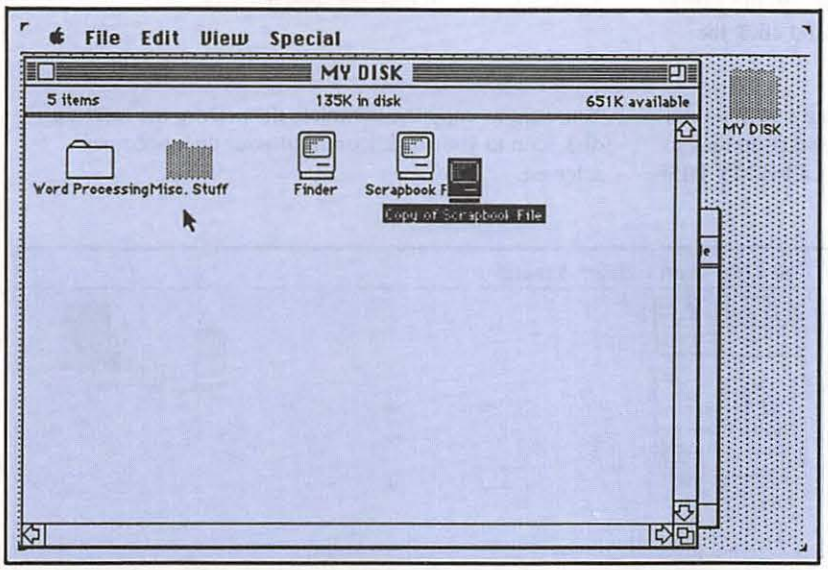


Figure 3.58
A duplicate of the Scrapbook is now in the window, along with the original.

3.27 BACKING UP A COMPLETE DISK

The most efficient way to make sure that you have copied everything you need from one disk to another is to copy the complete disk, not just a single file.

There is a major difference between copying a complete disk and copying just one or two documents. **When you copy a complete disk, all prior folders, files or documents on the destination disk are erased.** All the folders, files and documents on the source disk (except invisible files) are then copied to the destination disk.

What To Do	*Why You Are Doing It*
Close the MY DISK, System Folder, and Misc. Stuff windows.	Clean up the desktop so that you can see what disks you have, and where they are located.

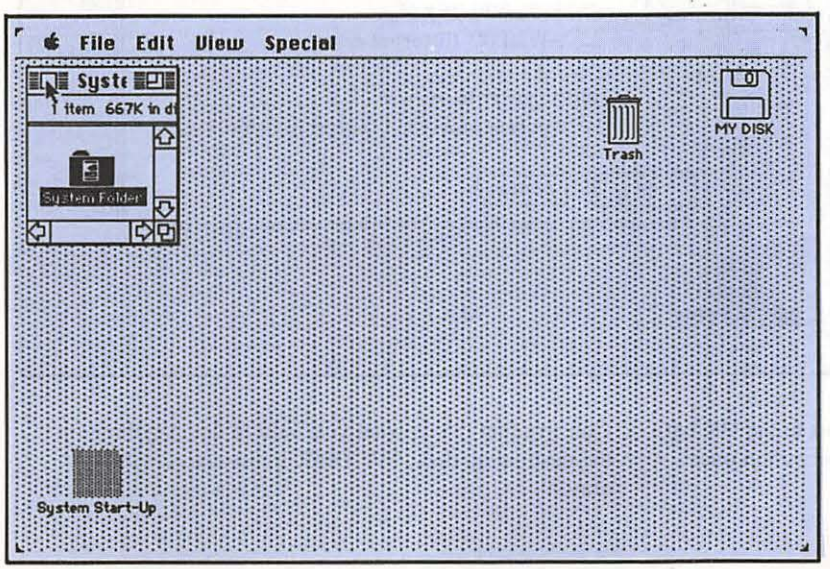


Figure 3.59
Your desktop should look similar to this figure.

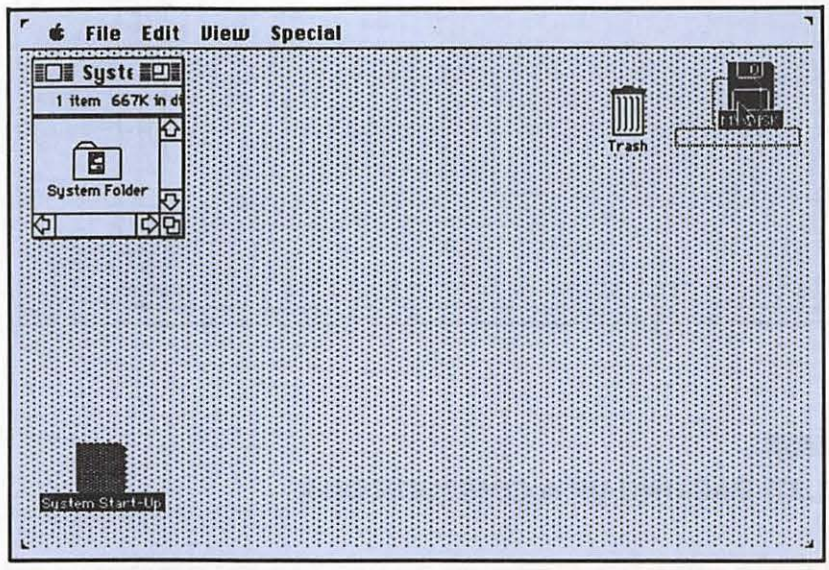
Place the mouse pointer on the icon of your START-UP disk and click the mouse button once.

Make the start-up disk the selected disk.

Press and hold the mouse button, and drag the outline of the start-up disk to the icon of your disk, called MY DISK.

You want to copy the complete disk. Drag the start-up disk icon to your disk icon until your disk becomes selected.

Figure 3.60
The hollow icon of the System Start-Up disk is dragged to the disk MY DISK so that the complete disk is copied.

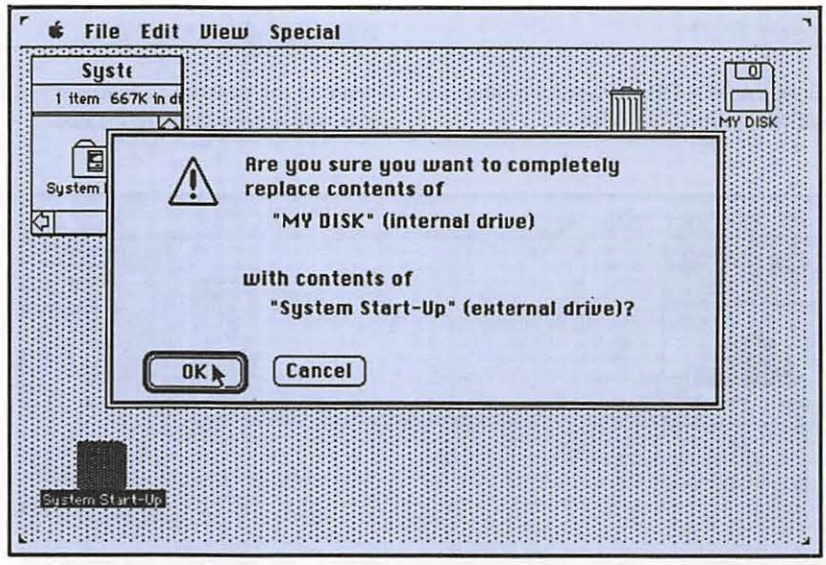


Release the mouse button.

Tell the Macintosh to copy the disk. At the same time, you are telling it the destination disk for the copy.

You will now see a dialog box asking you to confirm that it is OK to erase completely the contents of MY DISK and replace it with the contents of your start-up disk.

Figure 3.61
Confirm that you want to copy the System Start-Up disk onto MY DISK.



Move the mouse pointer to the OK button and click the mouse button once.

Confirm that this is what you want to do. Anything on the destination disk, MY DISK in this case, will be erased!

The copy process will take several minutes to complete. If the disk you are trying to copy is "copy protected," it probably will not copy successfully, or the software will not run properly if it does. Remember, copy files and disks **only** if they are your own work. It is against the law to copy commercial programs without the permission of the company.

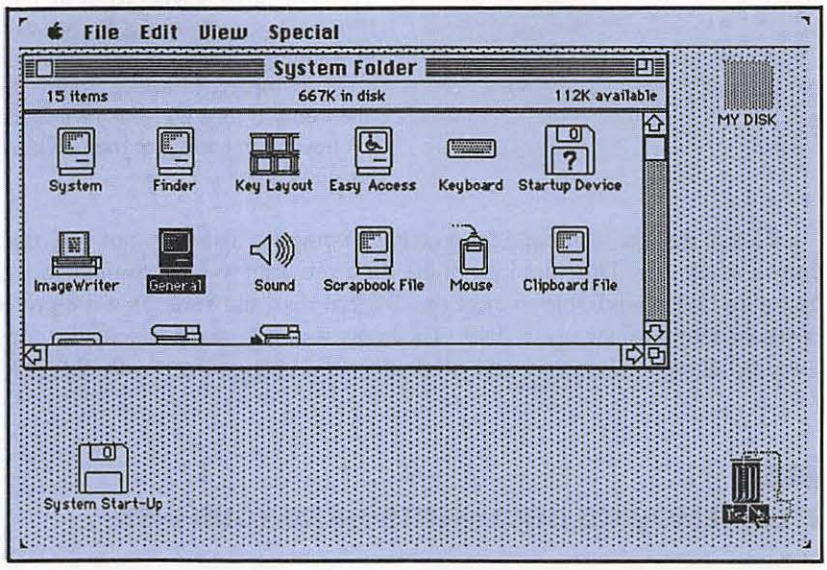
Notice that the technique for copying a complete disk does not vary much from that used to copy a single file. Drag the icon of the **disk** you want to copy to the new disk and click on OK. You may find it advisable to eject the original disk and slide its write-protect tab to the protect position before you copy a disk. This way you will not accidentally copy your disks in the "wrong" direction, erasing your originals and replacing them with old back-up copies.

3.28 REMOVING DOCUMENTS FROM YOUR DISK

Sooner or later you will want to get rid of older documents. This is the purpose of the trash can. Documents, folders or programs are deleted from a disk by dragging them to the trash can that sits on the Macintosh desktop. You will discover that when you put something in the trash can, all you are doing is changing the icon's location on the desktop, at least until you empty the trash or eject the disk.

What To Do	*Why You Are Doing It*
Close any open windows on your desktop.	We want to start with a clean desktop. This will ensure that we are removing the files from the back-up disk MY DISK, and not from the original start-up disk.
Click and hold the Trash can icon, and move it to the bottom right of the desktop.	Return the trash can icon to its original location on the desktop so that it will be easily accessed.
Open the MY DISK icon by double-clicking the mouse pointer on the disk icon.	We want to delete items from the back-up disk, so this is the one we are opening.
Open the System Folder.	We are going to delete something from the system folder.
Locate the file called General.	This is the file we want to delete.
Move the mouse pointer to General, and click and hold the mouse button.	Select the file General.
Drag the General icon to the trash can at the lower right of the desktop.	Throw away this document.
With the trash icon selected, release the mouse button.	Releasing the mouse button will drop the selected icon into the trash. The General icon will disappear from the folder, and the trash can will bulge, indicating that it contains at least one item.

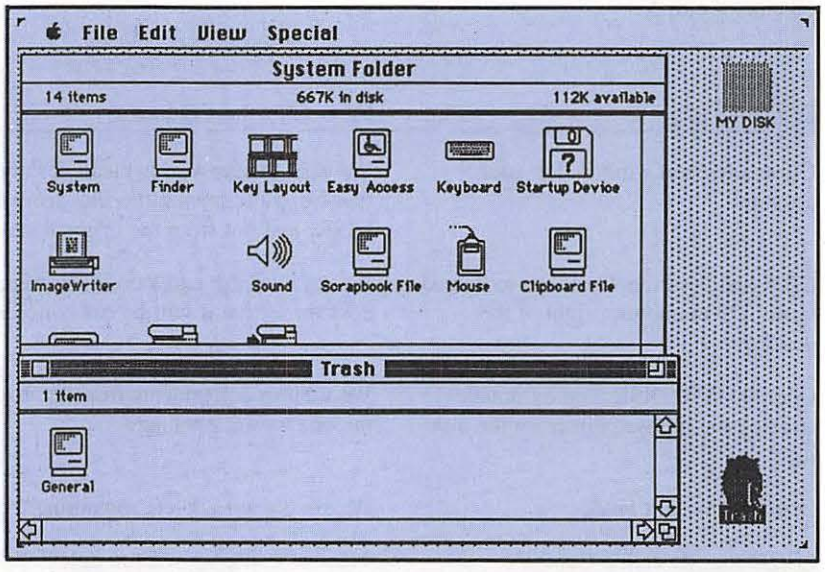
Figure 3.62
The icon for the General system document is placed into the trash. You are able to tell, in this instance, that you are working on your copy of the System Start-Up disk since the MY DISK icon is hollow, indicating that it is open, while the System Start-Up disk icon is closed. This may not always be the case, however. Always be cautious when deleting files from a disk.



Double click on the trash can icon.

Look at the contents of the trash can. You will see the item you just threw away.

Figure 3.63
Note that even the hollow (open) icon of the Trash is bulging, indicating that there is something in your trash. You can also see that the General icon is no longer in the system folder.



Because the item is in the trash can, it is possible to retrieve it. To do so you simply drag it out of the trash can window and put it back onto the disk. Do not do this at this time. We want to dispose of this document.

Once the trash has been emptied, an item can no longer be retrieved.

Pull down the Special menu from the menu bar at the top of the desktop.

The Special menu contains an option for emptying the trash.

Drag the mouse pointer to the Empty Trash option.

This option is available only when the trash contains something. If the trash is empty, the Empty Trash option will be dimmed.

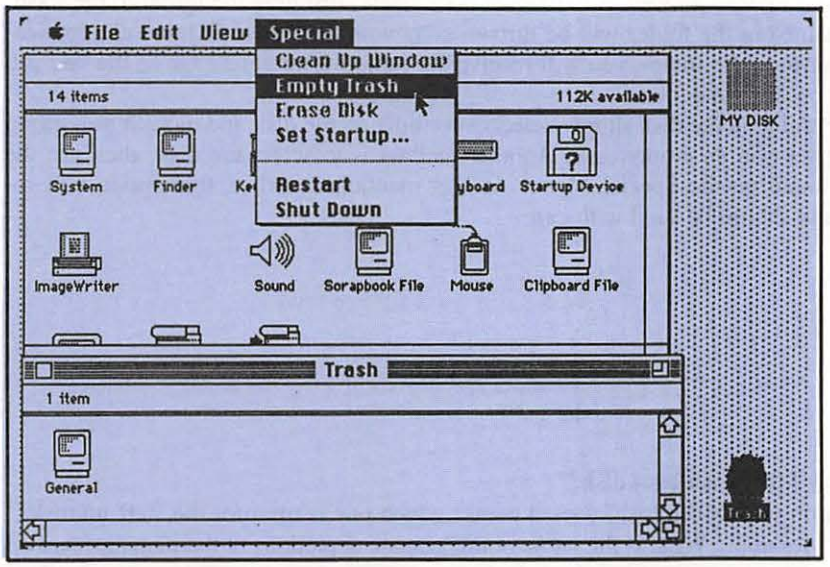


Figure 3.64
After you empty the trash, the information you have thrown out can no longer be retrieved.

Release the mouse button.	Empty the trash. The trash can icon will return to normal size.
Locate the icon for the Finder in the System Folder on MY DISK.	This is the next item you want to throw away.
Drag the Finder to the trash and release the mouse button.	Throw away the Finder. The Macintosh will recognize the Finder as a part of the operating system. The computer is hesitant to throw away parts of the operating system or any application programs, so you are now asked to confirm that you really intend to throw away this document.
Click on OK.	Confirm that you want to throw away the Finder. If you click on cancel, the Finder will not be thrown out.

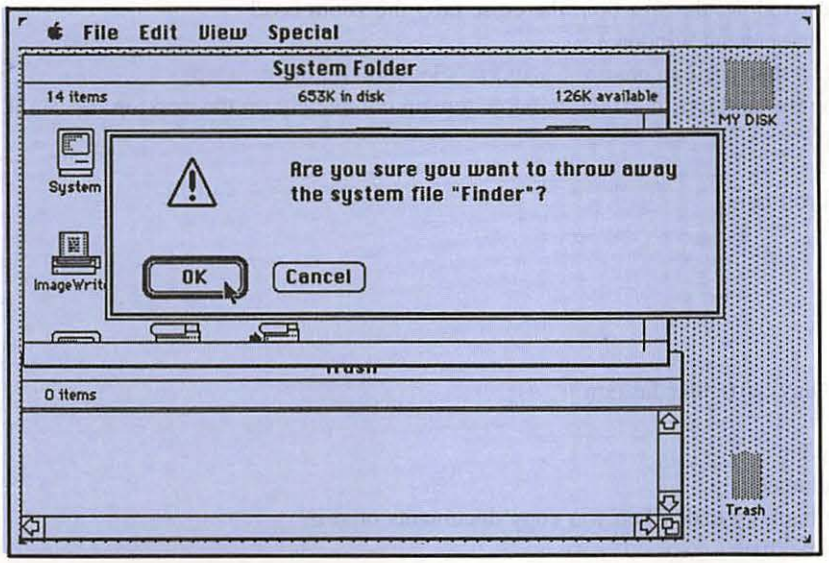


Figure 3.65
Tell the computer you really want to dispose of the Finder.

You can throw out folders, as well as individual documents. Just drag the folder to the trash. Any document contained in the folder will be thrown away with the folder. If there are application programs contained in the folder, you will receive the same warning message as the one you saw when throwing out the Finder.

To remove everything on the disk simply select everything on the disk and move it as a group to the trash. This gives you an empty disk. Another method is to select the disk, then use the Erase Disk option found on the Special Menu. As was mentioned earlier, this option will re-initialize the disk, and should be used with care.

EXERCISES

1. What purpose does the Finder serve?
2. What does a boot disk do?
3. What two programs are found on almost every Macintosh boot disk?
4. If you have two or more disk drives available on your Macintosh, does it matter which one is used for the start-up disk?
5. The Macintosh screen is sometimes called a "desktop." What is the name of the graphic depictions of the items located on the desktop?
6. What purpose does the mouse serve?
7. How can you tell when an item on the desktop has been selected?
8. What do you do to complete a mouse movement on the Macintosh screen if you run out of room on your physical desk? Why is this possible?
9. How do you select an icon on the desktop?
10. How do you de-select an icon?
11. What is the difference between dragging and moving the mouse?
12. Do the disk and trash icons have fixed locations on the desktop, or can they be moved?
13. How do you drag an icon on the desktop?
14. How do you make a pull down menu appear?
15. Why are some menu items dimmed when you pull down a menu?
16. How do you select a menu option?
17. What purpose is served by command-key equivalents?
18. What is meant by the term "double-click"?
19. What happens when you double-click the mouse pointer on a closed disk icon?
20. Where are the following located on a selected window: the size box, the close box, the zoom box?
21. How can you tell a selected window from an un-selected window?
22. Where must the mouse pointer be positioned so that you can change a window's location on the desktop?
23. When you drag a window to a new location on the desktop, must the window remain completely on the desktop, or can it be positioned so that parts are off the desktop?
24. When do scroll bars become active?
25. What are the three ways you can use active scroll bars?
26. What purpose do dialog boxes serve?
27. How do you initialize a new disk?
28. How often do you need to initialize a disk?
29. How do you create a new folder on a disk?
30. What can you put into folders?
31. Must you organize the contents of a folder in any particular fashion?
32. How do you put items into a folder?
33. How do you make a back-up copy of a document?
34. How many documents can be backed up simultaneously?
35. What happens to any other documents on the back-up disk when you copy documents onto it?
36. How do you make a back-up copy of a complete disk?
37. What happens to any other documents on a back-up disk when a complete disk is backed up, rather than a single document?
38. How do you remove unwanted items from your disk?

CHAPTER

FINDER UTILITY PROGRAMS

4

CHAPTER OBJECTIVES

Upon completion of this chapter, the student will:

- **Identify the System folder and the function it serves.**
- **Explain the information stored as part of the System program/file.**
- **Explain what a font is.**
- **Explain the difference between a bit-mapped and laser font.**
- **Explain the difference between an "outline" and a "solid" font.**
- **Define the function of the clipboard.**
- **Explain what DAs are, and the purpose they serve.**
- **Use the following standard DAs:**
  - **Alarm Clock**
  - **Calculator**
  - **Chooser**
  - **Control Panel**
  - **Find File**
  - **Key Caps**
  - **Scrapbook**
- **Start an application program running.**
- **Exit an application program.**
- **Add fonts and DAs to the System file using the Font/DA Mover.**
- **Erase/re-initialize a disk.**
- **Use the Finder's View menu.**
- **Change the default start-up.**
- **Use MultiFinder.**

4.1 THE SYSTEM FOLDER

The System Folder holds a variety of files and information used by the Macintosh's operating system. Some of the information is used when the computer boots, while other parts of it are accessed when needed.

In current releases of the Macintosh operating system, you may identify the system folder by the miniature icon of a Macintosh that is displayed on it (Figure 4.1). Earlier versions of the operating system do not use this feature. The icon on the outside of the system folder tells you not only that the folder is the system folder, but also that the disk holding that folder may be used to boot the Macintosh.

Figure 4.1
Note the miniature icon of a Macintosh on this folder. This is a system folder.



The system folder, to be a bootable disk, must contain at least the System file and one application, usually the Finder. Beyond these two files, it is possible for the System Folder to contain a wide variety of items.

Many of the files are in some way connected with the operating system, and are called System documents. Some common system documents are the Scrapbook file, the Clipboard file, MultiFinder and Backgrounder.

Another type of item found in the System Folder is called an INIT (pronounced "in-it"), which is short for initialization. When located in the boot disk's system folder, INITs are loaded and executed during the boot process. INITs are sometimes referred to as Startup documents because they modify the operating system during system startup to perform a specific function. For example, an INIT that is supplied with the Macintosh operating system is called Easy Access. This INIT lets the user use keystrokes to move the mouse pointer and/or to perform functions that normally require the use of the mouse. However, if the Easy Access icon is not in the boot disk's system folder during the startup process, the INIT is not loaded.

A CDEV (pronounced "see-dev") may also be found in your System Folder. A CDEV is a Control Panel document. The control panel is a desk accessory. More will be said about desk accessories and the control panel later in this chapter.

You will also find a variety of resource files in the System Folder. Resource files are also called Chooser documents. The Chooser is another desk accessory, and will be discussed in more detail later in this chapter. A resource file is one that is used by an application program to accomplish a specific task. The most common resource files are the printer resources, called ImageWriter, LaserWriter and LaserPrep. Without these printing resources, application programs are unable to output to your printer.

In addition to these files, you may find some special application programs (such as the PrintMonitor application used to laser print and work at the same time), temporary files, and settings files. Temporary files are created by many applications that need a place to temporarily put information. These files come and go. After you have used Word to write a text document, it is not uncommon to see a Word Temp file in your System Folder. These temp files may be moved to the trash at any time.

Settings files hold information about an application program. Their names vary, but usually include either the word Settings or the word Defaults. The typical information in a settings file may include which options for a specific program you have turned on, or how you want the program to use the printer. For example, you will see that Word lets you select the level of menus you want to use, either Short or Full. The type of menu display you choose to use is saved in the file called Word Settings.

4.2 DETERMINING WHAT IS WHAT IN YOUR SYSTEM FOLDER

Now that you know there are different types of files stored in your System Folder, you may be curious to know how to tell what is what. Unfortunately, you cannot tell by looking at the icon that an item is a Startup Document, a Control Panel document, or a System document.

One way to find out what a particular item is, in the System Folder, or any other folder for that matter, is to use the Get Info command found on the Finder's File menu. This command, which may also be executed with the ⌘I, will display a summary information window of the currently selected icon.

If you do not yet have your computer turned on, turn it on now and boot it with a System Start-Up disk. After the computer has started, use the mouse pointer to open the disk's System Folder.

What To Do	*Why You Are Doing It*
Locate the file called System in the System Folder. Its icon is that of a Macintosh computer.	You will be looking at the information window for the System file.
Move the mouse pointer to the System file and click the mouse button one time.	Select the System file.
⌘I	Get the Information window for the System file. If you want, you may also use the mouse to pull down the File menu, then select the Get Info item. The results will be the same. The information you have obtained may be slightly different from what is shown in Figure 4.2. You can see that one of the lines of information displayed in this window is Kind, and that the System file is a System document.

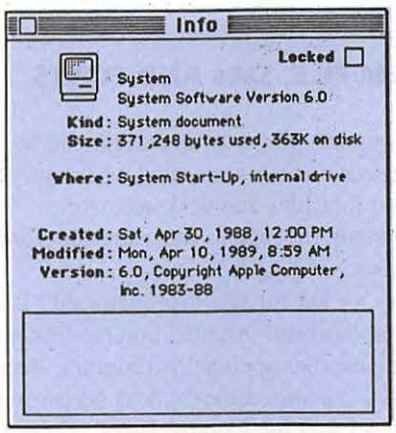


Figure 4.2
The Information window for the System file.

Locate the file labelled General. Its icon is also a Macintosh computer.	You now want to get the information for the General file.
Place the mouse pointer on the General icon and click the mouse button once.	Select the General icon.

⌘I

Get the Information window for the General icon. You can see that this is a Control Panel document (Figure 4.3).



Figure 4.3
The information window for the General Control Panel document.

Use the mouse pointer to close the two information windows. The close box for these windows is at the left side of the title bar, just as it is for any other window.

You may leave several windows open on your desktop at the same time, but it is a good idea to close windows once you are through with them to avoid cluttering up your computer desktop.

4.3 THE SYSTEM FILE, DAs AND FONTS

The System File is possibly the most important file found in the System Folder. This file is the Macintosh operating system and is executed whenever you turn on the machine. The System File also has installed in it font files and desk accessories. Whichever fonts and desk accessories are contained in the System file when you start the computer are available to the applications programs you then use.

A desk accessory, or **DA** for short (pronounced "D. A.," and not as a one syllable word), is a special program that has been installed into the System File and can be accessed and run even when you are running another application program. Because they require real space on the disk, different start-up disks can have different desk accessories available. Two DAs have already been mentioned, the Chooser and the Control Panel. These two, along with several others, are supplied by Apple Computer, Inc. with the operating system.

Fonts are descriptions of letters that are used as you type. The font files in the System file define the shape and size of the lettering. Each font in the System file has a name. Some standard fonts are Helvetica, Chicago, Courier, Times, New York and Monaco. Many other fonts are available through a variety of sources, both commercial and free.

There are two fundamental types of fonts available: **bit-map fonts** and **laser fonts**. A bit-map font has an exact description of each letter and symbol of the character set in terms of which dots to print, and which to leave white. Figure 4.4 shows the bit-map of the letter A in the Chicago font, at a size of 12 points. Some of the dots are turned "on," and thus appear black here. These are the dots that will print, either on the screen or on the paper. Every font that you look at on the screen of your Macintosh is a bit-map font. Even laser fonts have bit-map equivalents that are used for screen display. This is because the resolution (that is, the number of discrete points) of the Macintosh display at 72 dots per inch does not allow the fine smoothing achieved with the typical laser printer's 300 or more dots per inch. Thus, a laser font would be wasted on the screen.

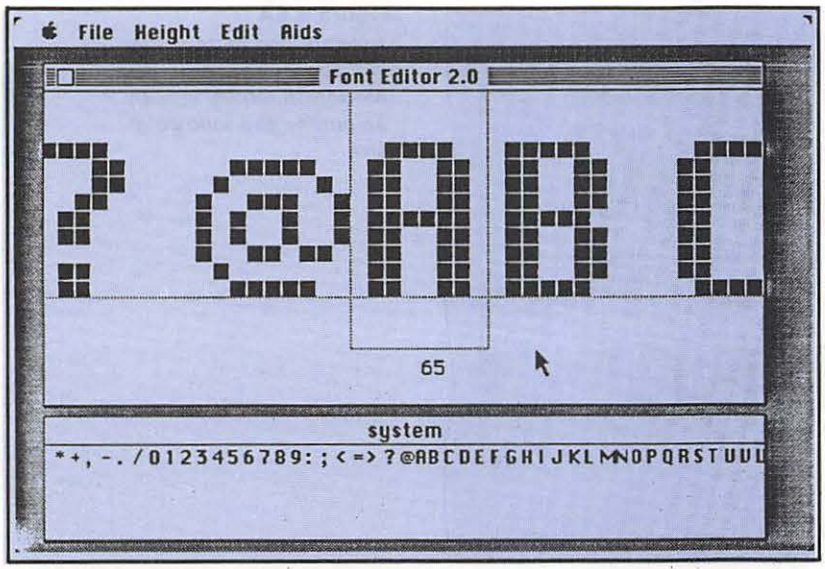


Figure 4.4
This display is from a font editor, an application program which lets the user modify the bit-map of a font. You can see the dots that are turned on to make up the letter A in the font Chicago, size 12.

A laser font is also an exact description of each letter and symbol of the character set. It is, however, a description in terms of how to draw the letters, rather than which specific dots to print or not print. Because laser font characters are drawn onto the paper, you have much more flexibility in terms of the size and appearance of the final output. A bit-map font looks best when used in one of its defined sizes. A laser font may be printed in almost any size and still look good on the printed page.

4.4 FONT SIZES

As suggested above, when you are using fonts, in addition to defining the shape of the letter, the Macintosh fonts also define the size of the letter. When choosing a size to use for a font, you must consider the final output device, and whether the font is a bit-map or laser font. A bit-map font looks and prints best when the size used matches a defined bit-map size. It is easy to tell which bit-map font sizes have been defined, and which have not.

When you look at the font size menu, you will notice that the point sizes listed appear in two type styles—normal solid lettering and outline lettering. Figure 4.5 shows a typical font menu with the Helvetica font selected. You can see that the point sizes 10 and 12 are listed in outlined lettering, while the point sizes 9, 14, 18, 24, 36 and 48 are in solid lettering. The two outlined lettering sizes, in this case 10 and 12, are the defined bit-maps for this font. Thus, if you are using this font to create a document, using 10 or 12 point type would produce the best appearing output. You may, if desired, use one of the other sizes. If you do this, the Macintosh will extrapolate from one of the bit-maps to try to make a pleasing font. Sometimes it works, and sometimes not. Figures 4.6A and 4.6B show the effects of bit-mat and laser fonts on the display and printed page.



Figure 4.5
The font menu from this application displays both the fonts available in the system file and the sizes that the program will let you use.

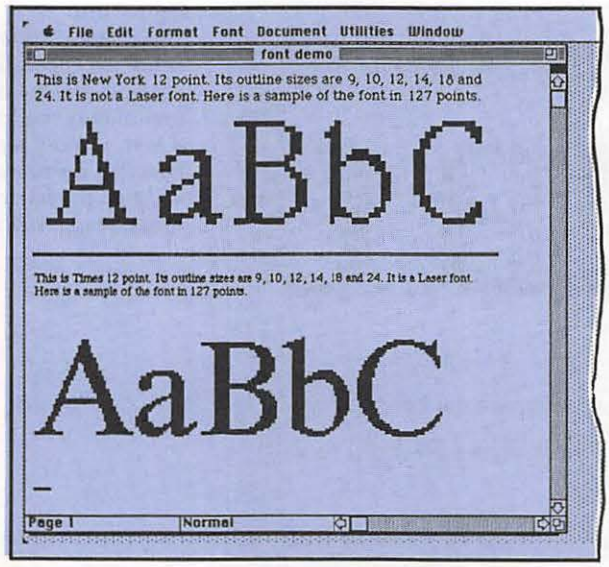


Figure 4.6A
Here are two fonts as they will appear on the Macintosh display in both an outline and solid point size

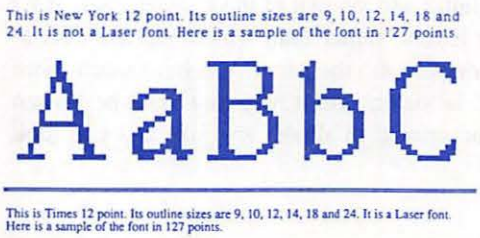




Figure 4.6B
The same text when printed on a laser printer. The laser font is smoothed, while the bit-map font retains its jagged appearance.

Later in the text, when you are working with Word, you will have the opportunity to experiment with different font sizes, and you will be able to see first hand the effect of using outline font sizes and non-outline font sizes. If you have a laser printer available, you will also be able to determine which of the fonts in your System file are laser fonts, and which are bit-map fonts...simply print a sample of each in a non-outline point size.

4.5 THE CLIPBOARD FILE

The Clipboard is a transient storage area. Its contents change constantly. As you work with the Macintosh, whenever you use a Cut or Copy command (found on the Edit menu of most software), the information that is cut or copied is placed onto the clipboard. The content of the clipboard is always the most recent item cut or copied! If you cut a word, it goes to the clipboard. If you then cut a different word, the first word disappears from the clipboard, to be replaced by the second item, and so on.

In short, the clipboard is a special memory area. It is actually a file, called the Clipboard File, found in the System Folder on your start-up disk (Figure 4.7). Even though it is constantly changing, the clipboard is useful because it is not erased when you exit one program and begin another. Thus, you can copy a picture in a drawing or painting program, or a chart from a spreadsheet/graphing program, exit the program, start a word processing program, and paste the graphic into the written document. At least you can do this if you do not cut or copy anything else between the time you copy the graphic in the first program until you paste it into the second program.

In essence, the clipboard is a special disk file that is accessed by every Macintosh program. All editing changes go there, and it is a file that you may use to transfer information between two Macintosh application programs. Many programs have a menu option to "Show Clipboard." In fact, you may find this option on the Edit menu of the Finder. Using it, you can see what is in the clipboard file. Always remember, however, that the contents of the Clipboard are constantly changing. If you want to transfer several items between programs, there is another way, called the Scrapbook, that makes multiple transfers a simple task. The Scrapbook is discussed later in this chapter.

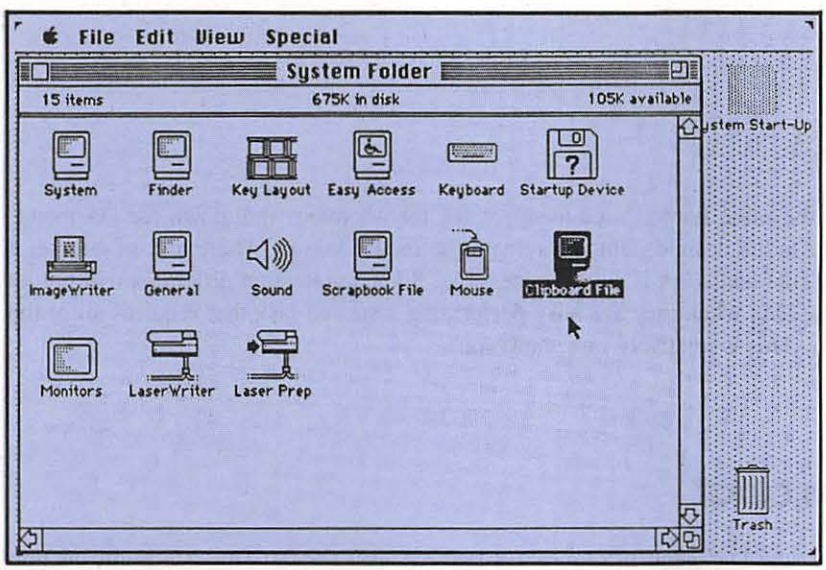


Figure 4.7
The Clipboard File appears in the System Folder of your boot disk.

4.6 THE APPLE MENU

You have undoubtedly noticed the small apple icon at the left of the menu bar. This icon is the "Apple" menu, and it contains a special selection of options called **desk accessories**, or DAs. Some people refer to the menu as the DA menu. When you pull down this menu, you will see two sets of things. At the top of the menu is usually an entry that reads "About ...", which gives you information about the program presently in use. You may also see items listed at the top of this menu to provide help for the current program. Next, you will see a list of program names that are available. These are the DAs.

Apple Computer, Inc., supplies several standard DAs with the Macintosh operating system. They are mostly utilitarian in nature, but you may find the Puzzle DA installed on your System Start-Up disk in addition to the Chooser, Control Panel and others. Some are very utilitarian in nature, and you can expect to find them as part of almost every System disk. They are the Chooser, the Control Panel, Find File, Key Caps and the Scrapbook. DAs, since they are just programs that can be executed by the Macintosh, can be created to do anything. You may find DAs to play games, spell check text documents, give you access to a thesaurus, or read a HyperCard stack. Figure 4.8 shows the DA menu found on the typical Apple supplied start-up disk.

Figure 4.8
These DAs are all supplied by Apple Computer, Inc. as part of the Macintosh Operating System.



Possibly the most important feature of DAs is **that they may be used at** almost **any time**. Very few programs deny you access to the DA menu. This means that you may use a DA while you are using another program. For example, you may want to change between a laser and dot matrix printer while you are working on a document to print a draft copy of your work. This task is performed with the Chooser DA, which may be selected while you are working on the document in question. You may want to have the computer give you an alert when a particular time of day is reached so you can get to class on time. This is done with the Alarm Clock DA. These DAs, like all others, may be used even while you are using a word processing or electronic spreadsheet program.

4.7 USING DAs

A DA is executed in the same fashion used to select any menu option. Pull down the DA menu, drag the selection bar to the desired item and release the mouse button. There are, of course, a few exceptions to the rule that a DA is always accessible. Some application programs will not let you have access to the DAs when they are busy performing a special task that requires all of the Macintosh's attention. This is relatively rare, however.

4.8 THE ALARM CLOCK

The first DA listed on the DA menu in Figure 4.8 is the Alarm Clock. This is a multifunction DA. It will display the current time of day as determined by reading the computer's internal clock. It also keeps track of the calendar date. In addition, the Alarm Clock DA will let you set the computer's system time and date. Finally, as its name implies, the DA gives you an alarm that you may set. When the time you have set is reached, the computer will Beep at you once and cause the Apple icon on the menu bar to blink. It will continue blinking until you turn off the alarm.

If you have the Alarm Clock DA on your DA menu, you may want to try it now.

What To Do	*Why You Are Doing It*
Use the mouse pointer to pull down the DA menu.	Pull down the DA menu so that you can use one of the Desk Accessories.
Drag the mouse pointer down to select the Alarm clock.	You want to test the Alarm Clock DA. Selecting a DA is done just as you would select any other menu item.



Figure 4.9
The Alarm Clock DA has been selected.

Release the mouse button.

Activate the Alarm Clock DA.

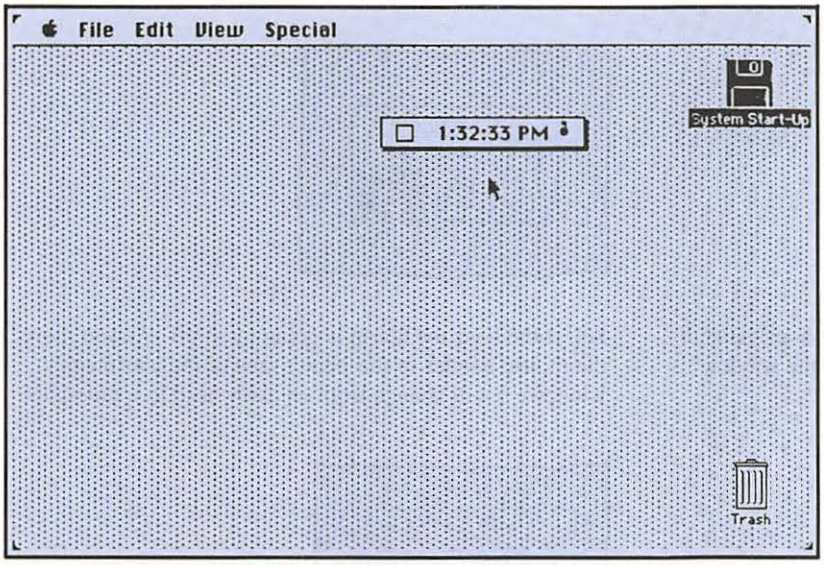


Figure 4.10
The alarm clock DA window as it first appears.

Note the small flag to the right of the time display. This flag is used to further open the window.

Place the mouse pointer on the flag.

You want to open the Alarm Clock window to set the alarm.

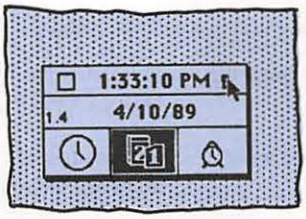


Figure 4.11
Note that the mouse pointer is positioned on the flag.

Click the mouse button once.

Pull down the flag, which opens the Alarm Clock window.

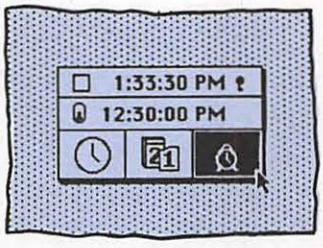
Figure 4.12
The alarm clock DA window after you have fully opened it.



You can see that the alarm clock DA window, when open, has three distinct areas. The top portion displays your computer's current system time. You can expect it to be a different time than the one shown in the Figures. The bottom portion displays three icons. From left to right, they are used to set the computer's clock, date and the alarm clock. As you select each of these three icons, the center area of the Alarm Clock window will change, showing the current settings for the time, date and alarm.

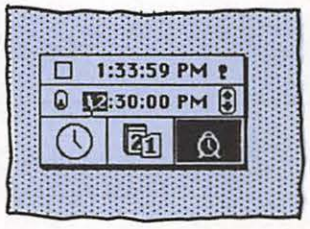
What To Do	*Why You Are Doing It*
Move the mouse pointer to the alarm clock icon at the bottom right corner of the Alarm Clock window and click the mouse button once.	You want to set the alarm clock. The current alarm setting will be displayed in the middle portion of the window.

Figure 4.13
The current setting of the alarm clock is 12:30 PM.



Move the mouse to the hour value displayed in the center of the window. Click the mouse once.	Select the hour the alarm is going to go off. As you move the mouse pointer in this center area of the alarm clock window, it will change from an arrowhead to a crosshair.

Figure 4.14
With the hour value selected, you are able to change the hour that the alarm will "ring."



Change the time that the alarm is to go off to be about 5 minutes later than the time shown in the top portion of the Alarm Clock window. Simply type the new hour, then select the minutes and type the new minutes. Finally, select the AM/PM indicator. Type A for AM or P to obtain PM. Note how the alarm time is set in Figure 4.15 in relation to the clock time displayed in the top portion of the window.

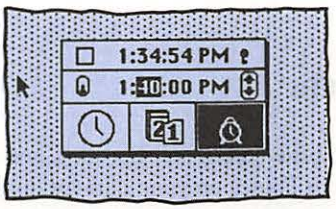


Figure 4.15
Note the difference in the times between the top and center portion of this Alarm Clock window.

Move the mouse pointer to the small switch icon at the left of the time you have just set.

This switch is used to turn on the alarm clock.

Click the mouse button once.

Turn on the alarm. Note that the switch moves to the up position, and the alarm clock icon at the bottom right corner of the window changes (Figure 4.16).

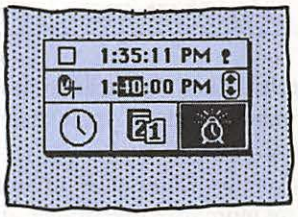


Figure 4.16
Note that the icon of the alarm clock is now "on," and the switch is up.

Move the mouse to the close box on the Alarm Clock window and click the mouse button once.

Put away the alarm clock.

Even though the window has been put away, the clock is still running. After the time passes between the current time and the time you have set for the alarm, you will hear a single beep from the computer, and the Apple icon on the menu bar will blink, indicating that the alarm has gone off. When this happens, use the DA menu to once again open up the Alarm Clock DA. Simply doing this will turn off the alarm. If you do not want the alarm to go off again in 24 hours, pull down the flag to open the complete Alarm Clock window. Next, select the alarm icon. Finally, turn the small switch at the left of the window to the off position to de-activate the alarm.



Figure 4.17
After the alarm goes off, you will see a miniature icon of the alarm clock blink at the DA menu position on the menu bar.

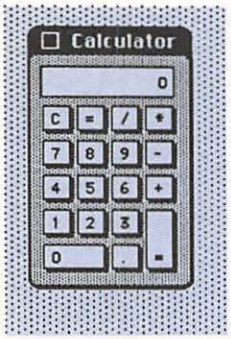


Figure 4.18
The Calculator DA.

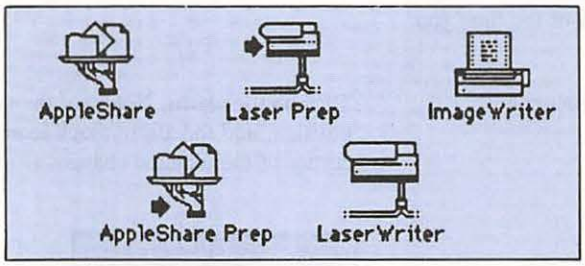
4.9 THE CALCULATOR

Everyone today knows how to use a calculator. The Calculator DA is a simple four-function calculator. All it does is add, subtract, multiply and divide. When you use the Calculator, you may use the mouse pointer to press the keypad, or you may simply type the desired numbers on the computer's keyboard.

4.10 THE CHOOSER

The Chooser lets you activate **resources**. For the Chooser to be aware of a resource, the resource file must be in the System Folder on your start-up disk. Figure 4.19 shows the icons of some of the resource files you can expect to see in your system folder.

Figure 4.19
These are the resource file icons found in the typical System Folder. Note that there are two icons for the LaserWriter. Both are required when printing with a laser printer.



If your computer is attached to an AppleShare network, the Chooser is used to activate the connection between your computer and an AppleShare disk volume. The AppleShare disk volume is a resource for your use.

The most common use of the Chooser is to select the desired output device or printer resource. It is possible to have more than one printer attached to your Macintosh, or you may be attached to a network that has multiple printers. The Chooser is used to tell your computer which printer you want to use at that moment. The Chooser is an important DA to remember when you are thinking about printing. The Macintosh formats text in a slightly different fashion for printing on a LaserWriter printer than when it prints on an ImageWriter dot matrix printer. When you select a printer with the Chooser, you are telling the Macintosh how to format the particular document.

You can see the effect of selecting the different printers in Figures 4.20 and 4.21. Both figures are of the same document as it is being written using MicroSoft Word. The ruler line has been turned on at the top of the text window in each figure. Figure 4.20 shows document formatted for the ImageWriter, a dot matrix printer. Note the spacing on the ruler line at the top of the window. The numeral six (6) is at the right edge of the ruler line partially out of the window at the top of the display. The triangle at the right edge of the ruler line just below the six inch point indicates the right margin of the document. Finally, notice the words that end each line: Union, common, to and the.

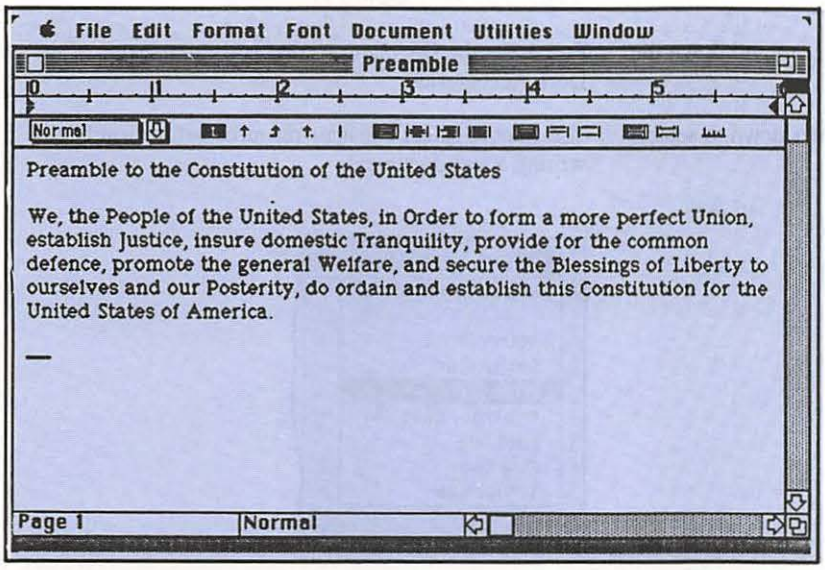


Figure 4.20
The Preamble to the Constitution is formatted by the ImageWriter printer resource in this figure. Compare the spacing on the ruler line in this figure to the one shown in Figure 4.21.

Figure 4.21 shows this exact same document with the LaserWriter as the selected printer. The size of the window is exactly the same as that shown in Figure 4.20. Notice, however, that the numeral six on the ruler line is no longer next to the right edge of the window. Similarly, the words at the end of each line have changed. The word Union, which is at the end of the first line in Figure 4.20, is at the beginning of the second line in this figure. Similar changes have occurred throughout the rest of the text.

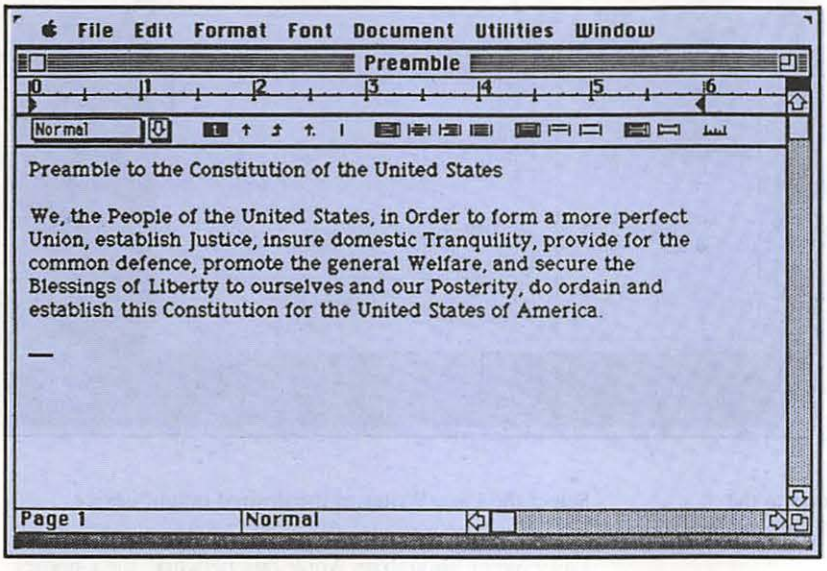


Figure 4.21
Here, the Preamble has been formatted by the LaserWriter printer resource. Compare the spacing on the ruler line in this figure with the one shown in figure 4.20.

The importance of these changes occur when you are trying to carefully format a document. If you are going to print it on an ImageWriter, be sure that you have selected that printer with the Chooser. If, on the other hand, you expect to print the document on a LaserWriter, you must use the Chooser to select that printer. The selection of the printer is best done before you start work on the document. That way you will not have to re-work parts of the text after you change the printer type.

What To Do	*Why You Are Doing It*
Use the mouse pointer to pull down the DA menu.	Pull down the DA menu so that you can use one of the Desk Accessories.
Drag the mouse pointer down to select the Chooser.	You want to select a printer resource before you begin writing a text document.



Figure 4.22
The Chooser DA has been selected.

Release the mouse button.	Activate the Chooser DA. In Figure 4.23, the printers available are an ImageWriter and a LaserWriter.

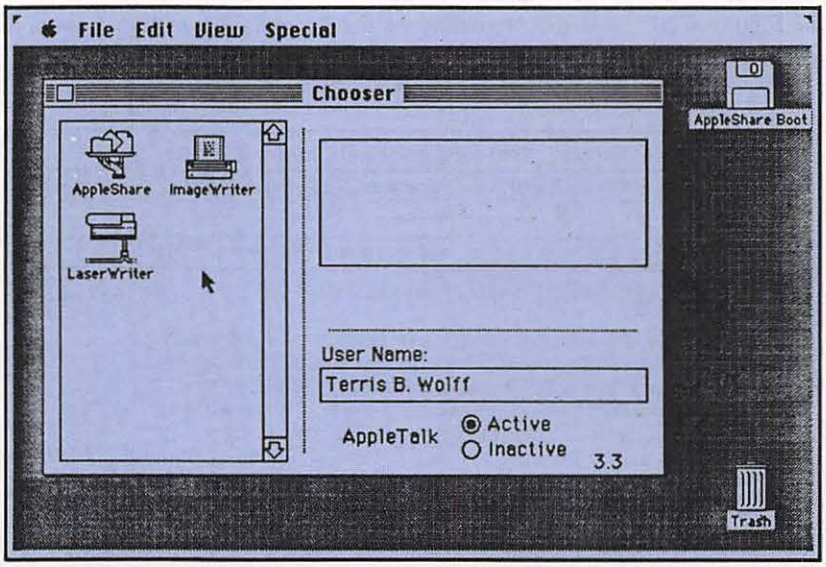


Figure 4.23
The typical Chooser DA window as it first appears. This computer supports an ImageWriter, a LaserWriter, and is attached to an AppleShare network.

Move the mouse pointer to the LaserWriter icon and click the mouse button once.	Select the LaserWriter as the desired output device. Since it is possible to have access to more than one LaserWriter through an AppleTalk network, the Chooser asks which printer you want to use. If you have more than one LaserWriter available on an AppleTalk network, you will see them listed here.

The computer in Figure 4.24 is attached to only one LaserWriter printer, which has been named simply "LaserWriter II NT." Part of the LaserWriter installation procedure is to name the printer. For example, a printer may be named by its physical location, such as "Marketing Office," or by its owner, such as "Alex's Laser."

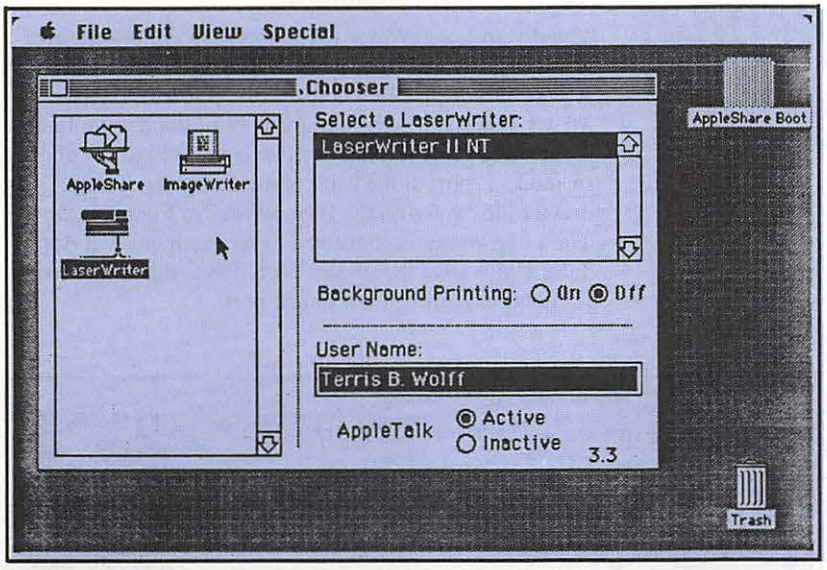


Figure 4.24
Selecting a resource in the left Chooser box activates a dialog in the right Chooser box.

You should also notice an option followed by two small buttons—Background Printing—which may be on or off. Only LaserWriters support this Macintosh feature. This feature causes a program to send your printed output to temporary storage on your disk, a relatively fast process compared to the time required to send the document to the printer. When this task is completed, the Macintosh returns control to you, and you may once again work on the document. While you are working, the computer starts executing a separate program, called PrintMonitor, whose sole purpose is to print the document from the temporary storage while you perform a different task. Generally, the computer pays more attention to you and what you are doing than to the PrintMonitor program, although you will find that the computer's response to mouse movements and some of the other actions you perform is slower than normal. The PrintMonitor is working behind the application you are using, and is said to be running in the background. Thus the option is called Background printing. You may also hear this type of printing referred to as spooled printing.

Background printing as described above is only available when you are using the MultiFinder, rather than the Finder, interface program, although there are print spooling programs available from software vendors other than Apple Computer, Inc. The main feature of MultiFinder is that it allows the computer to perform multiple simultaneous tasks. If you are using MultiFinder, you may decide to turn Background printing either On or Off. If you are using the Finder, the Background Printing On/Off options are dimmed, as in Figure 4.24, and the selection is not available to you. More will be said about MultiFinder later in this chapter.

WHAT TO DO	WHY YOU ARE DOING IT
Move the mouse pointer to the ImageWriter Icon and click the mouse button once.	You may change the desired printer at any time. When you select the ImageWriter, a different dialog appears in the right window of the Chooser. ImageWriter printers do not have names, as do LaserWriters. You must, however, tell the computer to which of two possible outlets, called a **port**, the printer is attached. Usually an ImageWriter is connected to the printer port at the back of the Macintosh. If, however, your computer is part of an AppleTalk network, or you have a LaserWriter attached to your computer in addition to an ImageWriter, your ImageWriter will be connected to the phone, or modem, port at the back of the computer. This is exactly the case with the ImageWriter in Figure 4.25. The LaserWriter is connected to the computer via AppleTalk, which uses the printer port. Thus, this ImageWriter is connected through the Phone port.

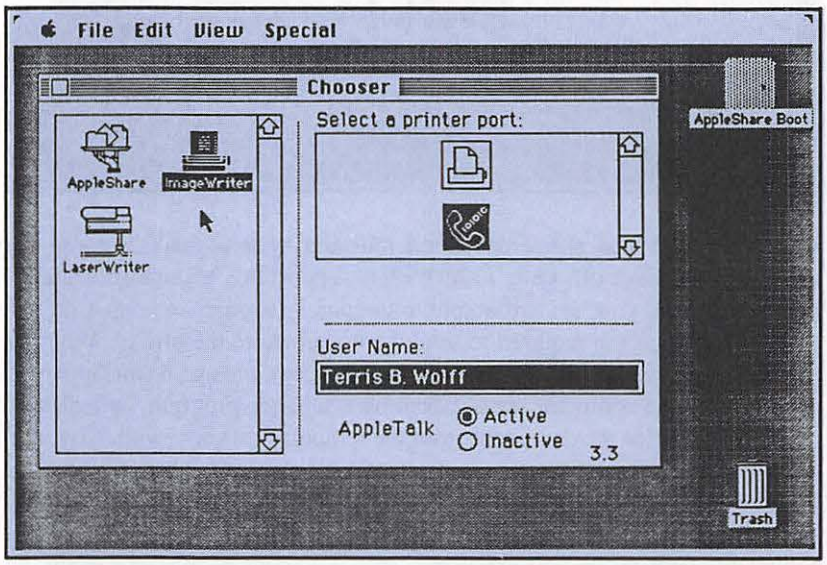


Figure 4.25
When you select the ImageWriter printer resource, you must tell the Macintosh to which port the printer is attached.

Before you continue, select the printer type that you will be using. If the computer you are working on does not have any printer attached to it, you may still select a printer so that your documents are properly formatted. If you select a LaserWriter, the dialog box on the right side of the Chooser window will remain blank, since the computer will not be able to detect any LaserWriter on the AppleTalk network. Don't worry. Even though no specific laser has been specified, the Macintosh will still format your work for eventual output on a LaserWriter.

WHAT TO DO	WHY YOU ARE DOING IT
Move the mouse pointer to the Close Box at the left side of the Chooser window's title bar.	After you have selected a printer, or other resource, you are ready to put away the Chooser desk accessory.
Click the mouse button.	Close the Chooser. Since you selected a printer, that printer resource will be active until you once again change the selection.

4.11 THE CONTROL PANEL

The Control Panel is used to set the operating environment of your Macintosh. It gives you control over things such as the desktop pattern, the volume of the speaker, the computer's internal date and time (this is the same date and time you may set with the Alarm Clock DA, except there is no alarm here), and the speed that the mouse pointer tracks in relation to the actual motion of the mouse on your desktop.

If you have more than one hard disk attached to your Macintosh, the Control Panel is used to tell the computer which disk to boot from. This is called setting the Startup device. If you are using a Macintosh II, IIx or IIcx with a color monitor, the Monitors option of the Control Panel lets you activate and de-activate color. That is, you may have an application that does not want to properly use the color display (this happens with older application programs written before the Macintosh II series of computers was available), or you are planning on black and white printed output and you do not want to be distracted by color options on the screen.

There are other Control Panel devices available with the typical Start-up disk, such as the Sound and Keyboard devices.

For icons to appear in the Control Panel, they must be in the System Folder of the Start-up disk. They are identified as Control Panel Documents in the Get Info window you used earlier. Remember, these documents are sometimes called a CDEV, for Control Panel Device.

What To Do	*Why You Are Doing It*
Use the mouse pointer to pull down the DA menu.	Pull down the DA menu so that you can use one of the Desk Accessories.
Drag the mouse pointer down to select the Control Panel.	You want to modify the desktop pattern, change the speaker volume, and adjust the mouse tracking speed.

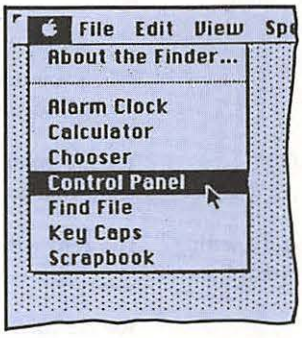


Figure 4.26
The Control Panel DA has been selected.

Release the mouse button.	Activate the Control Panel DA.



Figure 4.27
The typical Control Panel DA window as it first appears. The General Control Panel Device icon in the left window is selected. The right half of the window is showing the options you may adjust at this time.

Figure 4.28
The speaker volume has been set to its maximum level, 7. Note the present mouse pointer is a crosshair over the slide control.

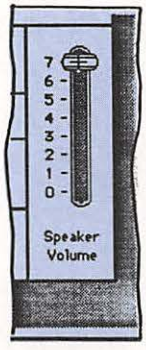
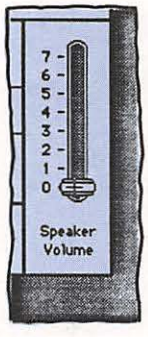


Figure 4.29
The speaker volume is set to zero, which turns off the computer's beep. Instead, the Macintosh will flash the menu bar when it wants your attention.



Move the mouse pointer to the box at the bottom right of the Control Panel window labelled Speaker Volume.	First you want to adjust the volume at which the computer "beeps." As you move the mouse pointer over the Control Panel window, you will see that it turns from the arrowhead to a cross hair. In Figure 4.27, the Speaker Volume is set at 4, the midpoint of the volume range.
Move the mouse pointer to the slide control on the speaker volume and press and hold the mouse button.	Grab the volume slide control.
Drag the slide control to the seven position at the top of the speaker volume control.	You want to set the computer's volume to its maximum level.
Release the mouse button.	When you release the mouse button, the computer will "beep" so you can hear the volume you have set.
Press and hold the mouse button.	You are going to re-position the slide control to once again change the volume.
Drag the slide control to the zero setting at the bottom of the volume control.	The zero setting will turn off the sound.
Release the mouse button.	You are turning off the computer's sound. When you release the mouse button, the menu bar will flash. Since the computer is unable to attract your attention through sound, it will now do it by flashing the menu bar when needed.
Press and hold the mouse button.	You are going to set the volume one more time.
Drag the slide control to the four setting, or another volume setting if you so desire.	The middle of the volume range is usually the best, unless you are in a particularly noisy or extra quiet setting.
Release the mouse button.	You are done setting the computer's speaker volume.

Now you want to change the desktop pattern. This is the dot pattern that is displayed as the Macintosh's desktop. If yours has not been changed, it is a grey pattern. You can see the enlarged pattern in the left box of the Control Panel segment labelled Desktop Pattern. The right box is a miniature representation of your computer's desktop. Note that it even has a small menu bar. If you are using a color monitor, you will see additional information that lets you control the color of the dots of your desktop pattern.

You may change the desktop pattern by clicking the mouse pointer (it is still a cross hair when using the Control Panel) in the miniature menu bar, or by using the mouse pointer to change the pattern in the left box.

What To Do	*Why You Are Doing It*
Place the mouse pointer on the center of the miniature menu bar of the desktop pattern box.	You will first change the desktop pattern by selecting one of the standard patterns. You may cycle through the standard patterns in either a forward or backward direction. Placing the cross hair on the center or right of the miniature menu bar indicates a "forward" cycle direction.

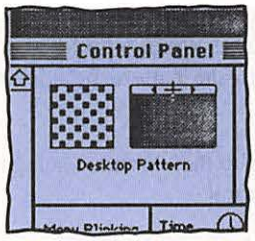


Figure 4.30
Note the mouse pointer cross hair positioned on the miniature menu bar of the Desktop Pattern control section.

Click the mouse button once.	Cycle the desktop pattern to the next standard option. This is a denser (i.e., darker) pattern.
Click the mouse button 3 more times.	Cycle through three more standard patterns. You should now have displayed a vertical bar pattern.

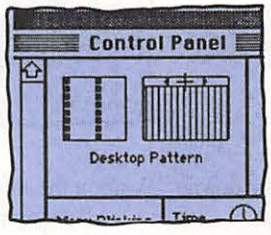


Figure 4.31
The current desktop pattern.

Move the mouse cross hair to the miniature desktop area.	You should have noticed that the actual desktop pattern has not changed. To make your selection the active desktop pattern, you click the mouse on the miniature desktop.
Click the mouse button once.	Activate the selected desktop pattern.

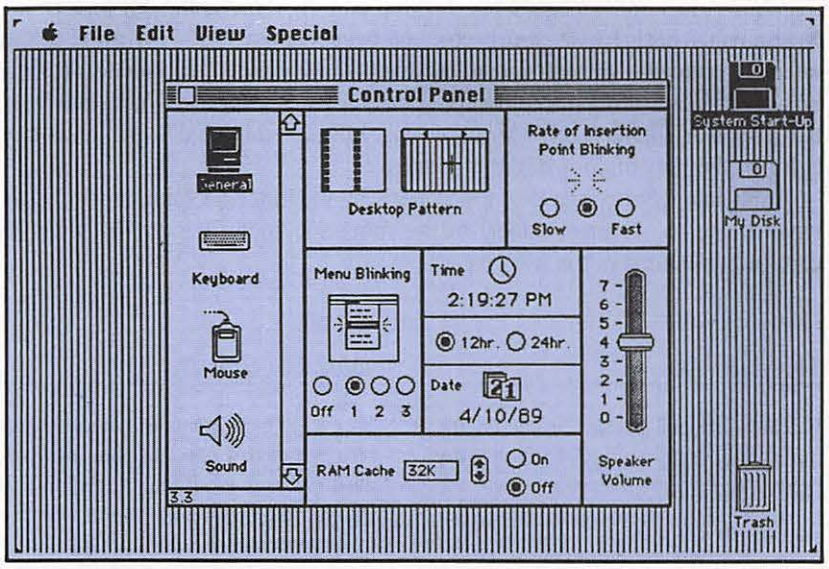


Figure 4.32
The new desktop pattern has been activated. Note the position of the mouse pointer cross hair on the miniature desktop. This is where it was clicked to activate the new desktop pattern.

You may also select a desired desktop pattern by editing the pattern as it appears in the left box of the Desktop Pattern control. When editing, you erase dots of the pattern by clicking the mouse on a dot. You add dots to the pattern by clicking the mouse in the white area. Try the following:

Move the mouse pointer cross hair to the left box of the Desktop Pattern control.	You are going to edit the desktop pattern.
Click the mouse on the dot at the top left corner of the box.	You are erasing this dot. The effect of this action is immediately displayed in the sample of the desktop pattern to the right.

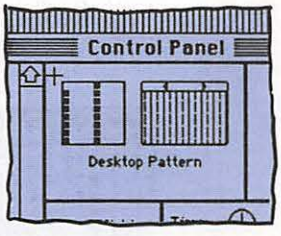


Figure 4.33
You have erased a dot that makes up the current desktop pattern. The effect is shown on the miniature desktop to the right.

Move the mouse pointer cross hair down to the next dot in the first column.	Position the mouse pointer cross hair to make more edits to the desktop pattern.
Press and hold the mouse button.	You may erase several dots by holding down the mouse button and dragging the mouse pointer cross hair over the dots to be erased.
Drag the mouse down over the next three dots of the desktop pattern.	When you are done with this step, you should have erased the top four dots, leaving four dots on the left column.
Release the mouse button.	You are done with this edit.

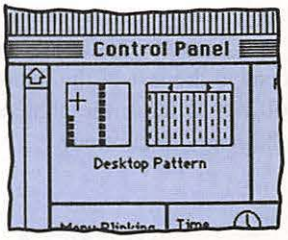


Figure 4.34
The current desktop pattern you have created.

Move the mouse pointer to the right column of dots.

You are going to make some changes to the appearance of this part of the pattern.

Erase the bottom four dots of this column.

You are completing the edit of the desktop pattern. The edited pattern should look like the one shown in Figure 4.35.

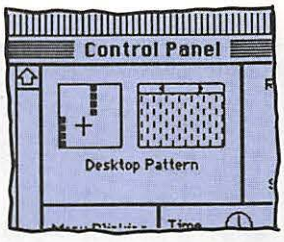


Figure 4.35
The new desktop pattern.

Note that the pattern is only displayed on the miniature desktop. To make it your active desktop pattern, you must once again click the mouse pointer on the middle of the miniature desktop at the right of the Desktop Pattern control.

Move the mouse pointer cross hair to the middle of the miniature desktop at the right of the Desktop Pattern control.

You want to make this new pattern your current desktop pattern.

Click the mouse button once.

Activate your new desktop pattern.

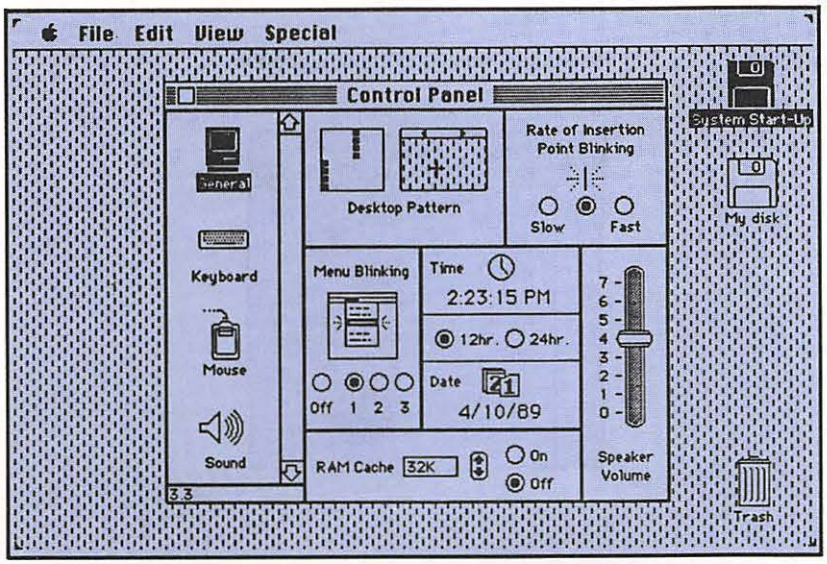
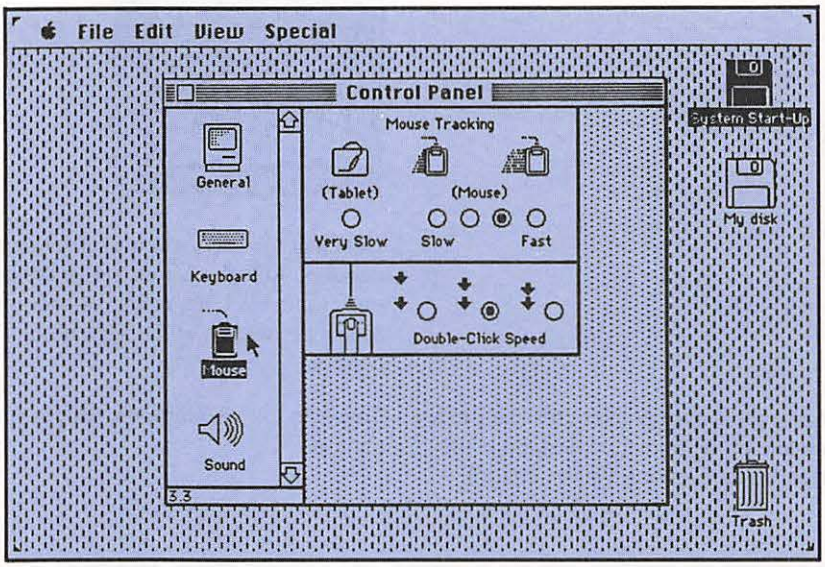


Figure 4.36
The new desktop pattern has taken effect.

Now you are ready to change the mouse tracking speed. There is nothing in the General control panel display that lets you perform this task. You must activate the Mouse control panel display. You can see several icons at the left of the control panel. If you do not see one labelled Mouse, use the window's scroll bar to move the contents of the display until you see what you are looking for. You will then be ready to continue.

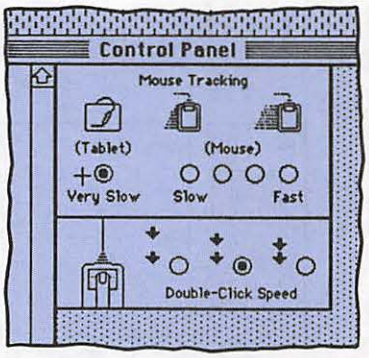
What To Do	*Why You Are Doing It*
Move the mouse pointer cross hair to the icon of the Mouse.	You want to make changes to how the mouse behaves.
Click the mouse once.	Select the Mouse Control. The content of the right half of the Control Panel will change. You can see that the mouse controls are limited to Mouse Tracking and Double-Click Speed.

Figure 4.37
The Mouse control panel display.



Move the mouse pointer cross hair to the button labelled Very Slow.	You are first going to see the effect of very slow mouse tracking.
Click the mouse button once.	Select the Very Slow tracking option.

Figure 4.38
The Very Slow mouse tracking option has been selected.



Move the mouse quickly two to three inches left and right on your desktop.

By moving the mouse, you can see the mouse pointer move on the Macintosh display at the same time. Note that there is about a one-to-one relationship between the distance that you move the mouse and the distance the mouse pointer moves on the screen.

Move the mouse pointer cross hair to the Fast button and click the mouse button once.

Select the Fast mouse tracking speed.

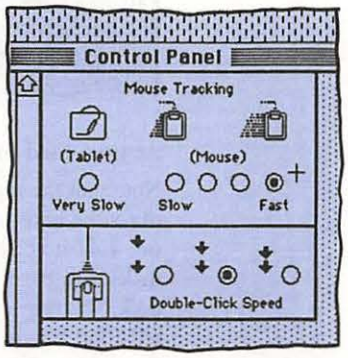


Figure 4.39
The Fast mouse tracking option has been selected.

Move the mouse quickly two to three inches left and right on your desktop.

Once again, notice the distance that the mouse pointer travels in relation to the distance you move the mouse. With the Fast option selected, short movements of the mouse produce long movements of the mouse pointer.

Before you continue, select the mouse tracking speed with which you are comfortable.

You are now done using the Control Panel. Move the mouse pointer to the close box at the top left corner of the Control Panel window and click the mouse to put the Control Panel away.

4.12 THE FIND FILE DA

The Find File DA is most useful if you have a hard disk drive on your Macintosh. It will, however, work on floppy disks.

Find File looks through all the folders on the disk searching for a file *name* that includes the text you have supplied. Any file name that includes what you enter is listed. Clicking on one of the listed names will tell you where on the disk the file can be found.

What To Do	*Why You Are Doing It*
Use the mouse pointer to pull down the DA menu.	Pull down the DA menu so that you can use one of the Desk Accessories.

Drag the mouse pointer down to select Find File.

You want to locate a file on your disk.

Figure 4.40
The Find File DA has been selected.

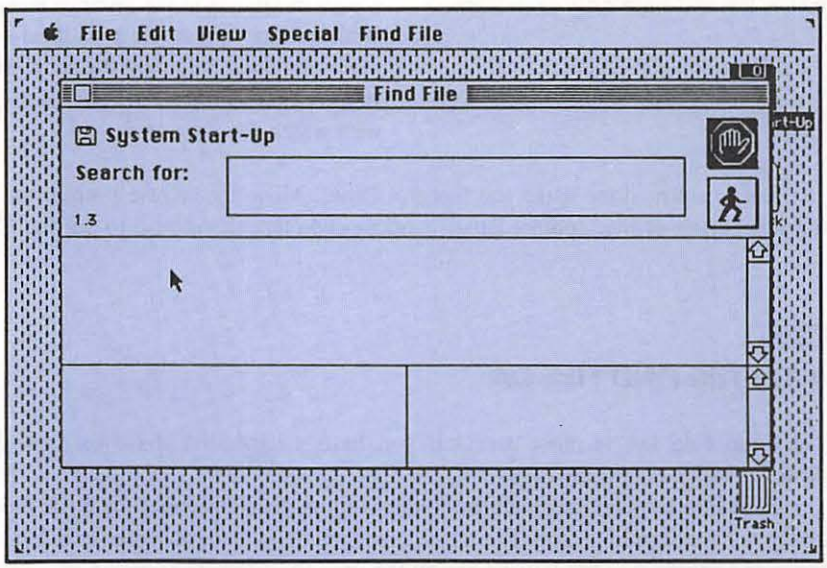


Release the mouse button.

Activate Find File.

Note that the top left corner of the Find File window displays the name of the disk that will be searched. In Figure 4.41 it is System Start-up. If you have more than one disk drive currently holding disks, or more than one hard disk, you may click the mouse pointer on the disk icon to tell Find File to search a different disk drive. For the time being, leave it searching your start-up disk.

Figure 4.41
The Find File DA window as it first appears.



rapb

Type "rapb" into the box next to the label "Search for:". This is the name of a file for which you are searching.

Move the mouse pointer to the icon of the man running at the right side of the window.

This button, when pressed, will execute the search. The button above, currently the selected one, is the Stop icon.

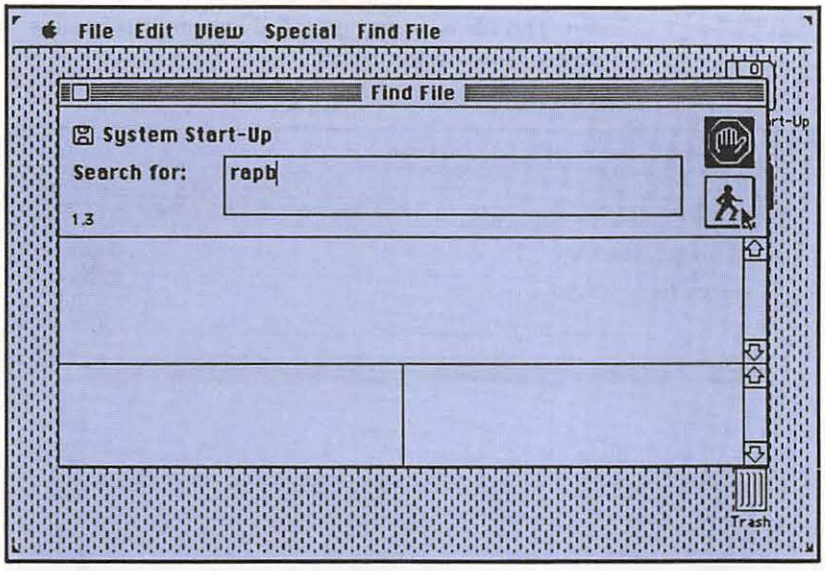


Figure 4.42
You are going to search the disk for a file whose name contains the string of characters "rapb."

Click the mouse button once.

Execute the search.

After a brief pause, you will see listed the Scrapbook File. The letters you entered, rapb, are part of the word Scrapbook, thus the match. When the search process is finished, the Macintosh will beep.

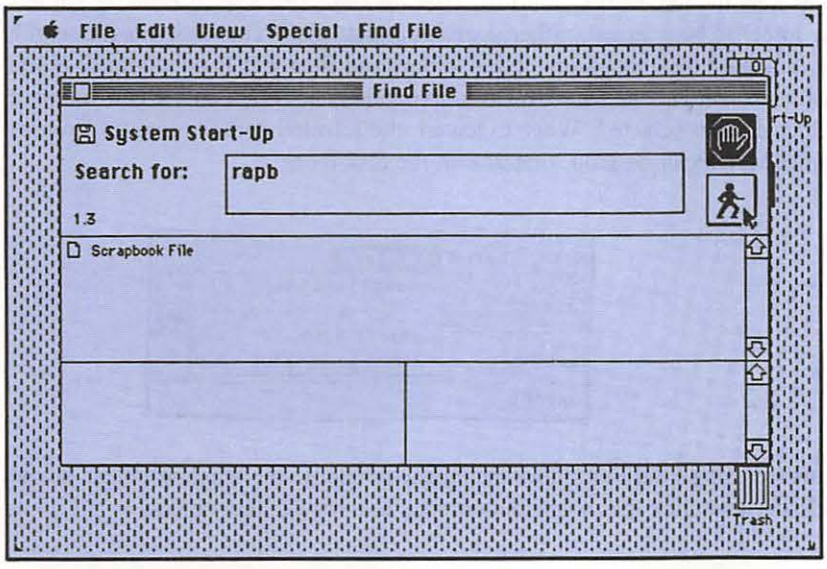


Figure 4.43
The Scrapbook File has been located.

Move the mouse pointer to the word Scrapbook in the list of located files and click the mouse button once.

Select the located file. The Find File DA now gives you the file statistics in the bottom left box, and shows you the location on the bottom right box of the Find File window.

Read the location of the file starting at the bottom of the list. This file is on the disk called System Start-up, in a folder called System Folder.

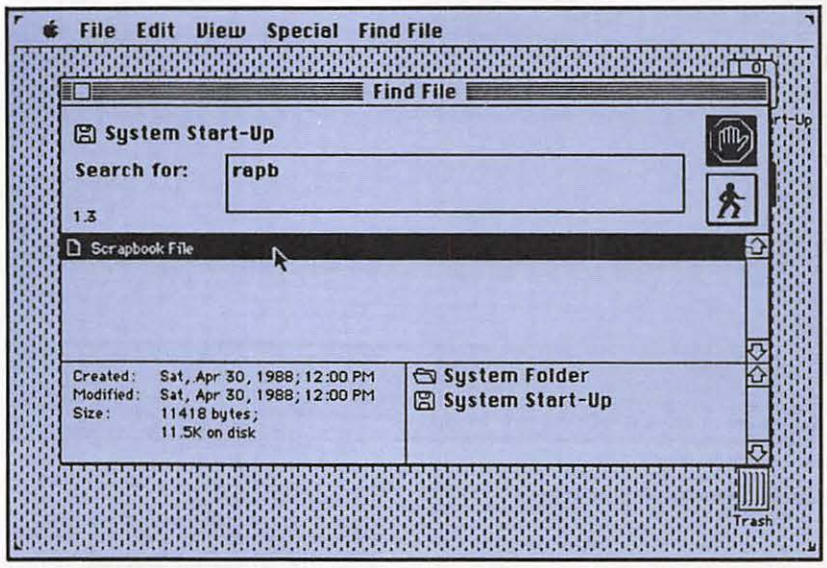


Figure 4.44
The Find File DA shows you the location on your disk of the file.

Note that Find File has added a new option to the menu bar at the top of the screen, Find File! Figure 4.45 shows this menu. As you can see, the menu item has a brief "About Find File" option which describes how the DA works, and two other options. The Search Here option lets you specify a specific folder to be scanned, rather than a complete disk. This shortens the search time when working with a hard disk containing many folders and files, but is only helpful if you know the folder in which to search. The Move to Desktop option is activated only when you have an item in the list of located files selected. When executed, the selected item is removed from its folder and placed on the Macintosh desktop, underneath the disk icons.



Figure 4.45
The Find File menu.

When you are finished using Find File, move the mouse pointer to the window's close box at the left side of the title bar and click the mouse button once to put away the window.

4.13 THE KEY CAPS DA

The Key Caps DA is used to display available type fonts. To properly make use of this DA the file Key Layout must be in your System Folder. This file lets the Macintosh determine which keyboard you are using, so it can draw the proper keyboard layout on your screen. Figure 4.46 shows the keyboard layout for the Extended keyboard. Figure 4.47 shows it for the Standard keyboard. Figure 4.48 shows the keyboard layout for the Macintosh Plus computer. Note that the

Macintosh Plus keyboard and the Standard keyboard are similar, except for the location on the keyboard of some special symbols. If you do not have the Key Layout file in your System folder, you will receive the error message shown at the top of Figure 4.49, and after clicking the mouse pointer on the OK button, the Key Caps window displayed at the bottom of Figure 4.49.

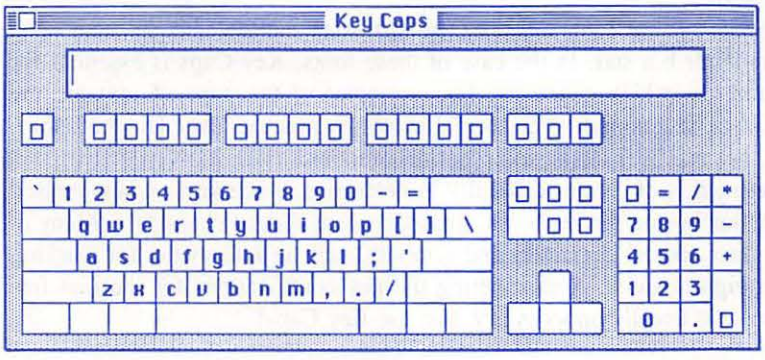


Figure 4.46
The Key Caps window for the Extended keyboard.



Figure 4.47
The Key Caps window for the Standard keyboard.

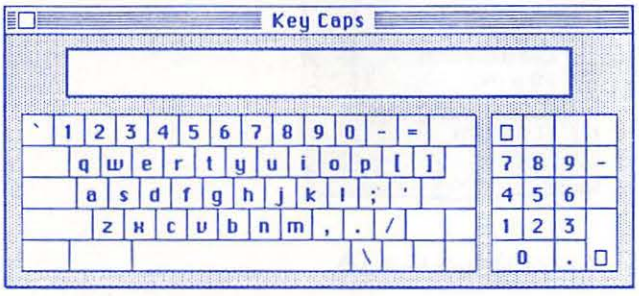


Figure 4.48
The Key Caps window for the Macintosh Plus keyboard.

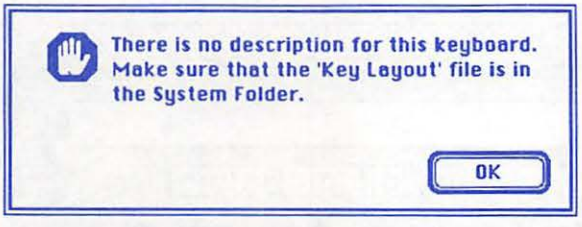




Figure 4.49
The Key Caps window will appear without a keyboard if you do not have the file Key Layout in your System Folder.

The Key Caps DA serves several different purposes. Because type fonts are installed into the start-up disk's System file and require real space on the disk, they are not necessarily the same for all start-up disks. With Key Caps you can discover the names of all the fonts installed on your start-up disk, and get an idea of what they look like. For most fonts the lowercase and shifted letters are the same. The letter "a" will remain the same for all the fonts, and will be in the same position on the keyboard.

There are, however, some special fonts that have no letters of the alphabet in them. The letter a may be a box. The letter b a star. In the case of these fonts, Key Caps is essential for determining which key produces which character. Two examples of this type of font are the Symbol font, which has Greek letters and other special symbols, and the Zapf Dingbats font, which is a variety of stars, boxes, checkmarks and other decorations.

In everyday use, however, it is of greater difficulty to determine which keys, when pressed with the Option or Shift-Option key on the keyboard, produce which special characters. Many of the available type fonts produce special characters and symbols, such as a heavy dot for marking items in a list, or the copyright symbol. Remembering the key combinations for the less frequently used of these symbols is usually unnecessary. Just use Key Caps!

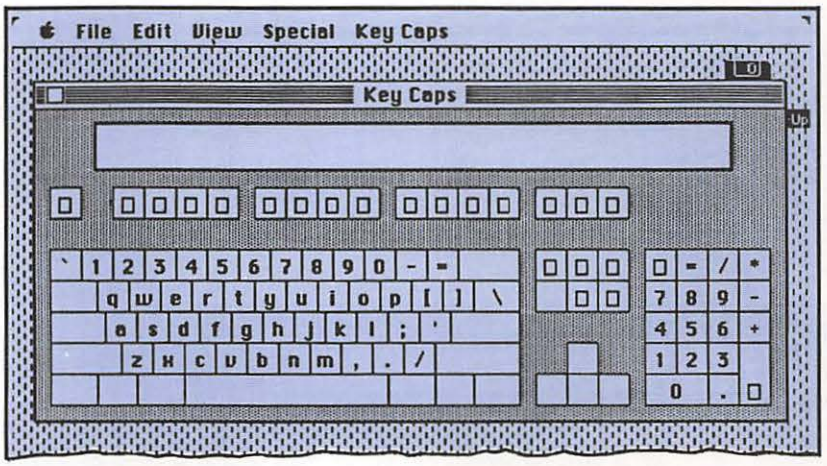
What To Do	*Why You Are Doing It*
Use the mouse pointer to pull down the DA menu.	Pull down the DA menu so that you can use one of the Desk Accessories.
Drag the mouse pointer down to select Key Caps.	You want to experiment with fonts.

Figure 4.50
The Key Caps DA has been selected.



Release the mouse button.	Activate the Key Caps DA.

Figure 4.51
The Key Caps DA window as it first appears.



The Key Caps DA always starts by showing you the Chicago font. This is a system font. Note that the lettering used in the menus matches this font.

Also notice that Key Caps has been added to the right end of the menu bar.

Press and hold down the SHIFT key.

Note that the keyboard layout now shows the letters as they appear when you press the Shift key. Also note that the Shift key on the keyboard layout is darkened, indicating that it is being held down.

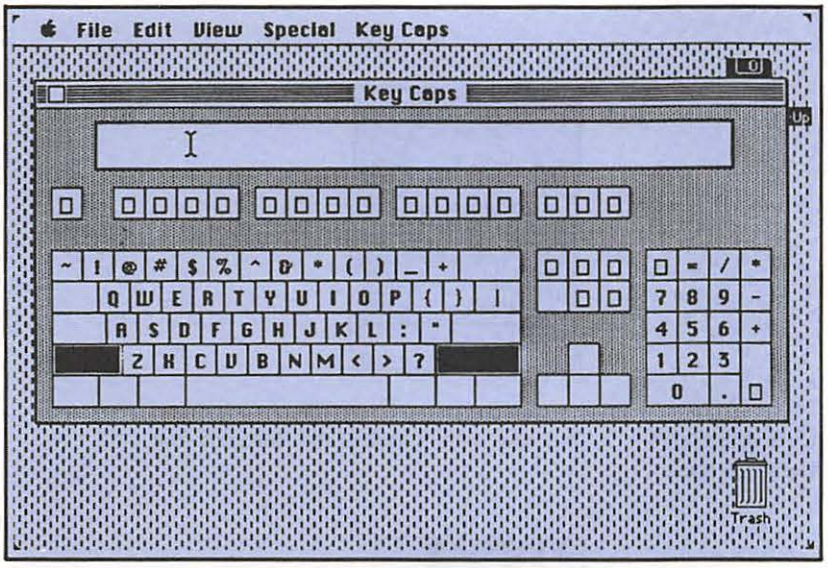


Figure 4.52
The Chicago font appears first in the Key Caps window. Here the shift key has been depressed.

Release the Shift key.

The keyboard returns to lowercase letters.

Press and hold down the OPTION key.

The keyboard layout now shows a completely new set of characters. Many of these characters are defined like this for other fonts. For example, note that the copyright symbol, ©, appears at the location of the lowercase letter "g". Many fonts include this symbol with Option-g.

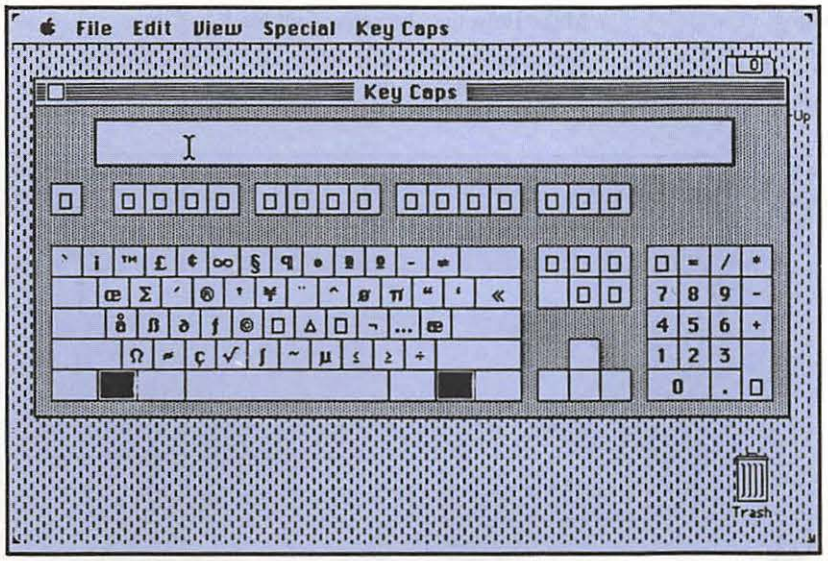


Figure 4.53
The Chicago font displayed with Key Caps while the Option key is depressed.

With the OPTION key held down, depress the SHIFT key.

The Option and Shift keys used together give you access to several more special characters.

Note that many characters appear to be a box. These are keyboard combinations which have not been defined for this font. When printed, they will appear as blank spaces on the line.

Release the Option and Shift keys.

Return to the normal letters.

Use the mouse to move the mouse pointer to the Key Caps option on the menu bar. Press and hold the mouse button.

Pull down the Key Caps menu.



Figure 4.54
This is a typical Key Caps menu. You may have these fonts, additional ones, or be missing some of the ones shown here.

Drag the mouse pointer and the selection bar down to the Helvetica font.

You now want to look at the Helvetica font.



Figure 4.55
Select Helvetica as the next font to look at.

Release the mouse button.

Make Helvetica the active font for Key Caps.

Note that the keyboard displayed by Key Caps now changes to display the Helvetica font.

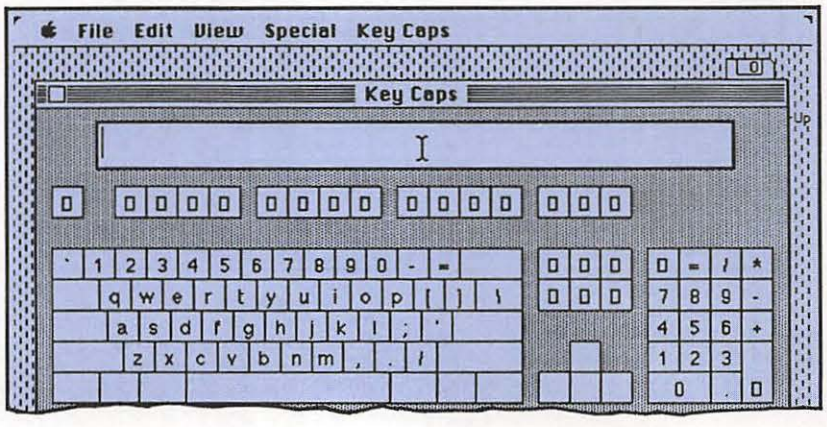


Figure 4.56
Helvetica is now the active font for Key Caps.

Press and hold the Option key.

Many of the same special characters that you saw with the Chicago font are displayed for the Helvetica font.

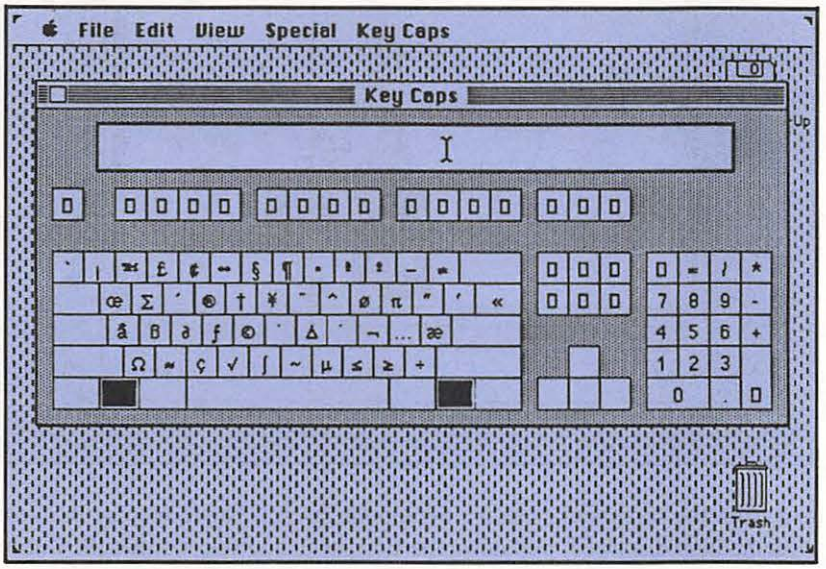


Figure 4.57
The Helvetica font in conjunction with the Option key has many of the same special symbols as seen when you held down the Option key with the Chicago font.

As was mentioned earlier, some fonts do not have any letters of the alphabet associated with them, but rather symbols. If you have access to an Apple LaserWriter, then you very likely have the font Zapf Dingbats. You may want to use Key Caps to see what this font looks like!

When you are done with the Key Caps DA, use the close box on the window's title bar to put it away before you continue.

One final note regarding Key Caps. Using this DA, and changing fonts with this DA, has no effect on the current font in use in the application program with which you are working at the moment. Key Caps is an information tool, only.

4.14 USING THE SCRAPBOOK

Because you have not yet begun using any Macintosh application programs, you are not in a position to make use of the Scrapbook. The following section is a brief discussion of how the Scrapbook DA works and how to use it. Once you have had the opportunity to use some application programs, you will then be ready to also make use of the Scrapbook.

The Scrapbook, which is accessed through the Scrapbook DA, can store either text or graphics. Unlike the Clipboard, anything stored into the scrapbook will remain there until you remove it. You place information into the scrapbook by first copying it to the clipboard. Next you activate the scrapbook DA. Finally you select the Paste option found on the Edit menu to paste the contents of the clipboard into the scrapbook.

Notice in Figure 4.58 on the next page that there is a scroll bar at the bottom of the scrapbook. This indicates that there is more than one item in the scrapbook. As you add items to your scrapbook, use the scroll bar to look at them. You can see that this is item 5 of 5 items in the current scrapbook, as indicated by the 5/5 below the left end of the scroll bar. Below the right side of the scroll bar is an indication of the type of information currently displayed. This item is a PICT, a special type of file format used for storing some graphic information.

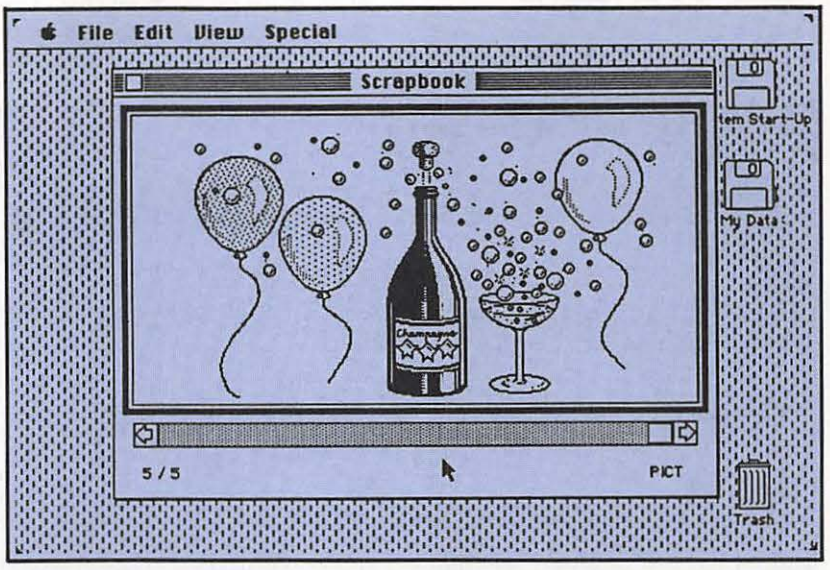


Figure 4.58
A scrapbook entry. This graphic is found in some of the standard scrapbook files distributed by Apple Computer, Inc.

To remove an item from the scrapbook, use the Scrapbook's scroll bar to display the item you want removed. With the item displayed, pull down the Edit menu and select either the Cut or Clear option.

To paste an item into a document from the scrapbook, use the Scrapbook's scroll bar to display the desired item. Pull down the Edit menu and select the Copy option. This will put a copy of the item onto the clipboard. Close the Scrapbook to return to the document on which you are working. Finally, select the Paste option of the Edit menu of the application you are using to restore the item from the clipboard into the document at the cursor location.

Because the Scrapbook is accessed through a DA, anything in the scrapbook can be copied into the current document on which you are working, assuming the document will accept the type of information you are trying to load—a spreadsheet will not accept a graphic from a drawing program, but a word processor will accept a graphic. In short, the Scrapbook retains information permanently, or at least until you erase it, and makes that information available to any other program you use.

Of course, this is a generality that can often be proved incorrect. The Scrapbook is a file that you can locate in the System Folder of your start-up disk. (Remember you were copying it in the prior chapter!) If you change start-up disks, you will also be changing Scrapbook files! If you carry your start-up disk with you as you move from Macintosh to Macintosh, then your Scrapbook file will move with you. On the other hand, if you change computers without changing start-up disks, your Scrapbook file will change too. If you want, you can copy your Scrapbook file to a disk, and copy it into the System Folder on the start-up disk you are using before you begin using a particular application program. Your Scrapbook will then be available.

You will have many opportunities to use the clipboard and scrapbook as you work in this textbook.

4.15 STARTING AN APPLICATION PROGRAM

You are now ready to begin using application programs on the Macintosh. Starting an application program running on the Macintosh is called **launching** a program, and simply requires that you open the application program's icon. Thus, to launch a program you must exercise the same skills as required to open a folder.

You should remember that there are several methods you may use to accomplish this task. First, you may select the icon and then pull down the File menu and select the Open option located there. Second, after selecting the icon, you may press ⌘O, which is the command key equivalent to the File menu Open option. Finally, you may position the mouse pointer on the icon and use the double-click method to activate the program.

4.16 EXITING AN APPLICATION PROGRAM

Exiting most Macintosh applications is almost as easy as starting them. The Macintosh convention is to place a Quit option on the File menu. Additionally, most programs let you use ⌘Q in place of pulling down the File menu to select Quit. There are some rare exceptions to this rule. A very few programs do not have a File menu. Usually, however, you will see a menu item on the menu bar, such as Control, or even Quit or Exit, that has the Quit option on it.

When you quit an application, such as Word or Excel, the program usually checks your work to see if you have made any changes to your work since you last saved it. If you have made changes, the program will ask if you want to save the work before exiting. You may then choose among Yes, save the changes; No, do not save the changes; or Cancel, I do not really want to quit the program right now.

In effect, while it is always easy to locate the Quit command on the File menu, the Macintosh will rarely let you exit a program if you have not saved your work.

4.17 USING THE FONT/DA MOVER PROGRAM

The Font/DA Mover is an application program used to install fonts and desk accessories into the System file. It may also be used to remove them from the System file. Remember, fonts and DAs reside in the System file found in the System Folder on your start-up disk. For an application to use a Font, or for a DA to be available, it must be in the System file at the time the Macintosh is turned on, or be installed by the Font/DA Mover program.

Before you begin this section, locate the Font/DA Mover on your start-up disk, or on one of your other disks. You can see what its icon looks like in Figure 4.59. You may also have available to you font files and/or DA files. The icons for these files are suitcases, as shown in Figure 4.60 and 4.61. If not, don't worry. You will learn how to move fonts and DAs out of the System file and into new Font and DA suitcases.

Figure 4.59
The Font/DA Mover icon.

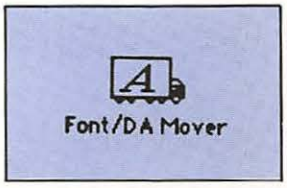


Figure 4.60
This is a Font suitcase.

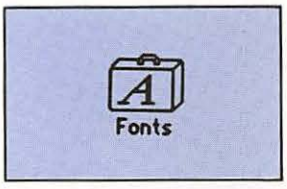


Figure 4.61
This is a DA suitcase.



What To Do	*Why You Are Doing It*
Move the mouse pointer to the Font/DA Mover application.	You want to use the Font/DA Mover. To start the program running (remember this is called launching a program), you may select it then use the File menu Open command, or you may double-click the mouse button.
Double-click the mouse button.	Launch the program using the double-click method. If you have trouble with the double-click, use the Open option on the File menu, or press ⌘O.

There will be a delay as this program starts executing. It is reading your start-up disk's System file to determine which fonts it has installed. When the program is ready, you should see a display similar to Figure 4.62. The amount of free space on the disk drive may be different, as may the name of the disk itself.

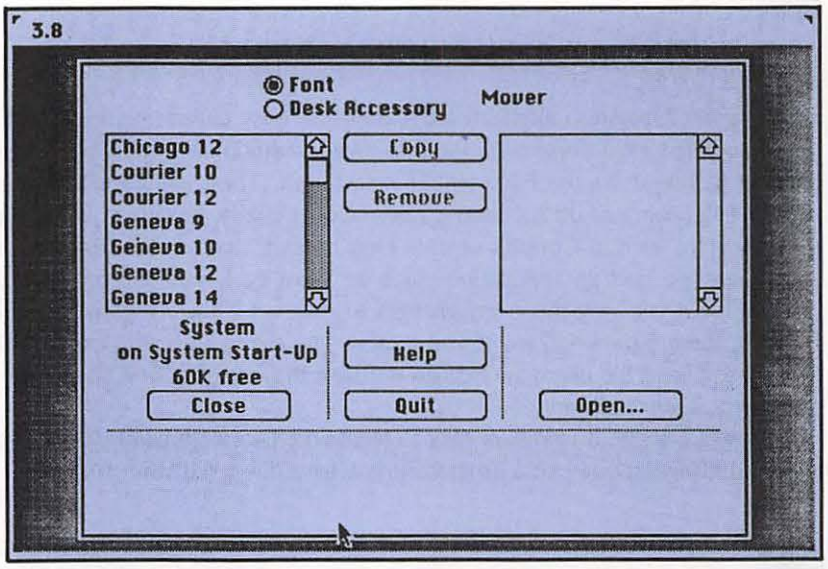


Figure 4.62
The opening Font/DA Mover display.

One thing you may notice about the Font/DA Mover is that there are no options on the menu bar. Indeed, the Apple menu is not even present. This is because this program requires the full attention of the computer since it is making changes to the resources available in the System file.

The window on the left shows the current font list for the System file. Note that the scroll bar is active, indicating that there are more fonts to be seen. The window on the right is empty, since it does not have a file open.

Move the mouse pointer to the Open button on the right of the Font/DA Mover display.

You want to open a font file.

Click the mouse button once.

Tell the Font/DA Mover to begin the Open process. You will now see a dialog box showing the available files that the Font/DA Mover will open. Note that there is a button labelled New in this dialog box. This will let you create a new font file.

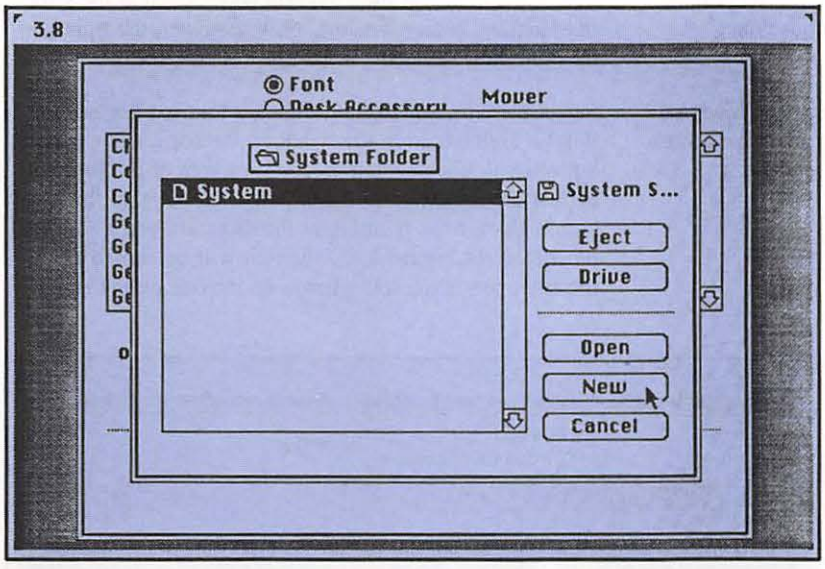


Figure 4.63
This dialog box will let you open any available font files, or create a new font suitcase.

Move the mouse pointer to the New button and click the mouse.

You want to create a new font file. You will see a new dialog box.

Font Xfer

Name the new font file Font Xfer.

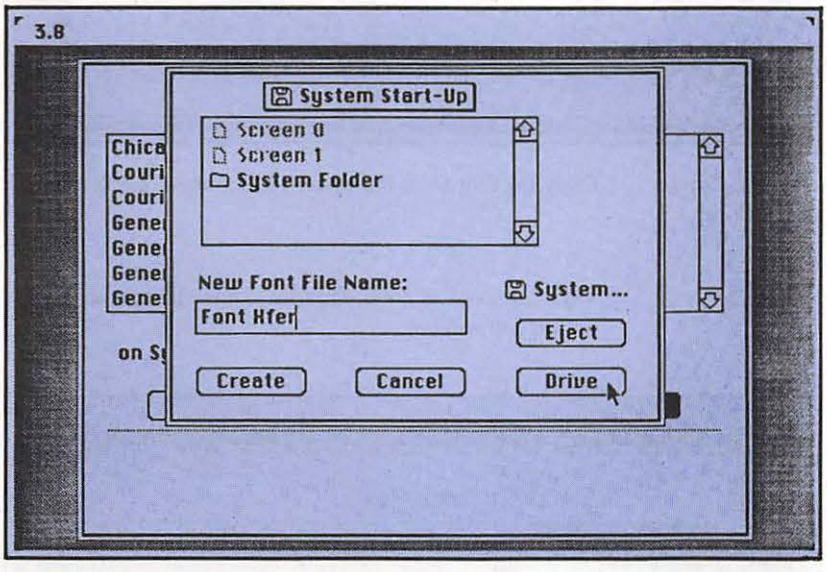


Figure 4.64
Enter a name for the new font file.

Move the mouse pointer to the button labelled Drive and click the mouse once.

If you have two disk drives and a second disk in the second disk drive, this tells the Font/DA Mover to create the new font file on your second disk. If you do not have a second disk in the second disk drive, this button will be dimmed.

Move the mouse pointer to the Create button and click the mouse once.

Create the new font file. You will be returned to the starting Font/DA Mover window. Now, however, the right window tells you the name of the font file it has access to.

Move the mouse pointer to **Chicago 12** in the left window and click the mouse button.

Select the Chicago 12 font. When a font is selected, it will be highlighted in the window, the copy and remove buttons will become active, and a sample of the font will appear at the bottom of the window. Notice that the Copy button has arrows pointing in the direction that a font will be copied. In Figure 4.65, the font will be copied from the file open in the left window to the one on the right.

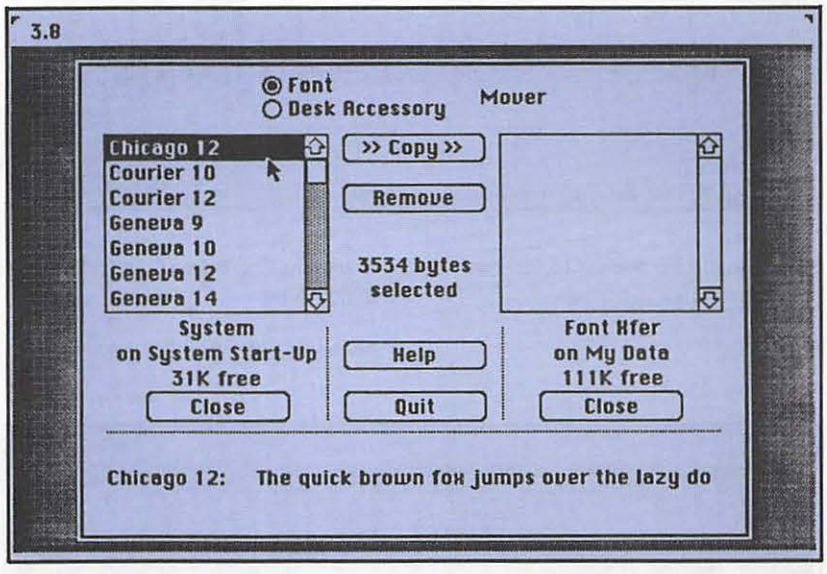


Figure 4.65
The Chicago 12 font has been selected. It takes up 3534 bytes of space on a disk. The copy button will place a copy of the font in the Font Xfer file.

Move the mouse pointer to the Copy button on the display and click the mouse once.

Copy the font from the System file to the Font Xfer file.

When the copy is done, the font name will appear in the destination window.

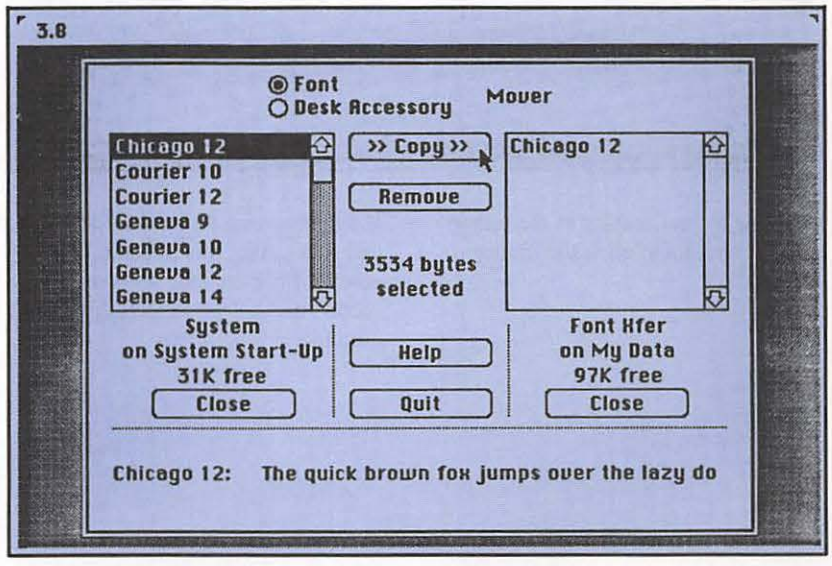


Figure 4.66
The font Chicago has been copied to the font file Font Xfer.

Use the scroll bar in the left font list to display New York 18 and New York 24.

You want to add these two fonts to the Font Xfer font file.

Move the mouse pointer to **New York 18** and click the mouse button once.

Select the New York 18 font. The sample of the font will appear at the bottom of the display and the byte count will be given for this font.

Move the mouse pointer to **New York 24**, but do NOT press the mouse button.

You want to move two fonts at the same time.

Hold down the Shift key and click the mouse button once.

Recall that the Shift-click will let you select multiple items when using the Finder. It works the same way in this program. Here you are selecting multiple fonts. Note that a sample of the font is not displayed, but that the total byte count of the selected fonts is.

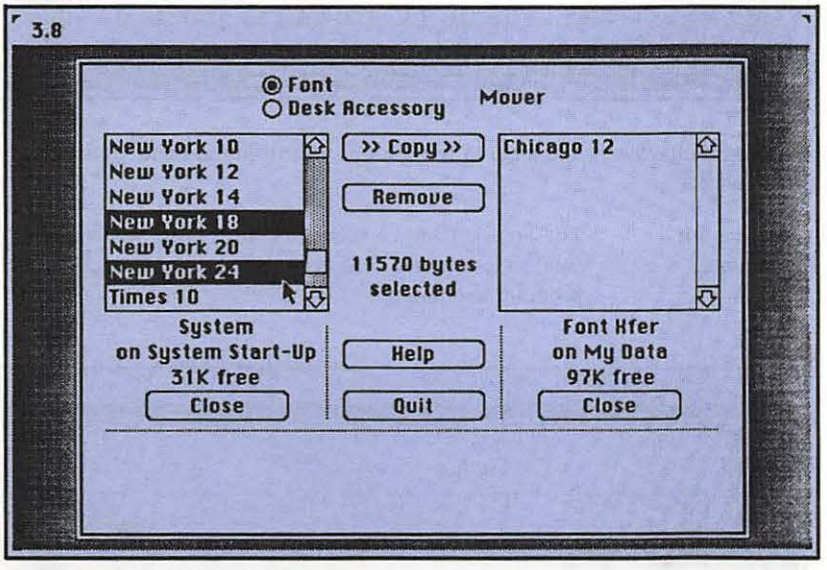


Figure 4.67
Two fonts have been selected for copying to the Font Xfer file.

Move the mouse pointer to the Copy button and click the mouse once.

Copy the two fonts from the System file to the Font Xfer file.

Removing fonts is easy. However, before you do so, it is a good idea to make a copy of the fonts you intend to remove. Thus, if you ever need them back, you will have them in a font file.

Move the mouse pointer to the right font file window.

You plan to work with the font file you have just created.

Move the mouse pointer to **New York 18** and click the mouse button once.

Select the New York 18 font. Note that the direction the arrows are pointing on the Copy button has changed. You may, it should be apparent, copy fonts from the right window to the left window if desired.

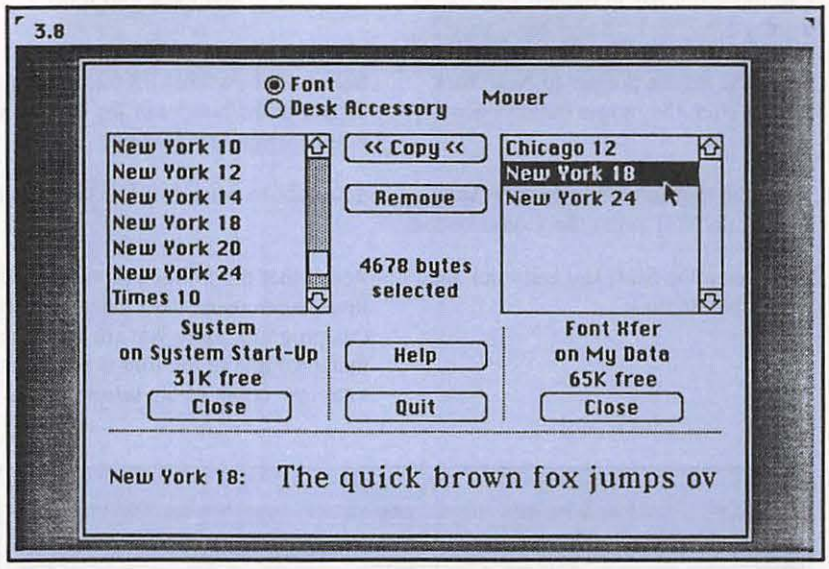


Figure 4.68
The New York 18 font in the font file Font Xfer has been selected.

Move the mouse pointer to the Remove button and click the mouse once.

You want to remove this font from the Font Xfer file.

Move the mouse pointer to the OK button and click the mouse once.

The Font/DA Mover wants to confirm that you really want to remove the font from the file. You are telling the program to continue.

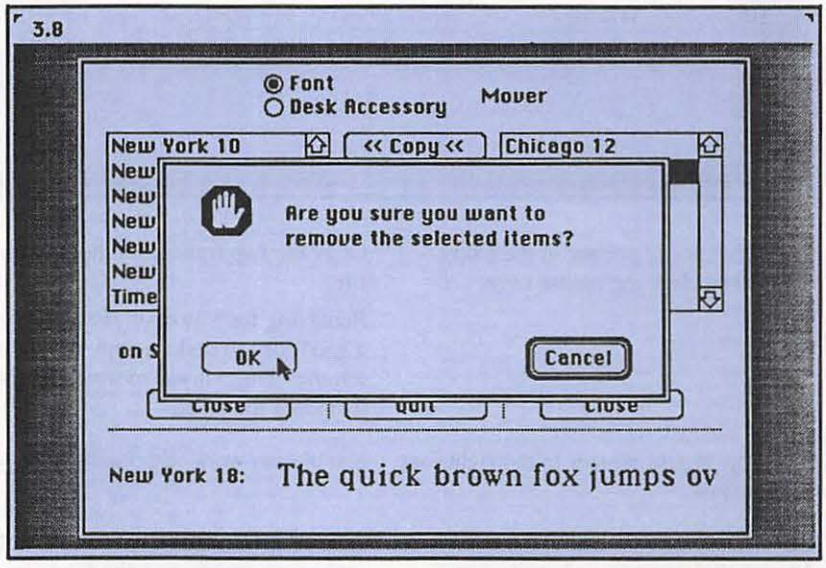


Figure 4.69
Confirm that you really want to remove the selected font from the file.

Move the mouse pointer to the button in front of Desk Accessory at the top of the display.

Currently, Font is the selected option. You now want to see which Desk Accessories are installed in the current system file.

Click the mouse button.

Tell the Font/DA Mover to close the font files and work with the Desk Accessory files.

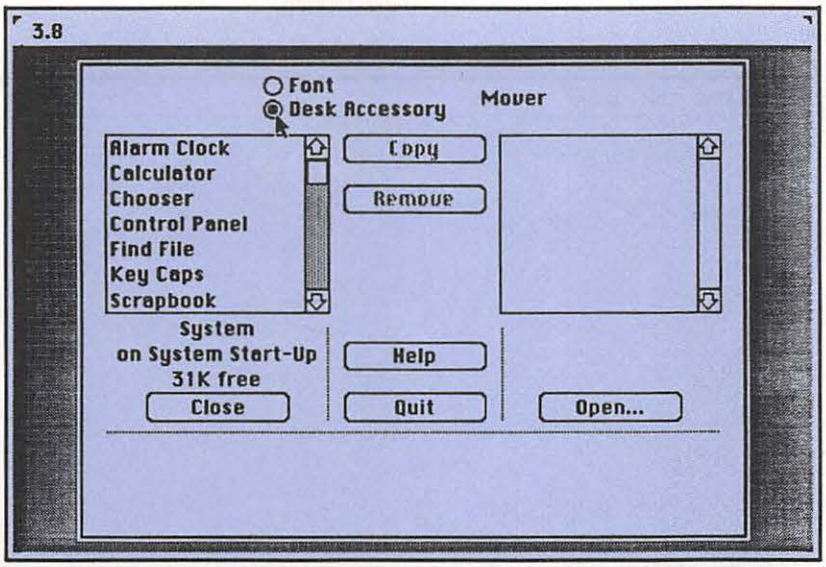


Figure 4.70
Look at the Desk Accessories in your current system file.

Move the mouse pointer to the Quit button and click the mouse once.	You do not want to do anything with DAs at this time. Exit the program.

Working with Desk Accessories is exactly the same as working with fonts. You may copy them between files and you may remove them. Keep in mind that there is a limit to the number of fonts and DAs which may be a part of a System file. If you are using a floppy disk, then disk space will constrain you before the actual limit of allowable fonts and DAs is reached. You are limited to 15 DAs in any system file at any one time. You are more likely to reach this limit when using a hard disk than with floppies. There are, however, ways to circumvent this limit by using programs such as Suitcase II, which lets you open as many font and DA files as you want.

4.18 RE-INITIALIZING A DISK

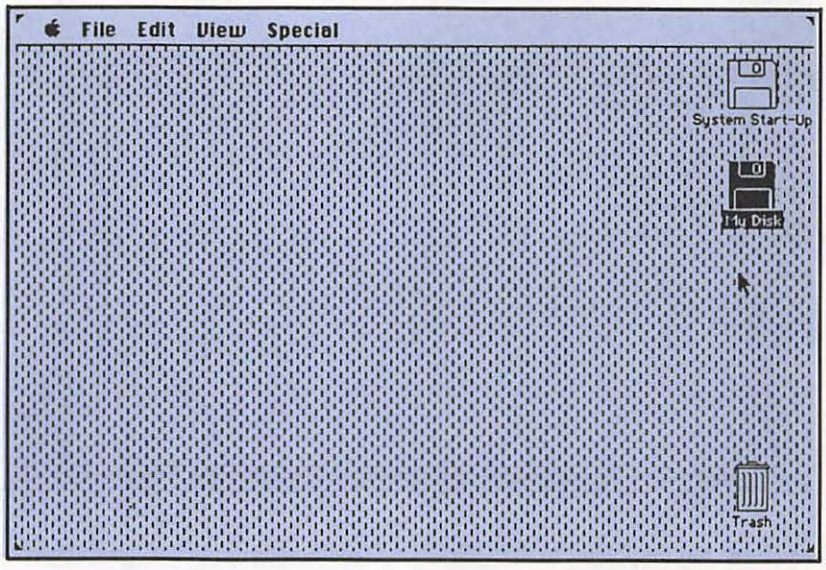
There will be times when you want to throw away everything on a disk. One way that you can do this is by dragging the complete contents of the disk to the trash. You will find, however, that you do not always recover all the space on the disk in this fashion. There is a hidden file on each disk, called the Desktop, that can grow as files and other information are placed on the disk. Moving all the files on the disk to the trash does not shrink the Desktop file back to its original size.

You can, however, have the Macintosh perform the initialization process on a disk. This will overcome the problem of the growing Desktop file.

What To Do	*Why You Are Doing It*
Place a disk to be erased into a disk drive.	You must place a disk into a disk drive so the Macintosh knows that it exists.

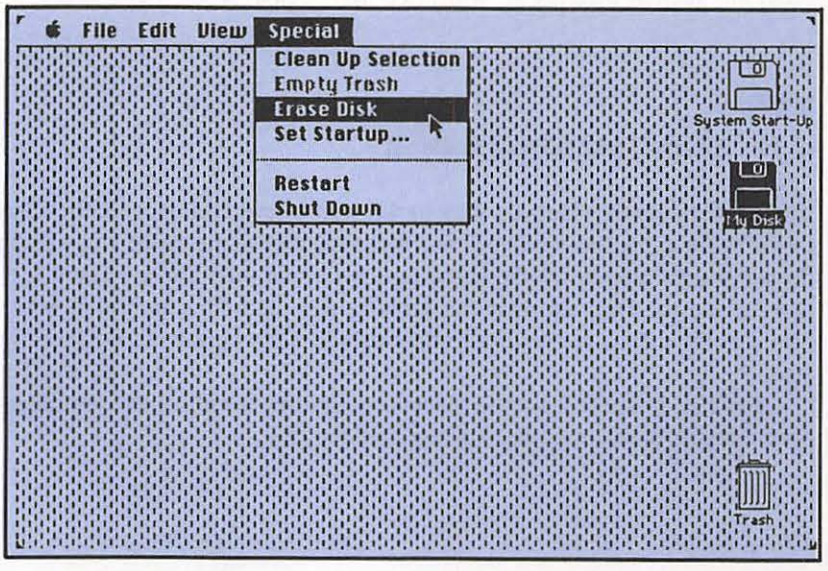
Move the mouse pointer to the disk and click the mouse button.	Select the disk on the desktop.

Figure 4.71
The disk to be erased has been selected.



Move the mouse to Special on the menu bar.	The option to re-initialize a disk is found on the Special menu.
Press and hold the mouse button.	Pull down the Special menu.
Drag the mouse down to select the Erase Disk.	Since a disk is selected on the desktop, the Erase Disk option is not dimmed.

Figure 4.72
Select the Erase Disk option on the Special menu.



Release the mouse button.	Activate the Erase Disk option.

Move the mouse pointer to the Two-Sided option.

The Finder is asking you to confirm that you really want to erase this disk. If you have made a mistake, select the Cancel button, rather than the two-sided button.

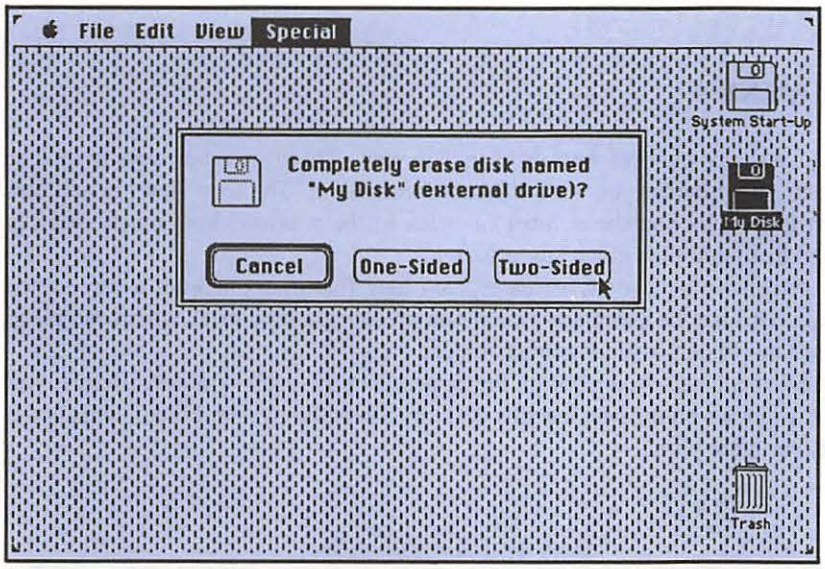


Figure 4.73
You want to erase the selected disk.

Click the mouse button once.

Begin the erase process. The Finder will tell you the progress of the erase process as it works by telling you it is Formatting, Verifying and Creating the Directory.

When the erase is completed, you will be returned to the Finder's desktop.

Move the mouse to the icon of the disk you just erased and double-click the mouse button.

The double click will open the disk on the desktop. You can see that it is an empty disk.

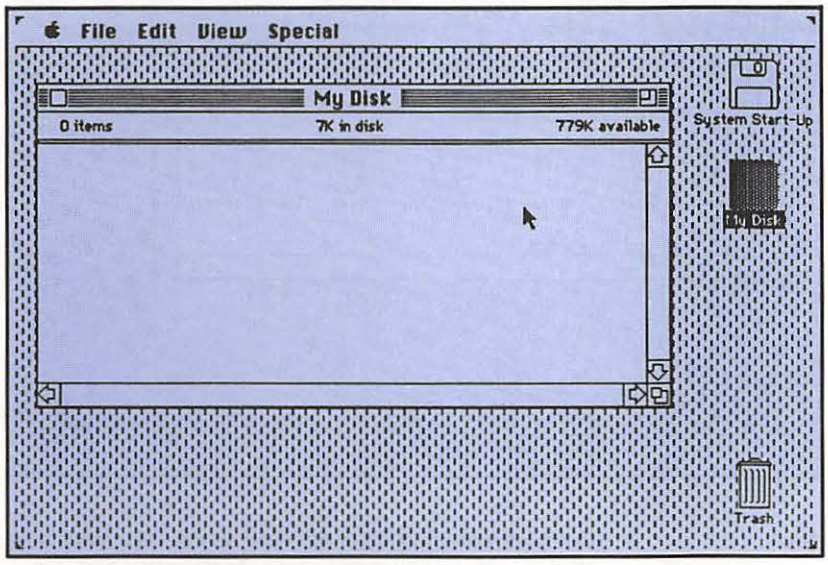


Figure 4.74
The newly erased disk is empty.

Remember, you should only use this procedure to completely erase the contents of a disk. Anything on the disk will be permanently lost. As a general rule, you only need to worry about initializing a disk when it is new.

4.19 THE VIEW MENU

So far you have looked at the contents of your disks in icon view. There are other ways to look at what is on a disk. Each way provides you with different information. The icon view, in addition to the names of each item, tells you the number of items in the window, how much space is currently in use on the disk, and how much space is free.

As the number of icons in a window increases, you may find that you want a way to see more of what you have. This can be especially true if you are using a hard disk, which can place a large number of files and folders within another folder.

The Finder's View menu lets you control the appearance of each window. Before you continue, close all the windows on the Macintosh's desktop except the System Folder. This is the one you will use to experiment with.

What To Do	*Why You Are Doing It*
Move the mouse pointer to the View menu on the menu bar.	You are going to change how the System Folder information is displayed in the current window.
Push and hold the mouse button.	Pull down the View menu.
Drag the mouse pointer down to the first entry on the View menu.	You want to view the contents of the System Folder by small icon, rather than by standard size icon.

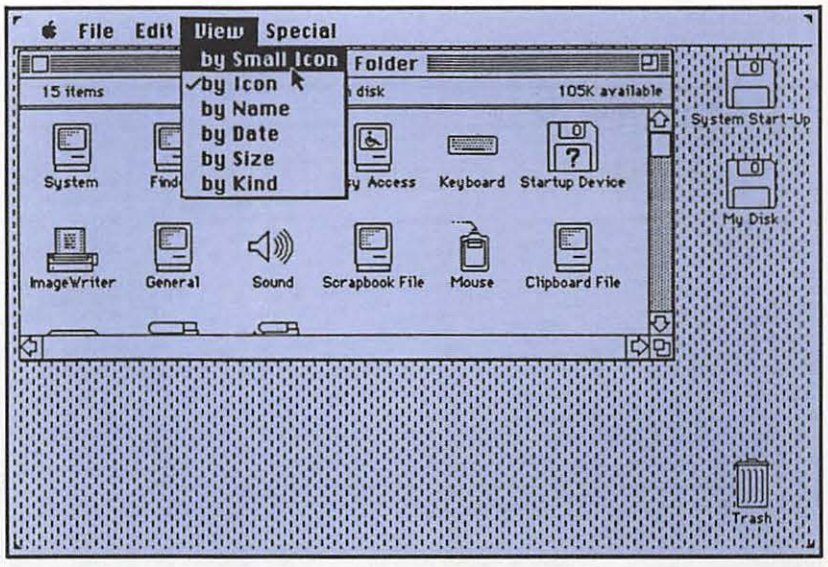


Figure 4.75
The View menu. Note that the "by Small Icon" item has been selected here.

Release the mouse button.	Complete the selection of the view option. The icons now change to their miniature version. In this view, you can fit more icons into the same size window by moving them around.

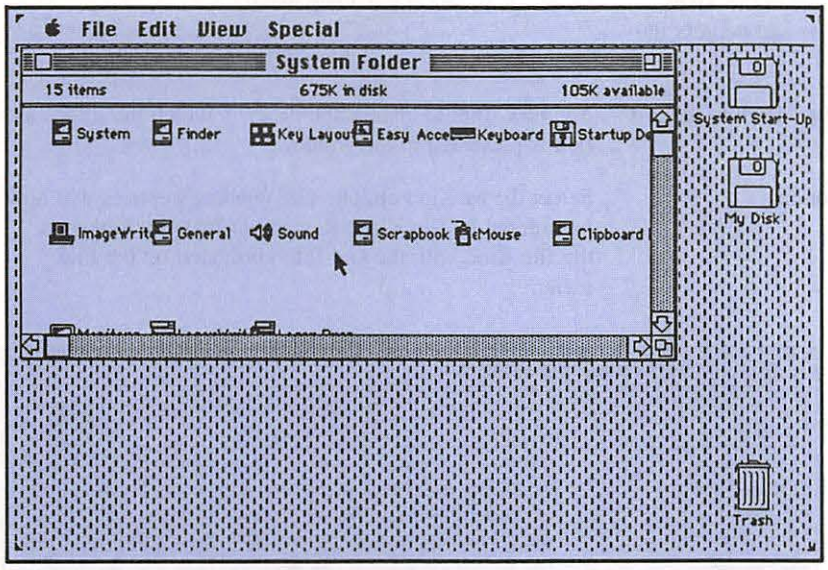


Figure 4.76
The small icon view of the System Folder. Here the icons have not been re-arranged, but may be.

Move the mouse pointer to the View menu and depress the mouse button.

Once again, pull down the View menu.

Drag the mouse down to the "by Name" option.

You now want to look at the window's entries listed in alphabetical order.

Release the mouse button.

Change the view to alphabetical by name of each entry.

Move the mouse to the zoom box at the top right of the title bar and click the mouse once.

Make the window as large as possible, if it is not already so.

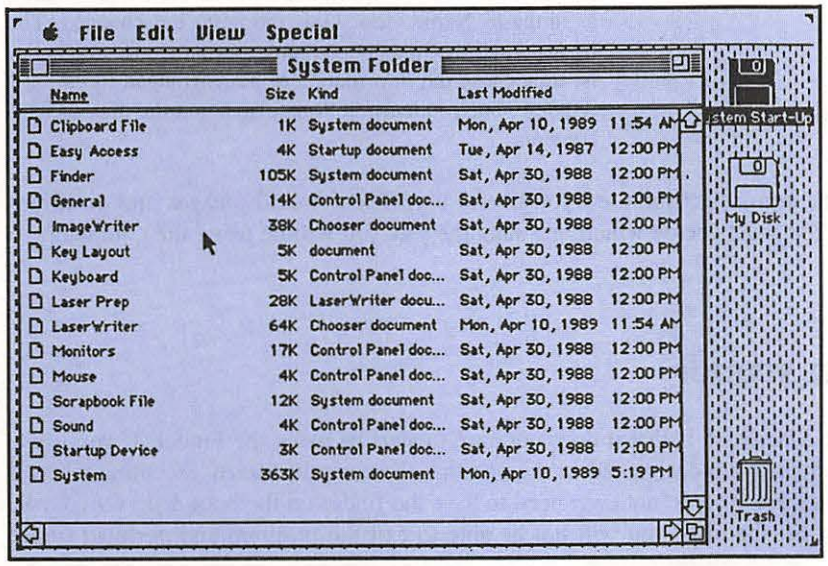


Figure 4.77
This is the "by Name" view of the window's contents. The window's content is listed alphabetically by the names of the files.

You see that this view of the window provides you with information about the individuals, but does not give you the status of the disk in terms of space used and space free.

Move the mouse pointer to the View option on the menu bar and depress the mouse button.

Once again, select the View menu.

Drag the mouse pointer down to the last option, by Kind.

You now want to change the order in which the information is presented in the window.

Release the mouse button.

Select the by Kind option. The window's entries will now be ordered by file Kind. Remember that you looked at the file Kind with the Get Info command on the File menu.

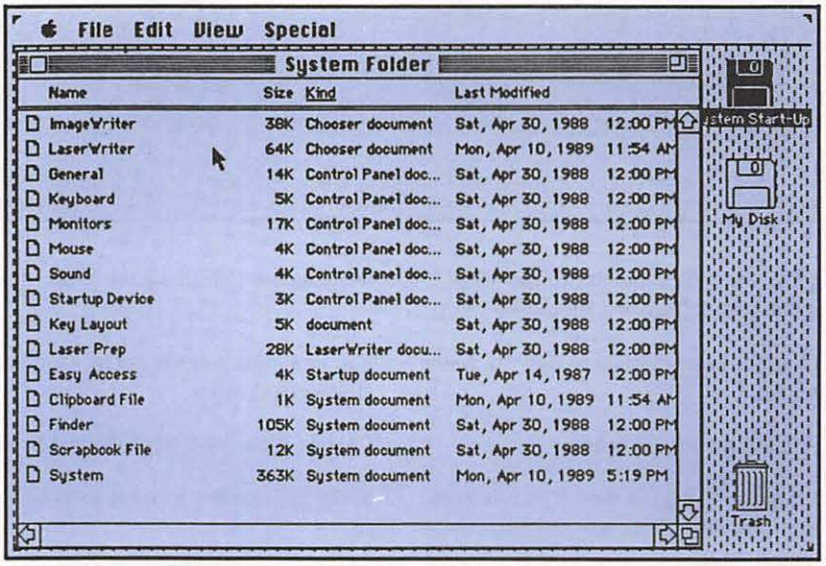


Figure 4.78
The contents of the System Folder viewed "by Kind."

You can see that the information in this view is the same as in the by Name view. Only the order has changed. The by Date and by Size options have this same effect. That is, they cause the information to be rearranged in the window, but you learn nothing else about the disk or its contents.

Use the View menu to select the view you like to use. There are advantages and disadvantages to each view. You must decide which one suits the way you will be using the computer.

4.20 USING SET STARTUP

A nice feature of the Macintosh is that it does not have to start by using the Finder. If you want, you may have another program designated as the one that the computer starts executing when it boots up. If this is the case, you do not even need to have the finder on the boot disk. Of course, by leaving the finder off the disk, you will not be able to exit the program and perform finder operations.

Generally, the Set Startup option is used when you do not want people to have to learn how to use the finder, or when the information you want to put on a start-up disk does not leave room for both the Finder and the program you want to execute. Set Startup is also used to have the Macintosh start up using MultiFinder, rather than the Finder. More will be said about MultiFinder later in this chapter.

To set a particular program to be the startup program, it must reside on the disk you use to boot the computer. If you are using a floppy disk system, you may have to remove some items from your startup disk to make room, such as some control panel devices, printing resources, or some INITs. You may even have to remove some DAs or font files from the System file. After you have completed the Set Startup procedure, you may remove the Finder from the disk and, depending on available disk space, restore the items you removed earlier.

Before you continue, make sure that the desired program is selected. The Set Startup option will then know that this is the program you want to execute when you turn on the computer.

When you pull down the Special menu and select the Set Startup option, your display will appear similar to the one shown in Figure 4.79. The user here has the option of making the Finder the start-up program. Additionally, you can see that the MultiFinder button is an available option. After making his selection, all this user needs to do is to move the mouse pointer to the OK button and click the mouse.

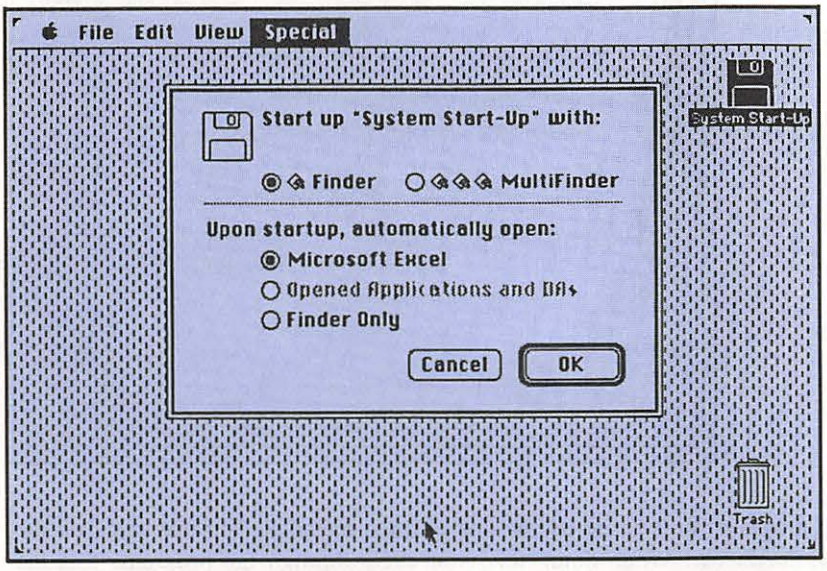


Figure 4.79
The Set Startup screen lets you tell the Macintosh which program you want it to run when you first turn on the computer.

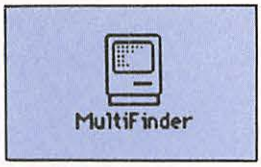
4.21 MULTIFINDER

As we mentioned above, MultiFinder is another program you may select to be the startup program. MultiFinder is a special version of the Finder. To use it successfully your Macintosh must have at least two megabytes (two million characters) of RAM (random access memory). (NOTE: RAM and the capacity of a hard disk are in NO WAY related. Your computer may have a 20 megabyte hard disk, but still only one megabyte of RAM.)

MultiFinder lets you simultaneously execute two or more programs, depending upon the amount of Random Access Memory (RAM) installed in your computer. You may then jump back and forth between the programs. In addition, if you are using a laser printer, MultiFinder lets you print documents while working on another document, or even with another program through background printing. This was discussed earlier in the chapter when the Chooser was introduced.

The functioning of the Finder type activities that you have learned in this chapter are the same when using either the Finder or the MultiFinder. Thus, you open folders and launch programs in the same fashion. New disks are formatted by inserting them into a disk drive. Menus are selected with the mouse pointer, and so on.

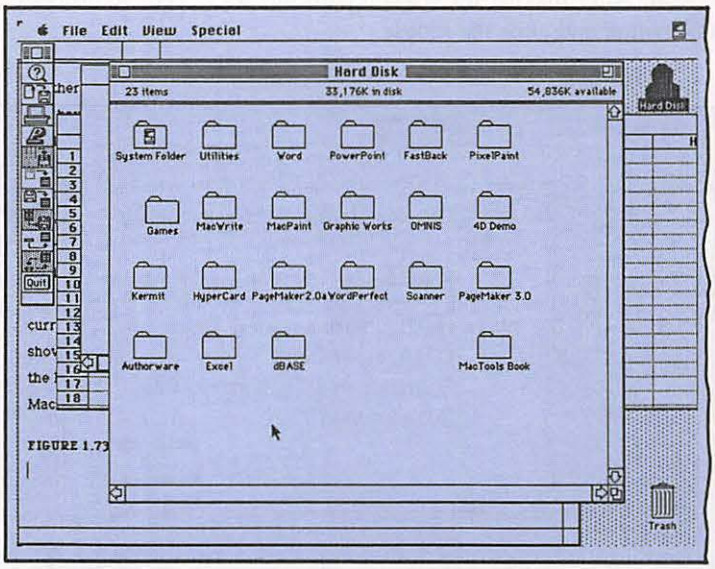
Figure 4.80
The MultiFinder icon as it appears in the System Folder.



To have your computer use MultiFinder you must have its icon in the System Folder of your start-up disk (Figure 4.80). If the MultiFinder icon is not in your System Folder, then the MultiFinder button will be dimmed when you use the Set Startup option found on the Special menu. Once you have selected the Set Startup option, simply click on the MultiFinder button. After changing the startup from the Finder to MultiFinder, or from MultiFinder to Finder, you must restart the Macintosh to activate your selection.

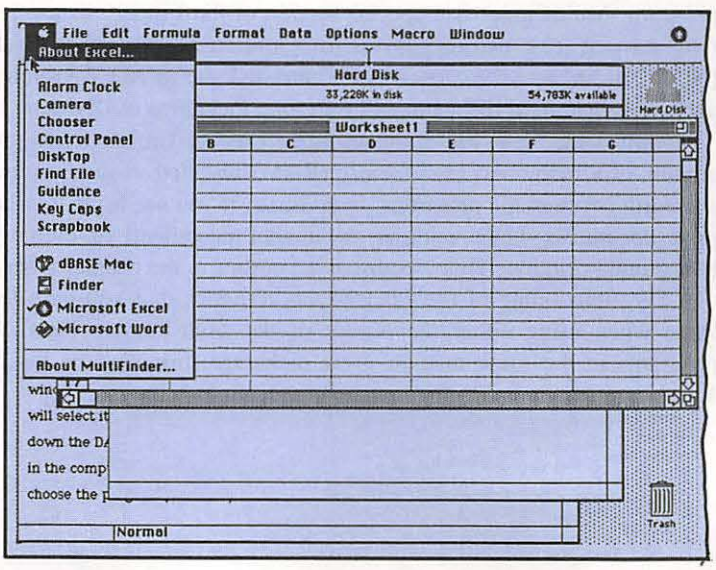
When using MultiFinder, a miniature icon of the program in current use will appear at the right end of the menu bar. Figure 4.81 shows the Desktop when MultiFinder is in use on a Macintosh II, and the Finder is the selected program. The menu bar shows a miniature Macintosh at this time.

Figure 4.81
The miniature icon of the Macintosh at the right side of the menu bar indicates that MultiFinder is in use, and that you are using the Finder, and not an application.



You select which program you want to use by one of three methods. You may click on the miniature icon on the menu bar. When doing this, you cycle through the programs that the Macintosh is running at the time. The second method involves using program windows. If a program has a window open on the desktop, and any portion of the window is currently visible, then clicking the mouse on that window will select it, and thereby activate the program. Finally, you may pull down the DA menu, which will now include a list of programs active in the computer's memory (Figure 4.82). Use the selection bar to choose the program you want.

Figure 4.82
The DA menu when using MultiFinder includes a list of the programs currently in the Macintosh's memory. You may select a program to execute as you would any other menu option.



One word of caution about MultiFinder. You must take some responsibility for memory management. Programs do not always start and take all the memory they will ultimately need. In this case you must assign the program more memory. Other, usually older, programs will want to take all the computer's memory. They were not written with MultiFinder in mind. These programs must be told to take less memory.

It is easy to change the amount of memory a program will take when it starts running using the Get Info option on the File menu.

Select the program icon, but do not start it running. Next use the Get Info option found on the Finder's File menu (or use ⌘I). At the bottom of the information window displayed is a box which lets you change the amount of memory requested by the program (Figure 4.83). Apple Computer, Inc., recommends that you make a back-up copy of any application program before you change its memory requirements, in case something goes wrong. Always close the information window when you are through with it.

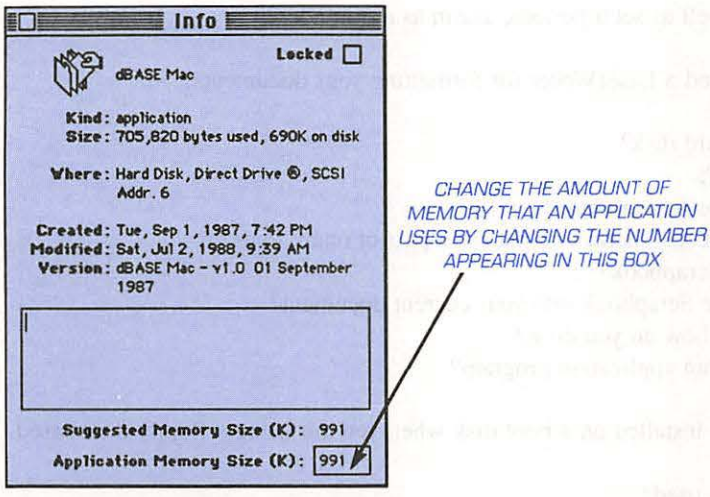


Figure 4.83
The Information window will let you change the amount of RAM a program allocates for itself when it starts running.

You can determine how much memory each program is using with the Finder. First make it active, then use the About the Finder... choice showing on the DA menu (Figure 4.84). Do not use the About MultiFinder choice for this. It will only tell you the version number of MultiFinder that you are using.

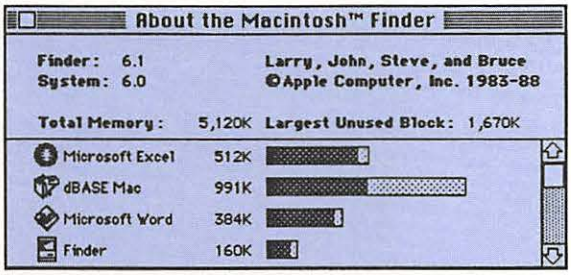


Figure 4.84
This is the display you will see when you select About the finder....

You may almost always safely increase the amount of memory a program uses. For example, by increasing the amount of memory Excel uses you may have a larger spreadsheet, or more documents open simultaneously. MacPaint 2.0 requires extra memory be allocated to it if you intend to open more than two or three pictures simultaneously. You may not, however, always safely decrease a program's memory requirement. Generally, the minimum requirement is set at the lowest value recommended by the program's authors. Lessening the memory used on program start-up should be done with great care.

EXERCISES

1. What about the System Folder icon tells you that the disk is a bootable disk?
2. When are INIT files loaded?
3. What does the term DA mean?
4. Which DA makes use of CDEV documents found in the System Folder?
5. What is a font?
6. What are the two fundamental types of fonts available?
7. What is the difference between an outline font and a solid font?
8. Which type of font, outline or solid, is the more desirable? Why?
9. Explain the difference between the Clipboard and the Scrapbook.
10. Under which menu item on the menu bar do you find DAs?
11. Where are fonts and DAs stored?
12. Which DA lets you set the computer's system time, as well as set a periodic alarm as a reminder?
13. What is the purpose of the Chooser DA?
14. Is there a difference between selecting an ImageWriter and a LaserWriter for formatting your documents?
15. List three things you can change with the Control Panel.
16. Will the Find File DA work on any disk, or only on a hard disk?
17. Can the Key Caps DA access fonts that are not installed?
18. Which file should be in your System Folder for Key Caps to work best?
19. Which keys are pressed on the keyboard to obtain the special characters that are a part of many fonts?
20. What are the steps required to put information into the Scrapbook?
21. What are the steps required to copy information from the Scrapbook into your current document?
22. What does the term "Launching a program" mean, and how do you do it?
23. On which menu can you expect to find an option to quit an application program?
24. What is the purpose of the Font/DA Mover program?
25. Is there a practical limit to the number of fonts and DAs installed on a boot disk when you are using a floppy disk-based system? If so, what is the limit?
26. Is it possible to re-initialize a disk? If so, which menu is used?
27. When looking at the contents of a folder, what information is displayed in the Icon View that is not displayed in the Name View?
28. What is the purpose of the Set Startup option?
29. What two things does the MultiFinder let you do that the Finder cannot do at present?

CHAPTER

BEGINNING WORD PROCESSING CONCEPTS

5

CHAPTER OBJECTIVES

Upon completion of this chapter, the student will:

- **Explain the concept of word processing.**
- **Explain the difference between the two major types of word processing programs.**
- **Start MS-Word.**
- **Enter text with MS-Word.**
- **Explain what word wrap is and why it is a helpful feature of word processors.**
- **Explain the function of the cursor.**
- **Move the cursor inside the text.**
- **Insert, replace, and delete text in a document.**
- **Save the document to disk for later use if needed.**
- **Print the document.**

5.1 WHAT IS WORD PROCESSING?

Word processing is the act of using a mechanical device, in our case the microcomputer, to manipulate (or process) words or text.



Figure 5.1
An IBM DisplayWriter stand-alone word processor.

5.2 THE WRITING TOOL FOR THE BEGINNER

Word processing allows beginning users to produce error-free final copy with neatly justified margins and underlined or boldfaced text with their first use of the tool. (Most of this book's text has left- and right-justified margins, which means that both the left and right margins are straight. When using a typewriter you usually end up with ragged right margins. This paragraph, by the way, was typed with ragged right margins so that you could see the difference between justified and unjustified margins. More will be said about justification in a later chapter.)

Initially, it may take as long for the beginning user to enter text into the computer as when he or she was typing on a typewriter. This can depend on typing skills, the difference in the feel of a computer keyboard versus a typewriter keyboard, lack of familiarity with the word processing program, and even lack of familiarity with a computer.

5.3 THE WRITING TOOL FOR THE EXPERT

The expert at the typewriter keyboard will find that he or she can produce finished documents in much less time with the aid of word processing than was possible with a typewriter. The action (the amount of pressure needed to strike the keys) of the computer keyboard is much easier than that of most typewriters, and there are no moving parts. Overall faster typing speeds are possible when you don't have to wait for parts to move.

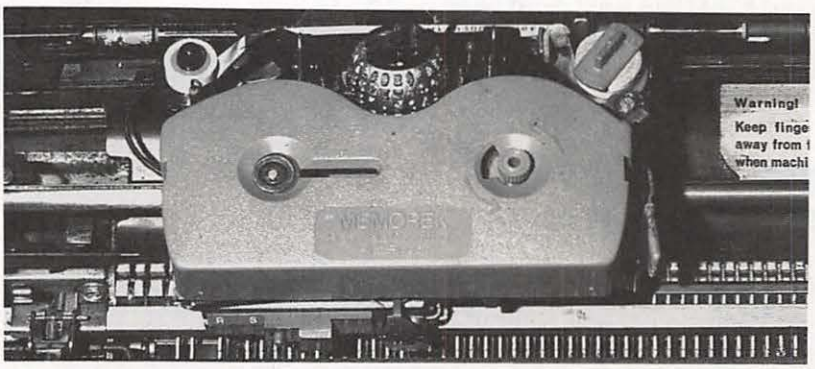


Figure 5.2
Inside a typewriter. Notice all the moving parts!

Possibly the greatest advantage of word processing is how easy it makes it for you to edit a document electronically. Typographical errors (typos) can be corrected more easily. The word wrap feature (when a typed word passes the right margin it is moved to the beginning of the next line automatically—more on word wrap later in this chapter) eliminates the need for you to use the return key and wait for the typewriter carriage to reposition itself for the next line of text. It is a relatively fast and simple process to correct a document on the computer's screen, making changes or corrections before the printing process begins.

5.4 THE PRINTER

A major contribution to the overall speed of document preparation with a word processor is the printer. Even if you elect to print a draft copy of the document to correct or to send to someone

else to correct or review, the speed of printers today is such that the computer can reprint the corrected version in almost no time at all compared to the time it takes to retype the document by hand after you have made corrections. There are impact printers (printers that put the letters on the page by physically striking a ribbon and pressing it to the paper) that will print up to 400 characters per second. Laser printers costing under $2500 can print up to eight pages per minute!

5.5 SPELLING VERIFICATION AND THESAURUS

Additionally, a majority of the word processing programs in use today can be used with some forms of spelling check and thesaurus programs. These programs have dictionaries and thesauruses ranging in size from 20,000 words to 220,000 or more words.

Some spelling check programs are available on-line. You may ask the spell checker to look up a single word, or to scan a sentence, paragraph or page of your text while you are editing the document. The spelling check program compares the text of your document against its dictionary. If the words are found in the dictionary, then you have no problems. However, if there are words the program does not find in its dictionary, the program (depending on which of several you are using) will either mark it for you as a "misspelled word," ask you if you want it marked as a misspelling for future corrections, or even ask you to fix the supposed error before the program continues to check the rest of the document. After the spelling check program marks mistakes, it is a simple matter to return to your word processing program to make the needed corrections. All this may even be done without ever printing a first copy of the document, again saving time.

A thesaurus works in a similar fashion. You enter a word for which you want a synonym, and the thesaurus finds and displays alternate words. You may then insert one of these synonyms into your text.

Word includes an on-line spell check program, and on-line thesauruses are available. Neither the dictionary nor the thesaurus are loaded into memory at all times, as they are each quite large. They are called upon on demand. More will be said about the Word spell check feature in a later chapter.

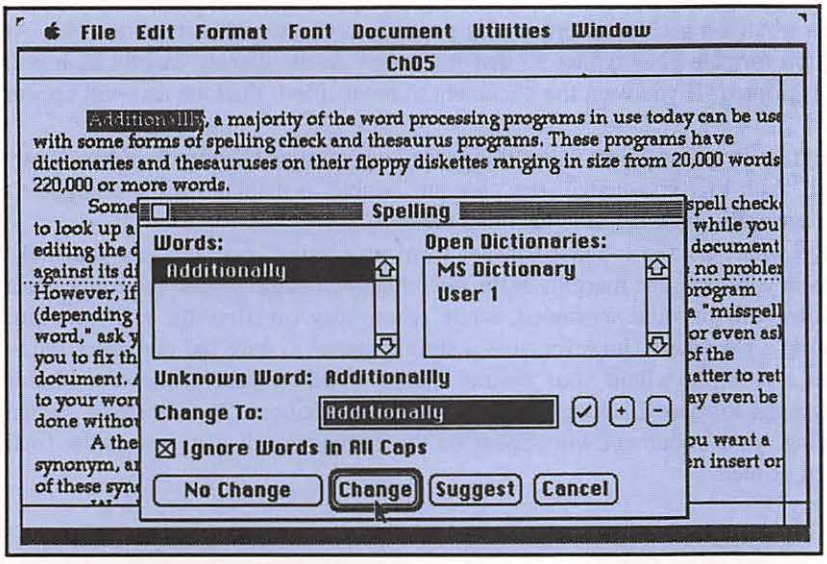


Figure 5.3
The Word spell check program in use.

5.6 FORM LETTERS

A word processing program can make a big difference for a small business in the generation of the ubiquitous form letter. Most word processing programs today are able to merge a mailing list into a form letter. All your letter needs is the special codes recognized by the word processing program in place of the name and address, for example, to tell the program where to enter names, addresses, or other text. With a little planning, you can even generate a form letter and include a personal postscript to selected people, all with the help of your word processing software. With a letter-quality printer, no one will suspect that the same letter has been received by tens, hundreds, or even thousands of people.

Another method of generating form letters is to save on disk, a group of single paragraphs, each being different. To write a letter to John Doe, for example, you might select paragraphs one, five, eight, and twelve. You simply merge these paragraphs together, and add the date, address, salutation, and closing. While the process of writing the initial group of paragraphs may be time-consuming, once you have them they need not be entered into your computer again. This method of letter or document preparation is often called boilerplating. You will see how to actually create a document in this fashion in the next chapter.

5.7 TYPES OF WORD PROCESSING PROGRAMS

There are two basic types of word processing programs available today for the personal computer. One is the "what you see is what you get" (WYSIWYG) type program, and may sometimes be referred to as a screen editor (although this may depend on the kind of computer you have), while the other is usually called a text editor/formatter, or sometimes a line editor/formatter.

5.8 THE WHAT YOU SEE IS WHAT YOU GET PROGRAM

The "what you see is what you get" word processing program is exactly what it sounds like. As you write, the program formats your typing so that it appears on the display exactly as it will when the document is printed. If you want the document to be justified, then the text will appear justified on-screen.

This kind of program frequently does other things for you, such as keep track of how many lines you have typed. With this knowledge, the program is able to display on the computer's monitor where one page ends and where the next one begins.

With some of the what you see is what you get word processing programs, as you make additions or deletions in your text, the margins of the document will begin to lose their nice, neat appearance. Some lines will become shortened, while others may overflow the right margin. After you finish editing a paragraph, however, it is a simple matter to have the computer reformat it, which places everything within your desired margins. Other word processors of this genre keep the paragraphs formatted automatically as you make changes. In either case, when you are through editing, your document will appear on the computer's display just as the final output will look when printed.

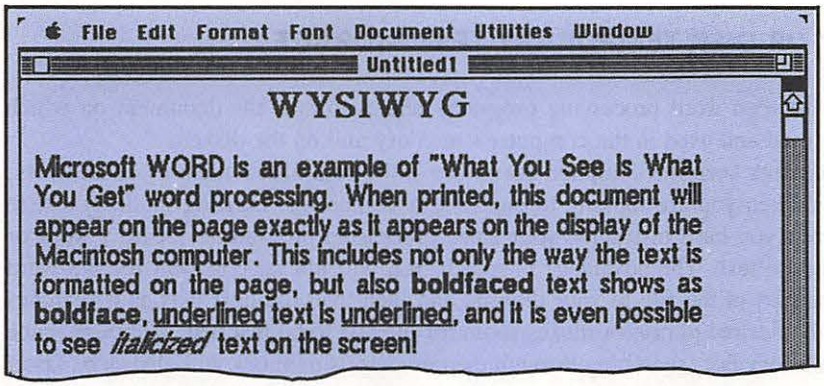


Figure 5.4
MS-Word is an example of a "what you see is what you get" word processor.

5.9 THE TEXT EDITOR/TEXT FORMATTER PROGRAM

The text editor/formatter program takes a different approach to how your document appears on-screen as you write or edit. With this type of program your computer's display rarely resembles the final printed output. You must direct the output formatter of these programs through print commands, which are part of the text you type, but which do not appear in the final output.

```
.LINELEN 55
.FILL
.JUSTIFY
.PARA
The FILL process will take words from
the next line and add them onto a short line
until the output line length is reached.
The output line length of this text will
be 55 characters, as defined in the .LINELEN
formatting command.
If I want to change the output line length,
I would change the value found in this command.
.PARA
The .PARA command will cause a new paragraph.
This means there will be an indentation in
the text for the new paragraph.
Some text formatters may also skip a line
between two paragraphs.
.PARA
The .JUSTIFY command will cause the output of
the text to be RIGHT justified.
This means the text will have a straight right
margin as does a newspaper column.
```

```
HERE IS WHAT THE OUTPUT OF THE TEXT FORMATTER WILL LOOK LIKE:

     The FILL process will take words from the next
line and add them onto a short line until the output
line length is reached. The output line length of this
text will be 55 characters, as defined in the .LINELEN
formatting command. If I want to change the output line
length, I would change the value found in this command.

     The .PARA command will cause a new paragraph. This
means there will be an indentation in the text for the
new paragraph. Some text formatters may also skip a
line between two paragraphs.

     The .JUSTIFY command will cause the output of the
text to be RIGHT justified. This means the text will
have a straight right margin as does a newspaper
column.
```

Figure 5.5
A text formatter program input, and the formatted output from the program.

There are, of course, advantages and disadvantages to both types of programs. The editor/formatter allows easy experimentation with margins and other formatting options, but does not display the results of your work until you print your document. The what you see editor makes it simple to enter tables and columns of numbers.

As you are working with Word, you will discover that, while it bears no relationship to a text editor/formatter, it is not 100 percent a what you see is what you get program. Word keeps track of line lengths, the number of lines on a page, and similar formatting options. If you want the document justified, then you will see it justified on the display. Problems with the appearance of the document sometimes occur when you print. These problems are mostly related to formatting quirks of the particular printer you are using. You will see that it is very important to have the correct printer selected with the Chooser (read about the Chooser DA in Chapter 4) when formatting and paginating your document.

5.10 MEMORY OR DISK TEMPORARY TEXT STORAGE

Another distinction between word processing programs relates to how the document on which you are working is stored and used in the computer's memory and on the diskette.

Some word processors keep the complete document in the computer's memory at all times. This is advantageous when you are looking through the document or inserting (adding) text to the document, or when you have instructed your word processing program to locate a word or phrase somewhere in the text. The advantage is speed. You will not have to wait for the word processor to save one part of the file to your diskette and then load the next part as it searches through the text for the desired phrase or makes room for the text to be inserted. Although some disk drive systems are very fast, searching through the computer's memory will always be faster than a search through text located on a diskette or hard disk drive.

The disadvantage of the word processors that keep the whole document in the computer's memory is the forced limitation on the total size of the document. Clearly, if the program wants to keep the complete document in memory, then the memory available after the word processor itself is loaded is the size limit of your document. The typical page of single-spaced text with six-inch lines will require approximately 3K to 3.5K characters of memory (one K represents 1024 characters). If your free memory area has room for 32K, your document size is limited to slightly more than nine of these pages.

When you use a word processor that keeps only a small segment of your document in memory, you give up some speed in search operations and speed of gross (covering several pages) cursor movements for ease of page numbering, page breaks and larger overall documents. This type of program may have greater overall capabilities because minimizing the size of the program is not as important as with the programs that load the entire document in memory.

5.11 TEXT ENTRY

Text entry is one of the major activities of persons using word processors. It is the act of typing the document and storing that document on disk. All the typing you do will occur within the text window.

Since most documents you type will not fit onto the computer's monitor in total, the computer's display really acts as a window into the text. In fact, that portion of the monitor used to display the current portion of your work is called the text window, just as the open disk icons are called disk windows.

5.12 THE CURSOR

The cursor can take on a different form for almost any computer you use. It commonly appears as one of the following:

- Solid block
- Blinking or flashing block
- Solid underscore character
- Blinking or flashing underscore character
- Blinking or flashing vertical bar

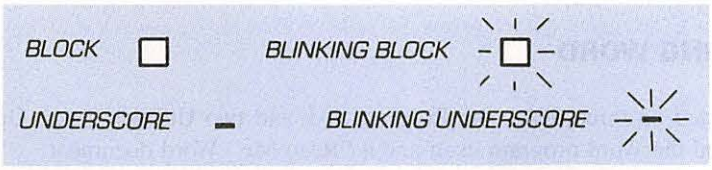


Figure 5.6
Typical cursors you will see with word processing programs.

The cursor type displayed is usually a function of the computer and not the software being employed, but it is possible for the software to generate its own unique cursor type. While you are typing, the cursor used by Word remains the standard blinking vertical bar used by the Macintosh as its cursor. The Macintosh, and Word, also use a second, special cursor type, called the I-Beam (Figure 5.7). This cursor will appear when you use the computer's mouse to re-position the cursor on the screen, or for performing a variety of other tasks while working with the document.

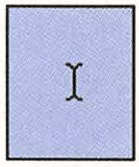


Figure 5.7
The I-Beam cursor as it appears on your Macintosh display.

Computers use cursors to indicate where the next letter or character you type will appear on the monitor. This is called the insertion point. Unlike a typewriter, on which this spot can be fairly easily identified, the computer's monitor does not move as you type, hence the need for the cursor.

5.13 OPENING A FILE

Sooner or later, all word processors will allow you to save your text onto your disk. Some word processors require that you name the file BEFORE you start the editing process. Others will let you create the complete document and then name it when you are ready to save it. In either case, you are said to be opening a file when you furnish the word processor with a name for the document.

Word will let you create and print a document without ever opening a file on the disk. This means that you may write a document and never save it! However, it is always a good idea to save a document before printing it. If you have a hardware problem, it will take less time to recover from the saved document than to retype it!

5.14 BEFORE YOU BEGIN

When you purchase an application program, such as Word, you are frequently told in the instructions to make a back-up copy of the program disks. This is not true of every application you purchase. If the instructions tell you that you are able to make a back-up copy, then making a **single** copy in this fashion is within your legal rights, and indeed it is a good idea. Use the procedure you learned in Chapter 3 for copying disks to make a copy of your original Word disks before you begin this section of the text. This copy of the disks is called a "working copy." After making the backup, put the originals in a safe place and use the working copy. By keeping the originals safe, if something goes wrong with your working copy, you will be able to make a new working copy of your software.

5.15 STARTING WORD

Word is distributed on three disks, the Program disk and two Utilities disks. On the Program disk you will find the Word program itself and a "Read Me" Word document.

The Read Me document contains the most recent update and release note information for the disks you have. There are frequently small corrections or changes that are made to a program that occur after the manual is printed, or errors are detected in the manual. The Read Me document is in effect an addendum to the program manual.

The Utilities 1 disk contains the Word help files, dictionaries, glossaries and sample documents. The purpose of the help files should be obvious. They are accessed through the Word help feature discussed later in this chapter. The dictionaries are used when you use the Word Spell Check feature. The glossaries are stored up phrases or special characters.

The Utilities 2 disk contains a variety of utility programs that are not required to make the Word program run, but which may come in handy at some time. For example, you will find Word Finder, a thesaurus desk accessory, on this disk, as well as SuperPaint, a graphics program which lets you create pictures which can be incorporated into your Word documents.

Figure 5.8
The MS-Word program icon.



After you boot your Macintosh with a System Start-Up disk, insert the Word Program disk into one of the computer's disk drives. If you are using a machine with a hard disk, you will not need to insert the Word program disk into a disk drive. Rather, locate the Word 4.0 folder, and open it so you can see the Word program icon. Place a disk (see Chapter 3 for how to initialize a new disk) with at least 200K available space into another one of your Macintosh's disk drives, if you have one available. This disk will be used for saving your work. If you do not have a free floppy disk drive, keep this disk available. You will need it for data storage.

In these instructions, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ...", means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ...", means to move the mouse pointer to the specified item and double-click the mouse button. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.

Finally, if you want your work to match the figures in the text, be sure to use the Chooser DA to select a LaserWriter and not an ImageWriter. You may select a LaserWriter even if your computer is not actually attached to one. You will not, however, be able to print if this is the case.

What To Do	*Why You Are Doing It*
If the disk's icon is closed, double-click on the icon with the mouse pointer.	Open up the disk icon onto the desktop. If the Macintosh you are using has a hard disk, then open the folder containing the Word program.
Locate the Word program icon inside the disk window (Figure 5.8). If you are using a machine with a hard disk, locate the Word program icon inside the folder's window.	

Move the mouse pointer to the Word icon and double-click the mouse button.	Launch Word. Remember, if you are having trouble with the double-click, you may select the Word icon with a single click, then use the Open command on the File menu (or ⌘O) to launch Word.

After a brief pause you will see a blank screen with a menu bar at the top. Below, occupying the rest of the Macintosh's display, is the text window in which you will be working. It has a title bar on top with the name "Untitled1", scroll bars at the right and bottom, a size box at the bottom right corner, and an information box at the left side of the bottom scroll bar that says Page 1. If you have already set Full Menus, you will also see the word Normal appear at the bottom left of the display.

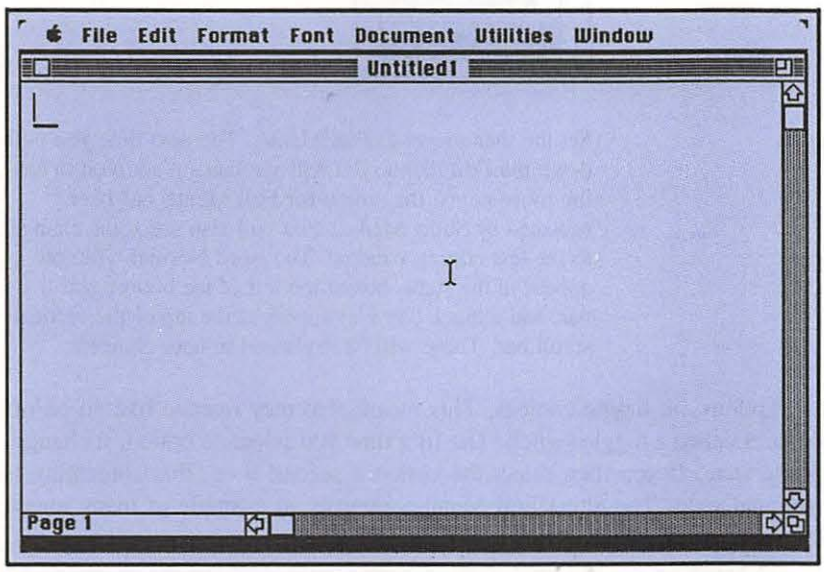


Figure 5.9
Opening Word screen.

Note that the standard Macintosh cursor, a blinking vertical line, is in the top left corner of the Word text window. Below the cursor is a short, dark horizontal line. This line indicates the end of the current document.

Before you begin to enter text, you must first set Word's menu level. Word will give you either "short" or "full" menus. A majority of the features you will use are found on the short menus, however some are available only on the full menus. When Word is sold, it is set for short menus, and must be changed to full menus.

What To Do	*Why You Are Doing It*
Pull down the Edit menu.	Remember, to pull down a menu, place the mouse pointer on the desired menu item then press and hold the mouse button. One of the Edit menu items lets you switch between the Short and Full menu levels. The last item reads Full Menus. This means that you are presently using the Short Menus.

Drag the mouse pointer down the menu until Full Menus is the selected item (Figure 5.10).

You want to change the menu level to Full Menus.



Figure 5.10
This is the Edit Menu with Short Menus selected. The Full Menus option, shown selected here, will change the menus to their full status.

Release the mouse button.

Set the menu level to Full Menus. The next time you pull down the Edit menu, you will see that, in addition to having more items, the option for Full Menus has been replaced by Short Menus. You will also see some changes to the text editing window. The word Normal will now appear in the status box at the left of the bottom scroll bar, and a black box will appear at the top of the vertical scroll bar. These will be explained in later chapters.

Many of the menu options are **toggle** choices. This means that they operate like an on/off switch, which is sometimes called a toggle switch. The first time you select an option, it changes something to its opposite state. If you then select the option a second time, that something is changed back to its original state. The Short/Full Menus option is an example of many toggle choices found on the various Word menus.

5.16 SELECTING A FONT

Before you begin entering text, there are two tasks you should perform. You should use the Chooser (on the DA menu) to select the printer you intend to use for final output, and you should select the font to be used for the majority of the document.

Recall from Chapter 4 that the printer you select has a direct impact on the formatting of the final document. Thus, if you do not have a LaserWriter available for output, make sure that you have used the Chooser to select the ImageWriter. If you plan the final output for a LaserWriter, even if you do not have one attached to the computer you are using, be sure to use the Chooser to select it, rather than the ImageWriter.

In a like fashion, it is a good idea to set the starting font before you begin to enter text. If your final output will be made using an ImageWriter dot matrix printer, then the New York font is a good one to use for starters. On the other hand, if you will be printing your final document on a LaserWriter, you will find that the Times font works better.

All the samples in the text are using the Times font for printing on a LaserWriter. Thus, if you are trying to match the examples exactly, you will have to use the Chooser to select the LaserWriter as your printer. The following section will show you how to select fonts.

What To Do	*Why You Are Doing It*
Pull down the Font Menu.	The Font menu controls both the typeface you will be using and the type size. If your System File has so many fonts installed that the list is longer than will fit on the screen, you will see a small down-pointing arrowhead at the bottom of the font list. This indicates that more fonts are available by dragging the selection bar down to this point on the menu. When you do so, the Font menu will scroll. As you use the Macintosh, you will find that this is a feature of many menus.
Drag the selection bar down to Times.	You want to create a new document using the Times typeface. Remember, if you are planning to output this document on an ImageWriter, the New York font will be a better selection at this time.

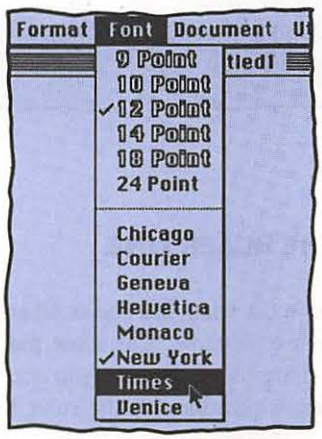


Figure 5.11
The check in front of the New York font name indicates that it is the current font, and will remain so if you do not make any changes. In the figure, the Times font has been selected and will become the current font when the mouse button is released.

Release the mouse button.	Releasing the mouse button will select the Times type font.
Once again pull down the Font menu.	You will find that the Times 12-point font is smaller than the default New York 12-point font. To compensate, you are now going to change the type size for the Times font to 14.
Drag the selection bar down to 14 point.	Select the size 14 point. This should be an outline font, meaning that the computer has a bit-map definition of the font in this size. Times is also a laser font. Thus, even if a 14-point outline size is not available, it will still look good when printed on the LaserWriter.
Release the mouse button.	Activate the selection.

Figure 5.12
The 14-point type size has been selected. This figure has this type size as an outline font. This may not be true on your computer.



5.17 ENTERING TEXT

Now that you have selected a printer, type font and size, you are ready to begin entering text. This is the easiest part of word processing. All you have to do is type. Type the following text, but do not press the [RETURN] key when you are done. Compare what you type to Figure 5.13.

```
Word processing is fun!
```

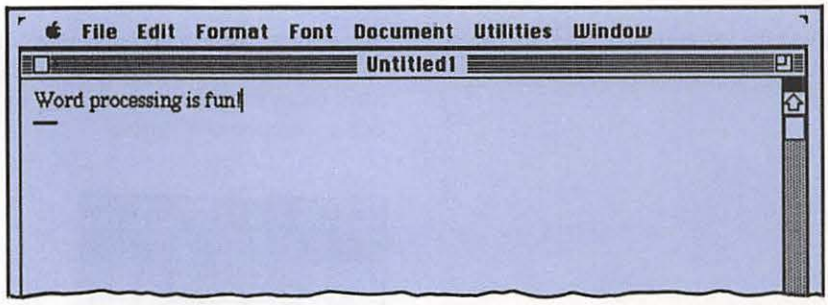


Figure 5.13
Your Macintosh screen should look similar to this one. Remember, if you are using an ImageWriter this line may have a slightly different appearance.

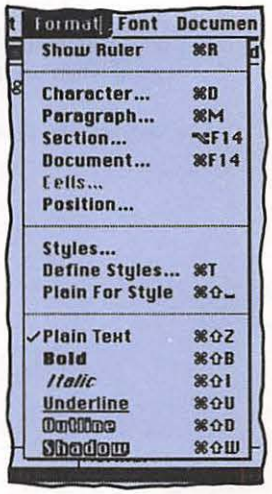
5.18 DISPLAYING THE RULER LINE

The ruler line is present on most what you see is what you get word processors. Some put the ruler line at the top of the text window, and some put it at the bottom of the text window. It defines the left and right margins of the text you are entering. Frequently you will also see characters appearing at various positions on the ruler line to indicate tab stops and other positions on the line.

Word does not display the ruler line unless you ask it to. This is done with a command found on the Format Menu.

What To Do	*Why You Are Doing It*
Use the mouse to pull down the Format menu (Figure 5.14).	You want to use a command on this menu.

Figure 5.14
The Format Menu.



Drag the mouse down to the first item, Show Ruler.	You want Word to display the ruler line.
Release the mouse button.	Execute the selected command, Show Ruler. The ruler line will appear at the top of the text window. (You may also use the ⌘R key to turn on the ruler line.) The Show Ruler option is another example of a toggle switch menu choice. The next time you look at the Format menu, the choice will have changed to Hide Ruler. ⌘R will still be the command key equivalent.

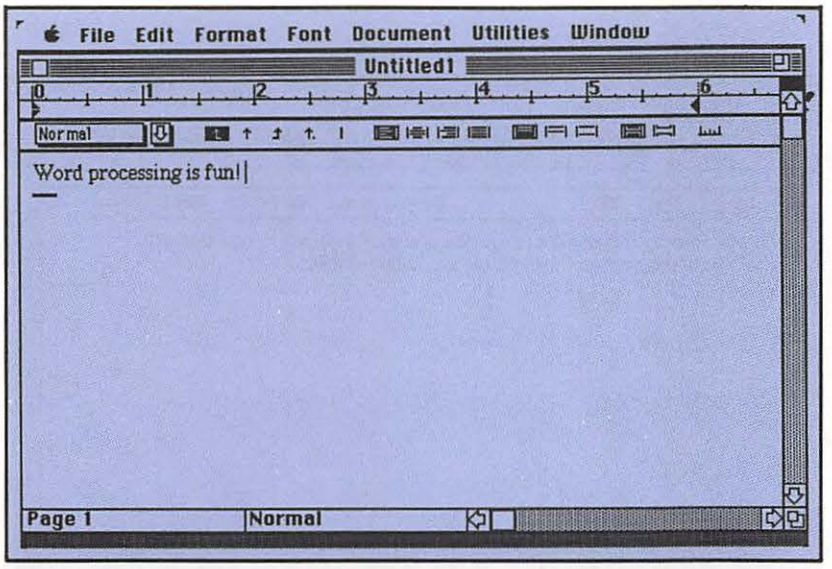


Figure 5.15
The ruler line is now displayed at the top of the current window. Remember that this is the ruler line as it will appear when a LaserWriter is the selected printer. The ruler line for the ImageWriter will have slightly different spacing.

In addition to the ruler markings at the top of the ruler line, there are other items of importance you should now notice. First, you should be able to recognize the tab stop positions. They are the small arrowheads appearing below the ruler markings every half inch. The left margin point is the two triangles beneath the zero at the left end of the Ruler Line. The right margin is the triangle located at the six-inch position on the margin.

Separating the ruler line from the text window is a box that starts with the word "Normal" followed by a row of small icons. The "normal" is part of a pull down menu of pre-defined styles. You will learn more about styles in a later chapter. The icons are the tab stop icons, the vertical line icon, the alignment icons, the line spacing icons, the spacing after paragraphs icons, and the normal paragraph icon. These icons, too, will be discussed in later chapters.

5.19 WORD WRAP

Word wrap is one of the features of word processing programs that helps speed up your text entry. This feature allows you to type nonstop. The software detects when a word you have typed extends past the right margin. When this happens, that word is automatically moved to the next line. You do not even have to pause in your typing. As a result of word wrap, the only time you will ever have to press the return key is to indicate a new paragraph, or to force information to stay on a single line, such as when you are entering tables or columns of numbers.

5.20 THE RULER LINE AND WORD WRAP

To see the effects of word wrap and how the ruler line interacts with your document, add the following sentence, errors and all, immediately after the sentence you have already entered. You will fix the errors later. Of course, add a space after the exclamation point ending the first sentence and before the beginning of this new sentence. When you are done, your screen should appear similar to Figure 5.16.

```
Wrd processing allows any person to type text with neately justifyed margins,
underlines, and boldfacd text.
```

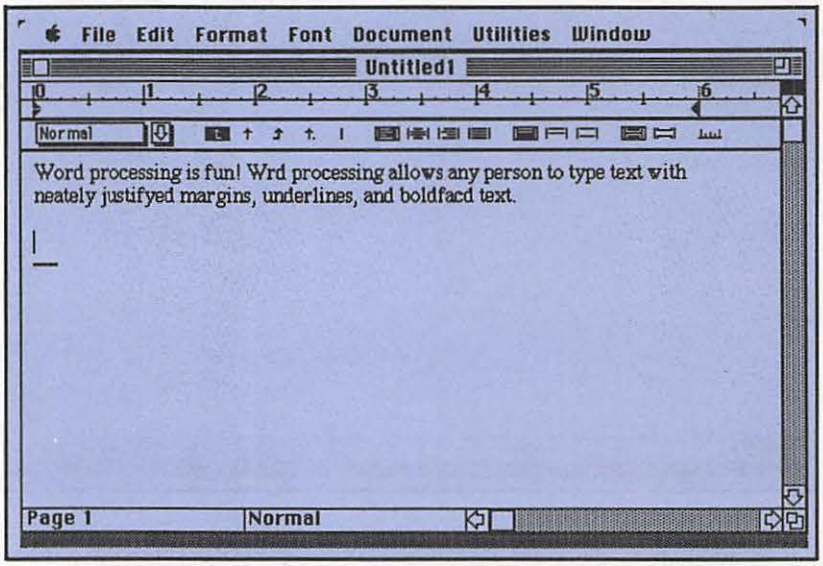


Figure 5.16
When you have finished entering the text, your Macintosh should look similar to this figure.

When you type the word "neately" you will have passed the six-inch right margin. The word will be moved to the next line for you. Do not press the return key. Word is wrapping the word that passes the right margin to the beginning of the next line.

After you have finished this paragraph, press the return key twice. You are doing this to indicate two things. First, you want to start a new paragraph in the document. Second, you want to separate the two paragraphs with a blank line. If you had not wanted a blank line between the two paragraphs, you would have pressed the return key only one time. Word does not display paragraph markers on the Macintosh display. To determine where you have put a return character, or any other special character such as the Tab key, you must turn on the Show ¶ option.



Figure 5.17
The current Edit menu with Full Menus set. Note that one of the options is Short Menus, which will return the menu level to the initial level.

What To Do	*Why You Are Doing It*
Pull down the Edit menu.	You want to execute a command found on the Edit menu. This menu looks different than the first time you used it. Because you are using full menus, you now have three more options appearing on the Edit menu (Figure 5.17).
Drag the mouse down to the Show ¶ option.	Select the show paragraph codes option.
Release the mouse button.	Execute the menu option. In the future, you may use either the menu or the ⌘Y key to turn on and off the Show ¶ option.

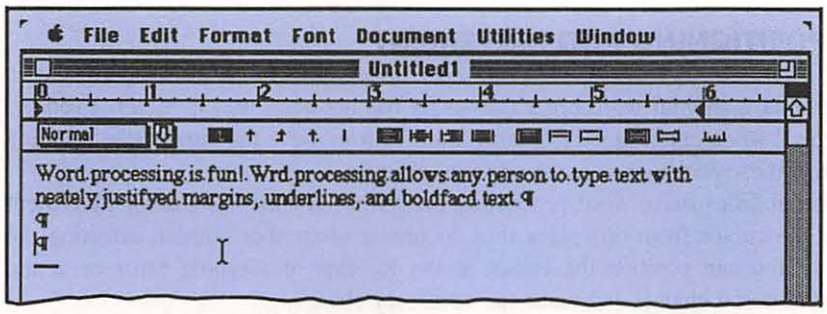


Figure 5.18
Note the paragraph symbols that now appear. You can also see dots between each word you have typed. These indicate where you have pressed the space bar.

With the Show ¶ turned on, you now see the paragraph symbols at the end of the text indicating where you have pressed the return key. Note that there are three such symbols, the third one indicating the end of the document.

Separating each word you have typed is a raised period. These indicate where you have pressed the space bar while typing. At this time, they are not important. However, when you are working with justified text (both the right and left margin are straight), as you will be in a later chapter, it will become important to know that the space that appears between two words is only a single space!

As you use Word and other special keys, such as the tab key, you will discover that the Show ¶ command will display them as well.

⌘Y

Word will let you enter new text with the Show ¶ displayed on the screen. However, the symbols can be distracting. For now, turn OFF the Show ¶ while you enter more text. Rather than using the pull down menu, try using the command key equivalent. If you have trouble, pull down the Edit menu and select Hide ¶.

⌘R

As you saw, it is possible to work with the ruler line displayed. It is, however, taking up some of the text window. For now, turn it off using the command key equivalent. Remember, the Show/Hide ruler options can be found on the Format pull down menu.

Now type the following text. Do NOT press the return at the end of the sentence:

```
Many word processing programs have a spelling check program available that scans the
text and indicates words not found in its dictionary.
```

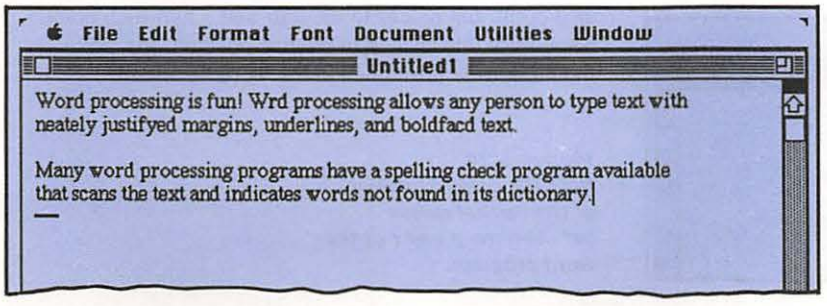


Figure 5.19
The Macintosh display after you have typed the second paragraph.

5.21 CURSOR POSITIONING AND MOVEMENT

The text you have entered with your word processor so far has not been very difficult. Even so, you have made "errors" when entering it. You must know how to move the cursor (the blinking vertical line) to correct these errors or to make editorial changes.

Cursor movement abilities make word processing programs very useful. Cursor movement is the act of moving the cursor from one place in a document to another without affecting the words on the screen. You can position the cursor at the location of a typing error or at the location of a planned editorial change and make the necessary changes.

You can position the cursor in the document with the arrow keys found on the bottom right of the standard or Macintosh Plus keyboards or to the right of the standard typing keys of the extended keyboard. You may also position the cursor anywhere you want in the text by using the mouse and the I-beam cursor. The sole limitation on cursor movement with Word is that you are only able to place the cursor where there is actually text. That is, the cursor cannot be placed past the heavy underscore at the end of the document, or above the first character of the document.

In a similar fashion you cannot place it past the last character on any given line. If you appear to be able to move the cursor beyond the end of a line, then there are space characters present after the last visible character on that line. These spaces will appear when you select the Show ¶ (⌘Y) option.

First, try moving the cursor with the arrow keys found on the keyboard.

What To Do	*Why You Are Doing It*
↑ ↑ ↑	This moves the cursor up three lines to the end of the first paragraph. Note that each arrow press moves the cursor up only one line. Word remembers the relative position of the cursor on each line. Word knows that the cursor is at about the five-inch point of the ruler line. (You can verify this by once again turning on the ruler line with ⌘R.) Thus, when you moved it up three lines with the up arrow, the cursor tries to remain at the five-inch point of each line of the text.
← ← ← ←	This moves the cursor left. Note that each arrow press moves the cursor left a single character.
→ → → →	This moves the cursor right, still only a single character at a time.
↓ ↓	This moves the cursor down. Again, you are moving the cursor only a single line at a time. The left and right cursor movements you entered above changed the cursor's relative position on the line. It is no longer at the five-inch point, but nearer to the four and a half-inch point. Because of this change in relative position, the cursor should now be positioned in the word "program".

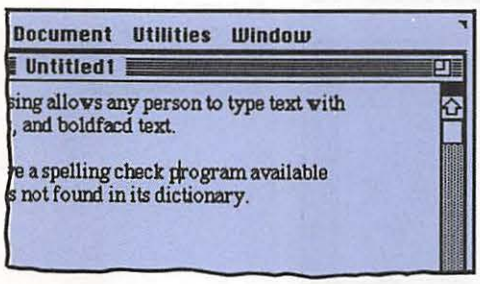


Figure 5.20
Note the current location of the vertical cursor between the p and r of the word program.

⌘← ⌘← ⌘←	Holding down the command key and pressing the left arrow moves the cursor left a word at a time. These three word left commands move the cursor so it is positioned in front of the word "spelling".
⌘→ ⌘→	The command key and the right arrow moves the cursor right to the beginning of the next word. The cursor should now be in front of the "p" of program.

During this time, the mouse pointer may have disappeared from your Macintosh display. If you do not see the mouse pointer or I-beam cursor, to have it return, simply move your mouse on the tabletop. The mouse will appear. If you had left it positioned outside the text window, it will re-appear as the familiar arrowhead. However, if the mouse is inside the text window, the cursor will appear as the I-beam. If you have your mouse pointer positioned outside the text window, move it into the text window now to get the I-beam cursor.

By positioning the I-beam on the document and clicking the mouse, you can move the cursor location in any size jump you want.

What To Do	*Why You Are Doing It*
Move the mouse so that the I-beam appears in the text window.	Moving the mouse on the desktop after you have been typing will make the mouse pointer or I-beam appear.
Move the I-beam so that it is positioned between the "a" and "n" of the word "any".	You are going to move the cursor from its current location to this new location.

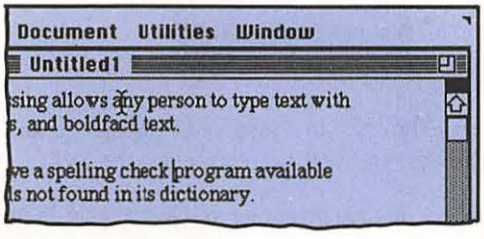


Figure 5.21
Place the I-beam cursor between the a and n of "any."

Click the mouse button one time.	Execute the cursor relocation.
Move the I-beam down on the screen.	When you clicked the mouse button, the I-beam blocked your view of the cursor. If you had typed, the I-beam would have disappeared of its own accord. You are moving the I-beam now so that you can see that the vertical blinking cursor did appear at the desired location.
Move the I-beam so that it is between the "p" and "e" in the word "spelling".	You are once again going to move the cursor location.
Click the mouse button.	Move the cursor location.

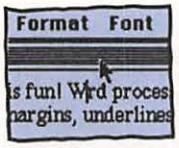
5.22 INSERTING TEXT VERSUS REPLACING TEXT

Now that you know how to move the cursor within your text, you are ready to make corrections and additions to what you have typed. These processes may be performed either by inserting new letters, words, sentences, and so on into your text or by replacing existing ones.

Insert is just that. When the cursor is positioned in the middle of a word and you type, as you type the letters from the cursor position and to the right in the text will be moved right on the line to make room for the new characters. **Characters are added between the current cursor location and the character immediately to the left of the current cursor location.**

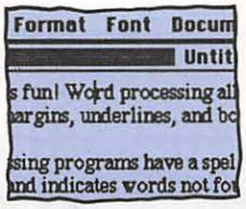
Word's replace process is a combination of a deletion and an insert. When the replace is used, selected text is automatically deleted from the document. You are then inserting text at the location of the deletion. You will discover that this method of replacing text is used in every Macintosh application.

Figure 5.22
The cursor has been positioned between the W and r of Wrd.



What To Do	*Why You Are Doing It*
Move the I-beam to between the "W" and "r" of "Wrd", at the start of the second sentence of the document.	This is where you will first try to insert text.
Click the mouse button.	Remember, after moving the I-beam, you must click the mouse to actually move the cursor to the desired location.
o	Add the letter "o" to "Wrd", which should now read "Word." The cursor will stay to the right of the new text you have added.

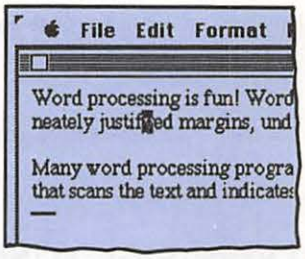
Figure 5.23
You have fixed the spelling of this word. Note that the cursor is after the new letter you have added to the word.



Now once again look at the text. The "y" in "justifyed" should be an "i." Rather than inserting an "i" and then deleting the "y," you will simply replace the "y."

Position the I-beam so that it is in front of the "y" in "justifyed".	You are preparing to select a letter in the word.
Press and hold the mouse button.	Begin selection of a text item by holding down the mouse button.
Drag the I-beam over the letter "y".	Select the "y".
Release the mouse button.	Complete the selection of the letter "y".

Figure 5.24
The letter "y" has been selected.



Type a letter "i". Note that the selected text, the letter "y" in this case, is removed and replaced with the text you have typed.



Figure 5.25
The letter "y" has changed to an "i". At the same time, all the text has been de-selected.

Dragging the I-beam over a letter, or words, of the text is one of many ways you can use to select text with Word. The double-click gives you a convenient method for selecting a whole word.

Move the I-beam so that it is on the word "available" at the end of the first line of text of the second paragraph.

Position the I-beam for selecting text.

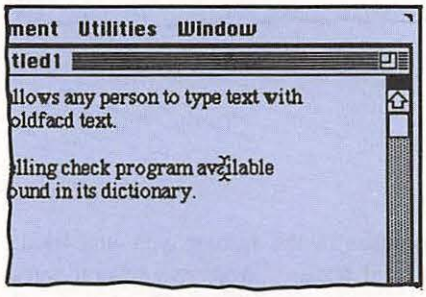


Figure 5.26
Note the position of the I-beam on the word available before the double-click is executed.

Double-click the mouse button.

The double-click will select the entire word. This is the word that you are going to replace with new text.

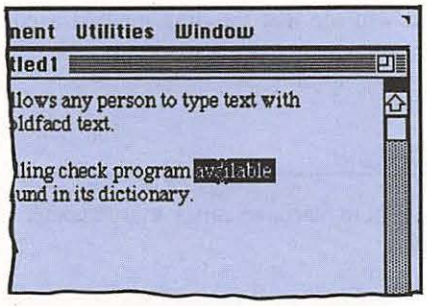


Figure 5.27
After the double-click, the complete word has been selected.

linked to them

Type this text.

When you began typing, the selected word was deleted from the document. Because this was a deletion of text, and Word does not know how many characters you intend to type, it immediately reformatted the text for the rest of the paragraph when you typed the first letter. The two words "that scans" are brought up to the line on which you are typing when you type the "l" of the word "linked." They return to the next line when you finish typing the phrase.

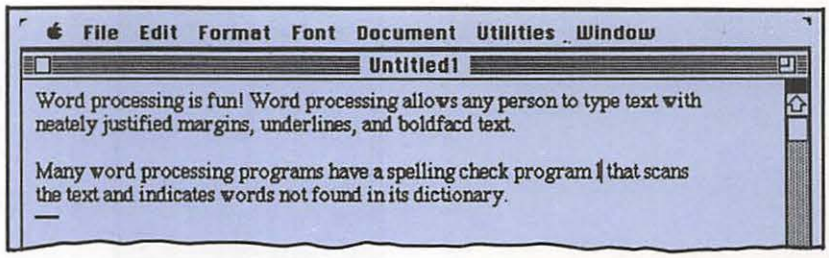


Figure 5.28
This is what your display should look like after you type the "l" to begin the word linked. Note that the complete word "available" has been removed.

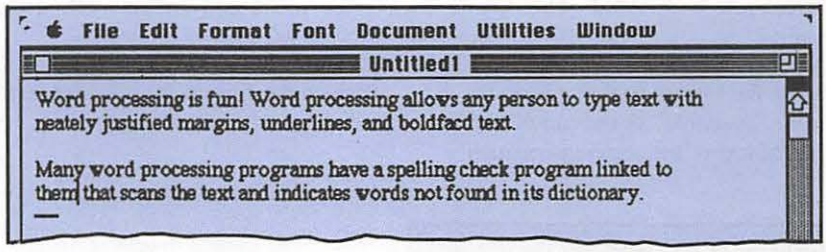


Figure 5.29
This is what your document should look like after you enter the complete phrase.

5.23 OTHER WAYS OF SELECTING TEXT

You will have many opportunities to replace words or phrases in the fashion you just tried. Because using this selection replacement technique is a useful feature, Word has several ways with which you can select sections of text. You have already used two methods. First, you used the drag method. That is, you positioned the I-beam cursor at one point in the document, then held down the mouse button as you moved the I-beam. This selected the desired letter of the document.

You also made use of the double-click to select a specific word of the text. Let's explore some other methods of text selection right now. First, you will see that the drag method used earlier may be used to select large portions of the document on which you are working.

What To Do	*Why You Are Doing It*
Move the I-beam to the space separating the first and second sentences of the first paragraph.	This is where you want to place the cursor to try another text selection method.
Click and hold down the mouse button.	You are beginning the selection process by holding down the mouse button.
Drag the I-beam right to the word "text." Do not yet release the mouse button.	As you drag the I-beam, text will be selected. Remember that the Macintosh lets you know something is selected by displaying it in inverse.

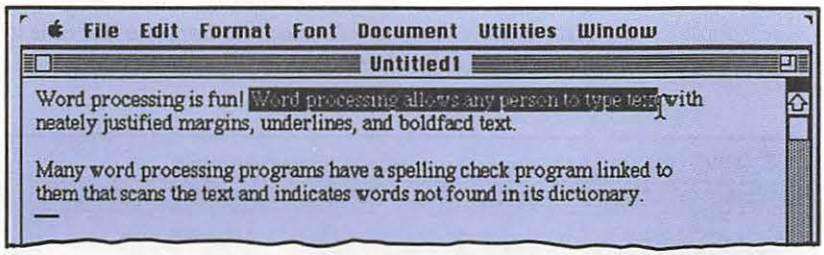


Figure 5.30
The selected text is highlighted. Note the location of the I-beam cursor between the last two words on the first line of the text.

Drag the I-beam down to the space between the two paragraphs. Do not release the mouse button yet.

By dragging the I-beam down, it is possible to select a complete line.

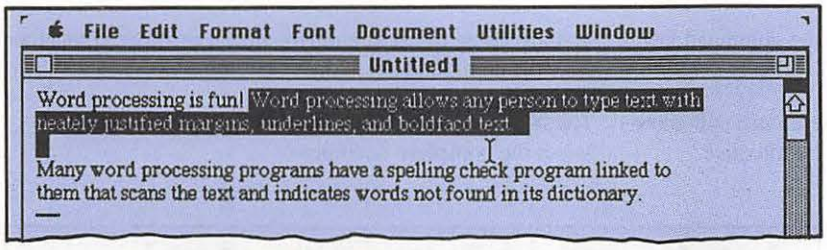


Figure 5.31
You can select large sections of your document by dragging the I-beam down.

Drag the I-beam up and position it in front of the first word of the text. Release the mouse button.

You can see that you may select by moving the I-beam forward from its anchor point (where the I-beam was sitting when you pushed down the mouse button) or backward.

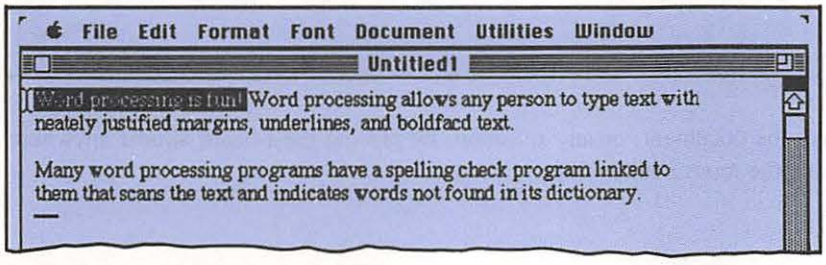


Figure 5.32
You may drag the I-beam either forward or backward. The anchor point, between the two sentences, has not been moved.

Drag the I-beam to the left edge of the letter "n" beginning the word "neately."

Position the mouse for another type of selection.

Slowly move the mouse left.

Move the I-beam a fraction of an inch to the left. The I-beam will turn into an arrowhead. It is not the mouse pointer that you are used to seeing, but rather a mirror image of it pointing up and to the right, rather than up and to the left (Figure 5.33).

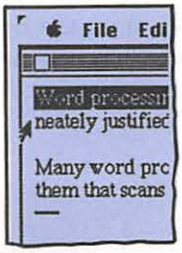
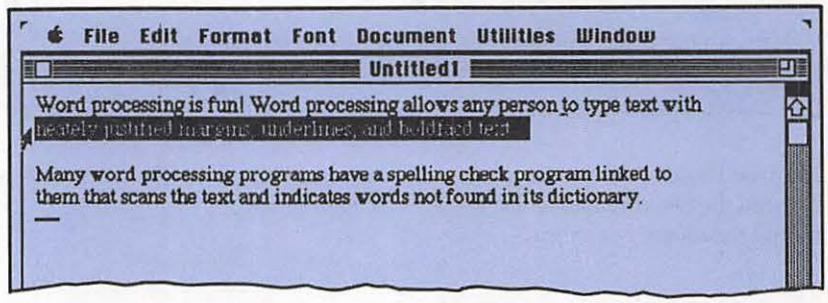


Figure 5.33
The I-beam turns into a mirror image of the familiar mouse pointer arrowhead when you move the cursor to the left edge of the text window.

Click the mouse button once.

The single click of the mouse when the mirror image arrowhead is showing will select the complete line of text that is being pointed to.

Figure 5.34
The whole line of text is selected with a single click of the mouse button.



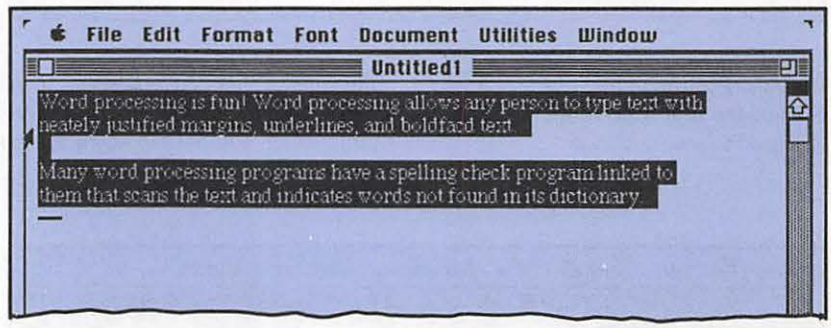
Press and hold down the command key (⌘).

You are going to use the mirror image arrowhead together with the command key.

With the mirror image mouse still showing, press the mouse button once.

The ⌘ key used with the mirror image arrowhead will select the **complete** document.

Figure 5.35
The complete document has been selected.



You may de-select the document, or any selection, by placing the I-beam almost anywhere on the text and clicking the mouse button once.

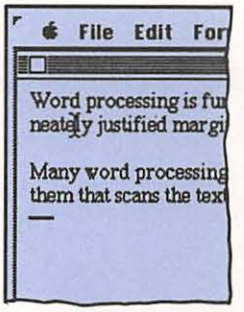
5.24 DELETING TEXT

The delete operation is the opposite of the insert operation—it removes text from the document and the space the text occupied on the line is immediately filled in. You have already learned one way to delete text—the Replace procedure. Select the text you want to remove, then type new text. You found that the replace operation starts by deleting text. If you choose to replace a large paragraph with a single sentence, then clearly you are deleting text.

You will not, however, always want to replace the text you are removing. In this case, you just want to delete the text. Word has several ways with which you can remove text from the document. One way is to select a portion of the text first, and then delete it. The selection may be as small as a single letter of the document, or as large as the complete document. Another way to easily delete small amounts of text is by using the delete, or backspace, key.

What To Do	*Why You Are Doing It*
Use the mouse to position the I-beam to the right of the second "e" in the word "neately" and click the mouse button once.	This word is incorrectly spelled. You have now positioned the cursor.
[DELETE]	The Delete key is found at the top right of the typing keys to the right of the + / = key. On the Macintosh Plus keyboard, this key is labelled "Backspace." This key is the character left delete, which removes the letter to the immediate left of the cursor's location. (If you are using an extended keyboard, you also have a key that will delete the character to the right of the cursor location. This is the key with "del" and an "X" enclosed in an open right-facing arrow.)

Figure 5.36
Note the position of the I-beam.



If you hold down the delete key, then several characters will be deleted. This key, like all the rest on the Macintosh keyboard, will begin repeating when held down.

Use the mouse to position the I-beam on the word "allows", the third word of the second sentence.

Double-click the mouse button.	Select the word "allows".

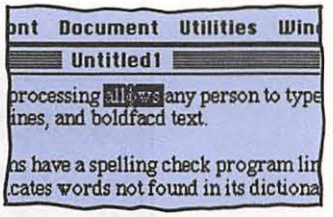


Figure 5.37
The word "allows" has been selected with the double-click.

[DELETE]	Once again press the delete key. The selected word is removed from the document. Note that the rest of the line squeezes left to fill in the space vacated by the deleted word, and that the word "neatly" filled in at the end of the line of text.

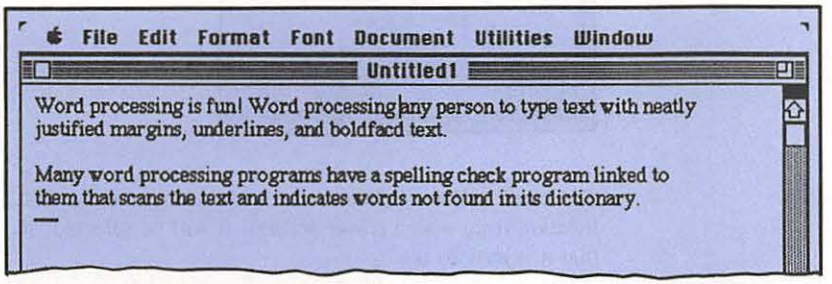


Figure 5.38
The edited text.

Word will always align the text to fit within the current margins as soon as you make an edit. Lines that are shortened because of an edit automatically have words pulled up onto them from the next line. Lines that overflow the margin because you have inserted text automatically have words pushed down to the next line. No special commands or keystrokes are required. Thus, when you deleted the word "allows", the word "neatly" was pulled up to the now shortened line.

5.25 RESTORING DELETED TEXT

It is also possible to restore accidentally removed text. The first option found on the Edit menu will constantly change to let you know if you can undo your last action. At times it will say "Undo Typing." This means that you can completely erase the text you have entered. The option will change to "Redo Typing" to restore what you have cut. Since you have removed text by typing new information (the delete key in this case), the menu should read "Undo Typing."

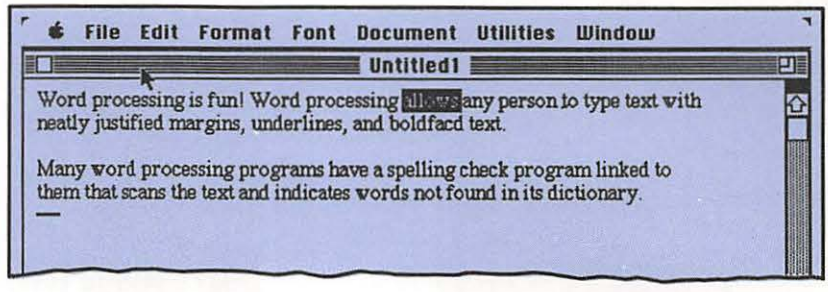
What To Do	*Why You Are Doing It*
Pull down the Edit menu.	
Drag the pointer to the first option, Undo Typing.	Select the Undo Typing option. Note that you may access the Undo command with the ⌘Z key.

Figure 5.39
The Undo Typing option has been selected.



Release the mouse button.	The word "allows" should return to the document at the location from which it was deleted. It will be selected, so that it is easy to see.

Figure 5.40
The word "allows" has been returned to the text.



Pull down the Window menu.

We want to look at the contents of another window.

Drag the mouse down to the Show Clipboard option.

The selection bar should highlight Show Clipboard (Figure 5.41).

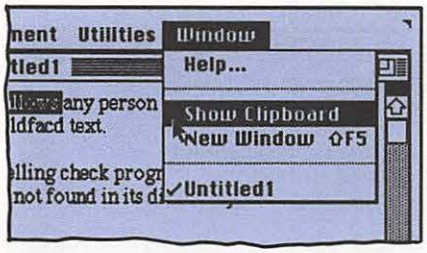


Figure 5.41
The Show Clipboard option of the Window menu is selected.

Release the mouse button.

The clipboard window will open on the bottom of the computer's display.

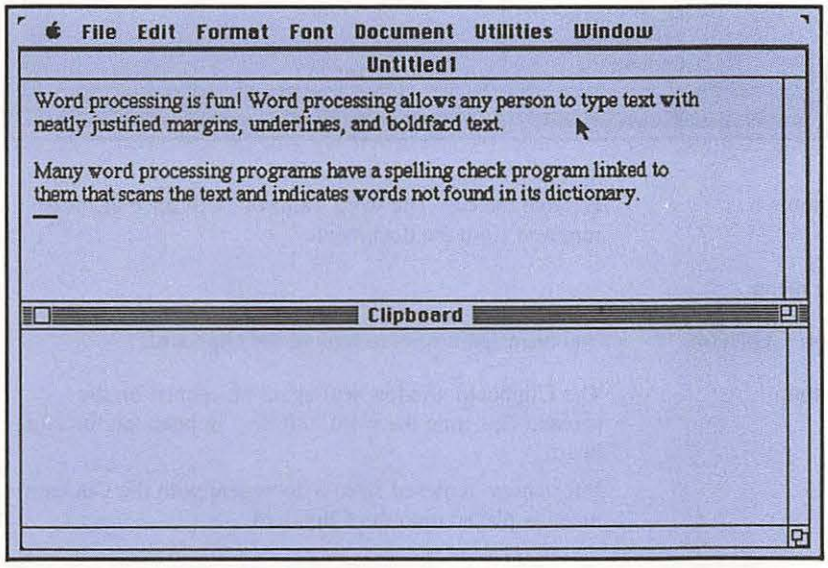


Figure 5.42
The current clipboard is empty. The Delete key does not move text to the clipboard.

Notice that the clipboard does NOT contain the word "allows". Word does not put text that you remove with the delete or backspace key onto the clipboard. Text deleted in this fashion is placed into a current typing buffer maintained by Word.

Click the mouse pointer on the Clipboard Close Box.

Remember that the close box is the box on the left end of the window's title bar. Clicking the mouse pointer on this box will put away the clipboard.

The word "allows" should still be selected. If not, use the double-click to select it again.

Pull down the Edit menu.

Drag the mouse down to the Cut option.

This time you will use the Edit menu's Cut option to remove the text from the document. You can see that you may use the ⌘X key for the Cut option.

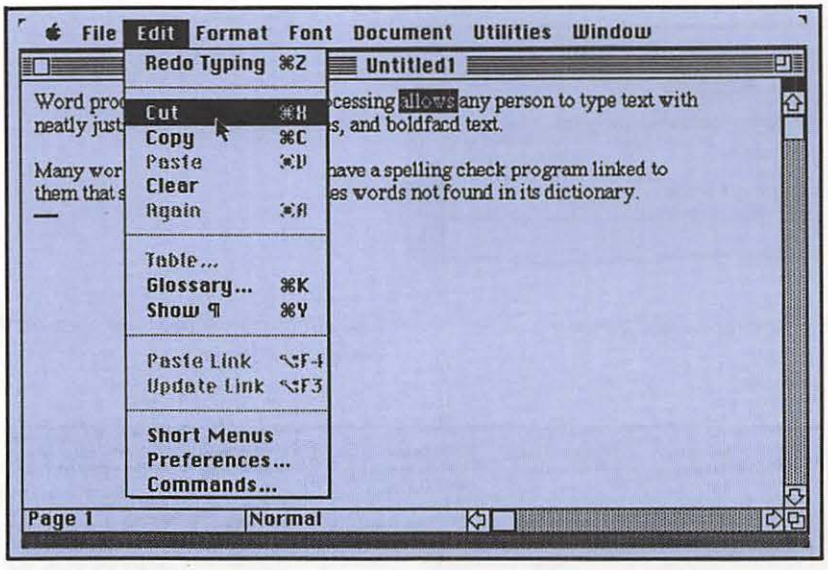


Figure 5.43
The Cut option is highlighted on the Edit menu. Note that the word allows is still selected. The Cut option will operate on the selected text in the current document.

Release the mouse button.

Execute the cut. The word "allows" will once again be removed from the document.

Pull down the Window menu.

Drag the cursor to Show Clipboard.

You once again want to look at the clipboard.

Release the mouse button.

The Clipboard window will again be opened on the screen. This time the word "allows" appears on the clipboard.

Information removed from a document with the Cut command is placed onto the Clipboard.

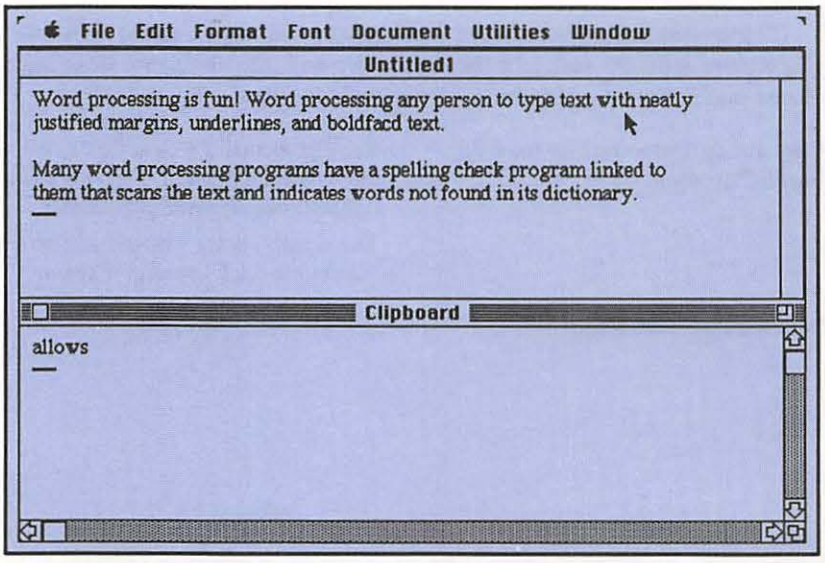


Figure 5.44
The clipboard now contains the word that was Cut from the document.

Click the mouse pointer on the Clipboard Close Box.

Put away the clipboard.

is easy

Type this new text into the document at the current location of the cursor.

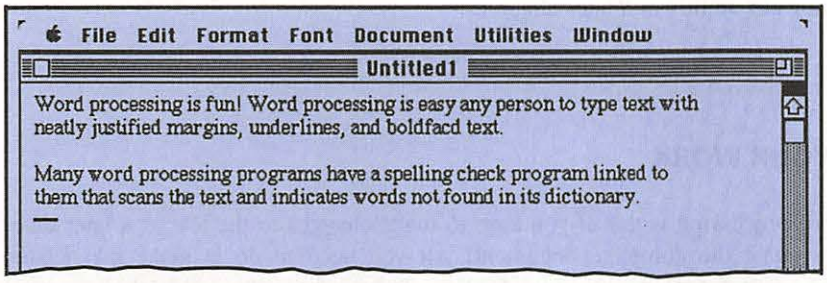


Figure 5.45
The edited text.

⌘Z

Just as above, this is the Undo Typing key from the Edit menu. You are undoing the last words you typed. The undo places the words into the current typing buffer, not the clipboard.

⌘Z

If you pull down the menu, rather than using the command key, you will see the first option reads Redo Typing, rather than Undo Typing. The Redo Typing command retrieves the text from the current typing buffer that was removed with the Undo Typing command.

⌘Z

Once again take out the phrase.

Pull down the Edit menu.

Drag the cursor down to the Paste option.

The Paste option, which can be activated by the ⌘V key, inserts into the text the current contents of the **clipboard**.

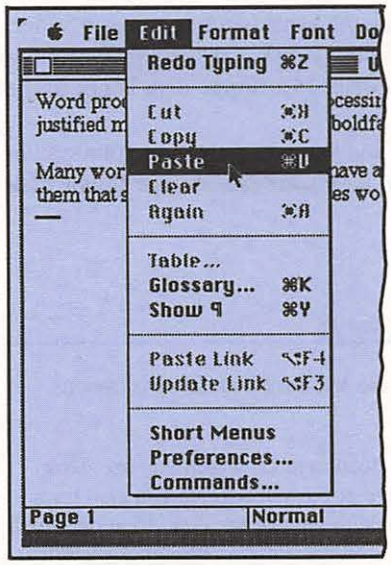


Figure 5.46
The Paste option has been selected.

Release the mouse button.	The word "allows", which was the last thing to be placed onto the clipboard with the Cut (⌘X) command, will be placed into the text at the current cursor location.

Unlike the current typing buffer, which restores text to the exact spot from which it was removed, the Clipboard may be used to restore text to any location in the document. You will have more opportunities to do this in a later chapter.

5.26 SAVING YOUR WORK

An advantage of word processing is that if you have to make changes to the text at a later date, you do not have to retype the complete document. All you need to do is make the needed corrections. Then the computer retypes the work for you. To have the computer do this you must first save your work. Once a document has been saved, you can retrieve it at a later date to make modifications or corrections.

Word has two save options—Save and Save As. These are the save options available with most Macintosh application programs. The Save option is used after you have saved the document at least one time. If you have not saved the document, then Word will ask you to supply a name for it. If you have previously saved the document, the Save option uses the current name of the document as it appears on the title bar, and places the document onto the same disk used for the prior save. The previous version of the document is erased and the copy you are working with is made current on the disk. You end up with one copy of the document, the most recent version.

The Save As command lets you supply a name for a new document, or change the name of an existing document before it is saved. In addition, you may change the folder into which the document is saved. If you want, you may even eject the floppy disk in the disk drive and change disks onto which the document is saved. The Save As lets you do any single one of these actions, or any combination of them. If you are using Save As with a previously saved document, and you are changing the name, folder or disk for the document, you will end up with two copies of the document, an older version and the newly edited one. If you use a name that already exists in a folder, you will have to confirm that you want to replace the prior document with the new one. Recall that the Finder will not let you have two documents with the same name in a single folder.

If you are using a computer with a hard disk and a single floppy disk drive, you may want to save this document on a floppy disk, rather than on the hard disk. If a floppy disk is not in the disk drive, insert one now.

If you are using a computer with two floppy disk drives, and you presently have your system start-up disk in one, and your Word program disk in the other, have your data storage floppy disk handy.

What To Do	*Why You Are Doing It*
Pull down the File menu.	The File menu has both the Save and Save As options located on it.
Drag the cursor down to the Save As option.	You want to save the document on which you are working, and give it a name at the same time. You also want the option of being able to change the disk drive on which it will be stored.

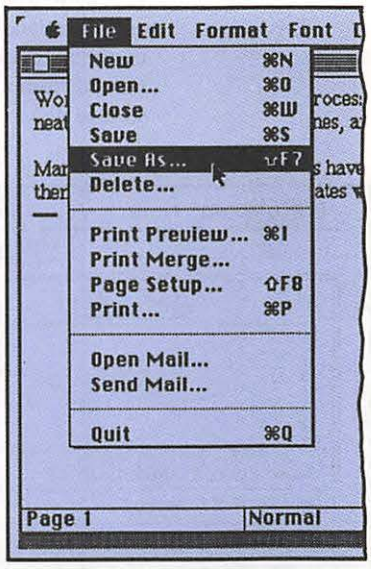


Figure 5.47
The Save As option has been selected.

Release the mouse button.

When you release the mouse button, you will see the Save As dialog box. Note that the document you have been working on does not yet have a name.

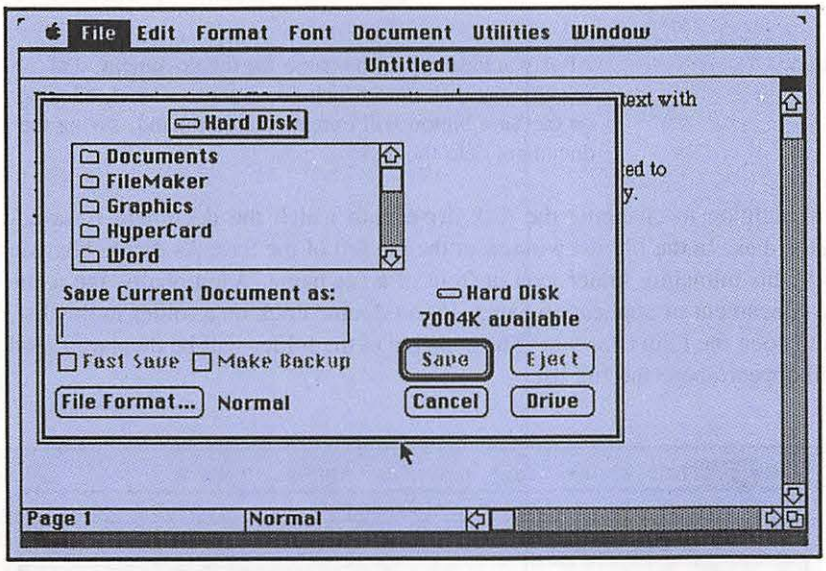


Figure 5.48
The initial Save As dialog box. You can see that a disk called "Hard Disk" is the currently selected disk drive, and is where the file will be saved if you do nothing to change the disk drive.

My First Document

Type the name of this document. Make it "My First Document."

If you are using a computer with a hard disk drive, and the name of your hard disk appears at the right of the Save As dialog box above the Save button, then you should click the Drive button. This will tell the Macintosh you want to save the document on the disk in the floppy disk drive. (If you did not put your disk into the floppy disk drive as instructed above, the Drive button will be dimmed!)

If you are using a computer with two floppy disk drives, and your data storage disk is not in either of them, click on the Eject button. This will cause one of the disks to be ejected from a disk drive. Replace the disk with your data storage disk.

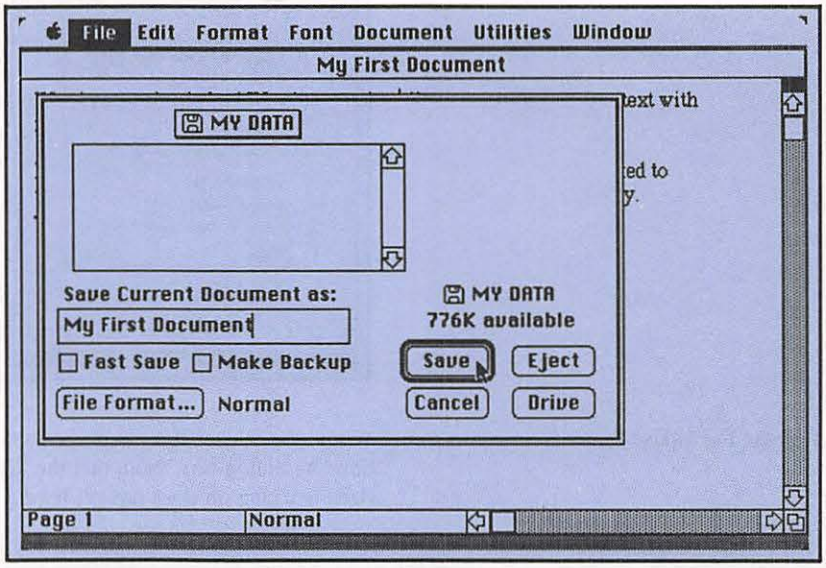


Figure 5.49
The disk drive onto which the file is to be stored has been changed from the Hard Disk to a disk called MY DATA. This was done by inserting a disk into a disk drive and clicking the mouse pointer on the Drive button found in the dialog box. MY DATA is an empty disk.

Click on the Save button.

After you have typed the name for the document, and selected the disk onto which you want to save it, clicking on the Save button will execute the command, saving the document onto the disk.

You may also, in addition to changing the disk drive onto which the document is saved, change the folder on the disk. In the file list window at the top left of the Save As dialog box you can identify a folder by the miniature folder icon in front of a file name. Additionally, the name is not dimmed, as is a document or application name. If you double-click on a folder in this list, you are telling Word to open the folder for you. The contents of the folder will be displayed, and the folder's name will appear above the file list.

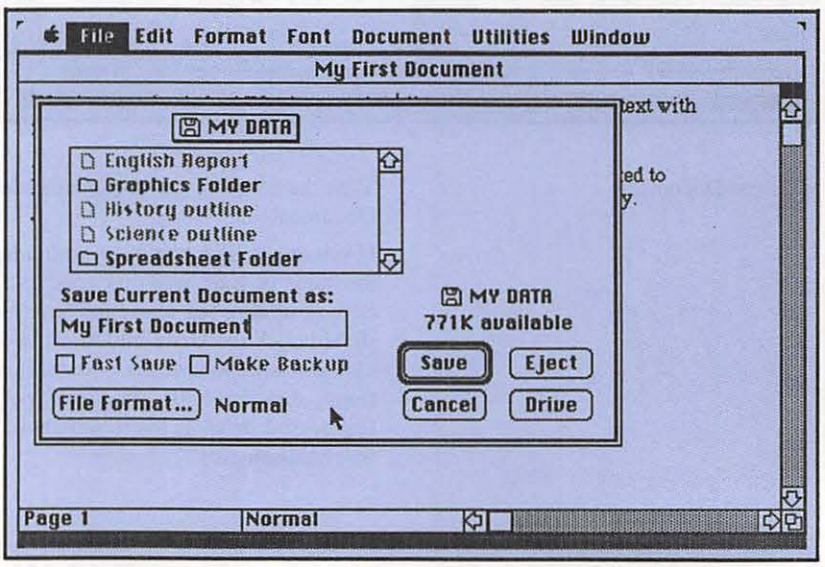


Figure 5.50
This dialog box shows another disk called MY DATA. It has two folders that appear in the disk's main window. There are also several files at the same level on this disk. The file names are dimmed, while the folder names are not. You may double-click on a folder name to make it the storage location. Your disk may not look exactly like this one.

You may also tell the Macintosh to close the folder. The folder name above the list of files it contains is a pull down menu. Use the mouse to pull it down, and select the desired level. If you select the bottommost item on this list, you will be telling Word to save the document on the disk's main window, and not in any folder.

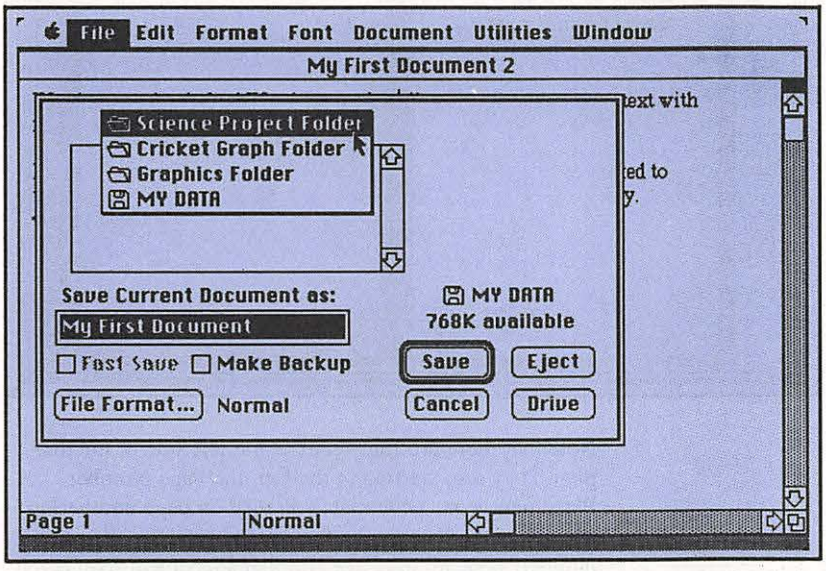


Figure 5.51
The folder name at the top of the file list window has been pulled down. You can see that the folder called Science Project Folder is inside Cricket Graph Folder, which is inside the Graphics Folder found on the disk called MY DATA. Your disk may not look exactly like this one.

5.27 USING PRINT PREVIEW

As you are working with larger documents, you may find it helpful to see what your work will look like on paper. Ultimately, this will require that you print your work. However, Word does provide you with a shortcut; a way to get a good idea of what your work will look like, and what will be where on each page before you actually print the document. This feature is called Print Preview. Print Preview will format your document and display it in miniature on your computer's screen.

You even have the option of working with your document in Page View, rather than in the view you have been using. Page View is the Print Preview screen, enlarged to full size. Page View will let you see how the document will actually appear on paper, displaying the margins, and items such as footnotes as they will actually appear when you create the final printed copy.

What To Do	*Why You Are Doing It*
Pull down the File menu.	The Print Preview command can be located on the File menu.
Drag the mouse down to Print Preview.	You want to see what your first document will look like when printed. Note that print preview may be accessed with the ⌘I key.
Release the mouse button.	Activate the Print Preview option. You will now see two "pages" appear on the screen that represent two sheets of paper. On the left one will be the text you have typed. Since a whole, 8 1/2-inch by 11-inch piece of paper cannot be displayed on the 9-inch Macintosh monitor, the pages are reduced in size, with your typing appropriately shrunk.

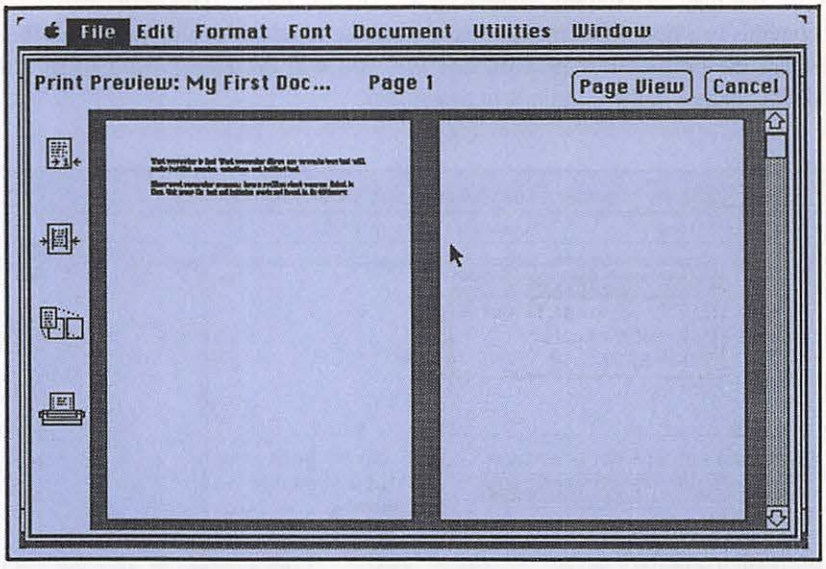


Figure 5.52
The initial Page Preview display.

Note that there are four icons at the left side of the display. They are, starting at the top, the Page Number Placement icon, which lets you turn on page numbering and select the location on the printed page for the page number. Beneath the Page Number Placement icon is the Margin Set icon. This icon will let you adjust the margins for the complete document. The third icon is for zooming the display. You may view either two consecutive pages of your work, as you are right now, or only a single page at a time. Clicking on this icon now will change the display so that only one page is shown, rather than two. The final icon will let you print the page displayed in the Page Preview mode (NOT the complete document!).

At the top right of the display you can see the Page View button and the Cancel button.

Click on the Page View button.

Select Page View.

Note that between the current page number and the word Normal, found at the bottom left of the text window, there now appears two arrowheads. These are used to move the cursor from one page of the document to the next.

You can see that the scroll bar at the bottom of the window indicates that you are no longer looking at the left edge of the screen.

Move the mouse pointer to the **left-pointing** arrow on the scroll bar at the bottom of the display.

You want to scroll the contents of the window. Note the location of the mouse pointer in Figure 5.54.

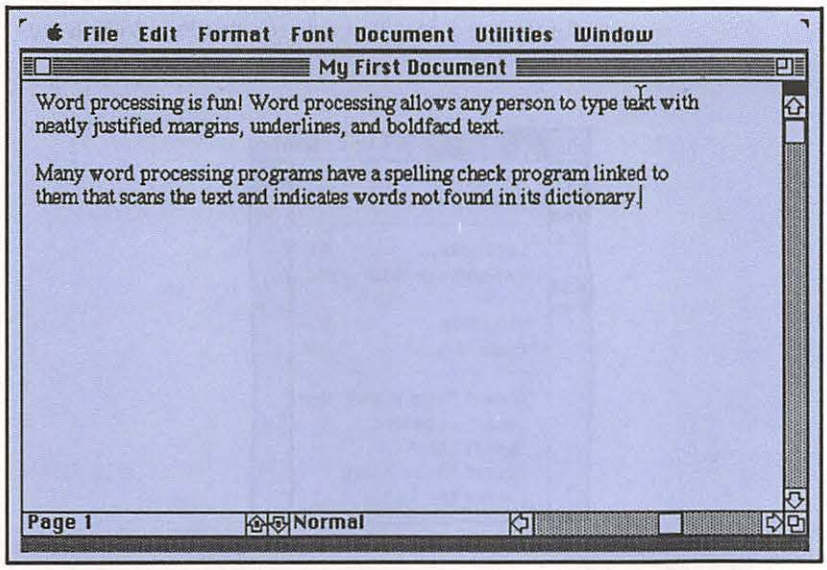


Figure 5.53
The first look at Page View for this document. Note the two arrowheads at the bottom of the text's window. Otherwise, this view appears the same as the one you are used to seeing.

Press and hold the mouse button until the box on the scroll bar is at the left edge of the scroll bar itself.

Scroll the window to the left. You will now see the left edge of the paper, and where the text will fall on the printed page.

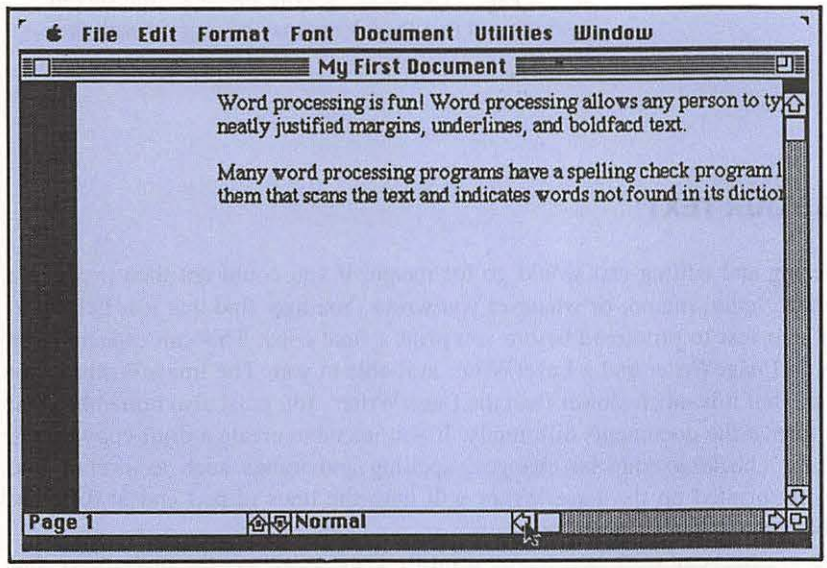


Figure 5.54
After scrolling the window as far left as possible, you can see the edge of the paper.

Pull down the Document menu.

The Document menu lets you perform a variety of tasks related to the appearance of the document.

Note that the Page View item has a check mark in front of it (Figure 5.55). This indicates that Page View is currently active.

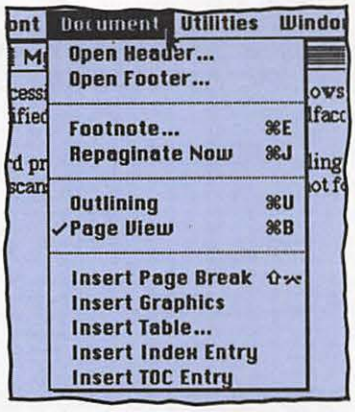


Figure 5.55
The Document Menu. Note that Page View is checked, indicating that the current document is displayed in Page View, rather than the standard editing view.

Drag the mouse down to the Page View item.	You want to change from Page View to the standard editing view.
Release the mouse button.	You will be returned to the standard editing view. Page View is a toggle menu item. You may re-enter Page View at any time by selecting this option. You do not have to access Page View by using Print Preview. You should have noticed that Page View may be toggled with the ⌘B key.

5.28 PRINTING YOUR TEXT

All the effort of entering and editing text would go for naught if you could not then produce a paper copy of the report, letter, memo, or whatever you wrote. You may find that it is helpful to print a draft copy of your text to proofread before you print a final copy. This can especially be true if you have both an ImageWriter and a LaserWriter available to you. The ImageWriter is not as expensive to operate, but it is much slower than the LaserWriter. You must also remember that the two printers will format the documents differently. If you intend to create a draft copy on the ImageWriter, use it for checking editorial changes, spelling and things such as overall line spacing. The final copy printed on the LaserWriter will have the lines of text end at different locations, and possibly even different page breaks.

It is a good habit to save your work before you print it. There is always the probability that you encounter a problem with the printing process, one which causes you to have to reset the computer or that in some fashion causes the loss of data in the computer's memory. If you have saved your work, it is a simple matter to fix the printer problem, then restart the computer, retrieve the document from the storage disk and once again print the text. If you have not saved your work, you will have to re-type the document before you can print it.

If you have been following instructions, you should already have your work saved at this time. If not, be sure to save what you have typed before you continue.

If you do not have a printer attached to your computer, you will not be able to complete the following steps!!

What To Do	*Why You Are Doing It*
Pull down the File menu.	The Print command can be found on this menu.



Figure 5.56
The File menu includes the Print command, which is the selected option here.

Drag the mouse down to the Print command.	You want to create a final printed copy of the text.
Release the mouse button.	Activate the print command. Note that you may also use the ⌘P key to begin the print process. Depending on which printer you are using, you will see one of two different dialog boxes. Figure 5.57 shows the dialog box you will see if you are using a LaserWriter. Figure 5.58 shows the dialog box you will see if you are using an ImageWriter.

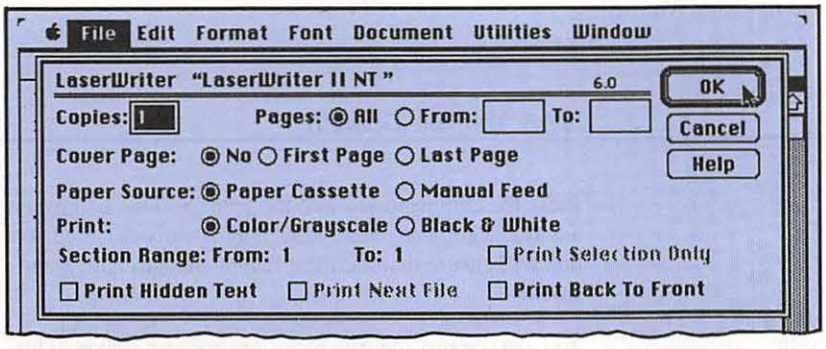


Figure 5.57
This is the dialog box you will see if you are using a LaserWriter printer. The name of your LaserWriter, here shown as "LaserWriter II NT," may be different.

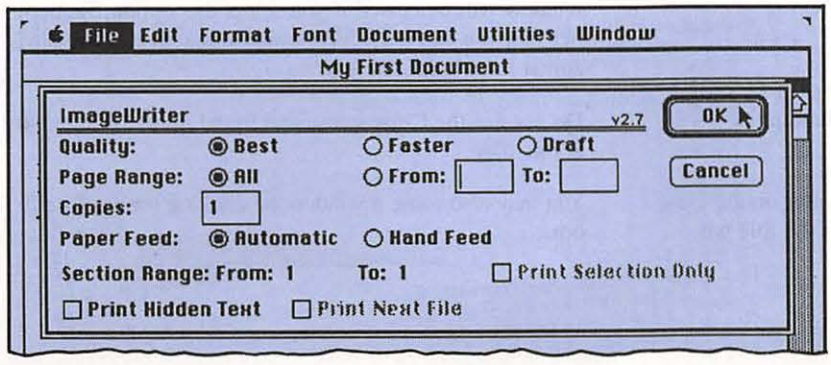


Figure 5.58
This is the dialog box you will see if you are using an ImageWriter printer.

	If you are using an ImageWriter, be sure to select the quality of print. If you select Draft quality, you will not see any of the font or type size changes you have used. Using the Faster quality will produce a printed copy of your document with all the font and size changes printed as you would expect to see them. Best quality output will take the longest to print, but will also have the best appearance. The LaserWriter gives you several different printing options. The Cover page is a summary sheet that can be useful if you are sharing the printer with many others, or the printer is in a location other than where your computer is, and you must go to it to pick up your work. Both types of printers give you a Pages option, which lets you select a subset of the document for printing. This is useful, for example, if you want to reprint the last two or three pages of a large document. If you do not have a printer attached to your Macintosh, click on the Cancel button. This will terminate the printing process. If you do have a printer, continue.
Click on the OK button.	For now, you want to print the complete document you have created. Clicking OK will start the printing process.

5.29 CLOSING A DOCUMENT

At any time, you may stop editing a document and start on a new one. Word will let you have more than one document open simultaneously. This lets you copy portions of text from one document to another. This is a form of boilerplating. However, there may come the time when you have too many documents open, or you have un-related documents open. In these cases, you will want to close one or more Word files.

What To Do	*Why You Are Doing It*
⌘S	Press the command key and the letter S. This will execute a SAVE command. Your work may already be saved, but this will ensure that the most recent changes have been saved.
Pull down the File menu.	You can see that the File menu has a Close option. This option may be accessed with ⌘W. The presently active window will be closed if you select this option. Remember that you can tell which window is active by the horizontal lines in its title bar.
Release the mouse button.	Do not use the Close command found on the File menu at this time.
Click the mouse pointer on the close box at the top left of the title bar.	You may also close a window by clicking on its close box.

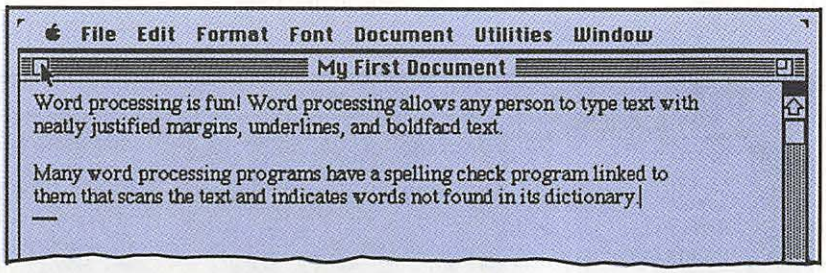


Figure 5.59
The mouse pointer is positioned on the close box.

After you have closed the file, you will see an empty desktop with the Word menu bar at the top of the screen. If you are not using MultiFinder, you will not see any disk icons or the trash can icon. These icons will be on the screen if you are using MultiFinder.

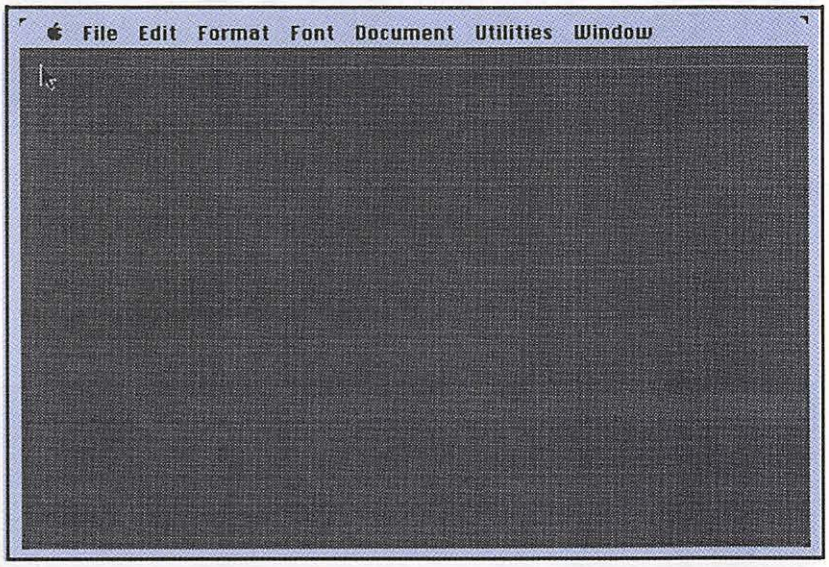


Figure 5.60
This is what your Macintosh display will look like after you have closed all the documents you have been working on.

5.30 STARTING A NEW DOCUMENT

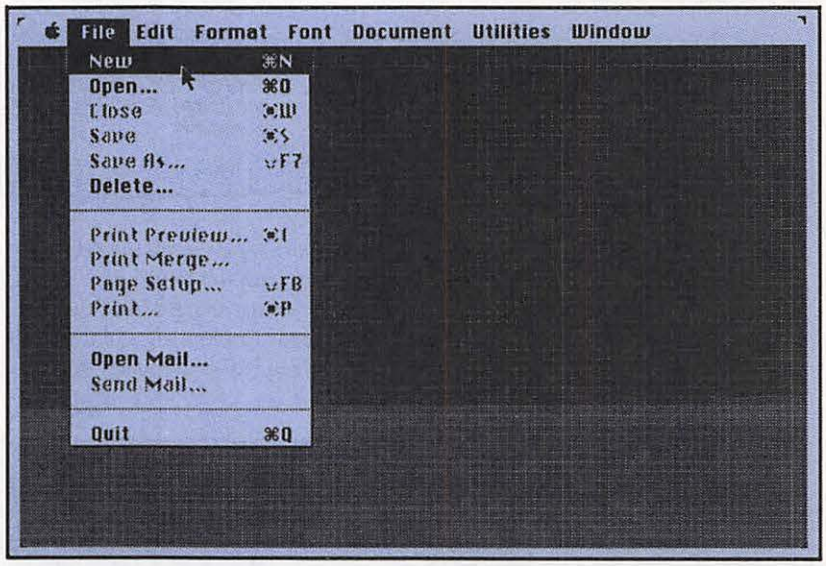
As suggested earlier in this chapter, it is possible to work on two or more documents at the same time. These may be existing documents, or one may be a new document. If you have already launched Word, it is a waste of time to exit the program and then re-launch it to start a new document. Instead, you may use the New option found on the File menu.

What To Do	*Why You Are Doing It*
Pull down the File menu.	You want to use the New option found on the File menu.
	You can see that you may use the ⌘N key to create a new document, as well as using the pull down menu.

Drag the mouse down to the New option.

You will use the Menu at this time.

Figure 5.61
The New option of the File menu has been selected.

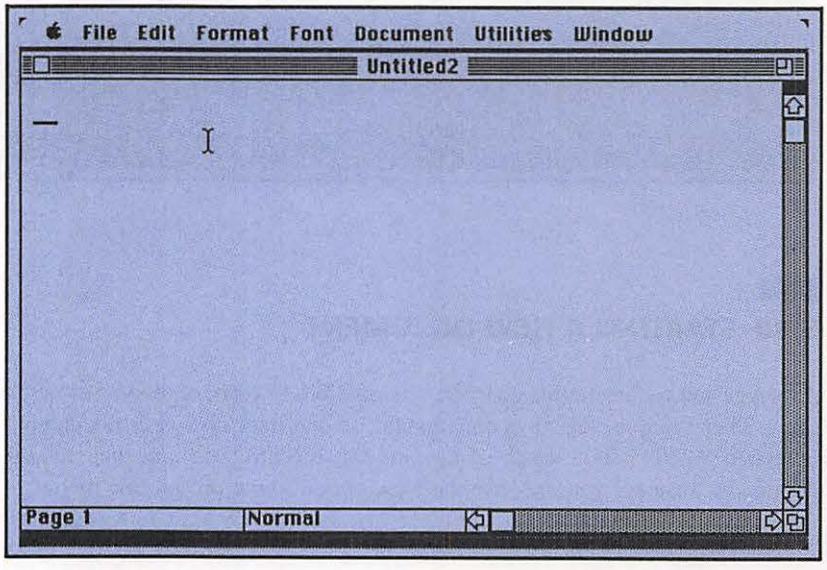


Release the mouse button.

Execute the New option. A new document will be created. Its name is Untitled2. You are now ready to begin working on a new document.

If you execute the New command again at this moment, the next document will be called Untitled3.

Figure 5.62
The new document is called Untitled2.



5.31 FINDING ON-LINE HELP

Word has a very useful help facility that may be accessed while using the program. You may get to the Help processor in one of two ways. Help is the first option listed on the Window menu (Figure 5.63). You may also get to help through the DA menu. When Word is running, the first item of the DA menu is "About Microsoft Word...". If you select this option, you will see a small window which includes the version and date of the program you are using and a Help button (Figure 5.64). By clicking on the Help button, you will get to the same place as selecting Help from the Window menu.



Figure 5.63
The Window menu. Note the Help option is the first item on this menu.

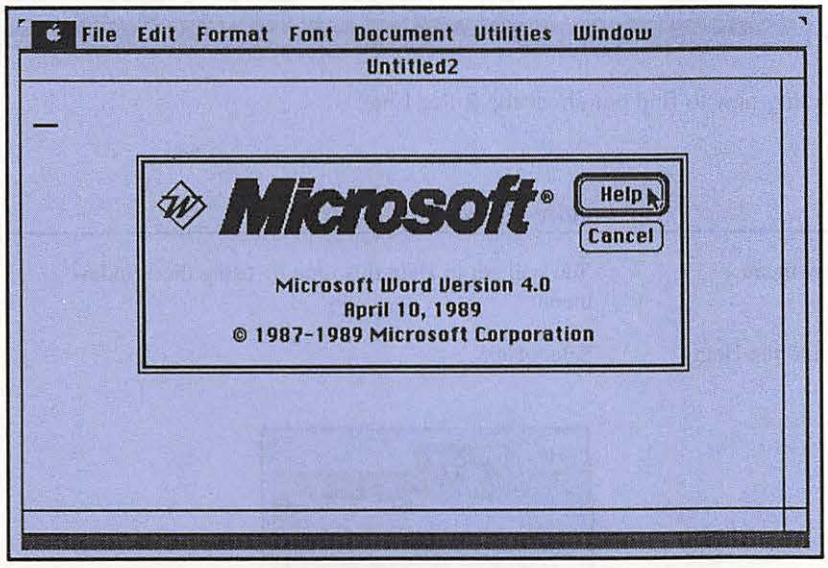


Figure 5.64
Selecting "About Microsoft Word..." on the DA menu gives you this information. You can tell that this information is off the DA menu, since the apple menu item is currently highlighted. Also notice that there is a Help button displayed on this information screen.

After selecting Help, you will see the Help window (Figure 5.65). You can see that it is an outline of topics. All you need to do is locate the desired topic, and then click on the Help button. You may then return to the Topic outline by clicking on the Topic button, or return to your work by clicking on the Cancel button.

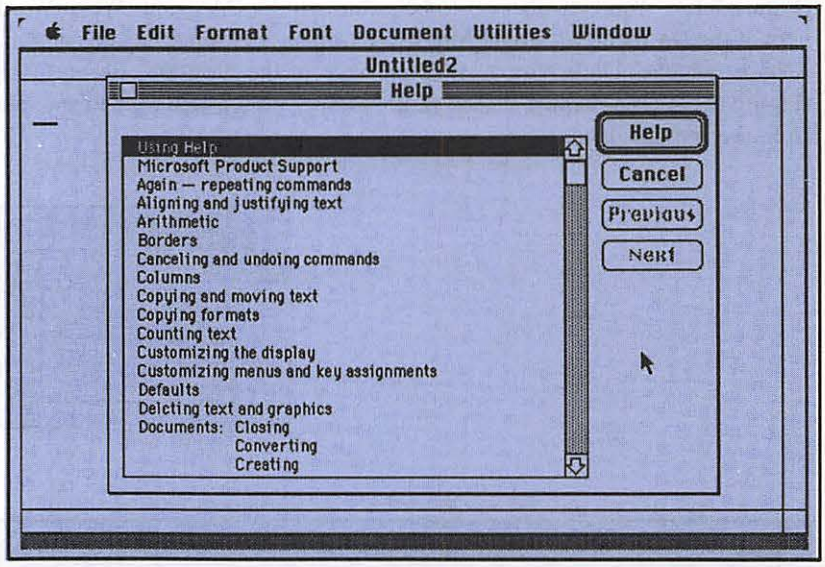


Figure 5.65
The help screen will look like this the first time you access it.

Use the Help facility now to find out about the Ruler Line.

What To Do	*Why You Are Doing It*
Pull down the Window menu.	You will get to Help this time by using the Window menu.
Drag the mouse down to the Help option.	Select Help.



Figure 5.66
The Help option on the Window menu has been selected.

Release the mouse button.	Activate Help.
Click on the lower part of the scroll bar that is on the right of the topic outline.	Scroll the topic outline until you see the word Ruler appear.
Click on the word Ruler in the topic outline.	Select Ruler as the topic for which you want help.

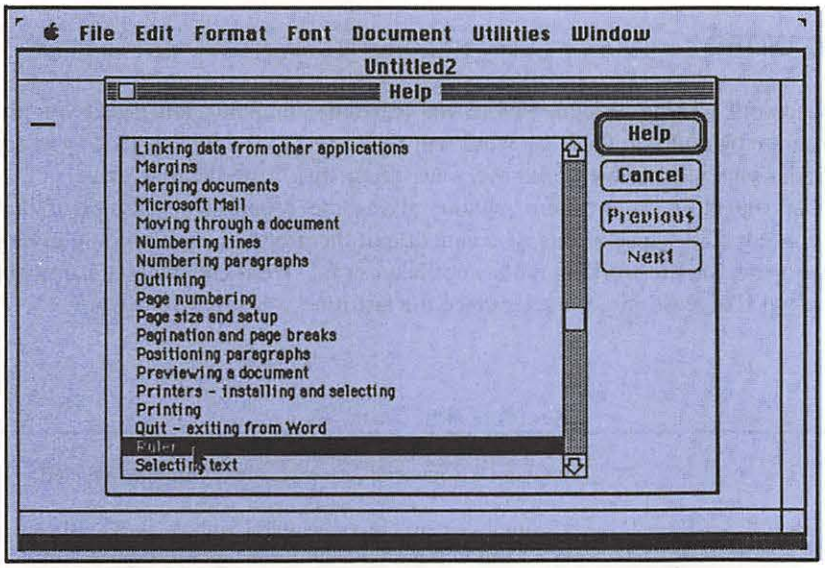


Figure 5.67
You are going to get information about the Ruler since it is the highlighted topic.

Click on the Help button.

Get the information about the Ruler that is available online. Use the scroll bar to read all of the information.

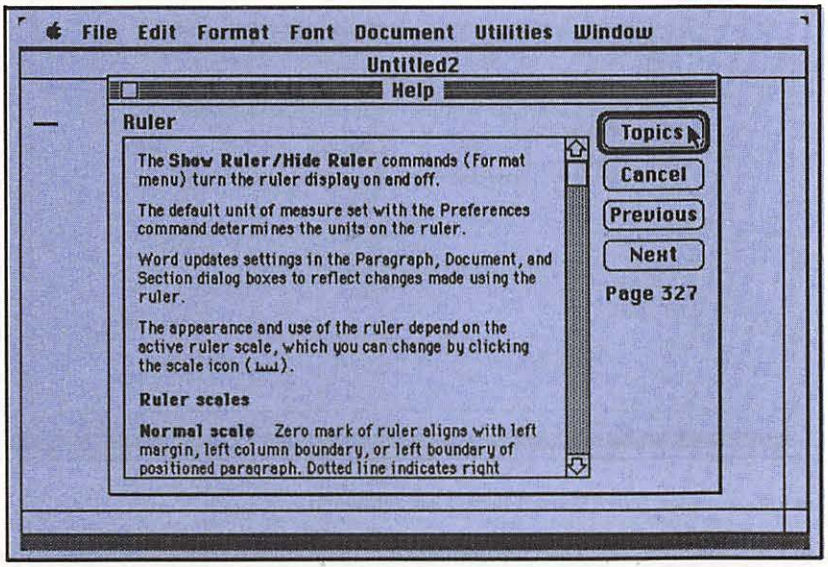


Figure 5.68
This is the beginning of the Help information for the Ruler topic. Note that the Help button has turned into a Topic button. Clicking on the Topic button will return the help processor to the help topic outline.

Click on the Cancel button.

You are done with Help. When you cancel Help, you are returned to editing your document.

There is a shortcut to getting help about an item in the Help topic outline—double-click on the topic. This will have the same effect as selecting it, then clicking on the Help button. Remember, the double-click may be used in many places to open or activate an option.

5.32 QUITTING WORD

You have now finished your writing session. Before you leave the computer, tell it that you are finished with the program by quitting. Quitting Word will return you to the Finder. Once you are working with the Finder you will be able to remove your floppy disk from the disk drive.

Word will not let you close a document without giving the program permission if that document has not been saved. Because of this, you cannot quit the program itself without giving permission if the document you are working on has not been saved. Word considers a document not saved if you have typed at least one character since the last time you saved your work.

What To Do	*Why You Are Doing It*
x	Type an "x" into the new document you have created.
Click on the Close box.	Try simply closing this document without previously saving it. You will get the dialog box seen in Figure 5.69.

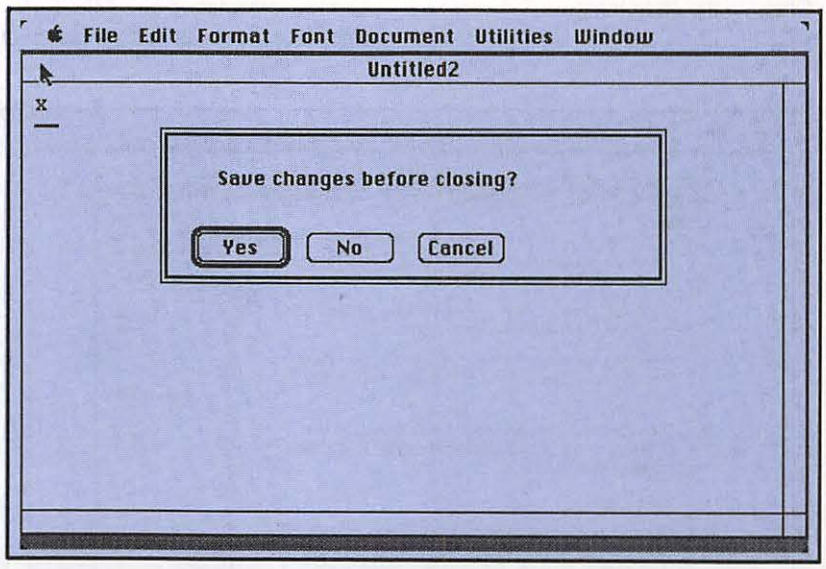


Figure 5.69
This dialog box appears when you try to close a document which has not been saved.

Click on the Cancel button.	Cancel the Close command.
Pull down the File menu.	The Quit command is the last item on the File menu. You can see that the Quit command can be activated with the ⌘Q key.
Drag the mouse down to the Quit command.	You are going to Quit Word.
Release the mouse button.	Execute the Quit command. Once again the dialog box seen in Figure 5.69 appears asking if you want to save the document. If you click on the Yes button, and this is a new document, you will see the dialog box which lets you name the document and change the disk and folder into which it is saved. In effect, you would be executing a Save As command, followed immediately by the Quit command.

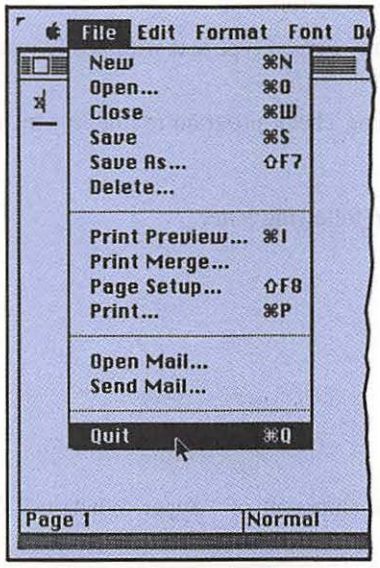


Figure 5.70
The Quit command has been selected.

If you click on the Yes button and this is an old document, the new version will be saved onto disk before the program ends.

Finally, if you click on the No button, the most recent changes to the active document will be discarded and the program will end.

Click on the No button.

In this case, you do not want to save this document. The document "Untitled2" will be discarded and you will soon have the Macintosh Desktop displayed on the screen.

Remember, when you exit the program, if you have not saved your work, Word will ask your permission to quit. Always keep in mind that a document is not saved if you have pressed at least one typing key since the last time you saved the work. You may use the mouse and cursor movement as much as you want without affecting the Saved status.

If all the documents you have open have been saved before you Quit, you will not see the dialog box shown in Figure 5.69. There is nothing that may be lost by a failure to save an already saved file, thus the dialog is unnecessary.

EXERCISES

1. What is the purpose of cursor movement?
2. What is meant by the term word wrap?
3. What is the difference between inserting text and replacing text?
4. When you save your work with MS-Word, where is the text saved, on the same disk as the program, or on a different disk?
5. How do you save your work with MS-Word?
6. How do you print your work with MS-Word?
7. What are some advantages of using a word processor instead of a typewriter to produce documents?
8. What is the difference between a screen editor type of word processor and a line editor type of word processor?

9. Modify the text you wrote this session so it reads as follows:

   Word processing is fun! Word processing lets any person type text with neatly justified margins, underlined and boldfaced text.

   Many word processing programs have a spelling check program available which scans the text and indicates words not found in their dictionaries.

10. Use your word processor to enter and print the following letter:

    June 12, 1989
    Mr. Fred Jones
    Sales Manager
    Gizmos and Gadgets, Inc.
    137 West Main St.
    Los Angeles, CA 90005

    Fred:

    Thanks one more time for expediting the last shipment of "Super Whatzits." They were the hit of the Homeowner's Gadget Show.

    I'll be in touch.

    Sincerely,

    Tom Hillski
    Distribution Manager
    This and That, Ltd.

11. Use your word processor to enter and print the following memo:

    TO: Harold Stien, Telecommunications
    FROM: George Graham, Data Processing
    DATE: November 14, 1983
    SUBJECT: Phone Installation

    Alex Jones in Market Research and Mary Anne Peters in Administration have each received personal computers. Their machines are equipped with internal modems to allow them to communicate with the company mainframe. Please contact them both to arrange installation of dedicated phone lines in their respective offices.

    Thanks.

12. Use your word processor to enter and print the following outline:

    MICROCOMPUTER TRAINING SESSION

    I. Introductions
       A. Instructors
          1. Alice Sykes
          2. Marissa Lopez
          3. Lester Klien
       B. Class introduce Self
          1. Name
          2. Department
          3. Previous computing experience

II. Hardware
    A. The parts of the computer
        1. Keyboard
        2. Monitor
        3. System unit
        4. Disk drives
        5. Printer
    B. Put the computer together
    C. Turn computer on
    D. Run system tests
III. Floppy Disks
    A. What they are
    B. Their construction
    C. Proper care
    D. What not to do with your disks
IV. The Word Processor
    A. How to start it
    B. Entering text
    C. Moving the cursor
    D. Editing—insertion and deletion
    E. Saving the text
    F. Printing the text
    G. Quitting the program
V. Training wrap-up

13. Use your word processor to enter and print the following letter:

    May 10, 1988

    Dear Mom and Dad,

    School is going great this year. It looks like I will get all A's and B's. The economics mid-term was a snap. The calculus mid-term was a bit tricky, but I escaped with an A minus.

    Now for the obvious...send money. I need to buy an airline ticket to get home.

    By the way, I have a summer job lined up at the Wolff's Department Store. They must have liked the work I did last summer, because I have been given a promotion from salesclerk to an area manager.

    I'll see you in a few weeks.

    Love,

    Fred

CHAPTER

INTERMEDIATE WORD PROCESSING CONCEPTS

6

CHAPTER OBJECTIVES

Upon completion of this chapter, the student will:

- Open an existing document.
- Explain the difference between cursor movement commands and text and window scrolling commands.
- Center text on a line.
- Move the cursor to the top and bottom of the display and document.
- Use the find feature of the word processor.
- Change the margins, line spacing, and justification of the text.
- Define a block as it pertains to word processing.
- Select segments of the text (referred to as a block), and move, copy, delete and undo the deletion of the selected segments.
- Make style changes to the text, such as adding boldface type and underlined type.
- Spell check the text.

6.1 INTERMEDIATE CONCEPTS

You learned in the last chapter all the basic procedures necessary to create, modify and print a document. But word processors are capable of performing many more functions than you have worked with so far.

There are functions that aid in the document preparation process, such as quick cursor moves. There are functions that allow you to change line spacing and margins. And you can change your text so it is printed with either a ragged right margin or a justified right margin. Word processors also let you move and copy segments of the text from one location to another and to jazz up the output with changes in the type style such as **boldfacing**, underlining, *italicizing* it, as well as changes in the size of the type, either bigger than you usually use, or smaller.

This chapter will explore how these useful tasks are accomplished.

6.2 THE TEXT WINDOW REVISITED

Most of the documents you write will not fit onto the Macintosh display in total. Much of what you write is either above or below the window holding the document. That portion of the monitor used to display the current portion of your work is in fact frequently referred to as the **text** window. It is just like any other window you may have open when using the Macintosh.

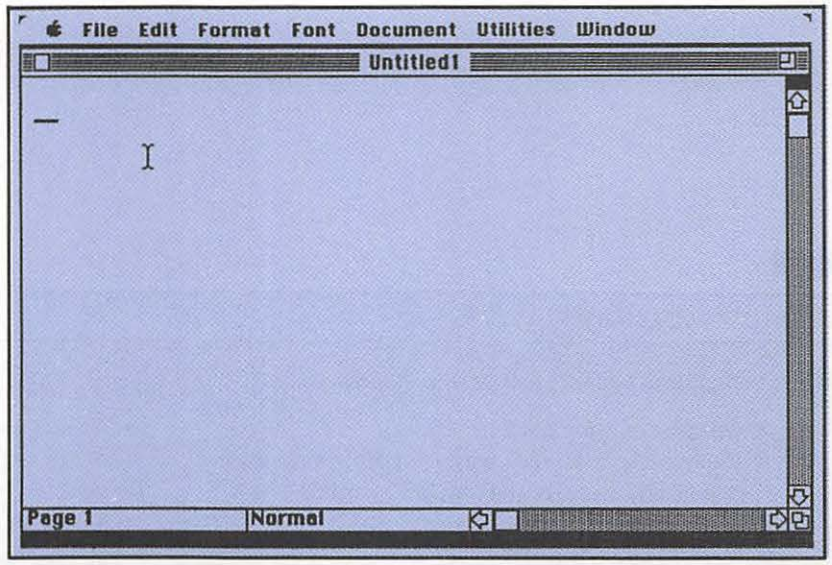


Figure 6.1
The Word text window.

There is more than one way to navigate through the text window. In the previous chapter you learned about cursor movement. That is the most common method and the easiest one to remember for moving the insertion point (that is, where the next character will appear when you type) through the text. Using cursor movement, you can push the text in the window up or down to allow you to see any portion of your document.

You may, however, decide to move the text without moving the current cursor location. You may want to do this to check what you have written at some other part of the document without losing your current insertion point. This is called text scrolling.

6.3 CURSOR MOVEMENT COMMANDS VERSUS TEXT SCROLLING

If you move the cursor to the bottom of the text window, then move it down one more time, the text will move up a line in the window, allowing the cursor to move down. The same is true if you move the cursor to the top of the window, then up one more line. The text will move down so the cursor can move up. The movement of the cursor has pushed the edge of the text window either up or down.

Text scrolling, on the contrary, moves the text inside the window but does not move the cursor off the specific line of text on which it is located. If, for example, your cursor is located on the word "widget," found on the third line of the text window, and you scroll the text down one line, the cursor will now be on the fourth line of the text window, but still on the word

"widget." A new line of text will appear at the top of the text window. The Macintosh word processing programs will even let you scroll the text so far that you can no longer see the cursor in the window!

6.4 RETRIEVING EXISTING DOCUMENTS

Start your computer as you did at the beginning of Chapter 5. After you boot your Macintosh with a System Start-Up disk, make sure that you have the Word Program disk at hand. If you are using a machine with a hard disk you will not need to insert the Word program disk into a disk drive. Rather, locate the Word 4.0 folder, and open it so you can see the Word program icon. If you have two disk drives on your computer, or a hard disk and a floppy disk drive, place the disk that you used while working in Chapter 5 into an empty disk drive. This disk should have the document you created stored on it. If you do not have a free floppy disk drive, keep this disk available. You will need it.

Just as in the prior chapter, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and click the mouse button two times fast. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.

Also, remember to use the Chooser to select a laser printer if you want your work in this chapter to closely match the figures.

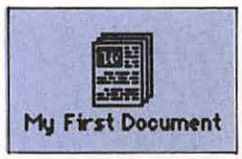
Before you can experiment with text scrolling, or any other features of Word, you must once again have a document with which to work. You will therefore start this chapter by loading back into the computer's work space the document you completed in Chapter 5. There are two ways to open an existing document when using Word.

First, you may double-click on the document's icon on the storage disk. The Macintosh will figure out which application program created the document and will automatically launch the program for you. This will only work, however, if the program can be found in one of the computer's disk drives. If you are using a floppy disk-based computer, you may not always have the program disk in a disk drive, so this method will not work for you. If you have two floppy disk drives, it is possible to launch an application from one of it's documents if you eject the System Start-Up disk, and replace it with the program disk, leaving the document disk in the second disk drive. You will find, however, that the computer frequently requires information off the Start-Up disk, and that you will do several disk exchanges before the program is running. It is best to start the application, and then open the document.

The second method available for opening existing documents is to use the Open command found on Word's File menu. This command will let you inspect the contents of all the disks in your computer. It even lets you eject unwanted disks from a disk drive and put different ones in. Clearly, to use this option, you must first launch the Word application.

If you are using a computer with a hard disk, begin here:

Figure 6.2
This is the icon you will see for Word documents.



What To Do	*Why You Are Doing It*
Locate the icon for the document you prepared and saved at the end of Chapter 5 and place the mouse pointer on the document.	You are going to launch Word by double-clicking on this icon. Figure 6.2 shows the icon that Word creates for its documents. The name of this particular one is My First Document.

Double-click the mouse.

By double-clicking on a Word document, the Macintosh will look on all available disks for the Word application program. If found, it will launch Word and open the document. If the Macintosh is not able to locate the application program, you will see a dialog box similar to the one shown in Figure 6.3.

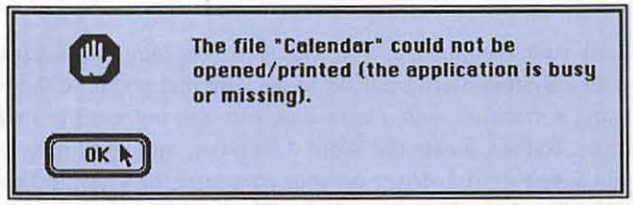


Figure 6.3
You will see this dialog box if the Macintosh is not able to locate the Word application program to open the file you are double-clicking.

If you have the Word application program on your hard disk, or on a floppy disk currently in one of the computer's disk drives, the program should start, and after a brief wait, the document you prepared during the last session will appear. You are now ready to begin editing the document.

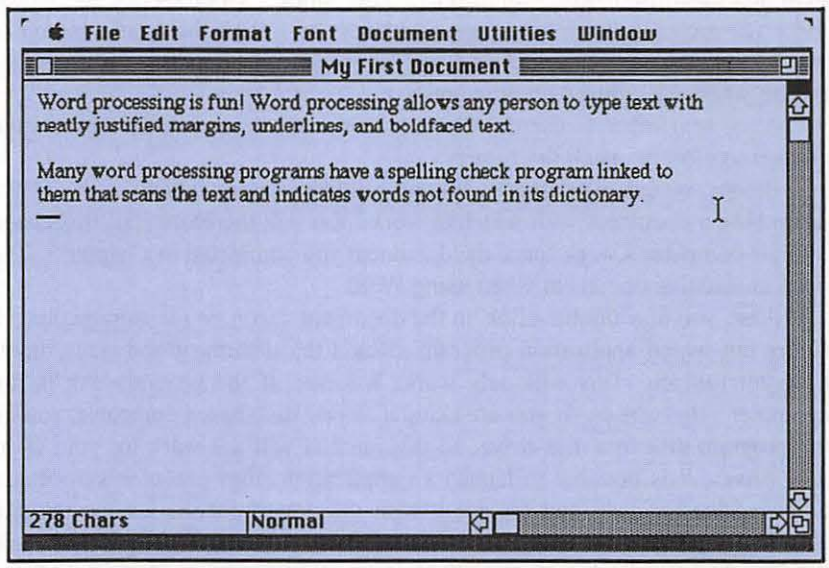


Figure 6.4
The retrieved document should look somewhat like this.

⌘Q

This is the Command Key equivalent for the Quit command found on the File menu.

You are quitting now so that you can learn how to use the Open command. Normally, you would not quit the Word program after you load the document you want to edit!

If you are using a computer that has only floppy disks, then start here.

Locate the icon for the Word program.

You will launch the Word application program by double-clicking on it.

Move the mouse to the Word icon and double-click.

The double-click will launch the application. If you have trouble with the double-click, you may also select the program's icon with a single click, then use the Open option on the File menu, or press ⌘O, the command key equivalent.

After a brief wait, Word will be running, and you will have a new, untitled document displayed in the window.

Move the mouse to the window's close box.

Remember, the close box is the one found at the left of the title bar (Figure 6.5).

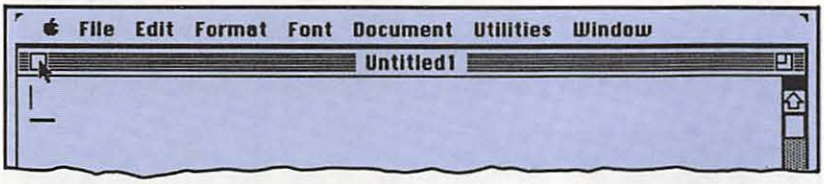


Figure 6.5
The mouse pointer is on the close box at the left of the title bar.

Click the mouse button once.

Close the untitled document. You are going to open an existing document, and it is less confusing to work with only one document active.

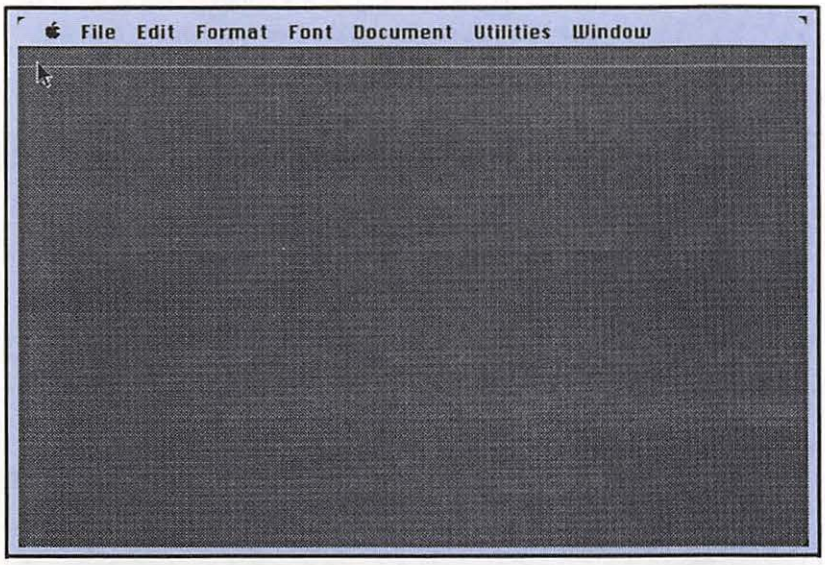


Figure 6.6
Your Macintosh after you have closed the untitled document. All that is showing is the current menu bar. If you are using MultiFinder, you may have other items showing on the desktop.

Pull down the File menu.

The File menu has the Open command.

Drag the mouse pointer down to the Open command.

The Open command lets you open existing documents found on the disk. Note that the Open command has ⌘O as a Command Key equivalent. You may recall that this is the same key used by the Finder's Open command.

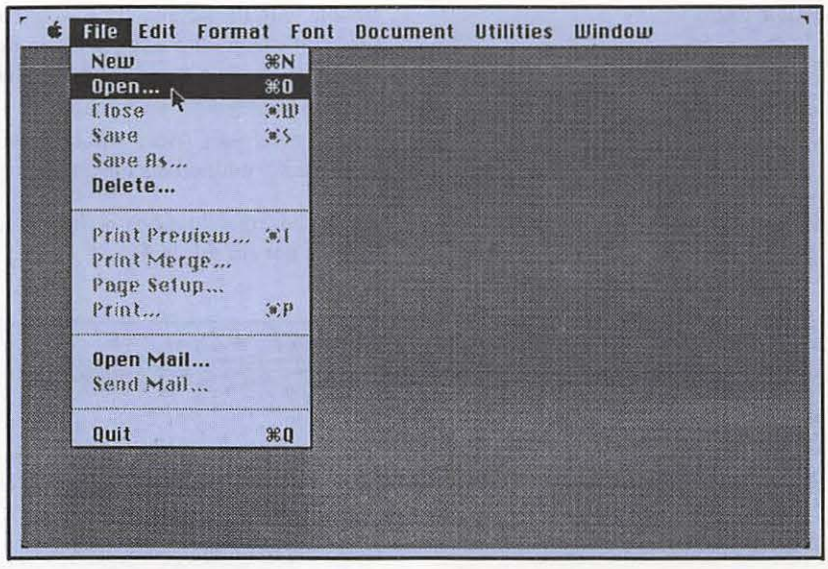


Figure 6.7
The Open command has been selected.

Release the mouse button.

Execute the Open command.

After a brief pause, you will see a dialog box similar to the one displayed in Figure 6.8, although the name of the disk being displayed and the free space on the disk will probably be different.

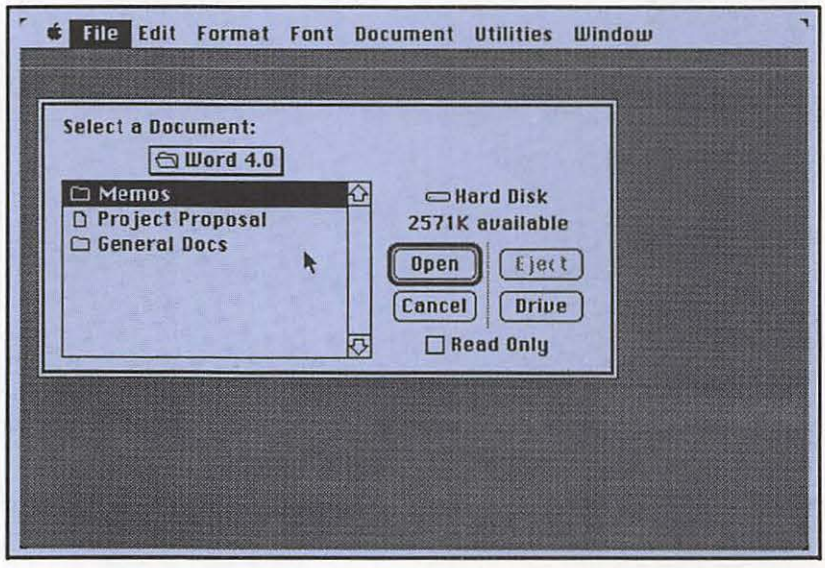


Figure 6.8
The Open dialog box. Since Word was launched from the Hard Disk, this is the one showing in the current dialog box.

Click the mouse on the Drive button shown in the dialog box.

The Drive button tells Word to display the document and folder names found on a second disk currently in your computer. This may be a floppy disk, or a hard disk. If you do not have a second disk in the computer, then the Drive button will be dimmed, and you will not be able to use it.

Continue clicking the Drive button until the name of the disk that contains your file appears in the dialog box.

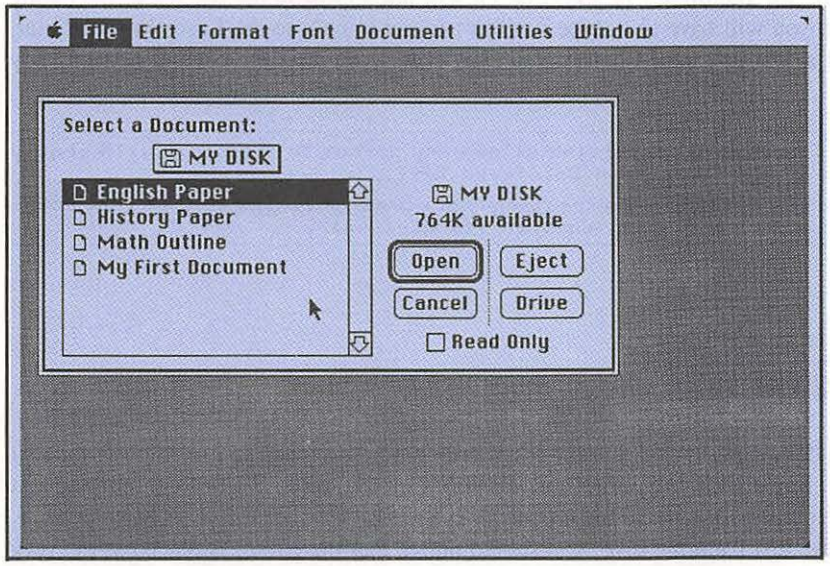


Figure 6.9
After clicking on the Drive box, the contents of MY DISK is displayed.

Click on My First Document.

You want to open the document you named "My First Document." By clicking the mouse pointer on the name in the dialog box, you are selecting this document.

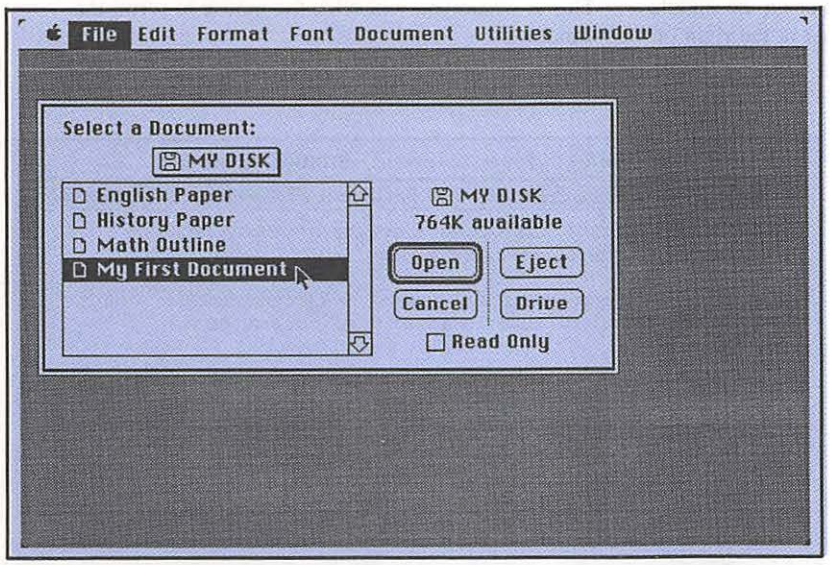


Figure 6.10
The document "My First Document" has been selected.

Click on the Open button.	Execute the Open command. After a brief pause while the computer reads the document, you will see a Word editing window, with the document displayed in it. You should remember that the double-click is often a shortcut to the Open command. You could have double-clicked the mouse on the document name, rather than selecting it and then clicking on the Open button in the dialog box.

If you do not have the file on any of your disks it will not appear in the file list in the dialog box. If this happens, you will have to re-type it. Don't forget to choose the LaserWriter printer, the Times font, and a font size of 14 before you start typing. Here is the current text of "My First Document":

```
Word processing is fun! Word processing allows any person to type text with neatly
justified margins, underlines, and boldfaced text.
Many word processing programs have a spelling check program linked to them that scans
the text and indicates words not found in its dictionary.
```

6.5 SCROLLING THE TEXT

Now that you have a document loaded into the Word editor, you are ready to use some of the text scrolling commands. Remember, the purpose of text scrolling is to move the document in the text window without moving the location of the cursor.

When you retrieve text from the disk, you should notice that the cursor is placed at the very beginning of the document.

What To Do	*Why You Are Doing It*
Place the mouse pointer on the middle of the shaded scroll bar at the right of the text window.	This is where you will click the mouse to scroll the window.

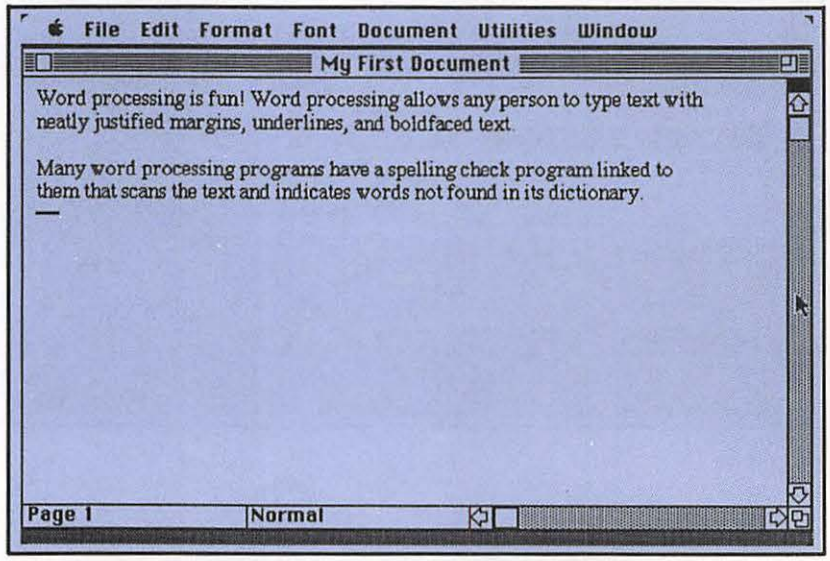


Figure 6.11
Note the location of the mouse pointer and the content of the text window before clicking the mouse.

Click the mouse in the middle of the shaded scroll bar at the right of the text window.

You want to scroll the text in the current window.

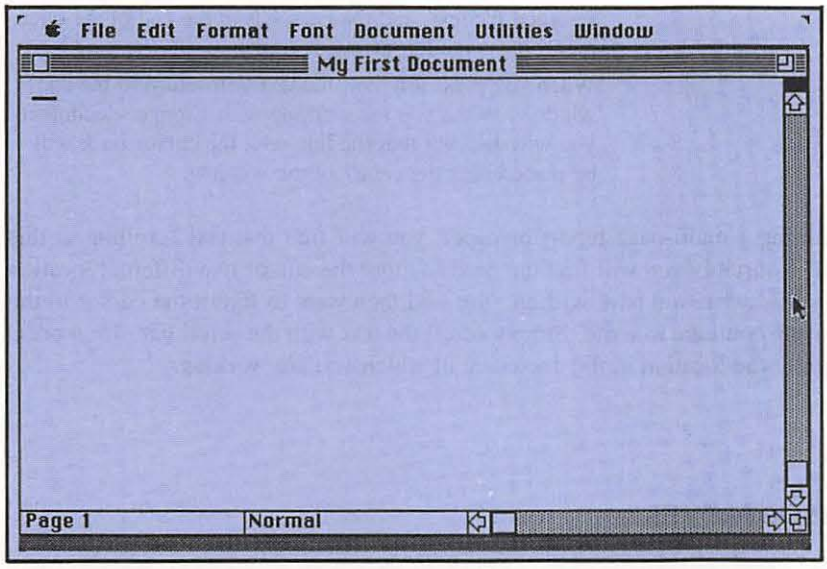


Figure 6.12
After clicking the mouse, the text has disappeared from the window, as has the cursor.

You may also use the down and up arrows at the bottom and top of the scroll bar to scroll the text.

Click and hold the mouse pointer in the top arrow of the right scroll bar.

This will gradually scroll the text back into the window. Note, once all the text has returned, that the cursor has not changed it's location.

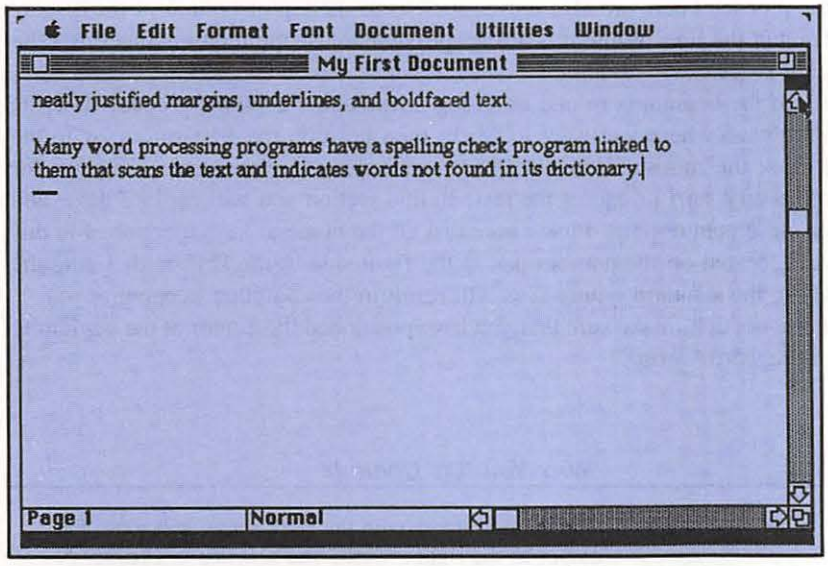


Figure 6.13
The text has partially scrolled back into the current text window. Note the location of the mouse pointer in the up-pointing arrow at the right scroll bar.

Release the mouse button.

After the text has returned to the text window, release the mouse button.

Click the mouse in the middle of the shaded scroll bar at the right of the current text window.	Once again, scroll the text so that it is all out of the text window.
→	Press the right arrow on your keyboard. (If you just re-typed the text, and the cursor is at the end of the document, press the left arrow instead!) When you press **any** key, the text will return to the text window. When you are working with a longer document, you will discover that the line with the cursor on it will be placed near the center of the window.

When you are editing a multi-page report or paper, you will find that text scrolling in this fashion is very useful. Invariably you will find the need to move the cursor to a different location in the text so you can read what you have written. You will then want to return the cursor to the end of the text so you can continue to write. Simply scroll the text with the scroll bar. Then press an arrow key to return to the location in the document at which you are working.

6.6 MORE CURSOR MOVES

As you work with a document, you will frequently find that the cursor is not where you want it to be. This will be especially true when you are editing a multi-page report or paper. Invariably you will find the need to move the cursor several paragraphs or pages. Even with shorter documents, you will want to move the cursor to the end of lines, or from one paragraph to the next quickly.

Word processors in general allow several types of cursor moves other than the simple line up/down and character or word left/right discussed in the previous chapter, and Word is not an exception. The Macintosh arrow keys can be a quicker way to move the cursor one or two lines than making use of the mouse. There are also moves such as to the top or bottom of the display or the beginning and end of the line. While it is always possible to use the mouse, sometimes the keyboard commands are faster.

Moving the cursor to the beginning or end of a long document is a simple process. Use the scroll bar to display the page where you want to work, then position the I-beam cursor to the desired location and click the mouse. However, there is a keyboard equivalent command for moving the cursor to the very start or end of the text. In this section you will explore these and other keyboard cursor movement options. Please note that all the numeral keys mentioned in this section refer to the keys located on the number pad at the right side of the keyboard. Using the number keys found above the standard typing keys will result in the computer beeping at you.

Before you begin this section, make sure that you have positioned the cursor at the beginning of the text, in front of the word "Word."

What To Do	*Why You Are Doing It*
⌘→ ⌘→ ⌘→	The command key with the right arrow will move the cursor to the right a word. You saw this in Chapter 5. Here you are moving the cursor right three words.

3

Use the numeral 3 **found on the number pad** for this to work. This key is equivalent to a **Page Down** key. If you are using an Apple Extended Keyboard, you may press either this key, or the Page Down key.

When you pressed the Page Down/3 key, the cursor should have moved to the end of the document. With longer documents, a new page worth of text would have appeared, with the cursor placed on the first line displayed in the text window.

9

The **number pad numeral 9** is the opposite of the Page Down command. It is the **Page Up** command.

Once again, because you are working with a short document, the cursor will simply return to the top of the window. With a longer document, you would see new text displayed in the window with the cursor placed at the top of the window.

1

Press the numeral 1 found **on the number pad**. This is the **End of Line** key. When you press this key, the cursor will jump to the end of the current line.

7

The opposite of the end of line key is the **Beginning of Line** key, the numeral 7 **on the number pad**. When you press this key, the cursor will jump to the beginning of the current line.

You should note that repeatedly pressing either the end or beginning of line key will cause the cursor to move to successive lines in the text.

⌘1

Closely related to the end and beginning of line commands are the end and beginning of sentence commands. When holding down the command key and pressing the **number pad numeral** 1, you are instructing Word to move the cursor to the **end of the current sentence**. The cursor should now be between the first and second sentences of your text (Figure 6.14).

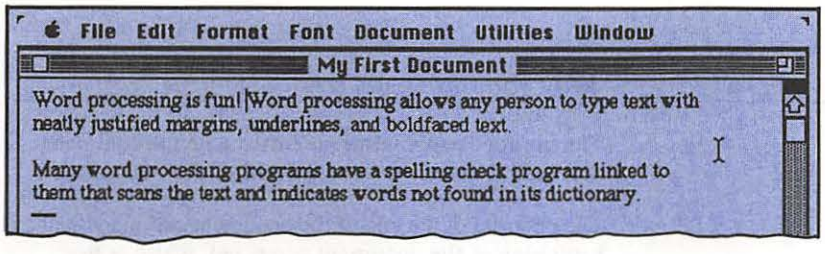


Figure 6.14
The cursor is now between the first and second sentences of the text.

⌘1

Move the cursor to the end of the next sentence.

⌘7

The opposite of the end of sentence command is the **beginning of sentence command**, which is the numeral 7 **on the number pad** used with the command key. Once again, the cursor should be between the first and second sentences of the document.

⌘↓	The down arrow used with the command key moves the cursor to the **next paragraph marker** in the text. Since you have pressed return twice between the first and second paragraphs, the cursor is moved to the blank line between paragraphs (Figure 6.15). The ⌘2 on the number pad will have the same effect as the ⌘↓.

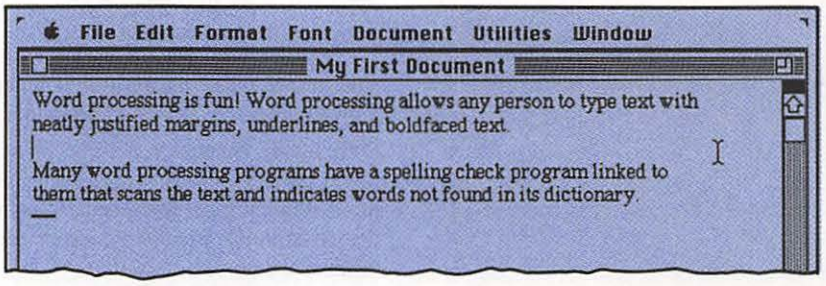


Figure 6.15
The cursor is now between the first and second paragraphs.

⌘↑	The up arrow used with the command key will move the cursor to the **previous paragraph marker** in the text. The cursor should once again be at the beginning of the document. You may also use ⌘8 on the number pad to achieve this same effect.

The most important thing to remember is that all of these cursor movement commands rely on the numerals found on the number pad at the right side of the keyboard. Using the numerals found above the standard typing keys will result in a beep from the Macintosh when used with the command key, or the entry of the numeral into the text if used alone.

6.7 BEGINNING AND END OF TEXT

Just as you can move the cursor in line or page size jumps, it is possible to move it to the end or beginning of the document with a single command. The cursor should be at the beginning of the text.

What To Do	*Why You Are Doing It*
⌘3	The **number pad's numeral** 3 used with the command key will move the cursor to the **end of the document**.
⌘9	The opposite of the end of the document command is the **beginning of the document** command, which is the numeral 9 from the **number pad** used in conjunction with the command key.

Because your current text is so short, you will not notice a major difference at this time between the page up and down commands, and the beginning and end of text commands. When you create larger documents, the difference will become apparent.

6.8 SELECTING LARGE SEGMENTS OF TEXT

Many of the features available with Word operate on segments of your document. As you learn more about using this application, it will be useful to discover more ways to select segments of your work.

You have already discovered the drag method of selecting text. Place the I-beam cursor at one location in the text, press and hold the mouse button and drag the cursor over the desired text. The result is a segment of selected text.

You have also seen the effect of the reverse arrow in the left margin, which lets you select a line of text, or even the complete document.

There are several other ways available for selecting text. Some involve the use of the cursor movement commands you have just experimented with, while others make use of the mouse. When using the cursor movement commands, selection of text is done by simply holding down the shift key, in addition to any other keys you may be pressing. You will explore these and several other methods of selecting text in this section.

What To Do	*Why You Are Doing It*
⌘9	Make sure that the cursor is at the beginning of the document. Remember, the numeral 9 that appears here is the one located on the number pad.
[Shift]-⌘↓	Hold down the shift key, then give the command to go to the beginning of the next paragraph, ⌘↓. Since the shift key is held down, all the text of the first paragraph will be selected, as shown in Figure 6.16.

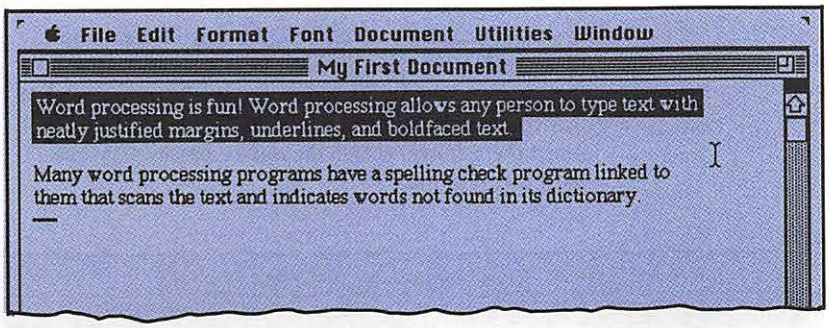


Figure 6.16
After using the Shift-⌘ ↓, all the text in the first paragraph is selected.

←	Press the Left arrow key to de-select the paragraph. The cursor should still be at the beginning of the document. You want to try something else.

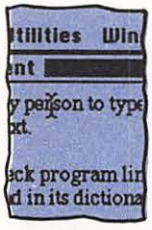
[Shift]-⌘1

Hold down the shift key, then give the command to go to the beginning of the next sentence. Remember, the numeral 1 to use is the one located on the number pad. You will have selected the first sentence of the document.

Figure 6.17
The first sentence has been selected.



Figure 6.18
Note the location of the I-beam cursor in the middle of the word "person."



←

Press the Left arrow key to de-select the paragraph. You once again are going to try something else.

[Shift]

Press and hold the shift key. This key is sometimes called the constrain key. You have been using it to constrain the movement of the cursor. You will do this one more time.

Move the I-Beam cursor so it is between the letters r and s of the word person, still on the first line of the document.

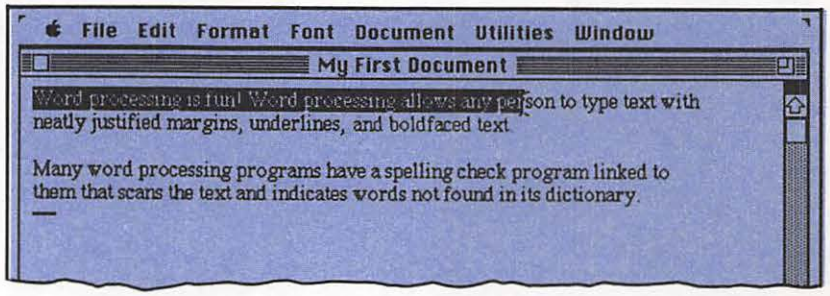
Remember to keep the shift key depressed. However, do not press the mouse button yet! Your display should appear similar to the one shown in Figure 6.18.

Click the mouse button once.

With the shift key held down, the cursor is stretched to select all the text between where the cursor was at the start of the action, and the location of the I-beam when you click the mouse.

It should be simply noted here that any of the cursor movement commands discussed earlier in the text, from the simple arrow key movement to the beginning/end of text commands, when combined with the shift key, will select the text over which the cursor passes. Try one more to prove this.

Figure 6.19
After clicking the mouse, all the text between the starting point of the cursor, in this case at the beginning of the document, and the I-beam is selected.



⌘9

Return the cursor to the beginning of the document.

[Shift]

Press and hold down the shift key.

→ → → → → → → → → →	Press the right arrow ten times. As you press this key, the text will be selected.
Release the [Shift] key.	You are finished selecting this text. Release the shift key to try something else.

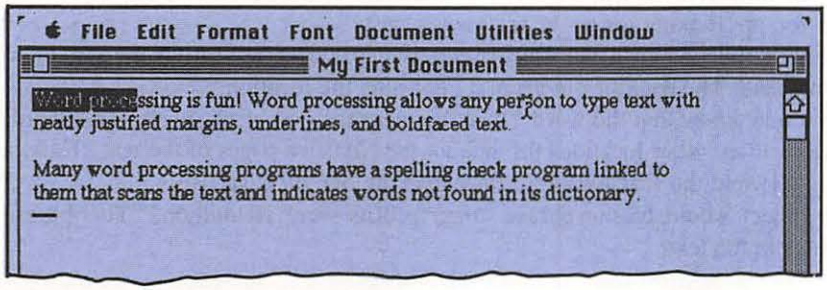


Figure 6.20
This text was selected by holding down the shift key while pressing the right arrow key. You may also use the up, down or left arrow to select text with the shift key.

⌘9	Return the cursor to the beginning of the document.
Move the I-beam to the left of the second line of text until it turns into the mirror image mouse pointer.	You now want to try using the mouse for selecting text.

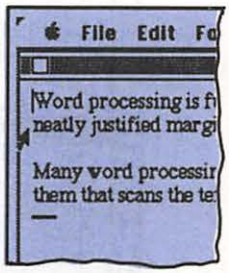


Figure 6.21
Note the position of the mirror mouse pointer cursor to the left of the second line of text.

Press and hold the mouse button.	You want to begin the selection process. The second line of the document will be selected.
Drag the mouse down to the beginning of the second paragraph.	You will have selected the last line of the first paragraph, the blank line between the first and second paragraphs, and the first line of the second paragraph (Figure 6.22).

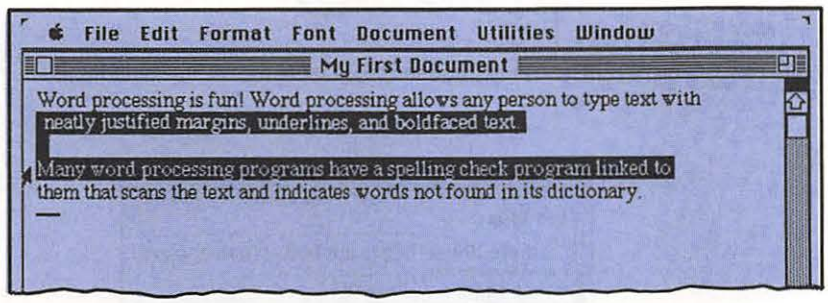


Figure 6.22
The text that has been selected.

Release the mouse button.	The text will remain selected.

6.9 LOCATING SPECIFIC TEXT IN YOUR FILE

Unfortunately, gross cursor moves may not always be what you want. If you are working on a ten-page report, and you want to make changes on the bottom of page five, getting to the desired location may take some time. This is true even if you make use of the scroll bar, since you may not see exactly what you are looking for as the text moves past.

However, the search function of a word processor is capable of relocating the cursor to specific locations with ease. The trick lies in properly defining the location.

For example, you may know that the word "their" is near the end of page five. This word, however, may also exist at ten other locations throughout the first five pages of the text. Thus, a search for this word will yield the first location rather than the one on page five.

A better search object would be the phrase "their profits were 10 million." This phrase exists in only one place in the text.

What To Do	*Why You Are Doing It*
⌘9	Make sure that the cursor is at the beginning of the document. The search process always starts at the current cursor location.
Pull down the Utilities menu.	This menu contains several useful options, including the Find and Find Again commands.



Figure 6.23
The Utilities menu. Note that Find Again is dimmed, since you have not yet entered any text to be found.

Select the Find option and release the mouse.	The Find option may also be activated by using the ⌘F key.

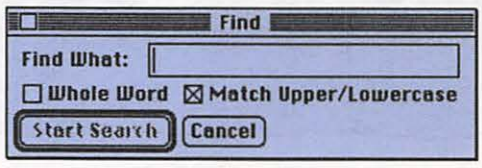


Figure 6.24
The Find dialog box.

check	Type the text that you want to locate in your document.

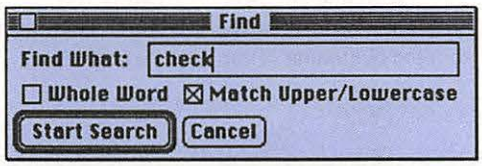


Figure 6.25
The text to be found has been entered into the Find dialog box.

Click on the Start Search button.

Execute the search. After a brief pause, the word "check" will be highlighted in the text (Figure 6.26).

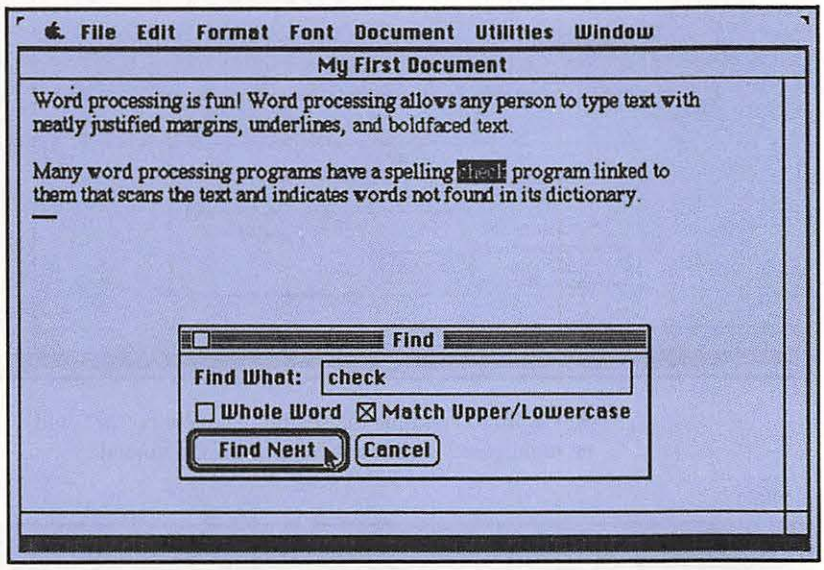


Figure 6.26
The word check has been located in the document.

Click on the Cancel button.

Put away the Find dialog box for now.

A potential pitfall of the search operation results from how Word compares the text you are looking for with the text in your document. The word processor does not recognize words as independent units unless you include spaces in the word you want it to find. Thus, Word will locate the word "and" imbedded in the word "sand."

⌘F

Begin another search operation. This search will start at the current cursor location and continue towards the end of the document. The word "check" will appear as the object of the search since this was the word you entered for the prior search.

or

Enter the word "or" into the dialog box as the word you want to locate in the text.

Click on the Find Next button.

Execute the search. The letters "or" will be highlighted in the word "words" at the end of the text.

Click on the Find Next button.

Execute the same search again. Since the end of the document is reached, Word wants permission to continue the search from the beginning of the document (Figure 6.27).

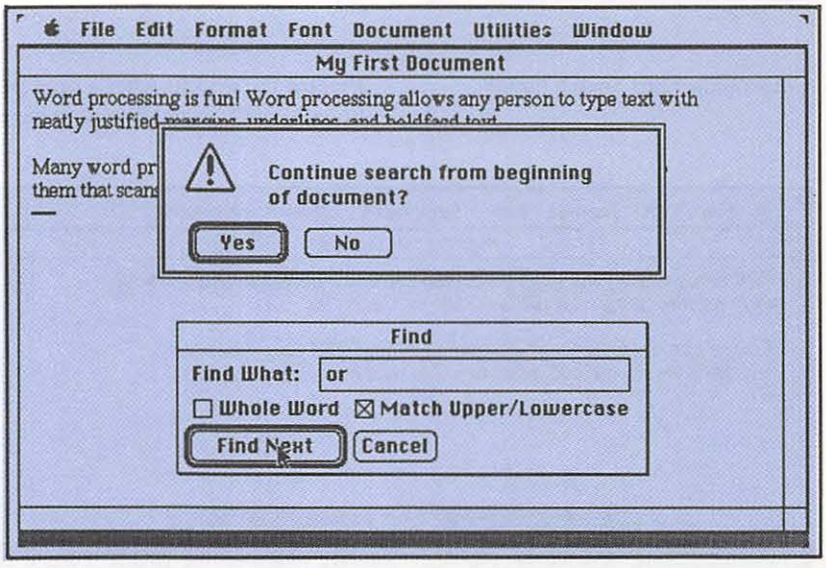


Figure 6.27
Word will continue the search for the next occurrence of "or" only with your permission.

Click on the Yes button.

Tell Word to continue the search. The letters "or" will be highlighted in the first word of the document!

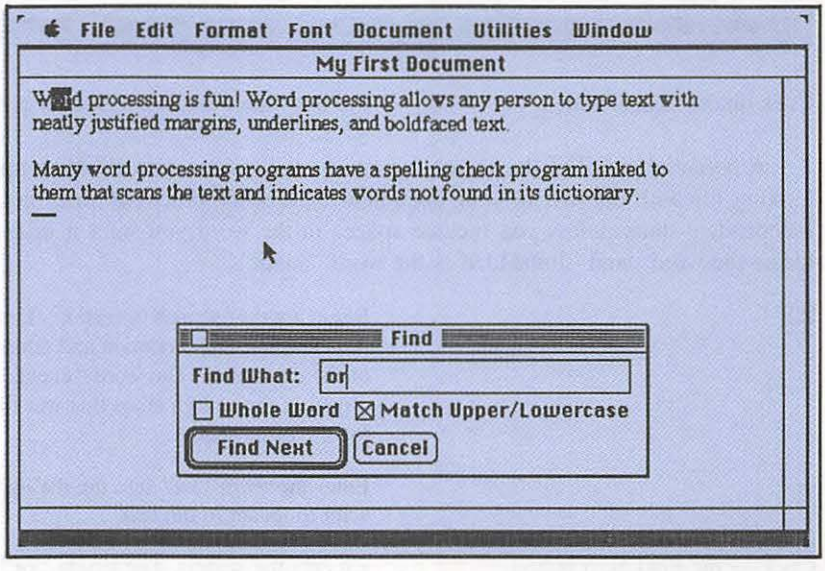


Figure 6.28
After clicking on Yes, the next occurrence of "or" is located at the beginning of the document.

Click on the Cancel button.

Once again, put away the Find dialog box.

6.10 REFORMATTING THE TEXT

Once you have your text written, you may decide to re-organize the way it will look on the printed page. It is, of course, possible to make these decisions as you enter the text. The choice is up to you.

The most frequent appearance changes made in a document are in its margins, line spacing, and justification. Word also lets you define the spacing between paragraphs. Some people prefer to leave a blank line between paragraphs, and Word is able to do this for you automatically, eliminating the need to press the return key two times at the end of a paragraph.

Many of the formatting options may be executed by using selections found on the Format menu (Figure 6.29). For example, if you want to adjust the margins for the complete document, you could select the Document option, and then adjust the left and right margins in the dialog box (Figure 6.30). If you just wanted to adjust the margins for a single paragraph, then you would use the Paragraph option, rather than the Document option, from this same menu.

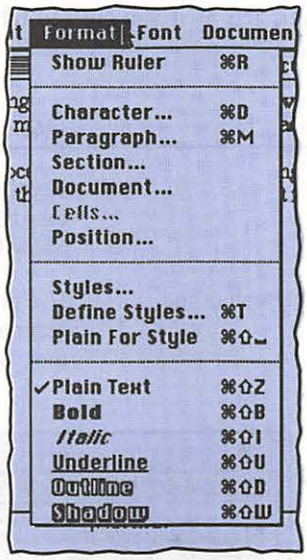


Figure 6.29
The Format menu contains options that let you control the overall appearance of the document.

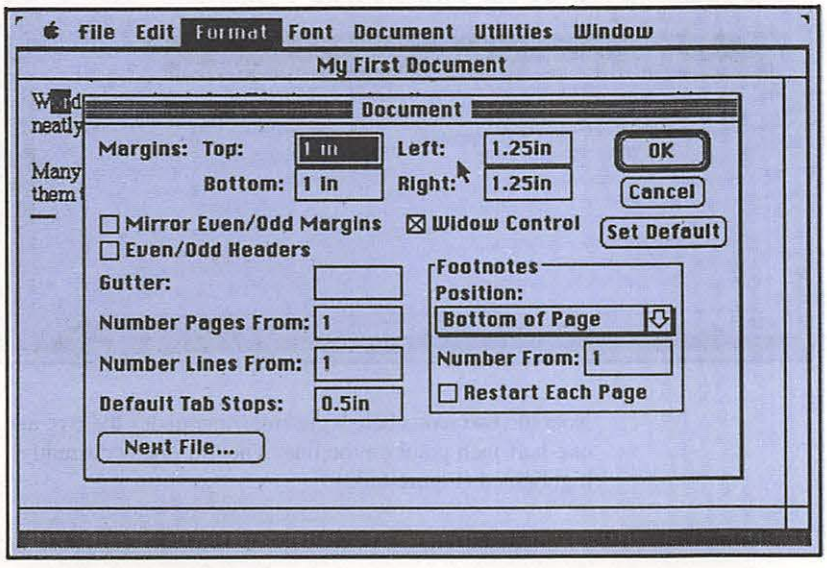


Figure 6.30
The Document dialog box lets you control items such as the complete document's margins, the default tab stops and the location of footnotes.

It is also possible to perform many of these formatting commands in other fashions. The simplest alternative to use is the document's ruler line. The ruler line lets you change margins, insert tab stops, adjust the document's alignment (ragged right or justified), change the line spacing and the spacing between paragraphs. Depending on what portion of the document has been selected when the changes are made, you can effect a single paragraph, several paragraphs, or the whole document.

6.11 CHANGING THE PARAGRAPH SPACING

It is not uncommon to double-space between the paragraphs of a document, even though the text itself is single-spaced. Word has a feature which will automatically double-space between paragraphs for you.

When you change the spacing between paragraphs, you are actually telling Word to double-space whenever you press the Return key. Two return characters are NOT placed into the document. Word, however, acts as if you pressed return twice.

What To Do	*Why You Are Doing It*
⌘R	Recall from Chapter 5 that this command key will display the ruler line at the top of the current window. This is the Show Ruler command found on the Format menu.
Select the second paragraph of the document.	Use one of the methods you have learned to select the second paragraph of the document. Your display should look similar to the one seen in Figure 6.31

Figure 6.31
The current text window.

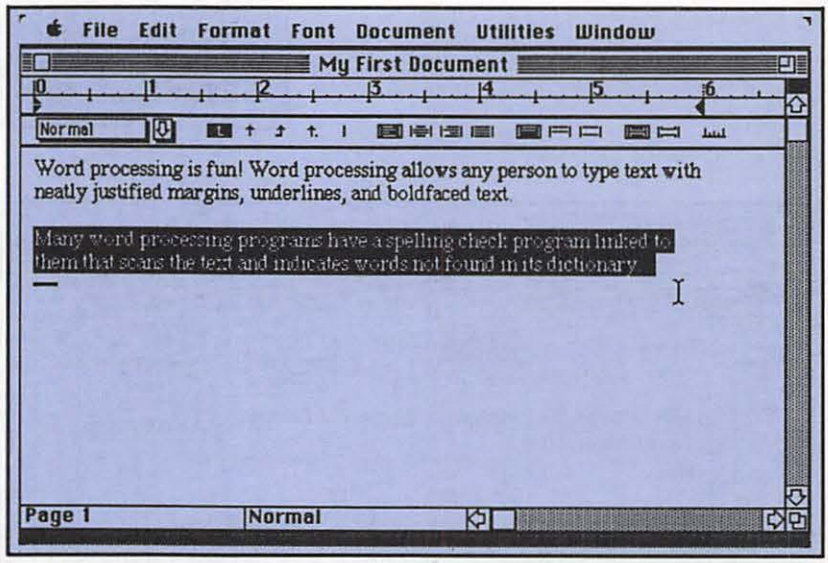


Figure 6.32
The inter-paragraph spacing icons.



Note the two icons below the ruler line under the five and one-half-inch point on the line. The left one is currently highlighted (Figure 6.32).

Click on the right icon of the two.	This is the icon used to cause a double-space between paragraphs. You can see by the text selected that the extra space between paragraphs belongs to the second paragraph.
⌘Y	Recall that this is the Show ¶ command, found on the Edit menu. Any place where the return key has been pressed in the document will now show the ¶ symbol. In Figure 6.33 you can see that the paragraph symbol shows only once between the two paragraphs.

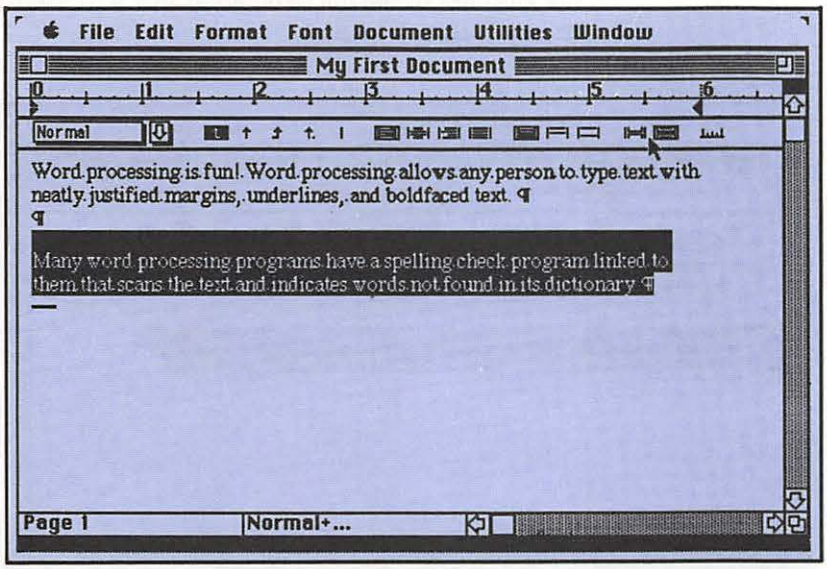


Figure 6.33
You can see that the selected paragraph includes the blank space between the first and second paragraphs. It is also possible to see that there is only a single ¶ symbol between the two paragraphs, even though it is clearly double-spaced.

Click on the single-space icon.	Return the spacing between paragraphs to single-space.
⌘Y	Hide the ¶ symbols.

6.12 MARGIN CHANGES

Some word processors have you enter text starting at the extreme left side of the text window. Others will include the margin in the display, so that text is entered starting several characters from the left edge of the display. While either of these two methods is appropriate for most text preparation, you must adjust the left and right margins of the text for items such as block quotations. Additionally, you may decide that the default line size is incorrect for your particular need. Again, the answer is to adjust the document's margins.

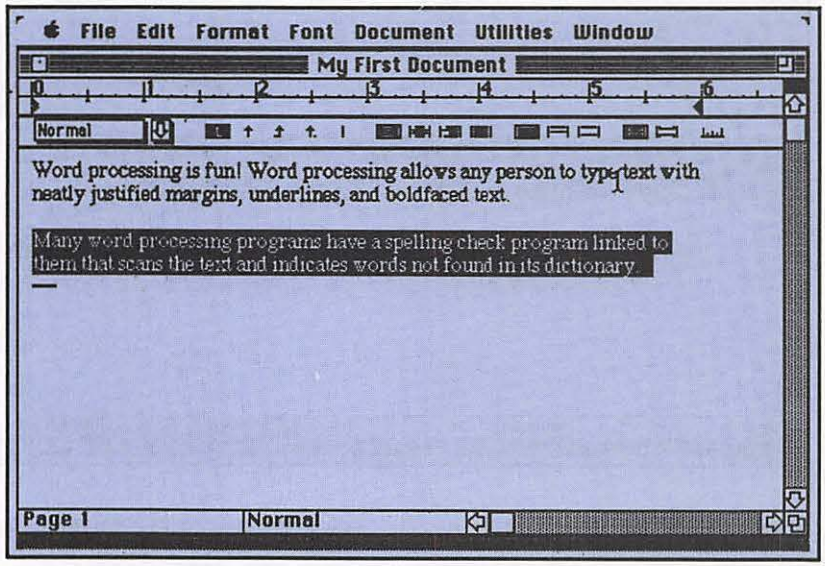
With the what you see is what you get (WYSIWYG) word processors, you will see the effect of the margin changes on screen as they are entered. Since Word is a WYSIWYG-type word processor, you will see the margin changes immediately.

As was mentioned earlier, formatting changes in Word will affect only text that is currently selected, or new text that you type immediately after a format change without changing the cursor location. For example, if, as you are typing in text, you want to set a margin for only one paragraph, then you must set the margins back to their original status after the paragraph is typed. If you fail to do this, you will continue typing with the new margins.

However, if you want to change the margins for a paragraph that has already been typed, you must select that paragraph first, then make the margin changes. These changes will affect only the selected text.

What To Do	*Why You Are Doing It*
Select the second paragraph of the document.	Use one of the methods you have learned to once again select the second paragraph of the document. Your display should look similar to the one seen in Figure 6.34. The Ruler line should still be displayed after you changed the inter-paragraph spacing.

Figure 6.34
The current text window.

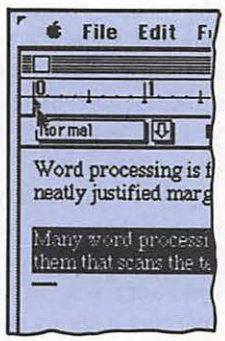


Note the split triangle under the zero at the left side of the ruler line. This marks the current left margin.

Move the mouse so the arrow is pointing to the lower half of the left margin marker.

When setting the left margin, it is important to move the margin marker by using the bottom half of the margin mark. The top half, as you will see, is used to mark the paragraph indentation.

Figure 6.35
Note the location of the mouse pointer in relation to the left margin indicator on the ruler line.



Press and hold the mouse button to select the left margin marker.

You want to change the left margin.

Drag the left margin marker to the one-inch mark.

Set the left margin to one inch. Note that in addition to being able to see the left margin location on the ruler line, you are told where you are placing the margin at the bottom left corner of the window, which should read "1 in".

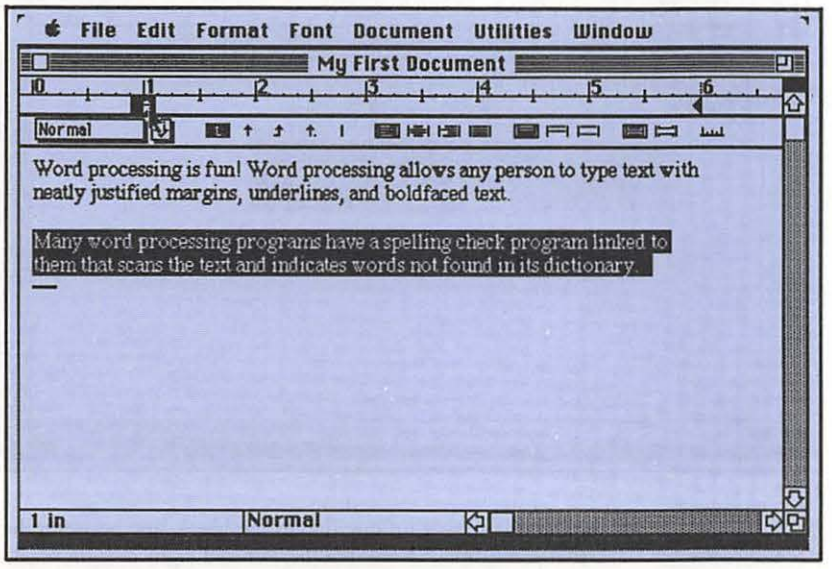


Figure 6.36
The margins have not yet been set, since the mouse button has not yet been released. Note the "1 in" at the bottom left of the display, indicating the exact location at which the left margin is to be set.

Release the mouse button.

By releasing the mouse button, the left margin will be set for the selected text.

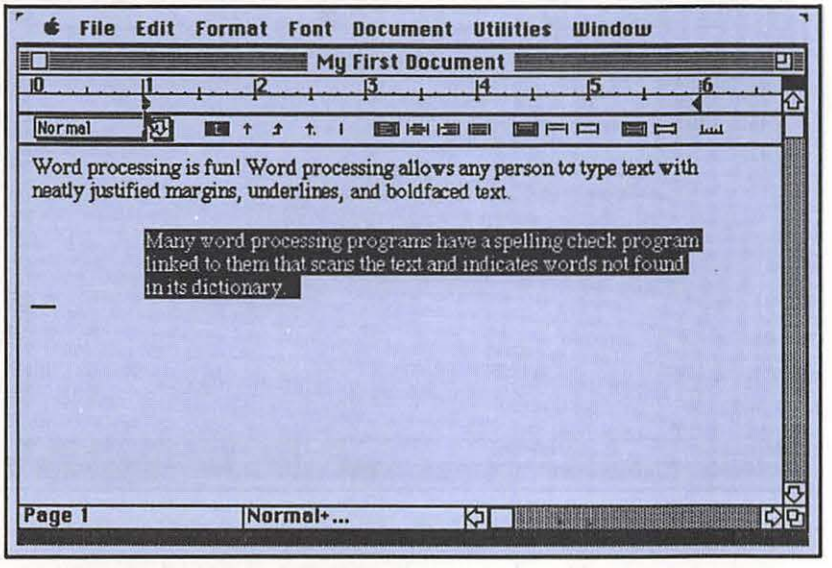
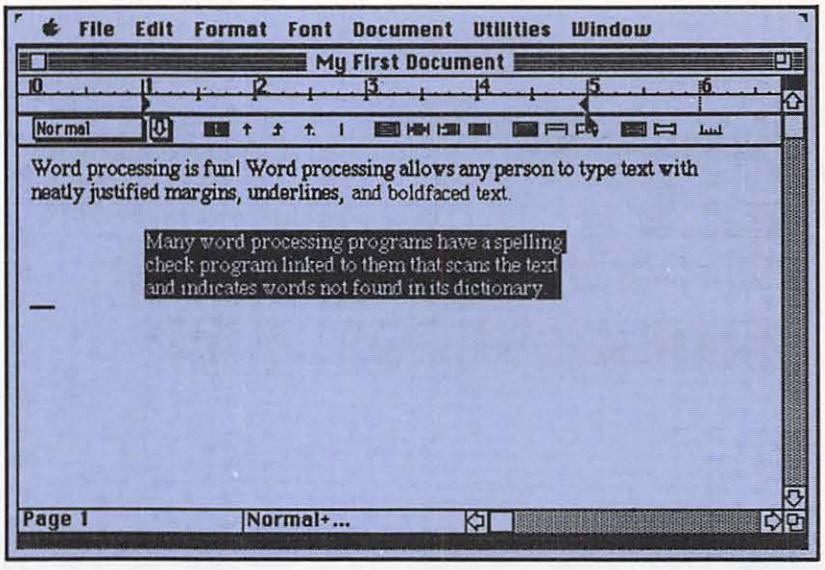


Figure 6.37
The left margin has been set for the second paragraph of the document.

Now locate the right margin indicator under the six-inch mark on the ruler line. This indicator is a single triangle.

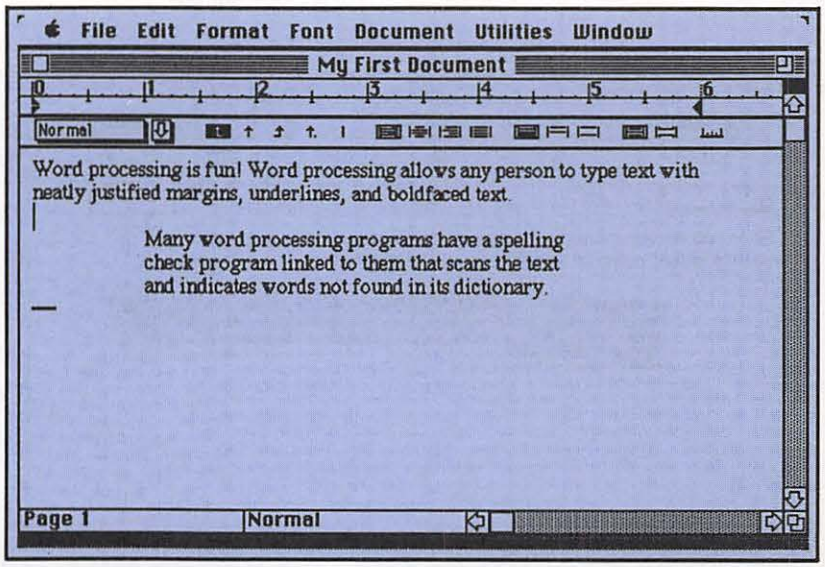
Drag the right margin left to the five-inch point and release the mouse button.	Set the right margin to the five-inch mark for the selected text.

Figure 6.38
The new margins for the second paragraph are now in effect.



↑	Move the cursor up one line to the blank line between the two paragraphs. Note that the left and right margin markers return to their original positions.

Figure 6.39
Note the margin markers are now at their original locations. You did not change the margins for this line of the text.



↓	Move the cursor down one line to the beginning of the second paragraph. The margin markers change to the current margin settings.
Place the cursor immediately after the period ending the second paragraph.	You want to see what happens when you add lines to the document.
[cr] [cr]	Press the Return key twice, adding a blank line at the end of the document.

Note that the left and right margin marks are unchanged after you add the two return characters. The margins are taken from the current settings as you type.

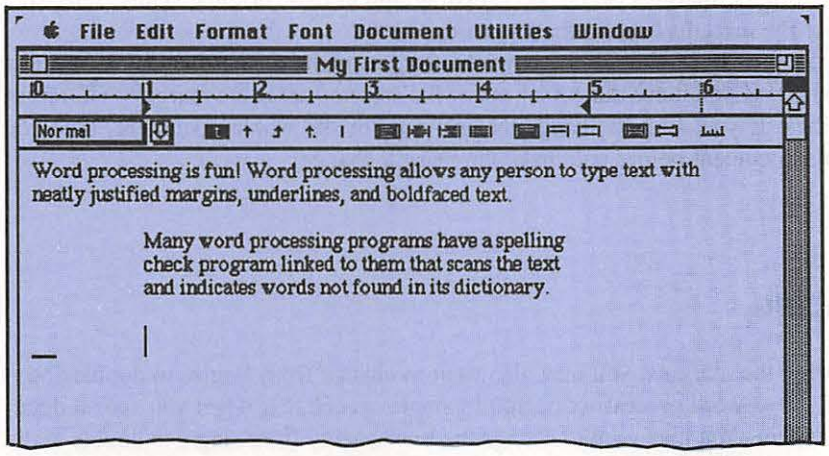


Figure 6.40
Note the left and right margins after you have added two return characters to the end of the document.

Drag the left margin to the zero position on the ruler line.

Return the left margin to its original location.

Drag the right margin to the six-inch position on the ruler line.

Return the right margin to its original location.

You have now returned the margins to their original locations. Since the second paragraph was not selected during this process, its margins have not been affected.

This is my first document.

Add this text to your document.

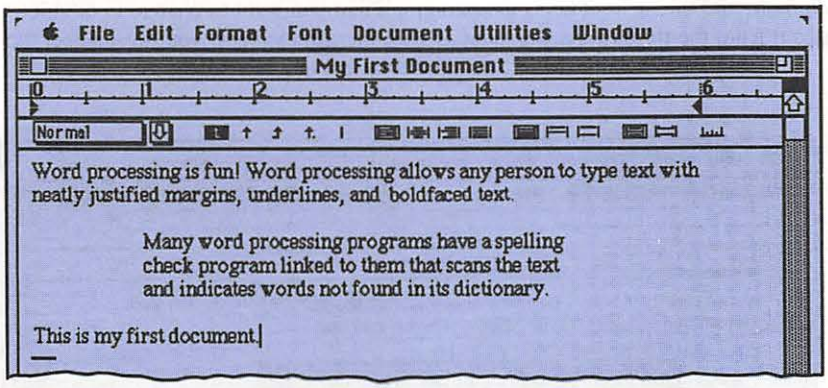


Figure 6.41
Your document now looks like this. Note that the margins for the last paragraph match the original margins of the document.

↑

Move the cursor up one line. Note that the margins change to match those of the second paragraph.

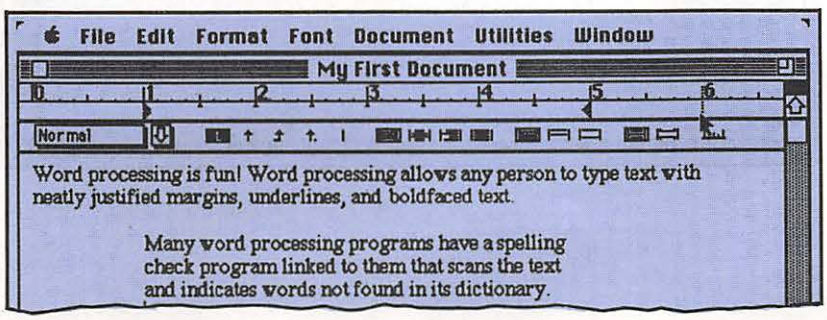


Figure 6.42
These are the left and right margin markers for the second paragraph.

⌘9	Jump the cursor to the very beginning of the document. The margins will once again return to their original settings.

If you want to return the margins of the second paragraph to their original status, select the paragraph, then move the margins back to their starting point.

The important thing to remember is that any change you make to the margins will affect only the selected text. Once you move the cursor out of the selected area, the margins will return to their default settings. If you want to change the margins for the whole document, then you must select the whole document before you make the margin change.

6.13 LINE SPACING

While you are adjusting the margins, you may also want to change from single- to double-space typing or vice versa. Most word processors default to single-spaced text when you start a document. Word is no different. You may want to change the line spacing from single to double at the outset. Ideally, you should be able to mix single- and double-spaced text throughout the complete document as needed. Word lets you do this if desired.

Just as with margin changes, with the what you see is what you get word processors, you will see the effect of spacing changes as new text is entered. With the line editor/formatter programs, you will have to wait for a printed copy to determine the exact effect. Changes in the line spacing of selected text are displayed on the computer's screen immediately.

What To Do	*Why You Are Doing It*
Select the second paragraph, and the blank line that separates it from the third paragraph.	This is the paragraph that you want to change to double-spacing. Just as with margin changes, you must select the text that you want to affect before making the change.

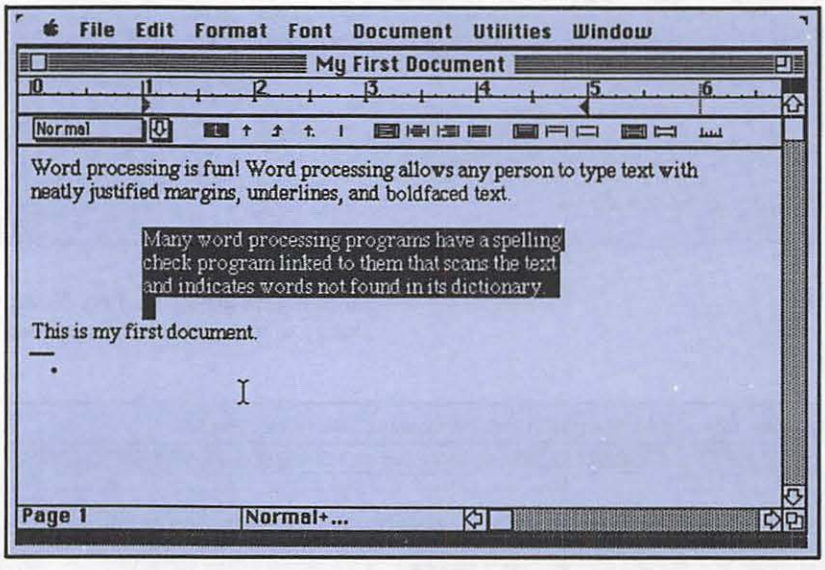


Figure 6.43
Select this text to be set to double-spacing.

Note the row of small icons on the bottom portion of the ruler line. The first grouping, with arrowheads, are used to set tab stops. The second grouping is used for formatting, such as centering or justifying text. The third grouping is used to set line spacing.

The small icon below the five-inch mark on the ruler line is the double-space icon. Under the four and one-half-inch mark is the single-space icon, which is currently highlighted. Between the two is the space and one-half icon.



Figure 6.44
The mouse pointer is on the double-space icon on the ruler line.

Click on the double-space icon. Set the selected text to double-spacing.

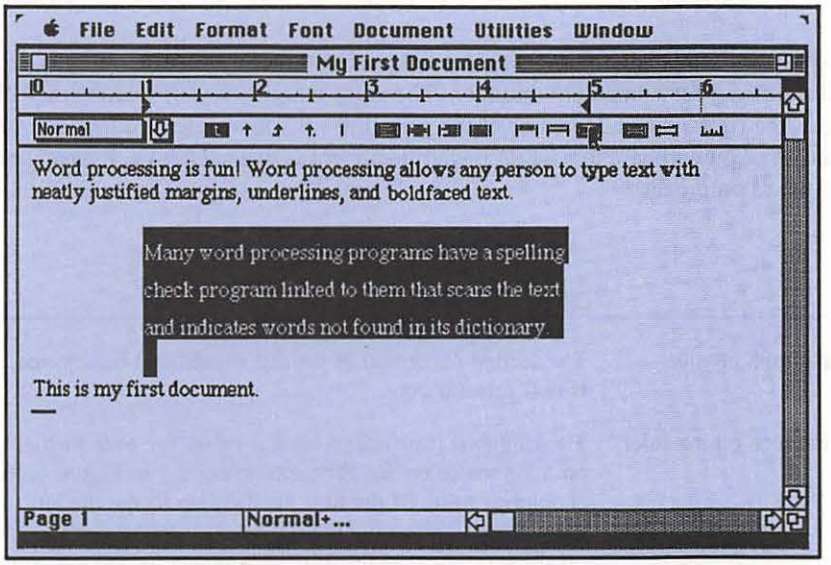


Figure 6.45
The second paragraph is now double-spaced.

Click on the space and one-half icon. Set the selected text to space and one-half.

Click on the double-space icon. Once again, set the second paragraph to double-space.

To return the second paragraph to single-spacing you would use the same procedure. Select the desired text, then click on the single-space icon.

6.14 JUSTIFICATION OF TEXT

Text justification is a feature that causes both the left and right margins of a document to be straight. Newspaper columns are justified, as is the text in most books.

Word processors justify by adding blank spaces between words of a short line until the last character of the last word on that line is at the right margin. When this line is printed, you will see these spaces. This process is called filling lines.

Some word processor/printer combinations are capable of producing microjustified spaced lines, which minimizes the appearance of the extra spaces between words on filled lines of text. This is done by adding partial spaces between the letters of words, not just by putting extra full spaces between words. Some word processor/printer combinations are also capable of producing proportional spaced lines. This is done by assigning space units to each letter of the alphabet. The letter "i" takes up less space than the letter "m," for example. When an "i" is printed, no "blank" space is placed around the letter. Thus, a line containing many letter "i's" will have more letters on the line than one with many letter "m's," because the "i" requires less space on the line. Most books are not only justified, but also are printed with proportional spacing. It is worth noting that the majority of type fonts available for the Macintosh are proportional fonts. Thus, Word is performing proportional spacing.

Fonts that are not proportional are called mono-spaced fonts. Monaco is a Macintosh font that is mono-spaced. If you use this font in your word processor, the text will not be proportionally spaced.

When using a what you see is what you get type word processor such as Word, you can see the effect of justification on your computer's monitor. The right margin of your document will form a straight line at the right margin indicator of the ruler line. If you are using a line editor/formatter word processor, you will have to wait until your document is printed before you can see the results of the justification process.

What To Do	*Why You Are Doing It*
Select the second paragraph of your document.	The second paragraph of the text should still be selected. If not, select it now.
Locate the justification icon on the ruler line.	The right/left justification icon is below the four-inch point on the ruler line. The mouse pointer in Figure 6.46 is pointing to it. Of the four justification icons, the left flush icon is presently highlighted. This is the way most people type. Next to the left flush icon is the center icon, followed by the right flush icon.

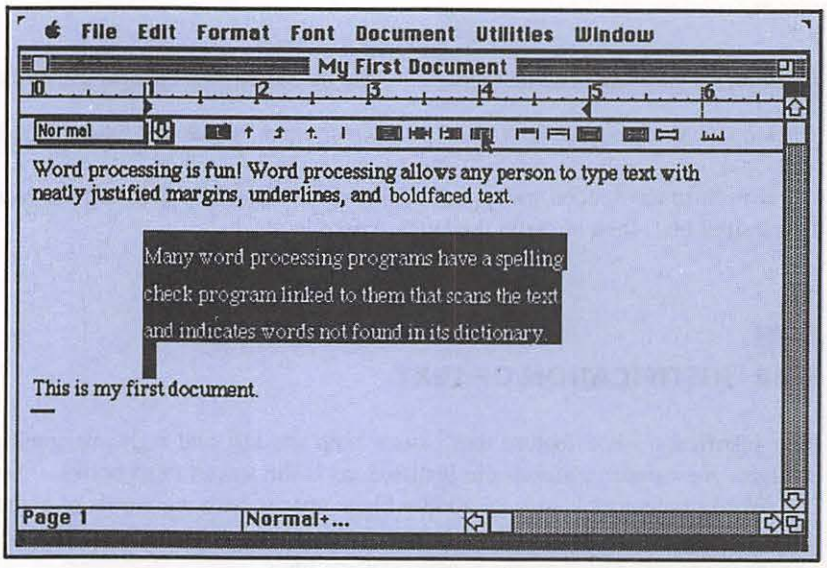


Figure 6.46
The mouse pointer is pointing to the right/left justification icon on the ruler line.

Click on the right/left justification icon.	Select full justification for the second paragraph.

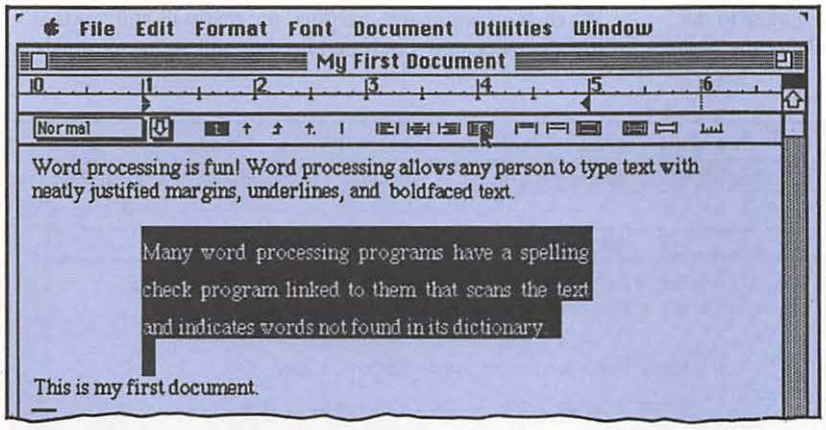


Figure 6.47
The second paragraph is now justified. Note that the ends of the first two lines of text line up underneath the five-inch margin mark. This is not true of the paragraph in Figure 6.46.

If you want to return a portion of the document to the left flush, then simply select that part of the text, then click on the left flush formatting icon.

6.15 CENTERING TEXT

It is a simple matter to center text with Word. Rather than selecting the right/left justification icon, all you need to do is select the center icon, which is below the three and one-half-inch mark on the ruler line.

When centering text, you must remember one rule. The text is centered **between the current margins**, and not between the left and right edge of the paper.

What To Do	*Why You Are Doing It*
↓	Press the down arrow, to de-select the second paragraph and place the cursor on the bottom line of the text.
Click on the center text icon on the ruler line.	The center text icon is directly below the three and one-half-inch point on the ruler line.

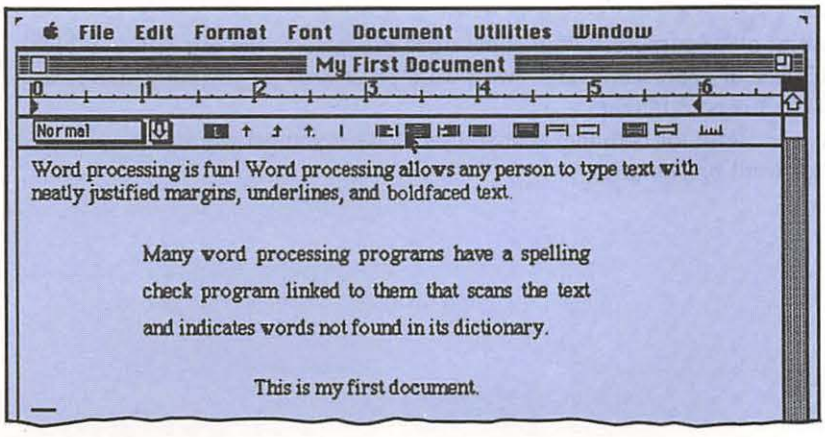


Figure 6.48
The last line of the document has been centered.

You can see that you did not have to select the complete line to center it.

Drag the right margin marker to the three-inch point and release the mouse button.

When you change the margins, the text will shift so that it remains centered between the left and right margins!

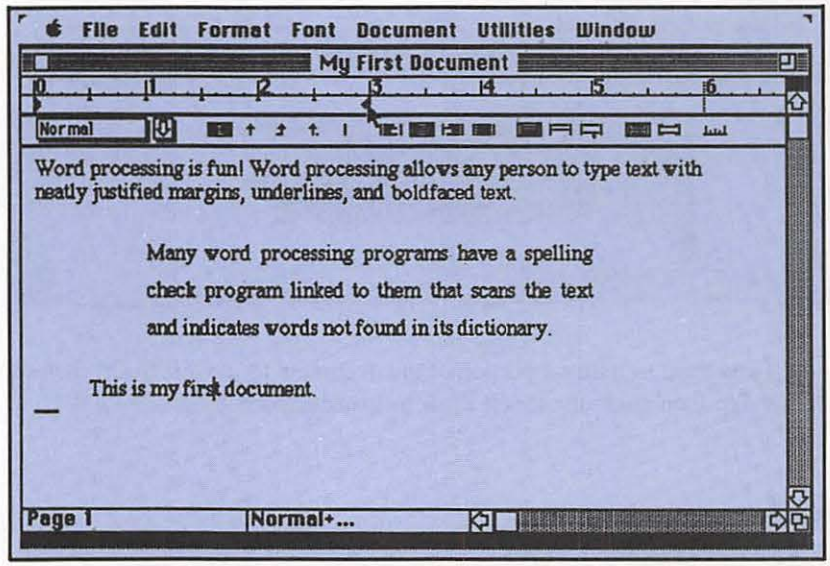


Figure 6.49
After changing the right margin, the text is centered between the margins, and not the left and right sides of the paper.

6.16 WHAT IS A BLOCK?

A block to a word processor is a segment of the text on which you are working. People generally think of a block as a large portion of the text, but it may be a single line, word, or character. In fact, a block may be any portion of the text you want.

When you select text, as you have been doing throughout this chapter, you are creating a block of text. You have then performed an action on the block, such as deleting or replacing it.

6.17 WHAT IS A BLOCK GOOD FOR?

A block can serve several other purposes. With some word processors, the text within a block may be turned into boldface or underscored text. Most word processors let you copy, move, save or delete blocks. MS-Word is no different.

In general, blocks are useful for both the what you see is what you get word processors and the line editor/formatter word processors.

6.18 HOW TO DEFINE A BLOCK

Your computer is not able to read your mind, of course, so you must tell Word which section of your text you want to treat as a block. You have already discovered several different ways of selecting portions of the document. All of these are defining a block of the text. Once the block has been defined, you may have Word perform one of several possible functions, such as moving the text to another location in the document, copying the text, deleting the text altogether, saving it to another document or enhancing the type style in some fashion.

Most word processors allow only one block to be defined at any given moment. Word is no different. Generally, you should think of a block as being dynamic in nature, always changing to suit your present needs.

After you have selected a block of text, Word expects you to perform an action with it immediately. Thus, after you select some text, some action is performed. After the action, the text may or may not remain selected. Regardless, after you perform the desired task and you are ready to continue working, the text must be de-selected.

What To Do	*Why You Are Doing It*
⌘9	Move the cursor to the beginning of the text.
Press and hold the Shift key.	The shift key, as before, acts as the constrain key, holding the cursor in place and stretching it to select text.
↓ ↓	Pressing the down arrow two times will select the first paragraph of the document.
	You now know yet another way to select text. You could have accomplished this same task by using the mouse to drag the I-beam cursor over the desired text with the mouse button depressed, or you could have used the inverse mouse pointer cursor in the left margin of the document. Any of the methods you have learned to move the cursor and select text will work.

The text displayed in reverse video represents the current block, which can be manipulated in some fashion yet to be decided.

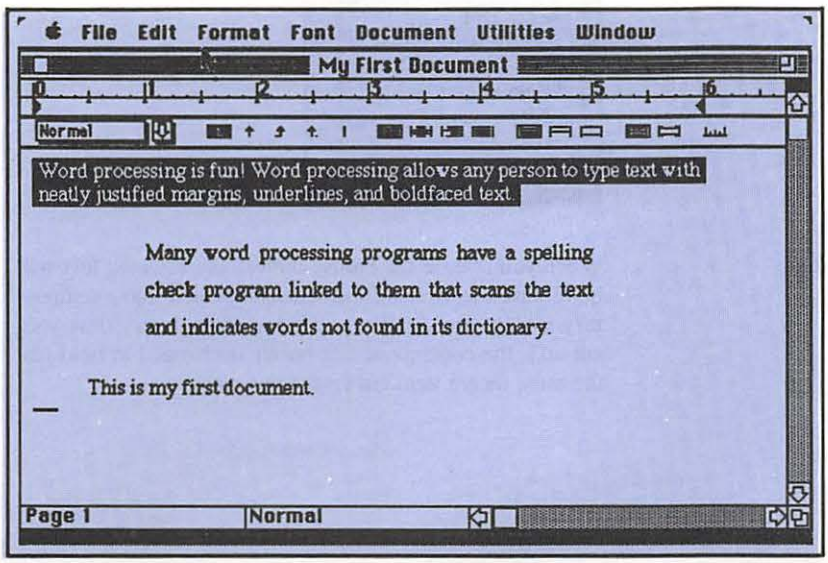


Figure 6.50
The inverse text is selected, and is the current block.

6.19 MOVING BLOCKS

Moving blocks of text is particularly useful during the editing process. You can relocate sentences or paragraphs to fix the flow of the document without retyping the sections involved. In a similar fashion, tables or charts may be moved so that they will not be affected by a page break when you print the document. When you move or delete a block of text, the hole created is automatically filled in by the word processor. No special command is needed.

Moving a block with Word is performed by using the cut and paste style of editing. That is, the section being moved is removed from the document and then restored to a different location in the text.

You should still have the first paragraph selected as a block for Word. This is the block you will be moving.

What To Do	*Why You Are Doing It*
Pull down the Edit menu.	This menu contains the commands used to cut and paste portions of the document. Note that the Cut command may be executed by pressing ⌘X. While this menu is down, note that the Paste option is ⌘V. When restoring this paragraph to the document, you will use this key, rather than the menu.
Select the Cut command.	You want to remove the selected text from the document using the menu.

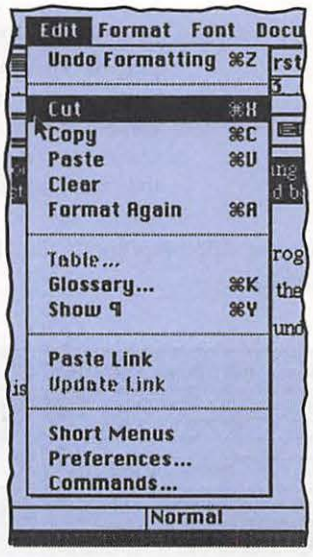


Figure 6.51
The Cut command is selected on the Edit menu. If no text has been selected, then this option will be dimmed!

Release the mouse button.	When you release the mouse button, the selected text will be removed from the document and placed into a temporary storage area, called an Undo buffer. Every time you cut text, the contents of this buffer is changed to hold just the most recent item cut from your work.

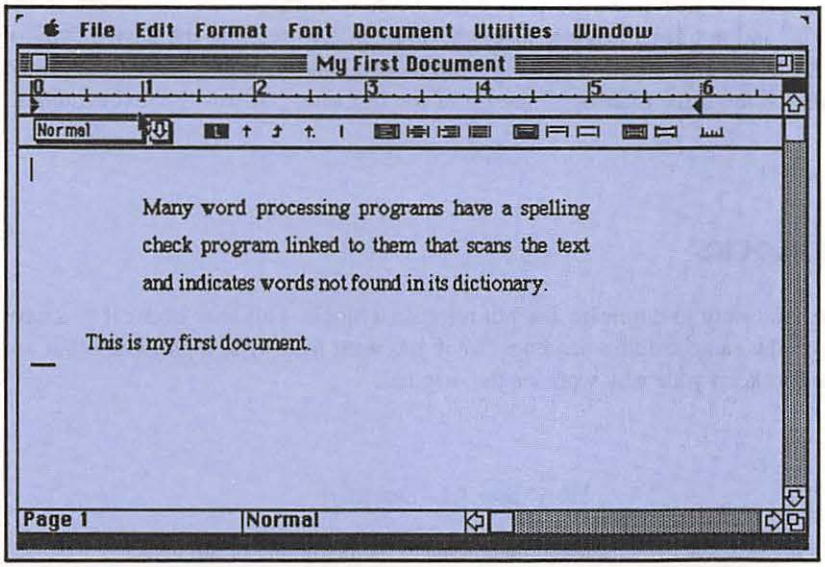


Figure 6.52
When you cut text, it is removed from the document.

⌘3

Move the cursor to the end of the document. This is where you want the block to appear when it is moved.

[cr] [cr]

Place several blank lines between the last paragraph and the place you will be putting the paragraph you just cut.

⌘V

Recall that when you pulled down the Edit menu, you saw that the Paste option was ⌘V. This option will copy the contents of the undo buffer back into the current document. The paragraph removed from the beginning of the document has now been restored at the end of the document.

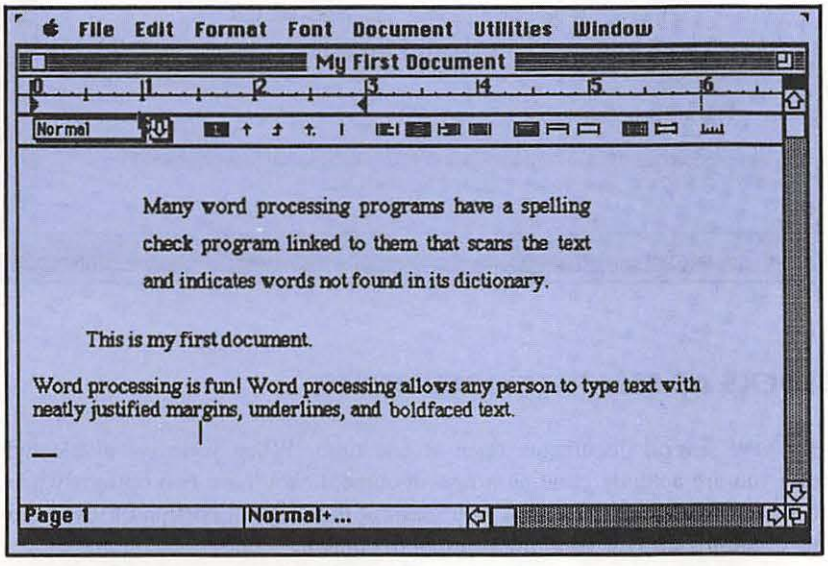


Figure 6.53
The cut text has been restored at the end of the document.

You should note that the text from the buffer has been returned to the document at the current cursor location, and not at its original location. You can also see that the pasted copy of the text brings with it the margins and line spacing from its original location. That is, the pasted paragraph did not take on the three inch right margin of the last line, nor was the text centered.

6.20 COPYING BLOCKS

Of course, sometimes you want to duplicate and not relocate a block. This may occur if you have tables of numbers with the same column headings, or if you want to rewrite a paragraph but are not sure you will want to keep your new work or the original.

What To Do	*Why You Are Doing It*
⌘9	Move the cursor to the beginning of the text.
⌘V	Paste into the document the paragraph you cut earlier. **This paragraph is still in the copy buffer because you have not cut or copied any other text.**

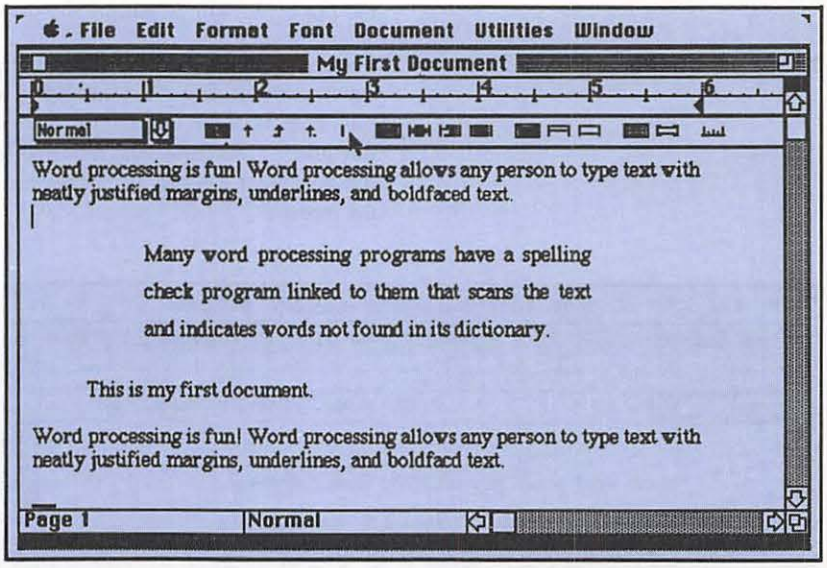


Figure 6.54
The paragraph is now at the beginning and end of the document!

6.21 SAVING BLOCKS AS SEPARATE DOCUMENTS

MS-Word lets the user have several documents open at one time. When you save a selected segment of a document, you are actually creating a new document. You have two options when creating a separate document from a block of text. You may cut the original portion of text from the original document, or simply copy it from the original document.

Placing text from one document into another is performed in the exact same fashion as creating a new document from a block of text. The sole difference, in this case, is that you are

placing the block of text into existing text, rather than into a new, untitled document. Just as with the cut and paste operation you just performed, when pasting text into an existing document from a second one, the pasted text is placed at the current cursor location.

Use the cursor movement keys or your mouse to place the cursor at the beginning of the second paragraph, beginning "Many word processing programs...". This is the paragraph that you will save to disk.

What To Do	*Why You Are Doing It*
Select the second paragraph of the current document.	Use one of the several methods you now know to select this paragraph. You may use the mouse, or the shift key in combination with a cursor movement key.

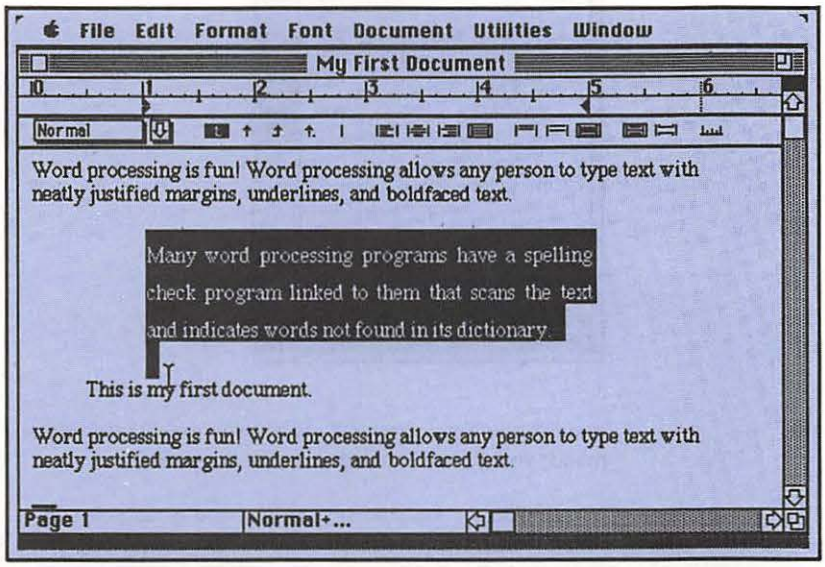


Figure 6.55
This is the paragraph you want to use to start a new document.

Pull down the Edit menu.	The Copy option is on this menu.
Select the Copy command.	This command will place the selected text into the cut/copy undo buffer, but will not remove the text itself from the document. The text will be copied into the buffer without changing the original text in the document. Once in the copy buffer, the text may be copied to another location in the current document, or into a different document.

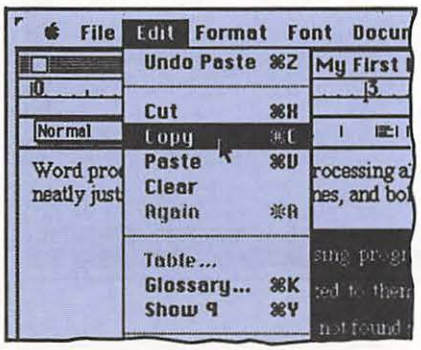


Figure 6.56
The copy command has been selected.

Release the mouse button.	Execute the Copy command.
Pull down the File menu.	This menu contains the options for opening existing files or creating new files.
Select the New option.	Recall from the prior chapter that the New option will open a second document. This command can be executed with the ⌘N key.

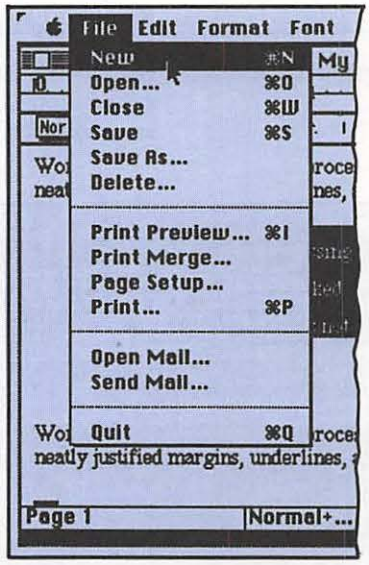


Figure 6.57
The New command has been selected.

Release the mouse button.	Execute the New command. When you execute this command, you will be looking at a new document.
⌘V	Use the Paste command key. This option is, as you will remember, found on the Edit menu. You are pasting the contents of the Cut/Copy buffer into the new document.

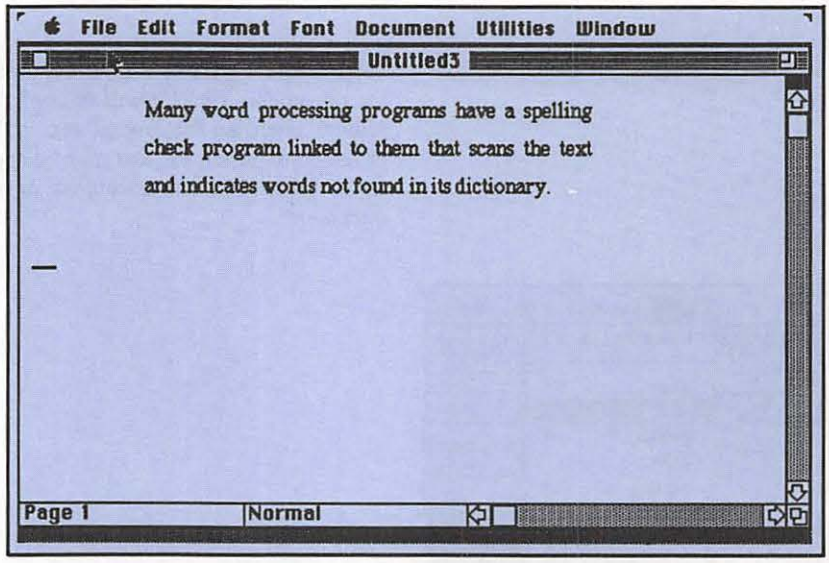


Figure 6.58
The new document now has the selected paragraph pasted into it.

You can see that the formatting of the second paragraph comes with it when it is pasted into the new document.

⌘S

You are now ready to save the new document. This is the command key for the Save option found on the File menu. Since the document is Untitled, you must now supply it a name.

TEMP

Type the name for this document, making it TEMP.

Click on the SAVE button.

Complete the save.

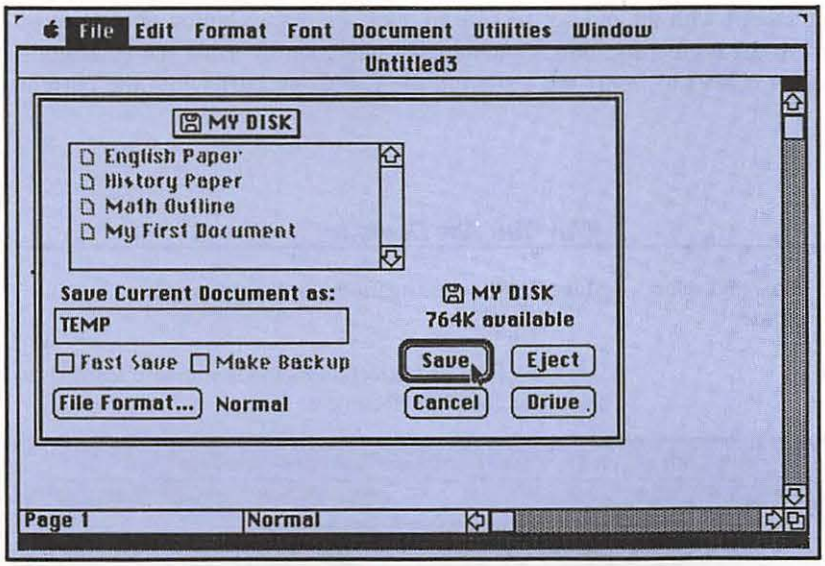


Figure 6.59
The new document has been named, and clicking on the SAVE button will complete the save process.

Pull down the Window menu.

This is the menu you used earlier to select the Help option. At the bottom of this menu are listed all the documents that Word currently has open. The check mark in front of TEMP indicates that it is the document in which you are presently working.

Select My First Document.

This is the name of the document you opened at the start of this session.



Figure 6.60
The Window menu shows you the names of all the documents Word currently has open. "My First Document" has been selected.

Release the mouse button.

When you release the mouse button, the selected document will appear on the computer's screen. Note that the text, which was selected when you created the new document, remains selected.

6.22 COPYING BLOCKS INTO EXISTING DOCUMENTS

As mentioned earlier, this same procedure may be used to move portions of text between two documents. The only difference is that, rather than creating a new document as the destination of the copied text, you use the Open command found on the file menu to open an existing document.

With the two documents open on the desktop, you perform the same basic operations. Use the Window menu to select the source document. Select the text you want to copy into the second document. Use the Copy command on the Edit menu (or ⌘C) to put the text into the Cut/Copy buffer. Once again use the Window menu, this time making the destination document active. Place the cursor at the location in the document where you want the new text to appear. If you are moving the I-beam cursor with the mouse, be sure to click the mouse button once to move the text insertion point to the correct location. Complete the operation by using the Paste command on the Edit menu (or ⌘V) to insert the text from the Cut/Copy buffer into the current document.

What To Do	*Why You Are Doing It*
Pull down the Window Menu and select TEMP, then release the mouse.	Make TEMP once again the active document.
Select the complete text.	Use one of the text selection methods you have learned to select the complete document.

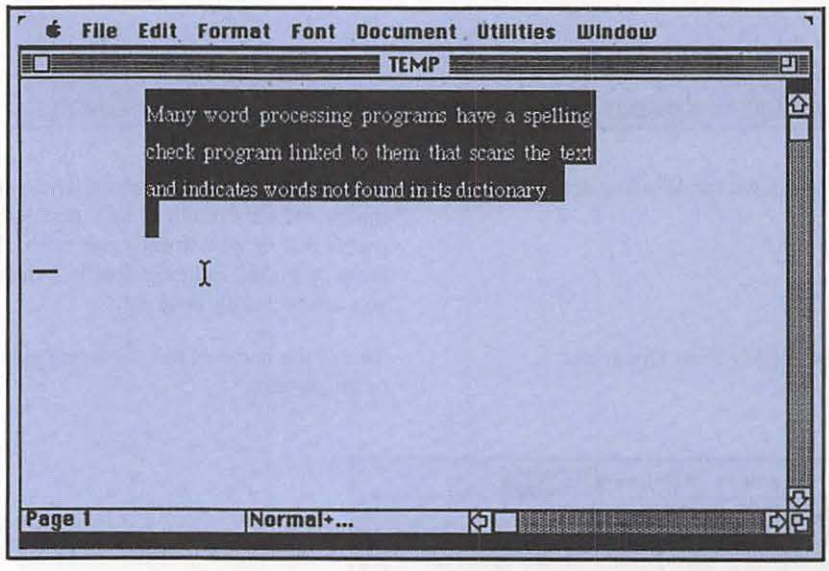


Figure 6.61
The complete document, TEMP, has been selected.

⌘C	Copy the text into the Cut/Copy buffer.
Pull down the Window Menu and select My First Document, then release the mouse.	Make the original document active, rather than the new one.
⌘3	Use the numeral 3 on the number pad with the command key to move the cursor to the end of the document. This is where you want to insert the new text from the document TEMP. You may, of course, use the mouse to move the I-beam to the end of the document, then click the mouse button once.

⌘V	Paste the text into the document at the end of the existing text.

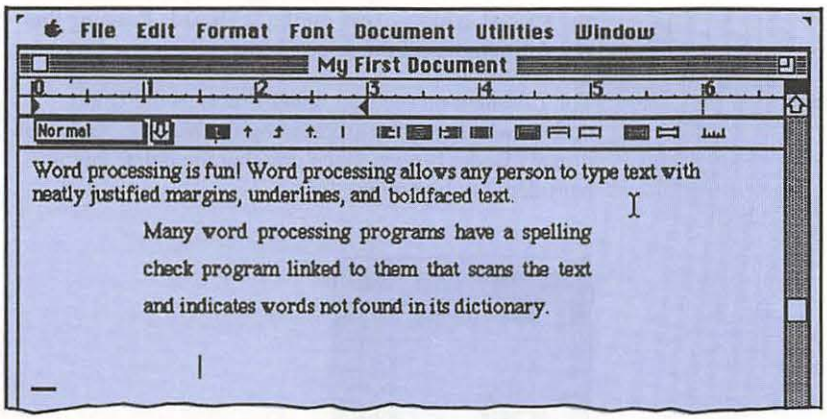


Figure 6.62
The text is inserted into the document at the current cursor location.

6.23 DELETING AND UNDOING DELETIONS OF BLOCKS

One of the major editing activities allowed by word processors is the delete process. As you edit, you may find you want to remove a sentence here or a paragraph there. The block delete lets you do this easily. If you are not sure you really want to delete a segment, it is a simple process to save the block to another document before you delete it. Then, if you decide you do not like the change, it is equally simple to reinsert the deleted block, thereby restoring the text.

Many word processors even have an "undo" command, which will "undelete" the text you last removed from the document. You should not rely on the undo feature always to save you from improper deletions. The content of the undo buffer is not always what you think it is, or what you want it to be! With Word, the Undo command, found on the Edit menu, varies its purpose, including actions such as an undo of the most recent paste command and an undo of the most recent typing.

Before you continue, use one of the text selection options you have learned to select the paragraph you just added at the end of the document.

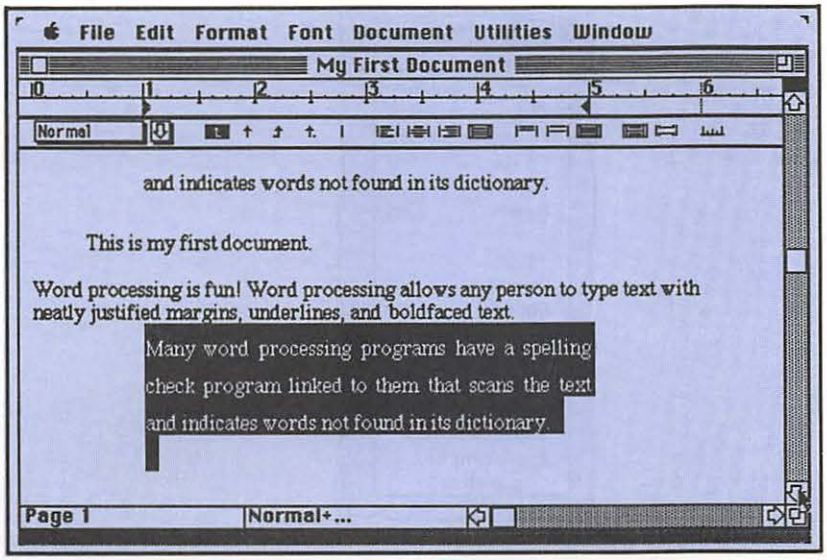
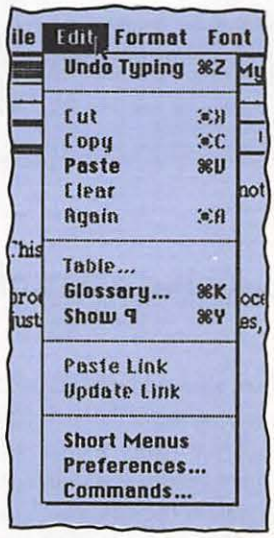


Figure 6.63
The current selection.

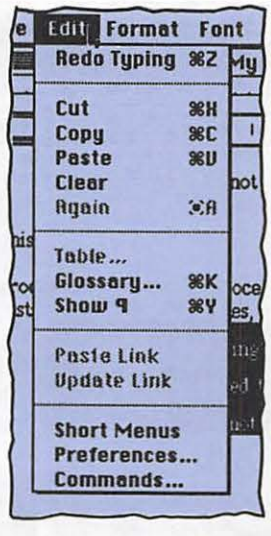
What To Do	*Why You Are Doing It*
[DELETE]	On some keyboards, this key is labelled BackSpace, rather than Delete. It is at the right side of the numbers and special symbols keys on the keyboard. Pressing this key will remove all the selected text.
Pull down the Edit menu.	The first item on the Edit menu is always the Undo option, which may be executed by the ⌘Z key. Right now it reads Undo Typing, since pressing the delete key is considered to be typing.

Figure 6.64
Note that the first entry of the Edit menu currently reads Undo Typing.



Select the Undo Typing command and release the mouse button.	After you execute this command, the paragraph that you deleted will return. It will be selected.
Pull down the Edit menu.	Once again, look at the Edit menu. This time, the undo option at the top should read Redo Typing, and it is still executed by the ⌘Z key. Selecting it will redo the deletion of the text.

Figure 6.65
The first entry of the Edit menu is presently Redo Typing.



When you are typing (as opposed to deleting as you are at this moment), you will find that the command definition that defines the ⌘Z makes more sense. As you type, the option is to Undo what you have typed. If you execute the Undo, you may then Redo (that is re-type) what you have deleted by Undoing the Undo!

Select the Cut command and release the mouse button.

This time, remove the text by cutting it, rather than with the delete key.

Pull down the Edit menu.

Once again look at the edit menu. The first entry now reads Undo Cut.

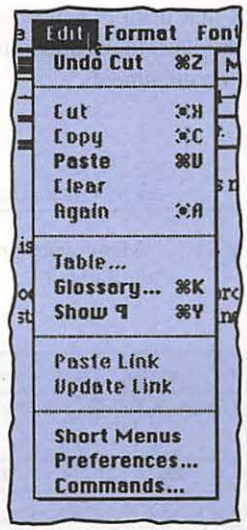


Figure 6.66
The Undo option on the Edit menu now reads Undo Cut, but it may still be executed with the ⌘Z.

Release the mouse button.

Do NOT yet select Undo Cut.

Move the I-beam to the top of the text window and click the mouse.

Reposition the cursor before you undo the cut.

⌘Z

Execute the Undo Cut command using the command key rather than pulling down the Edit menu.

When you execute this command, the text will be returned to the document, but at its original location, not at the current cursor location! This is true of any of the undo commands. The undo happens at the location in the text from which the item was first removed. This is not the case, however, for the Paste option, which restores cut text at the current cursor location.

6.24 PRINT ENHANCEMENTS

In addition to changing the layout of the document with a word processor, it is also possible for you to add enhancements to the appearance of the printed text. Typical print enhancements available in word processing programs are boldface characters, underlined characters, and superscripted or subscripted characters.

While print enhancements are easy to insert into your text after the bulk of the document has been written, it is also possible to enter the enhancements as you are typing. This eliminates the need to make a special read-through of the text to insert boldfacing, underlining, or other enhancements. Of course, this does not eliminate the need to read through the document several times to check for errors or other problems.

You should also keep in mind that print enhancements such as boldfacing, underlining, or drawing a box around text will produce their maximum effect if used in a sparing fashion, causing the effects to stand out in the document.

What To Do	*Why You Are Doing It*
Select the first four words of the second paragraph of the document.	"Many word processing programs" should now be highlighted.

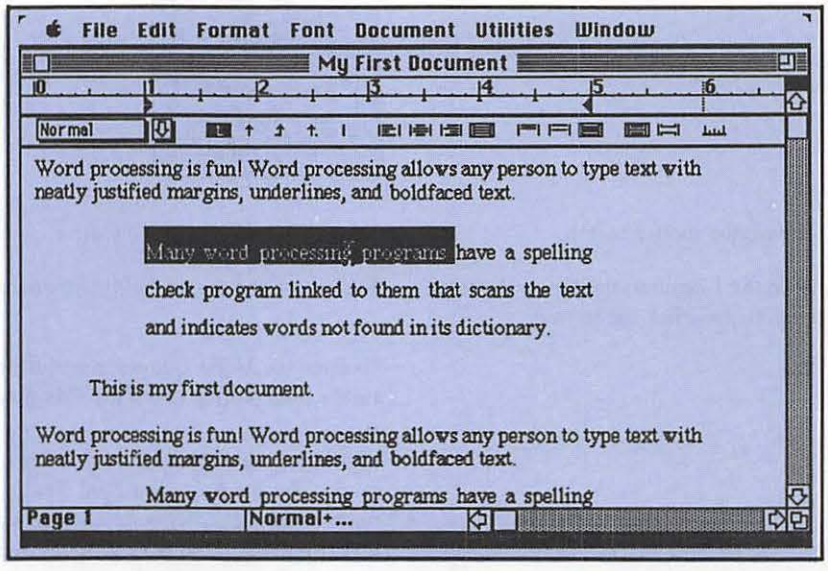


Figure 6.67
This text should be selected.

Pull down the Format menu.	This menu lets you control the appearance of the type fonts.

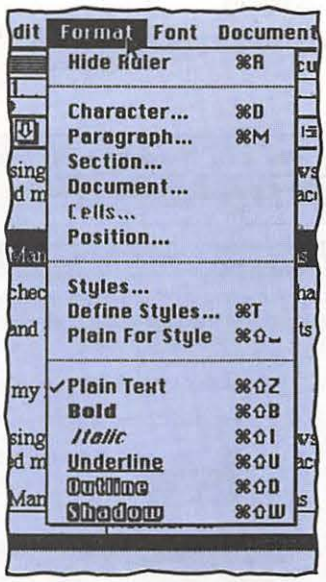


Figure 6.68
The Format menu.

Note the Bold option found in the bottom portion of the menu. It has a two key command key equivalent. The ⌘ key must be used with the shift key. This is denoted by the large open arrow pointing up.

Select the Bold option and release the mouse button.

The currently selected text will become boldfaced, but will remain selected. Note that the word "spelling" moves to the next line. Boldfaced letters take up more space on the line than plain text.

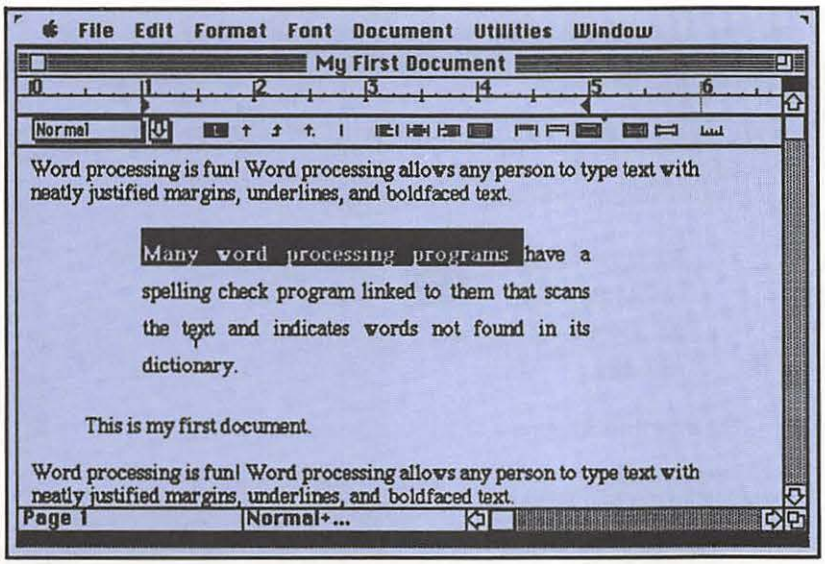
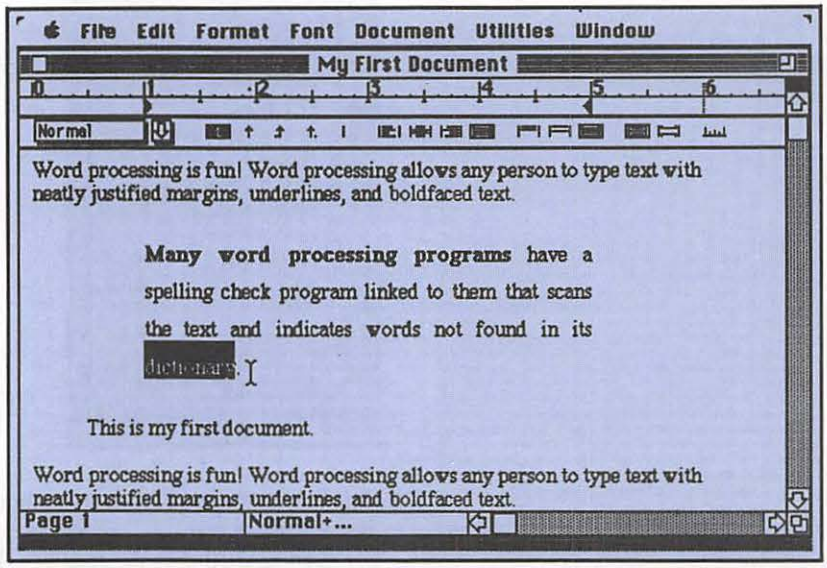


Figure 6.69
The selected text has been boldfaced.

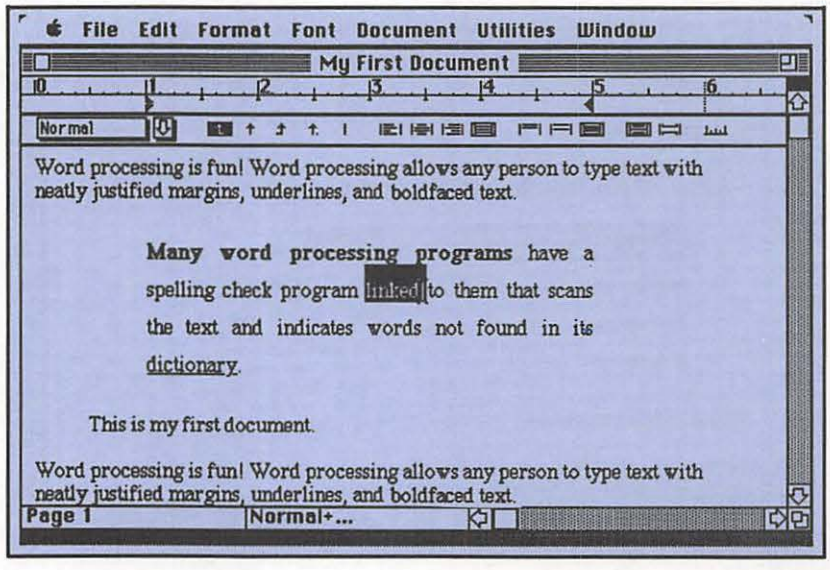
Double-click on the word "dictionary" at the end of the paragraph.	You are selecting this word to underline. When you double-clicked the mouse button, the previous text was de-selected.

Figure 6.70
The word dictionary has been selected.



Pull down the Format menu, select the Underline option and release the mouse button.	Underline this word. Note that you may use Shift-⌘U to execute this option.
Double-click on the word "linked".	Select this word to italicize.

Figure 6.71
The word linked has now been selected. Note that the word dictionary is currently underlined.



Shift-⌘I	Rather than using the pull down menu, use the command key equivalent to italicize this word.

Select the text "word processing programs".

This is part of the text that you have already boldfaced.

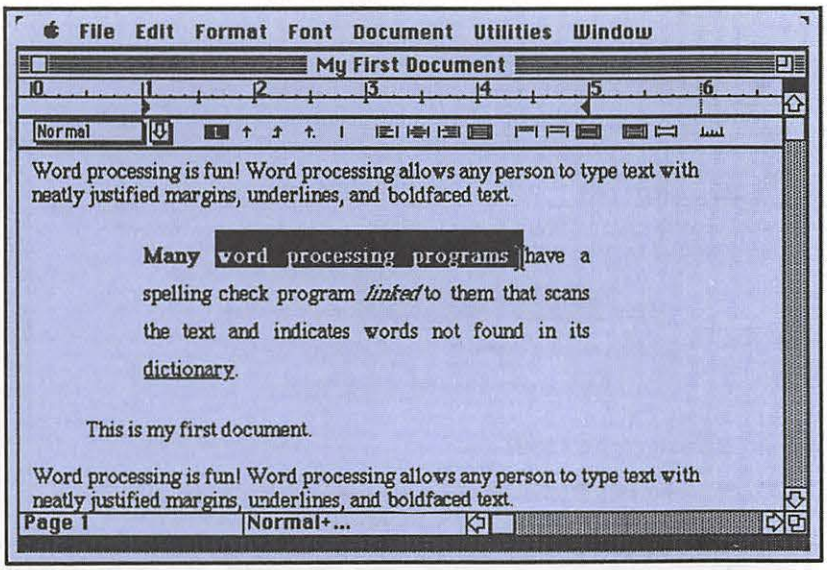


Figure 6.72
Select this text.

Shift-⌘U

Execute the Underline command key. The text will now be both boldfaced and underlined.

Shift-⌘I

Add Italics formatting to this text.

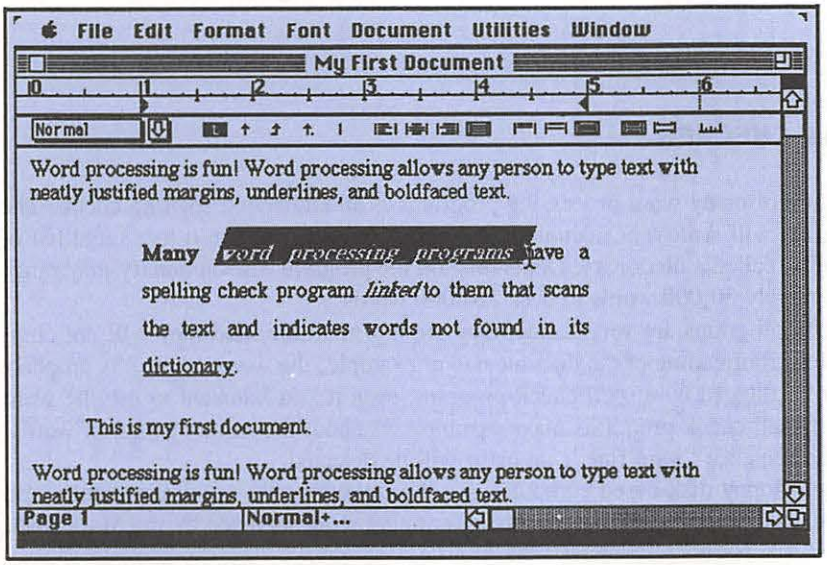


Figure 6.73
You can add many formatting features to the same selected text.

Shift-⌘U

You may undo a text formatting command by applying it a second time. Since this text is underlined, applying the Underline command will cancel the underline.

Shift-⌘Z	This is the Plain Text command key equivalent from the Format menu. It cancels all formatting commands and returns the text to a "plain" state.

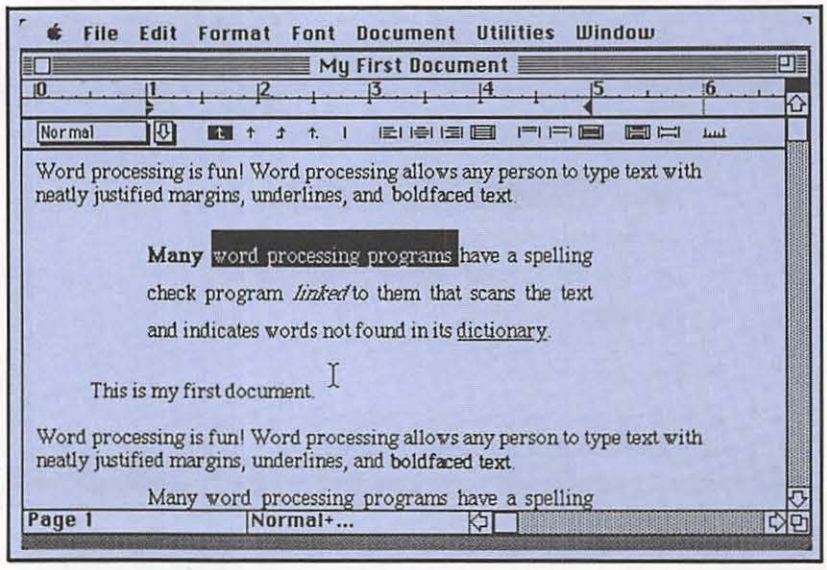


Figure 6.74
The selected text has been returned to plain text, with no formatting applied to it.

It is important to remember that the print enhancements may be undone in either of these two fashions: by applying the enhancement a second time, or by selecting the Plain option. The advantage of the former method is clear if you have several formatting options applied, and only want to remove one. Use the Plain Text option to cancel all formatting options.

6.25 THE SPELL CHECKER

One convenient feature of many word processing programs is an embedded spelling check. The spelling check program will scan your document and compare each word in it to a large list of properly spelled words, called a dictionary. Depending on the program, the dictionary may range in size from approximately 80,000 words to over 220,000 words.

While spell check programs are very handy, they are not infallible, and they will not completely replace careful proofreading of the document. For example, the word "there" is properly spelled and will not be flagged by a spell check program, even if you intended to use the word "their". Nor will all spell check programs make assumptions about the capitalization of words. If you spell check the sentence "i am fine", no error will be detected.

If you are using a floppy disk-based computer, the Word dictionaries are not available. You will have to do some disk swapping. Follow the disk swapping requests made by the Macintosh.

What To Do	*Why You Are Doing It*
⌘3	Press the command key numeral 3 to move the cursor to the end of the document.
Drag the right margin indicator for this line of the text back to the six-inch point.	Return the right margin to its default setting.

Click on the text left align icon under the three-inch point on the ruler.

Return the formatting to left aligned, rather than centered.

Add the following new text to your document EXACTLY AS IT IS SHOWN BELOW:

```
i typd this documnt al by miself!
```

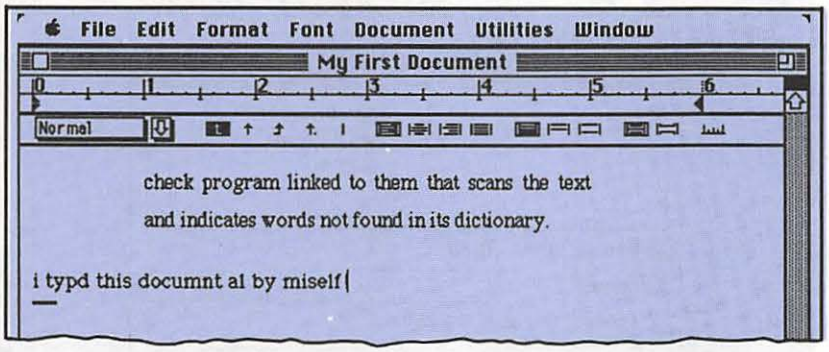


Figure 6.75
The text has been added to the end of the current document.

Pull down the Utilities menu.

The Spelling option is found on this menu. Note that spelling may be executed by using the ⌘L key.

Select Spelling and release the mouse button.

Begin the spelling checker.

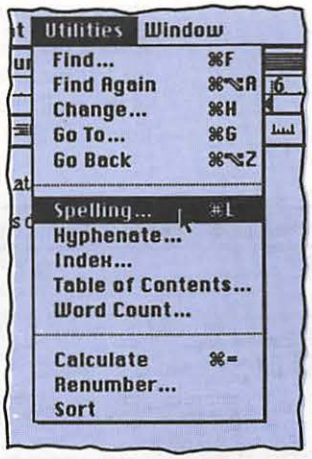


Figure 6.76
The Spelling option has been selected. It may be executed by using ⌘L.

After the dictionary is loaded, the spelling check process will begin.

Click on Start Check.

To begin the spelling check process, click on the start check button.

Click on OK.

The spelling check begins execution from the current cursor location. Since you just added text to the end of the document, the cursor is at the end. The spell check module has reached the end of the document and wants your permission to continue the process by jumping to the document's beginning. By clicking on OK, you are telling it to go ahead.

After a brief pause, the spelling check program will highlight "typd." Note that it does not stop on "i." "i" is a correctly spelled word, but it is not capitalized.

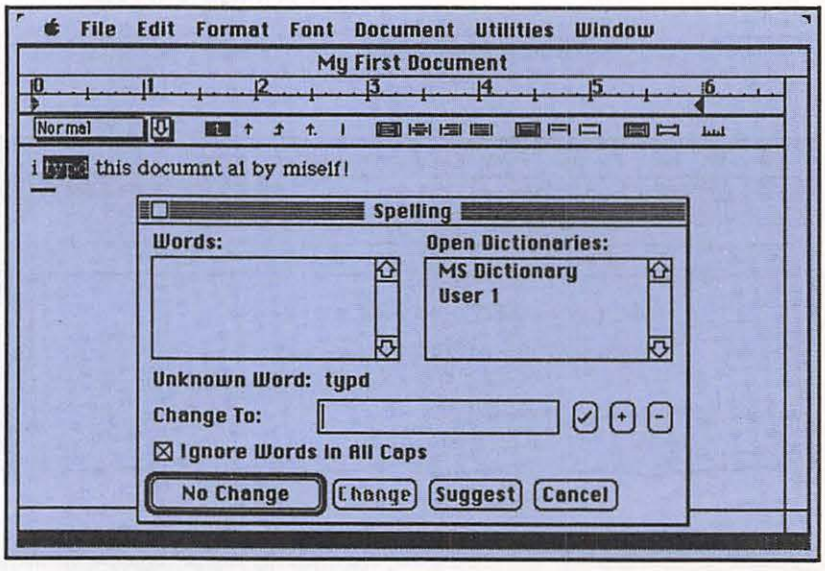


Figure 6.77
The spelling check module has located a suspect word.

As you can see, at the bottom of the spell check dialog box there are several options you may take.

Click on Suggest.

You are not sure of the spelling, and you want the spell check module to suggest possible alternative spellings.

After a brief pause, a list of several words will appear in the left list labelled "Words:" with the most likely word, in the spell check program's opinion, at the top. At this time, this should be the correctly spelled word "typed".

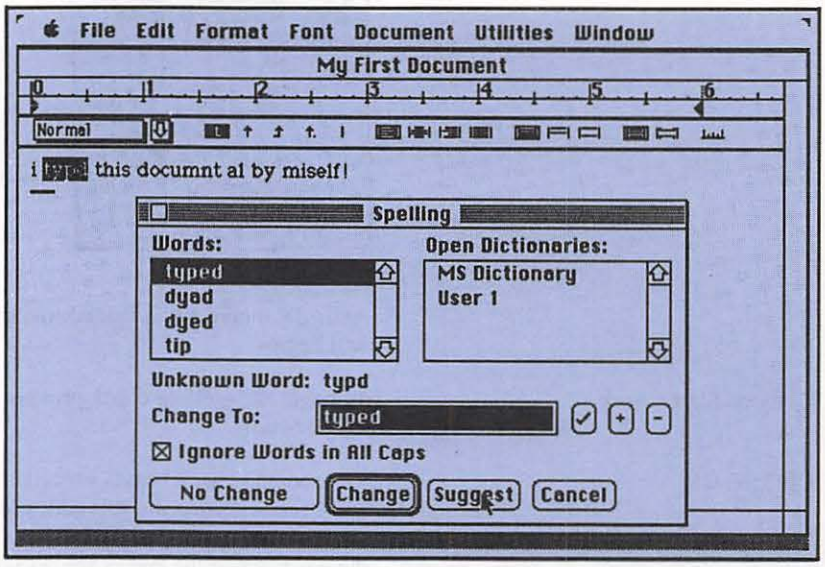


Figure 6.78
You can see the words that the spelling checker suggests in the list of "Words" at the top left corner of the Spelling Check dialog box.

Click on Change.

Tell the spell check module to make the correction in the text for you.

After a brief pause, the spelling checker will stop on "documnt."

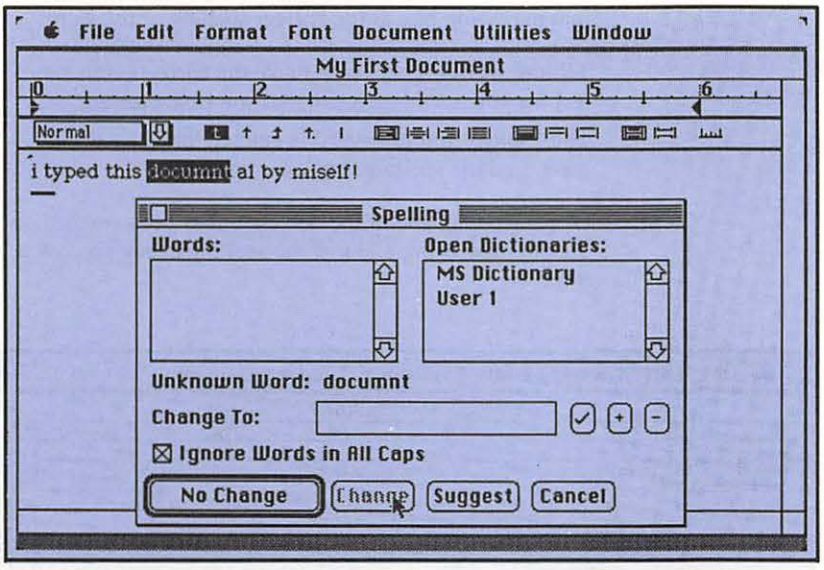


Figure 6.79
You can see that the word "typed" is now correctly spelled in the text, and that "documnt" has been highlighted as incorrectly spelled.

Click on Suggest.

Have the spell check module suggest the correct word. Again, the first word on the list is the one you want.

Click on Change.

Tell the spell check module to make the correction in the text for you.

After another brief scan, the spelling checker will stop on "al."

Click on Suggest.

Have the spelling checker suggest the correct word. This time, the only suggestion is that the word be capitalized! This is not what you want!

all

Simply type the correct word, all, into the dialog box. You may always override the suggestions made by the spelling check program by simply typing into the dialog box.

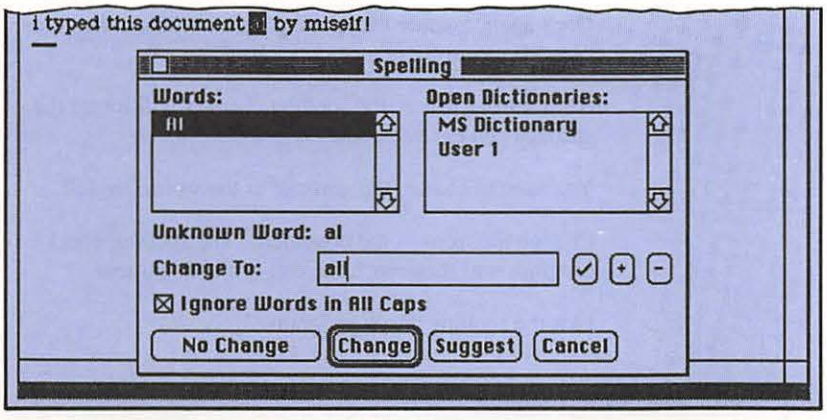


Figure 6.80
You may make your own suggestions if you do not like the options the spelling checker gives you.

Click on Change.	Tell the spelling checker to make the correction in the text for you, using the word that you have entered. After another brief scan, the spelling checker will stop on "miself."
asdf	Rather than asking for a suggestion, type this garbage into the dialog box as the correct spelling of the word.
Click on Change.	Tell the spelling checker to make the correction in the text for you, using the word that you have entered. The "word" you just typed is entered into your document, and the spelling check continues.
Click on OK.	Once again the end of the document has been reached. You are now being told that the spelling check process is over.

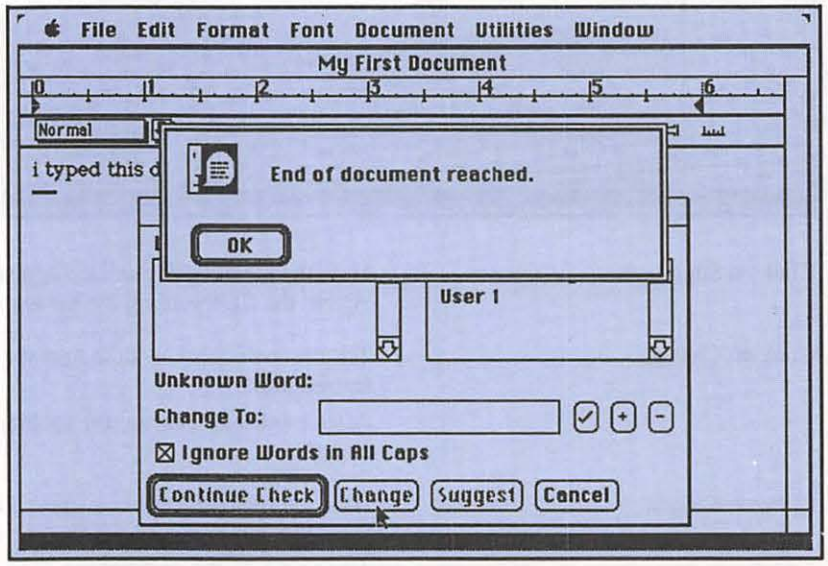


Figure 6.81
The spelling check is over.

	It is important to note at this time that the "i" was not found as a misspelled word!
⌘9	Use the command key numeral 9 to move the cursor to the beginning of the document.
⌘L	Once again execute the spelling checker, using the command key equivalent. After a brief pause, the spelling checker will locate the garbage you entered above.
myself	You want to change the garbage to the word "myself."
Click on Change.	Change the word in the document. The spelling check program will then reach the end of the document.
Click on OK.	Exit the spelling check program.

⌘S	Execute the Save command to save the modified document. Remember that this command may be found on the File menu.
⌘Q	Execute the Quit command to exit the word processor. After a brief pause, the Macintosh desktop will reappear.

EXERCISES

1. Explain the difference between text scrolling and cursor movement.
2. How do you move the cursor to the bottom of the screen?
3. How do you move the cursor to the end of the document so you can add new text at the end of the existing text?
4. How do you open an existing document?

Assume the following paragraph for questions 5 through 9:

> My Aunt Sally used to love to go to the shore. Of course, you on the West Coast would call it the beach, but it amounts to the same thing. She loved to walk in the sand and play with her dog. After spending a day at this activity, Aunt Sally would return to her home totally exhausted. The next morning, however, she was ready to return and once again walk on the warm sand with her dog.

5. Assume that the cursor is at the beginning of the text. If you then execute a search operation with Word searching for the text "and," what text will be selected?
6. If you repeat the same search with the cursor starting at this new location, where will the cursor then stop?
7. If you enter the text to be found as "TOTALLY," will it be found? What happens if you click on the box labelled "Match Upper/Lowercase" in the find dialog and execute this search again?
8. What if you enter the text to be found as "return"? Will it be found?
9. If you search for the phrase "and once," where will the cursor stop?
10. When you change the left margin of your document without selecting any text, does existing text below the point of the margin change automatically become aligned to the new margin, or do you have to issue a special command to cause this to happen?
11. If you change the line spacing of your document from single- to double-space, can you at a later time change it back from double- to single-spaced text?
12. If you select the whole document and then change the line spacing from single- to double-space, is the document displayed as double-spaced on the computer's display?
13. What is the difference between lines of text which have been filled to create justification, and lines which have been proportional spaced to create justification?

Assume the following paragraph for questions 14 through 21:

> There house was warme and cosey, even thoug it was rainning like cats and dogs. i was glad to be inside with tem, and not on the rod home.

14. When you spell check this text, will it tell you that the first word is incorrect?
15. When you spell check this text, what will the program tell you about the first word of the second sentence?
16. What words are suggested options for the word "warme"?
17. What words are suggested options for the word "cosey"?
18. What words are suggested options for the word "thoug"?
19. What words are suggested options for the word "rainning"?
20. What words are suggested options for the word "tem"?

21. Why is the word "rod" not considered a a misspelled word when it clearly should be the word "road"?
22. What is the minimum amount of text that can be selected to be a block?
23. Can you move or copy a block to any location in your document, or only to locations later in the document than the present location of the block?
24. If you accidentally delete a block of text, but do not realize it for several minutes, what governs whether or not that block will be in Word's undo buffer?
25. If the text you want to retrieve is not in the undo buffer, how do you get it back into your document?
26. When you move a block of text, what happens to the space that the text originally occupied?
27. When you copy a block of text, where does the copy always appear in the document?
28. Is it possible to copy text from one document to another?
29. Can Word boldface and underline a word at the same time?
30. Are you able to enter print enhancement commands while you are entering the text, or can you only return to existing text to add print enhancements?
31. Use Word to enter and print two copies—one in justified mode and one in unjustified mode—of the following memo. Be sure to include the boldface and underlined text:

    TO: Harold Stein, Telecommunications

    FROM: George Graham, Data Processing

    DATE: November 14, 1983

    SUBJECT: *Phone Installation*

    Alex Jones in Market Research and Mary Anne Peters in Administration have each received personal computers. Their machines are equipped with internal modems to allow them to communicate with the company mainframe. Please contact them both to arrange installation of dedicated phone lines in their respective offices.

    Thanks.

32. Use Word to enter and print the following brief letter. Don't forget the boldface and underlined words. The body of the text should be DOUBLE-SPACED:

    June 12, 1982

    Mr. Fred Jones
    Sales Manager
    Gizmos and Gadgets, Inc.
    137 West Main St.
    Los Angeles, CA 90005

    Fred:

    Thanks one more time for expediting the last shipment of **"Super Whatzits."** They were the hit of the *Homeowner's Gadget Show*. I anticipate that This and That, Ltd., will be able to sell several hundred **"Super Whatzits"** between now and the end of the season on July 18th.

    I'll be in touch.

    Sincerely,

    Tom Hillski
    Distribution Manager
    This and That, Ltd.

33. Use Word to print the memo in Problem 31 with a left margin of an extra one inch, and a right margin of an extra one inch.
34. Use Word to print the memo in Problem 31 double-spaced.

35. Use Word to enter and print the following outline:

MICROCOMPUTER TRAINING SESSION

I. Introductions
  A. Instructors
    1. Alice Sykes
    2. Marissa Lopez
    3. Lester Klein
  B. Class introductions
    1. Name
    2. Department
    3. Previous computing experience
II. Hardware
  A. The parts of the computer
    1. Keyboard
    2. Monitor
    3. System unit
    4. Disk drives
    5. Printer
  B. Put the computer together
  C. Turn computer on
  D. Run system tests
III. Floppy Disks
  A. What they are
  B. Their construction
  C. Proper care
  D. What not to do with your disks
IV. The Word Processor
  A. How to start it
  B. Entering text
  C. Moving the cursor
  D. Editing—insertion and deletion
  E. Saving the text
  F. Printing the text
  G. Quitting the program
V. Training wrap-up

36. Use Word to rearrange the outline from Problem 35 so it appears as follows:

MICROCOMPUTER TRAINING SESSION

I. Introductions
  A. Instructors
    1. Alice Sykes
    2. Marissa Lopez
    3. Lester Klein
  B. Class introductions
    1. Name
    2. Department
    3. Previous computing experience

II. Hardware
  A. Floppy Disks
    1. What they are
    2. Their construction
    3. Proper care
    4. What not to do with your disks
  B. The parts of the computer
    1. Keyboard
    2. Monitor
    3. System unit
    4. Disk drives
    5. Printer
  C. Put the computer together
  D. Turn computer on
  E. Run system tests
III. The Word Processor
  A. How to start it
  B. Entering text
  C. Moving the cursor
  D. Editing—insertion and deletion
  E. Saving the text
  F. Printing the text
  G. Quitting the program
IV. Training wrap-up

CHAPTER

ADVANCED WORD PROCESSING CONCEPTS

7

CHAPTER OBJECTIVES

Upon completion of this chapter, the student will:

- **Explain the difference between a simple find operation and a find and replace operation, which is called a change operation by Word.**
- **Execute a change operation.**
- **Insert footnotes or endnotes into the document.**
- **Draw a border around a paragraph.**
- **Change the default tab stops and use hanging indentations.**
- **Enter a column of numbers using decimal tab stops.**
- **Turn on page numbering.**
- **Define and use style sheets.**
- **Create a mailing list file.**
- **Merge a mailing list with a form letter.**

7.1 ADVANCED CONCEPTS

In the last chapter you learned how to maneuver through your document, getting from one location to another in the text quickly and easily. You also learned how to enhance the appearance of the text through format changes and print enhancements.

In this chapter you will learn advanced procedures which will allow you to relocate the cursor and change the text simultaneously, draw boxes around text and center it on a line, insert footnotes and create a mailing list.

7.2 FIND REVISITED

In the last chapter you learned about Word's find option. Recall that the trick to using the find function is to define properly what you want the word processor to locate. For instance, you probably do not want to ask the program to find the word "the," because it is too common.

7.3 FIND AND REPLACE

The find and replace feature, called "Change" on the Word Utilities menu, performs two functions. First, it will find a word just as the find operation you saw in Chapter 6 did. Second, it removes the word or words you asked the program to locate in the file. It will then replace the deleted text with new words. There are even enhancements to this feature, such as the global find and replace. This enhancement causes every occurrence of the specified word or words to be located in your document and replaced with the new text.

Start your computer as you did at the beginning of Chapter 5. After you boot your Macintosh with a System Start-Up disk, make sure that you have the Word Program disk at hand. If you are using a machine with a hard disk, you will not need to insert the Word program disk into a disk drive. Rather, locate the Word 4.0 folder, and open it so you can see the Word program icon. If you have two disk drives on your computer, or a hard disk and a floppy disk drive, place the disk that you used while working on Chapter 5 into an empty disk drive. This disk should have the document you created stored on it. If you do not have a free floppy disk drive, keep this disk available. You will need it.

Just as in the prior chapter, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and click the mouse button two times fast. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed. Finally, remember that you learned in the prior chapter that several keys on the number pad perform cursor movement functions. When you see an instruction to move the cursor, be sure to use the numerals found on the number pad at the right of the keyboard, and not the numerals at the top of the keyboard!

Before you can execute the Change command, you must first have a document to work with. This section starts by once again helping you retrieve your document for editing.

What To Do	*Why You Are Doing It*
Locate the icon for the Word program.	You will launch the Word application program by double-clicking on it.
Move the mouse to the Word icon and double-click.	The double-click will launch the application. If you have trouble with the double-click, you may also select the program's icon with a single click, then use the Open option on the File menu, or press ⌘O, the command key equivalent. After a brief wait, Word will be running, and you will have a new, untitled document displayed in the window.
Move the mouse to the window's close box.	Remember, the close box is the one found at the left of the title bar.

Click the mouse button once.	Close the untitled document. You are going to open an existing document, and it is less confusing to work with only one document active.
Pull down the file menu.	The file menu has the Open command.
Drag the mouse pointer down to the Open command.	The Open command lets you open existing documents found on disk. Note that the Open command has ⌘O as a Command Key equivalent. You may recall that this is the same key used by the Finder's Open command.
Release the mouse button.	Execute the Open command. After a brief pause, you will see a dialog box.
Click the mouse on the Drive button shown in the dialog box.	The Drive button tells Word to display the document and folder names found on a second disk currently in your computer. This may be a floppy disk, or a hard disk. If you do not have a second disk in the computer, then the Drive button will be dimmed, and you will not be able to use it. Continue clicking the Drive button until the name of the disk that contains your file appears in the dialog box.
Click on My First Document.	You want to open the document you named "My First Document." By clicking the mouse pointer on the name in the dialog box, you are selecting this document.
Click on the Open button.	Execute the Open command. After a brief pause while the computer reads the document, you will see a Word editing window with the document displayed in it. You should remember that the double-click is often a shortcut to the Open command. You could have double-clicked the mouse on the document name, rather than selecting it and then clicking on the Open button in the dialog box.

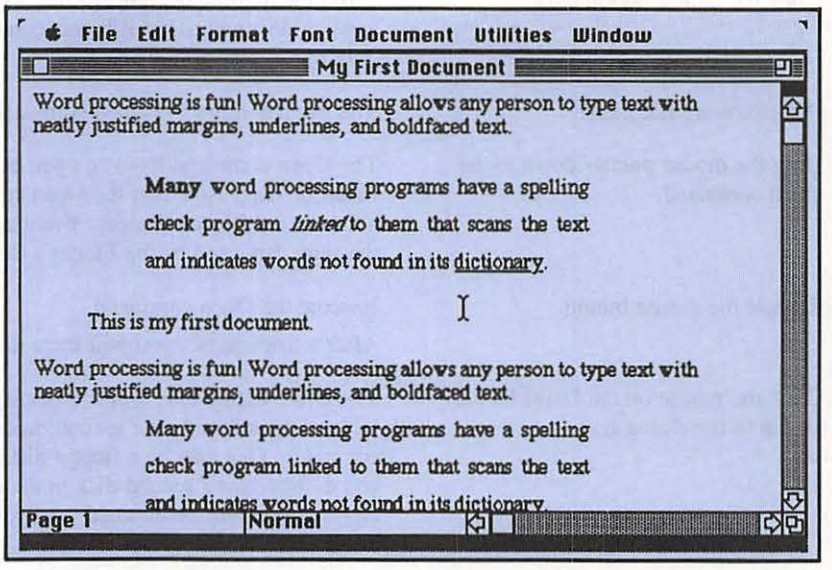
If you do not have the file on any of your disks it will not appear in the file list in the dialog box. If this happens, you will have to re-type it. Here is the current text of "My First Document":

```
Word processing is fun! Word processing lets any person type text with neatly
justified margins, underlined, and boldfaced text.
Many word processing programs have a spelling check program available which scans the
text and indicates words not found in its dictionary.
I typed this document all by myself!
```

If you are returning to your earlier text, you should note that the cursor is in the top left corner of the text window to the left of the W of "Word." You will also note that there is substantially more text in your document, along with several formatting changes.

If you just entered the text above, use one of the cursor movement options (such as the mouse, or ⌘9) to jump the cursor to the beginning of the text before you continue.

Figure 7.1
Your current document.



What To Do	*Why You Are Doing It*
Pull down the Utilities menu.	This menu has the Find command that you used earlier, as well as the Change option.
Select the Change option.	The Change option will locate the specified text, then replace it with different text.

Figure 7.2
The utilities menu. The Change option has been selected.



have a	Enter the word, or in this case phrase, you want the computer to locate.
[TAB]	Press the Tab key. The cursor will jump to the next item in the Change dialog box, Change To.
support a	Enter the word, or in this case the phrase, you want the computer to use to replace the original text.

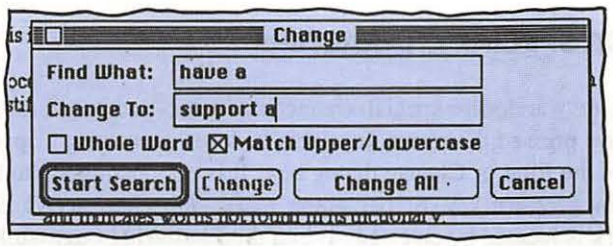


Figure 7.3
The Change dialog box.

Click on Change All.

This option tells Word to locate all the occurrences of the specified text, and to replace it with the new text. After a brief pause, all the changes will be done. Note that "2 changes" will appear at the bottom left corner of the text window.

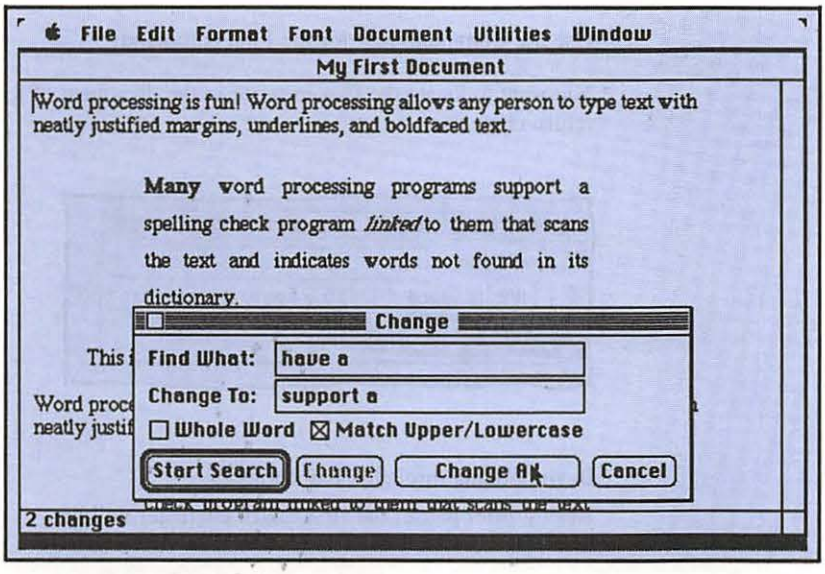


Figure 7.4
Note that 2 changes have been made in the text.

Click on Cancel.

Close the Change dialog box, and reactivate the document window.

There were two occurrences of the phrase "have a". Both have been replaced with the new phrase. Scroll up and down through the document to verify this. The fact that both instances of the original text were replaced suggests that you must be careful when making use of the "change all" feature. You may not always want every instance of a word or phrase changed, in which case you would click on the "Start Search" option. Doing this, Word would have stopped each time the "search for" phrase was found to ask if you want to replace the located text with the new text.

There is one easy way to protect yourself against the accidental replacement of all the occurrences of a word or phrase with unwanted text. Save the document before you execute the Change procedure. In the event you make an error, it is a simple matter to close the now incorrect document without saving the changes, then open a clean copy of the text from your storage disk.

7.4 SEARCHING FOR SPECIAL CHARACTERS

The Word program will let you locate special characters in the document, such as a TAB character or where you have pressed the return key. This is done by entering a special character into the Find What field of the Find or Change dialog box. It is not uncommon to have to locate a word that is preceded by a return key, or paragraph mark. Tab characters are also easy to locate. The paragraph mark is located by entering ^p into the Find What box, while the Tab key is located with ^t.

What To Do	*Why You Are Doing It*
⌘9	Make sure that the cursor is at the beginning of the document. Of course, you may also use the mouse and I-beam cursor pointer if desired.
⌘F	Use the Command Key for the Find command.
^p	You want to locate the first instance in the document of a return character.

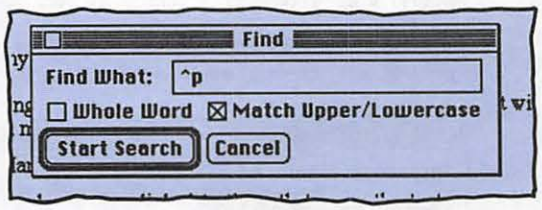


Figure 7.5
The current Find dialog box. You are searching for the first place in the text where you pressed the return key.

Click on Start Search.	Begin looking through the document. After a brief pause, the first return character will be located.
Click on Cancel.	Put away the Find dialog box. You can now see where the first time the return key was pressed in this document.
⌘Y	Turn on the Show ¶ option (you may find this option on the Edit menu!). The paragraph symbol at the end of the first paragraph is now highlighted.

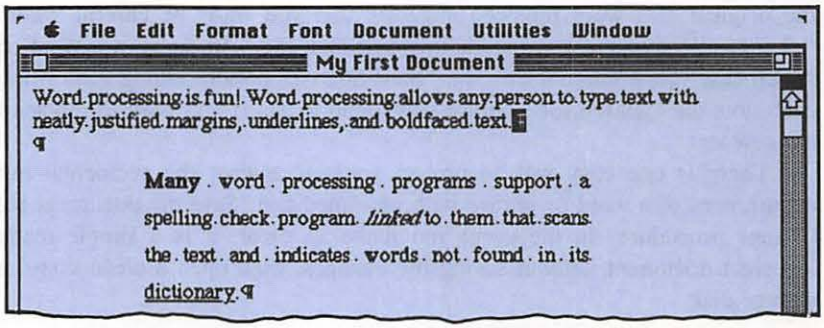


Figure 7.6
The¶ symbol at the end of the first paragraph is selected.

⌘Y	Turn off the Show ¶ option.

7.5 ADDING FOOTNOTES OR ENDNOTES TO THE TEXT

Many documents that you prepare will require the use of footnotes or endnotes. You may need to give credit for a quotation appearing in the text, or to supply extra information on a topic that does not belong in the body of the text. You may want to direct the reader to references on a particular topic, or to look at a different location in the document for specific information.

As the name suggests, a footnote will appear at the foot, or bottom, of a page. Word will attempt to put the footnote on the same page as the segment of the text that references the footnote.

Endnotes, on the other hand, are collected by Word into one location and printed at the end of the document.

What To Do	*Why You Are Doing It*
Pull down the Format menu.	This menu includes the Document command, which lets you select the ultimate location of footnotes: as footnotes or endnotes.
Select the Document command and release the mouse button.	You are going to inspect the options available for the location of footnotes. The Document dialog box will appear.

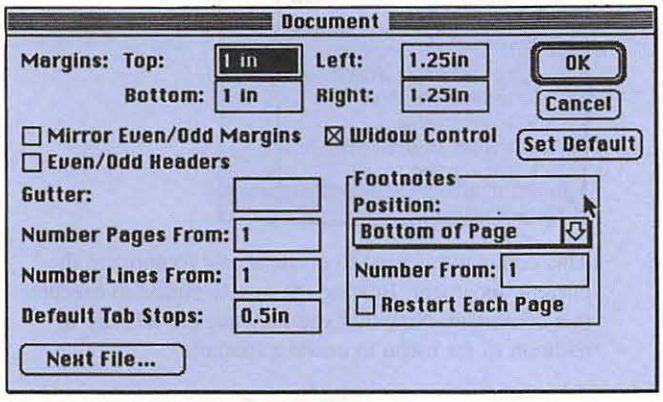


Figure 7.7
This is the Document dialog box, accessed from the Format menu. You can see that Footnote control is located at the lower right of the dialog.

Press and hold the mouse on the open arrow to the right of the words "Bottom of Page."	This is a pop-up menu. To use it, you drag the mouse pointer down to the location you desire for your footnotes.

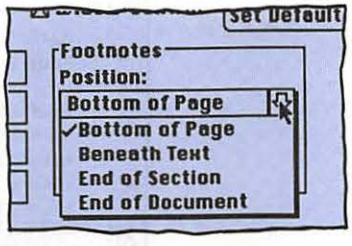
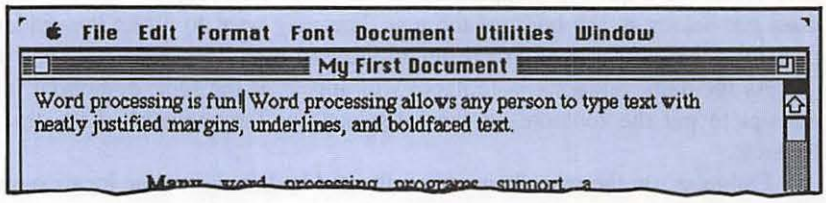


Figure 7.8
The footnote placement menu has been pulled down, and Bottom of Page is selected.

Release the mouse button.	For now, do not make a change in the location of footnotes.
Click on the cancel button.	Exit the Document dialog box without making any changes.

⌘9	Move the cursor to the beginning of the document.
⌘→ ⌘→ ⌘→ ⌘→ →	Position the cursor after the exclamation point ending the first sentence of the document.

Figure 7.9
Note the current location of the blinking cursor. You may also use the mouse to position the I-beam cursor to this location.



Pull down the Document menu.	This menu contains two references to "foot," the first being "footer" and the second "footnote."

Figure 7.10
The Document menu.



Select the Footnote option and release the mouse button.	This command is used to create a new footnote in the current document. Release the mouse button to execute this command. Note that you may use the ⌘E key in addition to the menu to create a footnote.

Figure 7.11
The Footnote option has been selected.



Click on OK.	The footnote dialog box (Figure 7.12) lets you control the appearance of the reference mark in the document. For now, you want to number the footnotes. Clicking on the OK button will sequentially number the footnotes.

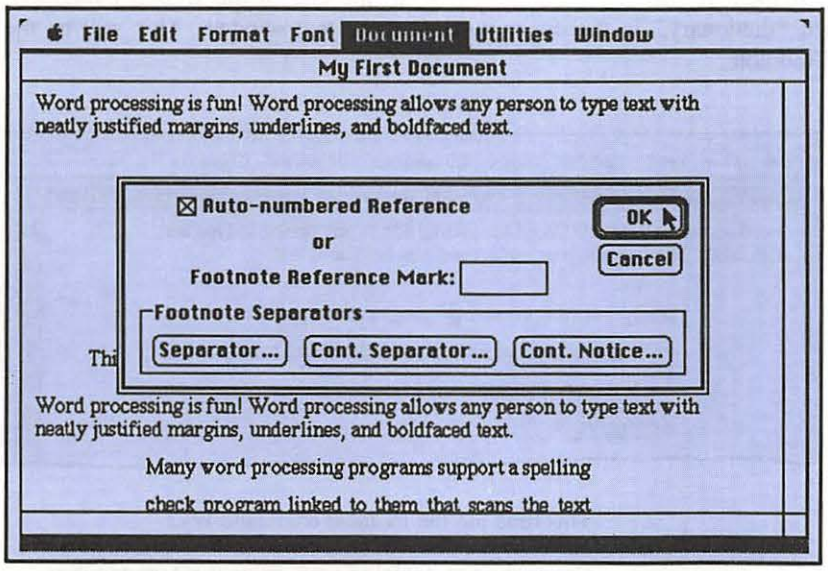


Figure 7.12
The computer's display after you execute the footnote option. The footnote function will automatically give you a footnote number.

After you click on OK, a superscript numeral 1 will appear in the document immediately after the exclamation point, since this is the first footnote in your document. The document window will split, and the cursor will be in the **lower** portion of the window, which will let you enter the text of the footnote.

Pull down the Font menu and select the Times font, then release the mouse button.

You want to make sure that the type font used in the footnote is the same as the one used in the body of the text.

Pull down the Font menu and select 12 point, then release the mouse button.

Make the size of the type for the footnote 12 points, rather than 10.

Credited to John Dough.

This is the text that you want to enter as the footnote. Do not push the return key at the end of the line. The next footnote will automatically start on a new line. If you press the return key now, you will create a blank line between footnotes.

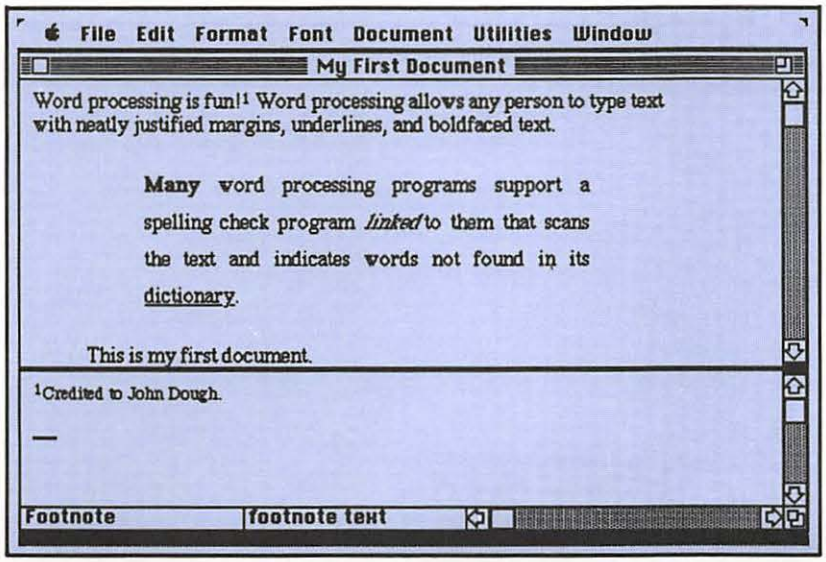


Figure 7.13
The footnote has been entered.

Use a cursor movement method to place the cursor at the end of the second paragraph, ending with the word "dictionary," in the upper portion of the text window. This will be the location of a second footnote.

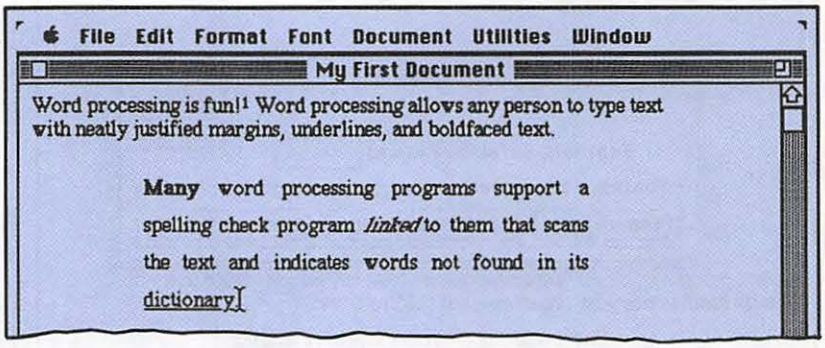


Figure 7.14
The I-beam cursor shows where you will place the second footnote in this document.

⌘E	This time use the footnote command key.
Click on OK	Create the new footnote entry using the Auto number default option. Notice that a superscript numeral 2 appears in the current document at the location of the cursor, and a superscript 2 appears in the lower portion of the window at the footnote area. Word is keeping track of the number of footnotes you have entered into your text so that they can be numbered in sequence automatically. Even though this text has had its margin changed, Word will make use of the overall document margins for the footnote.
Pull down the Font menu and select the Times font, then release the mouse button.	Once again, you must adjust the Font to match the body of the text.
Pull down the Font menu and select 12 point, then release the mouse button.	Make the size of the type for the footnote 12 points, rather than 10.

Enter the following text for this second footnote:

```
There are some very clever spelling check programs in use today, but they do not check
the writer's grammar.
```

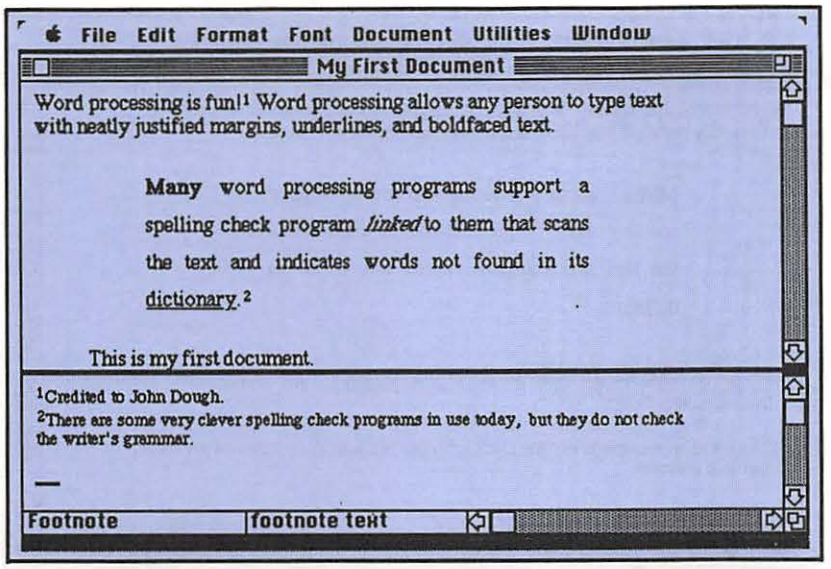


Figure 7.15
Your document should look like this at present.

7.6 INSERTING FOOTNOTES BETWEEN EXISTING FOOTNOTES

It is possible that, after reviewing your document, you discover that a footnote has been left out. It is just as likely that you may add more text that requires a footnote somewhere in the text.

When using a typewriter, one problem with adding new footnotes between existing ones arises from the footnote sequence number. All following footnotes must be renumbered by hand. When using Word, however, if you insert a new footnote between existing footnotes, all the ensuing footnote numbers are incremented by one automatically.

Place the cursor at the end of the first paragraph, just after the period following the word "text," by using the mouse to move the I-beam cursor, and then clicking the mouse button once. This is where you will add another footnote. It is, as you can see, between existing footnotes 1 and 2.

What To Do	*Why You Are Doing It*
⌘E	Use the command key to create a new footnote.
Click on the OK button.	Note that the footnote number inserted into the text by Word is 2, and that what used to be footnote 2 is now footnote 3 (Figure 7.16 on the next page).

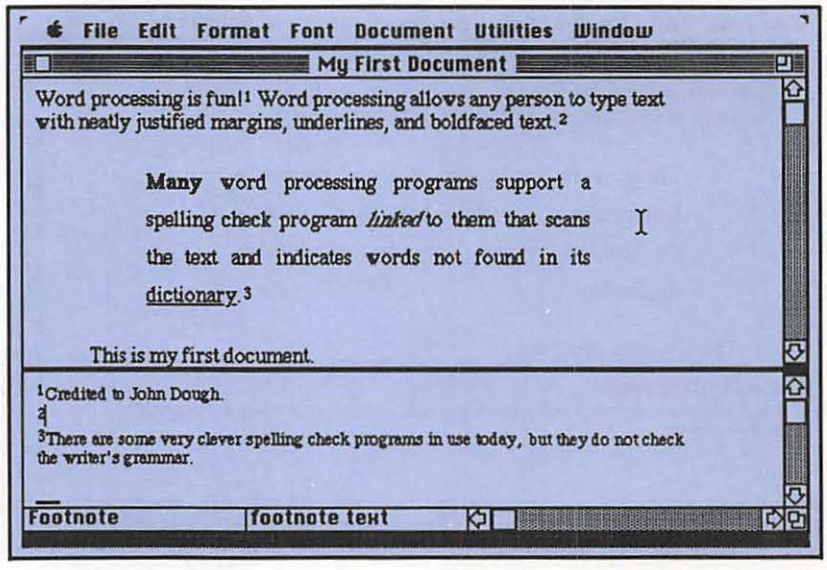


Figure 7.16
Note that inserting a footnote between existing footnotes will automatically renumber all the footnotes that follow the new one.

Pull down the Font menu and select the Times font, then release the mouse button.

Once again, you must adjust the Font to match the body of the text.

Pull down the Font menu and select 12 point, then release the mouse button.

Make the size of the type for the footnote 12 points, rather than 10.

Enter the following footnote:

```
Word can also outline text.
```

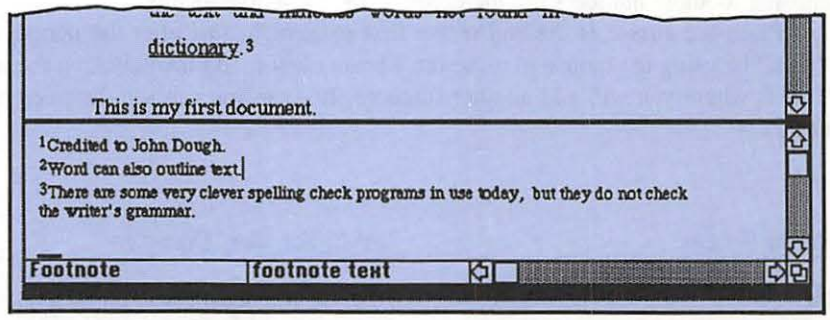
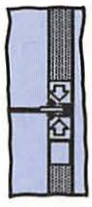


Figure 7.17
The completed footnote.

Figure 7.18
Note the appearance of the cursor when it is on top of the split bar.



Move the cursor to the black bar separating the top and bottom portions of the right side scroll bar.

This bar may be moved up or down to adjust the size of the split window. It is called the Split Bar. When the cursor is in the proper location over the Split Bar, it will change shape.

Drag the Split Bar to the up-pointing arrow at the top of the right side scroll bar and release the mouse button.

You are through using the split window for the time being, and want to return the window to a single work space. When you release the mouse button, the window will return to its normal state.

7.7 EDITING EXISTING FOOTNOTES

As with any other text you type, it is possible to make errors when entering a footnote. You can delete and then re-enter the offending note by simply removing the footnote number from the text and then re-creating the footnote. This, however, can be time-consuming, and it does not guarantee that you will not make another typing mistake. It is much easier to edit the note.

What To Do	*Why You Are Doing It*
Move the I-beam cursor to footnote number 1 in the text.	You plan to edit the footnote that is currently number 1. Note the placement of the I-beam cursor in Figure 7.19.

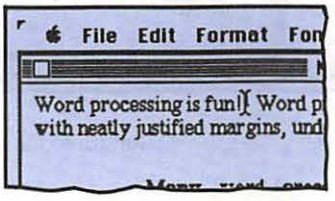


Figure 7.19
Note that the placement of the I-beam cursor is touching the superscript 1 in the main text.

Double-click the mouse button.	This is one way of opening the footnote area at the bottom of the text window. The cursor will be placed at the end of the selected footnote, in this case, footnote number 1.

Use standard Word editing to make the footnote read as follows:

```
Credited to John Q. Dough. He discovered word processing at age 83 and was then able to
complete a book in two weeks that he had been working on for over 40 years.
```

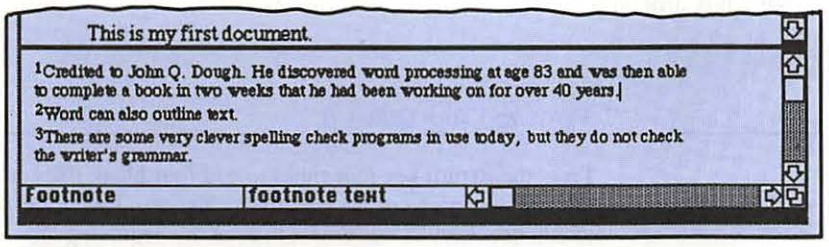


Figure 7.20
The newly edited footnote.

Drag the Split Bar to the up-pointing arrow at the top of the right side scroll bar and release the mouse button.	Once again, you are through using the split window. You no longer want to look at the footnotes.
⌘I	Command-I is the Print Preview command found on the File menu. While you cannot read the text in this fashion, you can see what the formatting of the document you have created will be.

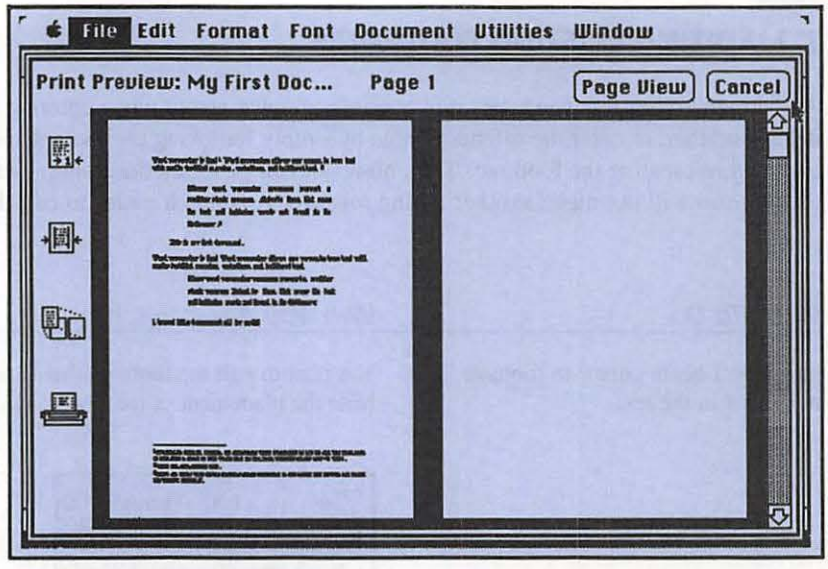


Figure 7.21
Print Preview will give you an idea of the overall appearance of your document.

Click on the Cancel button.	Return to the main editing window.

7.8 PUTTING A BOX AROUND A PARAGRAPH

Sometimes boldfacing or underlining text is not enough to make something stand out in a document. To make some text stand out even more, you may want to enclose it in a box. Word lets you put boxes around paragraphs of the text. The feature is called borders. In addition to being able to put four-sided borders, you may create a "custom" border, turning on and off the sides of the box in any fashion you desire.

Use the mouse (or ⌘9) to place the cursor at the very beginning of the document. We will add a title here and create a box around it.

What To Do	*Why You Are Doing It*
[cr] [cr] [cr] [cr]	Press the Return key four times to add four blank lines at the very beginning of the document. You now have room to add new text, in this case a title, at the beginning of the document. You can use this method to add new text at the beginning of ANY document.
↑ ↑ ↑	Position the cursor on the second line of the document by moving it up three lines.
⌘R	Activate the Ruler Line.
Click on the Center Text icon.	You want to center the document title. The cursor will move to the middle of the line.

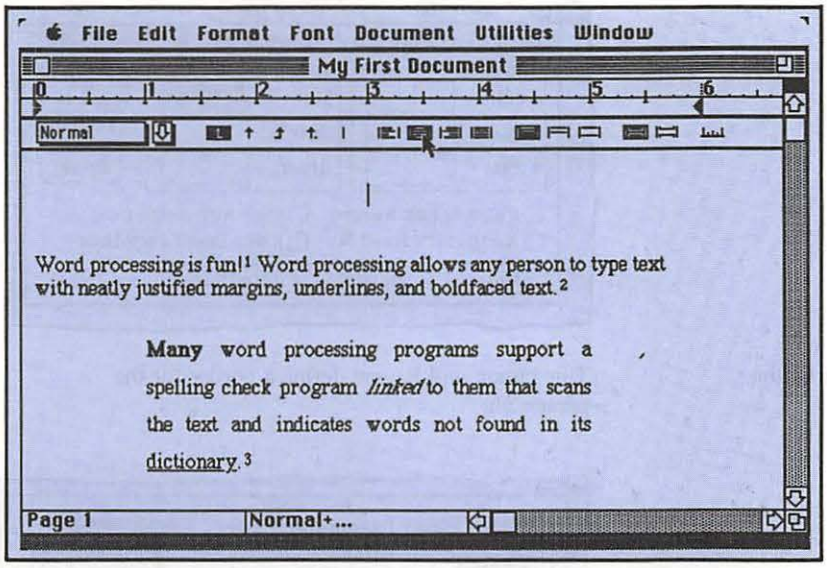


Figure 7.22
Blank space has been added to the beginning of the document, and the current line of text is set to be centered.

Word Processing — Type this text for the title of this document.

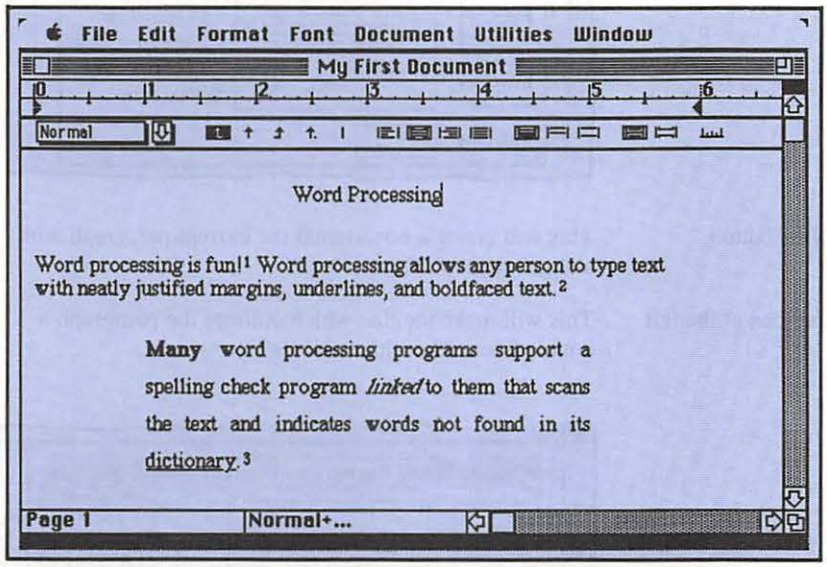


Figure 7.23
Your document should look like this.

Pull down the Format menu. — This menu has the Paragraph Command.

Select the Paragraph Command and release the mouse button. — The Paragraph command will let you place borders around the current paragraph. This command may be executed with the ⌘M key.

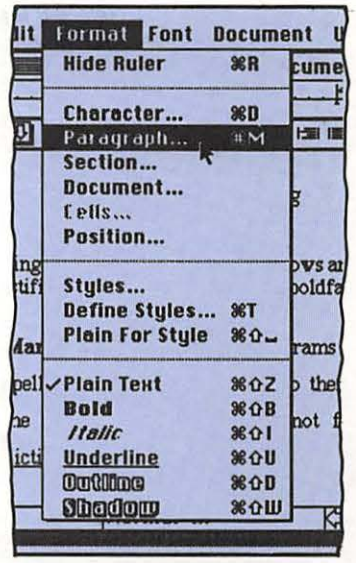
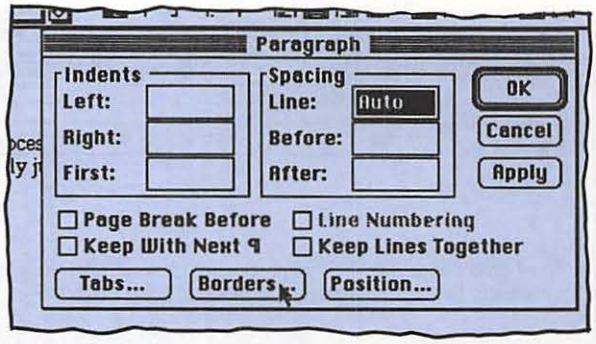


Figure 7.24
The Paragraph command has been selected.

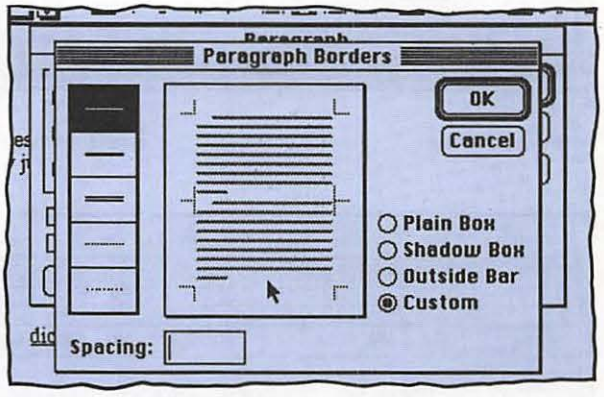
Figure 7.25
The Paragraph Dialog box.



Click on the Borders button.

This button will let you define a border for the paragraph.

Figure 7.26
The Paragraph Borders Dialog box.



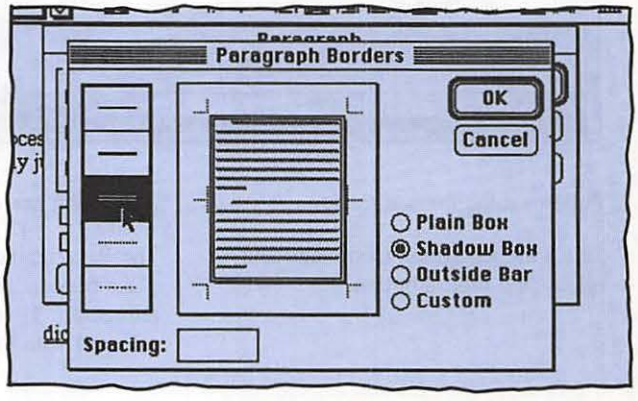
Click on the Shadow Box button.

This will create a box around the current paragraph with a slight shadow effect.

Click on the double line box at the left of the dialog box.

This will make the line which outlines the paragraph a double line, rather than a single line.

Figure 7.27
The borders have been selected for this paragraph.



Click on OK.

Close the Paragraph Borders Dialog box.

Click on Apply.

Apply this change to the current paragraph by clicking Apply in the Paragraph Dialog box.

Click on OK.

Close the Paragraph Dialog box.

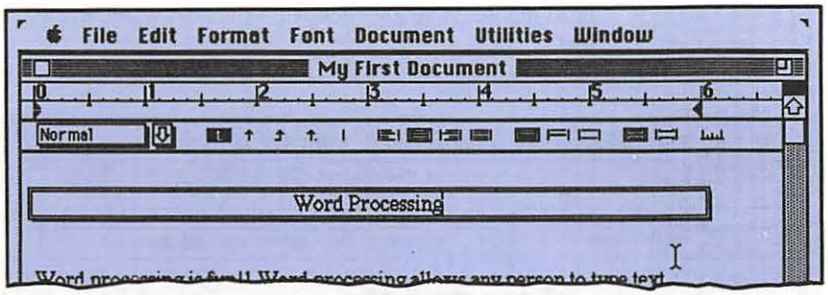


Figure 7.28
The title is now surrounded by a double line box with a slight shadow.

You can see that the box extends to the left and right margins for this line. The width of the box is controlled by the margins!

Drag the right margin indicator two inches to the left.

Change the right margin from 6 inches to 4 inches. Remember that text remains centered between its margins. The title of the document will shift left when you do this.

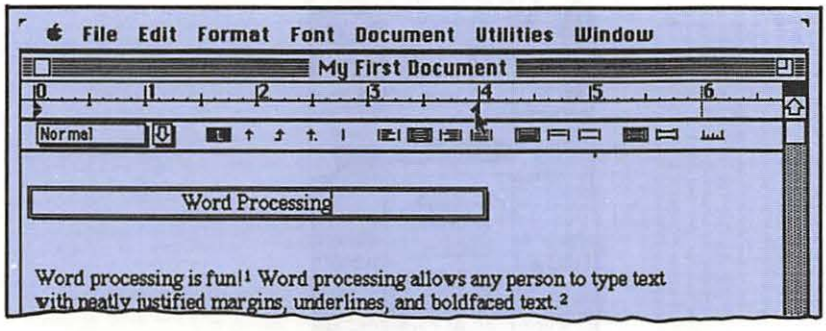


Figure 7.29
The new right margin. The mouse pointer is on the right margin indicator on the ruler line.

Drag the left margin indicator two inches to the right.

Make a matching change to the left margin for this line. Remember to drag the lower portion of the split left margin indicator so that the upper portion moves at the same time!

Since you have changed the left and right margins for this line an equal amount, the title is properly centered and contained in a reasonably sized box.

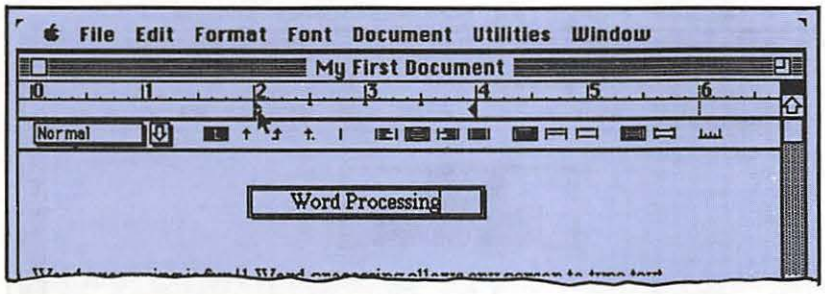
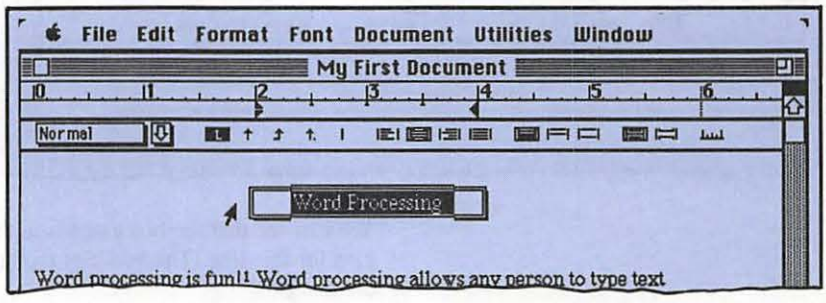


Figure 7.30
The nearly finished title.

Select the complete title.

You are going to do one more thing to this text. To make any changes, it must be selected. Simply place the mouse to the left of the title, where it will be a mirror arrow-head mouse. A single click will select the whole line of text.

Figure 7.31
The title is selected.



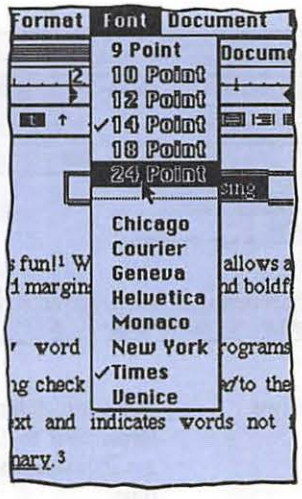
Pull down the Font menu.

You are going to change the size of this text.

Drag the selection bar to 24 point.

You want the title in a large type size.

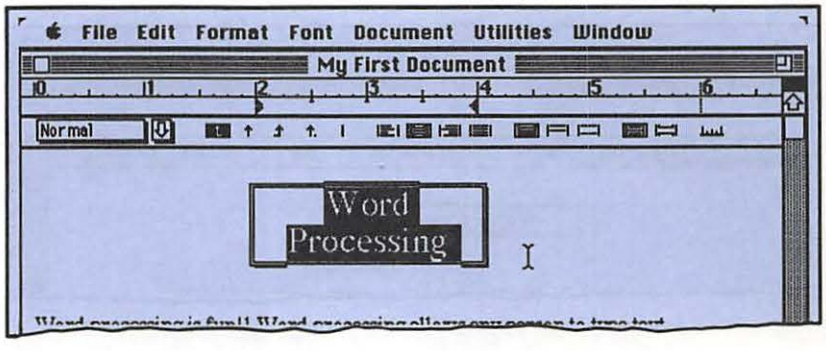
Figure 7.32
The 24-point size is selected.



Release the mouse button.

Execute the font size change. The document title will immediately be displayed in 24-point letters.

Figure 7.33
The re-sized title.



7.9 CHANGING TAB STOP POSITIONS

You have seen, by looking at the ruler line, that Word has default (that is, preset) tab stop positions at every one-half of an inch. Each tab stop is denoted on the ruler line by the small triangle beneath the ruler.

Unfortunately, these tab stop positions are not always the desired ones. It is a relatively simple task to change the preset tab stop positions. You may change them for a single paragraph of your work, or the complete document. Recall that when you made a margin change, it affected the selected text. The same is true when changing the tab stop locations. If the text is selected, a tab stop change will affect that paragraph. If the text is not selected when making the change, that un-selected text will not be affected.

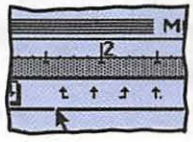


Figure 7.34
The Word tab stops.

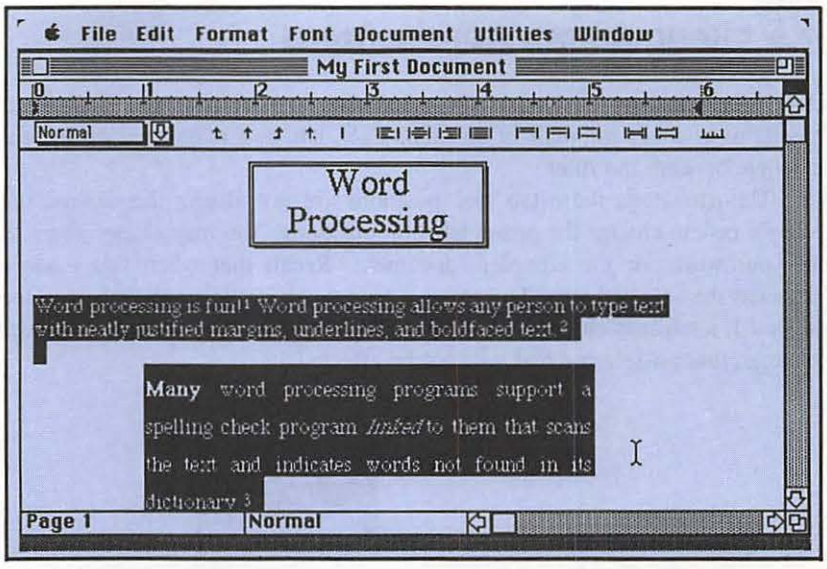
Before you begin, look at the four different tab stop types available to you. They are displayed under the ruler line between the one and one-half and two and one-half-inch marks. From left to right, they are the left align tab stop, the center tab stop, the right align tab stop and the decimal tab stop.

The left align tab stop is the one you may be used to using. All the default tab stops are of the left align variety. When you tab to one of these positions, typing continues onward from the location of the tab stop. The right align tab stop causes what you type to push backwards as you enter the characters. You will use a right align tab stop when you are entering the page number in a footer, later in this chapter. The center tab stop causes text to be centered around the tab position as you type, rather than between the left and right margin, which is where text is normally centered. The decimal tab stop causes numbers to line up in neat columns, like this:

67.98
1.05
987.55
1,765,654.21

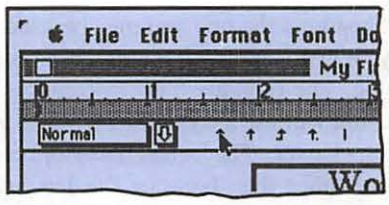
What To Do	*Why You Are Doing It*
Select all the text, except the document title.	You want to make a tab stop change and have it effect everything except the document title. Note that part of the ruler line becomes shaded when you make this selection. This is happening because there are margin, and possibly other, changes within the document. Thus, the shaded ruler line is telling you that there is a format change within the selected portion of the document.

Figure 7.35
You have selected the complete document, except for the document title. Note the shading on the ruler line.



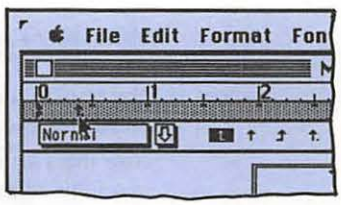
Move the mouse pointer to the left tab icon.	This icon is below the one and a half point on the ruler line.

Figure 7.36
You are about to use the Left Align tab stop icon.



Press and hold the mouse button.	Select the Left Align tab stop.
Drag the Left Align tab stop to the 3/8 point on the ruler line.	This position is one tick mark to the left of the half-inch position on the ruler.
Release the mouse button.	Position the tab stop.

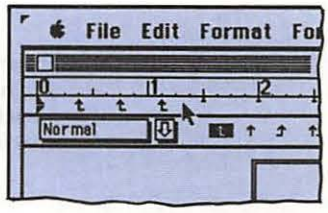
Figure 7.37
The tab stop has been placed on the ruler line.



Move the mouse pointer to the left tab icon.	You want to place a second tab stop.
Press and hold the mouse button.	Select the Left Align tab stop.
Drag the Left Align tab stop to the 3/4 point on the ruler line.	This position is half way between the one-half and one-inch marks on the ruler line.

Release the mouse button.	Position the tab stop. When you do this, notice that the preset tab stop disappears from the one-half-inch mark. **Adding tab stops removes the preset tab stop to the left of the new tab.**
Move the mouse pointer to the left tab icon.	You want to place a third tab stop.
Press and hold the mouse button.	Select the Left Align tab stop.
Drag the Left Align tab stop to the 1 1/8 point on the ruler line.	This position is one mark to the right of the one-inch mark on the ruler line.
Release the mouse button.	Position the tab stop.
←	Press the left arrow to de-select the document. You may also simply click the I-beam cursor anywhere in the document to achieve this same affect. Look at the ruler line. You can see the three new tab stops you have placed at the beginning of the ruler.
↓ ↓	As you move the cursor down in the text, you can see that the new tab stops remain on the ruler line. Remember, this will be true only if you selected the complete document before inserting the tab stop indicators.
Place the cursor in front of the word "Word" which starts the first paragraph.	You are going to insert a tab at this location.
[TAB]	Press the Tab key to indent the paragraph. The Tab key is located next to the letter "Q" on the left side of your keyboard, and is clearly labelled "tab."

Figure 7.38
You are now able to easily see the new tab stop positions. Notice that the preset tab positions at the 1/2" and 1" marks are no longer present.



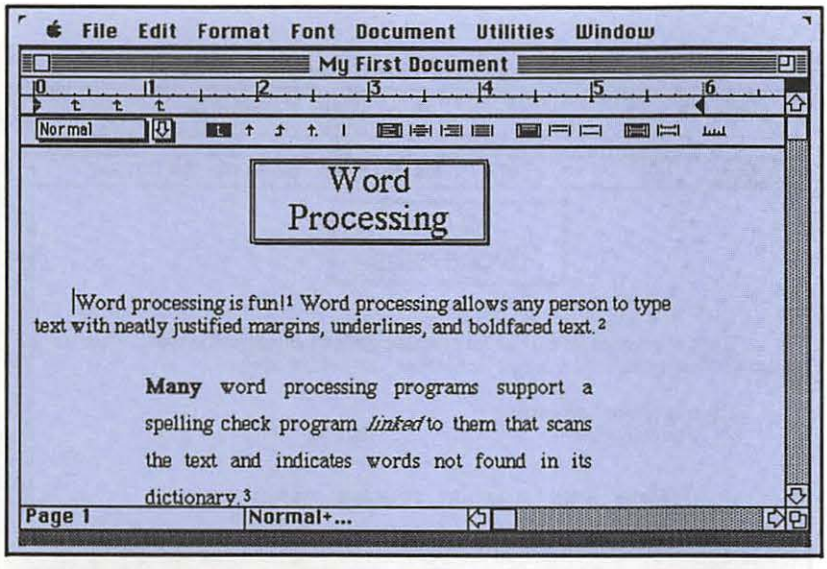
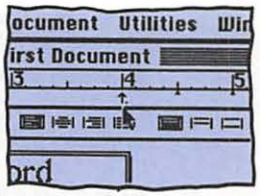


Figure 7.39
The first paragraph is indented to the newly inserted tab stop.

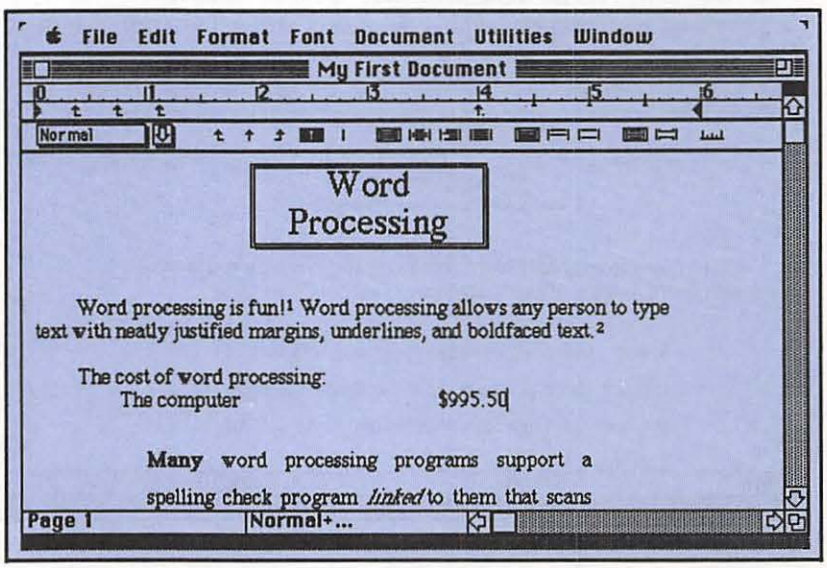
Place the cursor after the last character of the first paragraph.	You are going to add a new line of text after this paragraph, and use numeric tab stops.
[cr] [cr]	Add a blank line.
Move the mouse pointer to the decimal tab icon.	You are going to place a decimal tab stop on the ruler line.
Press and hold the mouse button.	Grab a decimal tab icon.
Drag the decimal tab to the 4-inch mark on the ruler line and release the mouse button.	Place the decimal tab stop at the four-inch mark on the ruler line.

Figure 7.40
The ruler line now contains a decimal tab stop at the 4-inch mark.



[TAB]	Tab the cursor to the first tab stop position.
The cost of word processing: [cr]	Type this line of text, followed by a return.
[TAB] [TAB] The computer	Type this text, after pressing the tab key twice.
[TAB]	Tab the cursor to the decimal tab stop position.
$995.50	Enter this amount. Watch the Macintosh display as you type. The characters will move left on the screen, rather than the cursor moving right. When you press the decimal point, normal typing will be restored.

Figure 7.41
Note that the decimal point is directly under the tab stop location at the four-inch point on the ruler line.



[cr]	Push the return key and start a new line.
[TAB] [TAB] The printer [TAB] 350.00 [cr]	Enter the next line. Note that the decimal points line up in a neat column.

[TAB] [TAB] The software [TAB] 250.00 [cr]	Enter the last line.
[TAB] [TAB] [TAB] TOTAL [TAB]	Enter a line for the total.
$1,595.50	Enter the total cost.

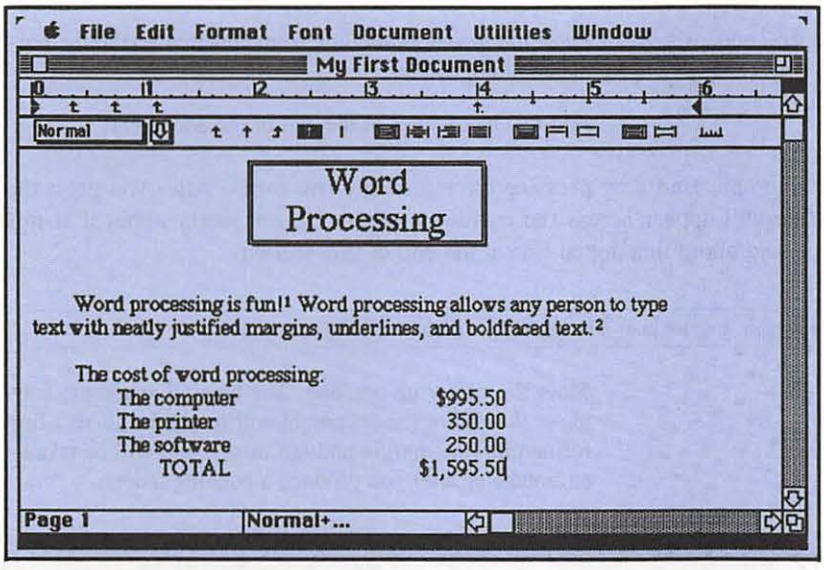


Figure 7.42
All of the entries line up on the decimal tab stop. This is even true for the total, which included a dollar sign and a comma.

7.10 THE HANGING INDENTATION

The hanging indentation, or indent is a useful feature when you create lists of information. It is a form of margin change. To create it, you will take advantage of the split left margin indicator to create a double left margin.

The hanging indent creates text that looks like this:

* This is the first hanging indent paragraph. Notice that the left margin of this paragraph is not under the star. The indentation is, in effect, hanging out backwards into space. Some people call this a backward indent!
* Here begins a second hanging indent paragraph. Because the asterisks are hanging out, each paragraph or point in your list can be located easily.

This same effect can be created by use of the tab key or the space bar. However, problems will then occur if you edit the text of the paragraphs created in this fashion. You will have tabs or spaces appear in the middle of paragraphs if you add or remove enough text to effect where the lines must word wrap. The hanging indent avoids this problem by creating a left margin position that follows a press of the return key, and a second left margin position that follows text that is word wrapped. If text is edited, Word knows to wrap the lines to the second left margin that you have created, rather than the first.

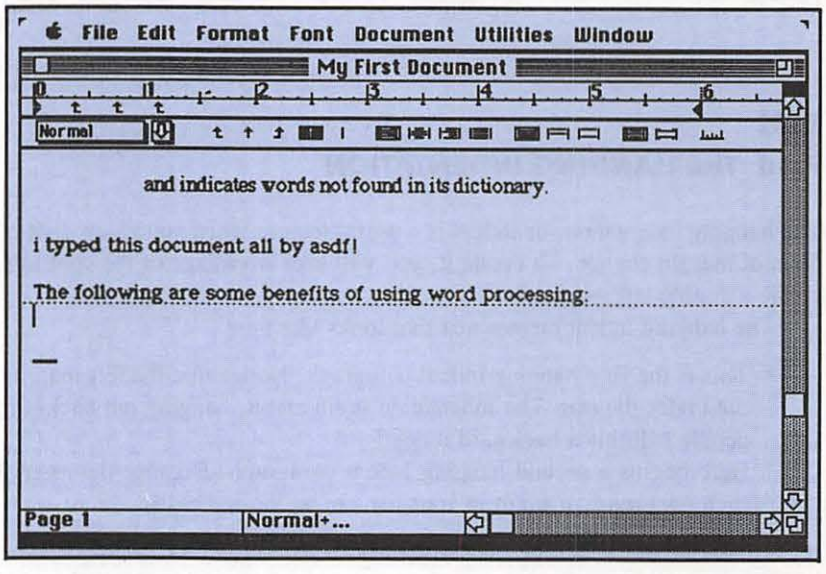
What To Do	*Why You Are Doing It*
⌘3	Move the cursor to the end of the document. You may, of course, use the mouse to position the I-beam at the end of the document, then click the mouse button once.
Drag the right margin indicator to the six-inch point on the ruler line.	Reset the right margin to its default location.
Click on the left align icon under the 3 on the ruler line.	Reset the format of the line from centered text to the normal, left aligned text.
[cr] [cr]	Add two blank lines to the end of the document.

Type this brief paragraph. End it by pressing the return key **two** times. After you press the return key, a dotted line will appear across the current window. Do not worry about it at this moment. More will be said about this dotted line at the end of this section.

```
The following are some benefits of using word processing:
```

↑	Move the cursor up one line. The blank line you are leaving at the end of the document will retain the current line formatting (the margin and tab stops), and will be taken advantage of after you produce a hanging indent.

Figure 7.43
Your document.



Drag only the **top** portion of the left margin indicator LEFT on the ruler line three-eighths of an inch.	In effect, you are placing the left margin off the page! The ruler line will display negative values. Be sure that you grab only the top half of the left margin indicator at this time, leaving the bottom half of the margin indicator at the zero position on the ruler line. When you are done, your display should look similar to Figure 7.44.

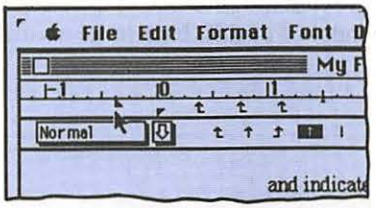


Figure 7.44
Look at the ruler line. It shows negative numbers.

Drag the **bottom** portion of the left margin indicator RIGHT on the ruler line to the 1 1/8-inch point on the ruler line.

This is the location of the third tab stop that was entered. Note that the top portion of the left margin indicator moved with the bottom portion.

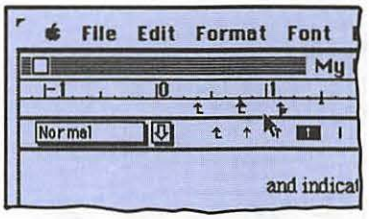


Figure 7.45
The split left margin indicator is aligned with the second and third tab stop.

[OPTION]-8

Hold down the Option key and press the number 8 from the numbers found at the top of the keyboard. This will place a bullet character into the document. The Option-8 key produces the bullet character in many of the standard Macintosh fonts.

Having entered the bullet, you are ready to enter the text.

[TAB]

The Tab key will move the cursor to the next tab stop on the line. This should be the third one that you entered. This tab position matches the bottom half of the left margin indicator.

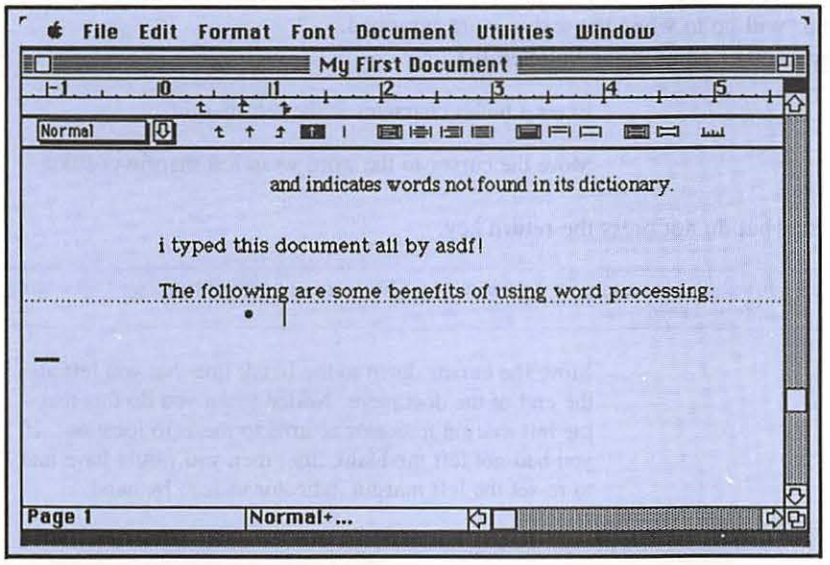


Figure 7.46
Look at the current location of the cursor.

Now enter the following text, and end by pressing the return key. As you are typing this line, the contents of the window will shift back to its normal location:

```
Faster text entry because it is easier to correct mistakes than with most
typewriters. [cr]
```

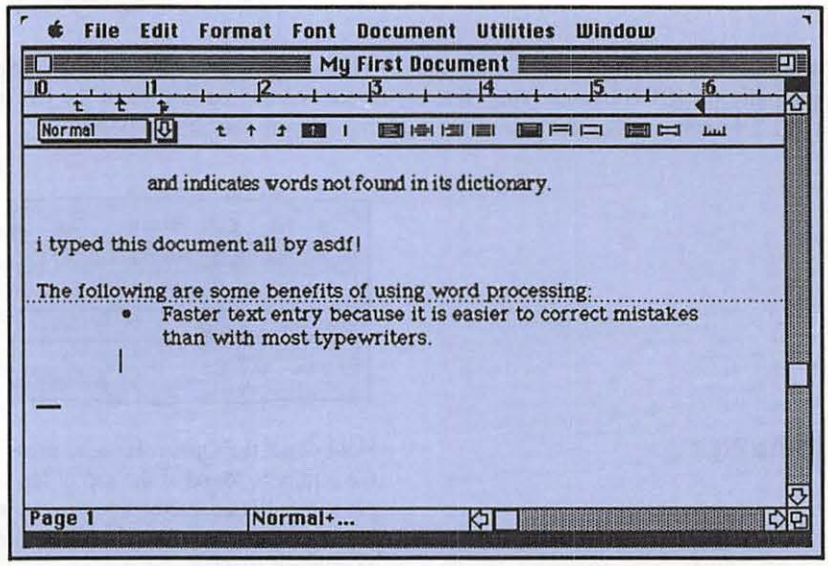


Figure 7.47
The line wraps after the word "mistakes" with the left margin indented to the margin position indicated by the bottom portion of the margin indicator.

When you pressed the [cr] at the end of this item, the cursor returned to its position under the bullet character you entered. The return denotes the end of a paragraph. If you had continued typing without pressing return, the left margin would have remained indented. Since you pressed return, the next paragraph begins at the farther left margin.

In fact, what is happening at this point is that the top portion of the left margin indicator represents the position on the line that the cursor will go to immediately after a return character is entered into the text. The bottom portion of the left margin indicator represents the position on the line that the cursor will go to when the text is word wrapped.

Now try entering another point in the bulleted list.

[OPTION]-8	Enter a bullet character at the left margin.
[TAB]	Move the cursor to the word wrap left margin position.

Type the following text, but do not press the return key:

```
Faster text entry because you do not have to wait for the typewiter mechanism to return
to the beginning of each line.
```

↓	Move the cursor down to the blank line that you left at the end of the document. Notice when you do this that the left margin indicator returns to the zero location. If you had not left the blank line, then you would have had to re-set the left margin indicator to zero by hand.

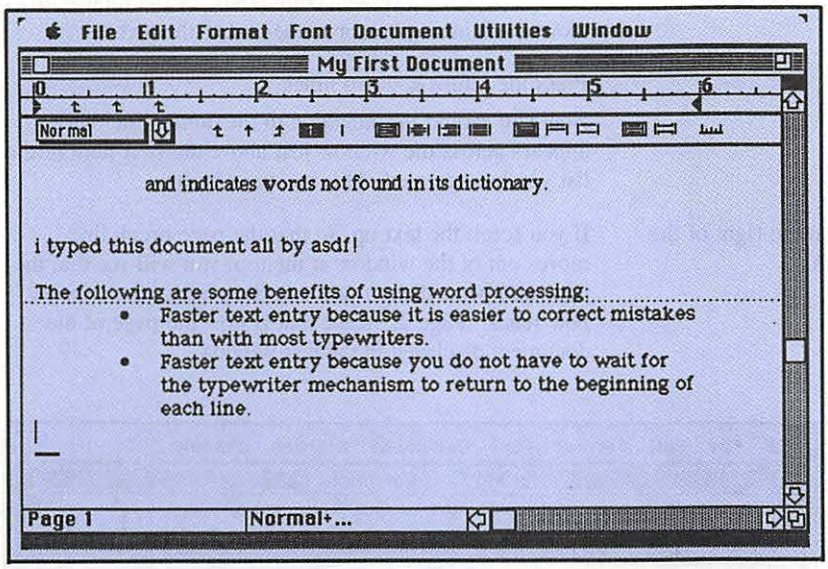


Figure 7.48
Note the left margin indicator on the ruler line.

Now position the cursor in front of the letter "c" beginning the word "correct" in the first point you entered. You are going to make this phrase read "make corrections to mistakes."

make [SpaceBar]

Type the word "make" in front of the word "correct" and then press the spacebar. As you are typing, the text is adjusted. Note that the word "mistakes" is moved to the next line, but that it stays at the left margin defined by the bottom half of the left margin indicator.

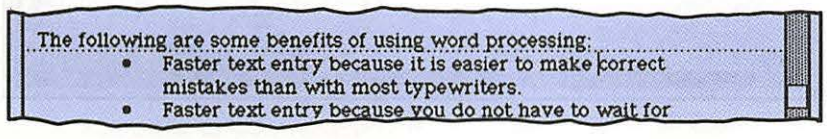


Figure 7.49
The word "mistakes" has wrapped to the indent position on the next line of the text.

Move the cursor to the end of the word "correct."

This is where you will add more text.

ions to

Complete the edit.

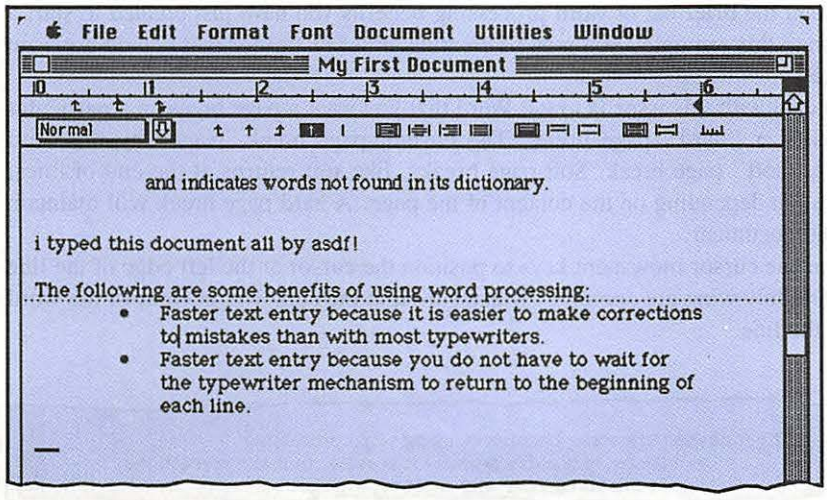


Figure 7.50
The completed edit.

Move the cursor to the end of the document.	Use the cursor movement commands, or the mouse, to move the blinking cursor to the end of the text.
[cr] [cr]	Press the return key two times.
	Now you should pay attention to the dotted line that appears across the window just above the first item of the list you have created. This is a page break.
Move the scroll box at the right of the window to the bottom.	If you scroll the text up, so that the page break line moves out of the window at the top, you will see that the page number indicator at the bottom left of the window now reads "Page 2," since that is now the page of the document displayed in the text window.

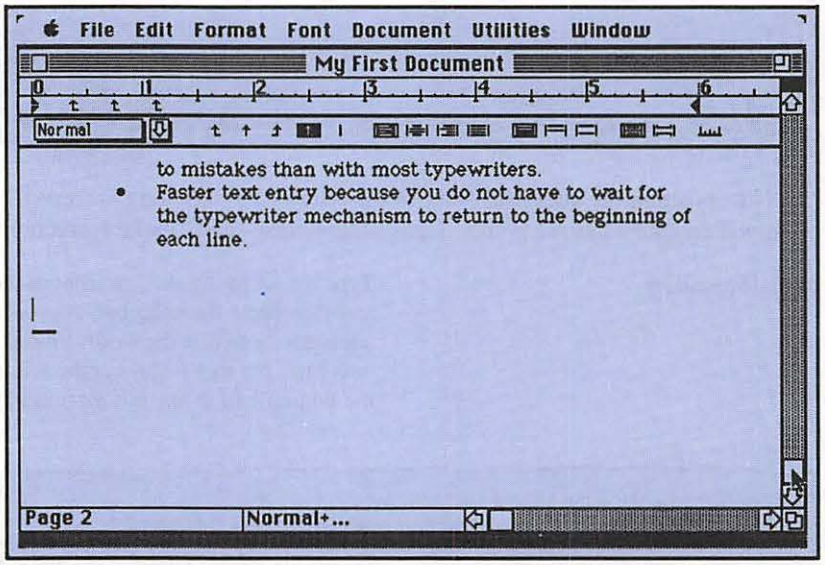


Figure 7.51
The current page number now reads 2.

7.11 FORCING A NEW PAGE

As a stylistic issue you may find it desirable to keep portions of a document on one page. For example, you may want the brief list of word processing benefits you have just created to start a new page. In addition to this example, you may be creating tables or figures that you do not want broken over two pages.

The best way to deal with this issue is to tell Word that you want a page break in a particular location. This is called a "hard" page break. The current page break, placed by the word processor, is called a "soft" page break. Soft page breaks, like soft returns at the end of lines, can change their location depending on the content of the page. A hard page break will maintain a fixed location in the document.

Use the mouse or the cursor movement keys to position the cursor at the left edge of the line of text beginning "The following are some...". Make sure that the cursor is in front of the word "The" which starts the line.

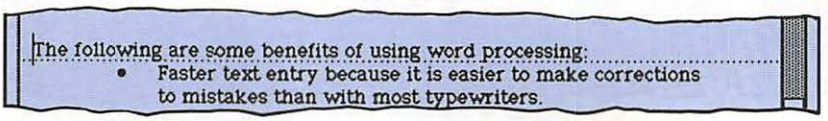


Figure 7.52
Note the location of the cursor in the text.

What To Do	*Why You Are Doing It*
[SHIFT]-[ENTER]	Hold down the Shift key and press the key labelled "enter," **found on the keyboard's number pad**. This is NOT the same as the return key.
	You have inserted a Hard Page break into the document. You can see that a hard page break appears as a line of closely spaced dots across the screen, as compared to the line of separated dots you saw earlier that denoted a soft page break.

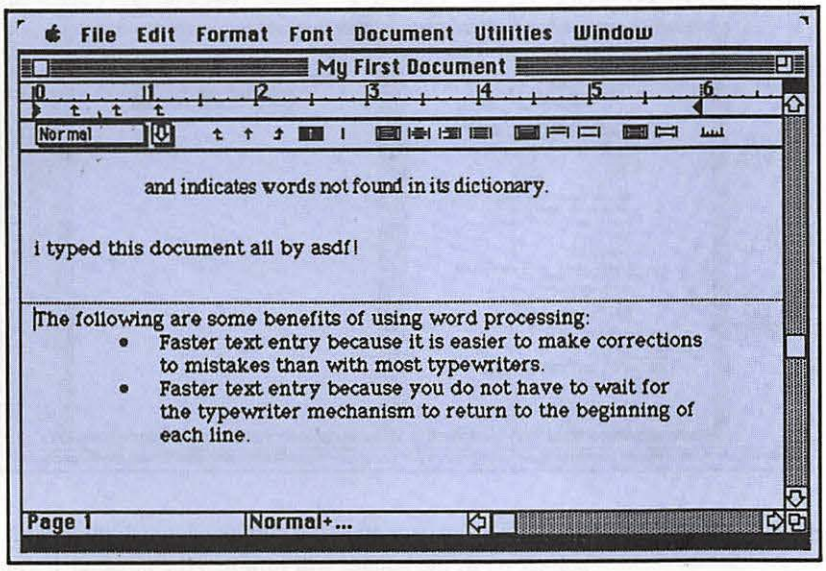


Figure 7.53
Compare the hard page break shown here with the soft page break seen in Figure 7.52.

If you place a hard page break into the text in either the wrong location, or because of editing what becomes the wrong location, it is easy to remove. All you need to do is remember that the hard page break is another character that you have entered into the text. You may use any technique you are already familiar with for deleting characters to delete a hard page break. For example, use the mouse to position the I-beam on the line immediately **after** the hard page break. Click the mouse button to move the cursor to that location, then press the backspace key. The cursor in Figure 7.53 is shown in the correct location to delete the hard page break by pressing the backspace key. You may, of course, select the hard page break line by double-clicking on it. Then, once again, press the backspace key to delete the page break from the text.

7.12 ADDING PAGE NUMBERS TO THE DOCUMENT

Word does not insert page numbers automatically into your printed document. While not having page numbers is desirable for documents such as letters, you may want to include page numbers on longer documents and reports.

You may create page numbers two ways with Word. The easiest is to make use of the Print Preview/Page View feature to position the page number on the page. You may also include page numbers in either a running header or running footer. This latter method is discussed in the next section of this chapter.

What To Do	*Why You Are Doing It*
⌘I	This is the command key for the Print Preview command, found on the File menu. Note the four icons at the left of the display. The top one is used to activate and position the page number in the document.

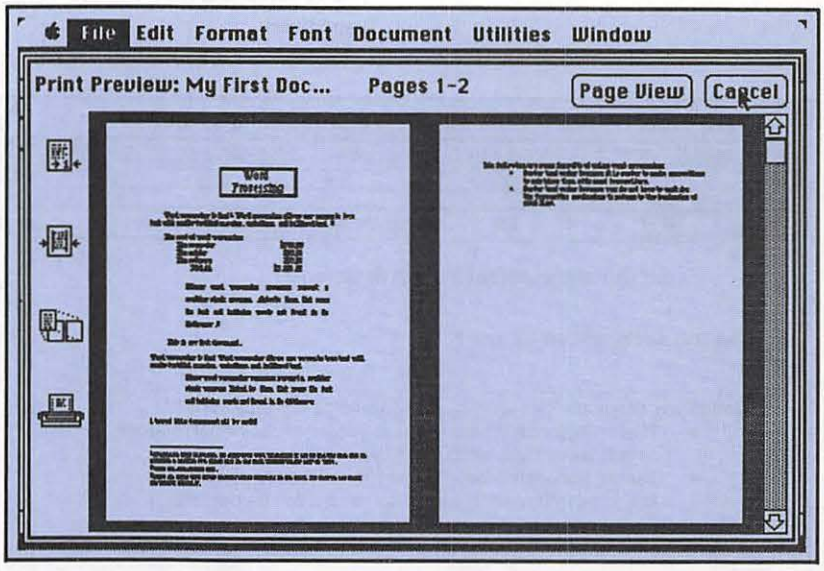


Figure 7.54
The Print Preview display. Note the icons at the left of the screen.

Click on the TOP of the four icons.	This is the page number icon. When you click the mouse pointer on it, the pointer will turn into the numeral 1 with small arrows pointing to it.
Move the mouse to position the page number icon at the top right of the first page of the document.	You want to page number the document, and you want the page number to be printed at the top right corner of the page.

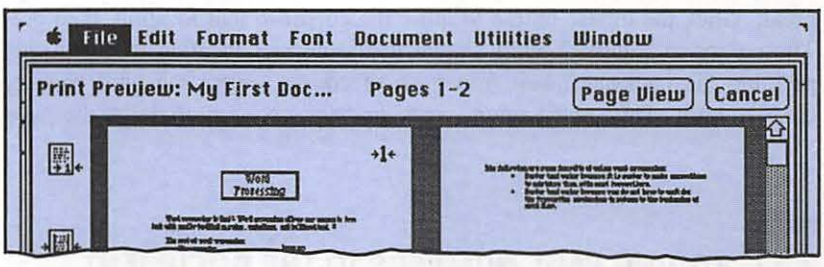


Figure 7.55
The page number icon is positioned at the top right of the first page of the text.

Click the mouse.	By pressing the mouse button once, you place the page number icon. After a brief pause, the pages will be redrawn with the page numbers included.

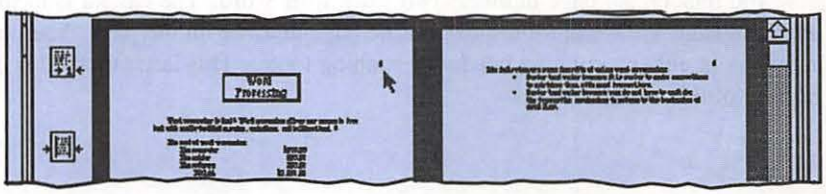


Figure 7.56
After clicking the mouse, the page numbers are inserted into the document.

Click on the Cancel button.	You are through looking at the Print Preview screen. Clicking on the Cancel button returns you to the normal Word edit mode.

If you decide that you do not like the location of the page number, simply click on the page number icon at the left of the screen again. After you have activated the page number icon, position it to the desired location on the page, and click the mouse button. The old location of the page number will be forgotten, and the new one you have chosen will take its place.

7.13 HEADERS AND FOOTERS

An alternate method you may use to number your document's pages is to create running headers or running footers and include the page number in them. A running header or footer is a line or two of text that will appear at the top (in the case of a header) or bottom (in the case of a footer) of each page in the document. If you look at the top of any page of this text, you will see a running header. The header on the right side page, the odd page number, is the same throughout the complete document. The header on the left side, or even page number, changes in every chapter, but remains the same within a single chapter.

Before you activate either a running header or a running footer, you should delete the page number you activated through print preview. You do not want both active for aesthetic reasons.

What To Do	*Why You Are Doing It*
Pull down the Format menu and select the Section command.	The Section dialog box (Figure 7.57) will let you deactivate automatic page numbering, which is what you turned on in the last section.

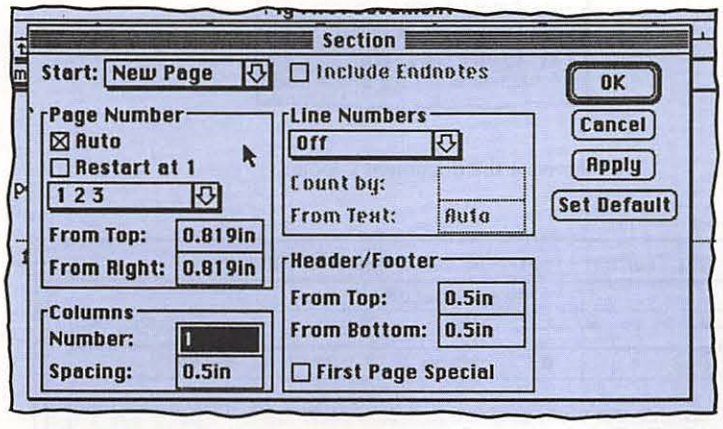


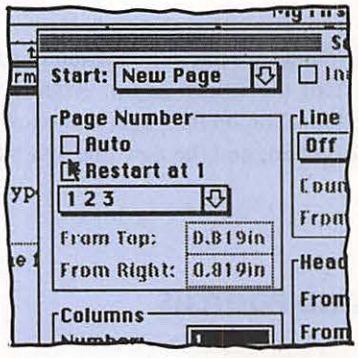
Figure 7.57
The Section dialog box.

At the top left of the Section dialog box is an outlined area labelled Page Number. Inside this area is a check box labelled Auto. The Auto check box is currently "X"ed, indicating that auto page numbering is active.

Click on the Auto check box.

Turn OFF auto page numbering.

Figure 7.58
Auto page numbering has been turned off.



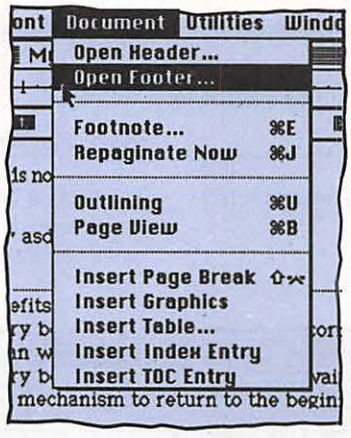
Click on the OK button.

Put away the Section dialog box. You are now ready to activate a header or footer to contain the page number.

Pull down the Document menu and select the second item, Open Footer.

You have decided to use a running footer in which you will include the page number.

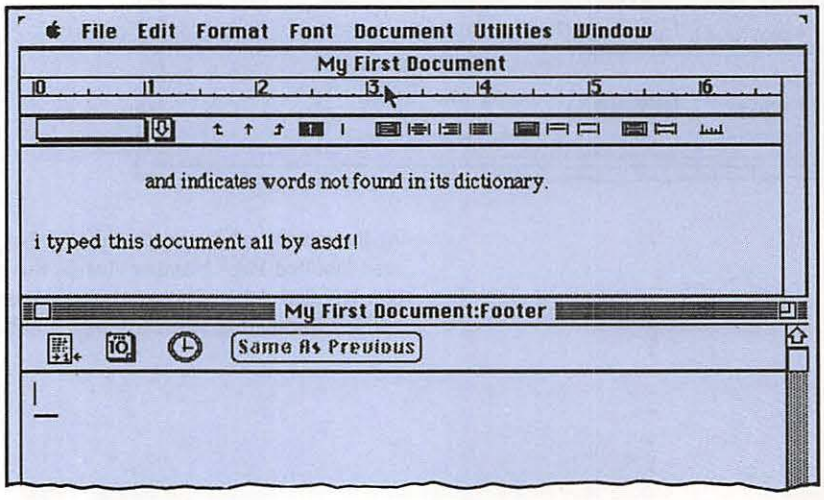
Figure 7.59
Open Footer... has been selected from the Document menu.



Release the mouse button.

Activate the document's footer.

Figure 7.60
You are ready to enter a new footer into the document.



You are now ready to enter the text of the running footer.

Word Processing Report

This is the text that you want to appear in the footer.

⌘R

Activate the Ruler Line for the footer. Look carefully at the right margin indicator. You can see that there is a tab stop positioned at the right margin. This is preset to a right aligned tab.

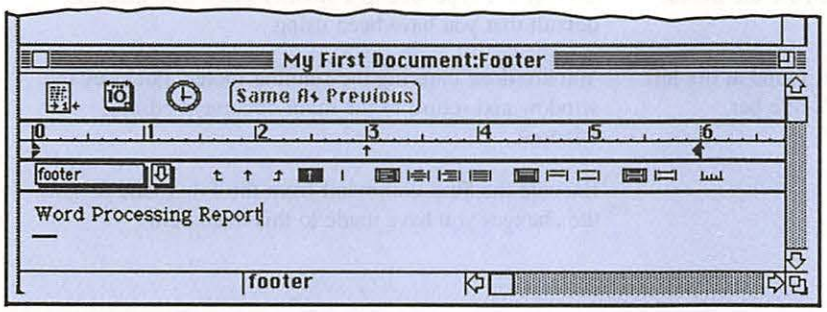


Figure 7.61
The ruler line in the footer is different from the default ruler line in the main document. Note the center tab stop in the middle of the ruler line, and the right align tab stop under the right margin indicator.

[TAB] [TAB]

Tab the cursor to the right align tab stop at the end of the line.

Page [SpaceBar]

Enter the word "Page" followed by a single space.

Click on the page number icon at the top left of the footer window.

The page number icon looks exactly the same as the page number icon you used on the print preview screen.

When you click on this icon, the current page number will automatically be inserted into the footer at the current cursor location. The other two icons you see in the footer window will let you place the current date and time into the footer. These same icons appear in the header window.

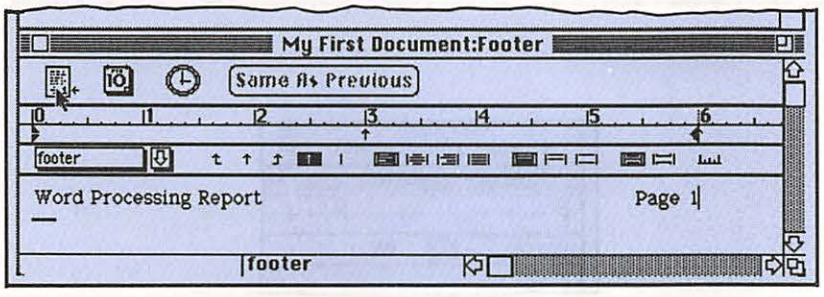


Figure 7.62
The page number has automatically been inserted into the footer.

Click on the left edge of the footer window to select the complete line of text you have just entered.

Now that you have entered the text into the footer, you must make its font match your hardware and the rest of the document.

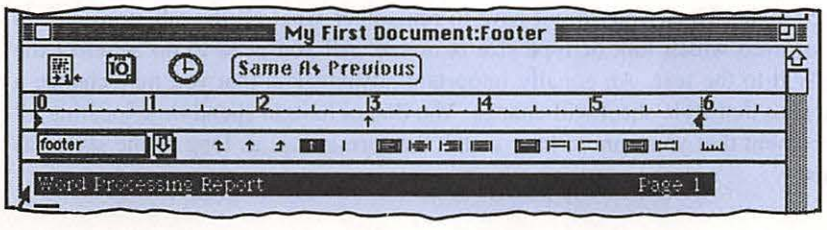


Figure 7.63
The complete line of the footer has been selected.

Pull down the Font menu.	The footer is set to the default Word font, which is New York. You must change this to Times if you are using a LaserWriter.
Select the Times font and release the mouse button.	Change the font in the Footer to Times.
Pull down the Font menu.	This time, you are going to change the size of the type.
Select 10 Point and release the mouse button.	Change the type size to a smaller point size than the default that you have been using.
Click on the close box found at the left of the footer window's title bar.	You are done entering the running footer. Put away the window and return to the main document editing window.
⌘S	Execute the Save command from the File menu to save the changes you have made to this document.

7.14 MODIFYING AND USING EXISTING STYLE SHEETS

By now you have noticed the word Normal that appears at the bottom of the current document window (Figure 7.64). This is a message telling you which style sheet Word is making use of at the moment. The box below the left end of the ruler line has also displayed the name of the style sheet in use (Figure 7.65). A style sheet is a tool for defining formatting commands. You may use a style sheet to hold ruler line and paragraph definitions, as well as character font and size definitions. In short, the formatting accessed on the Format and Font menus can be combined into a single entity, called a style.



Figure 7.64
The word Normal appears at the bottom of the text window, telling you that the Normal style sheet is in use.

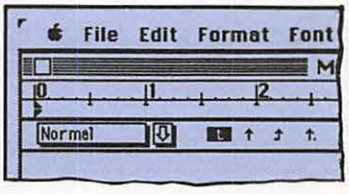


Figure 7.65
The word Normal, indicating the current style sheet, also appears in the box at the left end of the ruler line.

You have actually seen other preset styles when you used footnotes and footers. You can change styles within a document, or even change the definition of a style. In this section, you will have the opportunity to change existing style sheets, as well as create a new one.

The advantage of Style Sheets is that you may apply them to existing text, making that text conform to the defined style. Thus, you do not have to remember what all the tab stop settings are for a paragraph, or even which font or type size is in use. All you need to do is select the desired style and apply it to the text. An equally important advantage is that you may change a style, and all text that uses that style sheet will change. You do not have to spend time locating all the places in your document that you want to have match the formatting, as long as the style has been applied to the text.

What To Do	*Why You Are Doing It*
Place the mouse pointer on the open down arrow to the right of the word Normal just below the ruler line.	This arrow key is one way that you can access the list of styles associated with the current document.
Press and hold the mouse button.	Pressing the mouse button will pull down the list of styles.

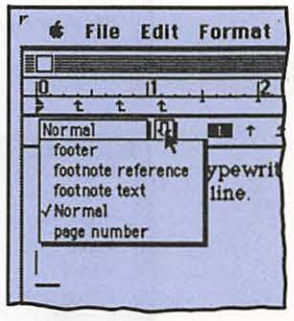


Figure 7.66
These style sheets are available in this document.

Release the mouse button.	Do not change a style yet.
⌘9	Move the cursor to the beginning of the document.
Double-click on the footnote reference number 1 after the first sentence of the text.	Double-clicking on a footnote reference will open the footnote window at the bottom of the window. You can see that the style sheet indicators no longer read Normal, but Footnote Text. There is a different style associated with footnotes than normal text.

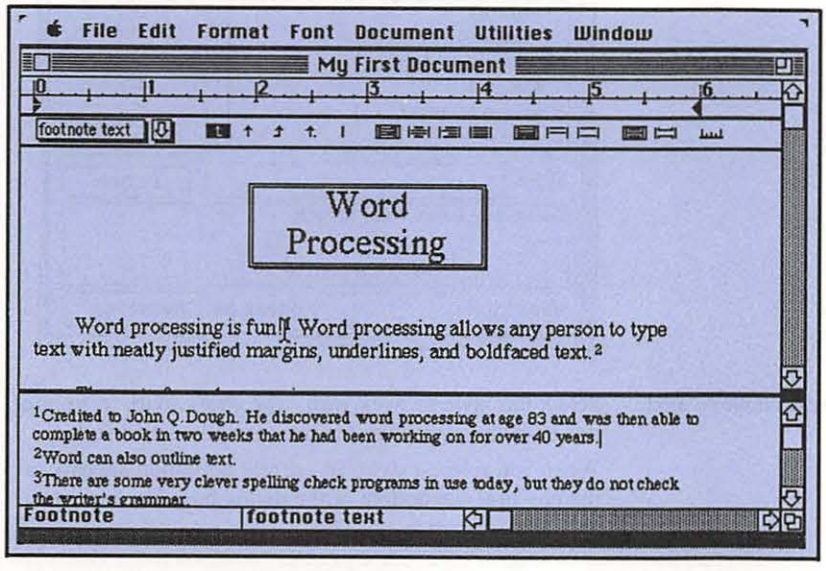


Figure 7.67
You can see that Footnote Text appears at the bottom of the window and in the box at the left end of the ruler line.

Pull down the Format menu.	This menu contains the command for editing style sheets.

Select Define Styles.

The Define Styles command may be executed by using ⌘T.

Figure 7.68
The Define Styles command has been selected.



Release the mouse button.

Execute the Define Styles command. After a brief pause, you will see the Style dialog box for the current document.

Figure 7.69
The Styles dialog box.



Click on the style named Footnote Text.

Select this style to work with. The check mark in front of this style indicates that it is the currently active style.

When you select a style, its current definition appears in the box near the bottom of the dialog box. You are going to modify this style.

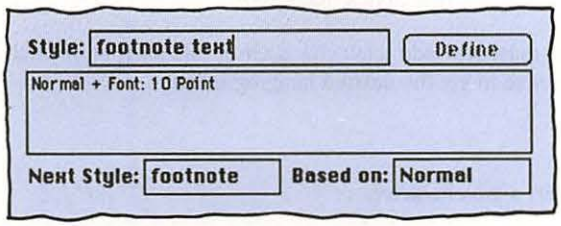
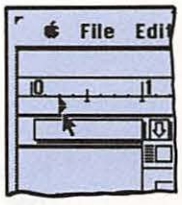


Figure 7.70
The style definition for Footnote Text.

Pull down the Font menu and select the Times font, then release the mouse button.	Make Times the font used in the footnote text definition, rather than the default New York font.
Pull down the Font menu and select 12 Point.	Make the size of the font 12 point, rather than 10 point.
Drag the left margin on the ruler line to the one-fourth position.	You are going to create a hanging indent for the footnotes, so that the numbers stand out at the bottom of the page.
Drag the top portion of the left margin back to the zero position on the ruler line.	Remember, to create a hanging indent you define two left margin positions. After a return is encountered, the cursor returns to the position of the top portion of the left margin marker, otherwise it word wraps to the position of the bottom portion of the left margin marker.
Drag a left align tab stop to the position of the bottom portion of the left margin indicator.	Set a tab stop to the same position as the indented left margin.

Figure 7.71
Note the position of the left margin.



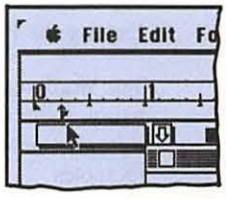


Figure 7.72
The left margin indicator now looks like this.

Click on the Define button.	Make the definition you have created the current one for this style. The style definition is now complete. You can see what it is by looking in the definition box (Figure 7.73).

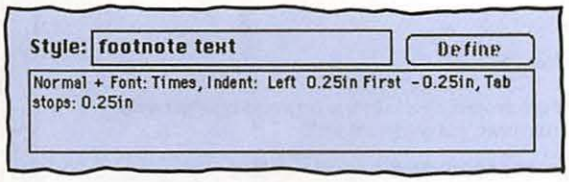
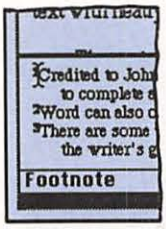


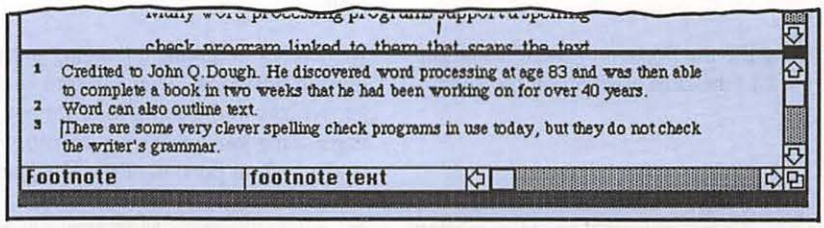
Figure 7.73
The updated style definition box reflects the changes you have made to the Footnote Text style.

Figure 7.74
Note the location of the cursor.



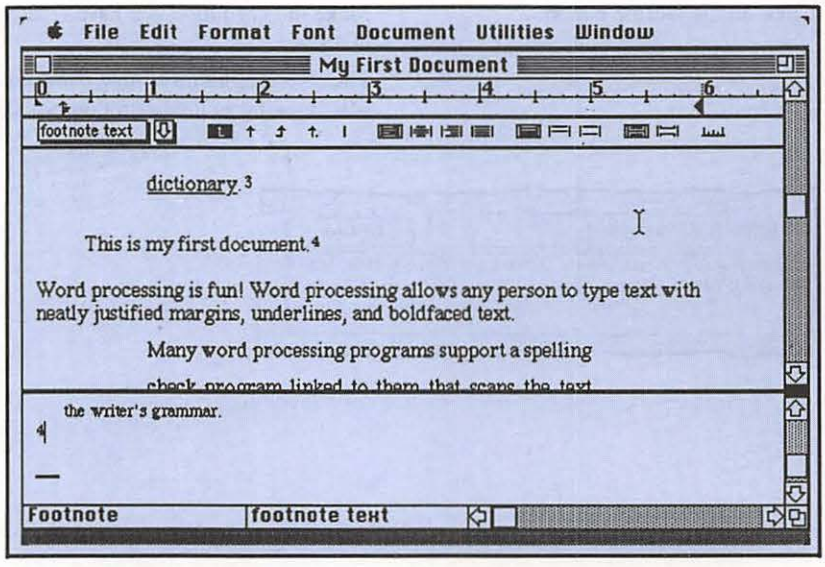
Click on OK.	Close the Define Styles dialog box.
Move the I-beam cursor so that it is between the footnote reference number and the footnote text, then click the mouse button once.	You must now add a tab character at this location in each footnote to get the desired hanging indent.
[TAB]	Insert a tab character.
↓ ↓ ← ←	Move the cursor so it is between the footnote reference number and the text for the second footnote.
[TAB]	Insert a tab character.
↓ ← ←	Move the cursor so it is between the footnote reference number and the text for the third footnote.
[TAB]	Insert a tab character.

Figure 7.75
Your footnotes will now have a hanging indent.



Click the I-beam after the sentence "This is my first document." in the body of the text.	You are now going to add a new footnote. This will show you that the style you have defined will take effect in any new footnote.
⌘E	Execute the Footnote command.
Click on OK.	Tell Word to auto-number the footnote. After a brief pause, footnote four will appear. You can see that the ruler line now shown is the one that you created for footnotes.

Figure 7.76
Note the location of the new footnote. Also, look at the current ruler line. It is the one you just created.



[TAB] But not my last!	Enter this text for the footnote. Don't forget to start it by pressing the tab key.
Drag the Split Bar on the right scroll bar to the top of the right scroll bar.	You are now finished with footnotes. Recall that this will hide them.

7.15 CREATING A NEW STYLE SHEET

Another important advantage of the Style sheet lies in your ability to create your own. You do not need to rely on Word to create them for you. In this section, you will create a new style sheet, based on existing text. You will then use this style sheet for new text.

What To Do	*Why You Are Doing It*
⌘9	Move the cursor to the beginning of the document.
↓	Move the cursor down one line into the title of the document.
⌘T	This command key activates the Define Styles dialog box. As before, New Style is highlighted. Notice that the style definition box near the bottom of the dialog box summarizes the formatting changes you made earlier to this line of text.
Titles	You want to use this style definition as it is. To do so, you must first assign it a name. Type Titles as the name for style.



Figure 7.77
The style definition box shows what you have done to the selected section of the text. You are giving it a name.

Click on the Define button.	Enter the Titles style into the list of styles that this document may use.

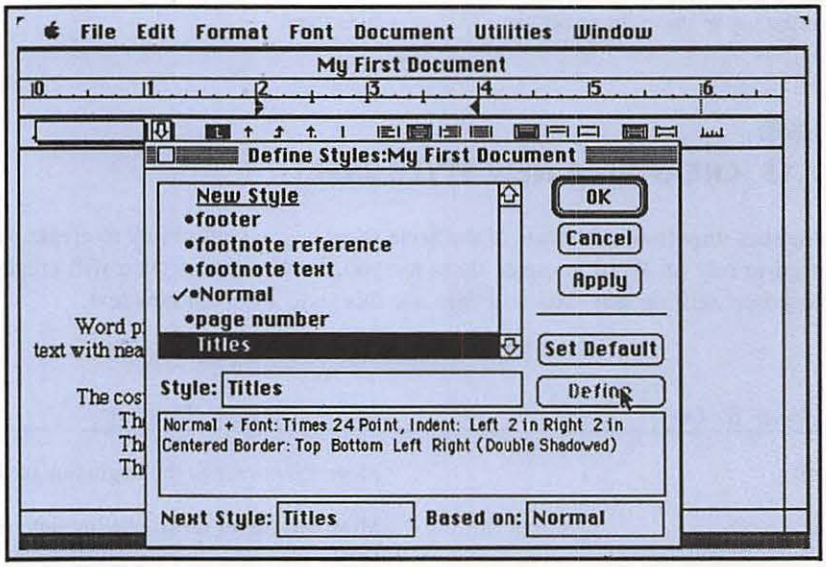


Figure 7.78
Titles is now a style that you may use in other parts of the document.

Click on OK.	You are done defining the style.
⌘3	Move the cursor to the end of the document.
[cr] [cr]	Add two lines to the end of the document.
↑	Move the cursor up one line, leaving a blank line at the end of your work.
Old Style	Type the text Old Style.
Pull down the styles list at the left side of the ruler line.	The Titles style now appears on the list of available styles.
Select the Titles style.	You want to apply this style to the current paragraph of your text.

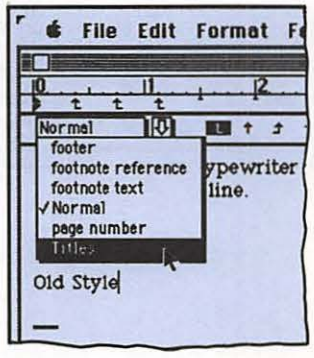


Figure 7.79
The Titles style has been selected.

Release the mouse button.	Apply this style to the current paragraph.

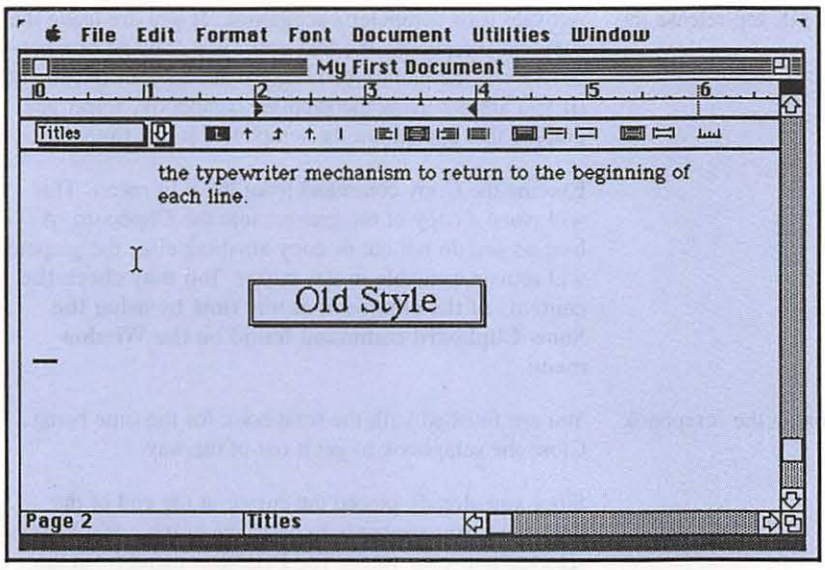


Figure 7.80
The Titles style has been applied to the current paragraph.

⌘S	Save the changes you have made to the document before continuing.

If you want to apply a style to several paragraphs or lines of the text, simply select the desired text before applying the style. You may also activate a style before you type. There is no need to wait until after typing to apply a style.

Remember, if you make a change to the definition of a style, that change will effect all segments of the document to which the style has been applied.

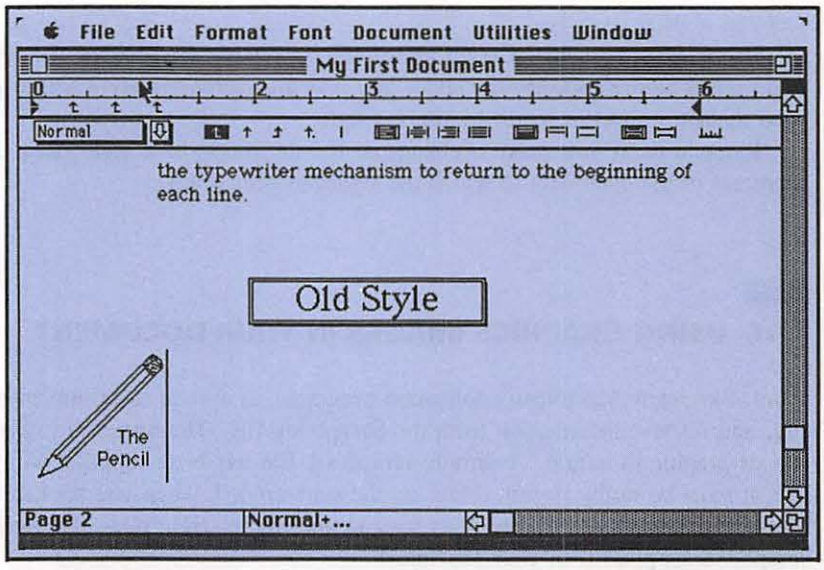
7.16 USING GRAPHICS IMAGES IN YOUR DOCUMENT

Word, like many Macintosh application programs, is able to store information to the Scrapbook file, and retrieve information from the Scrapbook file. The retrieved information may be either text or graphic in nature. A sample scrapbook file has been supplied with the text. To use this file, it must be in the system folder on the start-up disk when you boot the computer. If you do not have the supplied scrapbook in your system folder right now, you may also use the default scrapbook supplied with your Macintosh.

What To Do	*Why You Are Doing It*
⌘3	Use the command key numeral 3 (on the number pad!) to move the cursor to the end of the document. This should be the blank line that you left when you added the title in the prior section.
[cr] [cr] ↑	Add two more blank lines, then move the cursor up one line.
Pull down the Apple menu at the left side of the menu bar.	Remember that the Apple menu is the Desk Accessory, or DA, menu. The scrapbook is one of several DAs supplied by Apple with your computer.

Select the Scrapbook DA and release the mouse button.	Activate your computer's scrapbook. If you are using the supplied scrapbook, the first entry is a drawing of a pencil. This is the picture you want to add to your document. (If you are not using the supplied scrapbook, select any graphic that appears in the scrapbook at this time.)
⌘C	Execute the Copy command from the Edit menu. This will place a copy of the graphic into the Clipboard. As long as you do not cut or copy anything else, the graphic will remain available in this buffer. **You may check the contents of the clipboard at any time by using the Show Clipboard command found on the Window menu.**
Click on the close box on the scrapbook title bar.	You are finished with the scrapbook for the time being. Close the scrapbook to get it out of the way.
⌘V	Since you already placed the cursor at the end of the document, you are ready to paste the graphic you have selected into your work. The Paste command from the Edit menu will insert the graphic into the text.

Figure 7.81
The graphic is now a part of the document.



Drag the scroll box in the right scroll bar to the bottom of the scroll bar.	You want to size this graphic. To do so, you will want as much of the window available for working in as possible.
Place the I-beam pointer in the middle of the graphic and click the mouse button once.	By clicking the I-beam pointer on the graphic, you are selecting it. Note the three small black squares. These are used for changing the size of the graphic space in the document. They are called handles, since they are used to grab and manipulate the graphic.

Place the mouse pointer on the handle at the bottom right corner of the graphic.

This handle will let you stretch or shrink the graphic both wider and taller in equal proportions. The handle at the right side will make the graphic wider, while the one on the bottom will make the graphic taller.

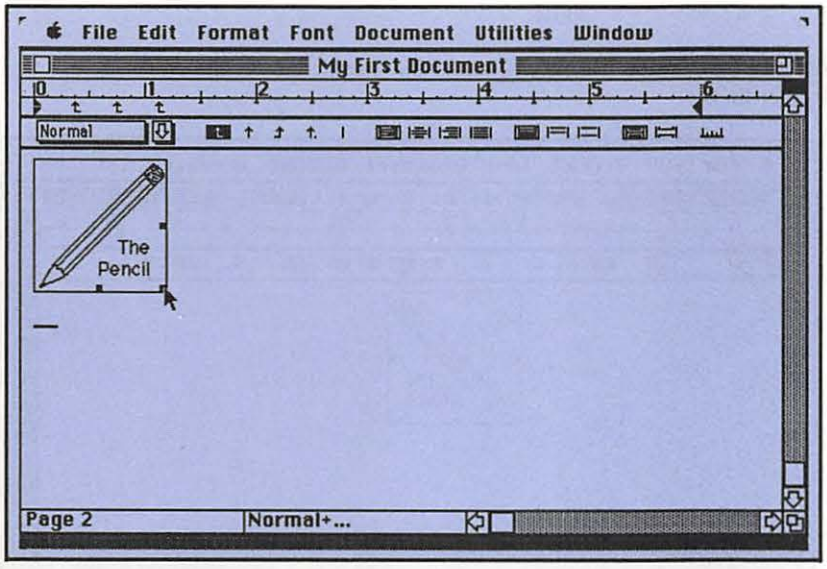


Figure 7.82
The mouse pointer is positioned on the handle at the lower right corner of the graphic.

Press and hold the mouse button.

When you press the mouse button, the page indicator at the bottom left of the window will read as a percent. This represents how much you are making the graphic bigger or smaller.

Drag the mouse down and to the right, making the graphic larger. Do this until the size indicator at the bottom left of the window reads 200%.

You are doubling the size of the graphic.

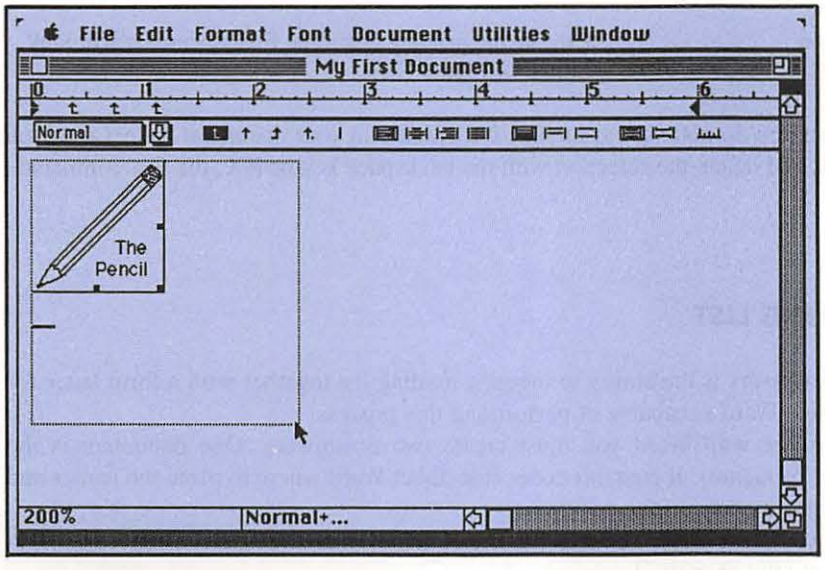


Figure 7.83
The new size of the graphic will be 200% of the original.

Release the mouse button.	The graphic will now adjust itself to the new space you have given it.
⌘Z	The UNDO command. If you pull down the Edit menu, it reads "Undo resize picture." You are returning the picture to its original size because you don't want it to be at 200%.
Click on the center text icon underneath the 3 1/2 point on the ruler line.	This will center the graphic on the line.

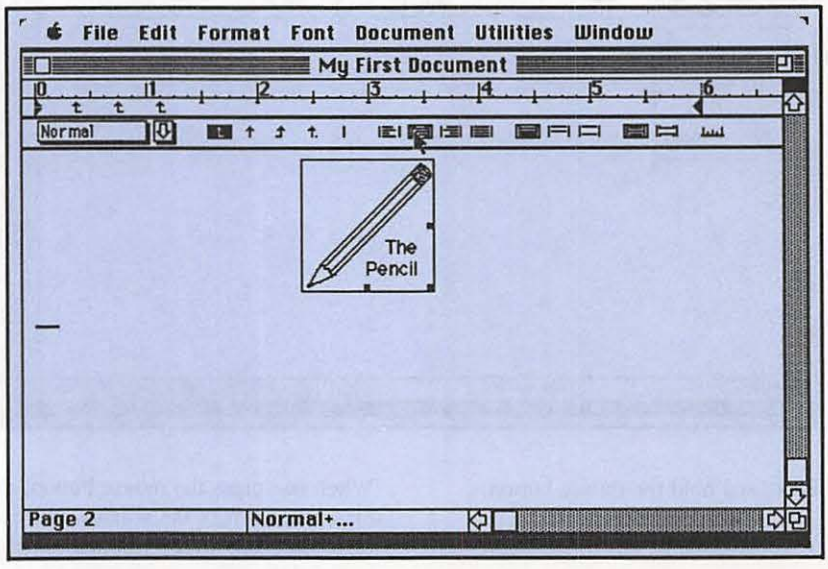


Figure 7.84
The graphic has been centered. You may also use the right align text icon to move the graphic to the right side of the line.

⌘S	Save the changes you have made to this document.

NOTE: YOU MUST HAVE A PRINTER ATTACHED TO YOUR COMPUTER TO PERFORM THE NEXT STEP.

⌘P	Execute the Print command from the File menu.
Click on the OK button	Execute the printing task. The final document will look similar to Figure 7.85.

If you decide that you do not want to include the graphic in your document, select it as you would any other text, and delete the selection with the backspace key or ⌘X, the Cut command.

7.17 THE MAILING LIST

A feature of word processors is the ability to merge a mailing list together with a form letter for mass mailing purposes. Word is capable of performing this process.

To perform a merge with Word you must create two documents. One document is the template of the letter (or memo). It contains codes that direct Word where to place the names and addresses, or other information, in the document.

The second file you must create contains the list of names and addresses, or other information, to be inserted into the primary document.

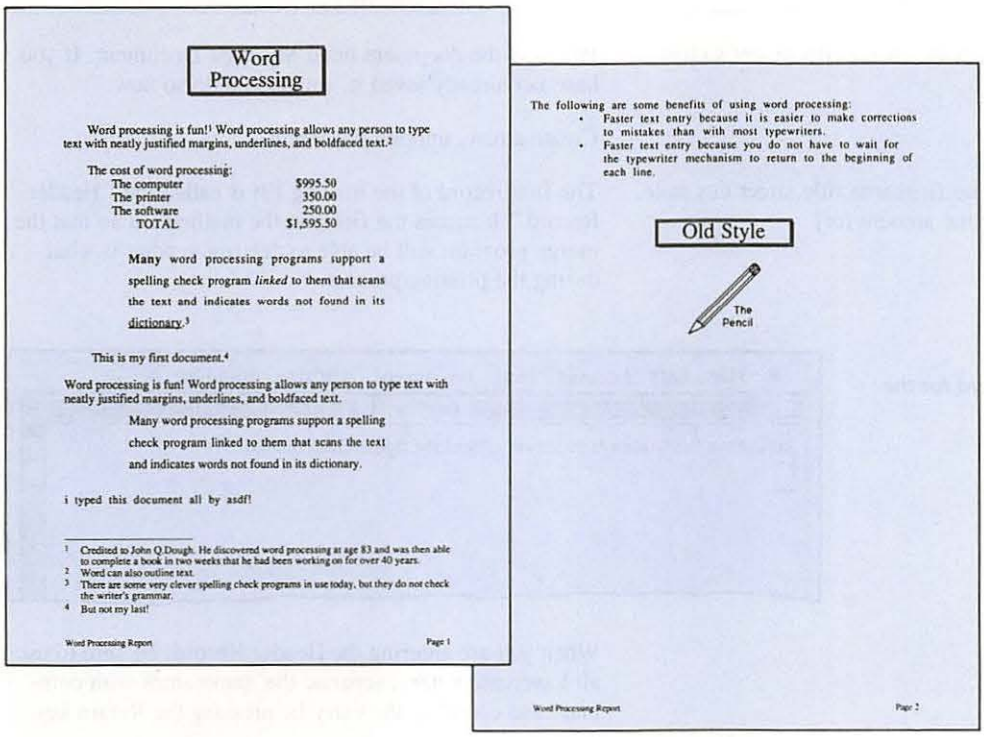


Figure 7.85
The completed document.

7.18 CREATING THE MAILING LIST FILE

You will start this exercise by creating the list of names and addresses. Before you begin creating this, it is advisable to close any documents you presently have open. Do this now by clicking the mouse on the close box of each open document.

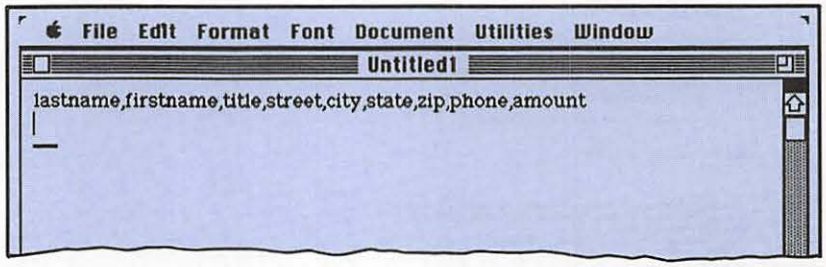
You will then enter a set of information about each person on the mailing list. This set of information is called a record. Each set is broken into distinct parts, called fields. When you create the letter in the next section, you will be telling Word which field to put in specific locations in the letter. After each letter is printed, a new record is read by the program and the process is repeated.

The records you will be creating for this exercise will contain the following fields:

Last Name
First Name
Title
Street Address
City
State
Zip Code
Phone Number
Amount

What To Do	*Why You Are Doing It*
Click on the current document's close box.	Put away the document titled My First Document. If you have not already saved it, you should do so now.
⌘N	Create a new, untitled document.
lastname,firstname,title,street,city,state, zip,phone,amount [cr]	The first record of the mailing list is called the "Header Record." It names the fields in the mailing list so that the merge program will be able to determine what is what during the printing process.

Figure 7.86
The header record for the mailing list.



When you are entering the Header Record, be sure to use all lowercase letters, separate the item names with commas, and complete the entry by pressing the Return key.

You are now ready to enter the mailing list.

Aaron,	Enter the last name of the first person on the mailing list, followed by a comma. Do NOT press [cr].
Alice,	Enter this person's first name, again followed by a comma.
Ms.,	Enter this person's title, followed by a comma.
1405 N. Pepper Ave.,	Enter this person's street address.
Highland Park,	Enter this person's city name.
CA,	Enter the state.
90210,	Enter the Zip code.
213-553-1234,	Enter the phone number.
75.00 [cr]	Enter the amount and press the return key to indicate the end of the information for this person.

Figure 7.87
The first record has been entered.



Smith,Fredrick,Mr.,	Begin the second record.
"1508 N. Barrington Ave., Apt. 4C",	Note that Mr. Smith's address contains a comma. To include a comma inside a data item, the complete item must be enclosed in quote marks. Be SURE to do so here.
Los Angeles,CA,90046,	Continue the information for this record.
,	Enter just a comma at this point. There is no phone number available for Mr. Smith; however, a space must still be reserved in the record for this field because the Merge procedure expects to find the same number of fields in every record of the mailing list you create.
100.00 [cr]	Enter the amount information for Mr. Smith, indicating the end of the record with the return key.
Wholstein,John,Mr.,333 W. Broad Rd.,	Begin entering a third record into the mailing list.
Culver City,CA,90123,213-602-8181,75.00 [cr]	Complete the third, and last, record. Remember to end by pressing the return key.
⌘S	You must Save this document.
ClubList	Name the mailing list "ClubList". Before you click on the Save button, make sure that the drive and folder names displayed in the dialog box are the ones you want. If not, make the necessary adjustments to ensure that this document is saved onto your disk into the appropriate folder.
Click on the Save button.	Complete the save process.

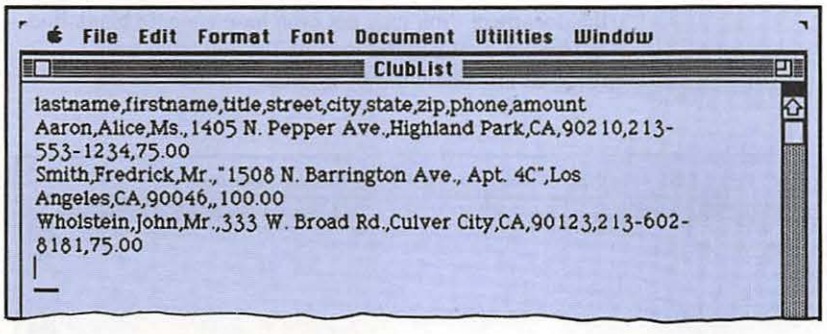


Figure 7.88
The completed mailing list file.

7.19 CREATING THE MASTER DOCUMENT

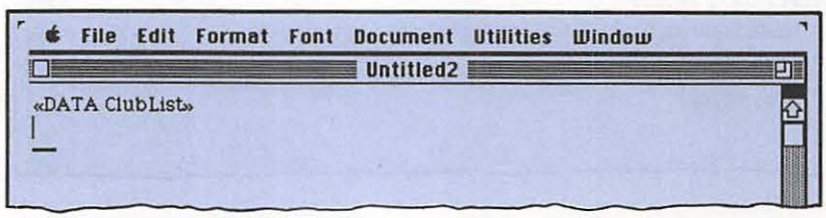
To complete this exercise, you will create a short letter to be sent to the people in the mailing list. Before you begin writing this new document, you may want to put away the current document. Do this by clicking the mouse on the close box found at the left side of the ClubList title bar.

As you are writing the letter, remember the fields you created and named in the header record. In the letter, the fields must be referred to by these names, typed in lowercase just as they were entered.

CONTENTS	FIELD NAME
Last Name	lastname
First Name	firstname
Title	title
Street Address	street
City	city
State	state
Zip Code	zip
Phone Number	phone
Amount	amount

WHAT TO DO	*WHY YOU ARE DOING IT*
⌘N	Create a new document.
[OPTION]-\	Hold down the option key and press the backslash. You will see << appear in your document.
DATA ClubList	Type the word DATA followed by the name of the mailing list file you created earlier, ClubList.
[OPTION]-[SHIFT]-\	Hold down the option key and the shift key and once again press the backslash. You will see >> appear in the document.
[cr]	Press the return key so that this line has no other text on it. You have just entered the command that links the letter you are about to write to the mailing list you created earlier. This command MUST be at the very beginning of the document. You may not even have a single blank line in front of it! When the mailing list and letter are merged, this line will not appear.

Figure 7.89
This is the beginning of your letter. No other lines or characters may be in front of this command line, which links the letter to the mailing list.



[cr] [cr] [cr] [cr]	Leave room for the letterhead at the top of the paper.
December 31, 1988 [cr][cr]	Enter the letter's date.

You will now create the inside address. This is done by telling Word to print particular fields from the Mailing List File.

The first line of the inside address should contain the title, first name and last name.

[OPTION]-\	Just as the DATA command is enclosed in the special symbols << and >>, so are the field names in the body of the letter. This allows Word to differentiate text that you enter from a field name.

title	You want to start the inside address with the title field. Remember to enter the field name in all lowercase letters, as you did when you created the header record for the mailing list file.
[OPTION]-[SHIFT]-\	Finish the field entry in the document.
[SpaceBar]	Add a single space between this field and the next one. If you do not do this, the two fields will be printed with no spaces between them!
[OPTION]-\ firstname [OPTION]-[SHIFT]-\	Enter the merge field name for the first name field.
[SpaceBar]	Again, add a single space to appear between the first and last name fields.
[OPTION]-\ lastname [OPTION]-[SHIFT]-\	Enter the merge field name for the last name field.
[cr]	Press return to move the cursor to the second line of the inside address. This line will be just the street address field.
[OPTION]-\ street [OPTION]-[SHIFT]-\	Enter the merge field name for the street address field.
[cr]	Move the cursor on to the third and last line of the inside address.
[OPTION]-\ city [OPTION]-[SHIFT]-\	Enter the merge field name for the city field.
, [SpaceBar]	Add a comma followed by a single space after the city field.
[OPTION]-\ state [OPTION]-[SHIFT]-\	Enter the merge field name for the state field.
[SpaceBar]	Add a single space after the state field.
[OPTION]-\ zip [OPTION]-[SHIFT]-\	Enter the merge field name for the zip code field.
[cr] [cr]	Press the return key two times to add a blank line to separate the inside address from the beginning of the letter.
Dear [SpaceBar]	Begin the letter.
[OPTION]-\ firstname [OPTION]-[SHIFT]-\	Enter the merge field name for the first name field. You can see that you may use a field more than once inside the document.
: [cr][cr]	Continue the letter.
Our records show that you donated $	Begin the first paragraph of the letter.
[OPTION]-\ amount [OPTION]-[SHIFT]-\	Enter the merge field name for the amount field. Note that you do not need to include in your letter all the fields found in the mailing list file. The phone number field will not be used in this letter.

Finish the letter with the following text:

```
in 1988 to the Philosophy Club, a non-profit organization.
Thank you for your continued support. We hope to see you at the first club meeting in
January of next year.
Sincerely,

H. H. Wabbit
Executive Director
```

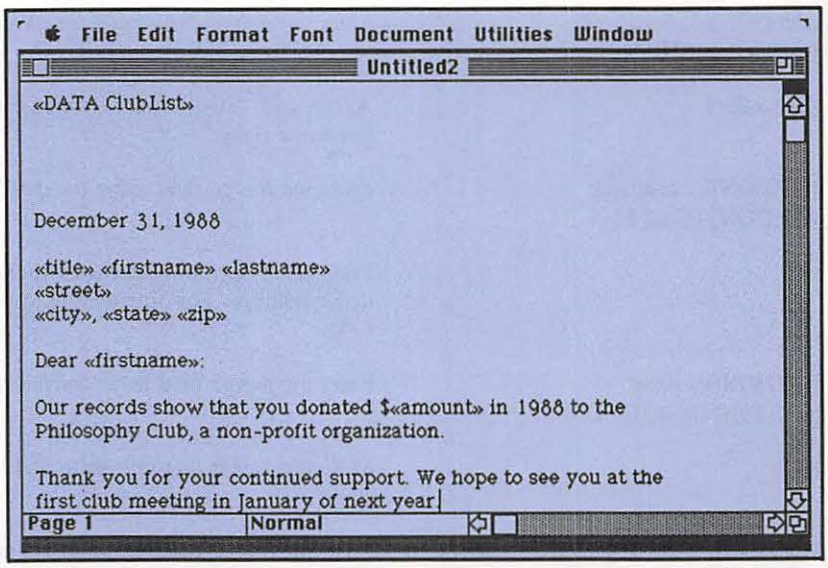


Figure 7.90
The first half of the completed master document. Note the appearance of the inside address.

⌘S	You must now save the letter.
ClubNote	Name this document ClubNote.
Click on the Save button.	Complete the save operation. Since, when you saved your mailing list, you confirmed the location that the file was to be saved, you do not have to do so a second time. Word will save this document at the same location as the last save you execute. Do not close this letter.

7.20 MERGING THE LETTER AND MAILING LIST

You are now ready to merge the letter and the mailing list. Before you continue, make sure that the master letter is in the active window. If you did not properly create the mailing list file, Word will give you an error message. If this happens, do not worry, simply check your mailing list and make sure that each line has the correct data and the correct number of commas before you continue.

What To Do	*Why You Are Doing It*
Pull down the File menu.	This menu contains the Print Merge command.
Select the Print Merge command and release the mouse button.	The print merge dialog box lets you choose between printing the merged documents immediately, or creating a new document.

Click on the New Document button.

This option will let you create a new document, called Form Letters1, which you can then edit as you would any other Word document.

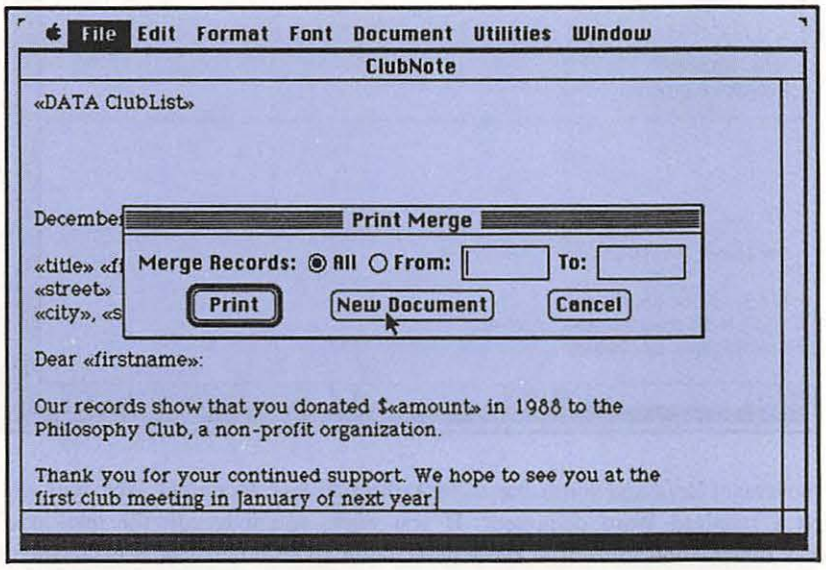


Figure 7.91
The Print Merge dialog box.

If you have an exceptionally large mailing list, or a medium sized list and large document, you may not be able to merge to a new document because of the computer's memory limitations. If you are merging a document and run out of memory, then you should merge directly to the printer.

After you click on New Document, the merge process will begin. Since you are merging a short list, this process should not take very long.

When the merge process has finished, the cursor will be at the beginning of the first document created. You are now looking at the individual letter to Ms. Alice Aaron. Word placed section breaks between each of the three letters.

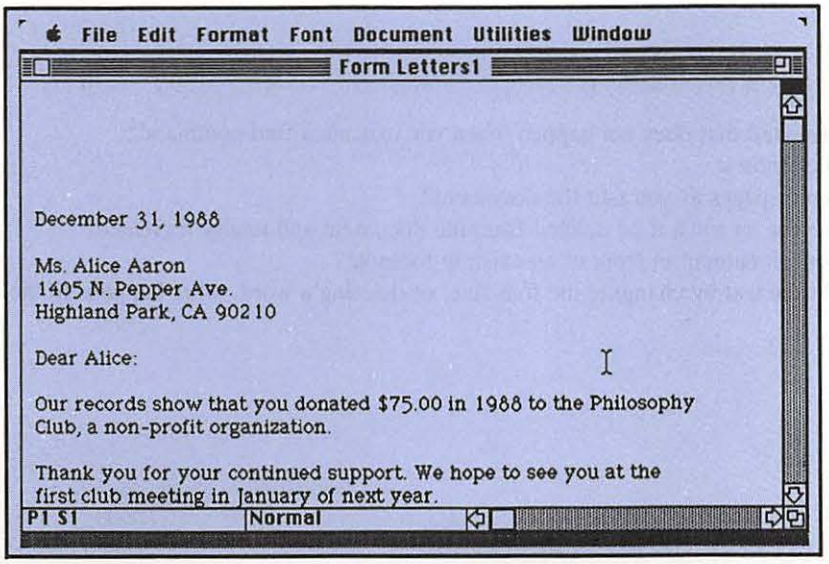


Figure 7.92
The merged document. The section break, a double dotted line, can be seen in the next figure.

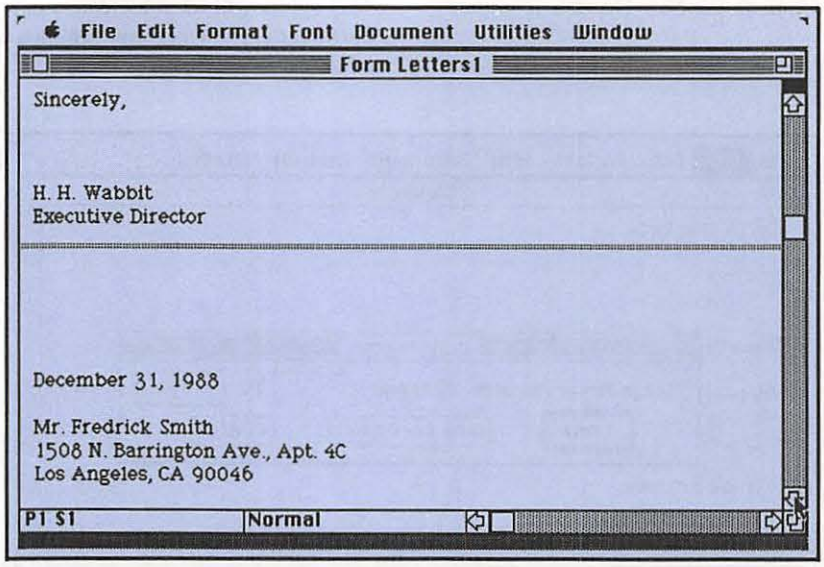


Figure 7.93
If you scroll the window, you can see the section break, the double dotted line, which separates two letters in the merged document.

Use the cursor movement keys and scroll bar to look through this document. You will see that you have created a standard Word document. If you want, you may edit the text, add personal notes or other information to each of the letters, or in some other way edit the three letters. Merged documents may be printed immediately, saved for later modification and printing or simply discarded, depending on your needs.

⌘S	You want to save the letters for later printing.
Merged Letter	Name this document Merged Letter.
Click on the Save button.	Execute the Save command.
⌘Q	Execute the Quit command. Click on the Yes button if you are asked to save changes to a document before the program ends. After some disk activity, you will be returned to the Macintosh desktop and the Finder.

EXERCISES

1. What happens when you execute a change command that does not happen when you execute a find command?
2. Explain the difference between footnotes and endnotes.
3. Does the text of footnotes appear at the bottom of pages as you edit the document?
4. Is it possible to edit a footnote if you find an error, or must it be deleted from the document and totally recreated?
5. What happens if you add a new footnote to your document in front of an existing footnote?
6. If you activate the paragraph borders, then edit the text by changing the font size, or deleting a word, what happens to the box?

7. Is text centered between the left and right sides of the paper, or between the left and right margins?
8. Must text be centered after it is entered, or can it be centered as it is typed?
9. What are the default tab stop positions?
10. What must you do to the left margin to create a hanging indent?
11. What is the advantage of using a hanging indent over the tab key or spacebar to create the same effect?
12. What do you insert into the text to force a page break at a particular location in the document?
13. Can a forced page break be removed, or relocated, or once in the document must it remain always?
14. When you activate the page numbering, where will the page number appear on the printed page?
15. What is a running header?
16. What will appear on the computer's screen to inform you that a page break has been reached?
17. How can you tell a hard page break from a soft page break?
18. When preparing a bulk mailing you must create a mailing list and a form letter. What must be entered into the form letter to link it to the mailing list?
19. What must be at the beginning of the mailing list file to tell Word how to treat the information in the file?
20. What do the terms record and field mean when applied to a mailing list file?

21. Use Word to enter and print the following letter:

    June 12, 1982

    Mr. Fred Jones
    Sales Manager
    Gizmos and Gadgets, Inc.
    137 West Main St.
    Los Angeles, CA 90005

    Fred:

    Thanks one more time for expediting the last shipment of *Super Whatzits*. They were the hit of the **Homeowner's Gadget Show**.

    I'll be in touch.

    Sincerely,

    Tom Hillski
    Distribution Manager
    This and That, Ltd.

22. Use Word to enter and print the following memo:

    TO: Harold Stein, Telecommunications

    FROM: George Graham, Data Processing

    DATE: November 14, 1983

    SUBJECT: Phone Installation

    Alex Jones in Market Research and Mary Anne Peters in Administration have each received personal computers. Their machines are equipped with internal modems to allow them to communicate with the company mainframe. Please contact them both to arrange installation of dedicated phone lines in their respective offices.

    Thanks.

23. Put the following footer onto the memo created for Problem 22 and reprint the memo:

    Filing Code For This Memo: 14983

24. Use Word to create and print a simple invoice.

INVOICE

Invoice Number 87.458
Date April 23, 1987

TO: Mr. & Mrs. John Doe
135 Any Sreet
Big Rock, CA 90068

FOR:

1986 Federal Income Tax preparation	$ 225.00
1986 State Income Tax preparation	100.00
W-4 withholding computation service	50.00
1987 Tax Planning	50.00
TOTAL	$ 425.00

25. Use Word to create a mailing list file for the following people:

Mary Alice Jones
1458 Barton Ave.
West Orange, NJ 07444
Lasagna

Fredrick Smyth
1212 E. Smitty St.
East Orange, NJ 27455
Fried Chicken

John Bigelowe
77 Live Oak Ln.
Cherry Hills, NJ 07453
Salad

Maureen Dietmann
329 S. Holland Ave.
Foggy Hills, NJ 07431
Soft Drinks

26. Use Word to create the following letter template:

June 28, 1989

<<fullname>>
<<street>>
<<city>>, <<state>>, <<zip>>

Dear <<firstname>>:

This is just a short note to remind you that the July meeting of the Bridge Club will be held starting at 12:00 noon on the 18th. Be sure to bring food for the pot luck lunch. My notes of the last meeting have you planning to bring <<food>>.

I'm looking forward to seeing you,

Albert P. Smart

27. Merge the mailing list created in Problem 25 and the letter created in Problem 26 into one document and print it.

CHAPTER

DESKTOP PUBLISHING WITH MS-WORD

8

CHAPTER OBJECTIVES

Upon completion of this chapter, the student will:

- **Define the term Desktop Publishing.**
- **Follow the planning steps required for desktop publishing:**
  Identify the audience of the publication.
  Identify the topic of the publication.
  Identify the equipment available for producing the publication.
- **Explain the difference between a serif and sans serif font and about the different groups of typefaces.**
- **Identify the proper typefaces for use with the publication, both for the body of the publication and for headlines.**
- **Explain the fundamental concepts of page formatting and design.**
- **Use the side-by-side table capabilities of Word to create a masthead.**
- **Create newspaper style multiple-column documents.**
- **Reposition art and paragraphs on the page.**

8.1 WHAT IS DESKTOP PUBLISHING?

Desktop publishing, simply put, is the creation of a document using the resources of your desktop computer. People typically think of newsletters and small magazines when desktop publishing is discussed. However, other documents may be desktop published. You may desktop publish a resume, a series of graphics, advertisements, reports and more.

In this chapter, you will use the skills you have developed with Microsoft Word to create a newsletter for the Miniville Corporation. All the stories are written, and all the necessary artwork is ready; all you will have to do is put them together into a single document and format the whole thing. You will, however, have to create the newsletter masthead by yourself.

8.2 PLANNING—THE FIRST STEP

Just like any other document you may want to prepare, you must do a significant amount of planning before sitting down to the computer to publish. There are several steps in the planning process. They are to identify the audience, identify the topic, and identify your hardware.

8.3 IDENTIFY YOUR AUDIENCE

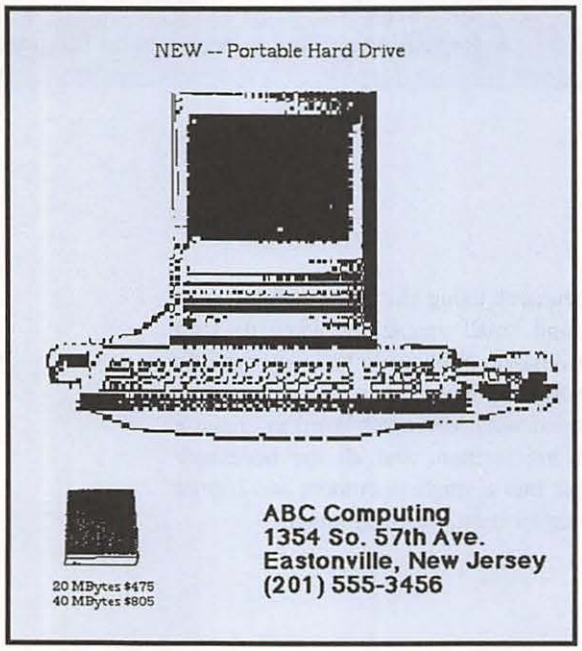
When you identify your audience, you are determining who will read the publication. Why do you want to do this? Different groups of people will expect different designs and "looks" of the document. The best way to do this is to imagine the one person who represents the group for whom the document is being created. This stereotypical person may be a completely imaginary person, or may be a real person whom you know.

When determining who your stereotyped reader is, consider the person's background, education and age. A publication for an older reader may require larger type to compensate for vision changes. One for a high school reader may require changes in vocabulary.

The audience for the newsletter you are creating in this chapter are the employees of Miniville Corporation. They range in age from recent high school graduates to people nearing retirement age. The education levels of the employees are as diverse as their ages, ranging from high school to PhD.

8.4 IDENTIFY THE TOPIC

Figure 8.1



When you are identifying the topic, you are determining what the information is that you are trying to convey. This may seem obvious, but it affects choice of graphics and their placement, headlines and overall layout of the publication.

Consider, for example, a one-page advertising flyer for a portable hard disk. You may be tempted to include a graphic of the hard disk sitting next to a desktop computer. The focus of such a graphic is the computer (Figure 8.1), which is not the topic! A better graphic is one showing the portable hard disk, with the computer in the background (Figure 8.2). The focus is shifted to the hard disk, but you retain the association with computing.

The Miniville newsletter is a publication designed to keep the employees current with what is happening to people within the company, and new events in the company itself.

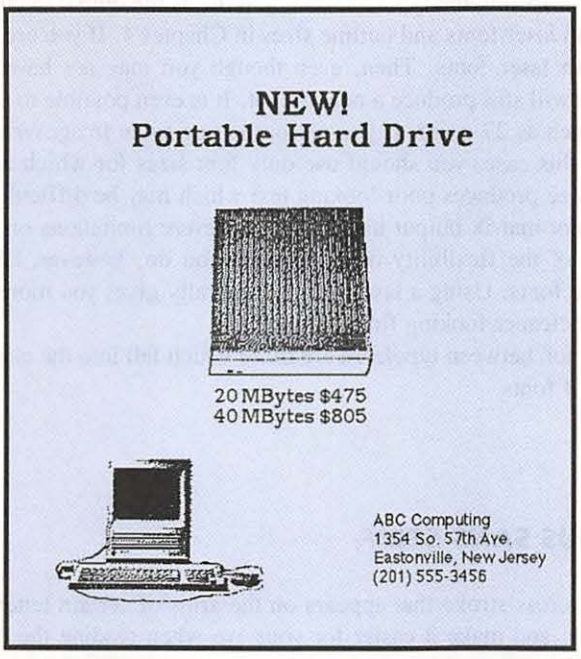


Figure 8.2

8.5 IDENTIFY YOUR EQUIPMENT

Since you are reading this text, it is fairly likely that you will be using a Macintosh computer for your desktop publishing. More important, however, than the type of computer you are using is the type of output you can produce. Do you have only a dot-matrix printer such as an ImageWriter which produces output at 72 dots per inch, or can you produce output on a laser printer at 300 dots per inch? Do you have access to a high resolution typesetting machine, such as a Linotronic or Compugraphic, capable of producing output in the range of 1200 to 2400 dots per inch, compared to the LaserWriter's 300 dots per inch? The more dots per inch, the better the appearance of the document.

While spending the money for laser output is probably worth while, it may not be necessary to spend $12 to $30 per page (plus a job set-up fee) for high resolution output for this publication. Laser output can usually be had for pennies a page!

8.6 PICK A TYPEFACE

Now that you have identified the reader, topic and output device, you are ready to make some design decisions. The first of these involves the typeface. The typeface is what the letters look like on the printed page. Combine looks (or style) with size and you have a type font.

There are two typeface decisions you must make. You must choose a typeface for the body of the document. The body is all the text of the various stories. It is possible to choose a different typeface for each story, but this is not a good idea. You may want to change the typeface for a particular story to make it stand out in the publication.

The second typeface decision is for headlines, subheadings and the like. That is, what typeface should you use for the parts of the publication that are not the body?

One major factor affecting the typefaces that you use is the output device. Recall the discussion of bit-mapped and laser fonts and outline sizes in Chapter 4. If you are using a laser printer, it is best to stick with laser fonts. Then, even though you may not have an outline size of a particular typeface, it will still produce a neat output. It is even possible to create a size that does not normally exist, such as 27 point. If you are outputting to an ImageWriter, you will be using bit-mapped fonts. In this case, you should use only font sizes for which an outline size exists. Using a non-outline size produces poor-looking text which may be difficult to read.

Basically, using dot-matrix output imposes some severe limitations on the desktop publishing process in terms of the flexibility of type sizes. You do, however, have access to a large number of bit-mapped fonts. Using a laser printer generally gives you more flexibility with type sizes, and produces a cleaner looking final output.

The other distinction between typefaces are those which fall into the class of sans serif fonts, and those that are serif fonts.

8.7 SERIF VERSUS SANS SERIF

The serif is the small cross stroke that appears on the arms of certain letters. They improve the legibility of the letters, and make it easier for your eye when reading the document, helping to guide your eye over the letters.



Figure 8.3
The W on the left is from a font which has serifs. The serifs help guide the eye over the text. The W on the right is from a sans serif font. It has a more stark appearance.

Serifs also help you distinguish one letter from another. An example is the word Illinois, seen in Figure 8.4. The sans serif version on the left does not have in it the visual clues to help distinguish the capital letter I from the lowercase letter l. As you can see, a sans serif font does not have the extra strokes of the serif font.



Figure 8.4
The word Illinois is an example of how serifs help in letter recognition.

8.8 GROUPS OF TYPEFACES

Today, it is possible to add some further distinction to the groups of typefaces. Typographers argue about the actual number of groups of typefaces. Here we will discuss five groups, sometimes called races or species.

The first group is called roman. The majority of serif type styles fall into this race. Another characteristic of the roman typefaces is that the vertical stroke of the letter is generally heavier than the horizontal stroke. Figure 8.5 shows the letters E and O in a typical roman typeface, Times. You can easily see that the vertical part of each letter is heavier than the horizontal part. Times, Bookman, Schoolbook and Palatino are all members of the roman group of typefaces. More will be said about these typefaces later in this chapter.



Figure 8.5
This is an example of typical members of the roman group of typefaces.

The second group of typefaces is the sans serif group. These typefaces have a more modern appearance and reproduce well even in poor printing conditions. Figure 8.6 shows the letters E and O in a typical sans serif font, Helvetica. Avant Garde, Helvetica and New Helvetica Narrow are all members of the sans serif group of typefaces.



Figure 8.6
This is an example of typical members of the sans serif group of typefaces.

The square serif group is the third group of typefaces. As the name suggests, the serifs of this group of typefaces are squared, rather than rounded. An approximation of this font is Bookman Bold, shown in Figure 8.7.



Figure 8.7
The serifs of the Bookman Bold font are heavier than those of the serifs found on fonts of the roman group of typefaces.

Script, or cursive, style fonts make up the fourth group of typefaces. These are different from italics typefaces. The purpose of one of these fonts is to appear close to handwriting or calligraphy. An example of this font is Zaph Chancery, seen in Figure 8.8.



Figure 8.8
The Zaph Chancery font looks similar to calligraphy.

The fifth group of typefaces is called special. It is a catchall group. There are many typefaces that fall into this group, but the majority are bit-mapped fonts. Figure 8.9 shows examples of some of this group of typefaces.



Figure 8.9
The majority of special fonts are bit-mapped. The Symbol and Zapf Dingbats fonts are exceptions, and are available as laser fonts.

8.9 TYPEFACE FAMILIES

In addition to groups, or races, of typefaces, there are families of typefaces. A family of typefaces is made up of several typefaces that share the same basic typeface. For example, the Times typeface family consists of Times Roman, Times Italic, Times Bold, Times Bold Italic, Times Outline and Times Shadow. Many people tend to think of these as variations on a single typeface, whereas in fact each is a separate and distinct typeface.

8.10 TYPEFACES FOR THE PUBLICATION

The selection of a typeface is controlled by the purpose of the publication and the audience. If you are publishing an invitation, you might want to use a script or cursive typeface. If you are publishing a book for a first grade class, then Bookman is the appropriate font.

The majority of your publications, however, will probably be newsletters. As a general rule, you should use a serif font for the body of this type of publication. You can see that this type of font improves the readability and appearance of the document. There are times, however, when a serif font is not appropriate. When the type size is very small, under 8 points, serifs tend to blend into the letters, offering little to the appearance of the text. A sans serif font is better in these cases.

The serif fonts you are most likely to have access to are New York, Times, Bookman, Schoolbook and Palatino. New York is a bit-map font best used with the ImageWriter dot-matrix printer.

The shape of the letters of the Times font is virtually the same as the New York font. Times, however, is designed for laser printers. It is a slightly more compact font. Figure 8.10 shows text in both these fonts at 24 points, an outline size for each. You can see that the text in the New York font takes slightly more space on the line than the text set in the Times font.

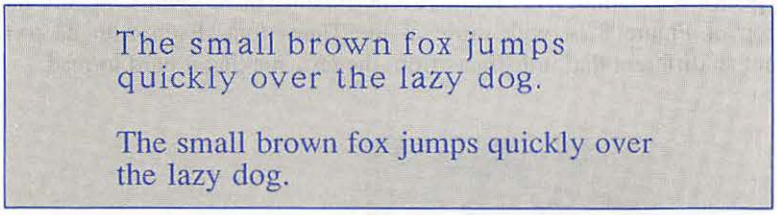


Figure 8.10
The top line of text is set in New York 24 point, while the bottom line is Times 24 point.

In fact, the Times font is a very compact font. It uses smaller serifs and narrower horizontal strokes than other fonts in this group that have been mentioned. Compare the letters in Figure 8.11. The ones on the top are in the Times font, the ones on the bottom in the Bookman font. Note how thin the upper portion of the letter k is in the Times font, compared to the Bookman font. Also, you can see that the serifs are much less pronounced in the Times font than the Bookman font. The goal of the Times font is to minimize the space requirements without sacrificing overall readability. It was designed for newspaper applications, in which space is at a premium, but readability is still necessary.

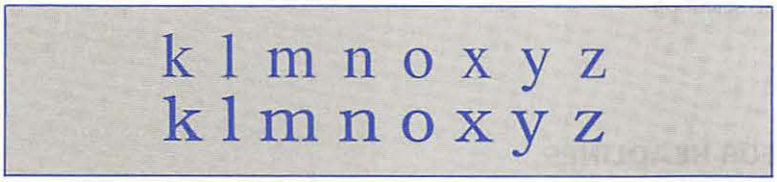


Figure 8.11
Compare the size of the Times characters with the size of the Bookman characters.

The Bookman font is a very round font. The font also blends its serifs into the letters, rather than attaching them. This can be seen in Figure 8.12, which shows the letter D in the Bookman font on the left, and the same letter in the Schoolbook font on the right. Notice how the serif on the Bookman font flows into the letter, while the Schoolbook serif appears to be attached. The Bookman font is easy to read since it is not very compact. It produces documents that have a first grade schoolbook appearance. It is a font that is good for publications produced for early, or inexperienced readers.



Figure 8.12
The Bookman serifs flow into the letters, while the Schoolbook serifs appear to abutt the letters.

The Schoolbook font is not as round as the Bookman font, but not as compressed as the Times font. Look at the examples in Figure 8.13. The word on the bottom is set in the Bookman font, while the same word in the middle is set in the Schoolbook font. The top line is set in the Times font. When using the Schoolbook font, more text can be fit into the same space than when the Bookman font is used. This font is better for the more experienced reader.

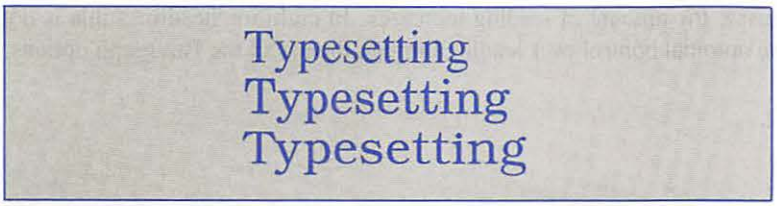


Figure 8.13
The Schoolbook font, in the middle, is not as round as the Bookman font on the bottom, but is not as compressed as the Times font on the top.

The final popular typeface is Palatino. This font has a personality of its own. Compare the Palatino letters on the top of Figure 8.14 with those of the Times font. Even with its own personality, this font is not so different that it distracts from the text, making it hard to read.



Figure 8.14
The Palatino letters on the top exhibit a personality all their own.

Remember, selecting the appropriate typeface is affected by the audience of the publication and the purpose of the publication. Once you select a typeface, you should stick to it. For a newsletter, such as the Miniville Corporation newsletter, the Times font, or one very much like it, is the most appropriate selection.

8.11 TYPEFACES FOR HEADLINES

Typefaces in parts of the publication other than the body of the text are frequently referred to as display type. There are some simple rules for deciding which typeface to use for headlines. They are:

- Never mix type fonts from the same typeface group. For example, Times and Schoolbook are in the same group, and should not appear together.
- Never use a typeface family for more than one purpose. For example, you may want to use a sans serif family for the headlines and subheads and a roman typeface family for the text.
- Allow one typeface family to dominate the publication.

With these rules in mind, and since the Times font has been selected to be used in the body of the publication, Helvetica will be used for the headlines and subheads in the Miniville Corporation newsletter.

8.12 DESIGN THE FORMAT OF THE TEXT

There are several issues that affect the design of the text. Two of these are not controllable in Word, but are in a page layout program. The first is leading (pronounced ledding) and the second is kerning.

Leading is the amount of space between lines of text. When using Word you will find that as the size of the font increases, the amount of leading increases. In multiline headlines this is not always desirable. We have nominal control over leading through the use of the Paragraph options.

Figure 8.15 shows the effect of varying the leading of a document. This figure was produced with a page layout program which allows this type of control with greater precision than is possible with Word.

The Preamble to the Constitution of the United States: We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

The Preamble to the Constitution of the United States: We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

Figure 8.15
The leading of the paragraph on the left is standard, while this same paragraph on the right has extra leading, increasing the space between the lines of the text.

Kerning is control over spacing between pairs of letters. If you look at the printed page produced by Word you will see that the letters do not overlap. It is possible to draw a vertical line between any two letters on the printed page without touching either. For most letter pairs this is satisfactory. Sometimes, however, a letter pair would look better if the spacing between the two letters was reduced so that one letter overhangs its neighbor. An example is the word "we" when it appears at the beginning of a sentence. In this case, the "w" is capitalized, leaving a large amount of white space under the right edge of the letter before the letter "e" appears. Figure 8.16 shows you how "We" appears when printed by Word. By adjusting the kerning between these two letters, Figure 8.17 was produced. Again, like figure 8.15, this figure was produced by a page layout program designed to properly kern pairs of letters such as "We."



Figure 8.16
This text, printed in 48 point Times, was created by Word.



Figure 8.17
This text, like Figure 8.16, is 48 point Times. It was produced by a page layout program.

You do have control over the columns that you choose to create. You can control the width of the columns and the space between them. The rule of thumb for column width is that it should be **about** 1.5 lowercase alphabets of the typeface and size in use. A 1.5 lowercase alphabet is abcdefghijklmnopqrstuvwxyzabcdefghijklm. Figure 8.18 shows two sample columns, each a different width, but each of a different type size, and each equally readable. Both are in the Times typeface.

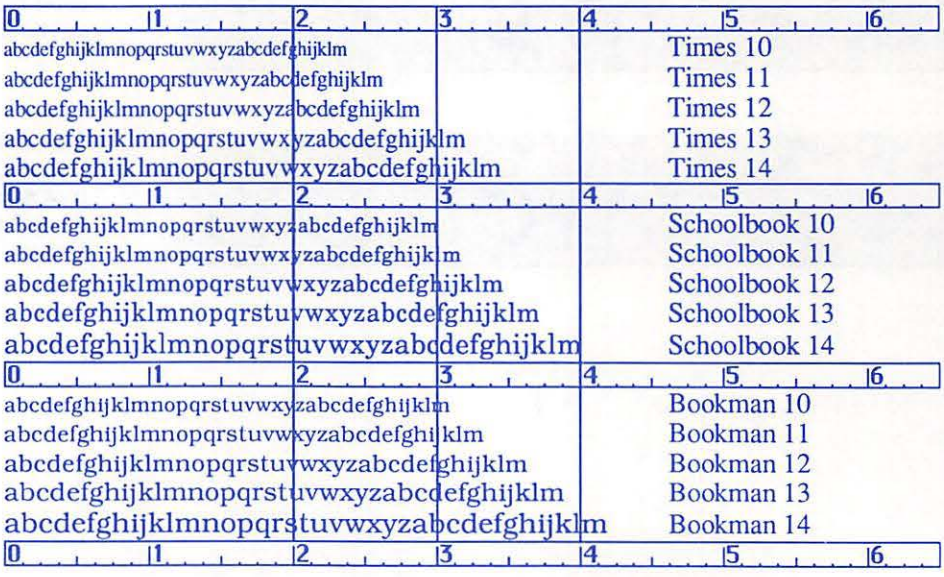
Figure 8.18
The two paragraphs are the same, but the column width has been changed to reflect the change in size of the typeface.

The Preamble to the Constitution of the United States: We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

The Preamble to the Constitution of the United States: We the People of the United States, in Order to form a more perfect Union, establish Justice, insure domestic Tranquility, provide for the common defence, promote the general Welfare, and secure the Blessings of Liberty to ourselves and our Posterity, do ordain and establish this Constitution for the United States of America.

You can see in Figure 8.19 that the preferred column width changes depending on the typeface and size in use. The most appropriate column width for Times 10 is about 2.5 inches, while Schoolbook 10 and Bookman 10 should be in 3-inch wide columns.

Figure 8.19
As the typeface changes, so does the ideal column width.



It must be emphasized that this width is only an approximation. The column may be up to a third of an inch narrower or wider than the 1.5 alphabets size and still be a good fit for the typeface you are using. We will be using the Times font in a 12-point size. You can see from Figure 8.19 that a column width of about 3 inches is required.

In addition to controlling column width, you may control the space between the columns. The minimum amount of space needed to separate columns in any publication is one-sixth of an inch. To a typographer, this amount of space is a **pica**. For a typical two-column newsletter such as you are creating, two picas (about 1/3 inch) is commonly used to separate the columns.

8.13 PAGE DESIGN

There are several important concerns which must be addressed as you complete the design of the Miniville Corporate newsletter. Not all of these concepts may be implemented using Word. Page layout programs are much better for doing page design. However, we do have control over a couple elements of page design when using Word.

The first of the page design elements that can be controlled is margins. Margins should not be equal all the way around the text. This creates monotony. If you are creating a facing page publication, such as a four-page newsletter, then the inside margin should be the smallest. The margins should then get progressively larger, starting with the top margin, followed by the side margin and then the bottom margin, which should be the largest. For a single sided or front and back newsletter, the left and right margins should be equal, but the top margin should be smaller than the bottom margin.

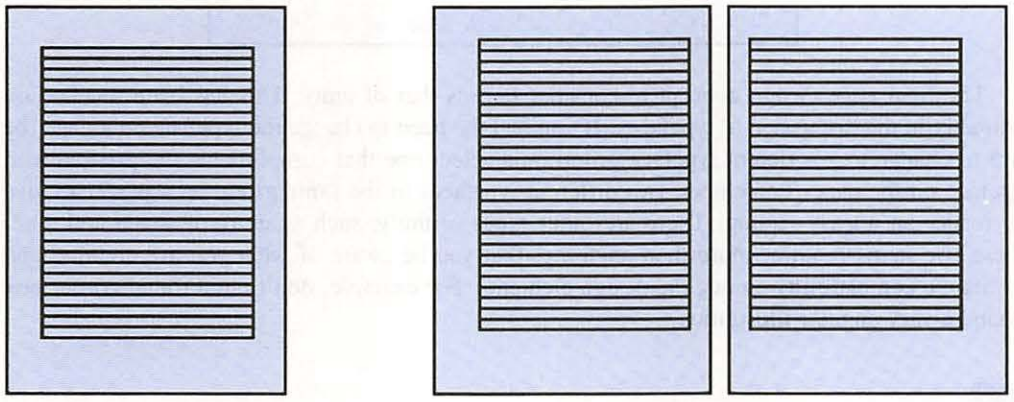


Figure 8.20
The layout on the left has margins that are appropriate for a single page publication. The layout on the right uses margins that progressively get larger and works for a publication that will have facing pages.

Related to margins is the concept of white space. Margins are one form of white space. It is desirable to have other areas of white space to add proportion to the page and to help organize the overall arrangement. Do not consider white space to be "leftover" and a waste. In short, do not try to fill all available space. Word gives you control over the publication's margins, and some control over white space.

The next important concept of page design is balance. This is an easy concept to understand. A page has an optical center that is about three-eighths from the top. The weight of all the elements on the page should balance around this optical center. A balanced page gives the reader a good feeling, while an unbalanced page will make the reader feel uncomfortable. When dealing with a two page layout, balance may be achieved by considering the two pages as one.

A page may be symmetrical, or formally balanced. Invitations and graduation announcements typically are balanced in this fashion. Non-symmetrical balance may be achieved by using dark objects to balance larger paragraphs. A page will either feel balanced to you, or it will not.

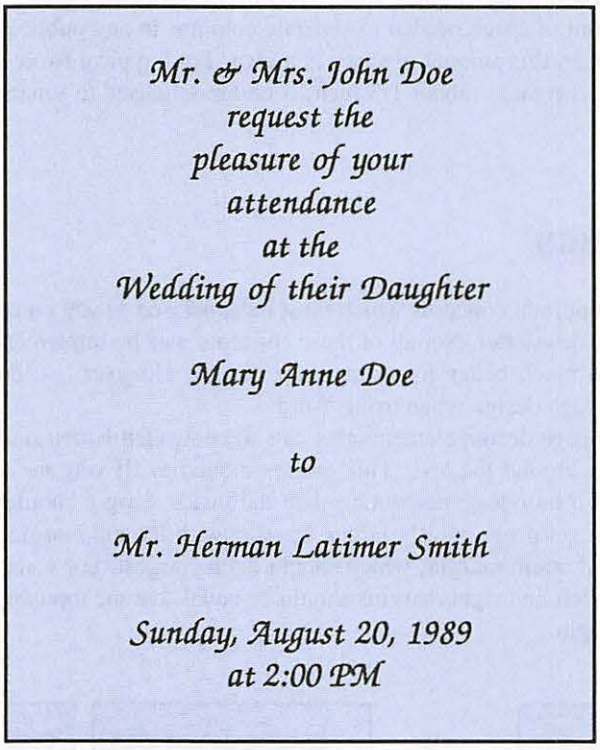


Figure 8.21
This page is symmetrical and in balance.

The final page design concept to consider here is that of unity. This has been touched on indirectly in the discussion of typefaces. If you feel the need to change the typeface on a page, be sure to change to a different typeface group, and select one that compliments the predominant typeface on the page. Remember, two different typefaces in the same group on a page can give the reader an uneasy feeling. There are other types of unity, such as unity of shape and tone. These two items require, more than anything, that you be aware of what you are creating and maintain a compatibility among the design elements. For example, don't put a round corner box around a very angular illustration.

8.14 ILLUSTRATIONS

There are many things that are called illustrations. An illustration may be a photograph or a drawing. Drawings may have shades of gray, or they may be simple line art.

There are several ways that artwork can be created to insert into your publication. The work you create with a painting or drawing program is easily pasted into either the clipboard or scrapbook, and from either of these locations into your publication. Drawings and photographs may be scanned, and also placed in either the clipboard or scrapbook.

Unfortunately, because creating and inserting graphics into a publication is so easy, these items can be used inappropriately. Artwork should not distract from the text of the publication, but rather enhance it. Don't use graphics or artwork to fill white space. Use graphic elements only after you have considered what you gain by placing it on the page. Be sure that a graphic is not distracting or superfluous.

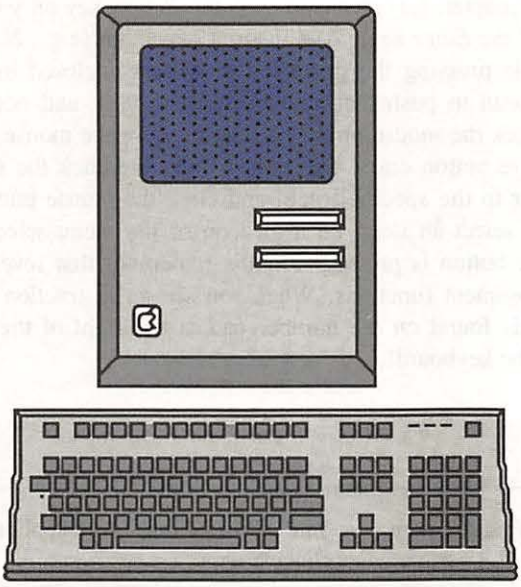


Figure 8.22
This is an example of typical line art.

Using scanned photographs poses an additional set of problems. Most printers, including the 300 dot per inch lasers, are not able to produce high quality images, regardless of the quality of the scanned image. Page layout programs are better equipped to print high resolution scanned images, but even they leave something to be desired. If possible, have photographs prepared separately from the publication and paste an image into the final version before it goes to the printer. Even better, leave a blank spot on the page for the photograph and send the original photo to the printer with your master publication. Give the printer instructions about which portion of the picture to print, called cropping, and where in the publication it is to appear. Leave the rest to your print shop.

8.15 YOUR OWN PUBLICATION

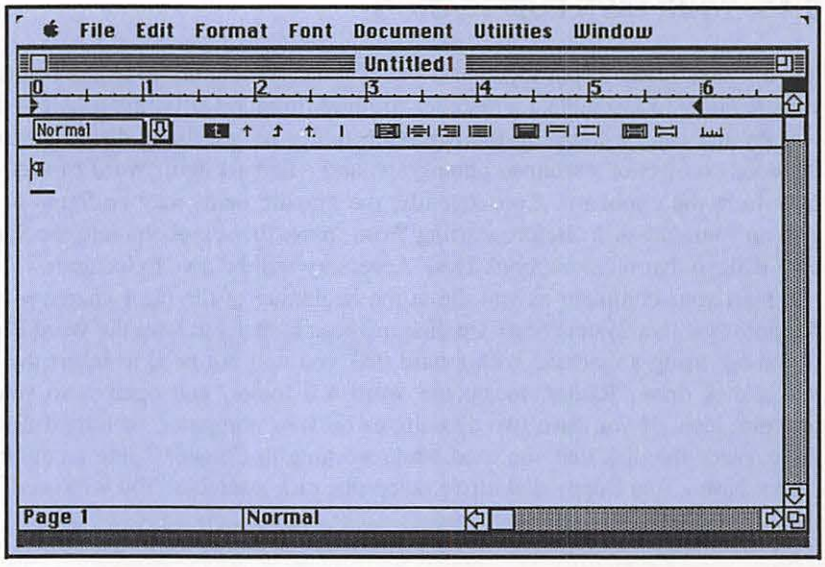
You are now ready to put together a publication. As mentioned at the beginning of the chapter, you are going to assemble a newsletter for the Miniville Corporation. All of the stories have been written and can be found in the Miniville folder on your data disk. The artwork that is to be included consists of a scanned photograph and a line art item. Word can retrieve graphic images only from the clipboard. Consequently, the graphic items may be found in the scrapbook file, also on your data disk. Before starting Word, move the scrapbook into the System Folder on your boot disk so that the Scrapbook Desk Accessory will be able to locate it.

Start your computer as you did at the beginning of the prior chapters. After you boot your Macintosh with a System Start-Up disk, make sure that you have the Word Program disk at hand. If you are using a machine with a hard disk you will not need to insert the Word program disk into a disk drive. Rather, locate the Word 4.0 folder, and open it so you can see the Word program icon. If you have two disk drives on your computer, or a hard disk and a floppy disk drive, place the disk that you used while working in Chapter 7 into an empty disk drive. If you do not have a free floppy disk drive, keep this disk available. You will need it.

Just as in the prior chapter, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and click the mouse button two times fast. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed. Finally, remember that several keys on the number pad perform cursor movement functions. When you see an instruction to move the cursor, be sure to use the numerals found on the number pad at the right of the keyboard, and not the numerals at the top of the keyboard!

What To Do	*Why You Are Doing It*
Locate the icon for the Word program.	You will launch the Word application program by double-clicking on it.
Move the mouse to the Word icon and double-click.	The double-click will launch the application. If you have trouble with the double-click, you may also select the program's icon with a single click, then use the Open option on the File menu, or press ⌘O, the command key equivalent. After a brief wait, Word will be running, and you will have a new, untitled document displayed in the window.
⌘R	Turn on the ruler line. Much of what you will be doing involves the ruler line.
⌘Y	Turn on the Show ¶ option. This will let you see the location of the table you will be creating for the masthead.

Figure 8.23
Your starting screen.



Pull down the Format menu.	Before you begin, you are going to change the top margin.

Select the Document command.	The document dialog box contains the margin options. When the dialog box opens, the top margin option is already selected for you.
.75	Change the top margin to .75, or three quarters of an inch.

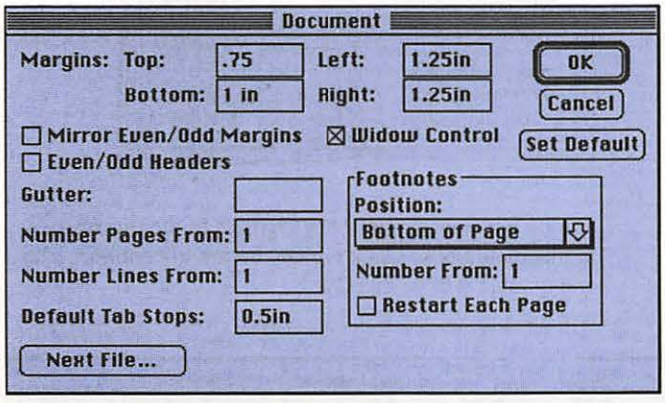


Figure 8.24
The top margin has been changed.

Click on the OK button. Leave the dialog box.

8.16 THE NEWSLETTER MASTHEAD

The masthead is the title of the publication that is displayed across the top of the first page. The masthead you will create will include a graphic, in addition to the title of the publication. To create the masthead, you will create a two-column table. In one cell you will paste the graphic, and in the other you will type the desired text.

If you do not see the table gridlines when you insert the masthead, select preferences, found on the Edit menu, and click on the Show Table Gridlines box.

What To Do	*Why You Are Doing It*
Pull down the Document menu and select Insert Table.	This command will insert a blank table into the document at the location of the cursor.

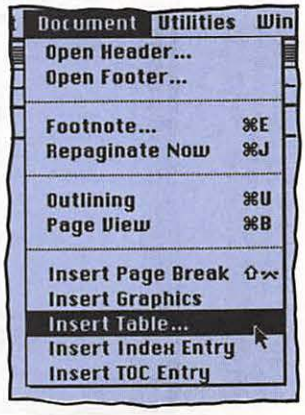
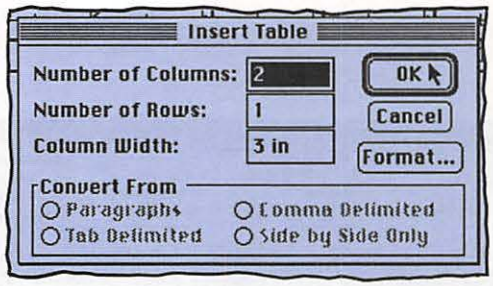


Figure 8.25
The Insert Table command has been selected.

Release the mouse button.

Execute the command. After a brief pause, the Insert Table dialog box will appear (Figure 8.26).

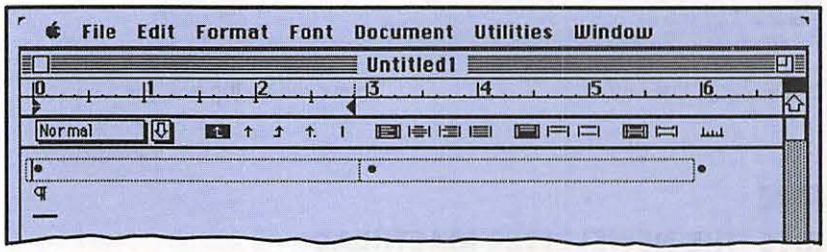
Figure 8.26
The Insert Table dialog box.



Click on the OK button.

You do not want to make any changes to the information in this dialog box. Click the OK button to continue. The empty table will be displayed.

Figure 8.27
The empty table. Notice that the right margin indicator is at the 2 7/8 point. This is the right margin for the left cell of the table.



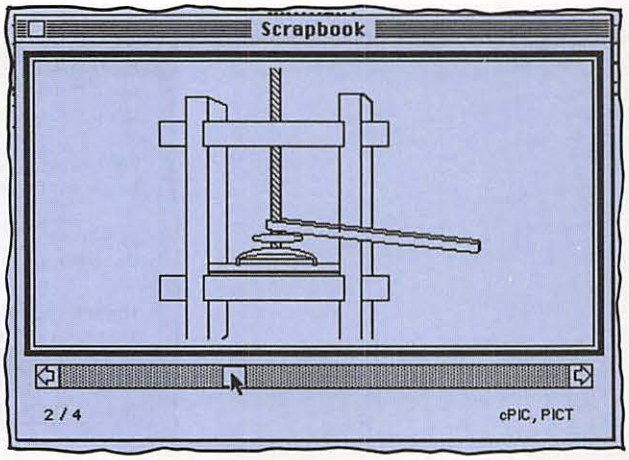
Tables of this sort may be used for columns of numbers, or for placing paragraphs side by side. You are going to do the latter here, except the left side paragraph will consist of just a graphic. The right side paragraph will consist of text.

Pull down the Apple menu and select the Scrapbook DA, then release the mouse button.

This Desk Accessory will let you copy a graphic from the scrapbook file into the clipboard. Once the graphic is in the clipboard, it may be pasted into the Word document.

Click on the scroll bar at the bottom of the Scrapbook window until the line art drawing of an old fashioned printing press appears (Figure 8.28).

Figure 8.28
This is the graphic that you want to place into the masthead.



⌘C

Use the Command Key to execute the Copy command found on the Edit menu. This will place a copy of the graphic onto the clipboard.

Click on the close box on the Scrapbook's title bar.

Put away the scrapbook.

The cursor should still be inside the left side box of the table that you placed at the beginning of the publication. If not, make sure that it is there before you continue.

⌘V

Use the Paste command to place a copy of the contents of the clipboard, which should be the graphic, into the document at the current cursor location.

→

Move the cursor to the right side cell of the masthead table.

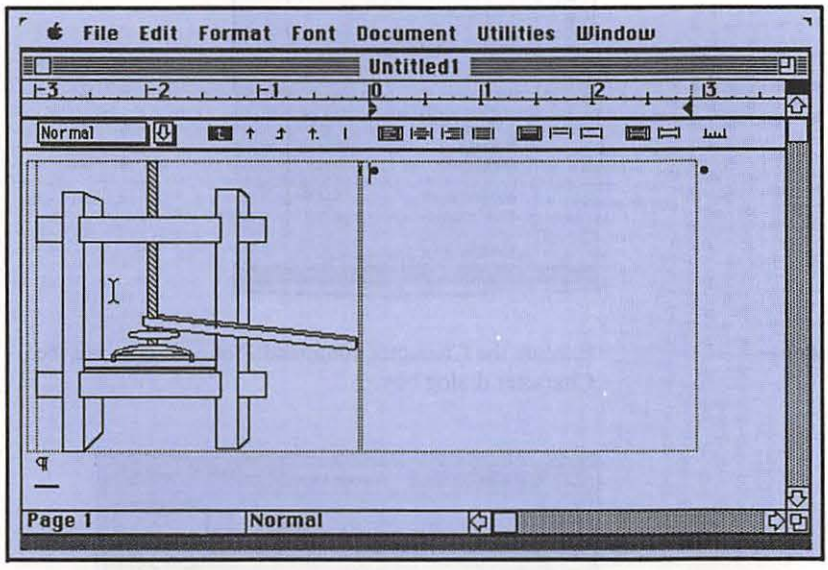


Figure 8.29
You have the graphic placed into the masthead, and are now ready to enter the text. Notice that the ruler line now shows a new line length based on the left and right margin of the current cell of the table.

Hot Off [cr] The Press [cr]

Type the name of the newsletter.

Use the cursor keys to select just the title you have entered.

You are now going to change the typeface and size of the newsletter title. Remember, to change the font of some text requires that the text be selected.

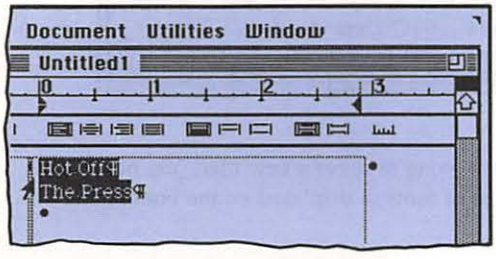


Figure 8.30
The selected text is ready for a font change.

Pull down the Format menu and select the Character option.

You are going to change the typeface. Rather than pulling down the font menu to change the font, then pulling down the font again to change the type size, and finally pulling down the Format menu to make the text boldface, you are going to use the Character menu to make several changes at once to the selected text.

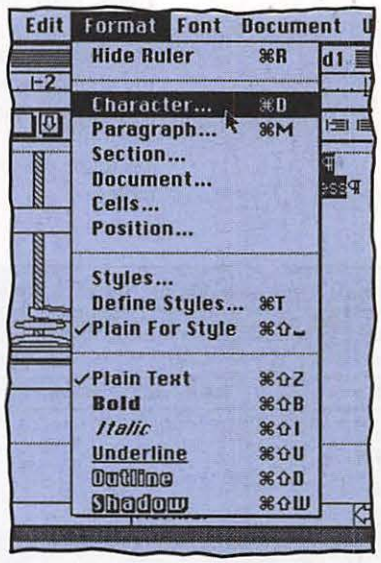


Figure 8.31
The Character command has been selected. Note that ⌘D is the equivalent for this action.

Release the mouse button.

Execute the Character command. You will now see the Character dialog box.

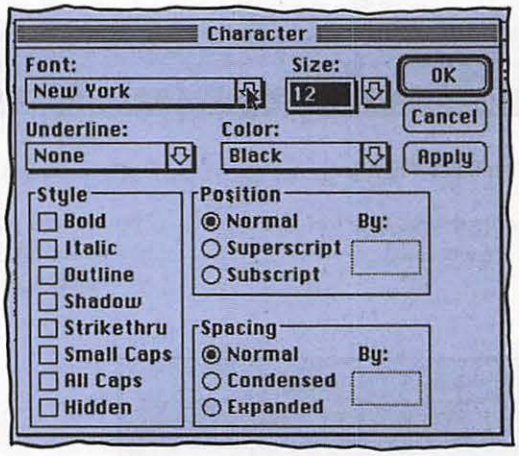


Figure 8.32
The Character dialog box.

Pull down the Font list by positioning the mouse pointer on the down pointing open arrow to the right of a font name and pressing and holding the mouse button.

First you are going to select a new font. You now have the same list of fonts as displayed on the Font menu.



Figure 8.33
Note the position of the mouse pointer. By pressing and holding the mouse button down, the font list will be displayed.

Drag the mouse down into the font list and select the Helvetica font, then release the mouse button.

Change the font to Helvetica.

Below the font selection menu of the Character dialog box is the style box.

Click on the word Bold.

You want the text to be bold.

Note that below the word Size, at the top right of the Character dialog box, is a box that has a selected value. There is also a pull down menu arrow to the right of the selected number.

If you pull down the size menu, you will see a list that tells you which bit-mapped sizes of the selected font are available.

36

Helvetica is a Laser Font, and may be sized on most laser printers to any point size between 4 and 127. Here you are entering a point size without selecting a menu item.

It is important that you remember that the Character command lets you enter any point size that you want. If a point size is not available on the Font menu, it is through the Character command that it may be entered.

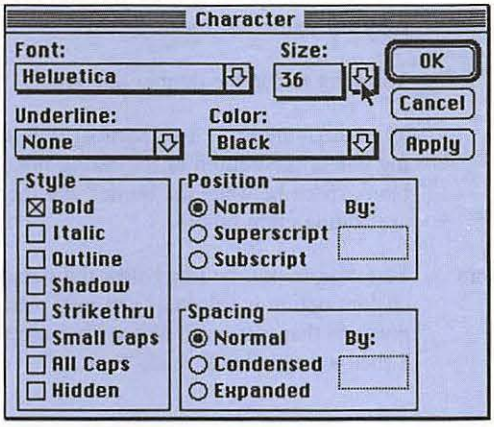


Figure 8.34
Your Character dialog box should look similar to this before you continue.

Click on the Apply button.	Have Word apply the changes you have made to the selected text in your publication.
Click on the OK button.	After you have applied the typeface and formatting changes, return to editing the text. The masthead text should still be selected.
Click the center text icon on the ruler line.	This icon is below what is currently the half-inch mark on the shifted ruler line. The text should now appear similar to Figure 8.35.

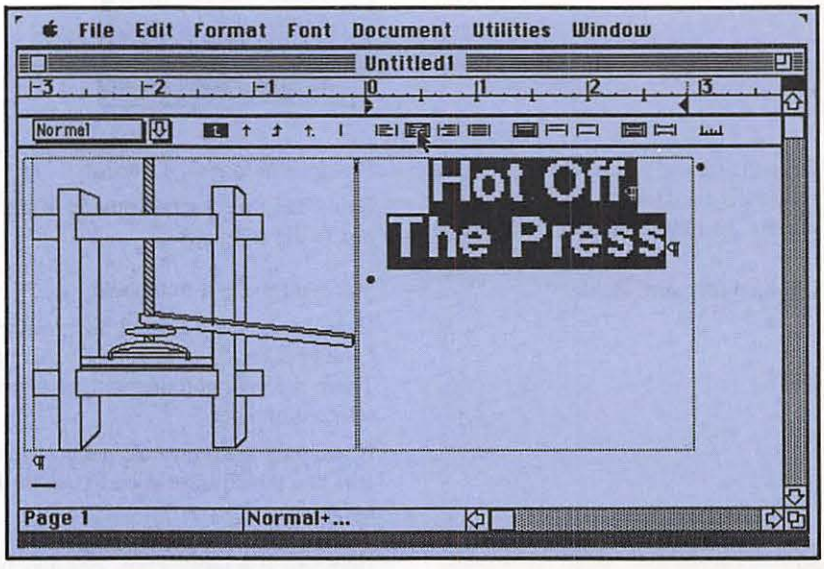


Figure 8.35
The current masthead.

Pull down the Format menu and select the Paragraph option.	This option lets you control the appearance of the selected paragraph, or group of paragraphs. You want to add a partial border to what you have created.
Release the mouse button.	Execute the Paragraph command. This command may be executed by using ⌘M.
Click on the Borders button.	The borders option will let you add lines around the selected text.
Click on the double line type.	You want to use the double line type.
8	Type the number 8. This number will appear in the spacing box at the bottom of the dialog box. Spacing will add blank space between the border and the text. Here you are adding eight points.
Click on the bottom line of the borders placement sample.	You want to put the line below the paragraph. Since the custom option is selected, you may pick only the border portions that you want. When you select this portion, the 8 that you typed will read "8 pt."

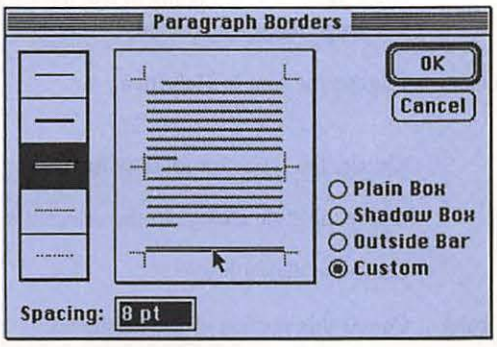


Figure 8.36
The border dialog box. Note the location of the mouse pointer. This is where you must click the mouse to obtain a border at the bottom of your selected text.

Click on the OK button.	Leave the borders dialog box. The Paragraph dialog box will still remain on the display.
Click on the Apply button.	Apply the border to the selected text.
Click on the OK button.	Leave the Paragraph dialog box.
↓	Move the cursor to below the paragraph.
[cr] The Newsletter of the [cr] Miniville Corporation [cr] Employees [cr] [cr] August 1989	Enter this text. Push the return key where you see [cr].
Select the first three lines.	You are going to change the font and size of the text you entered, but the date will have a different size than the subtitle. Thus, it is not selected here.

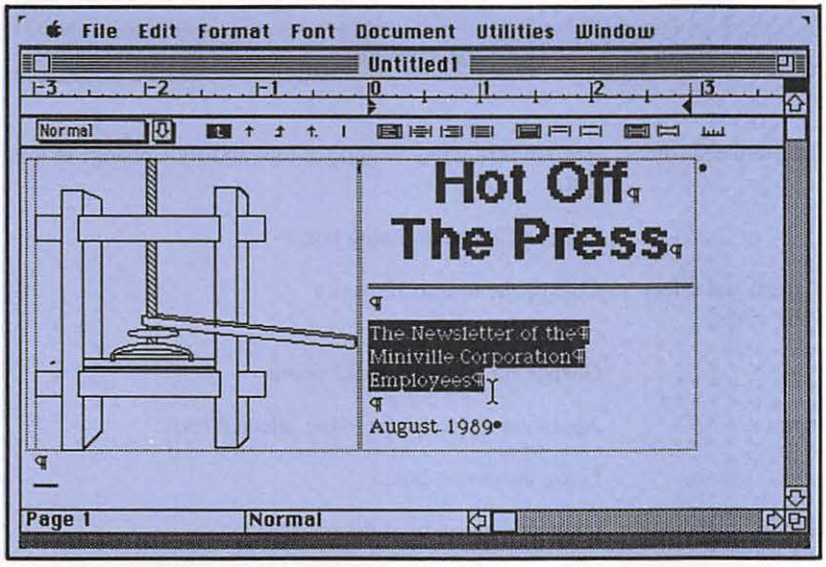


Figure 8.37
The new text has been added to the masthead, and the text you are going to work with has been selected.

⌘D	Once again you are going to use the Character dialog box to change the selected item.
Pull down the Font list menu and select Helvetica, then release the mouse.	Change the font to Helvetica.
18	Change the type size to 18 points.
Click on the Apply button.	Apply the style change to the selected text.
Click on the OK button.	Leave the dialog box.
Click on the center text icon on the ruler line.	Center this portion of the masthead.

Figure 8.38
The masthead as it currently appears.



Select the last line of the masthead, the date.	You are now going to apply a font and style change to this text.
⌘D	Use the Character dialog box.
Pull down the Font list menu and select Helvetica, then release the mouse.	Change the font to Helvetica.
12	Change the type size to 12 points.
Click on the Apply button.	Apply the style change to the selected text.
Click on the OK button.	Leave the dialog box.
Click on the center text icon on the ruler line.	Center this portion of the masthead.

↓	Move the cursor to below the masthead.



Figure 8.39
The completed masthead.

[cr]	Add a blank line.
↑	Move the cursor up one line.
⌘M	You are now going to add a line across the page to separate the masthead from the rest of the newsletter. The blank line you just added is necessary so that after you apply a border to the current paragraph you will be able to work below the border paragraph in the text.
Click on the Borders button.	Select borders.
Click on the heavy line.	This is the second line type down in the column of line type icons.
Click on the bottom border of the sample.	You want this border to appear only at the bottom of the paragraph.

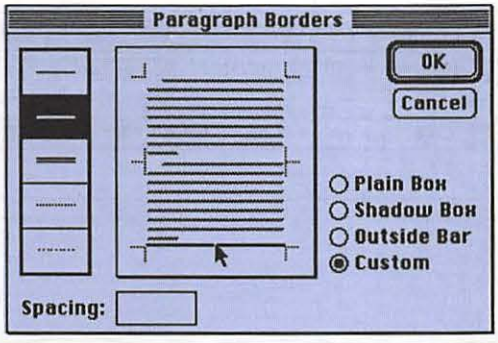


Figure 8.40
The border dialog box with the selections you have made.

Click on the OK button.	Leave the Border dialog box.
Click on the Apply button.	Apply the border to the selected paragraph.
Click on the OK button.	Put away the Paragraph dialog box.

8.17 NEWSPAPER COLUMNS

Newspaper columns are different from the side-by-side paragraphs that you created for the masthead. When newspaper columns are in use, text will flow from the bottom of one column to the top of the adjacent column. This is what we want to happen as we add stories to the Miniville Corporation newsletter.

8.18 THE SECTION BREAK

Newspaper columns are created by using section options. If the complete document is to be in columns, then the section option would be applied at the outset, affecting the whole work. In this case, however, you do not want newspaper columns in the masthead. Thus, before you change the section options, you must create a section break.

What To Do	*Why You Are Doing It*
↓	Move the cursor below the border paragraph. You cannot use the return key here!
⌘-[ENTER]	Hold down the command key and press the Enter key (NOT the return key). This will add a section break to the document. It will appear as a double line across the page. Also note that at the bottom of the window is displayed "P1 S1" instead of "Page 1." This stands for Page 1, Section 1.

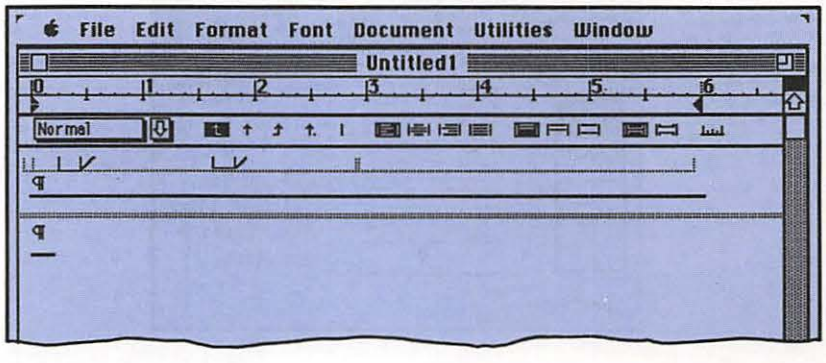


Figure 8.41
The section break appears across the window.

⌘S	Before you continue, save what you have created so far. If you have problems later this is a good point to return to.
Newsletter	Name the document Newsletter. If your disk is not selected, click on the disk button to change the selected disk.
Click on the Save button.	Save your work.

8.19 CHANGING THE SECTION OPTIONS

Just having multiple sections does not change anything. Before you continue you must change how the section you have just created is going to behave within the document. It currently has the same characteristics as the first section, which are to start at a new page and to enter text into a single column that occupies the complete width of the page.

What To Do	*Why You Are Doing It*
Pull down the Format menu and select the Section option.	You are now going to change the features of the section. Since the cursor is below the section break, you are adjusting the second section of the document. If you had moved the cursor above the section break you would be adjusting the first section.

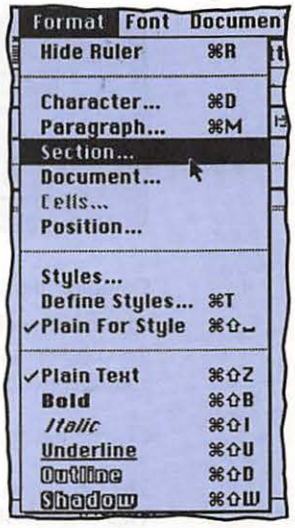


Figure 8.42
The Section command has been selected. If you are using an extended keyboard, you may access this menu by using Option-F14.

Release the mouse button.

After a brief pause, the Section dialog box will appear.

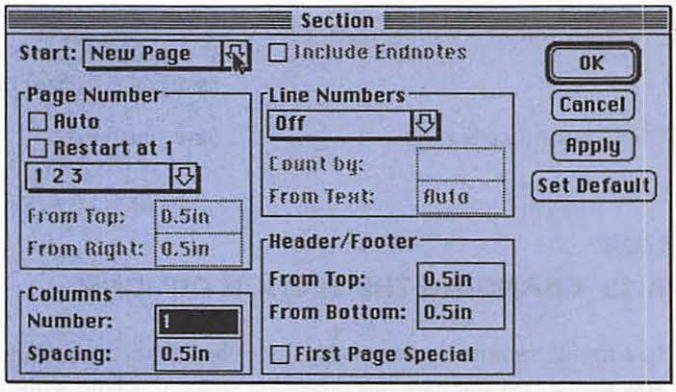


Figure 8.43
The initial Section dialog box.

Pull down the Start menu.

This menu is located at the top left of the dialog box. It works in the same fashion as the font list found on the Character dialog box.

At present the section is set to start a new page. This means that after the masthead is printed, the next bit of text will start on the next page. This is not what we want to have happen.

Select No Break.

By selecting the No Break option, this section will continue on the current page, rather than going to a new page.

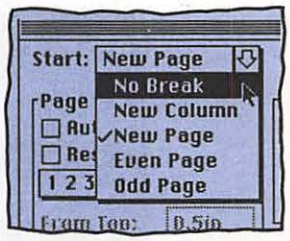


Figure 8.44
The Start menu is pulled down and No Break is selected.

Release the mouse button.

Complete the selection of the No Break option.

At the bottom left of the Section dialog box you will find the column options. The number 1 is currently displayed, and selected, as the number of columns.

2

Change the number of columns to 2.

[TAB]

The tab key will automatically select the Spacing entry. This controls the space between the two columns.

.25

Change the between-column spacing to one quarter of an inch.

Click on the OK button.

Complete the section changes and put away the dialog box. The only change you will see immediately is the right margin of the ruler line will reposition to reflect the width of the column.

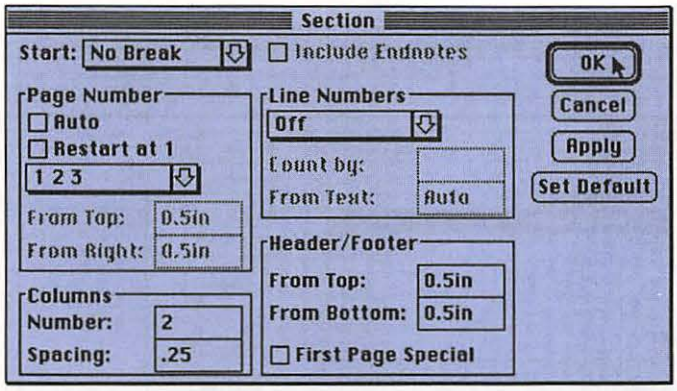


Figure 8.45
The Section dialog box after all the changes have been made.

8.20 EDITING THE NEWSLETTER'S STYLE SHEET

In an earlier chapter you saw the benefits of Word's style sheets. Before you add stories to the newsletter, define the styles so that the stories can be easily formatted.

What To Do	*Why You Are Doing It*
Pull down the Format menu, select Define Styles and release the mouse button.	You are going to change the Normal style to Times 12 point from its default settings.
Click on Normal in the style list.	You do not yet want to create a new style. Select Normal so that it may be modified.
Pull down the Font menu, select Times and release the mouse.	Change the font to Times.
Pull down the Font menu, select 12 point and release the mouse.	Change the point size to 12 points.
Click on the Justified Text icon on the ruler line.	You want the text to be justified, rather than ragged right.
Drag a left align tab stop to the 1/4-inch point on the ruler line.	Add a tab stop. The default half-inch tab is too large for the columns you have created (Figure 8.46 on the next page).
Click on the Define button.	Make the change permanent for this document.
Click on New Style in the style list.	You are going to add a new style to the style list for this document.
Header	Type "Header" into the style name box. This is the style that you will use for headlines within the publication.
Pull down the Font menu, select Helvetica and release the mouse.	Change the font to Helvetica.
Pull down the Font menu, select 14 point and release the mouse.	Change the point size to 14 points.

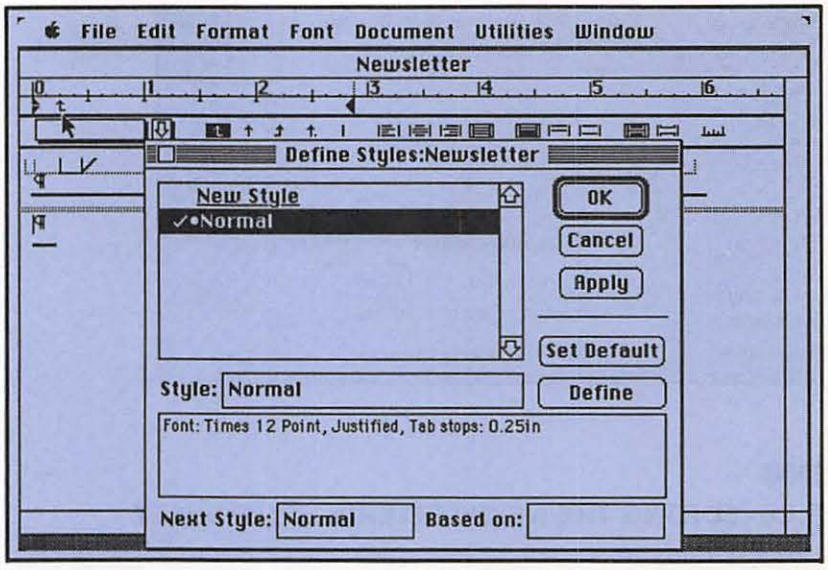


Figure 8.46
The style is ready to be defined.

Pull down the Format menu, select Bold and release the mouse.	Make the font boldfaced.

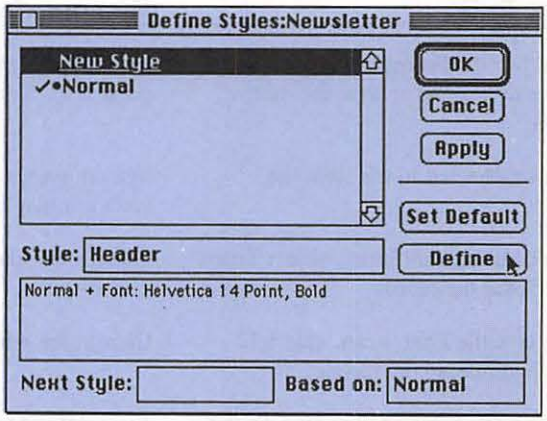


Figure 8.47
The style "Header" is ready to be defined. It uses the Helvetica font in 14 point, and is in a bold typeface.

Click on the Define button.	Create the Header style for this document.
Click on the OK button.	Close the Define Styles dialog box.
Pull down the style selection box at the left end of the ruler line, select Normal and release the mouse button.	After you defined the Header style, the current style was changed. Return the current style to the Normal style. You are now ready to add text to the newsletter.
⌘S	Save the changes you have made to the newsletter.

8.21 ADDING STORIES TO THE NEWSLETTER

You are going to add stories using the method you learned in Chapter 6 for moving blocks of text between two documents. To add a story to the newsletter you will perform the following steps:

- Open the story with the Open command.
- Select the complete story.
- Copy it into the cut/copy buffer.
- Close the story to return to the newsletter.
- Paste the contents of the cut/copy buffer into the newsletter.

What To Do	*Why You Are Doing It*
⌘O	This is the Open command from the File menu. If the Miniville folder is not open in the dialog box, double-click on it to open the folder. If you do not see the Miniville folder at all, you may have to click on the drive option, or eject the disk to place the proper disk into the disk drive.
Select Last Month Story and click on the Open button.	The first story that you want to place is called Last Month Story.

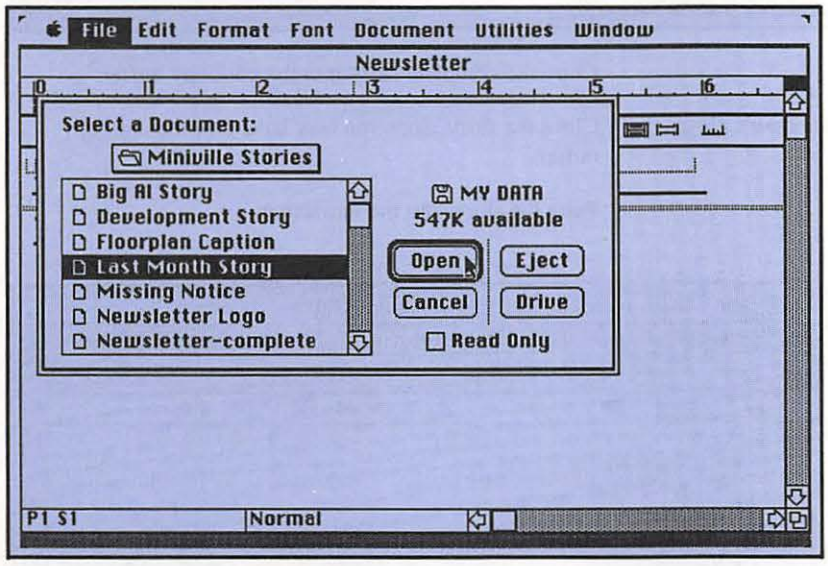


Figure 8.48
The "Last Month Story" has been selected in the dialog box and will be opened when the Open button is pressed.

After clicking on the Open button the story will be in the open window.

Move the mouse pointer to the left edge of the window so that you have the reverse mouse arrow.

You are going to select the complete story. This is the first step toward doing this.

⌘

Hold down the command key.

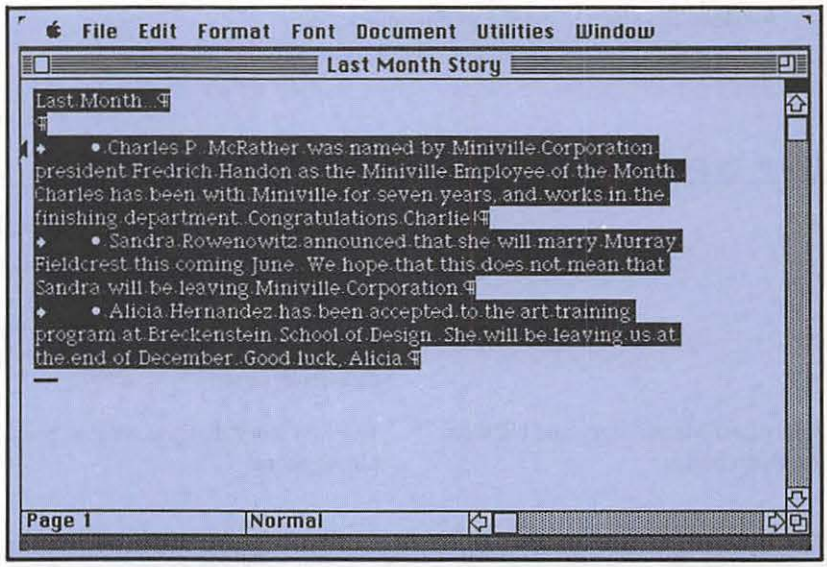
Click the mouse button.

When you click the mouse button, the complete document will be selected.

Figure 8.49
The reverse mouse arrow is in the left margin of the document.



Figure 8.50
The complete story has been selected.



⌘C

Copy the complete story into the cut/copy buffer.

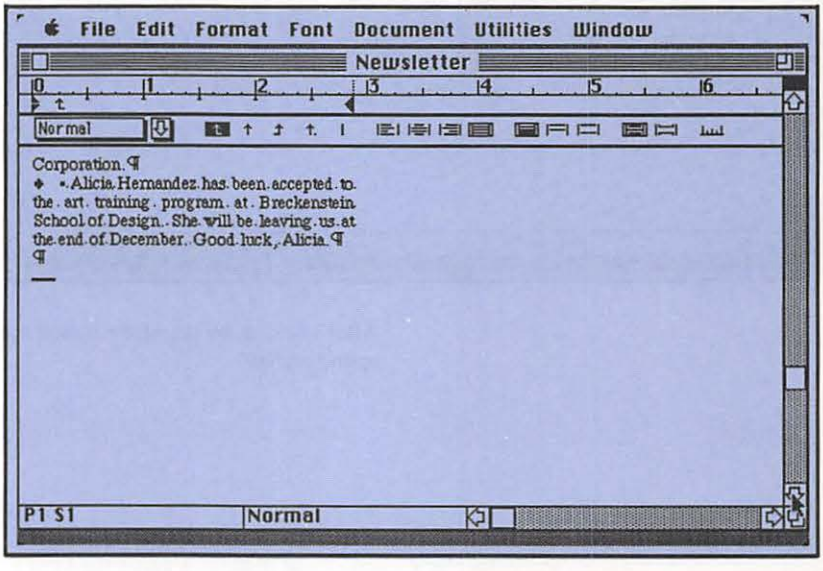
Click on the current window's close box.

Close the story since you now have it in the cut/copy buffer.

⌘V

Paste the story into the newsletter.

Figure 8.51
The first story is now in the newsletter.



Since you changed the definition of the Normal style for the newsletter, the pasted selection will take on the new Normal style definition.

Click on the top of the scroll bar at the right side of the window.

Scroll the window so that you can see the beginning of the story you placed into the newsletter.

You can see that the story's headline, "Last Month", has not taken on the Header style. There is no way for Word to have known that you wanted this one line in a different style.



Figure 8.52
You have selected the story's headline so that the headline style can be applied to it.

Select the story headline.

You are going to change the style for the headline.

Pull down the style list at the left side of the ruler line, select Header and release the mouse button.

Apply the Header style to the selected text.

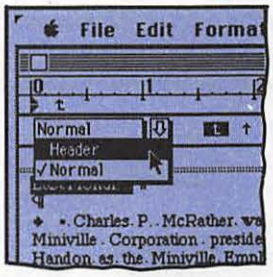


Figure 8.53
The Header style has been selected from the style list.

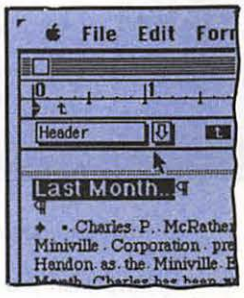


Figure 8.54
After releasing the mouse, the style is applied to the selected text.

⌘3

Use the 3 on the number pad to move to the end of the newsletter, which is where you will add the next story.

[cr]

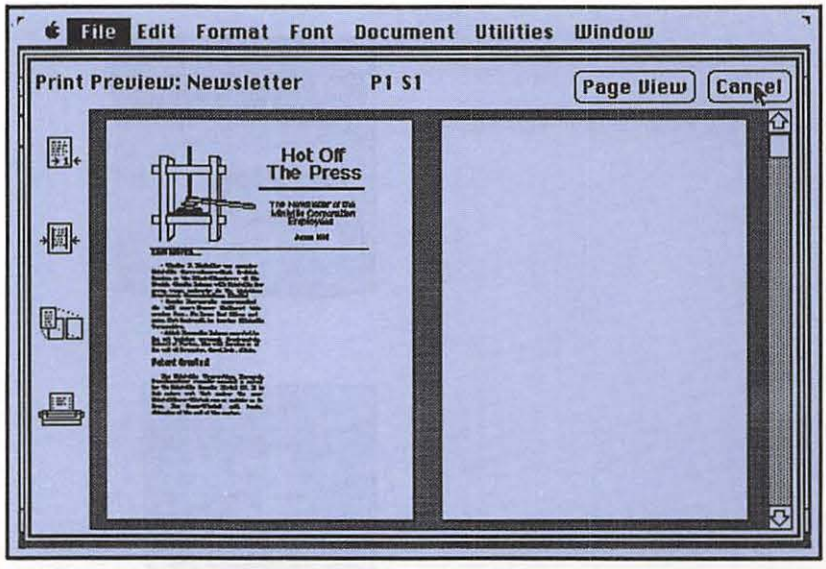
Add a blank line before you add the next story.

⌘O

Select the Open command.

Select Patent Story in the dialog box.	The Patent Story is the next story to be placed into the newsletter. You will have to use the scroll bar on the right side of the file list box to see this story title.
Click on the Open button.	Open the story.
Select the complete document.	Use the reverse mouse arrow, ⌘-mouse click to select the whole document.
⌘C	Copy the story into the cut/copy buffer.
Click on the current window's close box.	Put away the story and return to the newsletter.
⌘V	Paste the story into the newsletter.
Select the story's headline.	You are going to apply the Headline style to this line.
Pull down the style list at the left side of the ruler line, select Header and release the mouse button.	Apply the Header style to the selected text.
⌘I	Select the Print Preview command. This command is found on the File menu. The Print Preview will display in miniature form what you have created so far.

Figure 8.55
The Print Preview display.



Click on the Cancel button.	Return to editing the newsletter.
⌘S	Save what you have done so far.
⌘3	Use the 3 on the number pad to move to the end of the newsletter, which is where you will add the next story.
[cr]	Add a blank line before you add the next story.
⌘O	Select the Open command.
Select Missing Notice in the dialog box.	The Missing Notice is the next story to be placed into the newsletter.

Click on the Open button.	Open the story.
Select the complete document.	Use the reverse mouse arrow, ⌘-mouse click to select the whole document.
⌘C	Copy the story into the cut/copy buffer.
Click on the current window's close box.	Put away the story and return to the newsletter.
⌘V	Paste the story into the newsletter.
Select the paragraph you just added.	You are NOT going to add a headline to this item. It will be separated from the previous story by a line, called a ruler line.

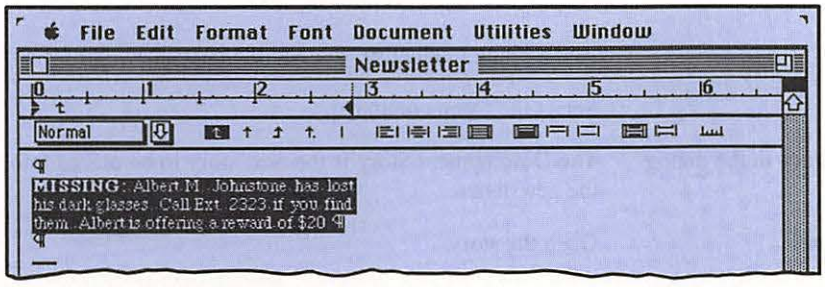


Figure 8.56
The last story added has been selected. Do not select the ¶ marks above and below this story.

⌘M	Select the Paragraph command from the Format menu.
Click on the Borders button.	You are going to place a border above this item to separate it from the Patent Granted story.
8	Enter 8 into the spacing box at the bottom of the Borders dialog box.
Click on the border above the sample.	You want to add a border above the current paragraph. Do NOT change the line type for this border. A single thin line is what is desired here.

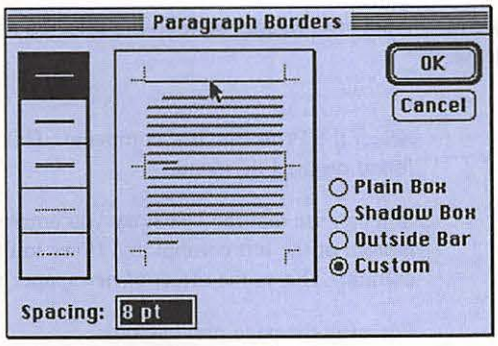
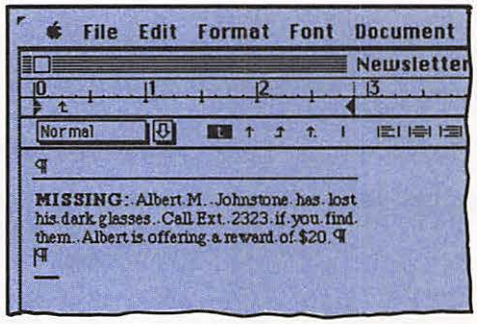


Figure 8.57
The current borders dialog box.

Click on the OK button.	Close the Borders dialog box.
Click on the Apply button.	Apply the border to the selected paragraph.
Click on the OK button.	Close the Paragraph dialog box.

⌘3	Use the 3 on the number pad to move the cursor to the end of the newsletter.

Figure 8.58
The Missing notice paragraph now has a line above it.



[cr]	Add a blank line before you add the next story.
⌘O	Select the Open command.
Select Development Story in the dialog box.	The Development Story is the next story to be placed into the newsletter.
Click on the Open button.	Open the story.
Select the complete document.	Use the reverse mouse arrow, ⌘-mouse click to select the whole document.
⌘C	Copy the story into the cut/copy buffer.
Click on the current window's close box.	Put away the story and return to the newsletter.
⌘V	Paste the story into the newsletter.
Scroll the window using the right scroll bar.	Scroll the window until you are able to see the headline of the story you just added to the newsletter.
Select the story's headline.	You are going to apply the Headline style to this line.
Pull down the style list at the left side of the ruler line, select Header and release the mouse button.	Apply the Header style to the selected text.
⌘I	Select the Print Preview command. This command is found on the File menu. You can see that the last story you entered starts at the bottom of the left column and flows to the top of the right column. This is the effect of newspaper style columns.
Click on the OK button.	Put away the page preview box.
⌘S	Save what you have done if it matches the text. If your work does not match the text, go back to the last time you saved the newsletter and try again.
⌘3	Use the 3 on the number pad to move the cursor to the end of the newsletter.
[cr]	Add a blank line before you add the next item.

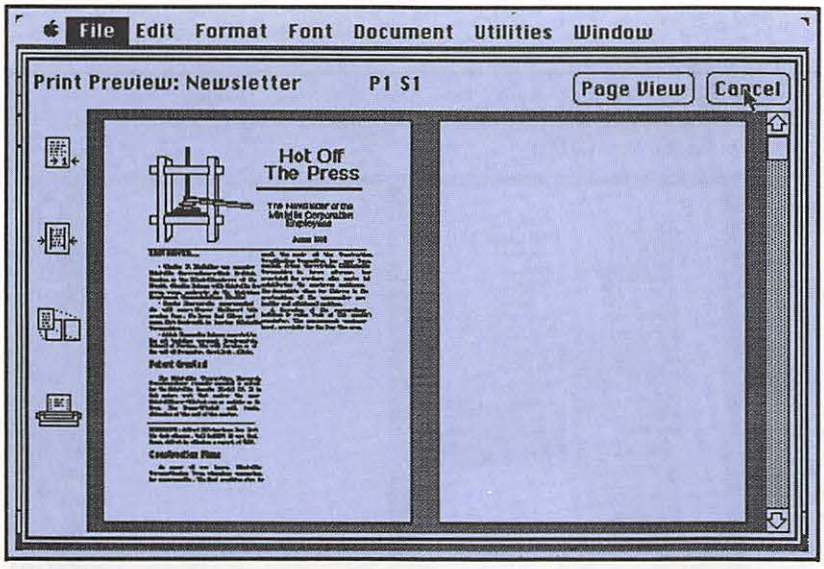


Figure 8.59
The current publication.

Pull down the Apple menu, select the scrapbook then release the mouse.

You now want to get a graphic from the scrapbook DA to place into the newsletter.

Click on the scroll bar at the bottom of the scrapbook until the picture of the Mississippi River appears.

You are going to place the picture of barges being pushed up the Mississippi River into the newsletter. This picture won the annual employee photography contest. It was scanned and saved in a special format, called PICT, that Word is able to use and print from.

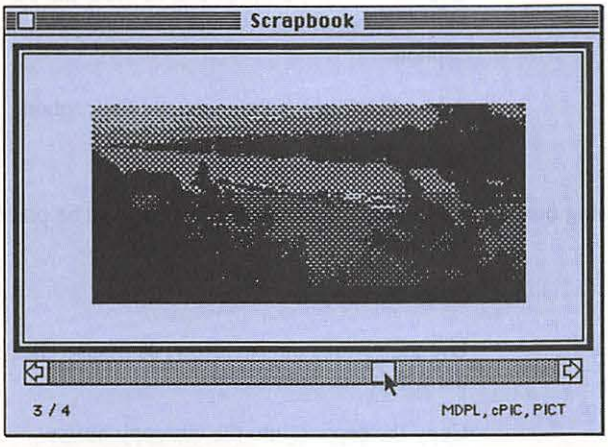


Figure 8.60
You should have this item in your scrapbook.

⌘C

Copy the picture from the scrapbook into the cut/copy buffer.

Click on the scrapbook close box.

Put away the scrapbook. The picture is now in the clipboard.

⌘V

Paste the picture into the newsletter.

⌘I	Preview the newsletter.

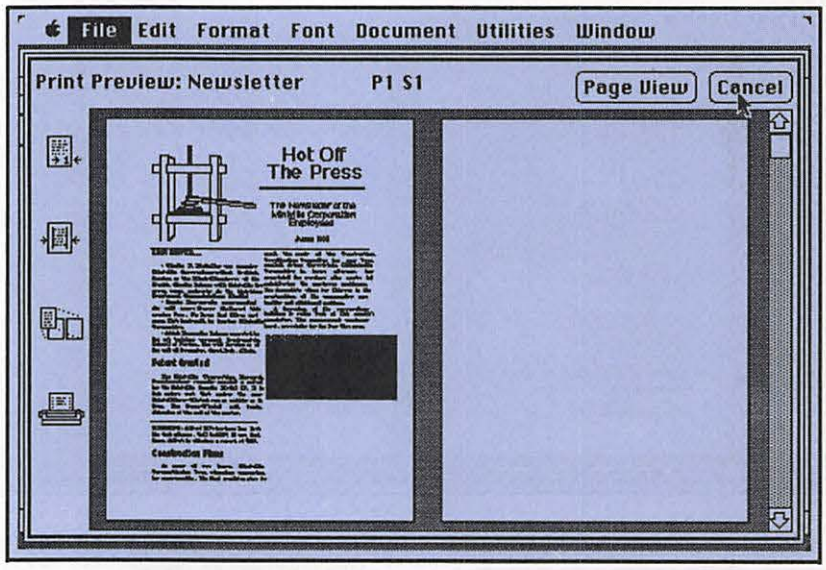


Figure 8.61
The newsletter now has a photograph.

	You can see in the preview that the photograph you have added extends over the right margin of the page. It is also at an awkward location on the page. Before this is fixed, however, add the caption.
Click on the OK button.	Put away the page preview box.
⌘3	Use the 3 on the number pad to move the cursor to the end of the newsletter, which is where you will add the caption.
[cr]	Add a blank line before you add the caption.
⌘O	Select the Open command.
Select Photo Caption in the dialog box.	The Photo Caption is the next item to be placed into the newsletter.
Click on the Open button.	Open the caption.
Select the complete document.	Use the reverse mouse arrow, ⌘-mouse click to select the whole document.
⌘C	Copy the caption into the cut/copy buffer.
Click on the current window's close box.	Put away the caption and return to the newsletter.
⌘V	Paste the caption into the newsletter below the photograph.
⌘I	Once again preview the newsletter (Figure 8.62).
Click on the Cancel button.	Leave the print preview display.
⌘S	Save what you have done if it matches the text. If your work does not match the text, go back to the last time you saved the newsletter and try again.

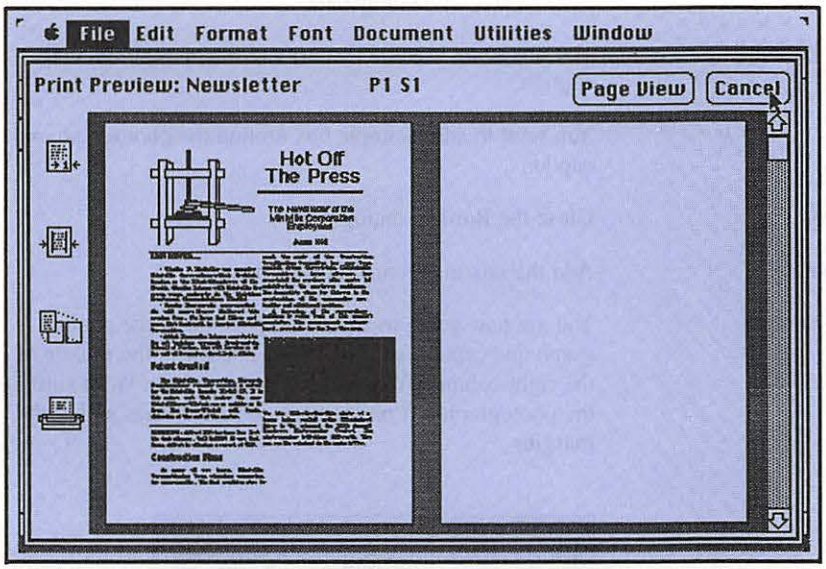


Figure 8.62
The caption has been added below the photograph.

8.22 POSITIONING AN ITEM ON THE PAGE

So far you have been adding stories and letting them flow into the defined columns. The last print preview shows, however, that the photograph is not ideally placed. It will take a lot of fiddling to attempt to get it placed in the right position if all you do is add blank lines or more story elements. However, Word does have a position option that lets you tell it where on the page you want a selection to appear. This section will place the photograph and its caption at the lower right of the page. To start this process, a box will be placed around the photo and caption.

What To Do	*Why You Are Doing It*
Select the photograph and caption.	Use the reverse arrow in the left margin to select the photograph and the caption that you have placed under it.

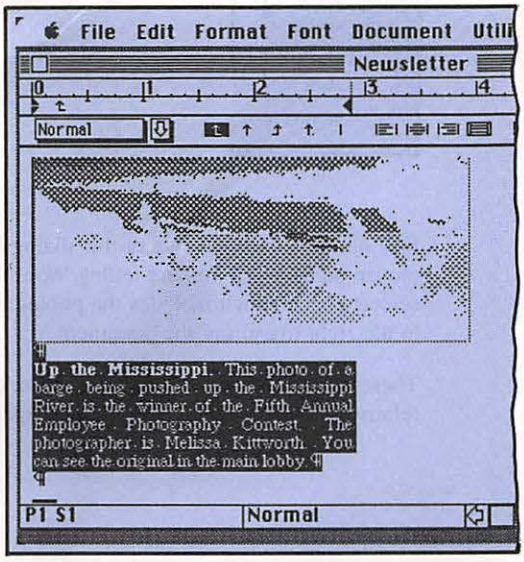
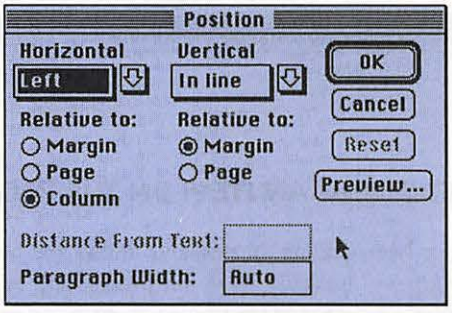


Figure 8.63
The photograph and caption have been selected. Do not select the ¶ below the caption.

⌘M	Select Paragraph commands.
Click on the Borders button.	You are going to put a box around the photograph and caption.
Click on plain box.	You want to add a simple box around the photograph and caption.
Click on the OK button.	Close the Borders dialog box.
Click on the Apply button.	Add the box to the current selection.
Click on the Position button.	You are now going to adjust the position of the photograph and caption so that it does not fall in the middle of the right column. You are also going to have Word shift the photograph left on the page so that it stays within the margins.

Figure 8.64
The Position dialog box.



Pull down the Horizontal options.	First you are going to position the photograph horizontally (left to right) on the page.
Select the Right option and release the mouse button.	You are going to position the photograph in relation to the right margin.

Figure 8.65
The Right option has been selected.



Click Margin.	Still on the horizontal side of this dialog box, click the mouse on Margin. You are telling Word to position the selected text, which includes the photograph, in relation to the right margin of the document.
Pull down the Vertical options.	These options let you adjust the position of the selection relative to the top and bottom of the page.

Select the Bottom option and release the mouse button.

You are going to position the photograph at the bottom of the page.

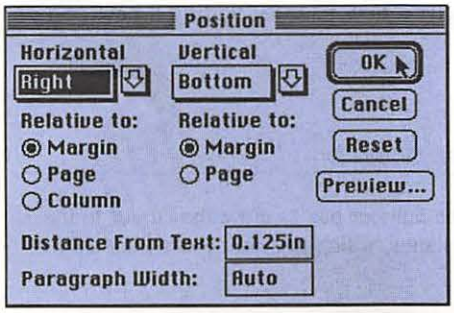


Figure 8.66
The completed Position dialog box.

Click on the Preview button.

The Preview button in the Position dialog box will take you directly to the print preview.

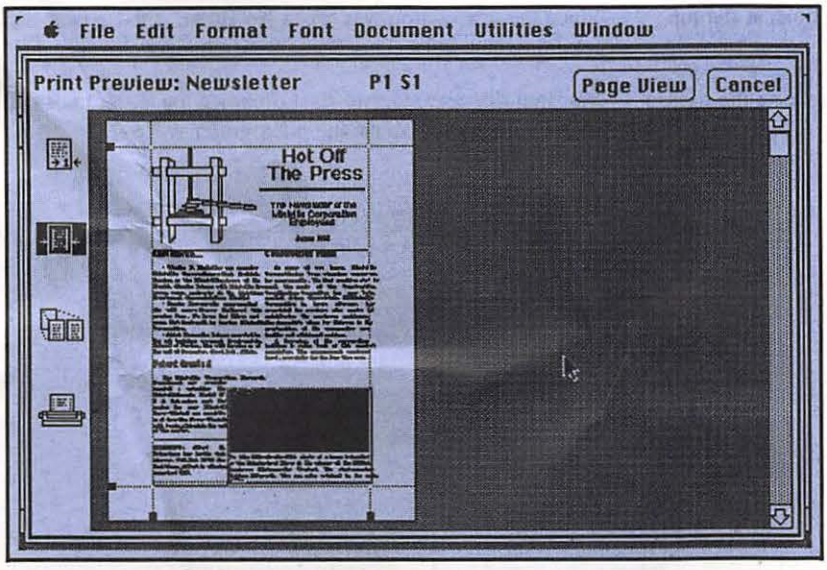


Figure 8.67
The current publication preview.

You can see that the photograph has shifted left on the page so that it no longer passes by the right margin. You can also see that the text to the left of the photograph flows around the picture and its caption.

Click on the Cancel button.

Return to editing the newsletter.

⌘S

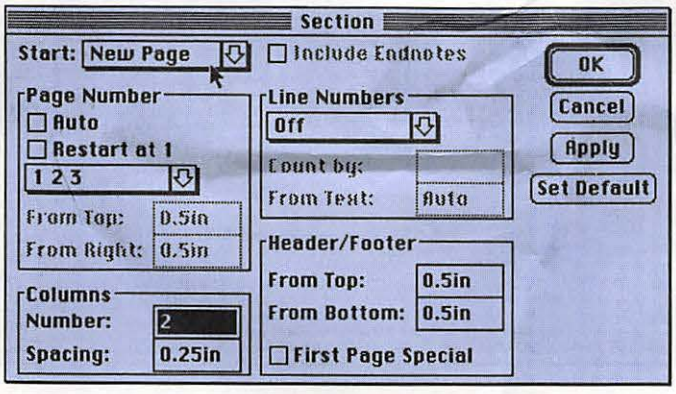
Save what you have done if it matches the text. If your work does not match the text, go back to the last time you saved the newsletter and try again.

8.23 STARTING A NEW PAGE

The first page of the newsletter is now full. We will start a new page by adding a new section break.

What To Do	*Why You Are Doing It*
⌘3	Use the 3 on the number pad to move the cursor to the end of the newsletter, which is where you will add the section break.
⌘-[ENTER]	Hold down the command key and press Enter to add a new section break.
Pull down the Format menu, select Section and release the mouse button.	You are going to adust the section options for the new section.
Pull down the Start options at the top left of the dialog box.	Since the last section was set to No Break, this section is retaining that style. This needs to be changed.
Select New Page and release the mouse button.	We want the next story to start on a new page, and not fill in the white space above the photograph.

Figure 8.68
The Section dialog box.



Click on the OK button.	You do not have to make any adjustments to the numbers of columns, since it already reads 2.
⌘O	Select the Open command.
Select Big Al Story in the dialog box.	The Big Al Story is the next story to be placed into the newsletter.
Click on the Open button.	Open the story.
Select the complete document.	Use the reverse mouse arrow, ⌘-mouse click to select the whole document.
⌘C	Copy the story into the cut/copy buffer.

Click on the current window's close box.	Put away the story and return to the newsletter.
⌘V	Paste the story into the newsletter.
Select the story's headline.	You are going to apply the Headline style to this line.
Pull down the style list at the left side of the ruler line, select Header and release the mouse button.	Apply the Header style to the selected text.
⌘I	Select the Print Preview command. This command is found on the File menu.

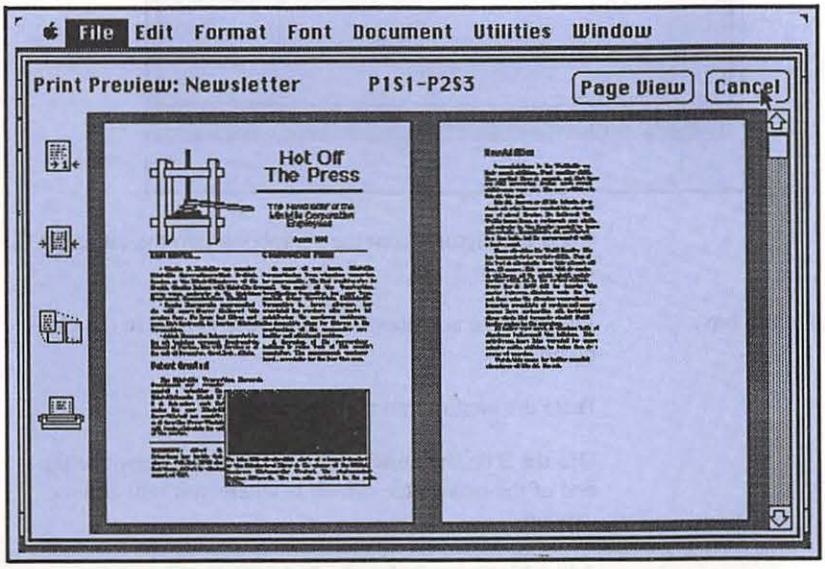


Figure 8.69
The Print Preview display. Your newsletter now has two pages.

If you forgot to add the section break, or change the section to New Page, then you will see the title of the Big Al story placed above the photograph on the first page. To fix this problem, add the section break as required and change the start option to read new page.

Click on the Cancel button.	Return to editing the newsletter.
⌘S	Save what you have done if it matches the text. If your work does not match the text, go back to the last time you saved the newsletter and try again.
⌘3	Use the 3 on the number pad to move the cursor to the end of the newsletter, which is where you will add the next item.
[cr]	Add a blank line before you add the next item.
Pull down the Apple menu, select the scrapbook then release the mouse.	You now want to get a graphic from the scrapbook DA to place into the newsletter.

Click on the scroll bar at the bottom of the scrapbook until the floor plan for the new Miniville Corporation plant appears.	You are going to place the floor plan into the newsletter.

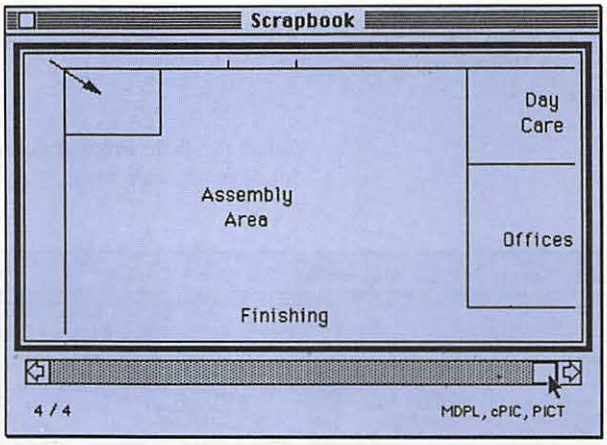


Figure 8.70
You should have this item in your scrapbook.

⌘C	Copy the picture from the scrapbook into the cut/copy buffer.
Click on the scrapbook close box.	Put away the scrapbook. The picture is now in the clipboard.
⌘V	Paste the picture into the newsletter.
⌘3	Use the 3 on the number pad to move the cursor to the end of the newsletter, which is where you will add the caption .
[cr]	Add a blank line before you add the caption.
⌘O	Select the Open command.
Select Floor plan Caption in the dialog box.	The Floor plan Caption is the next item to be placed into the newsletter.
Click on the Open button.	Open the caption.
Select the complete document.	Use the reverse mouse arrow, ⌘-mouse click to select the whole document.
⌘C	Copy the caption into the cut/copy buffer.
Click on the current window's close box.	Put away the caption and return to the newsletter.
⌘V	Paste the caption into the newsletter below the floor plan.
⌘I	Preview the newsletter.

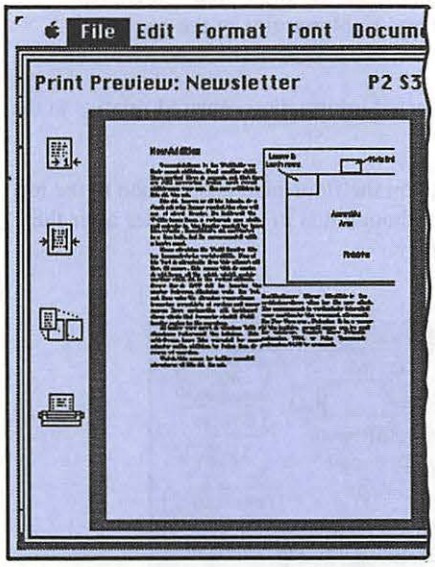


Figure 8.71
The newsletter has a problem with the floor plan!

You can see in the preview that the floor plan you have added extends over the right margin of the page.

Select the floor plan and its caption.

You are going to position the floor plan.

Pull down the Format menu.

The Position dialog may be reached either through the Paragraph commands as you did earlier, or directly from the Format menu.

Select the Position command and release the mouse button.

Go directly to the Position dialog box.

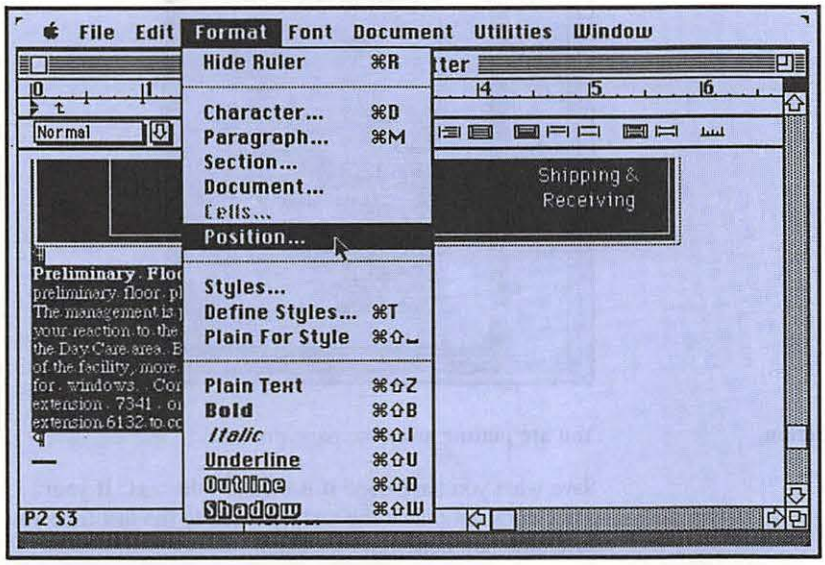
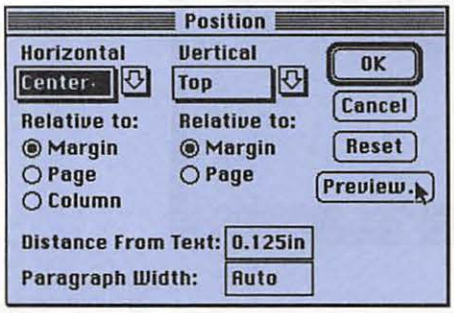


Figure 8.72
The Position command has been selected. Note that behind the menu the floor plan and caption are selected. Do not select ¶ at the end of the newsletter.

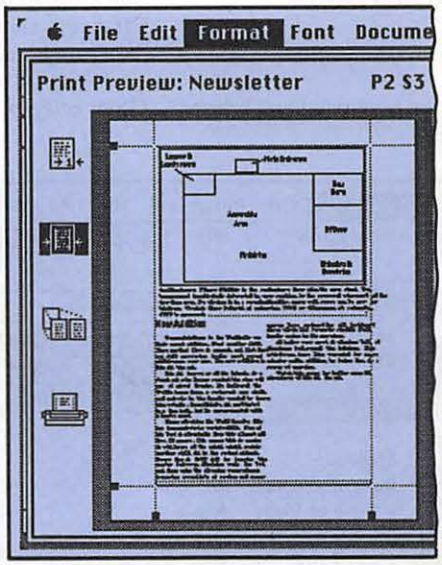
Pull down the Horizontal position menu, select Center and release the mouse button.	You are going to position the floor plan and caption between the left and right margins of the page.
Click on Margin under the Horizontal position option.	You want the selected information centered relative to the margins.
Pull down the Vertical position menu, select Top and release the mouse button.	You want to position the floor plan and caption at the top of the page, even though it is in the newsletter after the New Addition story!

Figure 8.73
The settings of your Position dialog box should match the settings in this figure.



Click on Preview.	Go directly to the Print Preview display.

Figure 8.74
The position of the floor plan and caption are now at the top of the second page of the newsletter.



Click on the Cancel Button.	You are putting away the page preview.
⌘S	Save what you have done if it matches the text. If your work does not match the text, go back to the last time you saved the newsletter and try again.
Locate the New Addition story headline.	Use the scroll bars to locate the beginning of this story.

Click the mouse in front of the word New.	Position the mouse at the headline.
Pull down the Format menu, select the Section command and release the mouse button.	You are going to modify the section options for the second page.
1	Change the number of columns for this section back to 1.

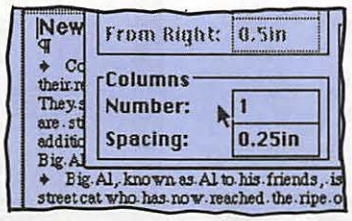


Figure 8.75
Change the number of columns for this part of the newsletter back to 1.

Click on the Apply button.	Apply this change to the section.
Click on the OK button.	Put away the Section dialog box.
⌘M	Open the Paragraph dialog box.
Click on the Borders option.	You are going to add a border above the New Addition story.
10	Make the spacing for the border 10.
Click on the border above the placement control.	Place the border above the paragraph.

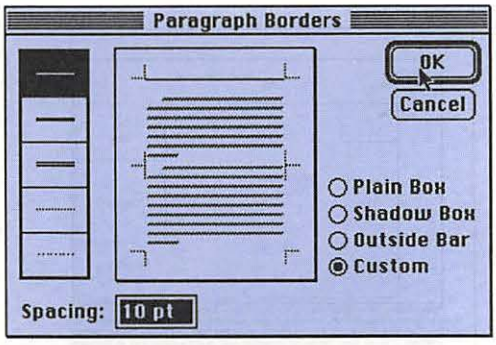


Figure 8.76
The Borders dialog box. Note that the spacing has been set to 10.

Click on the OK button.	Put away the Borders dialog box.
Click on the Apply button.	Apply the border to the selected paragraph.
Click on the OK button.	Put away the Paragraph dialog box.

⌘I	Preview the newsletter.

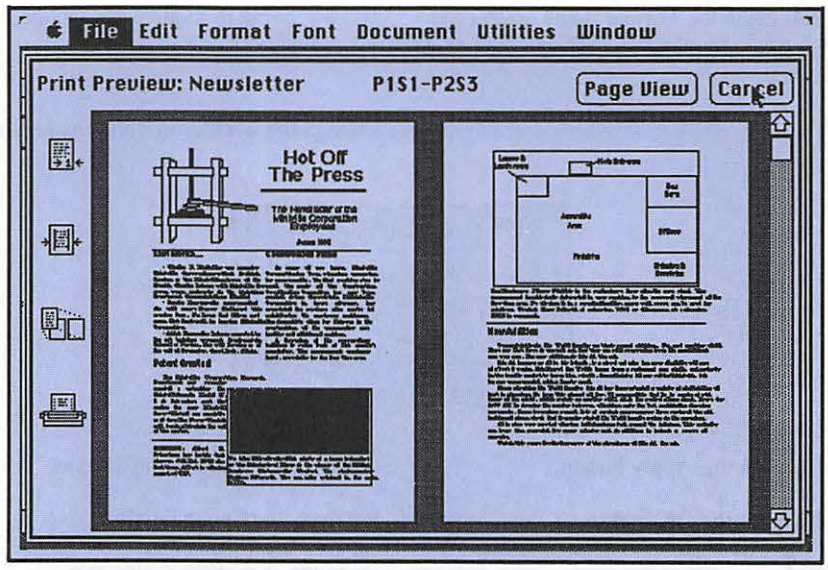


Figure 8.77
The Print Preview of your complete publication.

Click on Cancel.	Leave the Print Preview.
⌘S	Save the newsletter.
⌘P	If you have a printer attached to your Macintosh, Print the completed publication.

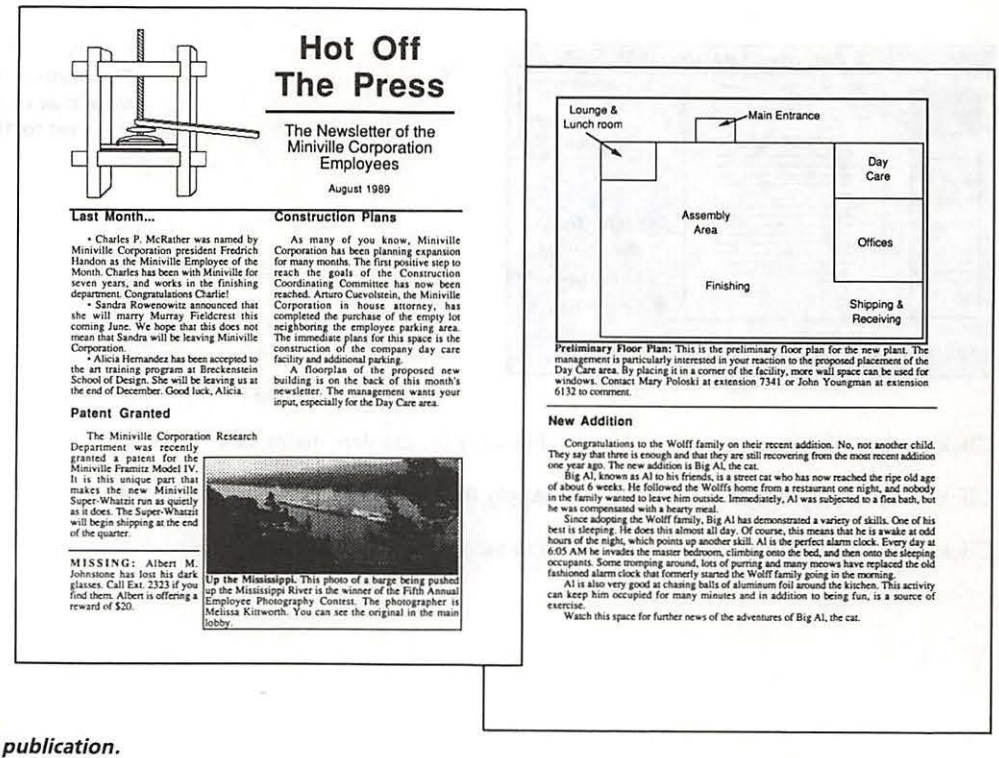


Figure 8.78
The complete publication.

⌘Q	If you are finished with the publication, quit Word.

EXERCISES

1. What are the three planning steps that should be carried out to ensure a successful publication?
2. What is a serif? What purpose do serifs serve?
3. What are the two typeface decisions you must make?
4. What are the five groups, or species, of typefaces discussed in the text?
5. What is a typeface family?
6. What would be a good typeface to use for a first grade reader? Why?
7. What are the rules you should employ to help you decide the appropriate typeface for headlines?
8. What is leading?
9. What is kerning?
10. How do you decide the appropriate width for a column?
11. What are the page design concepts mentioned in the text?
12. On which menu of MS-Word can you find the Insert Table command?
13. What are newspaper-style columns?
14. What is the advantage of newspaper-style columns over the side-by-side columns created with the Insert Table command?
15. What is a masthead?
16. How do you enter a section break into a Word document? What is the value of a section break?
17. Is it possible to draw a line above or below a paragraph without drawing a complete box around the paragraph? If so, how, and can the spacing between the text and line be adjusted?
18. Which menu command lets you adjust the position of text on the page?
19. When you adjust the position of an item, can you place it only at the bottom of the page, or may it also be placed in other locations on the page?
20. Is it possible to change section settings, or do you have to remove the section break and re-insert it?

CHAPTER

BEGINNING ELECTRONIC SPREADSHEET CONCEPTS

9

CHAPTER OBJECTIVES

Upon completion of this chapter, the student will:

- **Explain what an electronic spreadsheet is.**
- **Explain what an electronic spreadsheet may be useful for.**
- **Start Microsoft Excel running on the computer.**
- **Move the cursor from one location to another on the spreadsheet.**
- **Define the term range.**
- **Put text, numeric values and simple formulas into cells of the spreadsheet.**
- **Change the contents of a cell.**
- **Save a model.**
- **Print the spreadsheet.**
- **Start a new worksheet.**
- **Quit Microsoft Excel.**

9.1 WHAT IS AN ELECTRONIC SPREADSHEET?

If you have ever taken an introductory accounting class, you know what spreadsheet paper is—lined paper with a multitude of accounting uses. For example, you may use spreadsheet paper to create profit and loss statements, balance sheets or accounting journal pages.

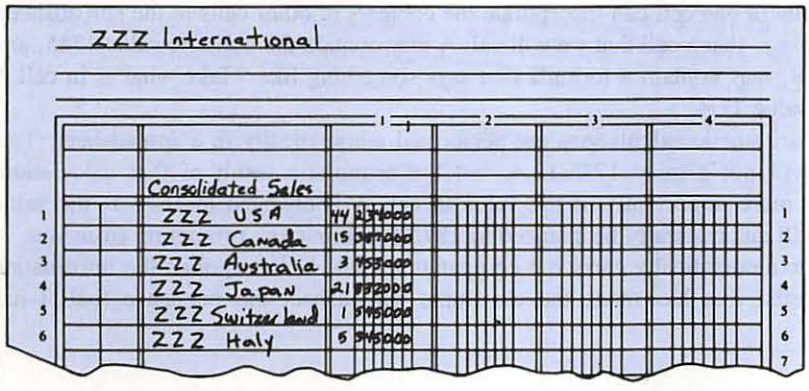
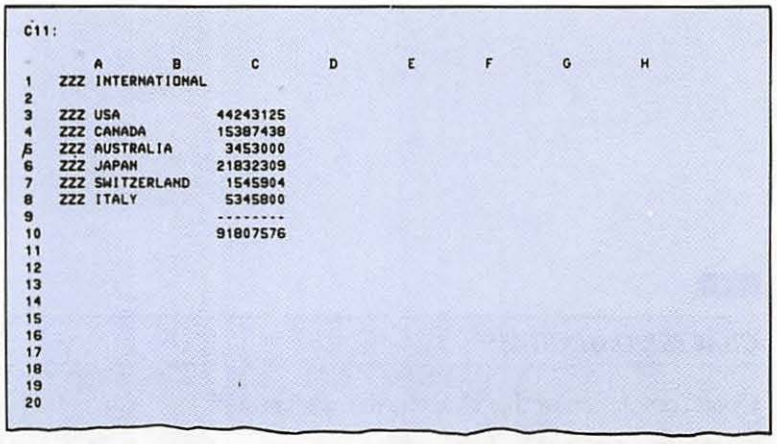


Figure 9.1
Accountant's spreadsheet paper.

An electronic spreadsheet has some similarities to the physical piece of paper shown in Figure 9.1. The computer's memory is arranged into something like a large, invisible electronic piece of horizontally lined paper with columns drawn on it. This results in an electronic page full of boxes, or cells, in the machine's memory. The more memory in the computer, the larger this electronic page can be, which really means that more of the cells making up the spreadsheet may be filled with information.


C11:

	A	B	C	D	E	F	G	H
1	ZZZ	INTERNATIONAL						
2								
3	ZZZ	USA	44243125					
4	ZZZ	CANADA	15387438					
5	ZZZ	AUSTRALIA	3453000					
6	ZZZ	JAPAN	21832309					
7	ZZZ	SWITZERLAND	1545904					
8	ZZZ	ITALY	5345800					
9			--------					
10			91807576					
11								
12								
13								
14								
15								
16								
17								
18								
19								
20								

Figure 9.2
A spreadsheet screen, containing the same information as the piece of paper in Figure 9.1.

This, however, is about where the similarities end. An electronic spreadsheet is capable of performing the same basic tasks as the traditional spreadsheet paper, holding and displaying information. Additionally, each box of the electronic spreadsheet is capable of performing a multitude of other tasks, such as arithmetic, finding information in other cells, or holding text display.

What makes an electronic spreadsheet the valuable tool that it is, however, is that it performs the arithmetic and other numeric operations for you automatically. Indeed, with most spreadsheet programs, you have to go out of your way to keep the program from updating all the spreadsheet's numeric values when a new number is added to the page. A paper spreadsheet, alas, can do nothing but display what you have written on it. If you make a change to a paper spreadsheet, you will have to change other areas of the document that are affected manually.

The ability to perform arithmetic calculations automatically is a major reason electronic spreadsheets have become one of the most important tools available on computers today. But their applications in the accounting field are not the sole reasons for their popularity. Indeed, spreadsheets are in use in a wide variety of fields and endeavors. As previously mentioned, the cells making up an electronic spreadsheet are capable of performing arithmetic calculations. These can be simple computations, such as 3 + 5/12. This type of computation is referred to as a formula. But a formula in one cell can incorporate the contents of other cells in the spreadsheet. This means, for example, that a cell that we will call A may contain the numeric value 1745, and another cell, called B, may contain a formula that says something like "Take what is in cell A and divide it by the value 12.4."

Now recall that arithmetic calculations are performed automatically in a spreadsheet. This means that cell B will not display 1745/12.4, but the arithmetic result of that calculation, 140.7258. However, more importantly, if the value in cell A is changed to 1677.1, the value displayed in cell B will automatically be changed to 137.25 without any prompting from you.

It is this ability to automatically carry out computations, and to incorporate the information found in multiple cells, that has made the electronic spreadsheet the pervasive tool it has become.

9.2 WHY USE AN ELECTRONIC SPREADSHEET?

All this is wonderful, but so what? Well, the phrase is not "so what" but "what if." The electronic spreadsheet makes playing numerical "what if" games as easy as counting.

"What if" may be considered the task of trying to predict the future. With the electronic spreadsheet, it is relatively simple for you to create a mathematical model reflecting, for instance, a company's financial health or some aspect of the company's production. With the spreadsheet, you can then change values within the model to see how the changes affect the rest of the organization. This is exercising the "what if" capability of the program.

For example, consider a company with many subsidiaries. While each subsidiary **must** be successful on its own, the success or failure of each contributes to the overall health of the parent company.

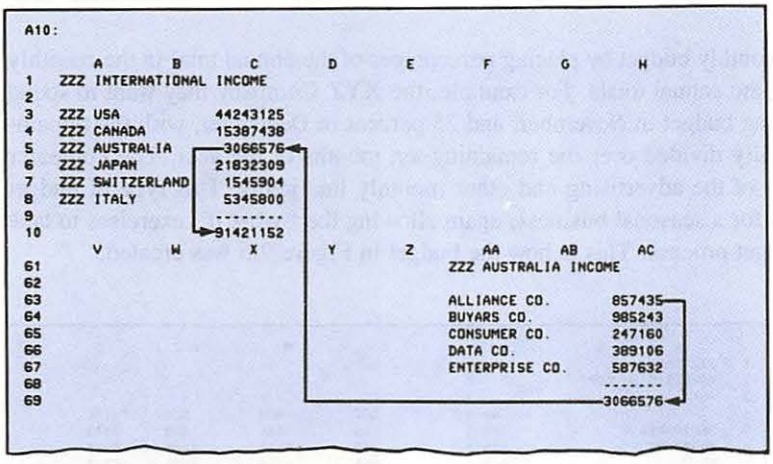


Figure 9.3
If the income for the subsidiary Alliance Co. changes, you can see how it is reflected in other portions of the spreadsheet, ultimately affecting the bottom line of ZZZ International.

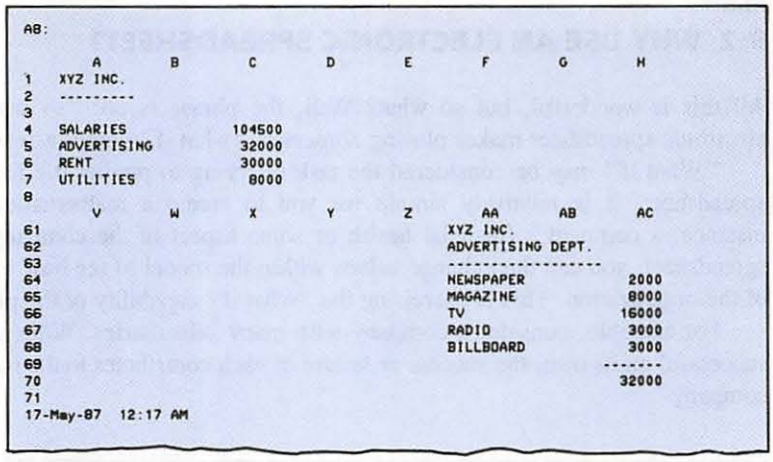
As you can see in Figure 9.3, a change at the bottom level in the Alliance Co. can have an effect throughout much of the rest of the parent organization. The parent company's officers can experiment with the cells in the spreadsheet representing the lowest level of the firm to see how each change affects the firm as a whole.

9.3 BUDGETING

The electronic spreadsheet can also be very useful as part of the budgeting process as well as the forecasting/planning process, as you saw above. Budgets, of course, are also part of the planning process. Budgets are "what if" exercises.

A typical budget has major categories and many line items under each of the categories. The bottom right of Figure 9.4 on the next page shows the advertising budget for XYZ, Inc. This budget is incorporated into the complete budget for the company, as seen at the top left of the figure. These are annual budgets, but the spreadsheet makes it simple to break them down into monthly or weekly budgets, if you so desire.

Figure 9.4
The departmental budget is on the bottom right, and the company budget on the top left. Note that the departmental budget is part of the overall company budget.

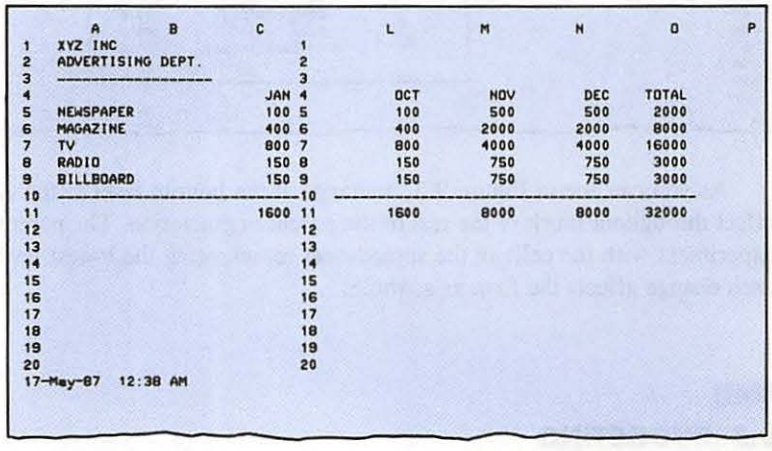


```
A8:

     A          B          C          D          E          F          G          H
1    XYZ INC.
2    ---------
3
4    SALARIES              104500
5    ADVERTISING            32000
6    RENT                   30000
7    UTILITIES               8000
8
     V          W          X          Y          Z          AA         AB         AC
61                                                         XYZ INC.
62                                                         ADVERTISING DEPT.
63                                                         ------------------
64                                                         NEWSPAPER                2000
65                                                         MAGAZINE                 8000
66                                                         TV                      16000
67                                                         RADIO                    3000
68                                                         BILLBOARD                3000
69                                                                                 -------
70                                                                                 32000
71
17-May-87  12:17 AM
```

You can extend the monthly budget by placing percentages of the annual total in the monthly cells and simply entering the annual totals. For example, the XYZ Company may want to spend 25 percent of its advertising budget in November, and 25 percent in December, with the remaining 50 percent to be equally divided over the remaining ten months of the year. The computer then calculates the values of the advertising and other monthly line items. This type of budget model can be very useful for a seasonal business, again allowing the "what if" exercises to take place as a part of the budget process. This is how the budget in Figure 9.5 was created.

Figure 9.5
Departmental budget by month.



```
     A          B          C                    L          M          N          O          P
1    XYZ INC                    1
2    ADVERTISING DEPT.          2
3    ------------------         3
4                          JAN   4      OCT        NOV        DEC        TOTAL
5    NEWSPAPER             100   5      100        500        500        2000
6    MAGAZINE              400   6      400        2000       2000       8000
7    TV                    800   7      800        4000       4000       16000
8    RADIO                 150   8      150        750        750        3000
9    BILLBOARD             150   9      150        750        750        3000
10   ------------------------   10     ------------------------------------------
11                         1600  11      1600       8000       8000       32000
12                               12
13                               13
14                               14
15                               15
16                               16
17                               17
18                               18
19                               19
20                               20
17-May-87  12:38 AM
```

You can use the electronic spreadsheet as another part of the budget/planning process to compute line item values needed to make the budget balance or to make predictions of the status of the profit and loss statement. For example, you may decide on a goal for company profits and then let the computer determine the necessary sales level to meet that profit goal. You can continue experimenting with the profit and loss statement through the "what if" exercises.

9.4 MANIPULATING NUMBERS

Another aspect of the electronic spreadsheet that makes it useful is its versatility. Along with budgeting, planning, and forecasting, you may also use spreadsheet programs for number

crunching, or mathematically processing numbers. Most spreadsheet programs have built into them the ability to perform such standard mathematical calculations as square roots, averages, and logarithms, as well as financial calculations such as internal rate of return and net present value.

With access to these functions, it is possible for you to use spreadsheet programs to perform statistical procedures such as regressions or to determine loan payments and interest rates. Teachers use electronic spreadsheet programs to maintain their class records, while businesses use them to maintain their business records.

In short, the electronic spreadsheet is a very versatile tool, enabling you to perform almost any needed combination of calculations. You are limited only by your imagination as to the potential uses of this type of program.

9.5 BASIC CONCEPTS

An electronic spreadsheet is composed of cells located in the computer's memory and displayed on the screen. Depending on the design and capabilities of the spreadsheet program, the number of cells available to you may be small or large. The ultimate number is influenced both by the size of the program and by the size of your particular computer's memory.

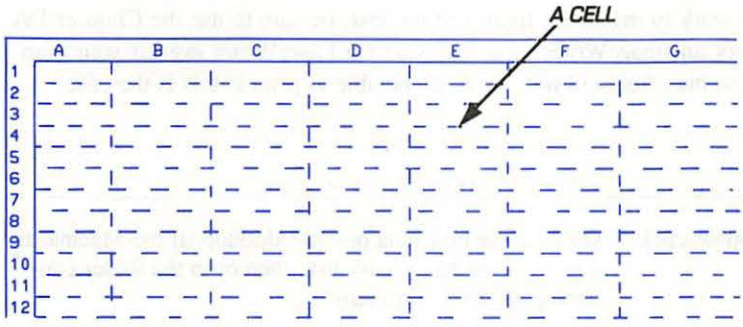


Figure 9.6
A spreadsheet. The arrow points to a cell.

Unfortunately, the greater the capabilities of the program, the larger the program must be. This results in less memory space being available for the contents of the spreadsheet. The sophisticated electronic spreadsheet programs of today, however, are segmented, and only part of the program is physically in the computer's memory at any given moment, leaving room for extensive models.

Additionally, it is possible to optimize the memory space available to you by designing your spreadsheet model to fill cells from the top left and down or from the top left and across, creating either a tall, skinny model, a short, fat one, or a square one. It is not, however, a good idea to place information in cells in random places on the spreadsheet page, because the program must use some of the computer's memory to hold the places of the unused cells above and to the left of the cells you are using. Even though the spreadsheet program uses memory management techniques to minimize the memory required for place holding, it can be very costly in terms of memory if there are many unused cells between the ones you are using and the top left corner of the spreadsheet. You will find that you will soon run out of memory if you are careless with the placement of your information within the worksheet.

9.6 STARTING MICROSOFT EXCEL

Excel is distributed on three disks, the Program disk, the Help and Examples disk, and a tutorial disk. On the Program disk you will find the Excel program itself, a sample spreadsheet and a second program called "Dialog Editor."

After you boot your Macintosh with a System Start-Up disk, insert the Excel Program disk into one of the computer's disk drives. If you are using a machine with a hard disk you will not need to insert the Excel program disk into a disk drive. Rather, locate the Excel folder, and open it so you can see the Excel program icon. Place a disk (see Chapter 3 for how to initialize a new disk) with at least 200K available space into another one of your Macintosh's disk drives, if you have one available. This disk will be used for saving your work. If you do not have a free floppy disk drive, keep this disk available. You will need it for data storage.

In these instructions, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and double-click the mouse button. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.

Finally, if you want your work to match the figures in the text, be sure to use the Chooser DA to select a LaserWriter and not an ImageWriter. You may select a LaserWriter even if your computer is not actually attached to one. You will not, however, be able to print if this is the case.



Figure 9.7
The MS-Excel program icon.

What To Do	*Why You Are Doing It*
If the disk's icon is closed, double-click on it with the mouse pointer.	Open up the disk icon onto the desktop. If the Macintosh you are using has a hard disk, then open the folder containing the Excel program.
Locate the Excel program icon inside the disk window (Figure 9.7). If you are using a machine with a hard disk, locate the Excel program icon inside the folder's window.	
Move the mouse pointer to the Excel icon and double-click the mouse button.	Launch Excel. Remember, if you are having trouble with the double-click, you may select the Excel icon with a single click, then use the Open command on the File menu (or ⌘O) to launch Excel.

After a brief pause you will see an empty spreadsheet on the computer's screen with a menu bar at the top. The spreadsheet window will occupy the majority of the Macintosh's display. It has a title bar on top with the name "Worksheet1", scroll bars at the right and bottom, and a size box at the bottom right corner. The large hollow plus sign in the middle of the worksheet is the mouse pointer.

Separating the menu bar at the top of the Macintosh display from the Worksheet1 window is the cell edit line. "A1" is currently displayed at the left end of this line. As the cell pointer location changes while you work, this will change to tell you the cursor's current location. The formulas that are entered into cells will appear in the box on the right side of this line as the cursor is placed on a cell containing information.

At the bottom of the Macintosh display, below the Worksheet1 window, is the status bar. The word "Ready" is displayed at the left end of this bar. As you work, this, too, will change. For example, as you pull down and access a menu item, the purpose of the menu item will be displayed on the status bar.

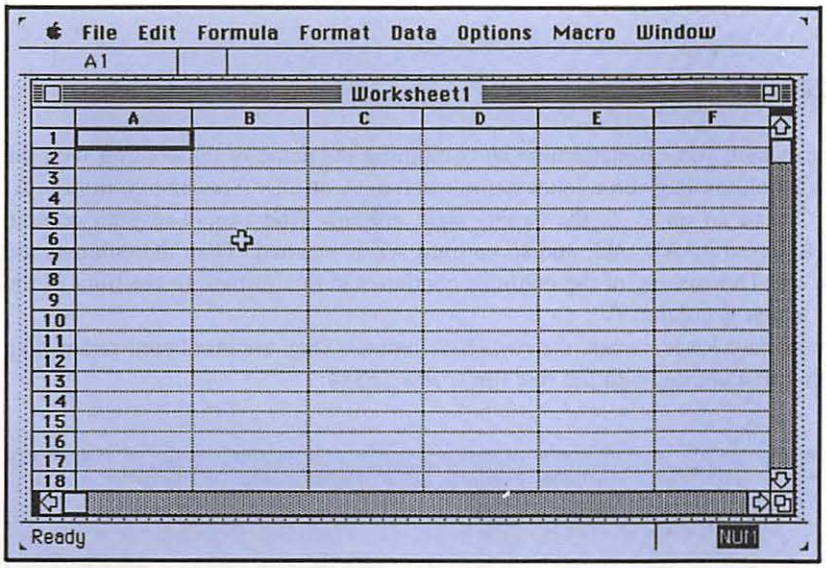


Figure 9.8
The opening Excel screen.

What To Do	*Why You Are Doing It*
Pull down the Options menu.	Remember, to pull down a menu, place the mouse pointer on the desired menu item and press and hold the mouse button. One of the Options Menu items lets you switch between the Short and Full menu levels. The last item reads Full Menus. This means that you are presently using the Short Menus.
Drag the mouse pointer down the menu until Full Menus is the selected item (Figure 9.9).	You want to change the menu level to Full Menus.

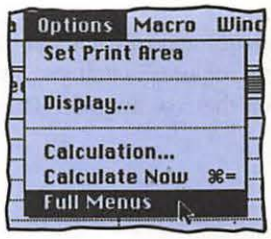


Figure 9.9
This is the Option Menu when Short Menus are active. The Full Menus option, shown selected here, will change the menus to their full status.

Release the mouse button.	Set the menu level to Full Menus. The next time you pull down the Options menu, you will see that, in addition to having more items, the option for Full Menus has been replaced by Short Menus.

Many of the menu options are **toggle** choices. This means that they operate like an on/off switch, which is sometimes called a toggle switch. The first time you select an option, it changes something to its opposite state. If you then select the option a second time, that something is changed back to its original state. The Short/Full Menus option is an example of this.

9.7 NAMING CELLS

Each cell has a name, which you can determine by combining the name of the column with the name of the row. Each column is given a letter name, such as A or CQ. The first column is A, the second B, then C, and so on to Z, the twenty-sixth column. The twenty-seventh column continues with AA, followed by AB, AC, and so on until AZ is reached. Then the columns are BA, BB, BC, and so on. The naming of the columns continues in this fashion to the limit of the number of columns, which is column IV.

Just as the columns have letter names, the rows have names. They are numbered rather than lettered, starting with 1 and ending with the row limit, row 16384.

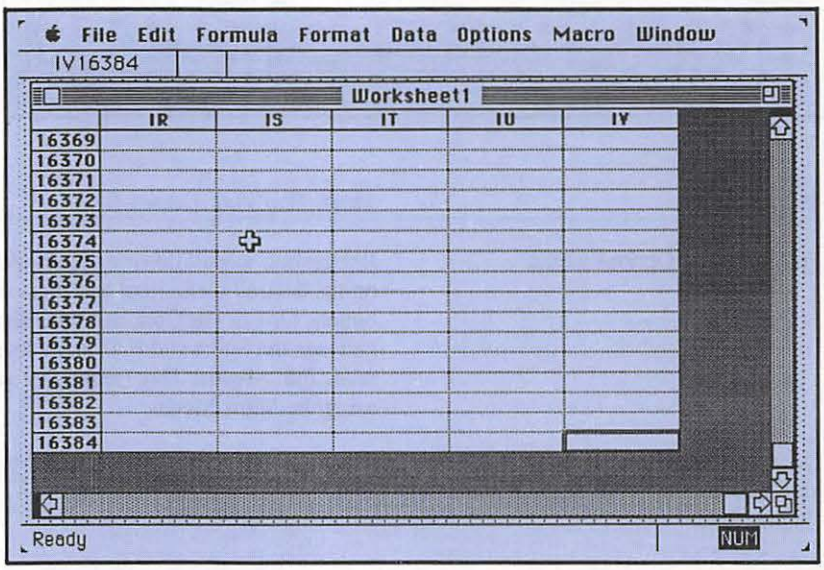


Figure 9.10
The bottom right corner of the spreadsheet. This cell is called IV16384.

Used together, the column letter and row number allow you to identify, or name, any single cell of the spreadsheet. All Excel requires is that you, when identifying a cell for some purpose, give first the column letter, then the row number. This letter/number combination is the cell's address.

9.8 CURRENT CELL LOCATION

Spreadsheet programs tell you in which cell of the spreadsheet you are presently entering information with the cell cursor, or current cell indicator.

The Excel cursor is an outline that surrounds the complete current cell. In Figure 9.8 the cursor is in cell A1, while in Figure 9.10, it is in cell IV16384.

As previously mentioned, Excel also displays the current column and row location of the cursor at the left of the edit bar below the Macintosh menu bar. This information is useful, because it is not always easy to determine the cursor's location visually. You will find this to be especially true when the cursor is positioned at the lower right side of a window and the gridlines are turned off, which makes it hard to distinguish the current cursor row number from the row indicators at the left of the screen. You can see in Figure 9.8 that the location A1 appears at the left of the edit bar. This is the starting location of the cursor. In Figure 9.10 the cursor has been moved to IV16384, which appears at the left of the edit bar.

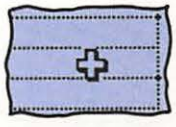
9.9 MOVING THE CURSOR

Moving the cursor from one cell to another is a simple process. Press one of the arrow keys found at the right side of the computer's keyboard to move the cursor in a particular direction. The cursor can be moved up, down, left, or right.

You can also see that the mouse pointer has turned into a large hollow plus sign. You may position this mouse on any cell and click the mouse button once to jump the cursor directly to that cell. In addition, Excel has a GOTO command, which allows you to jump the cursor from its present location on the spreadsheet to any other cell you have specified, even one outside the current window.

Before you begin using the spreadsheet, first note the A1 at the left side of the edit bar. This is the current cursor cell location, or address. As you move the cursor during the next exercise, you will see this location indicator change.

Figure 9.11
This is the mouse pointer when it has been moved over the active worksheet window.



What To Do	*Why You Are Doing It*
↓ ↓ ↓	Move the cursor down three cells. The cursor should now be in cell A4, and the cell location indicator at the top left of the screen should say A4.
→ → → →	Move the cursor right four columns. The cursor should now be in cell E4, and the cell location indicator should say E4.

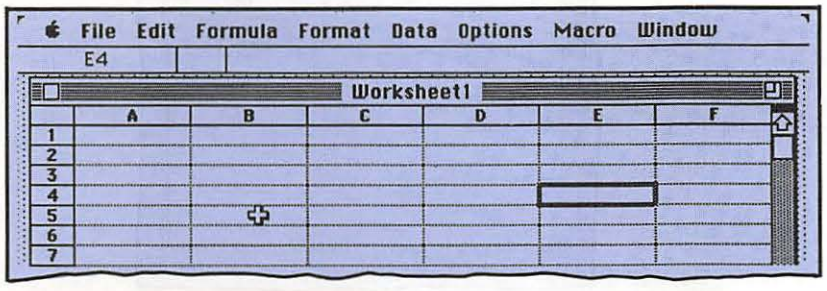


Figure 9.12
The cursor outline is now in cell E4, and E4 is displayed at the left of the edit bar.

↑	Move the cursor up one row. The cursor should now be in cell E3, and the cell location indicator should say E3.
← ←	Move the cursor left two columns. The cursor should now be in cell C3, and the cell location indicator should say C3.

⌘←	Press the left arrow key while holding down the command key.This will jump the cursor left. In this instance, it will be jumped to column A. The ⌘ key used with an arrow key will move the cursor in the direction of the arrow until Excel detects a change in the cell from occupied to empty (or empty to occupied).
Pull down the Formula menu.	This menu has the Goto option. This command lets you jump the current cell pointer to any location on the spreadsheet.
Drag the mouse down to select Goto.	You are going to jump the cursor to a cell. Note that you may access this command by using the ⌘G key.

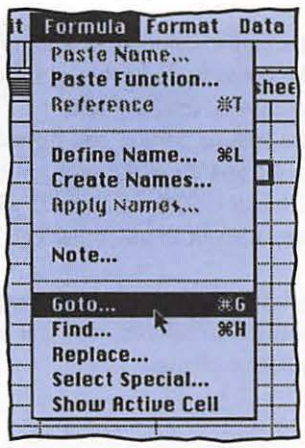


Figure 9.13
The Formula menu. The Goto command has been selected.

Release the mouse button.	Execute the Goto command. The Goto dialog box will be displayed, with the cursor blinking in the box labelled Reference.
F12	Specify cell F12 as the destination you want the cursor to GOTO.

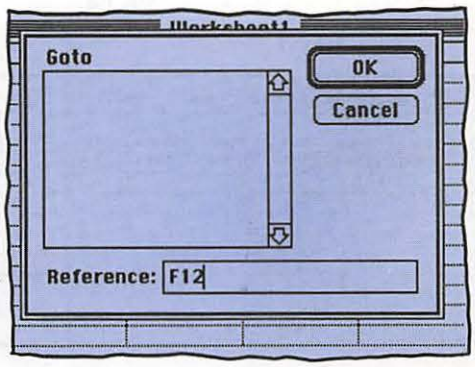


Figure 9.14
The Goto destination has been filled in.

Click on OK.	Click on the OK button. The cursor will jump to cell F12. The cell location indicator at the left of the edit bar should now read F12. Since the OK button is double outlined, you may press the return key ([cr]) instead of clicking the mouse on the OK button itself. Remember, this is true of any double outlined button.

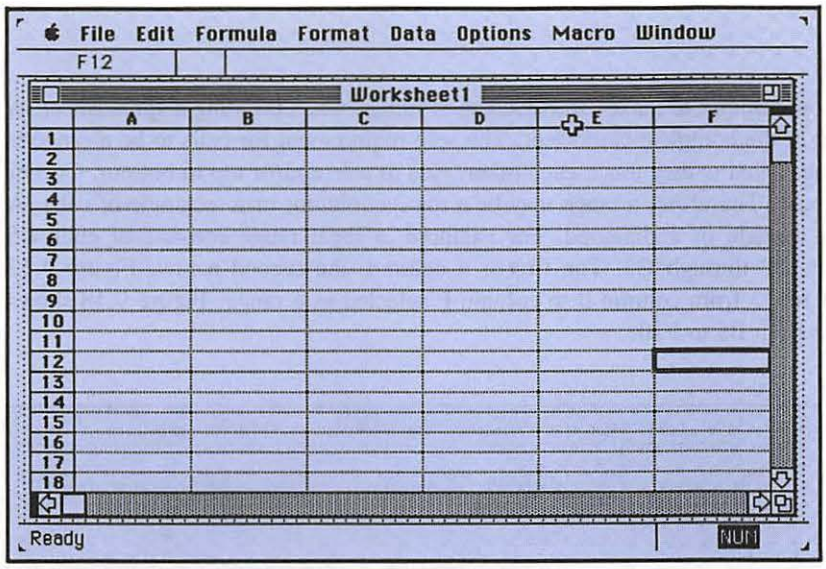


Figure 9.15
The cursor is now in cell F12.

⌘G

Execute the Goto command again, this time using the command key rather than the menu.

The Reference box now reads $A$3. This is the cell in which the cursor was located before you executed the prior Goto command. (The dollar signs have a special meaning to Excel that will be discussed later in the text.) If you click on OK now, the cursor will return to that cell. Excel will always remember the last cell the cursor was in when you execute a Goto, making it easy to return to that cell.

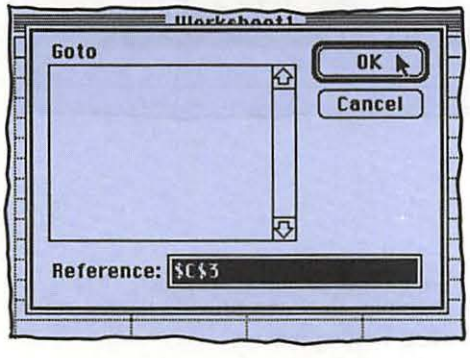


Figure 9.16
The Goto dialog box is now displaying the name of the cell the cursor jumped from.

Click on OK.

Return the cursor to the prior cell.

9.10 RANGES

Excel gives you the opportunity to make extensive use of ranges when building a spreadsheet. A cell range is a subset of the complete worksheet. The sole requirement for cells to be a range is that they be contiguous—that is they touch each other, side to side and/or top to bottom. Corner to corner does not count. Therefore, a range may be a row, a column, or a rectangle of cells. A range may not be a triangle or a diamond. For example, a legal range consists of cells C5 through C10, or cells B3 through G3. The first is a column, the second a row. Figure 9.17 shows the portion of row 3 from column B to column F selected as a range. Figure 9.18 shows the rectangular range from B5 to F10.

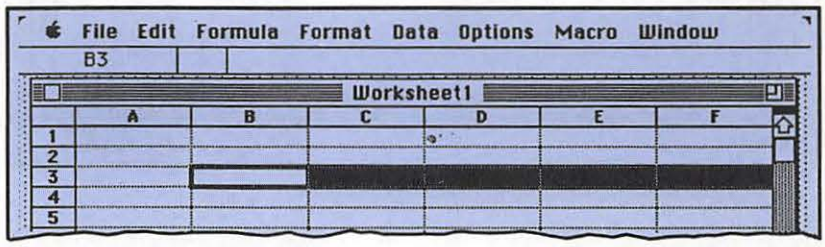


Figure 9.17
The cell range B3 through and including F3 is a range.

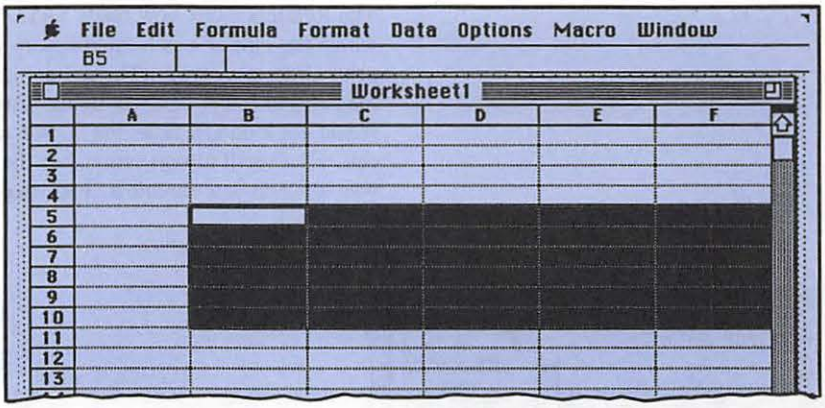


Figure 9.18
The rectangular range B5 through and including F10.

9.11 USING RANGES

You will see that there are many uses for ranges. For example, they can provide named references to areas of your spreadsheet. This is very useful when writing macros.

A selected area of the spreadsheet may also be used to define the current input area. In effect, when you select a range, you do so by stretching the cursor over the desired cells. This selected area then limits the travel area of the cursor until a new range is created, or the current range is de-activated.

What To Do	*Why You Are Doing It*
Place the mouse pointer (the open plus sign) in cell A1.	This is where you will start the range.

Press and hold the mouse button.

Begin the creation of the range.

Drag the mouse down to cell A5. Do not yet release the mouse button.

Define an input range as being from cell A1 to cell A5. Note that the left end of the status line displays "5R x 1C" to let you know the shape of the range, which is five rows and one column.

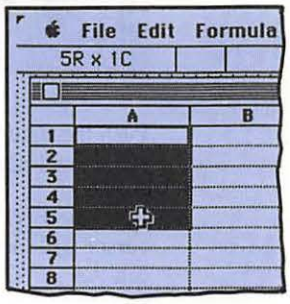


Figure 9.19
The indicator at the left end of the status line reads 5R x 1C.

Drag the mouse right to cell B5.

You are now creating a range that is five rows deep and two rows wide.

Release the mouse button.

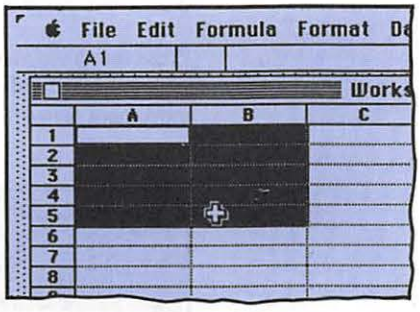


Figure 9.20
The range A1 through and including B5 has been defined.

Note in Figure 9.20 that the current cell, cell A1, is outlined, rather than solid black like the rest of the range.

[cr]

Push the Return key. The outlined cell cursor will move down to cell A2.

[cr]

Push the Return key again. The cursor will move down again.

[cr] [cr] [cr]

Push the Return key three more times. When you press this key the third time, the cursor will move from cell A5 at the bottom of the range to cell B1 at the top of the next column of the range. This will always happen when the cursor reaches the edge of a selected area of the spreadsheet. If you were not working within a selected area, the cursor would have continued moving down the A column.

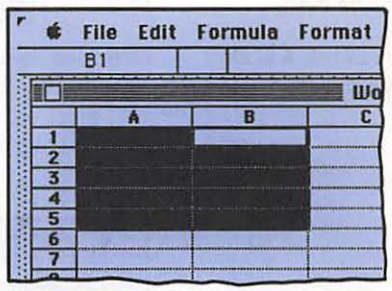


Figure 9.21
The cursor has moved to cell B1.

[cr] [cr] [cr] [cr] [cr]

Push the Return key five times. On the fifth push, the cursor will return to cell A1.

[Enter]

Press the ENTER key, rather than the return key. The cursor will move right to cell B1, instead of down to cell A2.

[Enter]

Press the enter key a second time. The cursor will move to cell A2. When the cursor reaches the edge of the selected area of the spreadsheet, it will move to the next row.

As long as you have selected a range of cells and you move the cursor with either the return or enter keys, the cursor will remain within the selected range.

↓

Press the down arrow to move the cursor to cell A3. The selected range will become de-selected by using a cursor movement arrow.

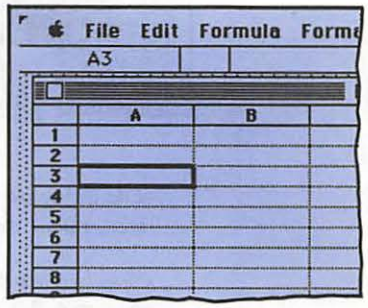


Figure 9.22
After pressing an arrow key, the selected range of the spreadsheet is de-selected.

[cr] [cr] [cr] [cr]

The return key will continue to move the cursor down the current column, even when a range of cells is not selected.

[ENTER]

The enter key, when no range is selected, will not move the cursor! This is useful. It will let you make changes in the content of a cell, and enter those changes, without changing the location of the cursor.

9.12 NAMING RANGES

After you have selected a range of cells, as you did above, you may assign this range a name. This name may then be used as the destination of the Goto command (⌘G), as well as a variety of other commands that work on areas of the spreadsheet, such as formatting and printing commands. You will see how these processes work later in the text.

In this section you will create a named range that will be used to create an initial spreadsheet model. The range will be cell A3 through and including cell B5.

What To Do	*Why You Are Doing It*
Place the plus sign cursor over cell A3.	This cell will be the top left corner of the range you will be selecting.
Press and hold the mouse button.	Begin selecting the range.
Drag the mouse down to cell A5, then right to cell B5.	Select the range to be named.
Release the mouse button.	You have now selected the range of the spreadsheet that you will name.

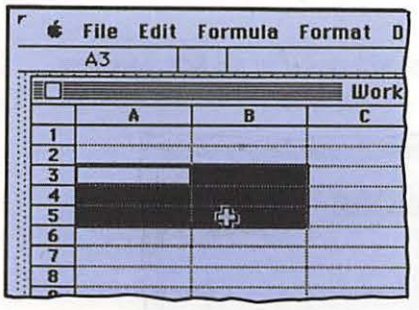


Figure 9.23
The selected range is cell A3 through cell B5.

Pull down the Formula menu.	This menu contains the Define Names command.
Drag the mouse down to select Define Names and release the mouse button.	The Define Names command may also be executed by using the ⌘L key. After you release the mouse button, you will see the Define Names dialog box. You can see in the Refers to box of this dialog box the reference to the selected range. The dollar signs in the range reference make the cell addresses fixed. More will be said about the use of dollar signs in cell names later in the text.

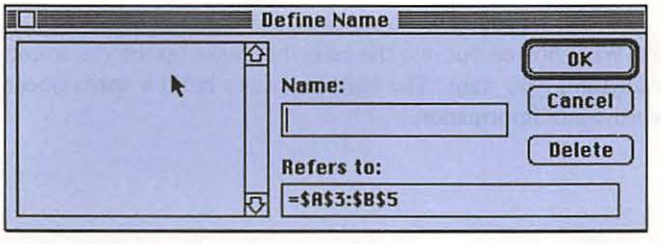


Figure 9.24
The Define Names dialog box. There are no names defined in a new spreadsheet.

InRange	Name the selected range "InRange."
Click on OK.	Define the range's name.
Move the plus sign mouse pointer to cell A1 and click the mouse.	De-select the range by selecting a different cell on the spreadsheet. We are now going to test the range name we have just defined.
⌘G	Execute the Goto command. The Goto dialog box now contains InRange in a list of places on the spreadsheet at the top left of the dialog box.

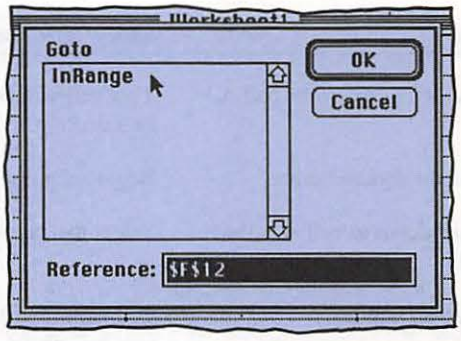


Figure 9.25
InRange appears as a place on the spreadsheet that the Goto command knows about.

Move the mouse pointer to the word InRange in the Goto list.	You are going to go to this range.
Click the mouse once.	The name InRange will appear in the Reference box.

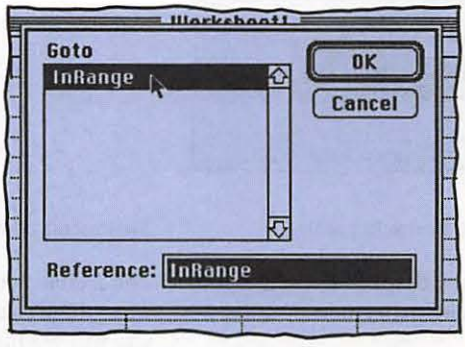


Figure 9.26
InRange has been selected as the destination of the Goto command.

Click on OK.	The range InRange will now be re-selected.

9.13 WHAT TO PUT INTO CELLS

Now comes the fun and the hard part! What do you put into the cells that make up the electronic spreadsheet? The answer—virtually anything you want. The hard part is to build a spreadsheet that is accurate and that gives you worthwhile information.

9.14 ENTERING LABEL CELLS

You may put words into cells, which are then considered **text** or **label** cells. For example, you may want to put the word "Sales" on a profit and loss statement or the word "Assets" on a balance sheet. It is the label cell that allows you to do this. To enter a label cell into the Excel spreadsheet all you have to do is place the cursor on (in) the desired cell and start typing letters.

To Excel, a label cell is begun by any character on the keyboard and contains at least one non-numeric character. For example, 953A is a label cell, as is MX943. Even entering 3 + 7 is considered a label cell, since the plus sign is acting as a non-numeric character in this example.

However, entering 374 by itself is not a label cell. If you start a cell with an equals sign (=), Excel will expect a formula, or computation cell, which is a numeric value. The formula, or computation, cell will be discussed later in this chapter.

What To Do	*Why You Are Doing It*
Make sure that the cursor (the outlined cell) is at cell A3 of the selected InRange.	Cell A3 is where you will begin building the spreadsheet.
SALES	Enter the text "SALES" into cell A3. Several things will happen as you type this text. First, the information you are typing will appear in the cell and on the edit line above the worksheet window. Second, you should notice that two boxes appear on the edit line between the current cell indicator on the left and the cell contents on the right. The box on the left has an X in it, while the one on the right has a check mark.

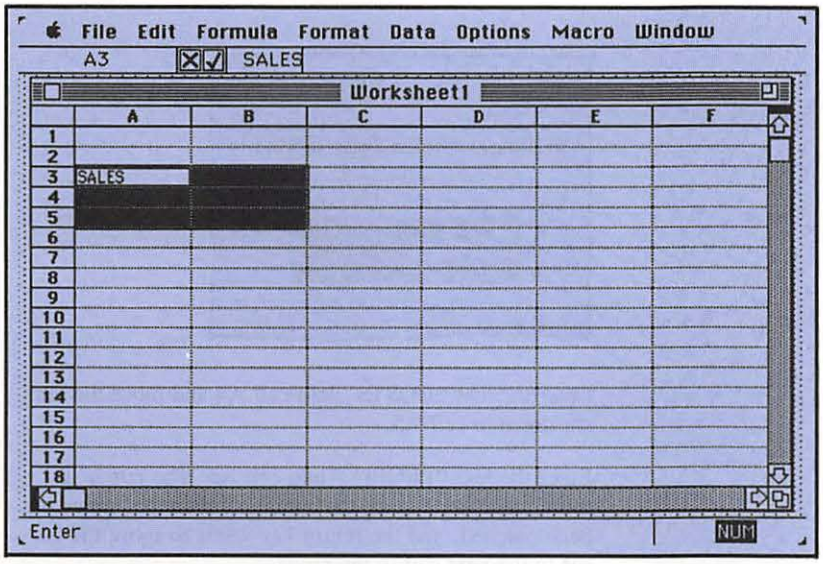


Figure 9.27
The text appears on the edit line and in cell A3 at the same time. Note the two small boxes that have appeared on the edit line.

The X box is used to cancel the entry you are making. The check mark box is used to place the entry you are making into the cell. All you need to do is click the mouse pointer on the desired box. In both instances there are alternatives. For the X, or cancel box, you may press the ESC key on the keyboard. For the check mark, or enter box, you may press the enter key on the keyboard.

Finally, notice that the word "Enter" will replace "Ready" at the bottom left of the screen. This is to let you know that Excel is accepting characters, and that you must enter the information into the cell before you continue.

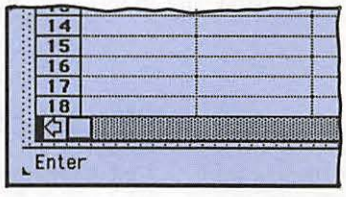


Figure 9.28
The word Enter is at the bottom of the display.

[cr]

Press the Return key to enter the text into cell A3 and move the cursor down to cell A4.

If you press the enter key, rather than the return key, the cursor will move right to cell B1. If you press an arrow key, the range will become de-selected.

It is important to keep in mind that if you are not working in a selected range, you may use any cursor movement key to enter information into the current cell and move the cursor. For example, you may press the down arrow to enter information into the cell and then move the cursor down one cell in the column.

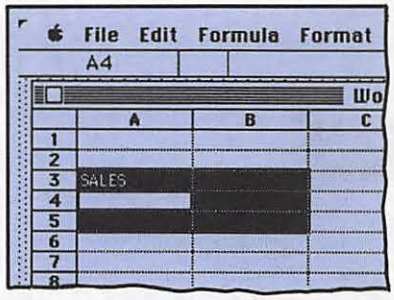


Figure 9.29
The text has now been entered into cell A3, and the cursor has moved to cell A4.

COSTS [cr]

Enter the text "COSTS" into cell A4 and move the cursor down to cell A5.

PROFIT [cr]

Enter the text "PROFIT" into cell A5. The cursor is moved to cell B3 since the bottom of the input range has been reached, and the return key wants to move the cursor to the next cell in the range.

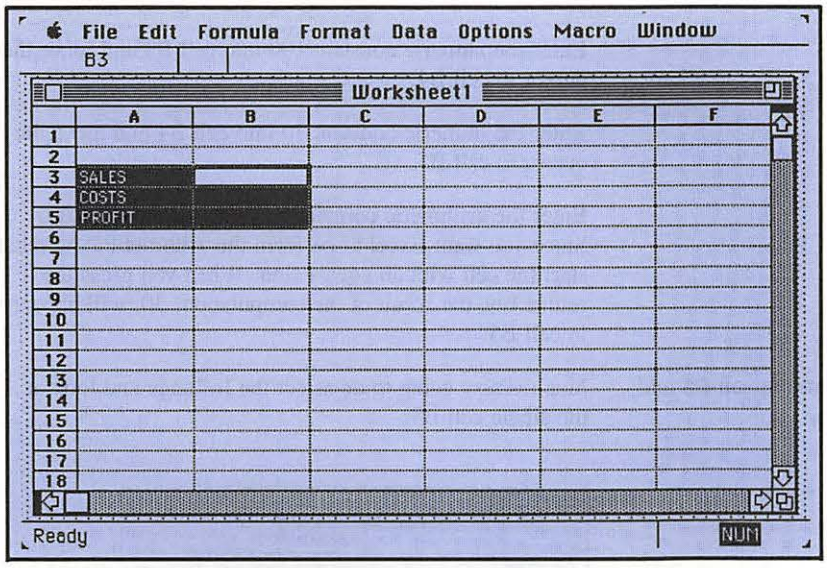


Figure 9.30
The current spreadsheet.

[ENTER] Press the enter key to move the cursor to cell A4.

Look at the edit line above the Worksheet1 window. To the right of A4, the cell location indicator, you can see the word "COSTS." The current contents of a cell will **always** be displayed next to the cell address whenever the cursor is placed on the cell.

[SHIFT]-[ENTER] Hold down the Shift key and press the enter key again. The cursor will return to cell B3.

This is a trick! The enter key by itself moves the cursor right a cell. The shift key will reverse the direction. Thus the shift-enter key combination will move the cursor left a cell. Since the cursor is at the left edge of the range, it moves to the end of the prior row. If you try the shift-return key combination, you will find that the cursor moves up a cell.

9.15 NUMERIC CONSTANT CELLS

You may also place constant numeric values, such as 365 or 12, into spreadsheet cells. This type of cell is called a value cell, because the entry is a numeric value. To enter a constant value, simply locate the cursor in the desired cell and type the number.

Another type of value cell is the arithmetic expression, such as 2.3 + 843/6. To enter this type of information into the Excel spreadsheet, you must start the cell with an equals sign. When you start a cell with an equals sign, you are telling Excel to perform a computation using the arithmetic formula you are entering.

When you create a formula, or computation cell, the formula you place in the cell is saved in the computer's memory, but the numeric value of the expression is computed, and this resulting value will be displayed within the cell on the computer monitor. Remember, you must start a computation cell with an equals sign, or Excel will treat it as another label cell.

What To Do	*Why You Are Doing It*
100 [cr]	Enter the numeric constant 100 into cell B3 and move the cursor to cell B4.
70 [cr]	Enter the numeric constant 70 into cell B4 and move the cursor to cell B5.
= 100–70 [cr]	Enter the arithmetic computation 100–70 into cell B5. Since you want Excel to perform the arithmetic, you must start the cell with an equals sign. When you press the return key, the result of the computation, 30, will appear in cell B5.
Move the mouse pointer to cell B5 and click the mouse once.	You are now going to de-select the InRange and look at the single cell B5.

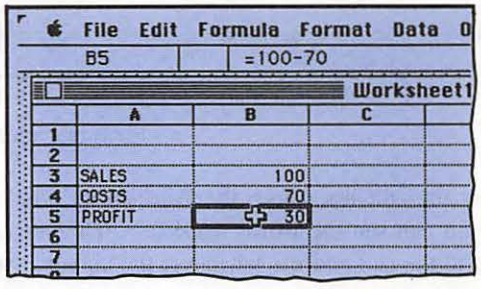


Figure 9.31
The edit line shows the contents of cell B5 as = 100–70, but the spreadsheet displays the resulting value, 30.

9.16 YOUR FIRST MODEL

You have now created a very simple model with your spreadsheet program. Unfortunately, it will not do much for you. You have entered all the numeric cells as numeric constants or arithmetic formulas with numeric constants. If the sales value changes, you will have to recalculate the profit by re-entering the complete contents of cell B5, changing the numbers appropriately. This is not a very exciting prospect, considering that the reason you are creating this model with a computer is to avoid extraneous typing and performing tedious arithmetic.

9.17 FORMULA CELLS

Now you will look at the feature that makes an electronic spreadsheet do what it does best. As part of an arithmetic expression in a given cell, you may also include the address of another cell (the column letter and row number).

When Excel finds a cell address in an arithmetic expression, it will replace that address with the value found in the specified cell. When the value in the cell referenced by the arithmetic formula changes (for any reason), the value in the cell containing the formula will make a corresponding change, its value being recomputed based on the new value substituted into the arithmetic formula in that cell. This change can cause many cells to make corresponding changes if the cells are linked by the use of cell addresses in the formulas.

Think back to the ZZZ International spreadsheets found in Figure 9.3. The grand total for ZZZ International includes a reference to the cell containing the total for ZZZ Australia. This cell refers to the subtotal for the ZZZ Australia portion of the spreadsheet. Finally, this subtotal includes a reference to the income for Alliance Company. When the income for Alliance changes, three other values change to reflect the new information.

9.18 CHANGING CELL CONTENTS

As you modify your existing model in these next few steps, you will be making changes to the present contents of cells. You will see that to make a change in a cell is simple. Place the cursor on the desired cell and type the new information. When you press the enter, return or an arrow key, the old cell contents will be replaced by the new information you have typed. Nothing special is required.

You should also be aware of how you enter a formula. Since you want Excel to perform a computation, you must start the cell with an equals sign. In some cases, it may then be beneficial to use parentheses to clarify the order of computation in the formula. Just as in algebra, Excel will perform computations on items enclosed in parentheses before it performs other computations. For example, the formula =4/2*5 will not give you the same value as the formula =4/(2*5). If you are not sure of the order of calculation, it is always safest to use parentheses.

What To Do	*Why You Are Doing It*
↑	Move the cursor to cell B4.
=(.7*B3)	This is a formula. The costs for this model will always be 70 percent of the sales. The sales value is found in cell B3. Thus the costs are (.7) (seven-tenths or 70 percent) of the sales. At present, the value computed is 70, the number originally entered, so the number displayed in the cell will remain unchanged.

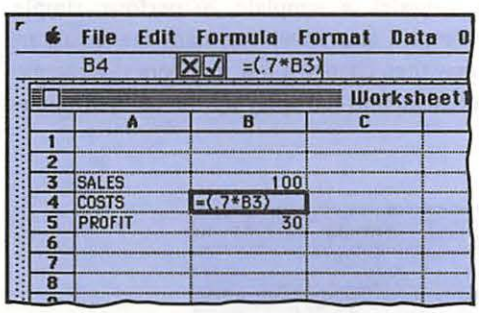


Figure 9.32
The formula you are entering is displayed on the edit line and in the cell. Since you have not yet entered the formula, its value has not been computed.

↓	Enter the formula into the cell and move the cursor to cell B5. You may also use the [cr] at this time.
=(B3–B4)	The profit is the sales minus the costs. This formula computes this value for us.
[ENTER]	Remember, pressing the enter key when no range is selected will put information into the current cell without moving the cursor.

As before, the number presently displayed in the cell should not change at this time. Notice that the contents of cell B5 is the formula =(B3-B4), even though the information displayed at location B5 is 30. The actual contents of a cell are displayed to the right of the cell location indicator on the edit line above the worksheet window.

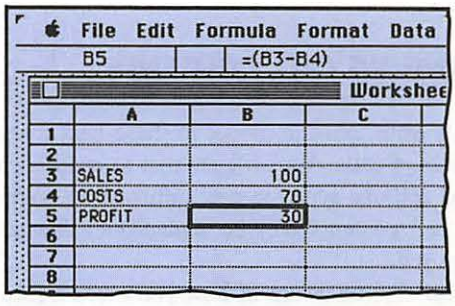


Figure 9.33
The cell is displaying the same value, but its content is a formula based on two other cells, rather than on numeric constants.

Notice that you entered this cell starting with an equals sign. If you had started the cell entry with the parentheses or letter B (of the address B4), Excel would have interpreted the entry as a label cell. Remember that you must start a computation cell with an equals sign (=), even if it is not using any cell references.

9.19 A REAL MODEL

You now have a true model. Use the cursor movement keys to move the cursor to cell B3. This cell controls the other two values of your spreadsheet. Recall that costs will be 70 percent of whatever sales are, and that profit is sales minus costs. What if sales were 175 instead of 100? Enter 175 into cell B3. (Remember, to change the contents of a cell, place the cursor on the cell and type the new information, ending with the enter key, the [cr] key, or an arrow key.) The costs should automatically change to 122.5 and the profit to 52.5.

This type of manipulation shows the true power of the electronic spreadsheet program. You may create a spreadsheet, frequently referred to as a model or template, to perform simple calculations as in the model you have just created, or complex ones involving many interrelationships among many cells, and complex formulas. You may then change a few numbers in strategic locations of the spreadsheet and let the computer recalculate and redisplay all the cells throughout the spreadsheet.

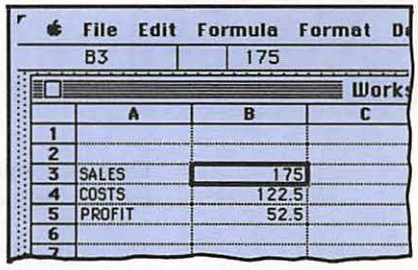


Figure 9.34
The value of cell B3 has been changed, and the remaining two values change automatically.

9.20 SAVING YOUR MODEL

All the work involved in entering a model would be wasted if you could not store it for later use. Every spreadsheet program provides some method of storing and retrieving models. Saving a model requires the use of the menu bar at the top of the Macintosh display. It is not an entry into one of the spreadsheet cells.

The Save command, as in all Macintosh applications, is located on the File menu. All commands that interact in some way with the computer's disk drive can be found on this menu. Once a spreadsheet has been saved, you can retrieve it at a later date to make modifications or corrections.

Excel has two save options—Save and Save As. The Save option is used after you have saved the spreadsheet at least one time. If you have not saved the spreadsheet, then Excel will ask you to supply a name for it. If you have previously saved the spreadsheet, the Save option uses the current name of the spreadsheet as it appears on the title bar, and places it onto the same disk as used for the prior save. The previous version of the spreadsheet is erased and the copy you are working with is made current on the disk. You end up with one copy of the spreadsheet, the most recent version.

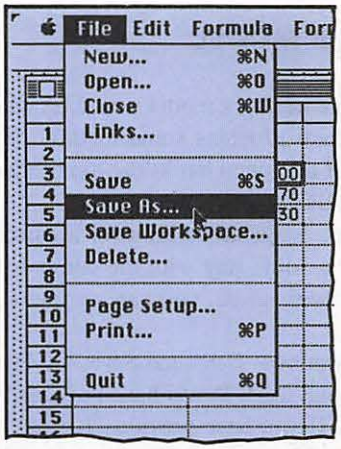
The Save As command lets you supply a name for a new spreadsheet, or change the name of an existing spreadsheet before it is saved. In addition, you may change the folder into which the spreadsheet is saved. If you want, you may even eject the floppy disk in the disk drive and change disks onto which the spreadsheet is saved. The Save As lets you do any one of these actions, or any combination of them. If you are using Save As with a previously saved spreadsheet, and you are changing the name, folder or disk for the spreadsheet, you will end up with two copies of the spreadsheet, an older version and the newly edited one. If you use a name that already exists in a folder, you will have to confirm that you want to replace the prior file with the new one. Recall that the Finder will not let you have two programs or other documents with the same name in a single folder.

If you are using a computer with a hard disk and a single floppy disk drive, you may want to save this spreadsheet on a floppy disk, rather than on the hard disk. If a floppy disk is not in the disk drive, insert one now.

If you are using a computer with two floppy disk drives, and you presently have your system start-up disk in one, and your Excel program disk in the other, have your data storage floppy disk handy.

What To Do	*Why You Are Doing It*
Pull down the File menu.	The File menu has both the Save and Save As options located on it.
Drag the cursor down to the Save As option.	You want to save the document on which you are working, and give it a name at the same time. You also want the option of being able to change the disk drive on which it will be stored (Figure 9.35 on the next page).

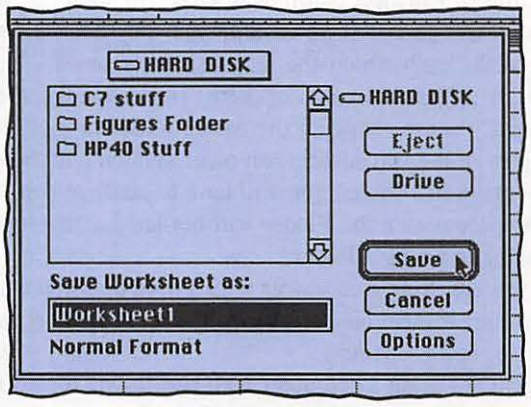
Figure 9.35
The Save As option has been selected.



Release the mouse button.

When you release the mouse button, you will see the Save As dialog box. Note that the spreadsheet you have been working on is called "Worksheet1".

Figure 9.36
The initial Save As dialog box. You can see that a disk called "Hard Disk" is in the currently selected disk drive, and is where the file will be saved if you do nothing to change the disk drive.



Model1

Change the name of this Spreadsheet. Make it "Model1."

If you are using a computer with a hard disk drive, and the name of your hard disk appears at the right of the Save As dialog box above the Save button, then you should click the Drive button. This will tell the Macintosh you want to save the document on the disk in the floppy disk drive. (If you did not put your disk into the floppy disk drive as instructed above, the Drive button will be dimmed!)

If you are using a computer with two floppy disk drives, and your data storage disk is not in either of them, click on the Eject button. This will cause one of the disks to be ejected from a disk drive. Replace the disk with your data storage disk.

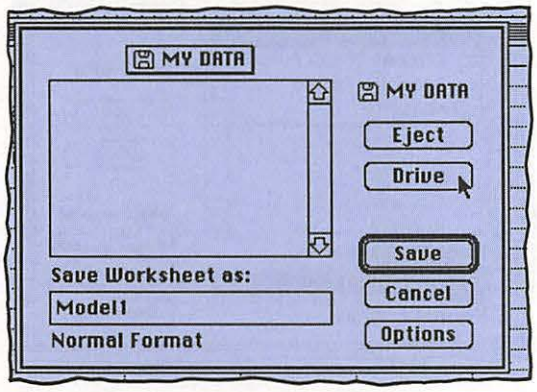


Figure 9.37
The disk drive onto which the file is to be stored has been changed from the Hard Disk to a disk called MY DATA. This was done by inserting a disk into a disk drive and clicking the mouse pointer on the Drive button found in the dialog box. MY DATA is an empty disk.

Click on the Save button.

After you have typed the name for the document and selected the disk onto which you want it saved, click on the Save button to execute the command, saving the document onto the disk.

You may also, in addition to changing the disk drive onto which the spreadsheet is saved, change the folder on the disk. In the file list window at the top left of the Save As dialog box, you can identify a folder by the miniature folder icon in front of a file name. Additionally, the name is not dimmed, as is a document or application name. If you double-click on a folder in this list, you are telling Excel to open the folder for you. The contents of the folder will be displayed, and the folder's name will appear above the file list.

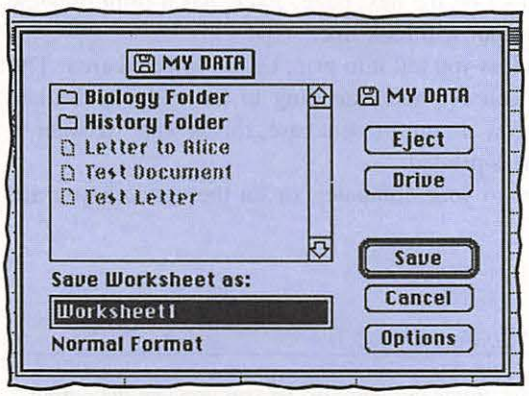


Figure 9.38
This dialog box shows another disk called MY DATA. It has two folders that appear in the disk's main window. There are also several files at the same level on this disk. The file names are dimmed, while the folder names are not. You may double-click on a folder name to make it the storage location.

You may also tell the Macintosh to close the folder. The folder name above the list of files it contains is a pull down menu. Use the mouse to pull it down, and select the desired level. If you select the bottommost item on this list, you will be telling Excel to save the document on the disk's main window, and not in any folder.

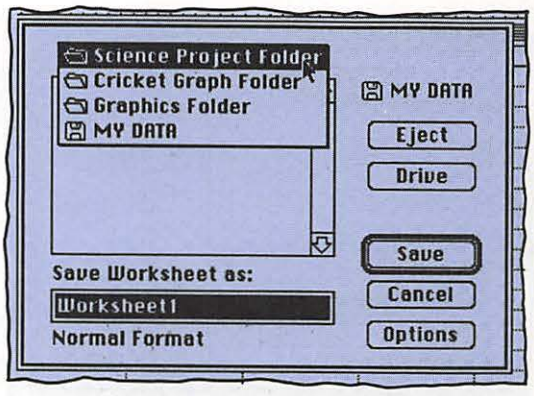


Figure 9.39
The folder name at the top of the file list window has been pulled down. You can see that the folder called Science Project Folder is inside Cricket Graph Folder, which is inside the Graphics Folder found on the disk called MY DATA.

9.21 PRINTING THE SPREADSHEET

Just as with any other computer tool, the spreadsheet would have limited usefulness if you could not print the results of your work. Spreadsheet programs do allow you to output your model onto paper. However, you must consider the width of the model in columns and the length of the model in rows before it is output. Just as the Excel window can show only a portion of the total spreadsheet, the printed page can hold only a portion of the same spreadsheet.

As with all Macintosh applications, the amount of information you can fit on the printed page depends on the printer (ImageWriter or LaserWriter), the font in use, and the size of the font.

If you try to print a spreadsheet wider than what will fit on the page, the program then prints what will fit on a page and will print the remainder on the next page. Excel has a print preview feature that lets you determine what your final output will look like.

Excel will print the complete spreadsheet unless you tell it to print only a selected area. The complete spreadsheet is defined as starting in cell A1 and extending to the right to the last occupied column, and down to the last occupied row. In our present case, this is what we want to print. However, you will see how to control what is printed.

Obviously, you must have a printer attached to your computer, or on the network you are using, to print your work.

What To Do	*Why You Are Doing It*
Pull down the File menu and select the Print command.	The Print command will also let you preview the output before you send it to the printer. Note that you may use the ⌘P key to activate this command.



Figure 9.40
The Print command has been selected on the File menu.

Release the mouse button.

Activate the Print command. After a brief pause, you will see the Print dialog box.

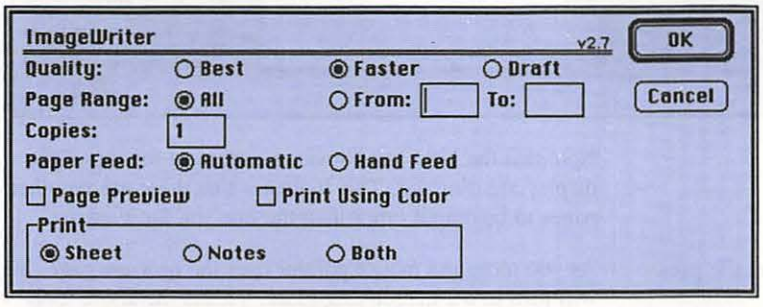


Figure 9.41
This is the print dialog box if you are using an ImageWriter dot matrix printer.

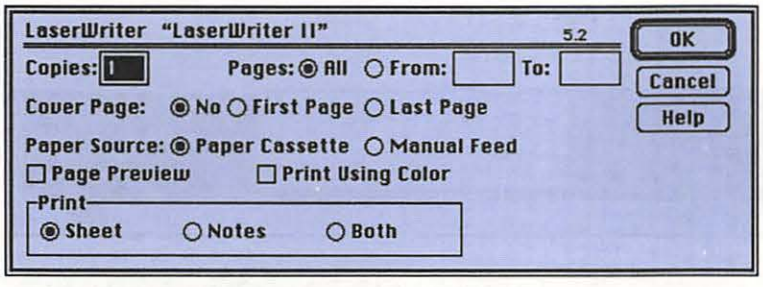


Figure 9.42
This is the print dialog box if you are using a LaserWriter laser printer. Your printer name may be different from the printer named here.

If you are using an ImageWriter, click on the Best quality button before continuing.

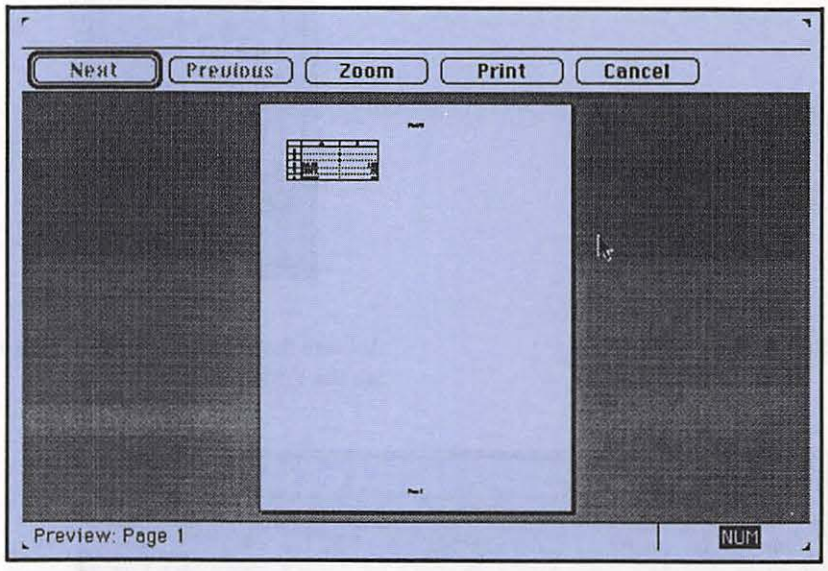
Move the mouse pointer to the box labelled Page Preview and click the mouse once.

On both print dialog boxes you can see a check box labelled Page Preview. Clicking the mouse in this box will place an X in this box, making it active.

Click on OK.

Begin the Print process. Since you have activated the Page Preview, the printing process will not yet begin. Instead you will see the Page Preview.

Figure 9.43
The page preview window shows you what your document will look like before you actually print it.



Note that the Next and Previous buttons at the top of the display are dimmed. This indicates that there are no other pages to be output other than the one you are viewing.

Move the mouse pointer over the preview page.

As you move the mouse pointer over the preview page, it will turn into a magnifying glass. This is the zoom tool.

Position the magnifying glass at the bottom of the page.

You want to see what is displayed at the bottom of the page.

Figure 9.44
Note the location of the magnifying glass cursor on the text at the bottom of the preview page.



Click the mouse button.

Zoom the bottom of the page up to full size so that it is readable.

Click the mouse button.

After you have read this text, clicking the mouse button again will return the preview to the full page overview.

Click on the Print button.

If you have a printer available, click on the Print button to create printed output. When the document is done printing, you will be returned to the spreadsheet.

If you do not have a printer, click on the Cancel button to leave the Page Preview window and return to the spreadsheet.

	A	B
1		
2		
3	SALES	100
4	COSTS	70
5	PROFIT	30

Figure 9.45
This is the output generated with the Print command.

Notice on the output, just as on the page preview, that the spreadsheet gridlines have been printed, as well as the column letters and row numbers. It is possible to turn these off to create final output.

Pull down the File menu and select Page Setup.

The Page Setup feature lets you control a variety of output features. With this option, you can turn the gridlines and headers on and off, as well as change the text that appears at the top and bottom of the page, or eliminate it completely.



Figure 9.46
Page Setup has been selected.

Release the mouse button.

Activate the Page Setup command.

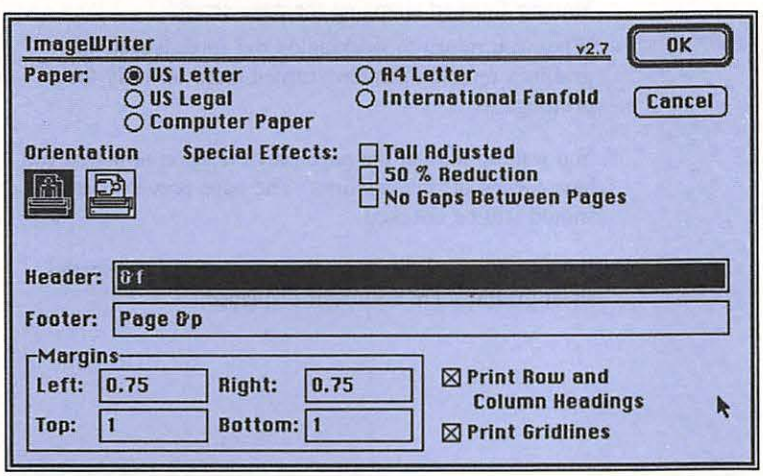
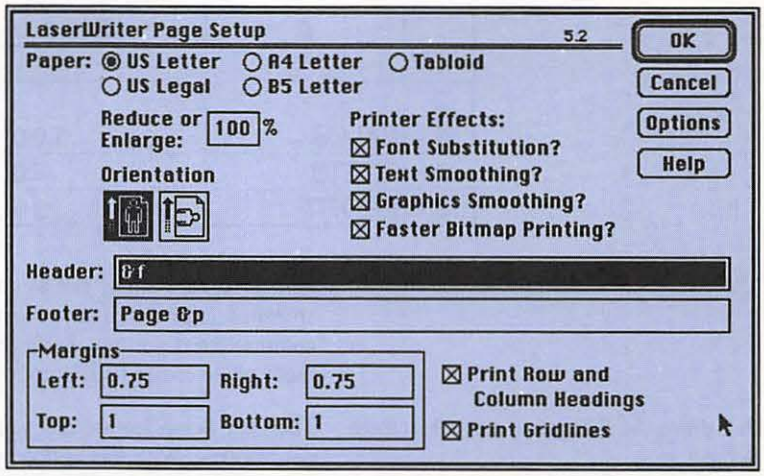


Figure 9.47
This is the Page Setup dialog box if you are using an ImageWriter printer.

Figure 9.48
This is the Page Setup dialog box if you are using a LaserWriter printer.



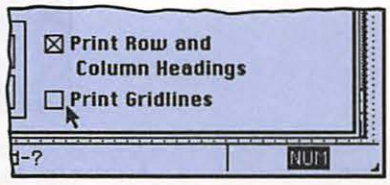
You can see that two options appear at the lower right of the Page Setup dialog box. These control the printing of the row and column headers and the gridlines.

This dialog box also gives you control over the page's margins, and the contents of the header and footer lines. If you erase the information displayed in the header and footer boxes, nothing will be printed on the final output.

Move the mouse pointer to the check box for Print Gridlines, and click the mouse button once.

Turn off the printing of the gridlines.

Figure 9.49
The print gridlines option has been turned off. Row and column headers, however, will still be printed since the X remains in that check box.



Click on OK.

You are finished changing the page setup.

When you return to working on the spreadsheet, the gridlines remain! You have turned them off only for printing.

⌘P

You want to look at the page preview again now that you have turned off the gridlines. The page preview box should still be checked.

Click on OK.

Look at the page preview. You can see that the spreadsheet gridlines are no longer displayed.

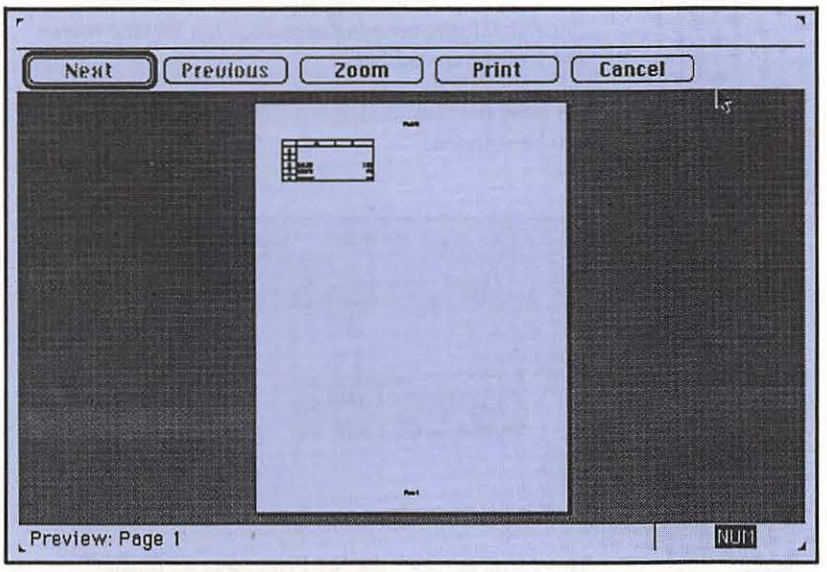


Figure 9.50
The gridlines are no longer displayed on the page preview. If you had de-selected the print row and column headings box in the page setup dialog, they, too, would be missing from this display.

Click on the Cancel button.	You do not want to print another copy of the spreadsheet at this time.
⌘S	Execute the Save command. By changing the Page Setup, you have made a change to the spreadsheet, and you want to retain this change. By saving the spreadsheet at this time, you are making the setup change a part of the spreadsheet. If you do not save the spreadsheet after changing the page setup, the change will be lost. This is true of a change of any type. Making a change and not saving the spreadsheet means that the change will be lost.

9.22 CHANGING THE PRINT AREA

There may be instances when you do not want the complete spreadsheet to be printed. If this happens, you must have a way to tell Excel what you want printed. This is done with the Options menu.

What To Do	*Why You Are Doing It*
⌘G	The Goto command. Before you change the print area, you must select the range of the spreadsheet you want printed.

Click on InRange in the Goto range list box.

You want to print only the area of the spreadsheet that contains information. InRange does not include rows 1 and 2 of the spreadsheet.

Click on OK.

Put away the Goto dialog box. The cells A3 through B5 will be selected.

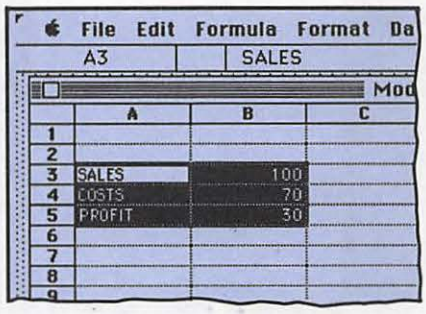


Figure 9.51
This is the range you now want to print.

Pull down the Options menu.

This menu contains the Set Print Area command.

Drag the mouse down to select Set Print Area.

You are going to change the default print area.

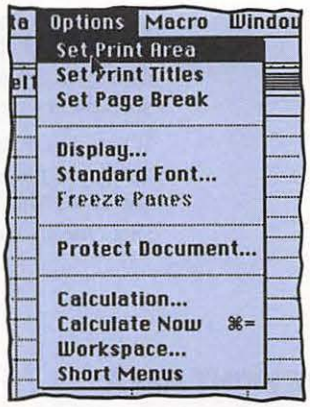


Figure 9.52
The Excel Options menu. Set Print Area has been selected.

Release the mouse button.

Set the selected range of the spreadsheet as the range that you want printed.

Note that the gridlines around the selected print area turn into dashed lines. The box that the dashed lines enclose is the print area you have set.

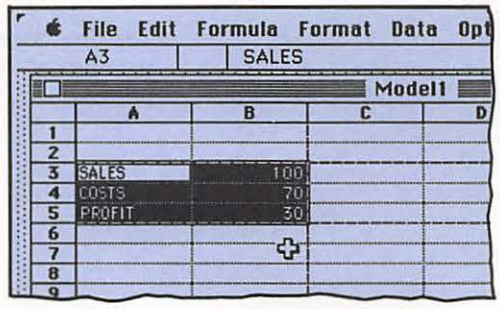


Figure 9.53
Look carefully at the gridline separating row 2 from row 3 of the spreadsheet. It is a dashed line. There are several other dashed lines on the spreadsheet.

⌘P	Execute the Print command. The Page Preview box should still be checked. It will only become unchecked if you uncheck it.
Click on OK.	Look at the page preview. You can see that it includes only rows three through five.

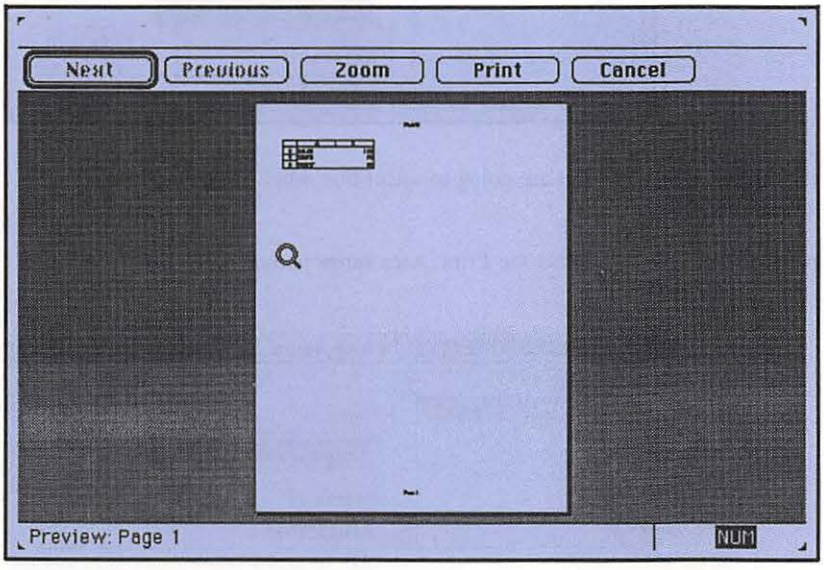


Figure 9.54
The page preview shows that only rows 3, 4 and 5 are to be printed. Compare this figure with Figure 9.50, which includes the first two rows of the spreadsheet. If you are having trouble with this preview, use the Zoom button, or the magnifying glass cursor to get a closer view.

Click on the Cancel button.	You do not want to print the document at this time.

As you are working, you may change the print area at any time. All you need to do is select a different range of the spreadsheet, then use the Options menu to set the print area. The most recent print area is the one that is "remembered" for the spreadsheet. The Set Print Area command is simply placing a special range name into the range name list. The actual range defined, called Print_Area, changes every time you execute the Set Print Area command.

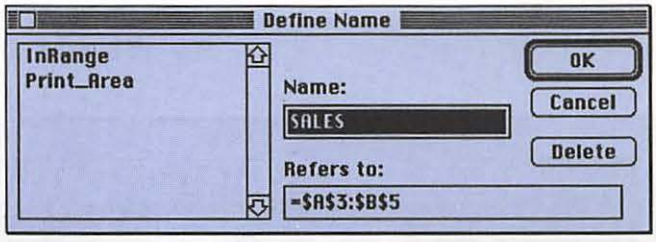
9.23 RESTORING THE DEFAULT PRINT AREA

Of course, there are times when you may want to cancel the print area you have set and return the spreadsheet to its default print area, the complete spreadsheet. To do this, you must remove the Print_Area range from the list of defined ranges. The Print_Area range, as was mentioned above, is created automatically by the Set Print Area command that you just used.

What To Do	*Why You Are Doing It*
⌘L	This is the Define Names command. Recall that it is located on the Formula menu. If desired, you may pull down this menu and select the Define Names option, rather than using the command key.

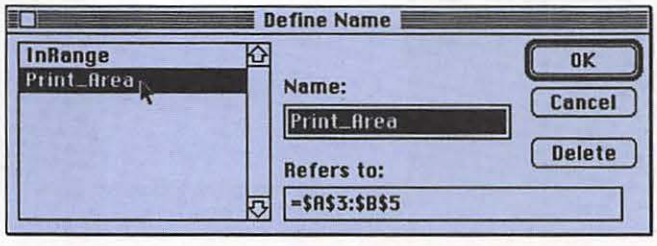
You can see that Print_Area now appears in the list of defined range names.

Figure 9.55
The current Define Names dialog box.



Move the mouse so it is pointing at Print_Area in the name list box.	You are going to select this range to delete.
Click the mouse button once.	Select the Print_Area range name.

Figure 9.56
The Print_Area range has been selected.



Click on the Delete button.	The delete button will remove the selected range name from the range name list.
Click on OK.	You are finished with the Define Names dialog box.
⌘P	You are going to look at the Page Preview one more time.
Click on OK.	Go to the Page Preview. You can see that rows 1 and 2 of the spreadsheet are once again included in what will be printed.
Click on the Cancel button.	Leave the Page Preview and return to the spreadsheet.

9.24 STARTING A NEW WORKSHEET

There will frequently be times when you want to start a new spreadsheet file. For example, you may be experimenting with a feature of the spreadsheet prior to creating the model. Or you may be showing a friend how to use the program.

In either case, it is a simple matter to open a new worksheet. Excel is able to work with multiple worksheets open. The number of open worksheets is limited by the available memory in your computer, and the amount of memory any single worksheet is using.

When you work with multiple spreadsheets, you are able to change between the different worksheet windows using the window menu. If you find having multiple worksheets open confusing, it is a simple matter to close the first one before opening the second. You may, of course, close the first one after opening the second if you so choose.

What To Do	*Why You Are Doing It*
Pull down the File menu.	This menu contains the New command.
Drag the mouse down the menu to select the New option.	You are going to open a second worksheet. Note that you may use ⌘N to execute the New command.

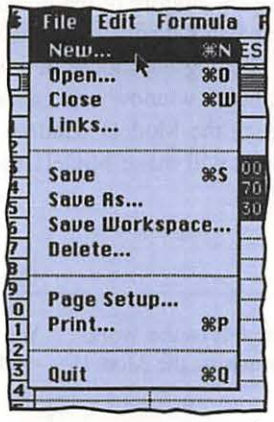


Figure 9.57
The File menu. The New command is selected.

Release the mouse button.	Execute the New command. The New dialog box will appear.

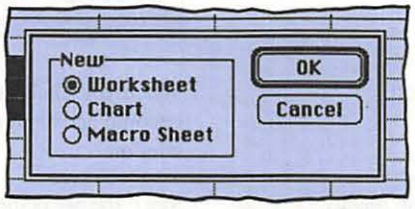


Figure 9.58
The New dialog box.

In addition to being able to create worksheets, the New command lets you create graphs and macro sheets. Both these items will be discussed in later chapters in the text. Of the three things you can create, the Worksheet button is selected.

Click on OK.	Create a new worksheet. A second worksheet window will open, called Worksheet2.

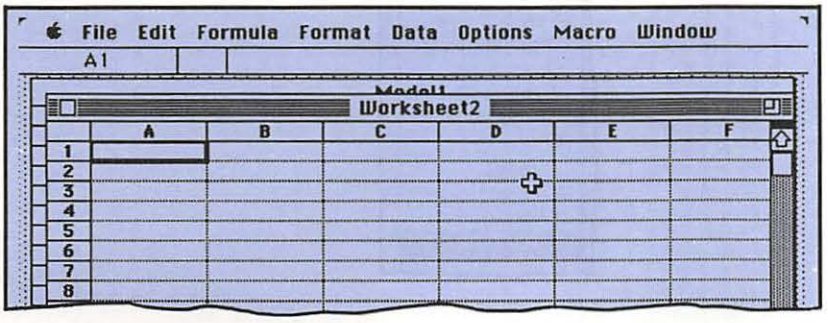


Figure 9.59
The second worksheet sits on top of the first.

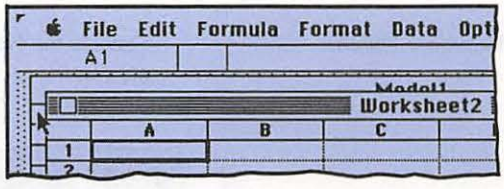
9.25 CHANGING THE ACTIVE WORKSHEET WINDOW

You now have two worksheet windows open. The top one, called Worksheet2, is the active spreadsheet. You may change the active worksheet in one of two ways. First, you may pull down the Window menu and select the name of the desired worksheet from the list of available windows appearing at the bottom of the menu. Second, if any portion of the desired window can be seen on the Macintosh's display, you may move the mouse pointer to the area and click the mouse. Remember, clicking the mouse in a window makes it the active window.

Since the Worksheet2 window was created after the Model1 window, it is slightly smaller. You can see the edge of the Model1 window to the left and above the current window. Clicking the mouse in this space will make Model1 the active window!

What To Do	*Why You Are Doing It*
Move the mouse to the left of the Worksheet2 window, but touching the Model1 window.	You are going to make Model1 the active window by clicking on it.

Figure 9.60
Note the position of the mouse pointer on the window behind the Worksheet2 window.



Click the mouse button.	When you click the mouse once, the Model1 window will become active. It completely hides the Worksheet2 window.
Pull down the Window menu.	Since the Worksheet2 window is completely hidden by the Model1 window, you must access it by using the Window menu.
Drag the mouse down to Worksheet2.	You are once again going to activate this worksheet. Note the checkmark in front of Model1 on this menu. This check mark indicates that Model1 is the presently active window.

Figure 9.61
The present Window menu. As more spreadsheets are opened on the desktop, this menu will get longer.



Release the mouse.	Reactivate the Worksheet2 window.

As a general note, you should remember that the size of a window on the Macintosh may be changed to better fit your needs. You may use either the zoom box at the top right side of the title bar, or the size box at the bottom right corner of the window. If a window completely hides another, you may use its size box to make it smaller, thereby revealing part of the other window. By changing the size in this fashion, and using the title bar to reposition the two windows, it is possible to modify the placement of the windows on the Macintosh display so that you may always see at least some of each window. By doing this, it is a simple matter to use the mouse pointer to click on the desired window to change the active window. This eliminates the need to use the Window menu to change the active window.

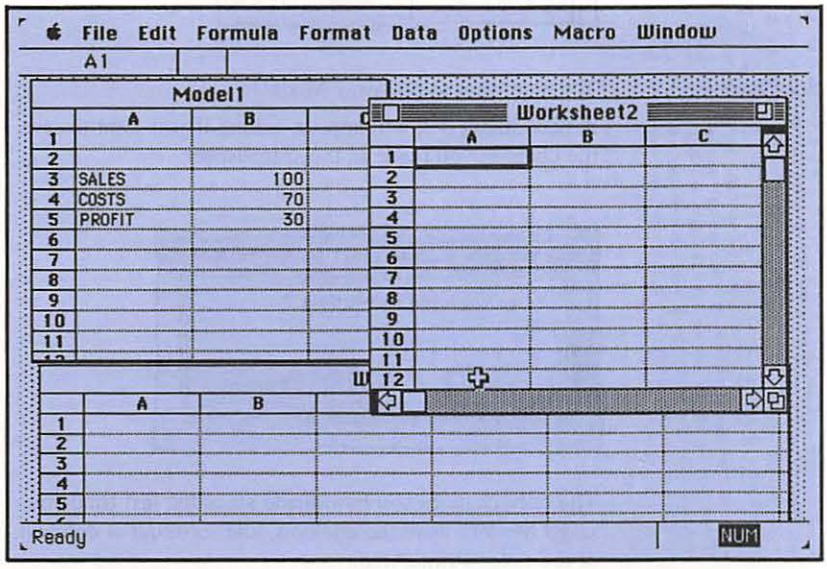


Figure 9.62
This is an example of how you may want to arrange several open spreadsheet windows so that all you need to do to change the active window is click the mouse on the one you want.

9.26 CLOSING SPREADSHEETS

Sooner or later you will want to put away a spreadsheet. You may, as suggested above, not want to have two open on the desktop at the same time, or you may be getting ready to do something else with the computer. Like all Macintosh windows, the title bar of the active window contains a close box. Additionally, the File menu contains a close option.

What To Do	*Why You Are Doing It*
Pull down the File menu.	You can see that the File menu has a Close option. This option may be accessed with ⌘W. The presently active window will be closed if you select this option. Remember that you can tell which window is active by the horizontal lines in its title bar.
Release the mouse button.	Do not use the Close command found on the File menu at this time.

Click the mouse pointer on the close box at the top left of the title bar.

You may also close a window by clicking on its close box. You are now closing the Worksheet2 window. The Model1 window will now be active, since it is the only available worksheet.

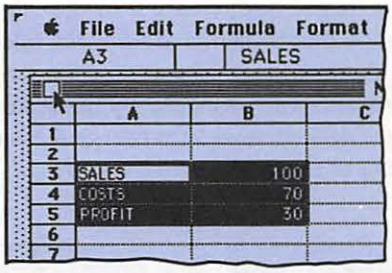


Figure 9.63
The mouse pointer is positioned on the close box.

Click on the Model1 close box.

You also want to put away Model1.

A new dialog box will appear, asking if you want to save the changes you made in the spreadsheet.

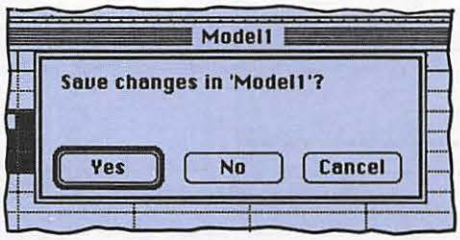


Figure 9.64
If you try to close a spreadsheet that has not been saved, you will receive this dialog box.

The only changes you have made since the last time you saved Model1 were the addition, and subsequent deletion, of the range Print_Area.

Click on the Cancel button.

For now, you do not want to close this spreadsheet. If you click on yes, the spreadsheet will be re-saved and then closed. If you click on no, the spreadsheet will be closed without it being re-saved.

9.27 FINDING ON-LINE HELP

Excel has an on-line help facility that may be accessed while using the program. You may get to the Help processor by using the Window menu.

What To Do	*Why You Are Doing It*
Pull down the Window menu.	You access Help by using the Window menu.
Drag the mouse down to the Help option.	Select Help.



Figure 9.65
The Help option on the Window menu has been selected.

Release the mouse button.

Activate Help.

The initial Help display is a list of topics.

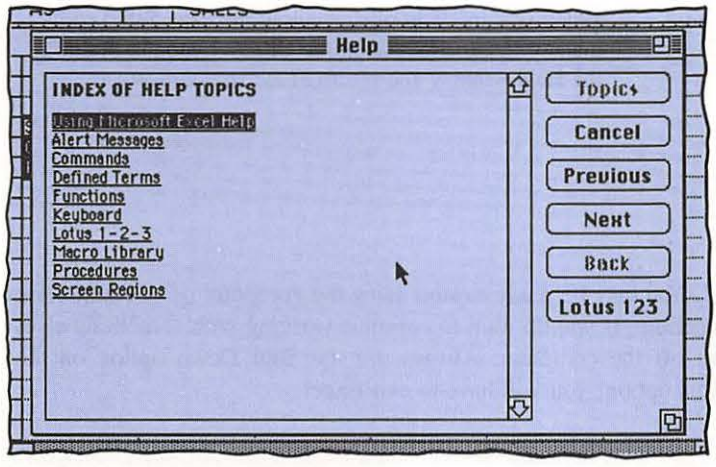


Figure 9.66
The initial Help window.

Move the mouse pointer over the word Commands on the topics list.

You want to get help about a command. Note that when you move the mouse pointer over the topic list, it turns into a hand with an extended index finger.

Click the mouse button once.

A single press of the mouse button will select the desired topic. A new list of topics will appear.

Figure 9.67
The Commands topic is going to be selected when the mouse button is pressed.



Scroll the window down until File Page Setup appears.

You want to find out more about the Page Setup commands. Use the scroll bar at the right of the topics list to scroll the topics until File Page Setup appears.

Position the mouse pointer over File Page Setup and click the button once.

You want to find out what help is available for this topic.

Figure 9.68
You are about to get information about the Page Setup command, which is found on the File menu.



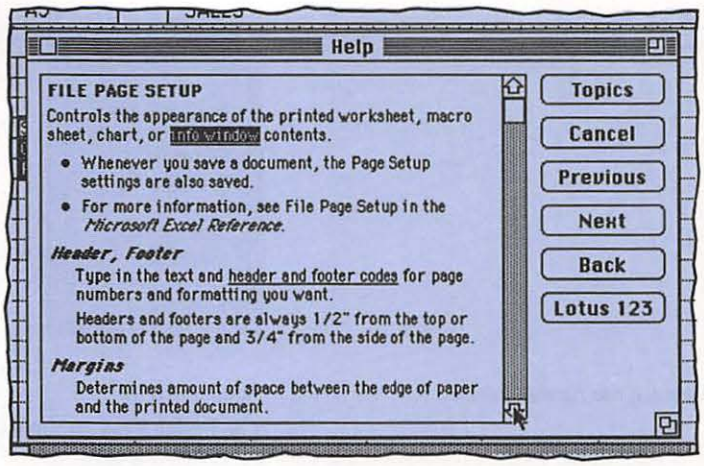


Figure 9.69
Part of the help that is available for the Page Setup command.

Click on the Cancel button.

When you are done reading about the Page Setup command, click the mouse on the Cancel button to put away the Help window and return to the spreadsheet.

9.28 QUITTING EXCEL

You are now ready to quit Excel. You may be ready to stop using the computer or you may want to do something else with the machine. If you do want to continue working with something else, it is a bad habit to simply turn off the computer. Always use the Shut Down option on the Finder's Special menu. To get this option, you will have to exit Excel.

What To Do	*Why You Are Doing It*
Pull down the File menu.	The Quit option is located on the File menu, just as it is for most Macintosh applications.
Drag the mouse down to select the Quit command.	You are now going to quit Excel and return to the Finder desktop. You can see that you may use the ⌘Q key to execute the Quit command if desired.

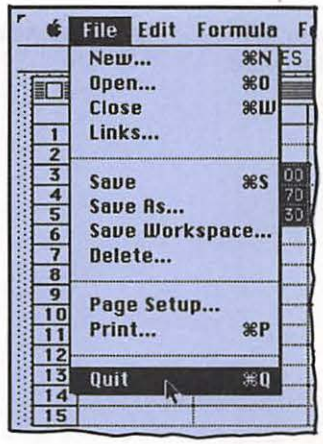


Figure 9.70
The Quit option has been selected on the File menu.

Release the mouse button.

Once again, the dialog box reminding you that the spreadsheet is not saved will appear. Just like all Macintosh applications, you cannot close a document, or exit the program, without deciding if you want to save the most recent changes to your work.

Click on the Cancel button.

For now, you do not want to quit Excel.

Click on the Model1 close box.

Remember that the close box is at the top left of the window's title bar. You are closing the window without exiting Excel. Again, the dialog box asking if you want to save the spreadsheet appears.

Click on Yes.

Re-save the Model1 spreadsheet.

After the save is complete, the menu bar at the top of the Macintosh screen will change to reflect the fact that no worksheet windows are open. Only the File, Edit and Window options will be showing. Additionally, you will see an empty desktop. If you are not using MultiFinder, you will not see any disk icons or the trash can icon. These icons will be on the screen if you are using MultiFinder.

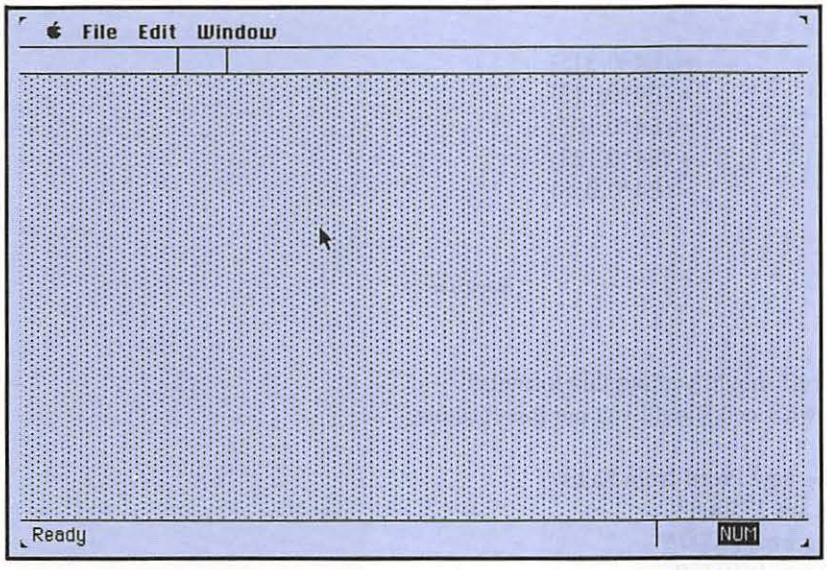


Figure 9.71
This is what your Macintosh display will look like after you have closed all the spreadsheets you have been working on.

Pull down the File menu.

Once again, you are going to quit Excel.

Note that the File menu is abbreviated, just as is the complete menu bar. The Print, Save and several other commands do not appear. They would be dimmed if they showed on the menu, since they are meaningless commands when there is no open spreadsheet.

Drag the mouse down to the Quit option and release the mouse button.

Execute the Quit command to leave Excel. After a brief pause you are returned to the Finder.

EXERCISES

1. If you want to enter the text "1986–87 Fiscal Budget" into a cell of a spreadsheet, do you need to enter a special character or command to tell Excel that you want to mix text and numbers?
2. If you enter 100/5 into a cell of a spreadsheet, what will be displayed in that cell?
3. If you enter =500/50 into a cell of a spreadsheet, what will be displayed in that cell?
4. What should you enter into a cell if you want it to display a value that is 4.5 times greater than the value displayed in cell F11?
5. What is the name (address) of the cell in the sixth column, fifth row of your spreadsheet?
6. If cell B3 contains the value 300, what will be displayed in the cell F5 if it contains the formula =(0.8*B3)?
7. If the cursor is presently in cell M235, what command key do you press to be able to move the cursor to cell A1 without using the scroll bars?
8. If cell E11 contains the formula =(D8+D9+D10), how do you change it to contain the formula =(D8+D9–D10)?

Build the following spreadsheet model for Problems 9 through 17:

	A	B	C	D	E
1	Jones Co.				
2	Sales Analysis				
3					
4	Gross Sales				476000
5					
6	Cost of Widgets			=(E4*0.315)	
7	Cost of Framitz			=(E4*0.113)	
8	Cost of Dingies			=(E4*0.102)	
9	Cost of Nuts & Bolts			=(E4*0.122)	
10	Cost of Sealant			=(E4*0.058)	
11					
12	Total Costs				
13					=====
14	Profit from Sales				

9. What is the formula for Total Costs? In what cell should you put this formula?
10. What is the formula for Profit from Sales? In what cell should you put this formula?
11. What is the present Profit from Sales?
12. Change the Gross Sales to 500000. What is the new Profit from Sales?
13. What is the cost of Widgets when Gross Sales are 375000?
14. What are the Total Costs when the Gross Sales are 525000?
15. What percent of Gross Sales are the costs of Nuts & Bolts?
16. What is the cost of Sealant when Gross Sales are 481000?
17. Change the percent of Gross Sales cost of Widgets from 31.5% to 33.8%. What are the Total Costs and Profit from Sales if Gross Sales are 593400?
18. Create the following spreadsheet model with this information:
    1) The Cost of Goods is 55 percent of Sales.
    2) Salaries are 10 percent of Sales.
    3) Overhead is 26 percent of Sales.
    4) Other expenses are 4 percent of Sales.

Use the appropriate formulas to compute the gross and net profit values.

SALES	500
COST OF GOODS	275
GROSS PROFIT	225
EXPENSES	
SALARIES	50
OVERHEAD	130
OTHER	20
NET PROFIT	25

19. What is the net profit in the model created in Problem 18 if sales are 879 and the cost of goods and the expenses remain the same percentage of sales as in this model?
20. What are the salaries in the model created in Problem 18 if sales are 1262?
21. What is the gross profit in the model created in Problem 18 if sales are 682?

INTERMEDIATE ELECTRONIC SPREADSHEET CONCEPTS

10

CHAPTER OBJECTIVES

Upon completion of this chapter, the student will:

- **Retrieve a spreadsheet from disk.**
- **Explain the concept of the spreadsheet window.**
- **Move the spreadsheet window.**
- **Explain what a range of cells is.**
- **Explain the difference between relative and absolute cell address copies when replicating cells.**
- **Use the relative and absolute cell copy features.**
- **Use the SUM, AVERAGE, COUNT, IF and HLOOKUP built-in functions in a spreadsheet.**
- **Nest functions within other functions.**
- **Find information about other built-in functions.**
- **Print the spreadsheet.**

10.1 USING THE ELECTRONIC SPREADSHEET

In the last chapter you learned how to start your electronic spreadsheet program, move the cursor, create a simple spreadsheet model, modify that model, print the model and, finally, how to save the model.

This chapter starts by showing you how to reload the spreadsheet model you built in the last chapter. After that you will explore more of the fundamental aspects of the spreadsheet window. Finally, you will explore some of the features of electronic spreadsheet programs that simplify model building.

10.2 RETRIEVING A MODEL

The usefulness of the spreadsheet program would be greatly diminished if you could not save your work onto the floppy disk and retrieve it when you needed it at a later date. In the last chapter you learned how to save a model. Now you must get that model back to work with it.

After you boot your Macintosh with a System Start-Up disk, insert the Excel Program disk into one of the computer's disk drives. If you are using a machine with a hard disk you will not need to insert the Excel program disk into a disk drive. Rather, locate the Excel folder, and open it so you can see the Excel program icon. Place a disk (see Chapter 3 for how to initialize a new disk) with at least 200K available space into another one of your Macintosh's disk drives, if you have one available. This disk will be used for saving your work. If you do not have a free floppy disk drive, keep this disk available. You will need it for data storage.

In these instructions, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets, (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and double-click the mouse button. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.

Finally, if you want your work to match the figures in the text, be sure to use the Chooser DA to select a LaserWriter and not an ImageWriter. You may select a LaserWriter even if your computer is not actually attached to one. You will not, however, be able to print if this is the case.

There are two ways to open an existing document when using Excel.

First, you may double-click on the document's icon on the storage disk. The Macintosh will figure out which application program created the document and will automatically launch the program for you. This will only work, however, if the program can be found in one of the computer's disk drives. If you are using a floppy disk-based computer, you may not always have the program disk in a disk drive, so this method will not work for you. If you have two floppy disk drives, it is possible to launch an application from one of it's documents if you eject the System Start-Up disk, and replace it with the program disk, leaving the document disk in the second disk drive. You will find, however, that the computer frequently requires information off the Start-Up disk, and that you will do several disk exchanges before the program is running. It is best to start the application, and then open the document.

The second method available for opening existing documents is to use the Open command found on Excel's File menu. This command will let you inspect the contents of all the disks in your computer. It even lets you eject unwanted disks from a disk drive and put different ones in. Clearly, to use this option, you must first launch the Excel application.

If you are using a computer with a hard disk, begin here:

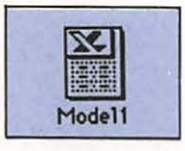


Figure 10.1
This is the icon you will see for Excel spreadsheets.

What To Do	*Why You Are Doing It*
Locate the icon for the spreadsheet you prepared and saved at the end of Chapter 9 and place the mouse pointer on it.	You are going to launch Excel by double-clicking on this icon. Figure 10.1 shows the icon that Excel creates for its Spreadsheets. The name of this particular one is Model1.
Double-click the mouse.	By double-clicking on an Excel spreadsheet, the Macintosh will look on all available disks for the Excel application program. If found, it will launch Excel and open the spreadsheet. If the Macintosh is not able to locate the application program, you will see the dialog box shown in Figure 10.2.

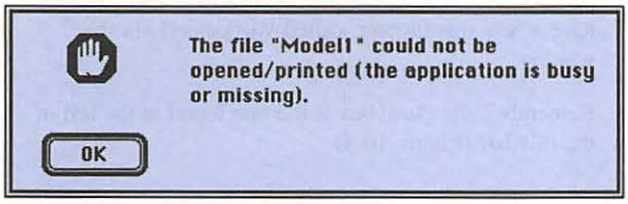


Figure 10.2
You will see this dialog box if the Macintosh is not able to locate the Excel application program to open the file you are double-clicking.

If you have the Excel application program on your hard disk, or on a floppy disk currently in one of the computer's disk drives, the program should start, and after a brief wait, the spreadsheet you prepared during the last session will appear. You are now ready to begin modifying the spreadsheet.

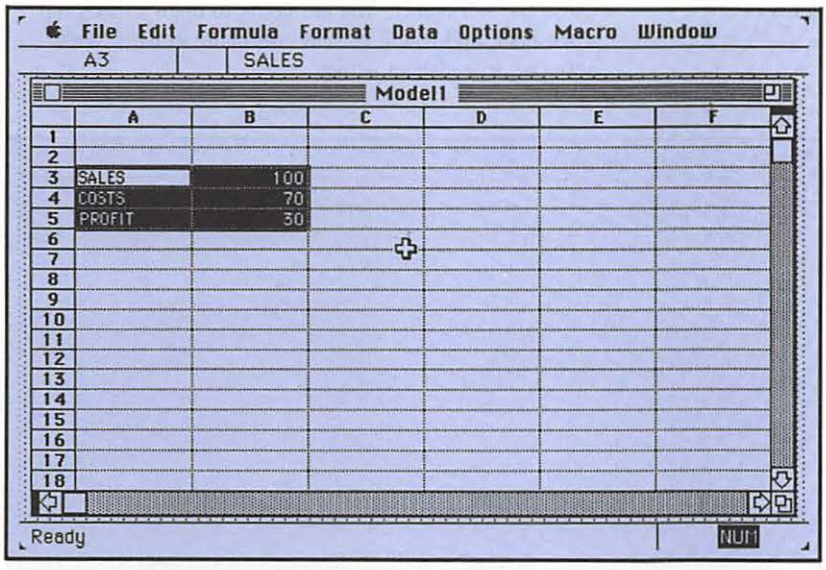


Figure 10.3
The retrieved spreadsheet should look like this.

⌘Q	This is the Command Key equivalent for the Quit command found on the File menu. You are quitting now so that you can learn how to use the Open command. Normally, you would not quit the Excel program after you load the spreadsheet you want to modify!

If you are using a computer that has only floppy disks, then start here:

Locate the icon for the Excel program.	You will launch the Excel application program by double-clicking on it.
Move the mouse to the Excel icon and double-click.	The double-click will launch the application. If you have trouble with the double-click, you may also select the program's icon with a single click, then use the Open option on the File menu, or press ⌘O, the Command Key equivalent.

After a brief wait, Excel will be running, and you will have a new spreadsheet, called Worksheet1, in the window.

Move the mouse to the window's close box.

Remember, the close box is the one found at the left of the title bar (Figure 10.4).

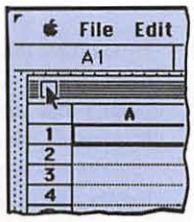


Figure 10.4
The mouse pointer is on the close box at the left of the Title bar.

Click the mouse button once.

Close the worksheet. You are going to open an existing worksheet, and it will be less confusing to work with only one spreadsheet active.

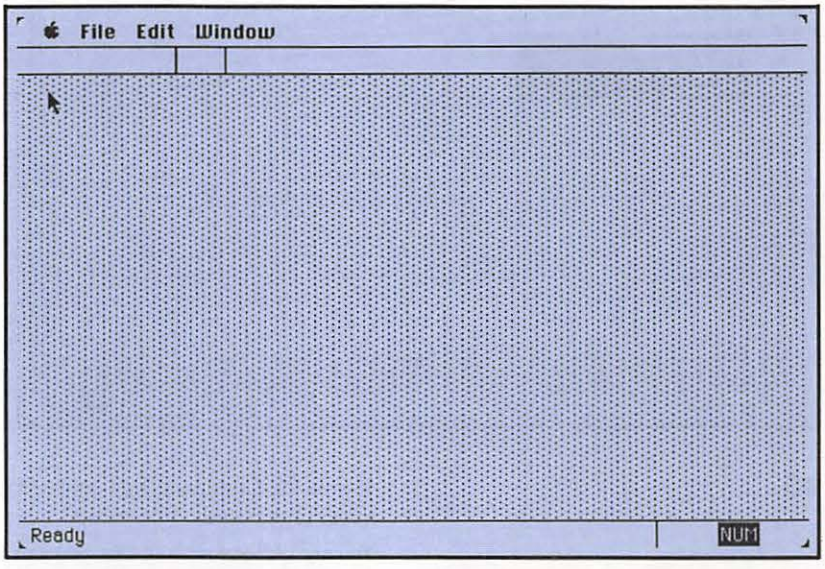


Figure 10.5
Your Macintosh after you have closed the new worksheet. All that is showing is the current menu bar. If you are using MultiFinder, you may have other items showing on the desktop.

Pull down the File menu.

The File menu has the Open command.

Drag the mouse pointer down to the Open command.

The Open command lets you open existing spreadsheets found on disk. Note that the Open command has ⌘O as a Command Key equivalent. You may recall that this is the same key used by the Finder's Open command.

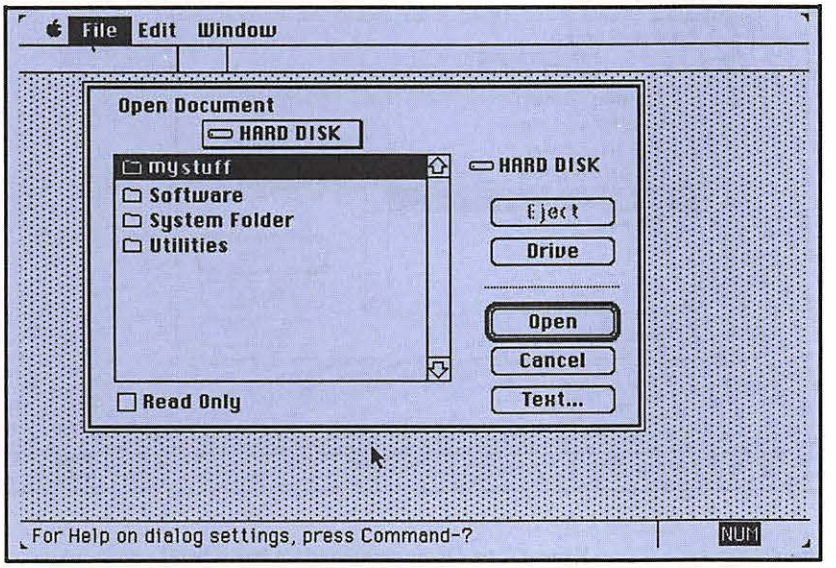


Figure 10.6
The Open command has been selected.

Release the mouse button.

Execute the Open command.

After a brief pause, you will see a dialog box similar to the one displayed in Figure 10.7, although the name of the disk being displayed and the free space on the disk will probably be different.

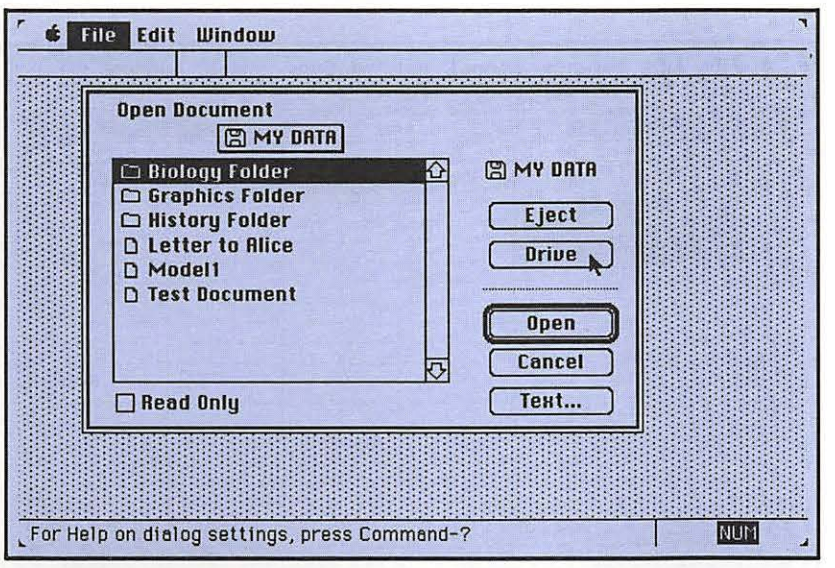


The Open dialog box. Since Excel was launched from the Hard Disk, this is the one showing in the current dialog box.

Click the mouse on the Drive button shown in the dialog box.

The Drive button tells Excel to display the spreadsheet and folder names found on a second disk currently in your computer. This may be a floppy disk, or a hard disk. If you do not have a second disk in the computer, then the Drive button will be dimmed, and you will not be able to use it.

Continue clicking the Drive button until the name of the disk that contains your file appears in the dialog box.



After clicking on the Drive box, the contents of the disk called MY DATA is displayed.

Click on Model1.

You want to open the spreadsheet you named "Model1." By clicking the mouse pointer on the name in the dialog box, you are selecting this spreadsheet.

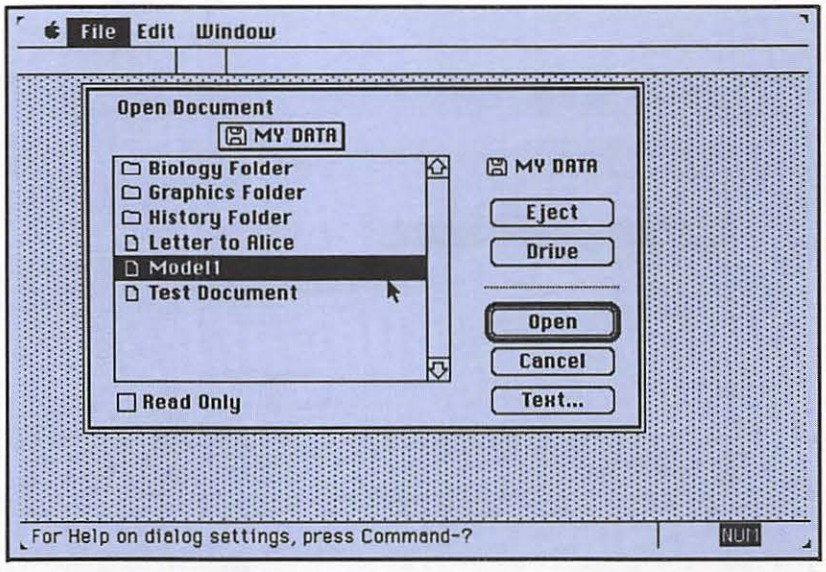


Figure 10.9
The spreadsheet "Model1" has been selected.

Click on the Open button.

Execute the Open command. After a brief pause while the computer reads the spreadsheet, you will see the Excel spreadsheet in the current window.

You should remember that the double-click is often a shortcut to the Open command. You could have double-clicked the mouse on the spreadsheet name, rather than selecting it and then clicking on the Open button in the dialog box.

When the file is loaded, the cursor will be placed on the cell it was in when the spreadsheet was saved. Here, the range A3:B5 has been selected, and the cursor is in cell A3.

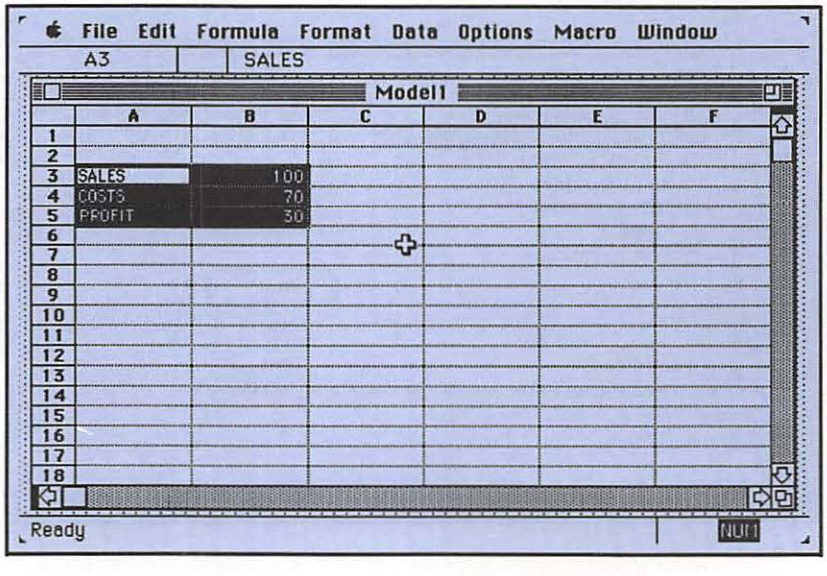


Figure 10.10
The spreadsheet you created has been loaded back, and the cursor is placed in the cell it was in when the spreadsheet was saved.

10.3 THE DISPLAY WINDOW

Even computers with limited amounts of memory have spreadsheet programs that allow you to create models much larger than can be displayed on the machine's monitor. As a consequence only a portion of the total worksheet is viewed at any given moment in the current window. Depending on how you like to think about things, you could say that to see other segments of the model, the window is moved around over the whole (stationary) spreadsheet (this is how most people view the situation), or that the spreadsheet is moved around under the (stationary) window.

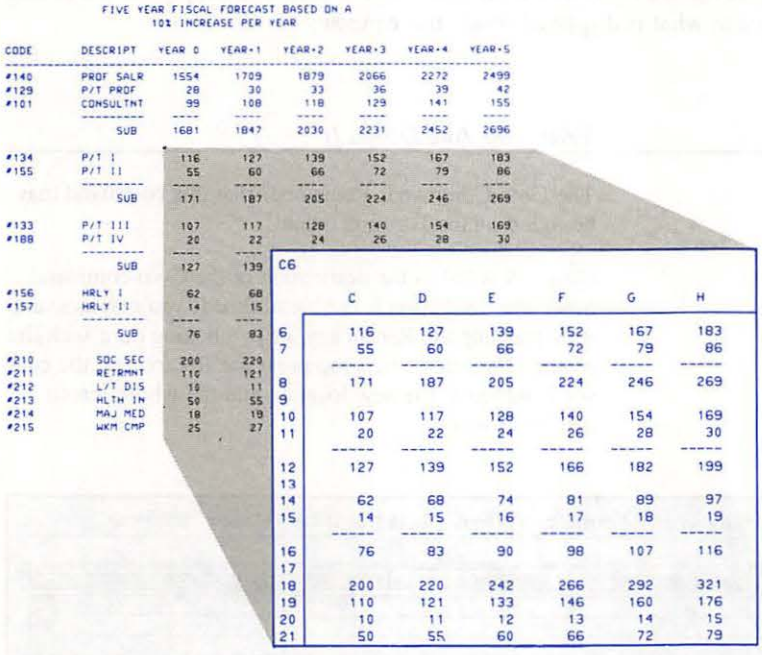


Figure 10.11
The spreadsheet window moves over the larger spreadsheet.

10.4 MOVING THE WINDOW

No matter how you view the relationship between the window and the spreadsheet page, you are able, through proper manipulations of the cursor, to see any area of the complete page.

There are several ways you can do this. First, spreadsheet programs allow you to make direct cursor jumps using the Goto command. You simply Goto a cell that is not currently inside the window. You used the Goto command in Chapter 9.

The second way is to use the cursor to push the edge of the window. This is done by moving the cursor to the boundary of the window, then moving it one more row or column in the same direction. In effect, you are moving the display window either left, right, up, or down, or, if you like, you are scrolling the spreadsheet page up, down, left, or right underneath the window.

Finally, you may make use of the scroll bars found to the right and below the active spreadsheet window. The Excel scroll bars work in almost the exact same fashion as the scroll bars found with any other Macintosh application. By moving the slide box on the scroll bar, Excel does not take you to the extreme of the spreadsheet. Recall that the limits of the spreadsheet are 254 columns and 16384 rows. The scroll bar has been made less sensitive, moving only a few rows and columns. You may use the arrows at the ends of the scroll bars to continue the scrolling process. Once a cell far to the right, or far down is occupied, the distance the scroll bars will move the spreadsheet is expanded.

As you can see in Figure 10.11, the window is presently displaying columns C through H. If you want to see column I, you move the cursor right until it is in column H. You then move the cursor right one more time. Now you will be looking at columns D through I of the spreadsheet. Columns A, B and C still exist, but they are no longer visible. Of course, you could use the scroll bar at the bottom of the window to shift the window right (or the spreadsheet left) to be able to see the desired portion of the spreadsheet.

You use the cursor or right side scroll bar in a similar fashion to see additional rows. The difference, of course, is to move it vertically rather than horizontally.

When you use the Goto command, if you give a destination cell that is not already inside the window, the window shifts so that the cursor is placed in one of the four corners of the window. However, if the destination of the GOTO is inside the window, the cursor is simply moved to that location without any change in what is displayed inside the window.

What To Do	*Why You Are Doing It*
⌘G	The Goto Command. Remember that this command may be found on the Formula menu.
A720 [cr]	Give cell A720 as the destination of the Goto command. Since the OK button is double outlined, you may activate it by pressing the Return key, or by clicking on it with the mouse. Note that when you press the Return key, the cursor is moved to the new location and the whole screen display changes.

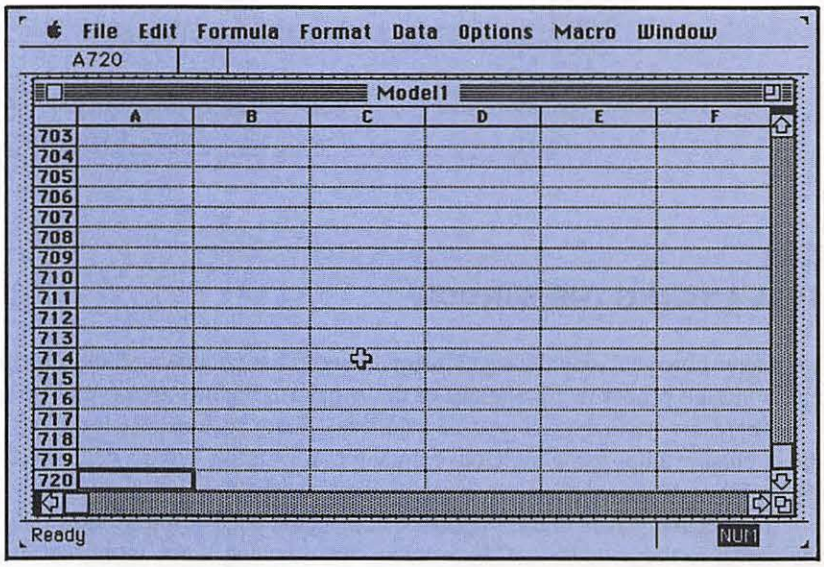


Figure 10.12
Your Model1 spreadsheet window after you execute the first Goto command.

⌘G	Goto again.
CT123 [cr]	Give cell CT123 as the destination of the Goto command. Again, the whole screen changes. The destination cell (CT123) is placed at the top right of the display.

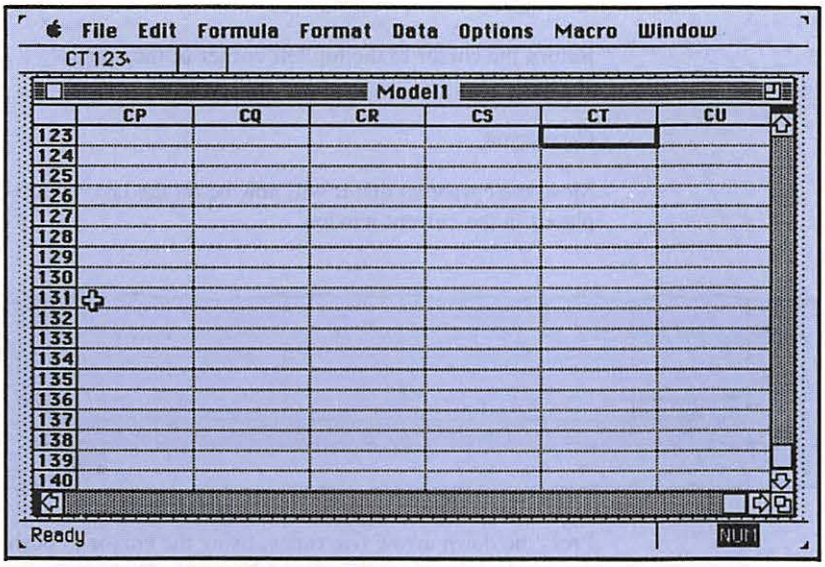


Figure 10.13
The cursor is now at the top right side of the display.

⌘G — Goto again.

CR130 [cr] — Goto cell CR130. This cell is inside the present window. The cursor is relocated, but the whole window is not scrolled. Cell CT123 remains at the top right of the display.

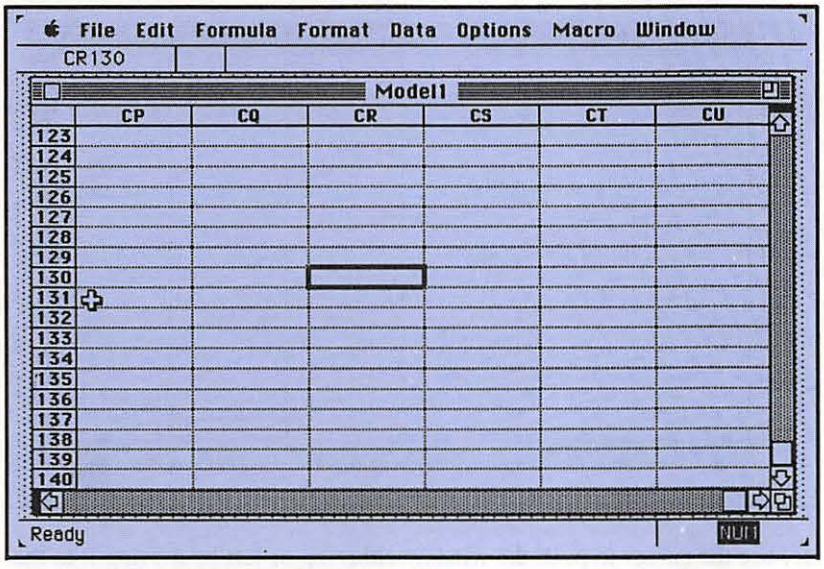


Figure 10.14.
The cursor has moved, but the content of the window remains unchanged.

⌘← — Hold down the Command Key and press the left arrow. The cursor will move to cell A130. Recall that this key combination moves the cursor left until there is a change from an empty to an occupied cell. Since there are no cells in use on row 130, the cursor will move all the way to the A column.

⌘G	Goto again.
A1 [cr]	Return the cursor to the top left corner of the spreadsheet.
⌘G	Goto again.
A100 [cr]	Move the cursor so that it will now be on the last row displayed in the current window.

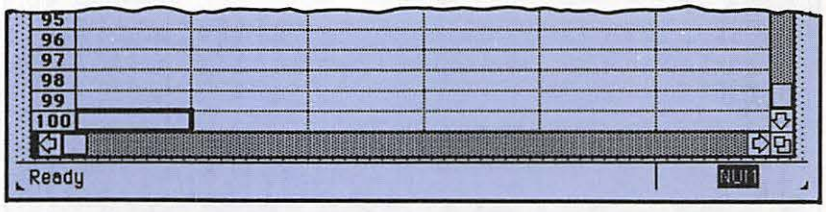


Figure 10.15
The cursor is on the bottom row of the current window.

↓ ↓ ↓ ↓ ↓	Press the down arrow five times, using the cursor to push the window down (or the spreadsheet up). The cursor should now be in cell K105.
→ → → → → → → → → →	Press the right arrow ten times, using the cursor to push the window right. The cursor should now be in cell K105.

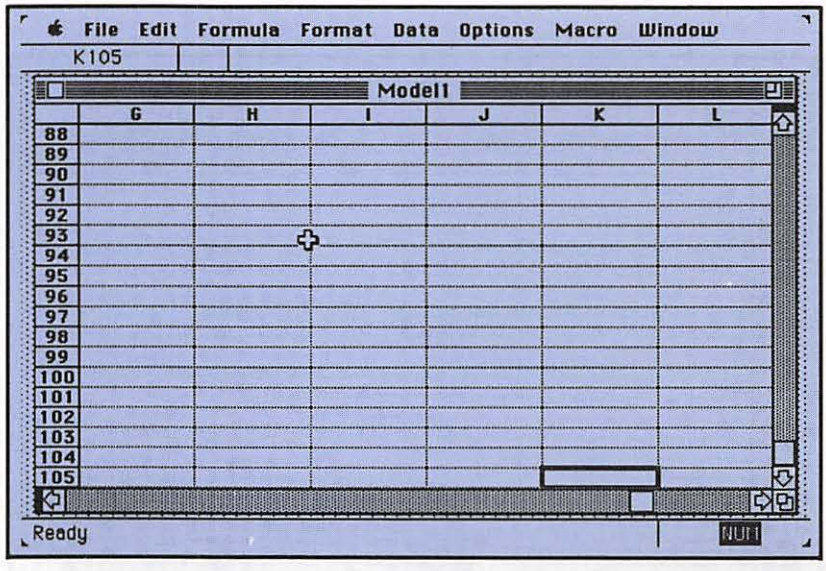


Figure 10.16
The current display.

You may, of course, use the cursor to push the window either up or left by moving it to the left or top of the window and then pressing a cursor movement key.

⌘←	Return the cursor to the A column. It should now be in cell A105.
←	Try moving the cursor LEFT. You cannot. There are no columns to the left of column A on a spreadsheet. Nothing will happen. You will get the same results if you try to move the cursor above row 1 of the spreadsheet.

10.5 COPYING CELLS INTO A RANGE OF CELLS

A major aspect of using financial models is to extrapolate a history of financial information in an attempt to predict where a business may be heading. This means that large portions of models may effectively be the same in terms of basic relationships.

For example, consider the model you built in the last chapter and retrieved at the beginning of this chapter. A major assumption when you started building this model was that costs would always be 70 percent of sales and that profits would always be sales minus costs. You may want these relationships to hold true if you extrapolate the model for one more year or for twenty.

Because of these constant relationships, it is possible to use the program to copy existing cells into unused cells and then have it adjust any formulas in the cells to reflect the new locations of the formulas. For example, if you copy the profit cell from the B column to the C column, you want the formula in the cell to read =(C3–C4), not =(B3–B4). In fact, when you do the copy, this is what will happen. This type of adjustment in the cell addresses is called a relative cell copy.

Another way to think of what is happening when performing a relative cell copy is to view a cell reference in a formula as a distance specification. If cell G18 contains the formula =(0.07*E13), then E13 specifies a distance from G18. The distance between G18, which contains the formula, and the referenced cell E13, is left two columns and up five rows. If cell G18 is copied to cell M35, the cell reference will be adjusted so that the relative distance between the new cell (M35) and the one referenced by the formula is kept the same, or two columns to the left and five rows up. M35 will contain a formula with a reference to cell K30, two columns left and five rows up.

It is also possible, and sometimes desirable, to copy cells and not have the cell addresses be changed. This is called an absolute cell copy. You may want to perform this type of copy when you want to divide the value in a range of cells by the same value found in a single cell. For example, you would include an absolute address when copying a formula to divide all the numbers of a profit and loss statement by the gross income figure.

With an absolute cell reference defined in a formula, no matter where the cell is copied, the reference will refer to the same cell. It is as if a rubber band is linked between the cell and the one being referenced. No matter which cell the formula is copied into, it keeps the rubber band attached to the same, absolute, cell.

It is possible to copy a single cell, or to copy a group of cells. In either case the cell or cells being copied, and the cell or cells being copied into, are ranges. You learned about ranges in Chapter 9. At that time, you learned how to define a name for a range, and how to input information into the cells of the range. You also used the Goto command to select a range.

10.6 USING THE RELATIVE COPY COMMAND

Assume that the model you built in Chapter 9 represents the first year of operations of a hypothetical company. Further, assume a two percent annual growth rate. The formula to be placed into cell C3 to compute two percent annual growth can be expressed in different ways, producing the same result: =(1.02*B3) or =((0.02*B3)+B3). Now you will extend the model to show what the sales, costs, and profit will be after fifteen years of operations with an annual growth in sales of two percent.

Excel has two methods available for copying cells. You may use the Copy command to place a copy of a cell's contents into the copy buffer. This is followed by the Paste command, which recalls the information from the copy buffer and places it into the selected area of the spreadsheet. The second method you may use is the Fill command. This is a special case of the copy/paste sequence. It works only when the destination of the copy is immediately adjacent to the original cell.

What To Do	*Why You Are Doing It*
⌘G	The Goto command.
A1 [cr]	Move the cursor to the top left corner of the spreadsheet. The model you built while working in Chapter 9 should now be in view in the window.
↓ ↓ → →	Move the cursor to cell C3. The sales amount for the first period is already in cell B3.
=(1.02*B3) [ENTER]	Enter this formula into cell C3, and finish by pressing the enter key. The enter key will leave the cursor on this cell. The formula you have entered into cell C3 represents 2 percent growth from cell B3 to cell C3. Since cell B3 contains the value 100, cell C3 should now contain the value 102.

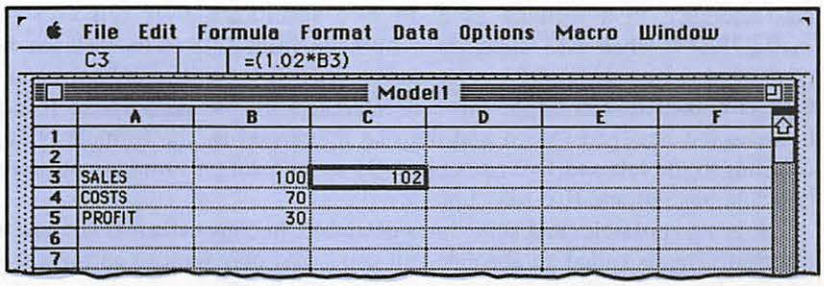


Figure 10.17
The formula you entered into cell C3 is displayed on the edit line above the current worksheet window.

Place the cursor over cell C3.	You are going to copy this cell into cells D3 through and including P3. For this first row you will use the Fill command.
Press and hold the mouse button.	Begin the cell selection process.
Drag the mouse right until you have reached cell P3.	Select the range into which you want to copy the formula. When the cursor reaches the right edge of the window, the window will scroll. The edit line, just below the menu bar, will read "1Rx14C" indicating the size of the selected range.

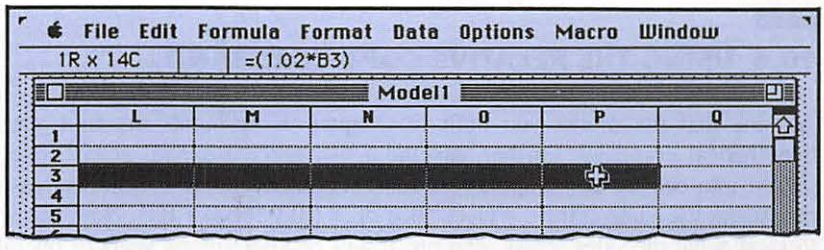


Figure 10.18
The edit line indicates that one row by fourteen columns have been selected.

Release the mouse button.	Complete the selection. Note that the edit line shows that the current cell is C3. This is the anchor cell of the range, and the presently outlined cell, even though it is out of the window to the left.
Pull down the Edit menu.	The Fill command is on the Edit menu.

Drag the mouse down to select Fill Right.

Since you have a cell that you want to copy into a row, you must fill to the right. Note that this command may be accessed by the ⌘R key. If you had a cell that you wanted to copy into a column, you would use the fill down command, or ⌘D.



Figure 10.19
The Fill Right command has been selected.

Release the mouse button.

Execute the Fill Right command. When you release the mouse button, the cells of row 3 will be filled with numbers. You can see that they are increasing in value.

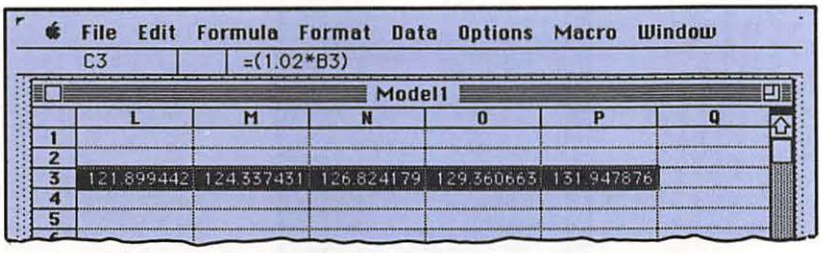


Figure 10.20
The row has been filled.

→

The right arrow key will de-select the row, and move the cursor right to cell D3. Look at the formula displayed in this cell. It reads =(1.02*C3). The B3 of the cell being copied was adjusted to become C3. If you move the cursor to the right along row 3, you will see that the cell reference in the formula has been adjusted in each cell.

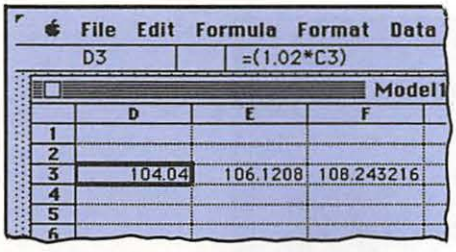
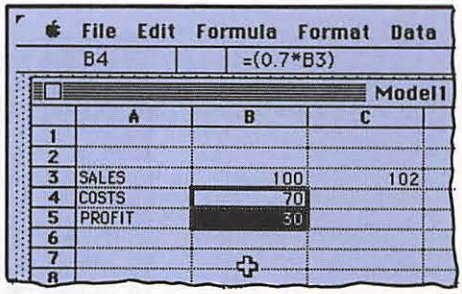


Figure 10.21
The adjusted formula is now in cell D3.

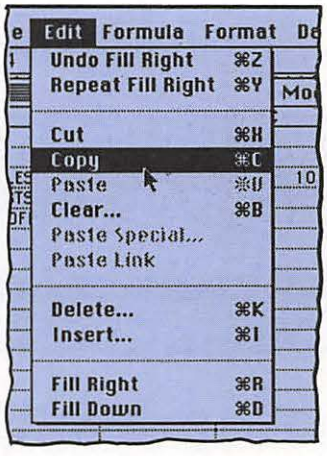
⌘←	Return the cursor to the A column.
Use the mouse to select cells B4 and B5.	You are now going to copy both cell B4 and cell B5.

Figure 10.22
Both cells B4 and B5 are to be copied.



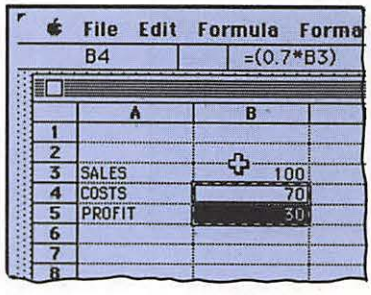
Pull down the Edit menu.	Before using the Fill command to copy these cells, you are going to try the Copy and Paste commands.
Drag the mouse down to the Copy command.	You are going to copy the two selected cells. As with most other Macintosh applications, the ⌘C key will execute the Copy command.

Figure 10.23
The Copy command has been selected on the Edit menu.



Release the mouse button.	When you release the mouse button, the two cells are copied into the copy buffer. The border around the selected cells will turn into a moving line of dashes.

Figure 10.24
The border around the cells in the copy buffer becomes moving dashes.



→ → →	Move the cursor to cell E4. Now that you have the desired cells in the copy buffer, you must reposition the cursor. You want to place the copies into cell E4.
Pull down the Edit menu.	The Paste command is on the Edit menu.
Drag the mouse down to the Paste command.	The Paste command will take the information in the cut/copy buffer and place it at the current cursor location. It may be accessed by using the ⌘V key.
Release the mouse button.	Paste the two cells into the spreadsheet. Since two cells cannot fit into one, the second one spills down into the next cell.

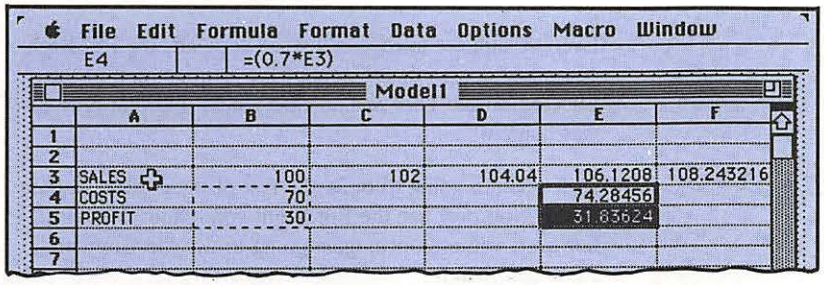


Figure 10.25
The information has been pasted into the destination cells.

The Fill Right command will let you copy the contents of a cell only to a cell that is immediately to its right. You cannot skip a cell as you did in this example.

Place the plus cursor on cell E4.	You are now going to try filling backwards, from E4 to C4.
Press and hold the mouse button.	Begin the selection process.
Drag the cursor left and down to cell C5, then release the mouse button.	You are going to try filling into these cells. Cell E4 is the anchor cell, and its contents show on the edit line above the window.

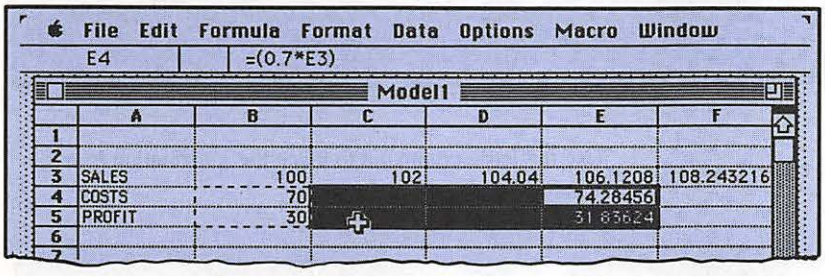


Figure 10.26
You are going to try to fill from cells E4 and E5 backwards to C4 and C5.

⌘R

Execute the Fill Right command. All the selected cells will become blank.

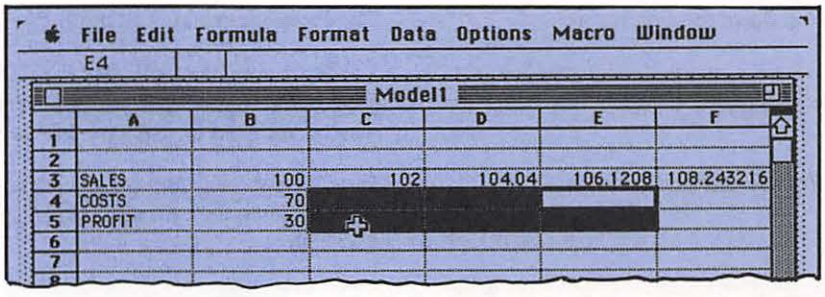


Figure 10.27
After you execute the Fill Right, all the cells in the selected range will be empty.

Even though the anchor cell was occupied, the Fill Right command copies the content of the leftmost cell of the selected range. This was an empty cell, and that is what was copied!

Select cells B4 and B5.

Now you are going to build the rest of the model. In the future, you may use the Fill Right command. This time, however, you are once again going to use the Copy and Paste commands.

⌘C

Use the Copy key instead of the menu. The two cells are now in the cut/copy buffer.

Select cells C4 through P5.

These cells represent the destination of the copy, where you want to paste what is in the cut/copy buffer.

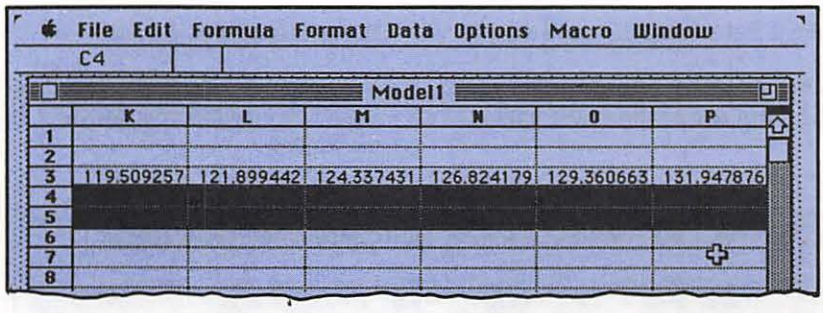


Figure 10.28
Part of the selected destination of the copy/paste process.

⌘V

Use the Paste command to place the information into the selected range.

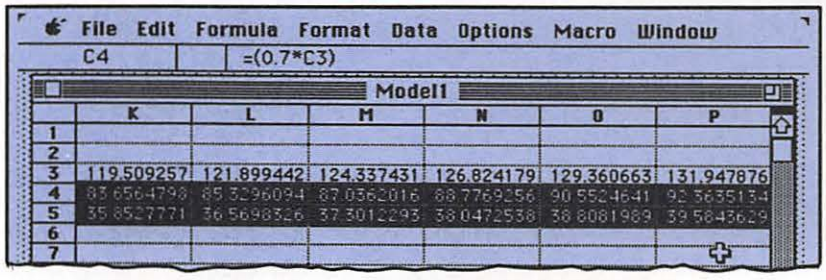


Figure 10.29
The right portion of the spreadsheet you are creating is now filled.

⌘←

Return the cursor to cell A4.

Pull down the File menu, select Save As and release the mouse button.

The Save As command will let you change the name of the spreadsheet as you save it.

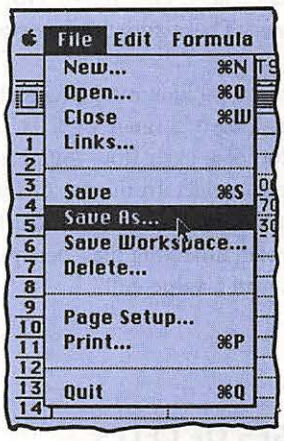


Figure 10.30
The Save As command has been selected.

When you release the mouse, you will see the Save As dialog box.

Model2

Save this modified version of the original model with the name Model2. It is always a good idea to save your work periodically, especially after you have made major changes, such as the ones you just made. If something now happens to crash your computer, you will not have to re-create the work just entered. By changing the name periodically, you can create a history of the development of your model.

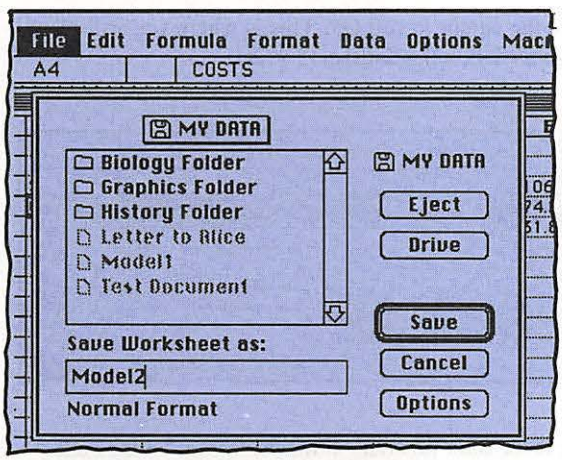


Figure 10.31
The spreadsheet name is being changed to Model2. Using this command, you may also change the disk or folder where the spreadsheet is placed.

Click on the Save button.

Complete the save process. Since the Save button has a double outline, you may press the Return key to execute this command.

10.7 BUILT-IN FUNCTIONS

In addition to the cell copy procedure, there are other features of spreadsheet programs designed to help building models an easier task. One major group includes a variety of special computational and conditional functions. These functions perform tasks on a range of the spreadsheet cells.

The functions available to you include mathematical operations, such as summing a range of cells or giving you the average value of a range of cells. They include financial functions, such as computing the net present value of a cash flow found in several cells. They include conditional functions which let the program select from two different computations or values based on a criteria you specify. They even include some statistical functions, such as the standard deviation of a range of cells. These special functions may occupy a cell by themselves or be included as part of an arithmetic expression in a value cell.

10.8 SUMMING RANGES OF CELLS

Possibly the most frequently used built-in spreadsheet function is the one that sums the values in a range of cells. The function used to add the values in a range of cells is the SUM function. It is used to replace a formula such as

(D5 + D6 + D7 + D8 + D9 + D10 + D11 + D12 + D13 + D14 + D15 + D16 + D17).

What To Do	*Why You Are Doing It*
⌘→	This will move the cursor to cell P4 and scroll the window for you at the same time. You are performing the same function as ⌘←, but in the opposite direction.
→ ↑	Move the cursor to cell Q3. This is where you will place the sum of the sales for the 15 years.

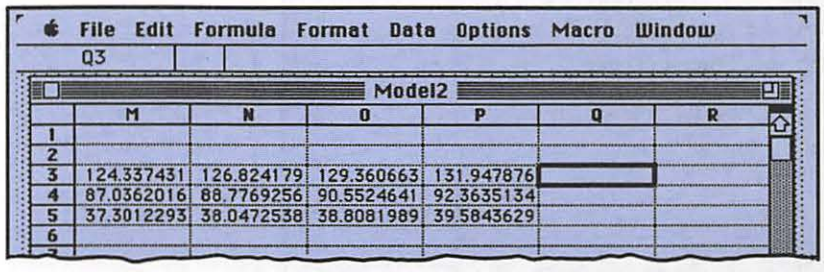


Figure 10.32
The cursor is in cell Q3. This is where you will put the next formula.

=SUM(B3:P3)	This is the Sum function. It means to sum all the cells listed inside the parentheses. In our case we have specified a range so that all the cells between and including B3 to P3, a fifteen-cell portion of the third row of the spreadsheet, will be included in the sum.

You should notice two things in the formula you are entering. First, is the colon which separates the two cell addresses. The colon is how you can identify a range. Ranges are entered by specifying the top left cell, a colon, and the bottom right cell of the range. The range from A5 down to D12 would appear as A5:D12. Next, you can see that no spaces are entered in the function. There are none between the word SUM and the left parenthesis, and none inside the parentheses. If you put spaces after the word SUM and before the left parenthesis, Excel will give you an error message. The other spaces it will remove when the formula is entered into the cell.

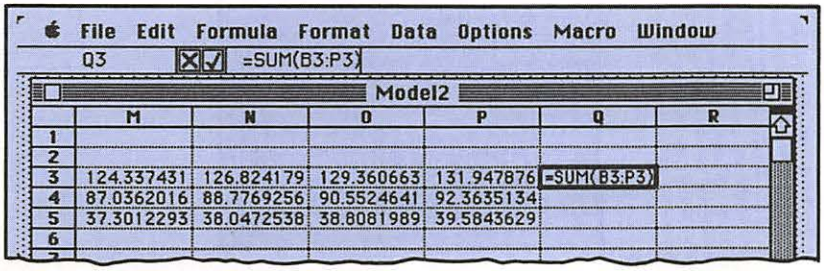


Figure 10.33
The formula and cell before the Enter key is pressed.

[ENTER] Enter the formula into cell Q3. The sum will appear. The cursor will remain in cell Q3.

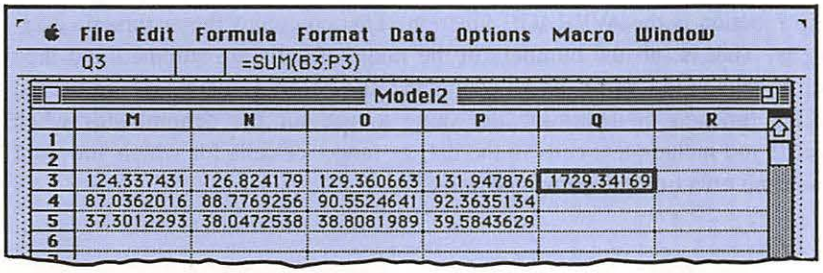


Figure 10.34
The formula has been entered into cell Q3.

[SHIFT] Hold down the shift key on the computer's keyboard for the next action.

↓ ↓ By holding down the shift key you are anchoring the cursor in its current cell. Pressing an arrow key then lets you select a range. You have done this same task by using the mouse.

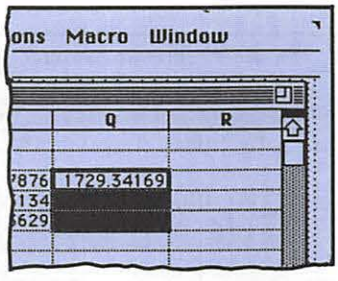
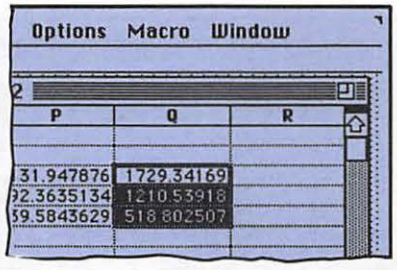


Figure 10.35
Cells Q3, Q4 and Q5 are a selected range.

⌘D	This is the Fill Down command. It may be found on the Edit menu, below the Fill Right command.
	The two sums will be calculated and placed in cells Q4 and Q5. If you look at the formulas now in these two cells you will see that you have just executed a relative copy. The formulas now reflect rows four and five, rather than the original row three.

Figure 10.36
The results of the Fill Down command. Cells Q4 and Q5 now have values in them.

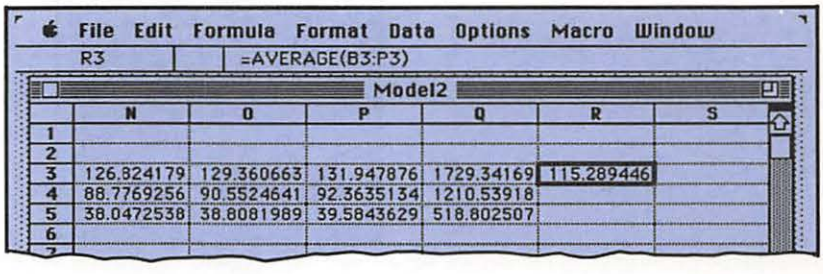


10.9 AVERAGING A RANGE OF CELLS

Another useful built-in function is the AVERAGE function. This computes the arithmetic average of the range of cells. That is, all the numbers in the range of cells are summed and then divided by the number of cells in the range. Excel counts the number of numeric cells in the list of cells specified in the function to determine the value to use for the denominator when computing the average. If you include text cells in the list, or range, of cells for which you want an average they will have no effect on the computed value!

What To Do	*Why You Are Doing It*
→	Move the cursor right to cell R3.
=AVERAGE(B3:P3)	This is the Average function. It is averaging all the cells between and including B3 through P3.
[ENTER]	Enter the function into cell R3. The average of the 15 numbers will appear.

Figure 10.37
The average of the 15 sales figures is computed in cell R3.



[SHIFT]	Hold down the shift key on the computer's keyboard.
↓ ↓	Select the cells R3, R4 and R5.
⌘D	Execute the Fill Down command.

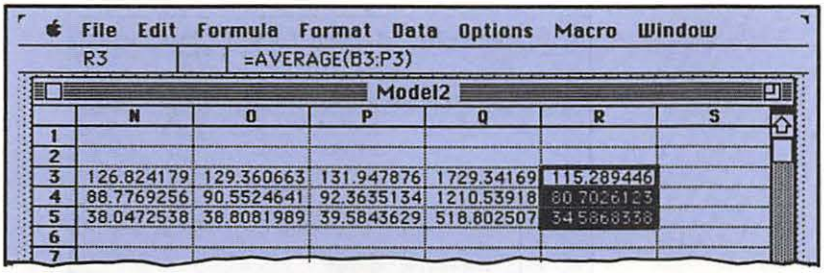


Figure 10.38
The results of the Fill Down command. Cells R4 and R5 now have values in them.

A useful bit of information is the moving average. This takes several periods of numeric information and gives an average. The next value in the list of moving averages drops the first value from the ones being averaged, and adds a new number in its place at the end of the list. For instance, the first value for a three month moving average will average the values for months 1, 2 and 3. The second moving average value will average the values for months 2, 3 and 4, while the third will use months 3, 4 and 5.

Now that you know how to use the AVERAGE function, use it to add a three year moving average to the model being created.

What To Do	*Why You Are Doing It*
⌘←	Move the cursor to cell A3.
↓ ↓ ↓ ↓	Move the cursor to cell A7.
3 YEAR MOVING AVERAGE [ENTER]	Label this line of the spreadsheet. Even though a number starts this cell, since you are mixing it with text Excel will treat is as a label cell. You can see that this text is significantly larger than the width of the A column. Excel will let text overflow into the adjacent cells as long as these cells are empty.

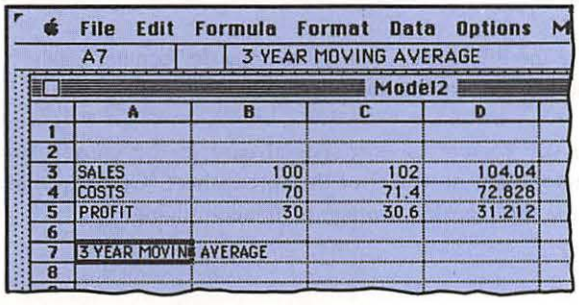
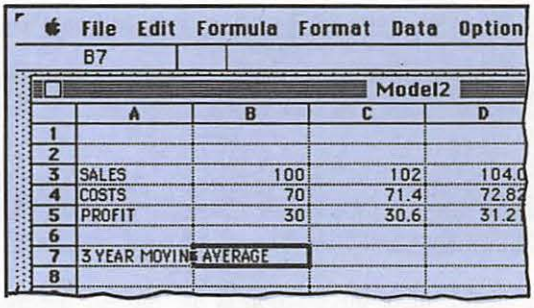


Figure 10.39
The text has overflowed into the B column.

→

Move the cursor right one cell to B7. Notice that while text is currently displayed in the cell, the cell itself is empty. You can tell this by looking at the left end of the edit line which shows that the cursor is placed in cell B7, but that nothing is in the cell at present.

Figure 10.40
The cell B7 is empty. The text is overflowing from cell A7.



→ →

Place the cursor in cell D7.

=AVERAGE(B3:D3)

The cell formula will give an average of the first three years of sales.

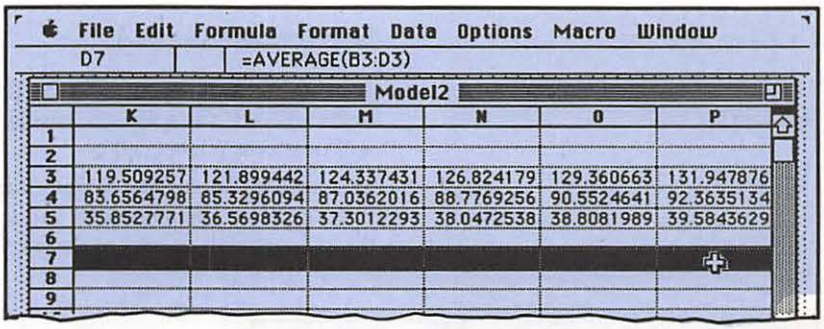
[ENTER]

Enter the formula into the cell.

Use the mouse to select the range D7 through P7.

Put the mouse on cell D7, press and hold the mouse button, and drag the mouse to cell P7 before releasing the button. You can tell that cell D7 is the anchor at the left end of the range since it appears as the anchor address on the edit line above the worksheet window.

Figure 10.41
The range D7 through P7 is selected. You can see that D7 anchors the range, since that address appears on the edit line.



⌘R

Use the Fill Right command to copy the formula for the moving average into the selected range of cells.

After the Fill Right command, which you remember is a special case of the copy/paste procedure, has been executed, move the cursor right on row 7 of the spreadsheet. Confirm that the formula has properly adjusted and that the three period average is indeed moving.

10.10 COUNTING THE NUMBER OF ENTRIES IN A RANGE OF CELLS

At times you may need to know the number of non-blank entries in a range or list of cells. The average function you just used does this. If you are creating your own statistical function, you may need to be able to do the same. The COUNT built-in function does this for you.

What To Do	*Why You Are Doing It*
⌘→	Move the cursor to cell P7.
→ → → → → ↑ ↑ ↑ ↑	Move the cursor to cell U3.
=COUNT(B3:T3)	This is the Count function.
[ENTER]	Enter the function into cell U3. The number 17, representing the number of numeric cells between and including cells B3 and T3, should appear.

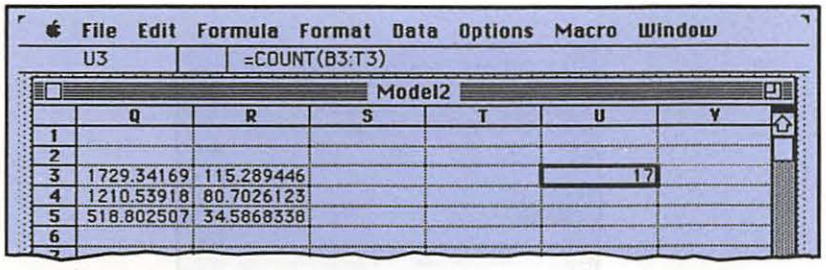


Figure 10.42
The Count function has found 17 cells in the range that contain numeric values.

← 1 [ENTER]	Put a value into cell T3, which is inside the range being counted. The count displayed in cell U3 should change to 18 because you have changed a blank cell into a non-blank numeric cell.
WORDS [ENTER]	Enter text into the cell. The count displayed in cell U3 should return to 17. The Excel Count function counts only numeric cells in the specified range. Text cells are not included in this count.

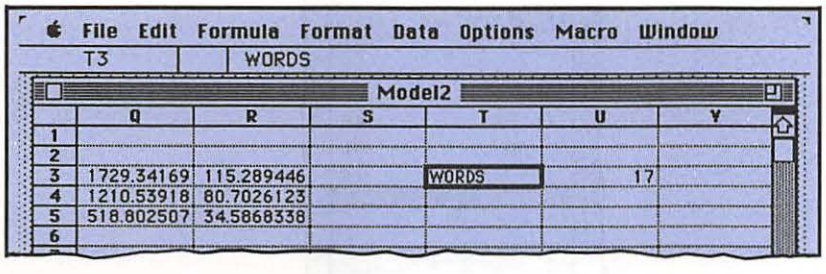


Figure 10.43
The text cell T3 does not affect the value of the COUNT function in U3.

10.11 CLEARING A RANGE OF CELLS

You now have information in cell T3 that is not desirable. Let us see how to correctly remove the contents of a cell.

What To Do	*Why You Are Doing It*
↓	Move the cursor down to cell T4.
[SpaceBar][SpaceBar]...[ENTER]	Press the space bar at least 25 times before you press the enter key.
↑	Return the cursor to cell T3. Note that the gridline between cells T4 and U4 is now missing (Figure 10.44). The space characters you have entered into cell T4 take up space, and are overflowing into cell U4. By this, it is safe to surmise that the space character will not clear the contents of a cell! Using the space simply places a space character into the cell.

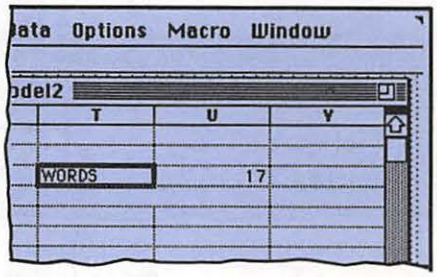


Figure 10.44
The space characters are overflowing into the neighboring cell.

[SHIFT]-↓	Select cells T3 and T4. You now want to remove the contents of both of these cells.
Pull down the Edit menu.	This menu has the Clear command.
Drag the mouse down to select the Clear command.	The Clear command, which may be accessed with ⌘B, will remove the contents of a cell. You will see that it can also remove formatting from numeric cells.

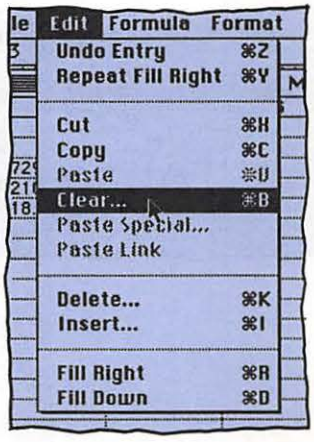


Figure 10.45
The Clear command has been selected.

Release the mouse button.	Execute the Clear command. You will now see the Clear dialog box.
Click on the All button.	You want to erase everything from the cells.
Click on OK.	Clear the two cells. The text in cell T3 and all the spaces in cell T4 are removed.

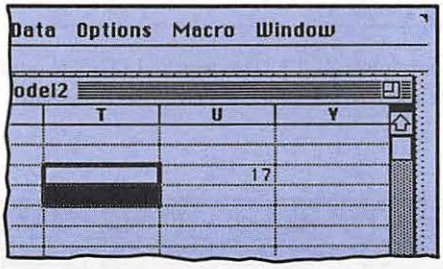


Figure 10.46
The cells have been erased.

10.12 A CONDITIONAL ACTION FUNCTION

It is not uncommon to want to have the spreadsheet perform one set of actions if one particular situation is true, and another set of actions if the situation is false. For example, you may want the word "PROFIT" displayed when the bottom line of the company's Profit and Loss statement is positive, and the word "LOSS" displayed if this figure is negative. You may want one set of calculations performed if the value in a particular cell is greater than that in another cell, and a different set of calculations performed if this is not the case. This selection of actions is done with the IF built-in function.

What To Do	*Why You Are Doing It*
Click the plus sign cursor on cell T3.	You want to enter a formula in this cell. This will de-select any other cells of the spreadsheet.
=IF(R3<120,"LOW","OK")	This is the IF function. It has three parts.

The first part, in this case R3<120, is a condition to be tested. In the example the test will tell us if the contents of cell R3 is less than the constant 120. You can specify another cell or enter a formula for either side of the comparison operator. In addition, you may use other comparison operators. There are six of these operators, called Boolean Operators:

=	equal to
<>	not equal to
<	less than
<=	less than or equal to
>	greater than
>=	greater than or equal to

The second part of the function, "LOW" in the example, is the action that the function will take if the condition being tested is true. This particular action is to display the word "LOW" in the current cell if the content of cell R3 is indeed less than 120. The action may also be a formula or other arithmetic expression. You are not limited to text.

The last part of the function, "OK" in the example, is the action that the function will take if the condition being tested is false. This particular action is to display the word "OK" in the current cell if the contents of cell R3 are greater than or equal to 120 (the opposite of less than is greater than or equal to). Like the action taken for the true value, this action may also be a formula or other arithmetic expression. You are not limited to text.

What To Do	*Why You Are Doing It*
[ENTER]	Enter the function into cell T3. The word "LOW" should appear, because the current value of cell R3 is less than 120.

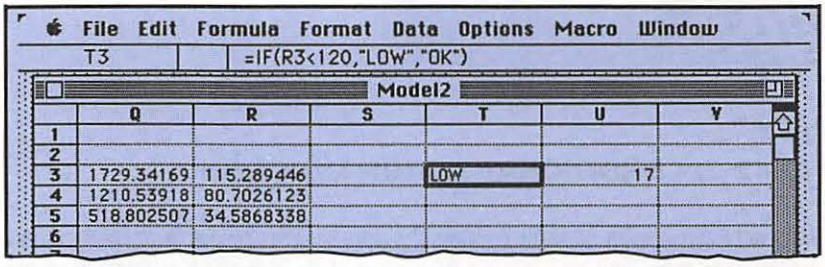


Figure 10.47
The If function has been entered into cell T3.

⌘G	The Goto command.
B3 [cr]	Jump the cursor to cell B3. This cell contains the initial year's sales value. All the following years grow from this base.
120 [ENTER]	Change the starting year's sales to 120. The average of the 15 years sales will now be greater than the 120 used in the IF function entered in cell T3.
⌘G	The Goto command.
T3 [cr]	Jump the cursor to cell T3. The 15 year average is now 138.347335, and cell T3 displays OK, rather than LOW.

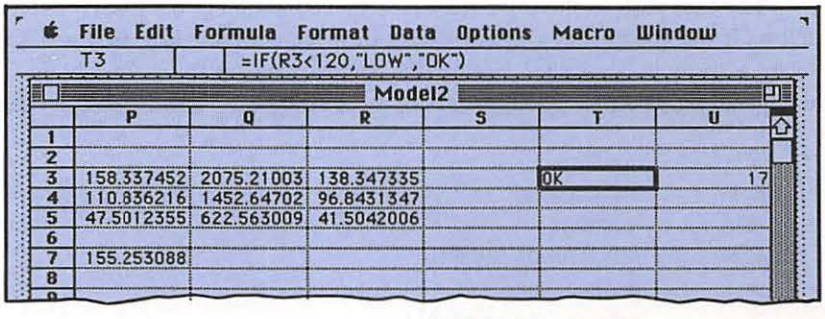


Figure 10.48
The If function now displays OK, since the value in cell R3 is greater than 120.

10.13 LOOKUP TABLES

Lookup tables are very useful when the formula for a value you may need is not easily determined or is derived from a series of IF-type comparisons. You can place the potential values into a table of numbers and let the computer locate the particular one it needs when it needs it.

An example of a lookup table is the tax table that comes with your Federal Income Tax forms. At the end of all your calculations, you have a value for taxable income. You then select the appropriate table (single, married, etc.), and find the range of values in the left column of the table between which your taxable income falls. Next you follow across the row you have located to the number of exemptions you have claimed. When you stop, you have looked up your tax. All you then need to do is compute the amount of additional tax, based on some percent, on the amount over the bottom number you found at the left column of the tax table.

Let us change the initial assumption regarding this company's growth rate to take advantage of lookup tables. Rather than fixing the growth at two percent per year, we will base growth upon total sales at the end of the year. Here are the new growth rate rules we will use:

- If sales are greater than or equal to 80, and less than 90, the growth in the following period will be projected to be 3 percent.
- If sales are greater than or equal to 90, and less than 100, the growth in the following period will be projected to be 5 percent.
- If sales are greater than or equal to 100, and less than 110, the growth in the following period will be projected to be 9 percent.
- If sales are greater than or equal to 110, and less than 120, the growth in the following period will be projected to be 7 percent.
- If sales are greater than or equal to 120, the growth in the following period will be projected to be 5 percent.

Notice that this set of rules does not provide for the instance of sales less than 80. In effect, the rules imply that a sales volume less than 80 is not allowed. You will see that the EXCEL lookup function handles this case by displaying an error message. We will have to add a rule that states:

- If sales are greater than or equal to 0, and less than 80, the growth in the following period will be projected to be 2 percent.

These six rules can be combined into one multi-nested IF function. For example, it might appear in cell C3 of the current spreadsheet as follows:

```
=(B3+(B3*(IF(B3<90,IF(B3>=80,0.03,0.02),IF(B3<100,0.05,
        IF(B3<110,0.09,IF(B3<120,0.07,0.05)))))))
```

Fortunately the table of rules we are using is small, and you can fit the complete formula into the cell. However, the fact that you can fit the nested IF functions into a cell does not mean that it is easy to read and interpret rapidly. The way the function in this cell was entered will also require time to edit in the event you decide to make a change to one of the assumed growth rates. Additionally, this formula appears in 14 cells of the spreadsheet, each one of which must be edited!

One way to simplify the potential editing problem posed by the previous formula is to place the growth rate percents into cells of the spreadsheet and use these cell names in the formula. Thus, when a growth rate percent changes, you will have to make only one change to the single cell containing the particular growth rate. Since the formula contains the cell reference rather than a numeric constant, the values in the cell will automatically be updated by the change in the growth rate cell.

If the growth rate percents are placed into row 10 of the spreadsheet starting with column C, the above formula will look like this:

```
=(B3+(B3*(IF(B3<90,IF(B3>=80,+D10,+C10),IF(B3<100,+E10,
    IF(B3<110,+F10,IF(B3<120,+G10,+H10)))))))
```

It is now easier to make changes to the growth rates, but it is no less difficult to read.

But what if you decide to refine the information in this table? Rather than looking at ranges of sales that are ten units apart, you may want to look at ranges that are two units apart. Additionally, rather than looking at a total range that starts with potential sales of 80 and deals with specific values to 120, you may want to start with 60 and look at values as high as 140. You will then need 42 rules similar to the six just stated! The six rules required 100 characters for the desired formula. Nesting the IF functions to complete 42 rules would require more characters than you can put into a cell (the limit to the number of characters a cell can hold is 255, regardless of whether it is text, a formula, or a numeric constant).

This is the purpose of the lookup function. This function lets you perform multiple IF comparisons with a single function that is easy to read and understand.

10.14 THE LOOKUP FUNCTIONS

There are three lookup functions available in Excel, HLOOKUP, VLOOKUP and LOOKUP. They operate in essentially the same fashion. The difference is how the table is laid out in the spreadsheet, horizontally (HLOOKUP) or vertically (VLOOKUP). If the values being looked through (the range of taxable values in the example given earlier) are not adjacent to the results table, then the LOOKUP function is used. In any of the cases, the table looked into may be several rows deep or columns wide.

The functions make use of IF rules similar to the ones written out previously. HLOOKUP searches the top row of a range until it finds a cell containing a value greater than a specified value. It then moves back one cell, selecting the column with the cell whose value is the highest number in the range less than or equal to the specified value. It then looks down the rows of the range to pick a particular value to display.

The VLOOKUP function searches the left column of a range rather than the top row. It then operates in the same fashion as the HLOOKUP function.

The LOOKUP function decides whether to look in the top row or left column based on the shape of the lookup table.

In order to use one of the lookup functions, you must have a table of values for it to look into. You will start this next section by building the necessary table for the HLOOKUP function to use.

What To Do	*Why You Are Doing It*
⌘G	The Goto command.
A1 [cr]	Move the cursor to the top left corner of the spreadsheet.
Move the mouse pointer to cell D14 and press and hold the mouse button.	Move the spreadsheet cursor to cell D14. This is the beginning of the input range for the lookup table you are going to build.
Drag the cursor to cell H15 and release the mouse button.	This is the range of cells that will hold the initial lookup table. The outlined cell should still be cell D14.

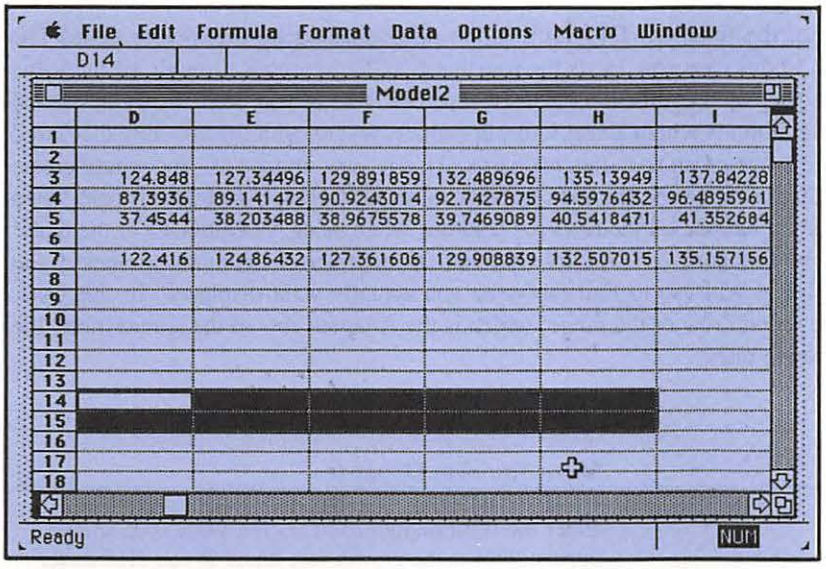


Figure 10.49
This is the range into which you will put the lookup table.

80 [ENTER] 90 [ENTER] 100 [ENTER] 110 [ENTER] 120 [ENTER]	This is the top row of the table. These values represent the sales levels. By pressing the enter key, rather than the return key, the cursor will move across the selected row, rather than down the column. When you finish these numbers, the cursor should be in cell D15.
0.03 [ENTER] 0.05 [ENTER] 0.09 [ENTER] 0.07 [ENTER] 0.05 [ENTER]	These are the percentage growth rates. The HLOOKUP function will be used to locate a sales level value in the first row of the table (D14:H14), and then it will use the value found directly below it in the table.

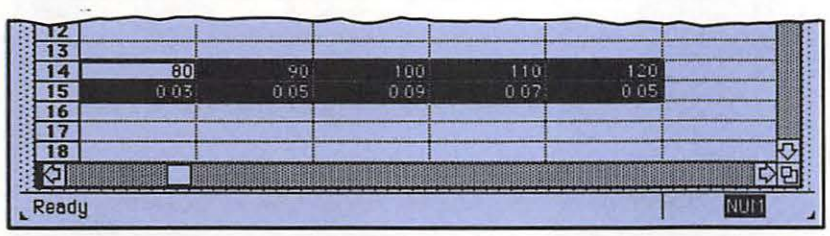


Figure 10.50
The completed lookup table.

⌘←	Move the cursor to the A column.
↑ ↑ ↑ ↑ ↑	Move the cursor to cell A9.
GROWTH RATE [ENTER]	Label this row of the spreadsheet.
→ →	Move the cursor to cell C9. This is where you will enter the first HLOOKUP function.
=HLOOKUP(B3,D14:H15,2)	This is the HLookup function. It has three parts.

The first part, B3, specifies the cell containing the value being looked for in the table. You can specify a constant, such as 45 or 19745.04; a cell, such as F9 or I18; or enter a formula, such as ((L15*J45)/C12).

The second part of the function, D14:H15, is the range making up the lookup table. The first row of the range, in this case row 14, is the row that EXCEL searches through for the value specified in the first part of the function, in this case cell B3. If you were using a vertical lookup, then the first column is where Excel looks up values, just as with the tax table discussed earlier. Notice that the range given specifies two rows. This is very important. You would create an error if you specified a range for the lookup table to be D14:H14. Always take care when entering the table range to include all the rows (or columns when using VLOOKUP) of the table!

The last part of the function, 2, is the row number of the range (or column number if you are using VLookup) Excel will use to find the value you actually want displayed. In this case, you are specifying the second row of the range, which is the fifteenth row of the spreadsheet, the row containing the growth rates.

What To Do	*Why You Are Doing It*
[ENTER]	Enter the function into cell C9. The value 0.05 should appear. This is the growth rate found in cell H15 under the sales value of 120.

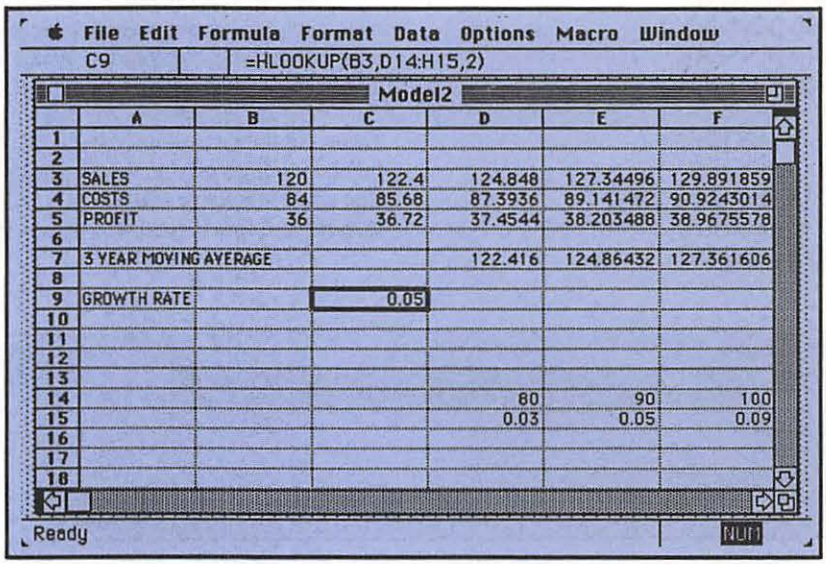


Figure 10.51
The HLOOKUP has been entered into the spreadsheet. It immediately locates the desired growth rate based on the current sales value in cell B3.

Move the mouse pointer to cell B3 and click the mouse button.	Move the cursor to cell B3. This cell contains the value being looked up in cell C9.

105 [ENTER]

Enter a new value into cell B3. The value displayed in cell C9 should now change to 0.09. The value 105 matches the rule "greater than or equal to 100, and less than 110". Thus the HLOOKUP stops at the 100 value and goes down to the row specified to use the value 0.09.

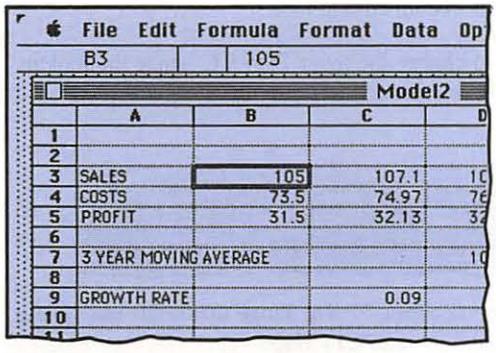


Figure 10.52
The value displayed in cell C9 has changed.

75 [ENTER]

Enter a value that is smaller than the first value of the lookup table's sales values.

Excel displays #N/A in cell C9. The value being looked for is to the left of the lookup table, or outside the range. The lookup function does not have a numeric response for cases similar to this.

Move the mouse pointer to cell C14 and click the mouse button once.

Move the cursor to cell C14.

0 [cr]

Add a new value to the left of the table you created earlier. The cursor should move to cell C15.

0.02 [ENTER]

Enter the growth percent for sales values in the range "greater than or equal to 0 and less than 80."

Cell C9 continues to display the #N/A message.

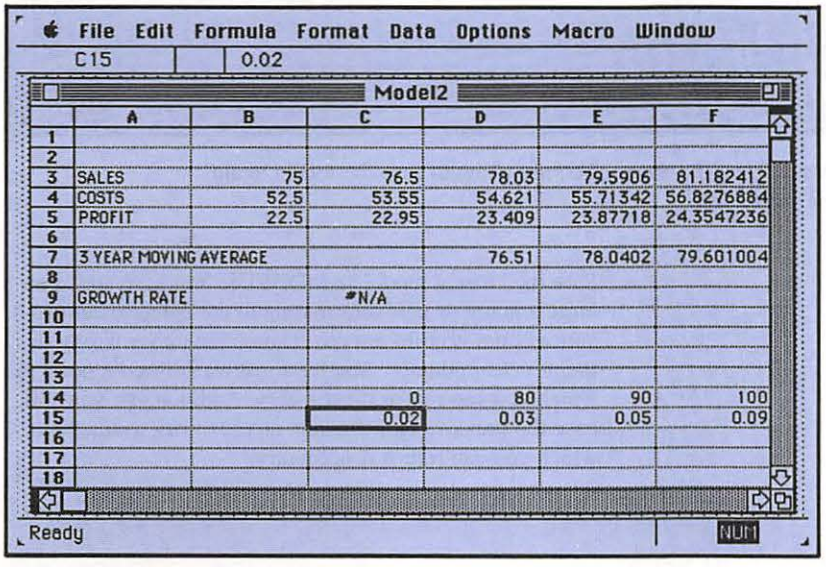


Figure 10.53
The Not Available error message is still displayed in cell C9.

The error message will remain in C9 until you edit the formula there to include column C in the lookup table.

↑ ↑ ↑ ↑ ↑ ↑

Move the cursor to cell C9. The formula is displayed on the edit line above the worksheet window.

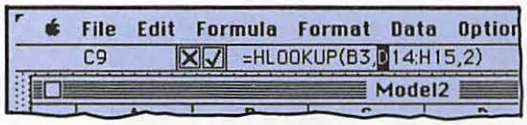
Move the mouse pointer over the formula on the edit line.

When you move the mouse pointer to the edit line, it will turn into an I-beam editing tool.

Select the D which starts the range definition.

You need to change the letter D to a C, since the lookup table has been extended left into the C column.

Figure 10.54
The D has been selected. It will be replaced with a C.



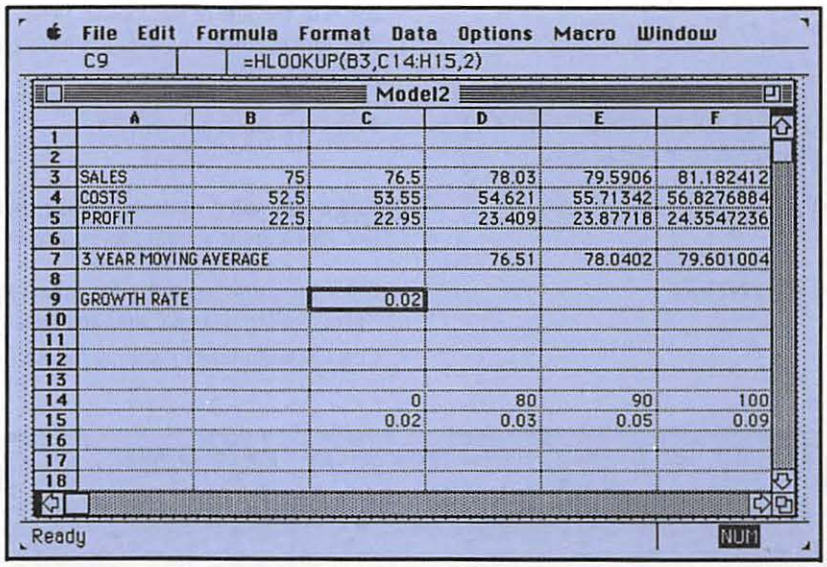
C

Replace the D with a C. The range that holds the lookup table should now read C14:H15.

[ENTER]

Enter the formula into the cell. Cell C9 should now display 0.02.

Figure 10.55
The edited cell now contains the correct value from the lookup table.



	A	B	C	D	E	F
1						
2						
3	SALES	75	76.5	78.03	79.5906	81.182412
4	COSTS	52.5	53.55	54.621	55.71342	56.8276884
5	PROFIT	22.5	22.95	23.409	23.87718	24.3547236
6						
7	3 YEAR MOVING AVERAGE			76.51	78.0402	79.601004
8						
9	GROWTH RATE		0.02			
10						
11						
12						
13						
14			0	80	90	100
15			0.02	0.03	0.05	0.09
16						
17						
18						

Pull down the File menu, select the Save As option, then release the mouse button.

You are going to save the model again.

MODEL3 [cr]

Save the current model as MODEL3. You have added a large amount of new information to the spreadsheet that you will not want to re-type if something goes wrong in the next few minutes. You have just established a point to which you can return if necessary. Additionally, you still have the previous two versions of your work available to which you can return if necessary.

10.15 PERFORMING AN ABSOLUTE COPY

Recall that Excel is able to perform two different types of copy, the relative copy and the absolute copy. You have already performed several relative copies. Don't forget that using the Fill Right and Fill Down commands are simply executing special cases of the copy/paste sequence. When you performed a copy/paste, Excel interpreted cell references in the cell being copied as distance specifications and adjusted them in the destination cells. The distances were kept the same.

If you now copy cell C9 to cell D9, shown on the edit line in Figure 10.56, this same thing will happen. Unfortunately, this is not desirable. Try it to see what happens:

What To Do	*Why You Are Doing It*
⌘C	Copy the cell into the copy/paste buffer.
→	Move the cursor right to cell D9.
⌘V	Paste the formula into Cell D9.

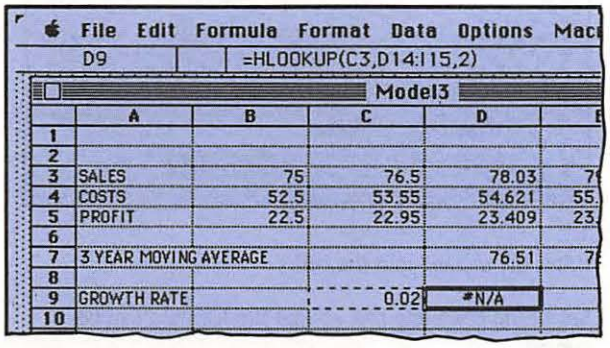


Figure 10.56
The formula has been copied into cell D9, and an error message, #N/A, is the result.

Notice that the formula in cell D9, shown on the edit line in Figure 10.56, thinks that the table being used by the lookup function is to be found in cells D14:I15. This is not the case. The lookup table has not moved from cells C14:H15 just because you copied a cell that uses it! Here, then, is a use for the absolute copy. When you copy cell C9, the first cell reference should be copied in the usual fashion, however, the table must be made into an absolute reference.

What To Do	*Why You Are Doing It*
←	Return the cursor to cell C9. You will have to make some changes to this cell before you attempt to copy it again.
Place the mouse pointer on the formula in the edit bar in front of the C specifying the beginning of the lookup table range.	You will start your edit here.

Push the mouse button down and drag the I-beam over the lookup table range specification.

You are going to replace the complete specification.



Figure 10.57
The specification of the lookup table has been selected.

$C$14:$H$15

Replace the range specification with the absolute reference. The dollar sign in front of the column name in a cell reference tells Excel to keep the column letter constant whenever the formula is copied. In a similar fashion, the dollar sign in front of the row number in a cell reference tells Excel to keep the row number constant whenever the formula is copied.

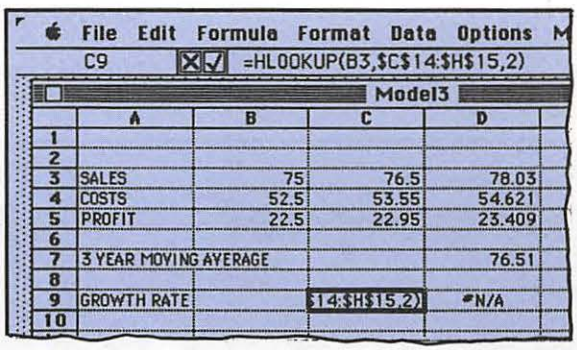


Figure 10.58
The edited cell before pressing return.

[ENTER]

Enter the change into the cell.

Select the range C9 through P9.

Select the complete row so that the formula can be copied.

⌘R

The Fill Right command.

→

De-select the row. The cursor should be in cell D9.

Note that the growth rate changes in column G from 0.02 to 0.03. This happens because the sales value in cell F3 is greater than 80!

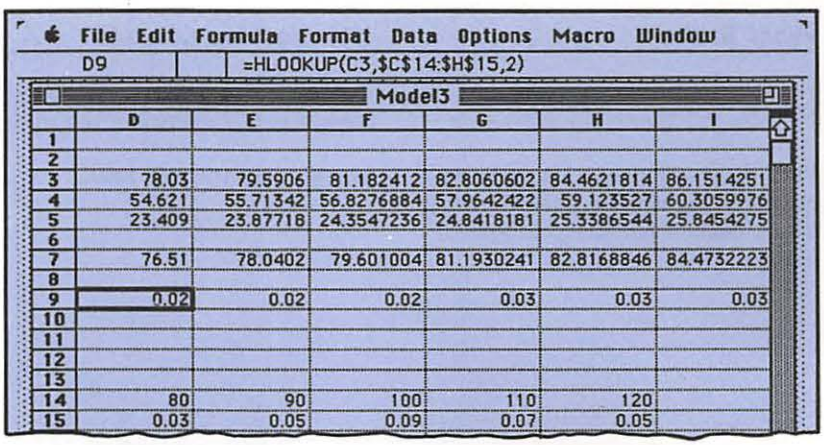
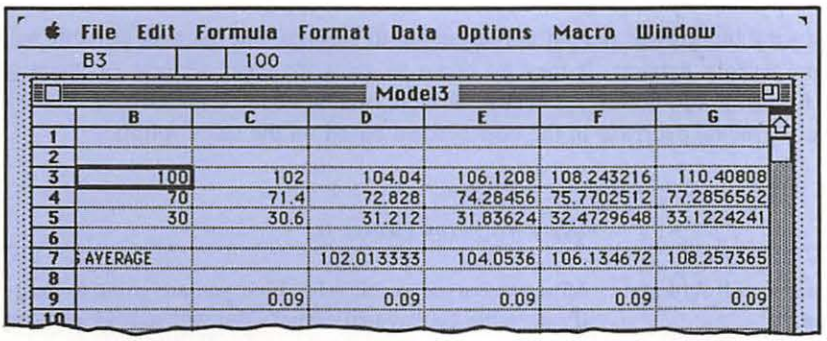


Figure 10.59
The growth rate changes in cell G9 to 0.03.

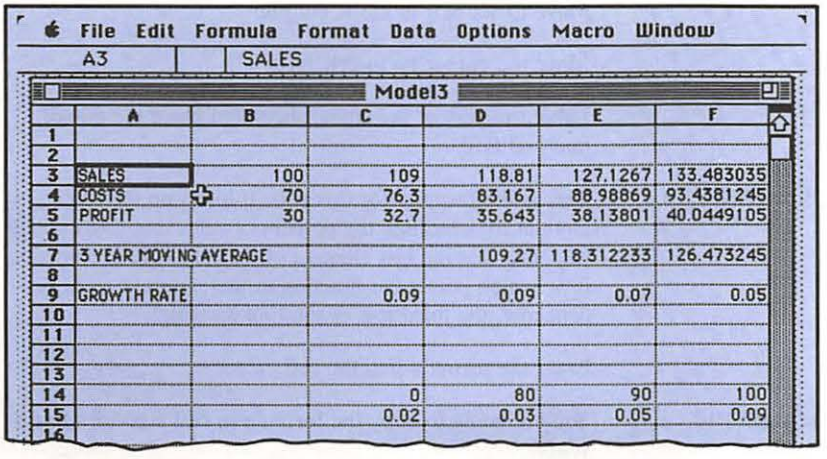
⌘G	The Goto command.
B3 [cr]	Jump the cursor to cell B3.
100 [ENTER]	Enter a new sales starting value. The growth rates shown in row 9 should change.



	B	C	D	E	F	G
1						
2						
3	100	102	104.04	106.1208	108.243216	110.40808
4	70	71.4	72.828	74.28456	75.7702512	77.2856562
5	30	30.6	31.212	31.83624	32.4729648	33.1224241
6						
7	AVERAGE		102.013333	104.0536	106.134672	108.257365
8						
9		0.09	0.09	0.09	0.09	0.09
10						

Figure 10.60
The growth rates have changed to 0.09.

→	Move the cursor to cell C3. You have not yet changed the formulas for the sales computations to take into account the new, variable growth rates.
=(B3*C9)+B3 [ENTER]	This formula will now use the growth rate found in cell C9 to compute the amount of growth, and add it to the prior period's sales to determine the current period's sales.
[SHIFT]-⌘→	You are going to copy this formula for all the years. Holding down the shift key while jumping the cursor to the right will select all the cells from C3 through R3.
[SHIFT]-←[SHIFT]-←	Press the shift-left arrow **2 times** so that the selected range ends at column P. The range is still anchored in cell C3. Remember, you can tell the anchor point by looking at the edit line.
⌘R	The Fill Right command.
→	De-select the row, placing the cursor into cell D3.
⌘←	Return the cursor to the A column.



	A	B	C	D	E	F
1						
2						
3	SALES	100	109	118.81	127.1267	133.483035
4	COSTS	70	76.3	83.167	88.98869	93.4381245
5	PROFIT	30	32.7	35.643	38.13801	40.0449105
6						
7	3 YEAR MOVING AVERAGE			109.27	118.312233	126.473245
8						
9	GROWTH RATE		0.09	0.09	0.07	0.05
10						
11						
12						
13						
14			0	80	90	100
15			0.02	0.03	0.05	0.09
16						

Figure 10.61
The current model uses the lookup table to control the growth rate.

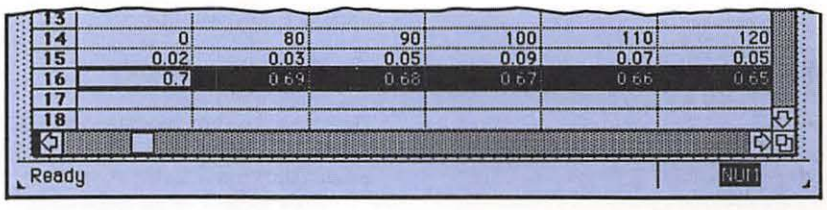
Pull down the File menu, select the Save As option, then release the mouse button.	You are going to save the model again.
MODEL4 [cr]	Save the current model as MODEL4. You have once again made major changes to the spreadsheet that you will not want to re-create.

In addition to varying the growth rate, it is reasonable to assume that the cost percent will not remain a constant seventy percent. It may go down as sales increase because of quantity discount purchases. It may go up, however, because of increased labor rates.

Let us enter a very gradual decrease in the cost percent based on the sales volume.

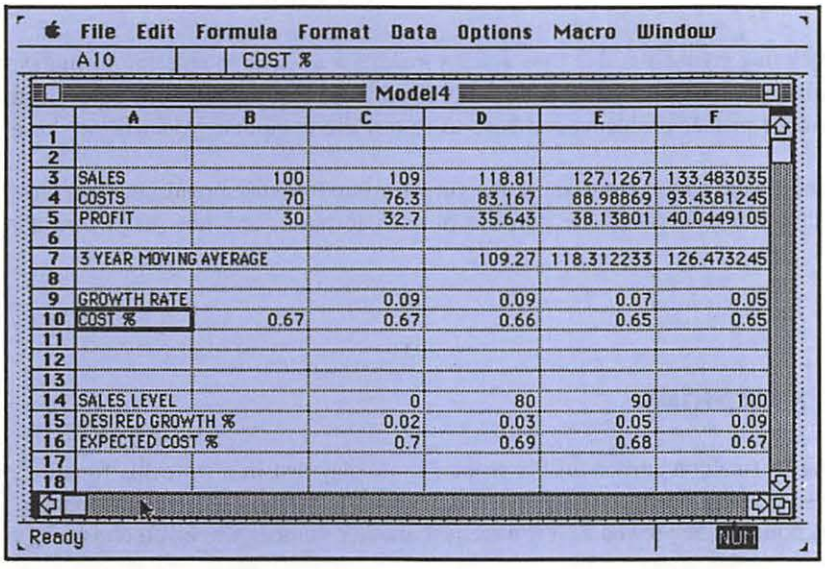
WHAT TO DO	WHY YOU ARE DOING IT
Move the mouse pointer to cell A14 and click the mouse button.	Move the cursor to cell A14. First you are going to modify the table you created earlier. You will start by entering row labels to clarify the information in the table.
SALES LEVEL [cr] DESIRED GROWTH % [cr] EXPECTED COST % [ENTER]	Enter labels to tell you what each row of the table means. These labels are NOT part of the lookup table you created. They are simply for clarification for someone looking at the spreadsheet.
Select the range C16:H16.	You are going to enter the cost percents into this row of the table.
0.70 [cr] 0.69 [cr] 0.68 [cr] 0.67 [cr] 0.66 [cr] 0.65 [cr]	Enter the expected cost percents.

Figure 10.62
The cost percents have been entered.



⌘←	Move the cursor to the A column.
↑ ↑ ↑ ↑ ↑ ↑	Move the cursor up to cell A10.
COST % →	Label this row of the spreadsheet and place the cursor into cell B10.
=HLOOKUP(B3,$C$14:$H$16,3)	This is the formula for this cell. It looks up the sales amount to determine the percent of sales that costs will be. Note that the last element of the HLOOKUP function is 3, which points the function to the expected costs percent row, the third row of the lookup table!
[ENTER]	Enter the formula into the cell.
Select the range B10 through P10.	You are going to copy the formula in cell B10 for all the years.

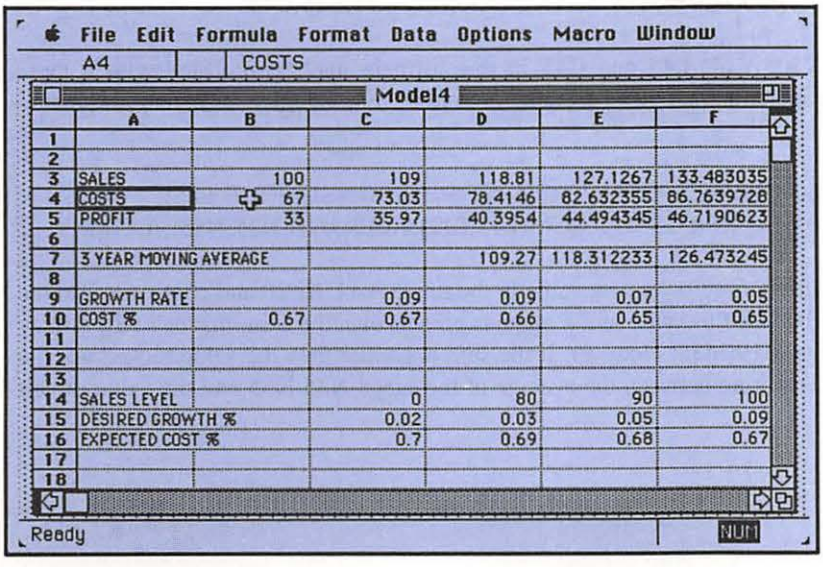
⌘R	The Fill Right command.
⌘←	De-select the row and return the cursor to the A column.



	A	B	C	D	E	F
1						
2						
3	SALES	100	109	118.81	127.1267	133.483035
4	COSTS	70	76.3	83.167	88.98869	93.4381245
5	PROFIT	30	32.7	35.643	38.13801	40.0449105
6						
7	3 YEAR MOVING AVERAGE			109.27	118.312233	126.473245
8						
9	GROWTH RATE		0.09	0.09	0.07	0.05
10	COST %	0.67	0.67	0.66	0.65	0.65
11						
12						
13						
14	SALES LEVEL		0	80	90	100
15	DESIRED GROWTH %		0.02	0.03	0.05	0.09
16	EXPECTED COST %		0.7	0.69	0.68	0.67
17						
18						

Figure 10.63
The cost percent row has been copied.

Move the mouse pointer to cell B4 and click the mouse button.	Move the cursor to cell B4. You must change the cost formula.
=(B10*B3) [ENTER]	Rather than using the constant 70 percent figure for costs, use the cost percent found in cell B10.
[SHIFT]-⌘→	You are going to copy this formula for all the years.
[SHIFT]-← [SHIFT]-←	Press the shift-left arrow **2 times** so that the selected range ends at column P.
⌘R	The Fill Right command.
⌘←	De-select the row and return the cursor to the A column.



	A	B	C	D	E	F
1						
2						
3	SALES	100	109	118.81	127.1267	133.483035
4	COSTS	67	73.03	78.4146	82.632355	86.7639728
5	PROFIT	33	35.97	40.3954	44.494345	46.7190623
6						
7	3 YEAR MOVING AVERAGE			109.27	118.312233	126.473245
8						
9	GROWTH RATE		0.09	0.09	0.07	0.05
10	COST %	0.67	0.67	0.66	0.65	0.65
11						
12						
13						
14	SALES LEVEL		0	80	90	100
15	DESIRED GROWTH %		0.02	0.03	0.05	0.09
16	EXPECTED COST %		0.7	0.69	0.68	0.67
17						
18						

Figure 10.64
The cost percent is now used by the model.

Pull down the File menu, select the Save As option, then release the mouse button.	You are going to save the model again.
MODEL5 [cr]	Save the current model as MODEL5.

In addition to protecting yourself at this time against making a mistake in entering formulas, you will soon print what you have created. It is always a good idea to save your work before you print it. If you experience printer problems and have to restart the computer, you will not have lost your work!

You may also want to take a moment to move the cursor around on the spreadsheet you have created. Make sure that you understand the purpose of each formula, and how each formula works.

10.16 NESTING FUNCTIONS

Although you used the IF function earlier in this chapter to display text in a cell, this function, and a majority of the spreadsheet built-in functions, are intended to output numeric information. Because of this, a function may be viewed as if it were just another number when you construct a formula in a cell.

This means two things—a function may be included as part of a formula and a function may be used within another function.

An example of the first situation might be a formula such as =(B4*100+@SUM (F4:F10)). Here is an example of a formula that makes use of the IF function:

```
=((M3+15)/(IF(M3=0,1,M3)))
```

As you know, dividing by zero is frowned upon. This formula will look at the value of cell M3 before it executes the division. If the value is zero, it will divide by 1. If the value is not zero, it will divide by the value found in cell M3.

Functions inside functions behave in a similar fashion. You have seen one possible example of this in the IF function shown earlier in this chapter. Here is an example that selects a value based on what is found in a lookup table:

```
IF(HLOOKUP(M18,AA1:AJ15,K10)<V14,B45,C45).
```

The cell references K10, V14, B45 and C45 in this formula may be replaced with a more extensive expression, including another function, of course! For example, you may use something such as:

```
IF(HLOOKUP(F45,AA1:AL20,COUNT(F1:F20))>SUM(B10:B35),
AVERAGE(M19:M35),IF(Q13*45>SUM(L12:S12),AVERAGE(N35:N55),AX18))
```

This extensive formula first looks up a value in the range AA1:AL20 and compares it to the sum of the range B10:B35. If this value in the range is greater than the sum, this cell will display the average of the range M19:M35. However, if the sum is greater than the value looked up, the second IF is executed, picking between the average of the range N35:N55 and the value of cell AX18.

10.17 OTHER EXCEL BUILT-IN FUNCTIONS

Excel has many more functions in addition to the ones just discussed. They are divided into several classes:

- Database Functions.
- Date and Time Functions.
- Financial Functions.
- Information Functions.
- Logical Functions.
- Lookup Functions.
- Mathematical Functions.
- Matrix Functions.
- Statistical Functions.
- Text Functions.
- Trigonometric Functions.

The scope of this text does not allow a discussion of each of these functions. However, it is worth knowing how to use these functions.

What To Do	*Why You Are Doing It*
⌘N	You are going to create a new spreadsheet. Do this so that you will not accidentally make changes to your current model. The New dialog box will appear.
Click on OK.	Since the Worksheet button is already selected, clicking on OK will create a new worksheet for us.
Pull down the Formula menu.	This menu contains two paste functions, paste name and paste function. Paste name is dimmed, since you have not created any range names in this spreadsheet.
Drag the mouse down to Paste Function.	You want to paste a function into the new spreasheet. Note that there is no command key equivalent for this operation.



Figure 10.65
The Paste Function command has been selected.

Release the mouse button.

Execute the Paste Function command. You will now see the Paste Function dialog box.

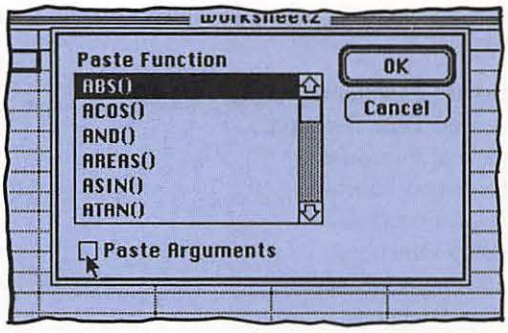


Figure 10.66
The Paste Function dialog box.

Click on the Paste Arguments check box.

By turning on this check box, Excel will place the function into the cell, and show you what information is expected by the function to make it work.

You may use the function list in two ways. You may use the scroll bar to scan the complete list of functions, or you may type a single letter to jump the list to a part of the alphabet.

I

Type the letter I. The function list will scroll to the beginning of the I's, which is the IF function.

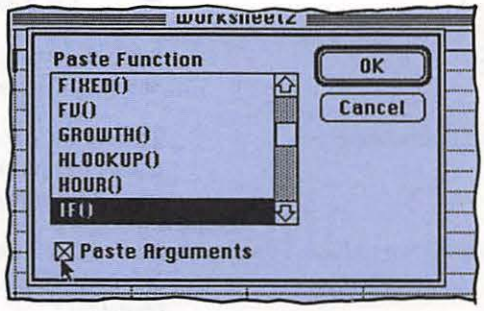


Figure 10.67
You have scrolled the function list to the beginning of the I's.

Click on OK.

Paste the IF function into the spreadsheet. Since you have checked the Paste Arguments box, you will be given a function on the edit line with its arguments filled in. You must now change the arguments to real information.

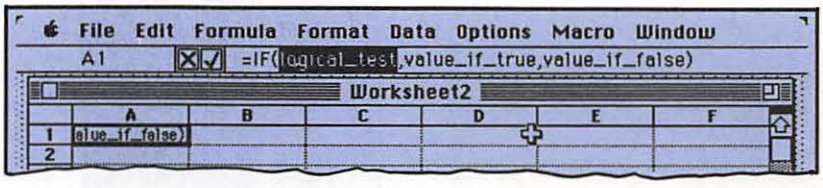


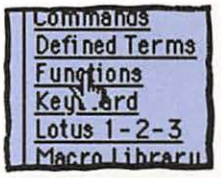
Figure 10.68
The arguments required by the IF function are displayed for you to edit.

Click on the X box on the left of the edit line.	This is the cancel entry box. You are not going to enter the function at this time.

You have access to all the Excel functions through the Paste Function command. With the Paste Argument box checked you can even get an idea of what type of information the function needs to produce the correct information for you.

You can get more information about the functions by using the Excel Help feature. You have explored this feature before, looking at help for the Commands. Now let's try getting help for a function.

Figure 10.69
The mouse pointer's index finger is pointing to Functions.



WHAT TO DO	WHY YOU ARE DOING IT
Pull down the Window menu, select the Help command then release the mouse.	Start the Help function. You will now see the initial help topics list.
Place the mouse pointer on the word Functions in the topic list and click the mouse button.	You want to get help about the Excel functions.
	After clicking the mouse, the topics list will change to a list of the Excel functions.

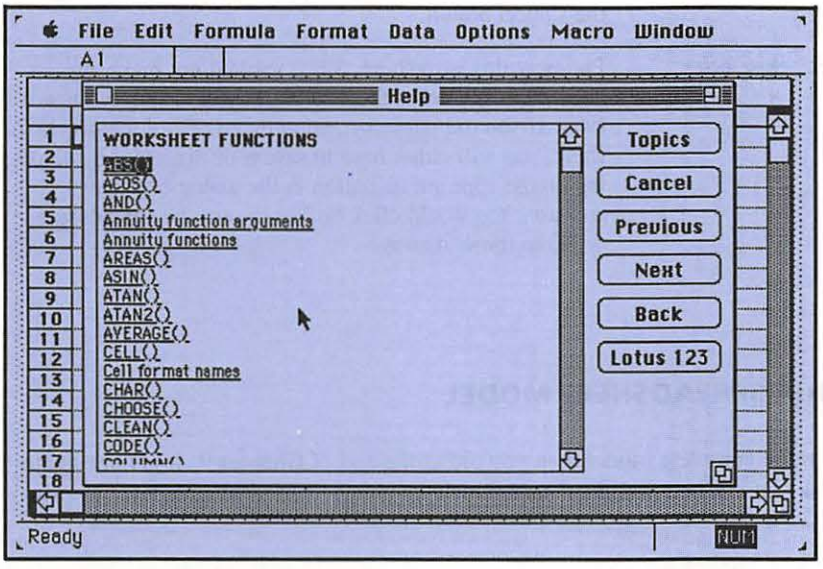


Figure 10.70
The functions topic list is now available.

	You may scroll through this topics list, or you may type a letter to jump to the desired part of the alphabet.
I	Jump to the beginning of the I's. Once again, you have located the IF function.

[cr]	Press the return key to see the help for the IF function.

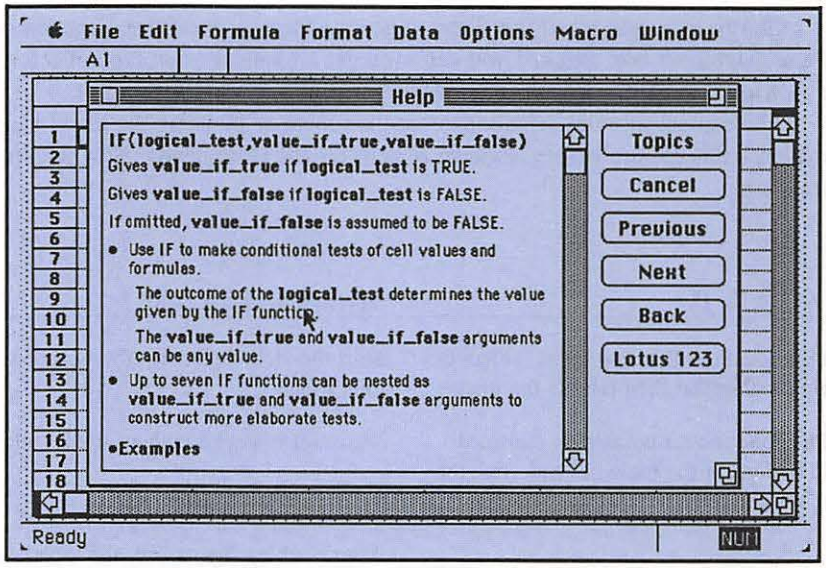


Figure 10.71
Part of the help information you will get for the IF function.

Click on the Cancel button.	When you are done using help, put it away by clicking on the Cancel button.
Click on the Worksheet2 close box.	Put away this worksheet. Since you did not make any changes to any cells, the new worksheet is simply thrown away. If you did put information into a cell of this worksheet, you will either have to save it or discard it by clicking on the appropriate button in the dialog box that appears. You would click on Yes to save the spreadsheet, or No to throw it away.

10.18 PRINT YOUR SPREADSHEET MODEL

You now have a much more complete model than you did at the end of Chapter 9. It is once again time to print your work. Of course, you must have a printer attached to your computer to print your work.

What To Do	*Why You Are Doing It*
⌘P	Execute the Print command found on the File menu.
Check the Page Preview box.	If you want to preview the document before you print it, make sure that the Page Preview box is checked in the Printer dialog box.
Click on OK.	Begin the Page Preview. Note that the Next button is not dimmed, as it was at the end of Chapter 9. This means that you should expect more than one page of output.

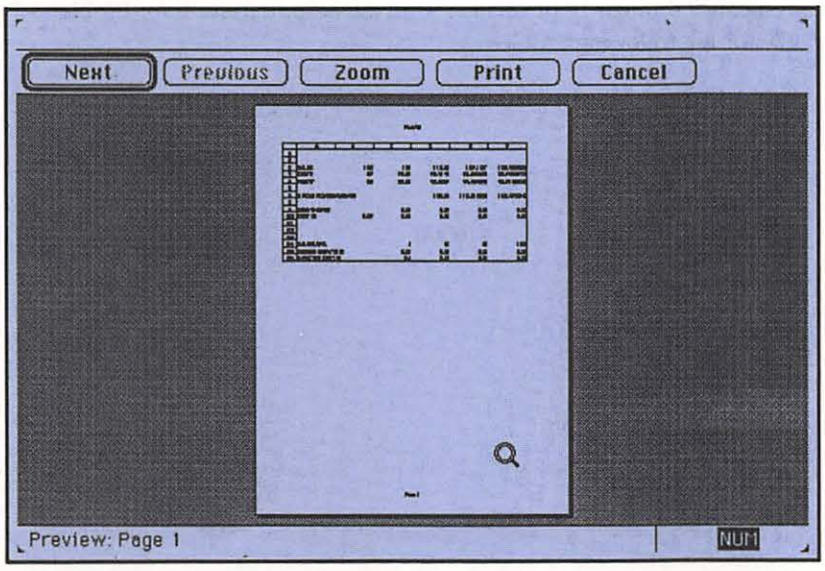


Figure 10.72
The first page of the page preview.

Click on the Next button.	Look at the second page of the Page Preview. Both the Next and Previous buttons are now active.
Click on the Print button.	After you are finished looking at the Page Preview, print the spreadsheet by clicking on the Print button. If you do not have a printer, or do not want to print your spreadsheet at this time, click on the Cancel button.
⌘S	Make sure that all changes to the spreadsheet have been saved. This time you are using the save command without changing the name of the spreadsheet.
⌘Q	Quit Excel and return to the Macintosh Finder.

EXERCISES

1. When you retrieve a spreadsheet from diskette, in what cell is the cursor placed when the spreadsheet is completely loaded?
2. How many columns and rows are displayed in the spreadsheet window when you first start the program running?
3. Can the following list of cells be defined as a legal cell range?

   C1, D1, E1, F1, G1, C2, D2, E2, F2, G2, C3, D3, E3, F3, G3
4. Can the following list of cells be defined as a legal cell range?

   C1, C2, C3, C4, C5, D1, D2, D3, D4, D5
5. Can the following list of cells be defined as a legal cell range?

   D6, D7, E7, D8, E8, F8, D9, E9, F9, G9
6. What special character must be added to a cell formula to make a cell reference copy in absolute mode, rather than relative mode?

You should have built the following spreadsheet for Problems 9 through 17 of Chapter 9. If you have, retrieve it for Problems 7 through 17. If you do not have it available, build it now for the following problems.

	A	B	C	D	E
1	Jones Co.				
2	Sales Analysis				
3					
4	Gross Sales				476000
5					
6	Cost of Widgets			=(E4*0.315)	
7	Cost of Framitz			=(E4*0.113)	
8	Cost of Dingies			=(E4*0.102)	
9	Cost of Nuts & Bolts			=(E4*0.122)	
10	Cost of Sealant			=(E4*0.058)	
11					
12	Total Costs				
13					=====
14	Profit from Sales				

7. Use the SUM function to compute this spreadsheet's Total Costs.
8. Add the following percent cost table for this model:

	I	J	K	L	M
1	SALES ->	450000	475000	500000	525000
2	Widgets	0.340	0.330	0.315	0.300
3	Framitz	0.120	0.113	0.113	0.109
4	Dingies	0.106	0.105	0.102	0.098
5	Nuts & Bolts	0.128	0.125	0.122	0.119
6	Sealant	0.060	0.060	0.058	0.058

9. Replace the formulas in cells C6 through C10 with a formula to select the percent cost of the line item based on the Gross Sales figure. Thus, if the Gross Sales are 475000, the percent of Sale for the cost of Framitz is 11.3. What is the formula you are using? Can you use the Copy command to copy this formula into all the required cells?
10. If Gross Sales are 465000, what will be the cost of Dingies?
11. What will the total costs be if Gross Sales are 495000?
12. What will the Profit from Sales be if Gross Sales are 522500?
13. What happens to the cost figures when Gross Sales are greater than 525000?
14. What happens when you enter a Gross Sales figure of 375000? What can you do to prevent this from happening?
15. What percent of Gross Sales are the costs of Nuts & Bolts when Gross Sales are 493724?
16. What is the cost of Sealant when Gross Sales are 481000?
17. Make the Gross Sales 480000. Print the spreadsheet and the percent cost table.
18. Create the following spreadsheet:

	JAN
SALARIES	300
RENT	75
INSURANCE	25
POSTAGE	5
TRAVEL	75
MISC.	20
TOTAL	500

19. Extend the spreadsheet you created in Problem 18 for 12 months with the following changes: (1) increase salaries 1/2 of a percent per month, (2) increase rent 1 percent per quarter (that is, in April, July, and October), and (3) decrease travel 10 percent in July. HINT: If the January insurance value is in cell B4, then by placing =B4 into cell C4, you will cause the value to appear in the C column unchanged.

20. Add to the spreadsheet created in Problem 19 totals and averages for each of the items.
21. What will the salaries value be after 10 months (November)?
22. Print the modified spreadsheet created in Problem 19.
23. Load the spreadsheet model you created for Problem 18 of Chapter 9. If you do not have it available, build it now for the following problems. Here is the information:

    1) The Cost of Goods is 55 percent of Sales.
    2) Salaries are 10 percent of Sales.
    3) Overhead is 26 percent of Sales.
    4) Other expenses are 4 percent of sales.

    Use the appropriate formulas to compute the gross and net profit values.

SALES	500
COST OF GOODS	275
GROSS PROFIT	225
EXPENSES	
SALARIES	50
OVERHEAD	130
OTHER	20
NET PROFIT	25

24. Use the IF function for salaries. Keep salaries at 10 percent of sales as long as sales are less than 600. Once sales reach 600, salaries should become 12 percent of sales.
25. Use the IF function for overhead. Make overhead 24 percent of sales as long as sales are less than 550. Once sales reach 550, overhead should drop to 22 percent of sales.
26. What are the salaries, overhead and net profit if sales are 575?
27. What are the salaries, overhead and net profit if sales are 625?

CHAPTER

ADVANCED ELECTRONIC SPREADSHEET CONCEPTS

11

CHAPTER OBJECTIVES:

Upon completion of this chapter, the student will:

- **Divide the spreadsheet window into "panes."**
- **Format the spreadsheet cells.**
- **Insert rows into the spreadsheet.**
- **Delete columns from the spreadsheet.**
- **Move cells of the spreadsheet.**
- **Use named ranges.**
- **Demonstrate automatic and manual recalculation.**
- **Discuss the ramifications of recalculation order, column order, row order, and natural order.**
- **Know what to avoid when using a spreadsheet.**

11.1 THE ELECTRONIC SPREADSHEET EXPERT

By now you should be very familiar with the workings of the electronic spreadsheet and modeling. This chapter will introduce you to a few other operating tasks that will make using the electronic spreadsheet much easier. You will learn about spreadsheet recalculation. You will also learn how to format the information on the spreadsheet, lining up decimal points, and in general making your work look attractive.

11.2 SPLITTING THE WINDOW

There are times when you may want to view the contents of columns A, B, C, P, Q and R, or some other combination of columns or rows that are widely separated and therefore will not fit into the spreadsheet window. You know that if you attempt to move the window to see columns P, Q, and R, you will not be able to see columns A, B, and C. Of course you may print the spreadsheet, but you may not have a printer available, or you may simply want to see what is happening in the right portion of the spreadsheet while you work on the left portion. Printing in this latter case is probably not appropriate.

You can deal with this problem by splitting the window. Most electronic spreadsheet programs will allow you to split the viewing window into two halves. You can control what is displayed in each of the two window panes independently.

When you split the window, all you are changing is what is being viewed and not any of the relationships among the cells of the spreadsheet. You are not creating two separate spreadsheets. Thus, if the contents of cell A5 affect the contents of a cell in column K, and the window is split, a change in A5 will still cause the contents of the cell in column K to change.

You can split the window between any two rows by splitting the window horizontally or between any two columns by splitting the window vertically. Excel even lets you split the window horizontally and vertically at the same time.

When you split the window between two columns or rows, all that you are defining is the amount of space for each window pane, and not what will always be displayed in that pane. You may change the contents of a window pane by scrolling the pane with the cursor or scroll bars in the same fashion as you scrolled the unsplit window. It is possible to display the same thing in all the panes, or to have the top pane display rows 41 through 49 while the bottom one displays rows 1 through 10!

11.3 SYNCHRONIZED WINDOW SCROLLING

When you split the window into two panes, you will see that the window scrolling is unaffected. For example, if you split the window horizontally, the top and bottom panes can scroll vertically independent of one another. However, the two windows will scroll horizontally together.

Thus, if you scroll horizontally to column AF, both the top and bottom pane will show column AF. However, you may scroll the top pane to show row 45 and the bottom pane to show row 972.

11.4 RETRIEVE THE SPREADSHEET

After you boot your Macintosh with a System Start-Up disk, insert the Excel Program disk into one of the computer's disk drives. If you are using a machine with a hard disk you will not need to insert the Excel program disk into a disk drive. Rather, locate the Excel folder, and open it so you can see the Excel program icon. Place a disk (see Chapter 3 for how to initialize a new disk) with at least 200K available space into another one of your Macintosh's disk drives, if you have one available. This disk will be used for saving your work. If you do not have a free floppy disk drive, keep this disk available. You will need it for data storage.

In these instructions, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and double-click the mouse button. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.

Finally, if you want your work to match the figures in the text, be sure to use the Chooser DA to select a LaserWriter and not an ImageWriter. You may select a LaserWriter even if your computer is not actually attached to one. You will not, however, be able to print if this is the case.

If you are using a computer with a hard disk, begin here:

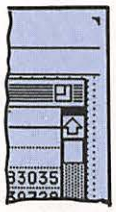
What To Do	*Why You Are Doing It*
Locate the icon for the spreadsheet you were working on in Chapter 10 and place the mouse pointer on the icon.	You are going to launch Excel by double-clicking on this icon. It is called Model5.
Double-click the mouse.	By double-clicking on an Excel spreadsheet, the Macintosh will look on all available disks for the Excel application program. If found, it will launch Excel and open the document. If the Macintosh is not able to locate the application program, you will get an error message. If you have the Excel application program on your hard disk, or on a floppy disk currently in one of the computer's disk drives, the program should start, and after a brief wait, the spreadsheet you saved at the end of Chapter 10 will appear.

If you are using a computer that has only floppy disks, then start here:

Locate the icon for the Excel program.	You will launch the Excel application program by double-clicking on it.
Move the mouse to the Excel icon and double-click.	The double-click will launch the application. If you have trouble with the double-click, you may also select the program's icon with a single click, then use the Open option on the File menu, or press ⌘O, the command key equivalent. After a brief wait, Excel will be running, and you will have a new spreadsheet, called Worksheet1, in the window.
Move the mouse to the window's close box.	Remember, the close box is the one found at the left of the title bar.
Click the mouse button once.	Close the worksheet. You are going to open an existing worksheet, and it will be less confusing to work with only one document active.
⌘O	Execute the Open command. This command is found on the File menu. After a brief pause, you will see the Open dialog box.
Click the mouse on the Drive button shown in the dialog box if your disk is not displayed in the dialog box.	The Drive button tells Excel to display the document and folder names found on a second disk currently in your computer. This may be a floppy disk, or a hard disk. If you do not have a second disk in the computer, then the Drive button will be dimmed, and you will not be able to use it. Continue clicking the Drive button until the name of the disk that contains your file appears in the dialog box.
Click on Model5.	You want to open the spreadsheet you named "Model5." By clicking the mouse pointer on the name in the dialog box, you are selecting this document.

Click on the Open button.	Execute the Open command. After a brief pause while the computer reads the spreadsheet, you will see the Excel spreadsheet in the current window. You should remember that the double-click is often a shortcut to the Open command. You could have double-clicked the mouse on the spreadsheet name, rather than selecting it and then clicking on the Open button in the dialog box.

Figure 11.1
This is the horizontal window split control.



11.5 SPLITTING THE WINDOW VERTICALLY

You are now ready to split the spreadsheet window. In this section you will split the window vertically.

The window split controls are found at the top of the scroll bar at the right side of the window (Figure 11.1), and at the left of the scroll bar at the bottom of the window (Figure 11.2). They are the heavy black bars found at the two locations.

Figure 11.2
This is the vertical window split control.



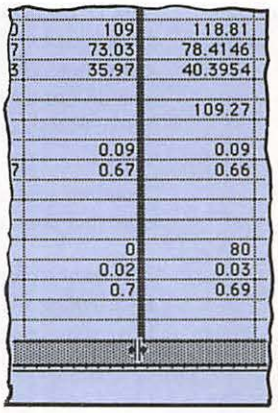
What To Do	*Why You Are Doing It*
Place the mouse pointer over the vertical window split control.	The vertical split control is at the bottom left of the current spreadsheet window. When the mouse is in the proper position, it will change to the window split tool.

Figure 11.3
The mouse pointer, now located over the vertical window split control, has changed to the split tool.



Press and hold the mouse button.	To split the window, you must drag the split control to the desired location.
Drag the mouse right to split the window in half.	You are going to split the window into two equal panes. As you drag the window split control, a heavy line will drag across the spreadsheet with it (Figure 11.4). This is to let you know where the split will occur.

Figure 11.4
The heavy vertical line indicates where the window will split if you release the mouse button.



Release the mouse button.

When you have the heavy line between columns C and D, the approximate center of the window, release the mouse button to split the window vertically.

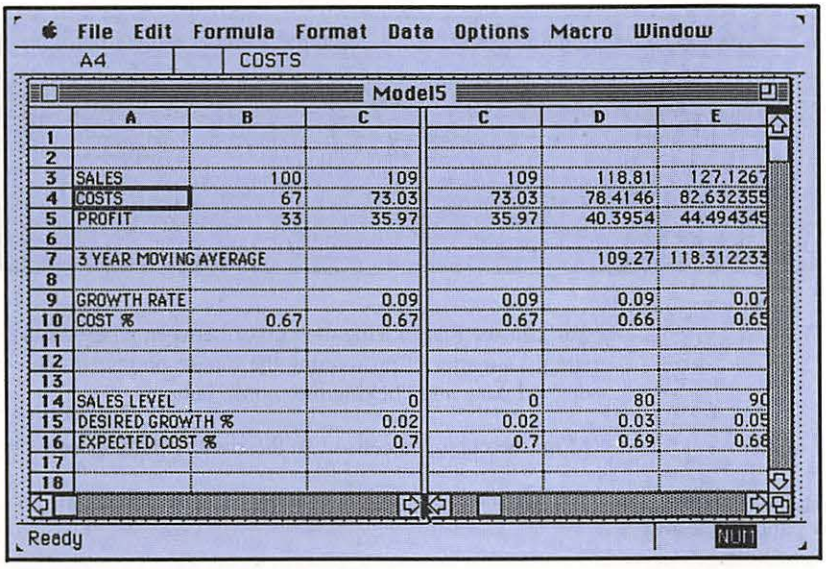


Figure 11.5
The window has been split vertically. Note that there are two scroll bars at the bottom of the window, but only one at the right of the window.

After you have split the window, you can see that the scroll bar on the right side, controlling vertical movement of the window, is unchanged. However, the scroll bar on the bottom of the window, controlling horizontal movement of the window, has been split. Thus, you are able to scroll each pane left and right independently. However, they will scroll up and down together.

Move the mouse pointer to cell A1 in the left pane and click the mouse button.

Place the cursor in cell A1.

→ →

Move the cursor right two cells to cell C1. When you do this, the left pane will scroll, and the cursor will now appear in both the left and right pane!

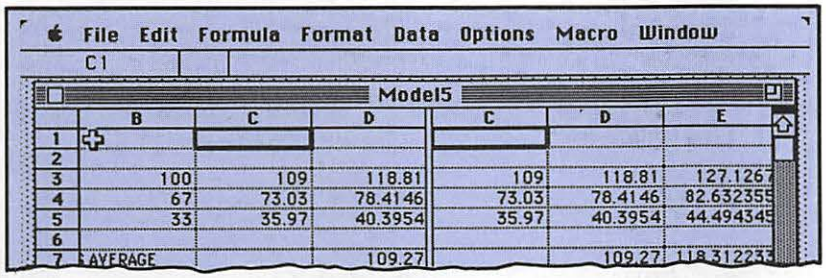


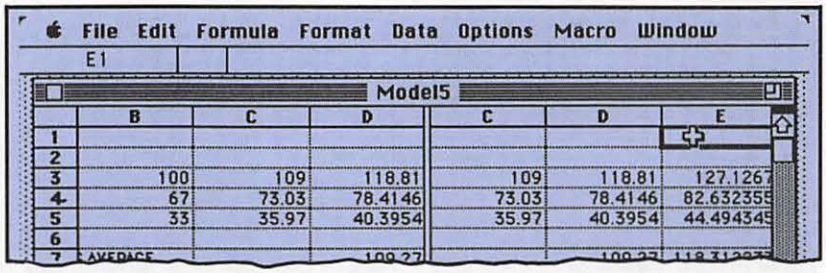
Figure 11.6
You now have the cursor displayed in both panes of the window.

Move the mouse pointer to cell E1 in the right pane and click the mouse button.

Move the cursor to cell E1 in the right window.

The cursor will disappear from the left pane, since cell E1 is not currently displayed there.

Figure 11.7
The cursor is now in the right pane.



You can see that moving the cursor between windows is simply a matter of positioning the mouse pointer in the desired pane and clicking the mouse button.

⌘←

Move the cursor to cell A1 in the right window pane.

Use the mouse to drag the scroll box under the left window pane all the way to the left end of the scroll bar.

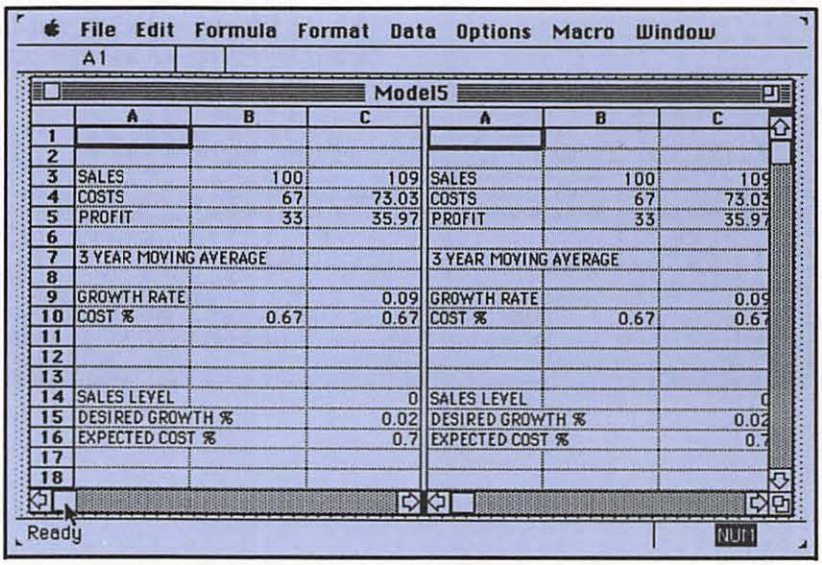
You are scrolling the left window using its scroll bar.

Figure 11.8
The scroll box on the left scroll bar is being moved all the way to the left end of the scroll bar.



When you release the mouse button, both the left and right window panes should be displaying the same information.

Figure 11.9
The two panes of the window are showing the same portion of the spreadsheet.



ABC CO. [ENTER]	Enter text into cell A1. Note that the text appears in both windows, and the edit line, even though the active pane is on the right. This offers proof that you are in fact looking at the same cells of the same spreadsheet.
→ → → → → →	Move the cursor to the right. You will see that only the right window scrolls, meaning that it is the currently active window pane.
Position the mouse pointer over the window split control at the bottom of the window.	You are going to clear the split window.
Drag the window split control left until it passes the row numbers at the left of the spreadsheet.	To clear the split window, you must return the window split control to its original location. As you drag the split control, the heavy line will once again appear.
Release the mouse.	When you release the mouse, the window will return to its original form.

Figure 11.10
You must put the window split control back at the left side of the spreadsheet to clear the split.



11.6 FORMATTING THE INFORMATION ON THE SPREADSHEET

Now that you can manipulate the spreadsheet and its contents, it is time to make it look better. You do this by formatting the numbers and text and adjusting the column widths.

You control the format of the cells by first selecting the desired range. The appropriate format is then applied to the information. There are formats for numbers, so that you can set the numbers to integers or set them with two digits to the right of the decimal point. There are alignment formats, such as right or left placement in the cell. And you can also control how wide a column is, or how high a row is. Of course, like most Macintosh applications, you may control the font, font size and style (such as boldface or underline).

11.7 FORMATTING THE ENTIRE WORKSHEET

When you apply a format to a spreadsheet, you must first select the range of cells that you want formatted. It is possible to format portions of the spreadsheet, or even the complete spreadsheet.

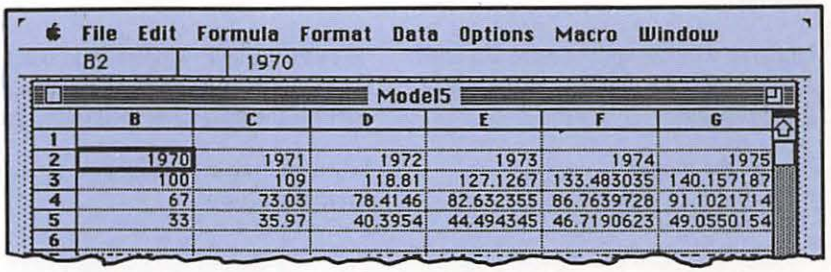
So far in this text you have been selecting ranges by keeping the mouse pointer inside the spreadsheet. You may also select ranges, or the whole spreadsheet, by using the border cells.

Before you begin the formatting process, add the years to this spreadsheet.

What To Do	*Why You Are Doing It*
Move the mouse pointer to cell B2 and click the mouse button.	Position the cursor at cell B2.
1970→	Enter the year for the first column of the model as 1970 and move the cursor to cell C2.

=(1+B2) [ENTER]	Enter a formula into cell C2. 1971 will be displayed.
Select the range C2 through P2.	Select the row to the right of and including cell C2. This is where you will place the year labels.
⌘R	The Fill Right command, which may also be found on the Edit menu.
←	De-select the row and return the cursor to cell B2. The years are now numbered 1970 to 1984.

Figure 11.11
The years are now numbered.

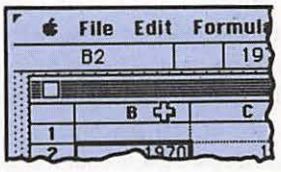


	B	C	D	E	F	G
1						
2	1970	1971	1972	1973	1974	1975
3	100	109	118.81	127.1267	133.483035	140.157187
4	67	73.03	78.4146	82.632355	86.7639728	91.1021714
5	33	35.97	40.3954	44.494345	46.7190623	49.0550154
6						

Now you are ready to format the spreadsheet information. First, however, you will learn some selection techniques.

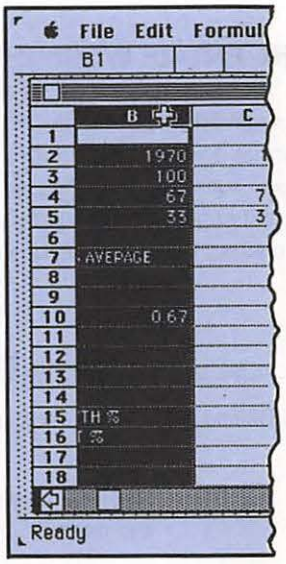
Position the mouse on the B column name box above the B column.	You are going to select the complete B column.

Figure 11.12
Note the position of the mouse pointer on the B column name box.



Click the mouse button once.	This will select the B column.

Figure 11.13
The complete B column has been selected.



You can tell that more than a range, which includes part of the B column, has been selected because the B column name box is also part of the selected range. Any time the border cell is included in a selection area, the complete column or row has been selected.

Position the mouse pointer over the row 5 box and click the mouse button.

Select the complete row 5 of the spreadsheet.

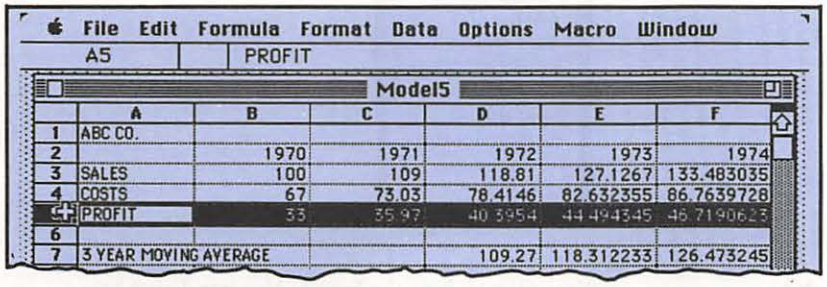


Figure 11.14
Row 5 has been selected.

Position the mouse pointer in the empty box at the top left corner of the spreadsheet window.

This box is used to select the complete spreadsheet. Do not confuse it with the close box above it on the title bar! For the sake of this text, we will call it the Select All box.

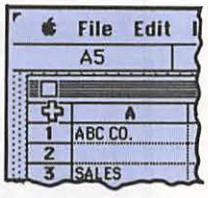


Figure 11.15
Note the position of the mouse pointer. This box will let you select the complete spreadsheet.

Click the mouse button once.

Select the complete spreadsheet. Now you are ready to begin formatting information.

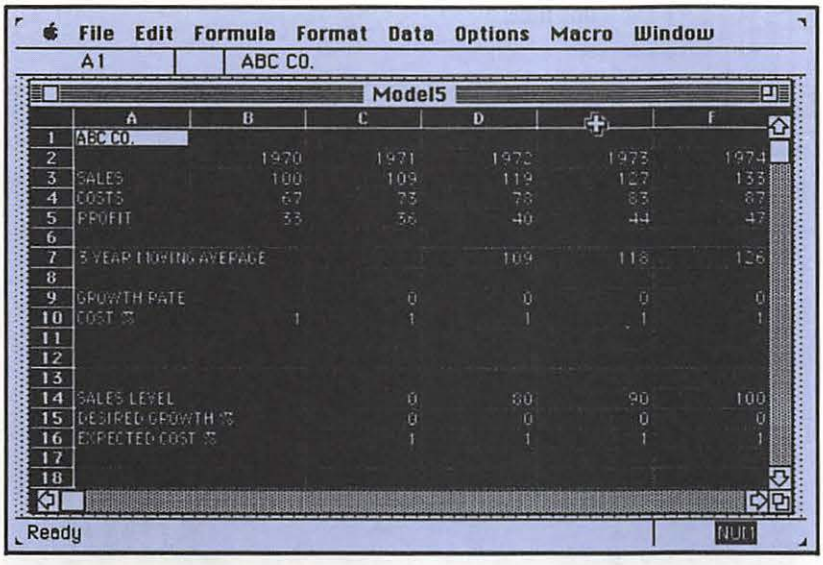


Figure 11.16
The complete spreadsheet has been selected.

Pull down the Format menu.

This menu contains the commands for formatting information on the spreadsheet.

Drag the mouse down and select the Number command.

You want to change how the numbers are formatted on the spreadsheet.



Figure 11.17
The Number formatting command has been selected.

Release the mouse button.

You will now have the Format Number dialog box.

Click the mouse on the second format down in the format list.

This format, which appears as simply a 0 in the list, is the integer format.

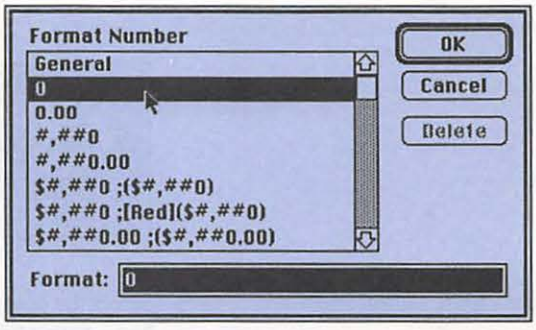


Figure 11.18
The integer format has been selected.

Click on OK.

Apply the integer format to the spreadsheet. All the numbers on the spreadsheet will be displayed as integers at this time.

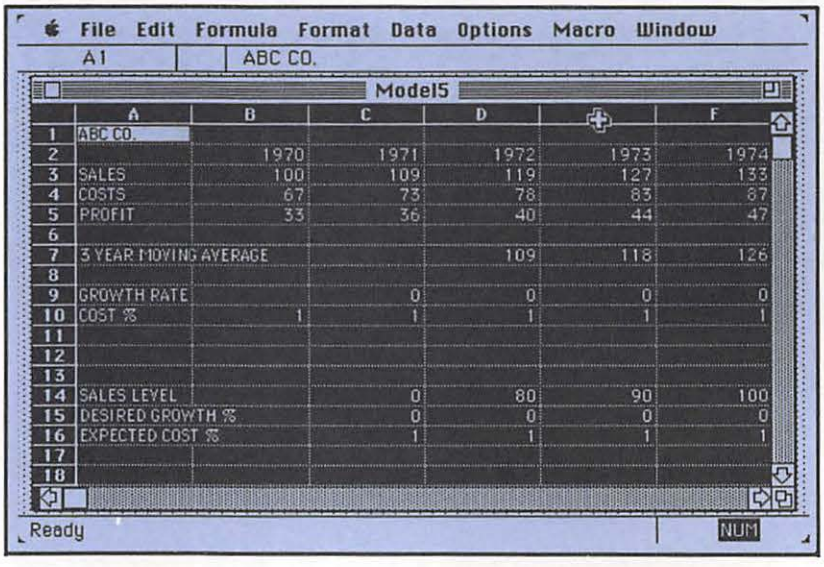


Figure 11.19
The numbers have all been formatted as integer values.

Look at the lookup table in the range C14:H16. The percents are now displayed as either 0 or 1. Excel has rounded the values of these cells to display them as integers. **Values greater than or equal to 0 and less than 0.5 are rounded down to 0, while values greater than or equal to 0.5 round up.**

⌘G	The Goto command.
R1 [cr]	Move the cursor to the right end of the spreadsheet. You can see that the format affected all the cells containing numbers.
Move the mouse pointer to the Select All box and click the mouse button.	Recall that we are calling the border box above the row indicator and to the left of the column indicator the Select All box. You are re-selecting the complete worksheet.
Pull down the Format menu, select the Number command, then release the mouse button.	Once again, you want to change how the numbers are formatted on the spreadsheet.
Click the mouse on the third format down in the format list.	This format, which appears as 0.00 in the list, is the format for displaying two digits to the right of the decimal point.

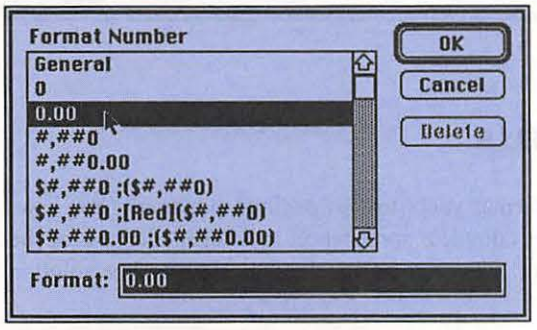


Figure 11.20
The two digits to the right of the decimal point format has been selected.

Click on OK. Apply the format to the spreadsheet. The appearance of all the numbers will change to the new format.

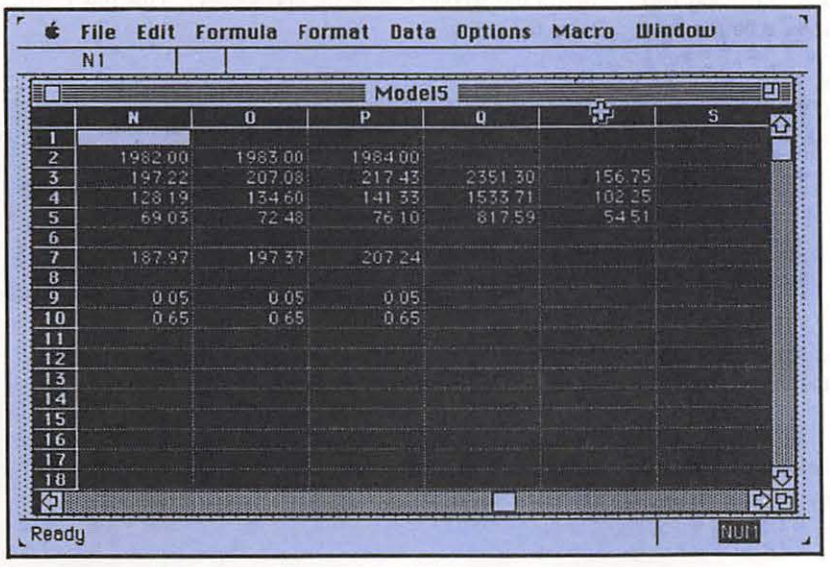
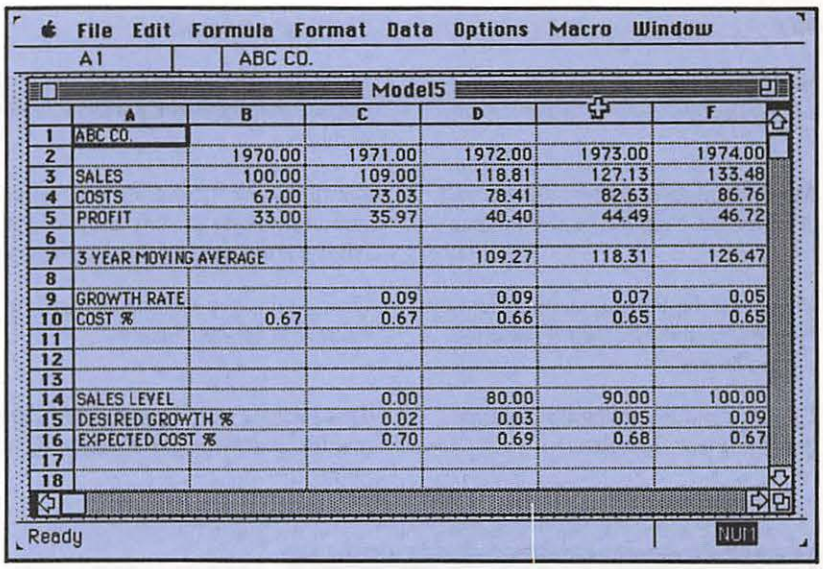


Figure 11.21
The numbers have all been formatted with two digits to the right of the decimal point.

⌘←	Return the cursor to the A column. You can see that all the values of the spreadsheet are now displayed with two digits to the right of the decimal point.

Figure 11.22
The complete spreadsheet has the new format.



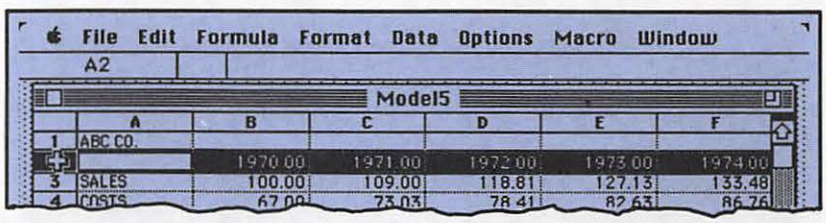
	A	B	C	D	E	F
1	ABC CO.					
2		1970.00	1971.00	1972.00	1973.00	1974.00
3	SALES	100.00	109.00	118.81	127.13	133.48
4	COSTS	67.00	73.03	78.41	82.63	86.76
5	PROFIT	33.00	35.97	40.40	44.49	46.72
6						
7	3 YEAR MOVING AVERAGE			109.27	118.31	126.47
8						
9	GROWTH RATE		0.09	0.09	0.07	0.05
10	COST %	0.67	0.67	0.66	0.65	0.65
11						
12						
13						
14	SALES LEVEL		0.00	80.00	90.00	100.00
15	DESIRED GROWTH %		0.02	0.03	0.05	0.09
16	EXPECTED COST %		0.70	0.69	0.68	0.67
17						
18						

11.8 FORMATTING A RANGE OF CELLS

It is not, unfortunately, accepted practice to format years to two decimal positions. You saw, however, that if you changed the format for the complete spreadsheet to integer, the rest of the values on the spreadsheet also changed to integer. This may be equally undesirable. The solution is to format a specific range of cells.

What To Do	*Why You Are Doing It*
Move the mouse pointer to the row two border and click the mouse button once.	Select the second row of the spreadsheet. This row contains the years.

Figure 11.23
The second row of the spreadsheet has been selected. This is the range that is to be formatted.

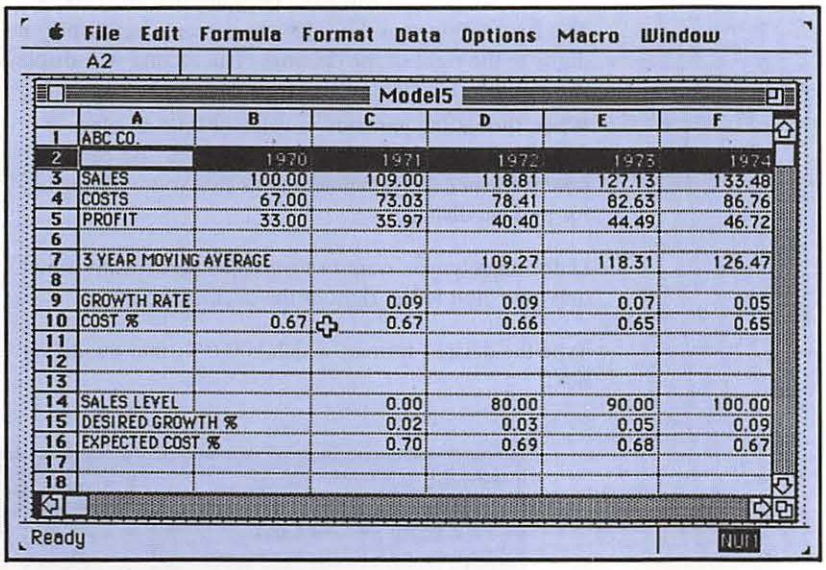


	A	B	C	D	E	F
1	ABC CO.					
2		1970.00	1971.00	1972.00	1973.00	1974.00
3	SALES	100.00	109.00	118.81	127.13	133.48
4	COSTS	67.00	73.03	78.41	82.63	86.76

Pull down the Format menu, select the Number command, then release the mouse button.	You want to change how the numbers in the second row of the spreadsheet are formatted.
Click the mouse on the second format down in the format list.	Remember that this format, the 0 format, will give you integer values.

Click on OK.

Apply the format to the selected row of the spreadsheet.



	A	B	C	D	E	F
1	ABC CO.					
2		1970	1971	1972	1973	1974
3	SALES	100.00	109.00	118.81	127.13	133.48
4	COSTS	67.00	73.03	78.41	82.63	86.76
5	PROFIT	33.00	35.97	40.40	44.49	46.72
6						
7	3 YEAR MOVING AVERAGE			109.27	118.31	126.47
8						
9	GROWTH RATE		0.09	0.09	0.07	0.05
10	COST %	0.67	0.67	0.66	0.65	0.65
11						
12						
13						
14	SALES LEVEL		0.00	80.00	90.00	100.00
15	DESIRED GROWTH %		0.02	0.03	0.05	0.09
16	EXPECTED COST %		0.70	0.69	0.68	0.67
17						
18						

Figure 11.24
The years now have an integer format, while the rest of the spreadsheet retains the format with two digits to the right of the decimal point.

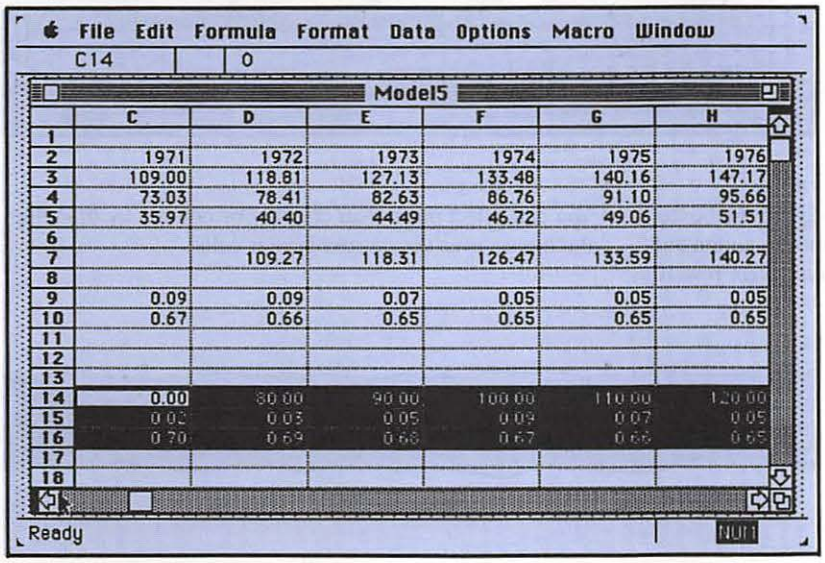
Another format that you can use to enhance the appearance of this spreadsheet is the Percent format. Again, you do not want to apply this format to the complete spreadsheet, but to a selected range.

What To Do

Select the range C15:H16.

Why You Are Doing It

This range is the percents found in the lookup table. Select even the first row of the table (cells C14:H14), which is the sales values, to be formatted at this time so you can see the effect of the percent format on these values!



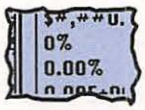
	C	D	E	F	G	H
1						
2	1971	1972	1973	1974	1975	1976
3	109.00	118.81	127.13	133.48	140.16	147.17
4	73.03	78.41	82.63	86.76	91.10	95.66
5	35.97	40.40	44.49	46.72	49.06	51.51
6						
7		109.27	118.31	126.47	133.59	140.27
8						
9	0.09	0.09	0.07	0.05	0.05	0.05
10	0.67	0.66	0.65	0.65	0.65	0.65
11						
12						
13						
14	0.00	80.00	90.00	100.00	110.00	120.00
15	0.02	0.03	0.05	0.09	0.07	0.05
16	0.70	0.69	0.68	0.67	0.66	0.65
17						
18						

Figure 11.25
You are going to format the lookup table.

Pull down the Format menu, select the Number command, then 00 release the mouse button.

You are going to format the selected numbers.

Figure 11.26
The two percent formats that are defined in the format list.



Use the scroll bar to look at the available formats. You will see two percent formats. They are 0% and 0.00%. The first will format the values to percent, but display no digits to the right of the decimal. The second will display two digits to the right of the decimal.

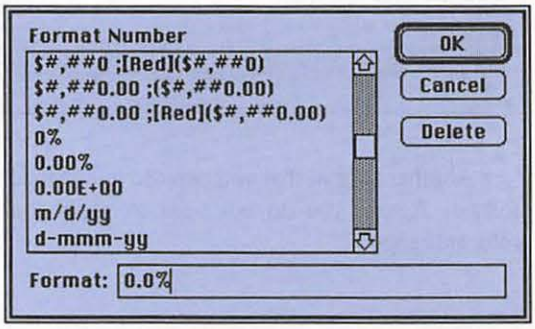
When formatting percents, a value of 0.05 displays as 5.00%. A value of 5 displays as 500.00%. Be careful how you enter the values into cells that you will format for percent display.

Unfortunately, you want to format the percents to show only one digit to the right of the decimal point.

0.0%

Type the desired format, which is 0.0%, into the dialog box.

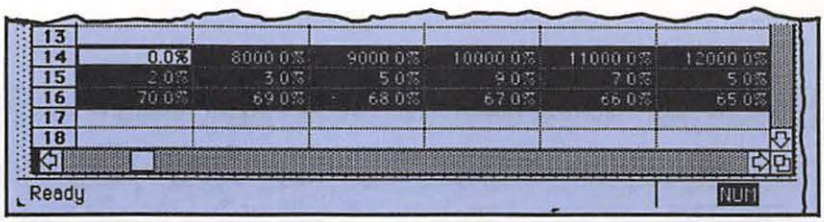
Figure 11.27
The format you want to use is now in the dialog box.



Click on OK.

Execute the format. The lookup table now displays the values as percents, and not as decimal values. Do not worry about row 14. You will fix it later. Do note the effect of the percent format on these values.

Figure 11.28
The format has been applied to the selected cells. Note the effect of the percent format on row 14.



Place the mouse pointer on the border for row 9, press the mouse button and drag the mouse down to select row 10 as well.

You can select more than one row or column by dragging the mouse over the desired border cells.

Figure 11.29
Two rows have been selected.



	You now want to format these rows, which display the percents used in the sales and costs rows.
Pull down the Format menu, select the Number command, then release the mouse button.	You are going to format the selected numbers.
0.0%	You still want only one digit displayed to the right of the decimal in the percent format.
Click on OK.	Execute the format. The two rows now display the values as percents, and not as decimal values.



Figure 11.30
The format has been applied to the selected rows.

11.9 CLEARING A FORMAT

You may now reasonably ask why were some format commands applied to rows, while others were applied to ranges. In this case there was no reason except to provide an example. However, when you build your own spreadsheets, you must consider what you are formatting with some care. A format is applied to a cell, regardless of the content of that cell.

Except for the ranges you have formatted, the complete spreadsheet now has a format of two digits to the right of the decimal point. Let us now confirm this.

What To Do	*Why You Are Doing It*
⌘←	Move the cursor to the A column. This will scroll the window so that columns A through F are showing.
Place the mouse pointer into cell B1 and click the mouse button.	Move the cursor to cell B1.
89 [ENTER]	Enter the value 89 into cell B1. It will be displayed with two digits to the right of the decimal point as 89.00.

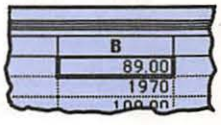
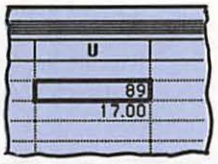


Figure 11.31
The value 89 takes on the format that was applied to this cell.

⌘B	Clear this cell by using the Clear command found on the Edit menu.
⌘G	The Goto command.
U1 [cr]	Move the cursor to cell U1.

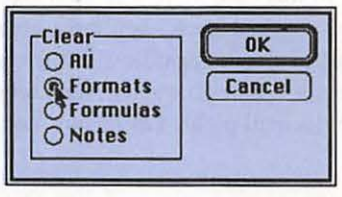
↓	Move the cursor down to cell U2.
	Recall that when you formatted the years to integer, you formatted the complete row of the spreadsheet.
89.3 [ENTER]	Enter this value into cell U2. It will be formatted integer, and 89 will display.

Figure 11.32
The value 89.3 takes on the format that was applied to this cell.



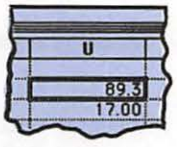
Pull down the Edit menu.	Recall that the Clear command is on this menu.
Drag the mouse down to the Clear command and release the mouse button.	Execute the Clear command from the menu, NOT by using the ⌘B key. You now have the Clear dialog box, which lets you select what you want cleared in the cell.
Click the Formats option.	You want to clear only the format applied to this cell without removing the value.

Figure 11.33
The Formats option has been selected in the Clear dialog box.



Click on OK.	The integer format will be removed from this cell. The value will now be displayed as 89.3.

Figure 11.34
The format has been removed from cell U2.



	You may remove the format from any cell or range in this fashion, returning it to the default start-up format used by Excel.
⌘B	The Clear command executed with the command key will still remove the contents of the cell.
←	Move the cursor left to cell T2.

89.3 [ENTER]	Put this value into the cell. It still retains the integer format.

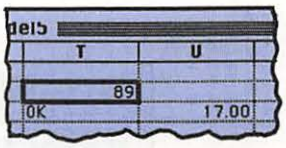


Figure 11.35
The cell to the left of the one you have cleared still retains the applied formatting.

⌘B	Clear this cell.
89.3 [ENTER]	Once again, put this value into cell T2. The integer formatting is still applied to the cell. The ⌘B key clears only the formula or content information, and not the formatting information.
⌘B	Clear this cell.
⌘G	The Goto command.
A1 [cr]	Return the cursor to cell A1.

11.10 INSERTING BLANK ROWS INTO YOUR SPREADSHEET

You have a fairly decent looking spreadsheet. The years are readable and it is clear what values are percentages. All the columns for the rest of the data displayed are neatly lined up on the decimal points. Now is the time for the finishing touches.

This spreadsheet would be much easier to look at if a blank row existed between the "Year" row and the "Sales" row. If you had planned this when you started working on the spreadsheet model, you would not need to add a row now. Unfortunately, you may not always have perfect planning, or you may simply decide to add something.

When you add a row or column to an existing spreadsheet, Excel will adjust all the existing formulas to reflect the data's new locations. Thus, if cell F3 contains a formula that refers to cell D7 and D7 becomes D8, the formula in cell F3 will now refer to cell D8.

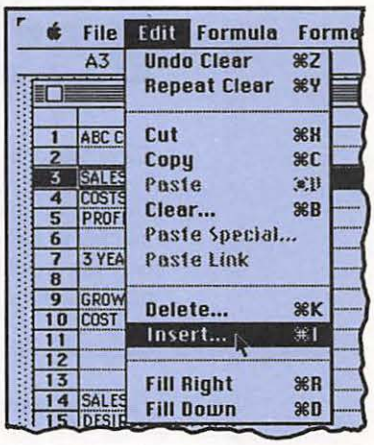
Excel lets you insert a cell in the middle of a row or column. Thus it is possible to push a single column down in the spreadsheet, without affecting all the other columns of your work. In the example, however, you will insert a row the complete width of the spreadsheet.

What To Do	*Why You Are Doing It*
Move the mouse pointer to the border for row three and click the mouse button.	Select the complete third row. You want to insert a row the complete width of the spreadsheet.
Pull down the Edit menu.	This menu contains the Insert and Delete commands.

Drag the mouse down to select the Insert command.

You are going to insert a new row at the current location of the selected cells, row three of the spreadsheet. You can see that the Insert command may be executed by using the ⌘I key.

Figure 11.36
The insert command has been selected.



Release the mouse button.

When you release the mouse button, a new row will be inserted into the spreadsheet. This row is inserted **above** the selection. Since row three is currently selected, the new row is inserted above row three, and below row two.

Figure 11.37
The new, empty row has been inserted into the spreadsheet.

File Edit Formula Format Data Options Macro Window

A3

Model5

	A	B	C	D	E	F
1	ABC CO.					
2		1970	1971	1972	1973	1974
3						
4	SALES	100.00	109.00	118.81	127.13	133.48
5	COSTS	67.00	73.03	78.41	82.63	86.76
6	PROFIT	33.00	35.97	40.40	44.49	46.72
7						
8	3 YEAR MOVING AVERAGE			109.27	118.31	126.47
9						
10	GROWTH RATE		9.0%	9.0%	7.0%	5.0%
11	COST %	67.0%	67.0%	66.0%	65.0%	65.0%
12						
13						
14						
15	SALES LEVEL		0.0%	8000.0%	9000.0%	10000.0%
16	DESIRED GROWTH %		2.0%	3.0%	5.0%	9.0%
17	EXPECTED COST %		70.0%	69.0%	68.0%	67.0%
18						

Ready NUM

Use the arrow keys to move the cursor around the spreadsheet. You will find that the formulas in the cells have all been adjusted to reflect the new row. For example, the formula for the Profit in cell B6 is no longer =(B3–B4), but rather =(B4–B5). This change in the formula was done automatically when you inserted the row.

11.11 PUTTING LINES ACROSS THE SPREADSHEET

Another enhancement you may wish to add is a line between the "Cost" and "Profit" rows. Again, this is something you do to make the spreadsheet look nice.

Excel performs this task by activating lines around the cells. You may control which lines are turned on around **any** cell of the spreadsheet, or any **range** of the spreadsheet. To draw a line across the spreadsheet simply entails turning on the appropriate set of lines. These lines are referred to as borders.

What To Do	*Why You Are Doing It*
Move the mouse pointer to the border for row five and click the mouse button.	Select the complete fifth row. You want to underline this row of the spreadsheet.
Pull down the Format menu.	This menu contains, in addition to the number formatting commands, the Border command.
Drag the mouse down, select the Border command, then release the mouse button.	Select the Border command.

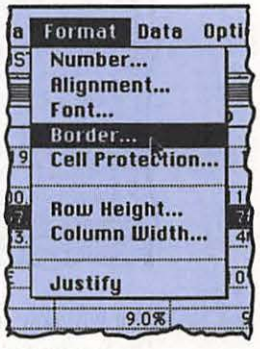


Figure 11.38
The Border command has been selected.

After you release the mouse button, you will receive the Borders dialog box.

Click the mouse on the Bottom check box.	You want to activate the border on the bottom of the selected cells.

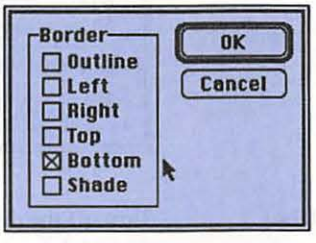


Figure 11.39
The Bottom box has been activated.

Click on OK.	Apply the bottom border to all the cells of row 5.

←

De-select the row. The cursor will be in cell A5.

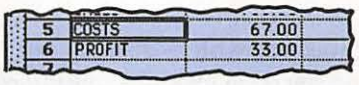


Figure 11.40
After activating the border, you can see the grid between rows five and six is now solid, rather than dotted, as it has been up to the present.

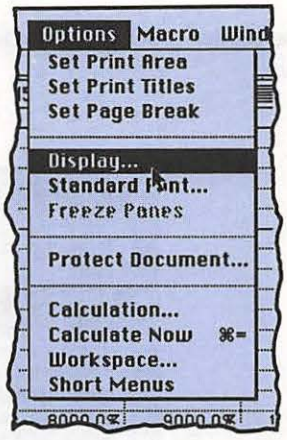
Pull down the Options menu.

To make it easier to see the border you have just added, you are going to turn off the gridlines on the display. You have already done this for the printed output, but it did not change the display!

Drag the mouse down to the Display command, and release the mouse button.

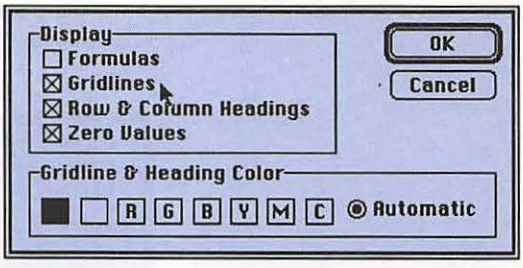
Activate the Display command.

Figure 11.41
The Display command has been selected.



You will now see the Display dialog box. This dialog box lets you turn off and on several items, as well as change the color of items if you are using a color monitor or printer.

Figure 11.42
The Display dialog box.



Click on the Gridlines check box.

Turn **off** the display of gridlines by removing the X from the check box.

Click on OK.	Put away the Display dialog box. The gridlines are no longer displayed on the spreadsheet. You can now clearly see the border line separating rows five and six.

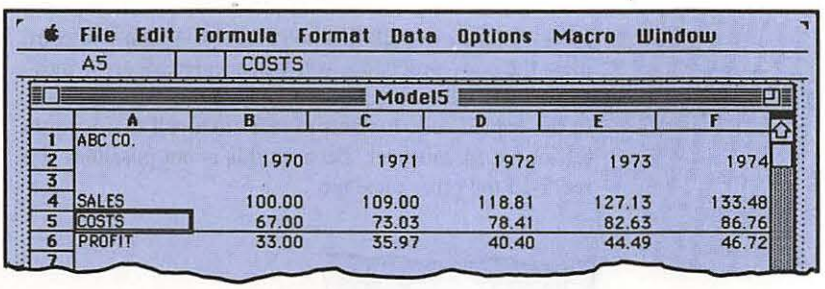


Figure 11.43
The border line between rows five and six is easy to see when the gridlines are turned off.

Pull down the File menu, select Save As, then release the mouse button.	You are going to save the edited version of this spreadsheet with a new name.
Model6	Name this spreadsheet "Model6."
Click on the SAVE button.	Execute the Save procedure. Remember that you may press the return key to complete the save process because this button is double outlined.

11.12 MOVING CELLS OF THE SPREADSHEET

It is not uncommon to discover that the original location of some information on your spreadsheet may no longer be optimal as the spreadsheet is developed. Sometimes, the problem may be solved by splitting the spreadsheet window as you have already done. You may also discover that you have entered several rows of information in the wrong order, or that a different order makes better sense to the reader of the spreadsheet. Splitting the window will not help in this case!

This problem can be solved by re-entering the information into the correct cells or by moving the information to the desired location. If the information is simple, or there is not a lot of it, you may find it easier to just retype the contents of the cells. However, if there are many formulas involved, or even a single complex one, you risk the danger of introducing errors as you re-enter the formulas. It is safer to move these cells to their new location, rather than retyping them.

When you move a cell, the contents of the cell being moved are ERASED from the original cell and placed into the destination cell. If there is information in the destination cell, then it will be lost! The move procedure does not add rows or columns to the spreadsheet; thus you may need to insert a blank row or column before you execute the move.

What To Do	*Why You Are Doing It*
⌘G	You are going to Goto the cell you want to move.
T4 [cr]	Goto cell T4. This cell contains the IF function you created earlier.

⌘C	First, you are going to try copying this cell.
⌘G	Goto the destination of the copy.
A14 [cr]	This is where you want to place the copy of cell T4.
⌘V	Paste the copy of cell T4 into cell A14. When you complete the copy procedure you will receive an error message, #REF. Excel has tried to adjust the cell reference in the copied cell. It wants to refer to a cell that is to the left of the spreadsheet. Because this is not possible, you received the error message.

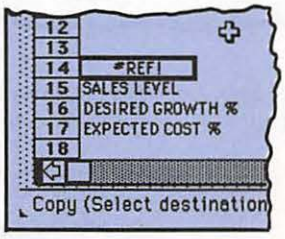


Figure 11.44
After you copy the cell, Excel will display an error message.

Clearly, you do not want to use the Copy command at this time.

⌘G	Once more, you are going to position the cursor on the cell you want to move.
T4 [cr]	Goto cell T4. You want to move the same cell you tried to copy.
⌘X	This is the Cut command found on the Edit menu.
⌘G	You are once again going to move the cursor to the destination cell.
A14 [cr]	This is where you want to place the moved copy of the cell.
⌘V	Paste the contents of the cut/copy buffer into cell A14.

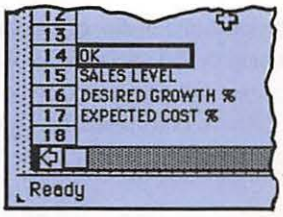


Figure 11.45
The cell has been moved, rather than copied. The reference is not adjusted.

The IF function in cell A14 is now the correct one, and the information displayed is "OK", since the sales in the fifteenth year are well over 120. Notice that the version of this cell that was copied into cell A14 has disappeared. Remember, this Move sequence does not insert a row or column into the spreadsheet. It replaces the contents of the destination cells. The prior information in cell A14 was replaced.

A key feature of the process you just completed is that the cell references are NOT adjusted as they are when you copy or fill a cell.

⌘G — The Goto Command.

U1 [cr] — You want to see the right portion of the spreadsheet you have created.

You can see that cell T4 is now empty.

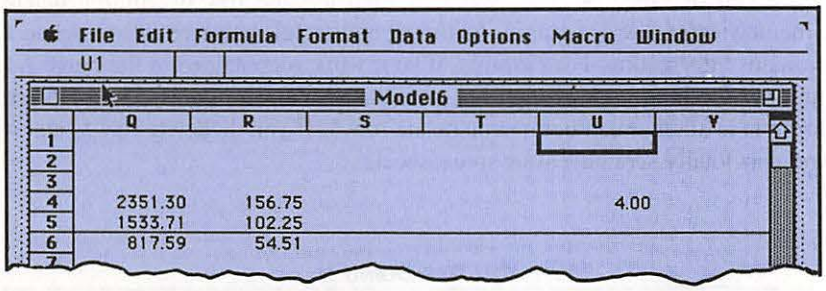


Figure 11.46
You can see that cell T4 is empty.

You should also notice that cell U4, which contains the example of the COUNT function, now displays 4.00.

Position the mouse pointer on cell U4 and click the mouse button. — Move the cursor to cell U4.

The COUNT function is now counting the occupied cells in the range A4:B14. The cell that anchored the range of cells being counted was moved, and the anchor moved with it! You must always be careful when moving cells (as compared to copying cells) to prevent this type of change to your model.

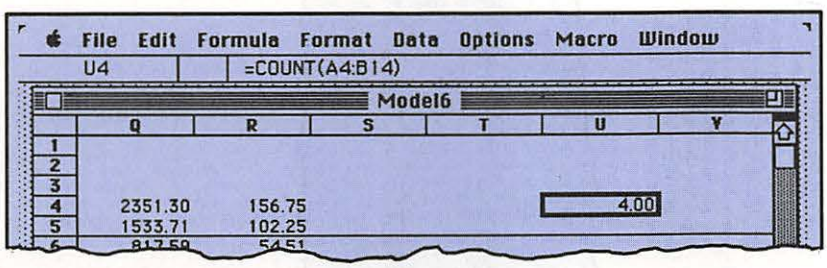


Figure 11.47
The count function in cell U4 has changed the range of cells being counted to A4:B14.

Move the mouse pointer to the edit line. — You are going to change the argument of the Count function.

Select the range definition on the edit line. — You are going to change A4:B14 to read B4:T4.

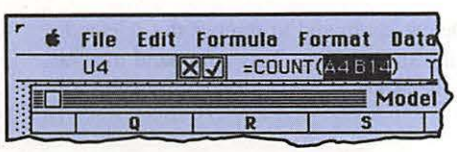


Figure 11.48
Select the range reference on the edit line.

B4:T4	Enter the new range into the formula.
[ENTER]	Enter the new formula into the cell. The count will return to 17.

11.13 DELETING EXTRA ROWS OR COLUMNS

After you have moved a cell or range of cells, you may then use the row or column delete command to remove the now extra row or column. You must be careful, however, not to delete a row or column that contains information. For example, if your work is contained in the range A1 through H20 and you move the range A5 through F5, you must make sure that G5 and H5 are not referred to by a formula in another cell before you delete row 5. If you do delete row 5, and it is referenced, then you may totally scramble your spreadsheet.

What To Do	*Why You Are Doing It*
Move the mouse pointer to the S column label box.	You are going to select the complete column.
Click the mouse button.	Select column S of the spreadsheet. This is the column you want to delete.

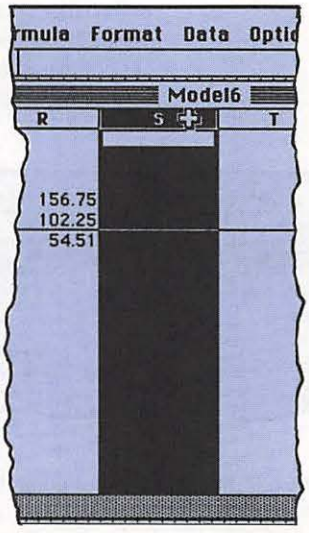


Figure 11.49
The S column has been selected.

Pull down the Edit menu.	The Delete command is, like the Insert command, located on the Edit menu.
Drag the cursor down to select the Delete command, then release the mouse button.	Execute the Delete command to remove the selected column from the spreadsheet. This command may be executed with the ⌘ key.



Figure 11.50
The Delete command has been selected.

After you release the mouse button, the S column will be removed from the spreadsheet. All columns to the right will be moved one column to the left.

Move the mouse pointer to cell T4 and click the mouse button.

Move the cursor to cell T4. The Count function now occupies this cell.

Notice that the range in the COUNT function has been adjusted from B4:T4 to B4:S4. Excel knows that a column has been removed from the range, and it is adjusting for this fact.

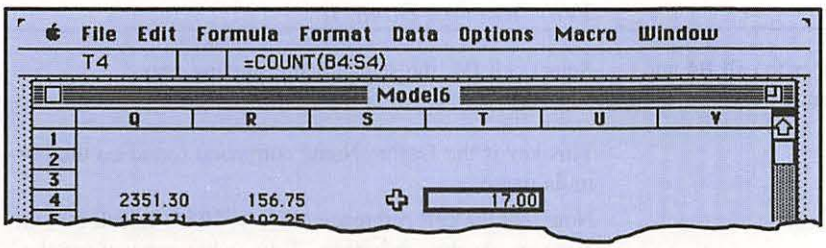


Figure 11.51
The count function has been adjusted to take into account the deleted column.

⌘←

Move the cursor to cell A1.

Pull down the File menu, select Save As, then release the mouse button.

You are going to save the edited version of this spreadsheet with a new name.

Model7

Name this spreadsheet "Model7."

Click on the SAVE button.

Execute the Save procedure.

11.14 NAMED RANGES

You have already had some exposure to the named range feature of Excel. You defined a range in Chapter 9 for input purposes. The ability to assign a name to any range is a useful feature of Excel. If the named range is a single cell, then you may use the name of the cell in a formula rather than the cell address. In a similar fashion, if the named range is a range, then you may use the name of the range in a formula when it is appropriate.

This feature lets you do several things. First, you can internally document the spreadsheet you are creating. You can make the formula for the Profit in cell B7 read =(Sales_Vol–Costs) rather than (B4–B5). In several weeks, which of these two will be easier to interpret?

By using named ranges you will be able to enter the range name directly into a formula or a command that requires it by using the Paste Name command found on the Formula menu. This can be easier than trying to remember the cell addresses. You are also able to use the Apply Names command to replace cell addresses with the defined range names.

11.15 DEFINING AND USING RANGES

Remember, to define a range, you first select it. Then you use the Define Name command found on the Formula menu. You will see that you may use the ⌘L key as a shortcut to pulling down the Formula menu to access the Define Name command.

What To Do	*Why You Are Doing It*
Move the mouse pointer to cell B4 and click the mouse button.	Select cell B4, the sales for the starting year.
⌘L	This key is the Define Name command found on the Formula menu. Note that the cell reference reads =$B$4. Recall that the $ means absolute reference. Thus, wherever you use the range name you are about to create, it will always refer to cell B4.

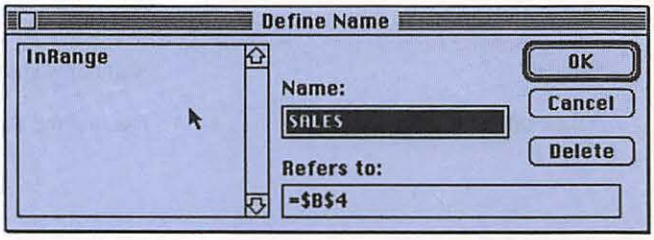


Figure 11.52
The Define Name dialog box. Note that the referenced range reads =$B$4.

Sales_Vol	Type the name "Sales_Vol" for the range name. **Range names may be up to 255 characters long. They must start with a letter of the alphabet, and may then include letters, digits (0..9), an underscore character (_) or a period (.). Spaces are not allowed.**

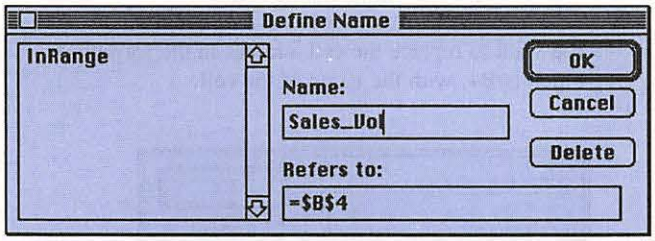


Figure 11.53
The name of this cell will be Sales_Vol.

Click on OK.	Complete this range name definition.
↓	Move the cursor down one cell to B5.
⌘L	The Define Names command.
Costs	Enter Costs as the name for cell B5.
Click on OK.	Complete the range name definition.
Select B4 in the formula on the edit line.	You are going to replace this cell reference with its range name.

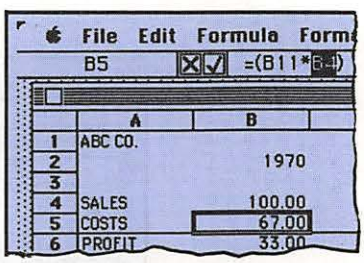


Figure 11.54
Cell B4 has been selected.

Pull down the Formula menu.	The Paste Name command, found on this menu, will let you insert range names into formulas.
Drag the mouse down and select Paste Name.	This command is only active when you have defined names. You can see that it does not have a command key equivalent.

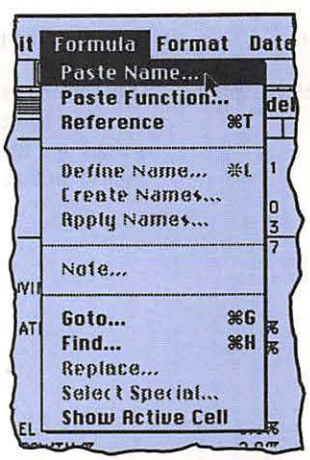


Figure 11.55
The Paste Name command has been selected.

Release the mouse button.

Activate the Paste Name dialog box.

Click on Sales_Vol.

You want to replace the cell address in the formula, which is B4, with the name of the cell.

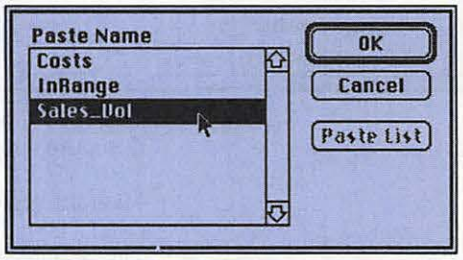


Figure 11.56
The range name Sales_Vol has been selected.

Click on OK.

Replace B4 with the selected range name.

[ENTER]

Press the enter key to complete the editing of the cell's formula.

You can see that the value displayed has not changed, but that the edit line now displays Sales_Vol in the formula, rather than B4.

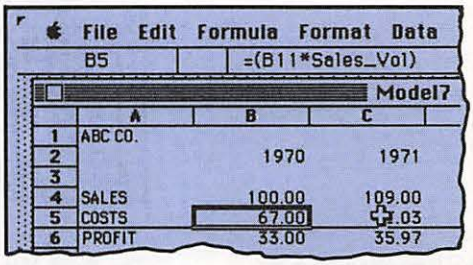


Figure 11.57
The formula now uses the range name, rather than the cell address.

Editing each cell in this fashion can be time-consuming, as well as cumbersome. Fortunately, you can have Excel substitute appropriate range names for cell addresses.

↓

Move the cursor down to cell B6, which contains the formula for the profit.

Pull down the Formula menu.

You are going to use a command from this menu.

Drag the mouse down and select Apply Names.

This command will replace cell addresses with a matching range name. Thus, if cell A1 is named "Start", and is used in a formula, this command will replace A1 with "Start" in that formula.



Figure 11.58
The Apply Names command has been selected.

Release the mouse button.

Execute the Apply Names command. This command does not have a command key equivalent. You will now see the Apply Names dialog box.

You can see that the first name of the names list, Costs, is the only one selected. If you execute the command now, only references to cell B5 will be replaced by the range name Costs. References to cell B4, which has been named Sales_Vol, will not be changed.

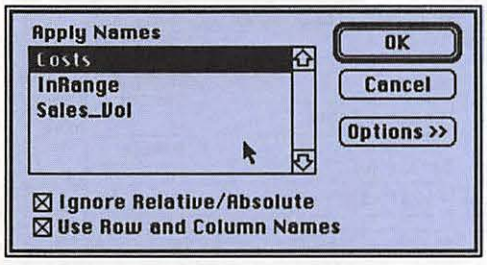


Figure 11.59
The initial Apply Names dialog box.

[SHIFT]

Hold down the Shift key.

Move the mouse to the last name in the list and click the mouse button.

Since the Shift key is held down, the selection will be stretched from its original location to where you clicked the mouse. You are selecting all three range names.

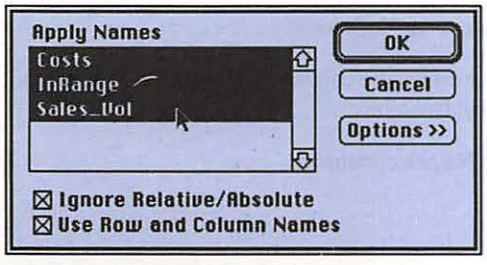


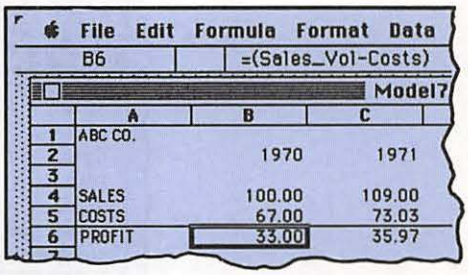
Figure 11.60
All the names in the list of range names have been selected.

Click on OK.

Execute the Apply Names command.

After a brief pause, the formula in cell B6 will change. The cell references will now be replaced by the appropriate range names.

Figure 11.61
The formula in cell B4 now uses the range names, rather than the cell addresses.



Select the range C15:H17.

This is the lookup table you created for determining the sales growth rate and the cost percents.

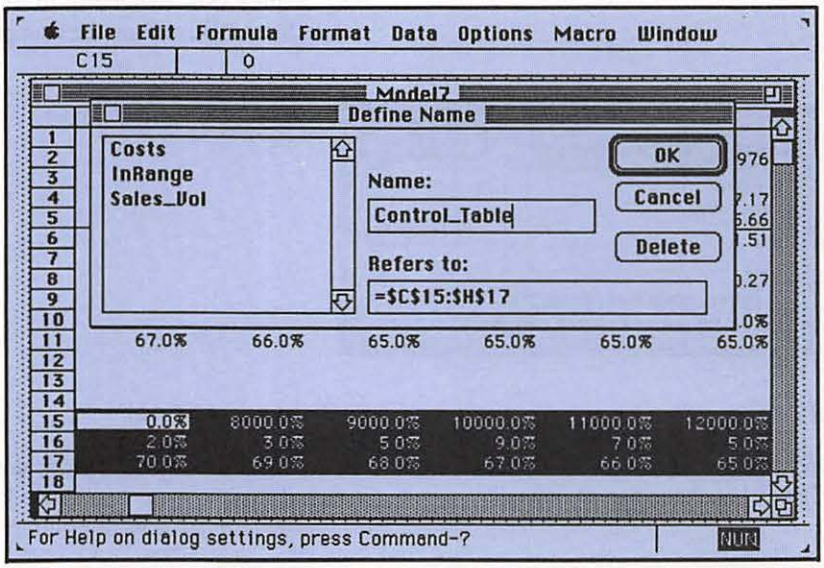
⌘L

The Define Names command.

Control_Table.

Name this range Control_Table.

Figure 11.62
The range C15:H17 is being named.



Click on OK.

Complete the name definition.

Select the range C15:H15.

This range overlaps the control table range. It is the first row of the control table.

⌘L

The Define Names command.

Sales_Control.	Name this range Sales_Control.

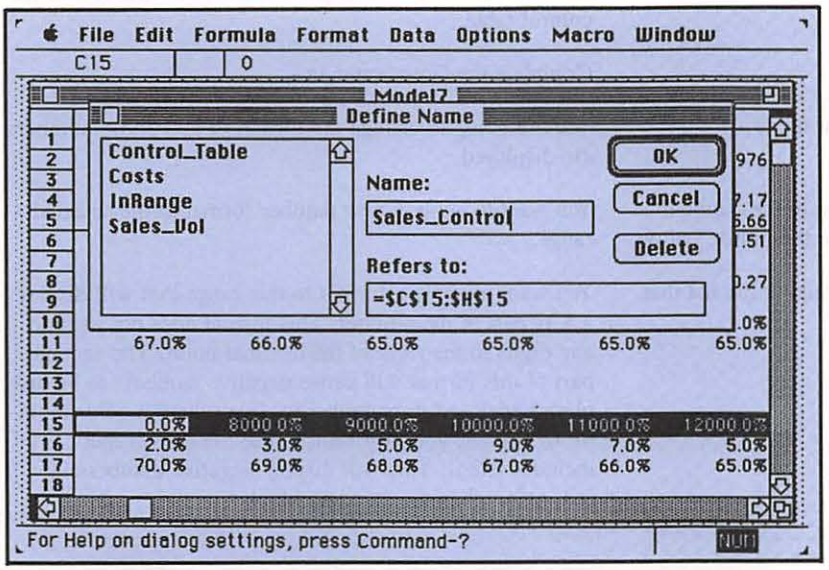


Figure 11.63
The first row of the Control_Table is given its own name.

Click on OK.	Complete the name definition. Once again, note that this range overlaps the control table range.
⌘G	You want to Goto a defined range.
Click on the name Control_Table.	You want to Goto the Control_Table range.
Click on OK.	Complete the Goto command. The control table range should now be selected.
Pull down the Format menu.	You are going to change the format of how these numbers are displayed.
Drag the mouse down to the Number command and release the mouse button.	You want to apply a new number format to the selected range.
0%	You want to continue to have these values displayed in percent format, but you do not want to have a digit displayed to the right of the decimal point. If desired, you may use the scroll bar at the right side of the format list to locate this format, then click the mouse on it to select it.
Click on OK.	Apply this new format to the selected range. The sales dollar amounts in row 15 of the control table are also formatted to percent. This is not desirable.

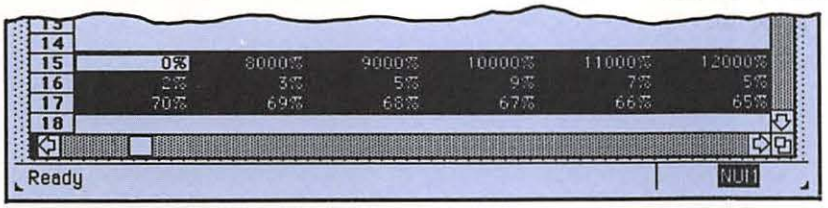


Figure 11.64
The first row of the control table is not properly formatted.

⌘G	The Goto command.
Click on the name Sales_Control.	You will reformat this range, which is the first row of the control table.
Click on OK.	Complete the Goto command.
Pull down the Format menu.	You are going to change the format of how these numbers are displayed.
Drag the mouse down to the Number command and release the mouse button.	You want to apply a new number format to the selected range.
Click on the first format in the list that starts with a $.	You want to apply a format to this range that will display a $ as part of the number. This format does not include any digits to the right of the decimal point. The second part of this format will cause negative numbers to be displayed enclosed in parentheses. If you have a color monitor or printer, you may want to use the format that includes [Red]. This will display negative numbers in red, rather than the standard black.

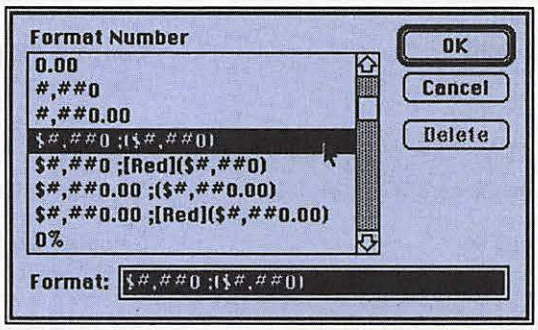


Figure 11.65
The currency for no digits to the right of the decimal point has been selected.

Click on OK.	Apply the format to the selected range. The prior formatting for the range is overridden, and the currency format is applied to the cells. Since the Sales Control range is not the exact same range as the Control Table range, the cells in rows 17 and 18 do not have their formatting changed.
Click on the Select All box.	Select the complete spreadsheet.
Pull down the Formula menu, select the Apply Names command, then release the mouse button.	You want Excel to replace all the cell references with their appropriate defined range names.
Click on the first range name in the list, press and hold the [SHIFT] key, then click on the last name in the list.	You want to apply all possible names to the selected spreadsheet.

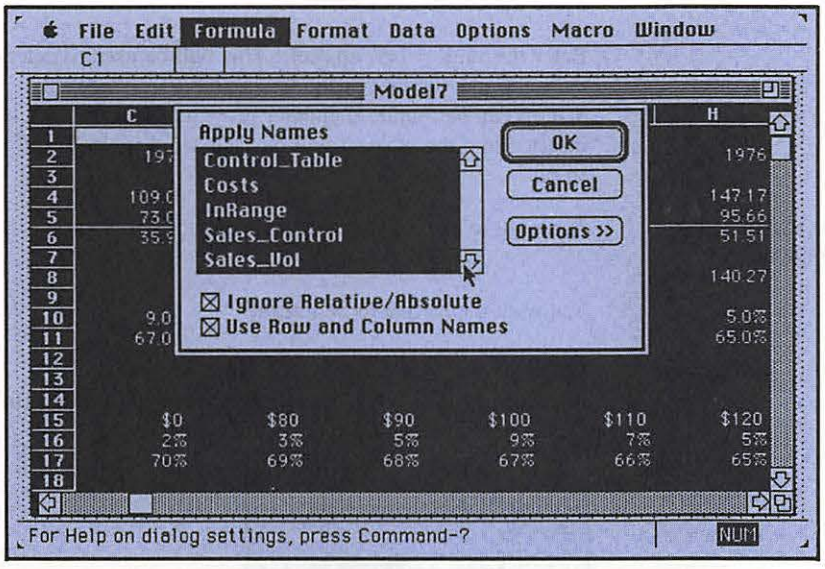


Figure 11.66
All the range names in the name list have been selected.

Click on OK.	Execute the Apply Names command.
⌘G	The Goto Command.
A1 [cr]	Move the cursor to the A column.
Pull down the File menu, select Save As, then release the mouse button.	You are going to save the edited version of this spreadsheet with a new name.
Model8	Name this spreadsheet "Model8."
Click on the SAVE button.	Execute the Save procedure.

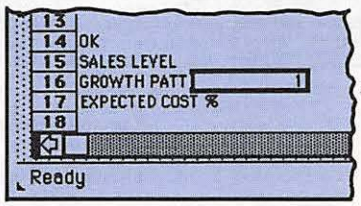
11.16 CHANGING THE WIDTH OF A COLUMN

There are many times when you will want to have a column be wider than the default width. At other times, you may want a column to be narrower. This is a simple task.

What To Do	*Why You Are Doing It*
Move the mouse pointer to cell A16 and click the mouse button.	Move the cursor to cell A16.
GROWTH PATTERN 1 [ENTER]	Enter this text into cell A16.

→	Move the cursor to cell B16.
1 [ENTER]	Enter the value 1 into this cell. This will be used to determine the row number of the lookup table in which this pattern can be found. If another growth pattern is inserted into the table, it will be assigned a value 2, and so on.
Pull down the Format menu, select number, then release the mouse.	You want to change the default format for cell B16.
0	You want the format to be integer.
Click on OK.	Execute the format change. Because cell B16 is no longer empty, the text in cell A16 cannot be completely displayed.

Figure 11.67
The complete contents of cell A16 are no longer displayed.

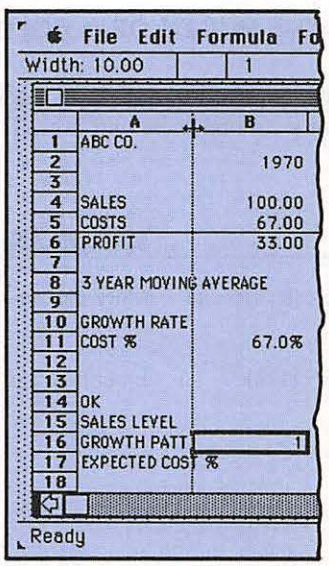


Move the mouse pointer to the vertical line separating the A and B border cells.	The lines separating the border cells can be used to change the width of columns. When the cursor is in the proper location, it will change its appearance (Figure 11.68).
Press and hold the mouse button.	When you press the mouse button, a line will extend down the window at the current column width. The actual value for the width will be displayed at the left end of the edit line.



Figure 11.68
The cursor changes shape, indicating that it may be used to change the width of a column.

Figure 11.69
The mouse button has been pressed. The current column width is displayed on the edit line, and the actual column can be seen on the display.



Drag the mouse right until the width reads 14.00 on the edit line.

You want to change the width of this column to 14.00.

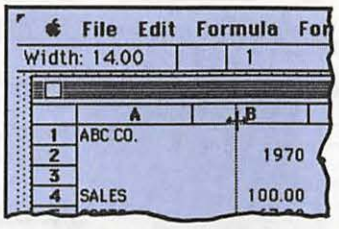


Figure 11.70
The width of the column is going to be set to 14.

Release the mouse button.

The column will stretch to the newly defined width.

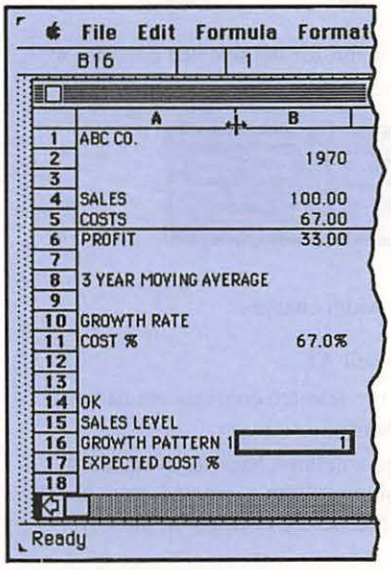


Figure 11.71
The A column has been made wider. If you turn on the spreadsheet gridlines (the Display command on the Options menu), the change in column width will be more obvious.

Move the mouse to the border of the B column.

You are going to select several columns of the spreadsheet.

Press and hold down the mouse button, drag the mouse right to column P, then release the mouse button.

Select columns B through P. The A column is not selected. It has its own width.

Pull down the Format menu.

This menu has an option that lets you control the width of columns. You could have used it to change the width of column A, rather than stretching the column.

Select the Column Width option.

You want to change the width of all the selected columns. Note that the standard column width is 10.

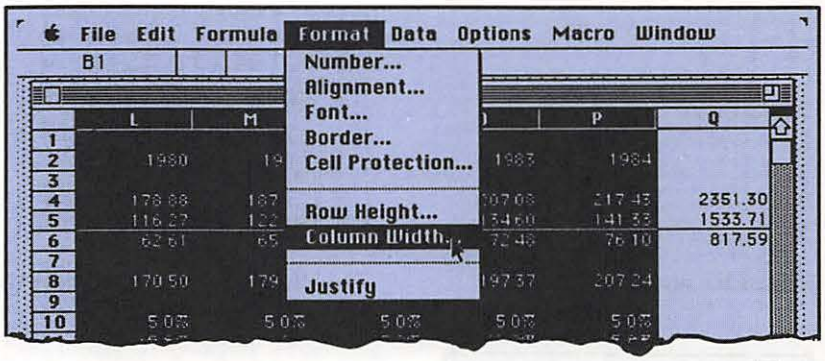


Figure 11.72
The Column Width command has been selected.

7

Change the column width for the selected columns to 7.

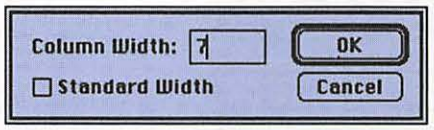


Figure 11.73
The Column Width dialog box. Note that the Standard Width box is not checked.

Click on OK.

Execute the column width change.

⌘←

Return the cursor to cell A1.

You can see that all the selected columns are narrower than they were originally.

If you want to change a column back to its standard width, select the Column Width command, then check the Standard Width box before clicking on the OK button.

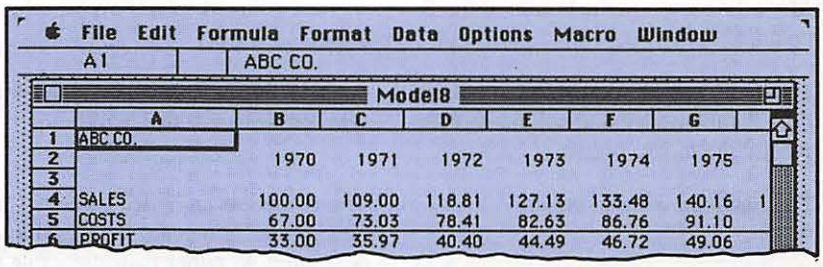


Figure 11.74
The columns have been made narrower.

It is possible to hide a column by making it's width 0.

Move the mouse pointer over the separator line in the border between columns D and E.

You are going to hide column D by making its width 0.

Press and hold the mouse button.

Select this column border.

Drag the separator left until the width reads 0.

When the width of a column is zero, the lines showing the current column width will disappear from the window.

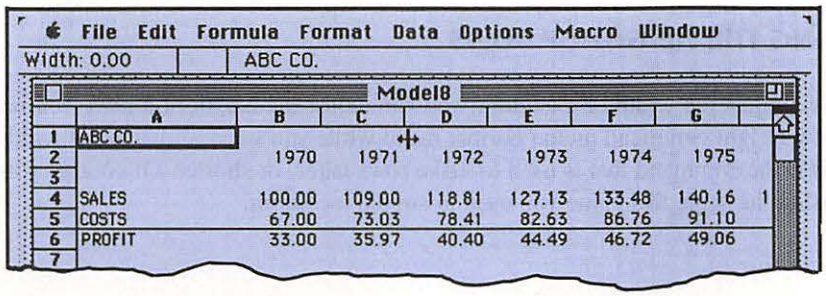


Figure 11.75
The edit line tells you that the width of the column is being set to zero.

Release the mouse.

The D column will disappear. Note that this has no effect on the computations.

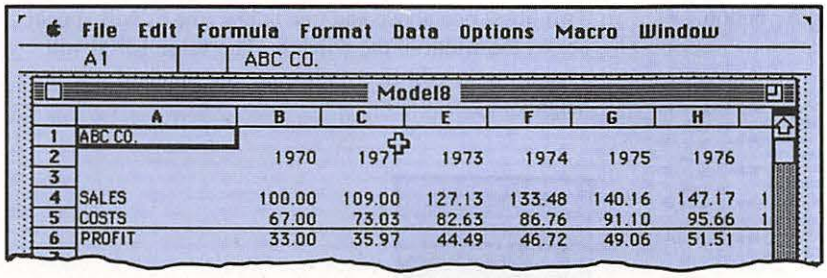


Figure 11.76
The D column has been hidden.

Select columns C and E.

Now you want to get the column back. Select these two columns by clicking in the border above the C column, and dragging the mouse right to the E column.

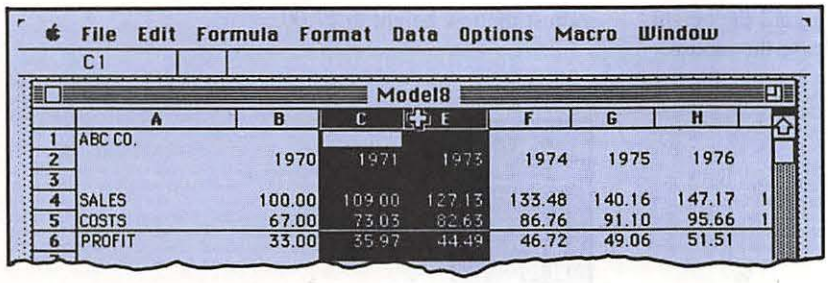


Figure 11.77
By drag selecting columns C and E, you have also selected column D.

Pull down the Format menu, select Column Width, then release the mouse button.

You are going to change the column width for the selected columns. The hidden column is in the range of the selection.

7

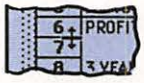
You are going to set the columns to 7, just as before.

Click on OK.

When you click on the OK button, the hidden column will return, since it's width has also been set.

11.17 CHANGING THE HEIGHT OF ROWS

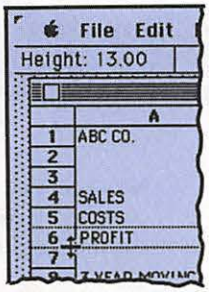
Figure 11.78
Note the position of the mouse pointer.



Just as you are able to adjust the width of a column, you can adjust the height of a row. You no doubt noticed the Row Height command on the Format menu while you were adjusting the width of the columns. This is the command that is used to make rows taller, or shorter. Of course, you may stretch a row using the same technique you used to stretch a column.

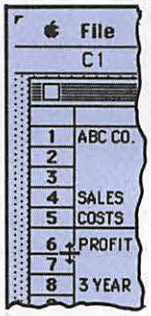
What To Do	*Why You Are Doing It*
Position the mouse pointer over the line separating the 6 and 7 border cells.	You want to adjust the height of row 6. The mouse pointer will change to the stretch tool.
Press and hold the mouse button.	Two lines, one above and one below row 6, will appear across the width of the window. The value 13.00 will appear on the edit line, indicating the standard row height.

Figure 11.79
The standard row height is 13.00.



Drag the mouse down until the height reads 17.00, then release the mouse.	Adjust the row height to 17.00.

Figure 11.80
The row height has been adjusted. You can see the additional row height space by comparing the border cell for row 6 with the other border cells, or by turning on the spreadsheet's gridlines.



11.18 CHANGING THE TYPE FONT

Like most Macintosh applications, Excel gives you full access to the different typefaces and type styles. If you want, you can make parts of the spreadsheet boldfaced, and other parts in a different type font.

What To Do	*Why You Are Doing It*
Click on the A column border cell.	Select the complete A column.

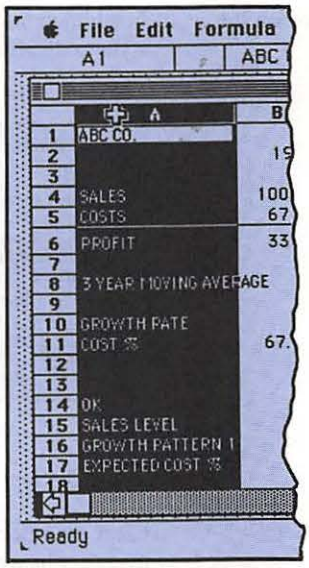


Figure 11.81
You are going to change the type style of all the cells in the column A.

Pull down the Format menu.	You have seen that this menu is used to change the appearance of the spreadsheet.
Drag the mouse down to the Font command.	You are going to change the font.

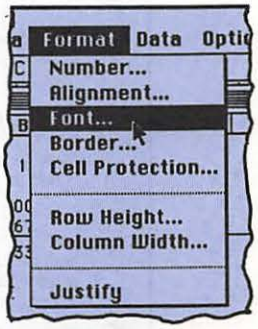


Figure 11.82
The Font command has been selected.

Release the mouse button.	When you release the mouse button you will get the Font dialog box.

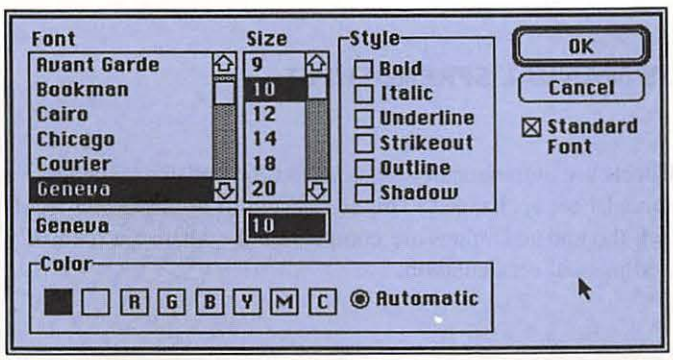


Figure 11.83
The Font dialog box.

Scroll the font list in the left window until you see Times.	You are going to change the type font for column A to the Times font.
Click on Times in the font list.	Select the Times font.
Click on Bold in the style box on the right.	In addition to changing the font, you want to change the style to display the text in the column in boldface.

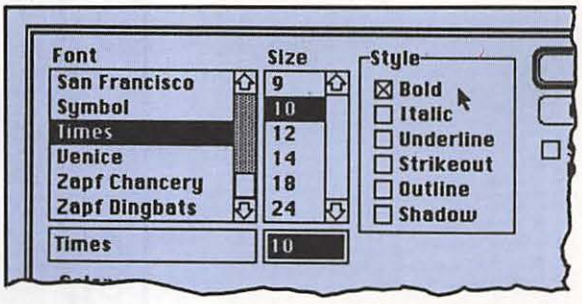


Figure 11.84
Changes have been made to the Font dialog box.

Click on OK.	Apply the font changes to the selected cells.
←	Clear the selection. You can now easily see the effect of the font change.

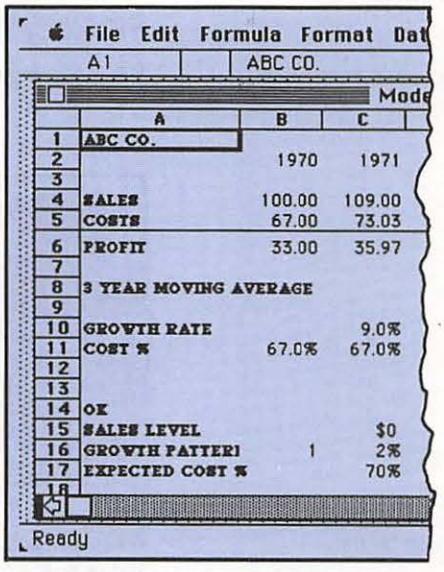


Figure 11.85
The type font for column A has been changed to Times Bold. You did not change the point size.

11.19 AUTOMATIC VERSUS MANUAL SPREADSHEET RECALCULATION

All the value cells of Excel spreadsheets are automatically recalculated (or updated) whenever a single cell entry anywhere in the spreadsheet is changed. This is referred to as automatic recalculation. The opposite state, in which the updated values are computed only when you manually tell the spreadsheet to do so, is called manual recalculation.

As the model you create or manipulate gets larger, the time the program needs to recalculate all the value cells can become correspondingly large, measurable in seconds or minutes, rather than in tenths of seconds. This delay can be bothersome. Excel lets you turn off the automatic recalculation feature. With automatic recalculate off, you may freely enter values and formulas into cells with no recalculation delay.

When you use the spreadsheet in this fashion, however, the values displayed will not be correct until recalculation occurs. To remedy this, you must give the manual command to cause the program to recalculate the spreadsheet values.

11.20 CHANGING THE RECALCULATION STATUS

You are now going to change the recalculation mode from automatic to manual. Remember, manual recalculation means that you cannot be sure that the spreadsheet will be displaying accurate numbers until after you tell it to recalculate.

What To Do	*Why You Are Doing It*
Pull down the Options menu.	Recall that this menu lets you control the print area and display features. It also lets you control the recalculation status.
Drag the mouse down to the Calculation command.	This command lets you turn off and on automatic recalculation. It does not have a command key equivalent.

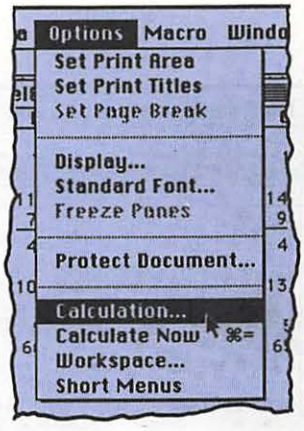


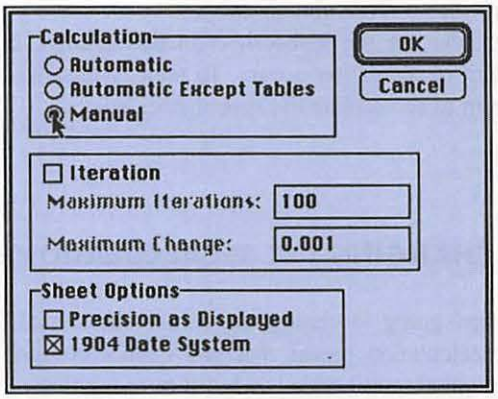
Figure 11.86
The Calculation command has been selected.

Release the mouse button.	You will see the Calculation dialog box when you release the mouse button.

Click on Manual in the calculation box.

The spreadsheet will recalculate only when you tell it to after you check the Manual option. This will save you some time when editing large spreadsheets.

Figure 11.87
The Manual option has been selected in the Calculation dialog box.



Click on OK.

Put away the dialog box, making the change in the calculation status.

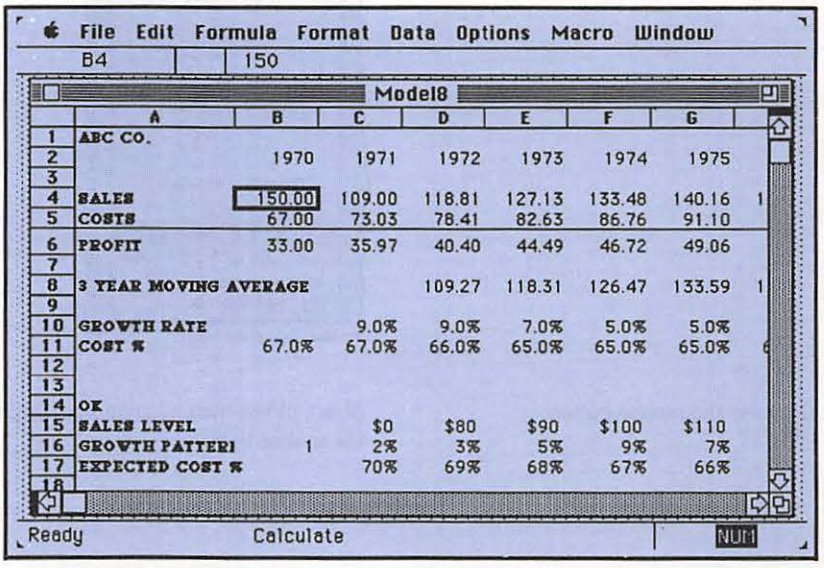
Move the mouse pointer to cell B4 and click the mouse button.

Move the cursor to cell B4.

150 [ENTER]

Enters 150 into sales for the first year. Notice that no other numbers change. This is the result of setting the spreadsheet to manual recalculation. At the same time, notice that "Calculate" appears at the bottom of the display on the status line. This is an indicator that the spreadsheet must be recalculated to display its values accurately.

Figure 11.88
The spreadsheet has not updated its values since it is set to manual recalculation. Excel is telling you not to trust the values displayed by showing the word Calculate at the bottom of the display.



Pull down the Options menu.

Look at this menu. You can see that there is a command called Calculate Now. This command is used to tell Excel to recalculate the spreadsheet. It can be executed by pressing the ⌘= key.

Release the mouse button.

Do not execute the command by using the menu.

⌘=	Hold down the command key and press the equals sign. This forces the spreadsheet to recalculate all the values.

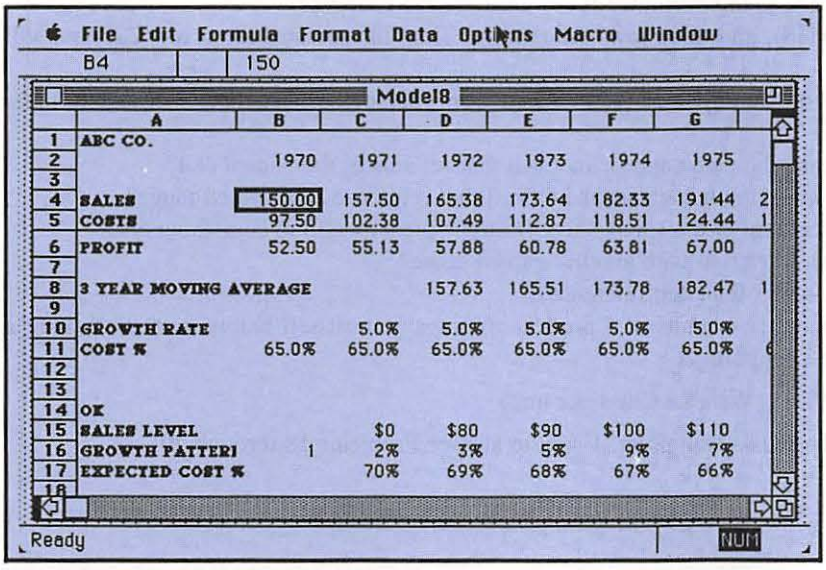


Figure 11.89
The spreadsheet has recalculated. The word Calculate is no longer displayed on the bottom of the screen since the spreadsheet is up to date in its recalculations.

Pull down the Options menu, select calculation, then release the mouse button.	You are going to return the calculation mode to automatic.
Click on the automatic button.	Return the recalculation status to automatic by clicking on automatic in the Calculation dialog.
Click on OK.	Put away the dialog box.
Pull down the File menu, select Save As, then release the mouse button.	You are going to save the edited version of this spreadsheet with a new name.
Model9	Name this spreadsheet "Model9."
Click on the SAVE button.	Execute the Save procedure.
⌘Q	Execute the Quit command to leave Excel and return to the Macintosh's desktop.

EXERCISES

1. If rows 1 through 18 are displayed on the spreadsheet window, and you split the window horizontally between rows 9 and 10, which rows will be in the top pane, and which in the bottom pane?
2. Can you split the Excel spreadsheet horizontally and vertically at the same time?
3. If you format the cell B4 to display two digits to the right of the decimal point, what value will be displayed if you enter 10.455 into the cell? What if you enter 10.456? What if you enter 10.454?
4. If you format the cell B4 to display no digits to the right of the decimal point (i.e., integer format), what value will be displayed if you enter 189.93 into the cell? What if you enter 189.43? What if you enter 189.99?
5. If a cell contains the formula =SUM(C10:C22), and two rows are inserted at row 17, what will the formula read after you insert the rows?
6. What is the difference between moving a cell and copying a cell?
7. What special character must be added to a cell formula to make a cell reference copy in absolute mode, rather than relative mode?

8. Must the special character you add to a cell formula for absolute mode copies be placed in front of the column name and the row number, just the column name, or just the row number?
9. If a cell contains the formula =HLOOKUP(G22,L1:P5,3), and a row is added to the spreadsheet at line 2, what will this formula read? Will any changes have to be made to this formula? If so, what are the changes?
10. If a cell contains the formula =SUM(M20:M45), and three rows are removed from the spreadsheet at row 29, how will this formula change?
11. If a cell contains the formula =SUM(E6:E10), and column G is deleted from the spreadsheet, how will this formula change?
12. If you assign a name to a cell, how do you make the name appear in a cell that references the named cell?
13. If you assign a name to a range, how do you make the name appear in a cell that references the named range?
14. Is is possible to change the width of a single column of the spreadsheet from the preset width to something else?
15. Must a named range be a unique range, or can it overlap with another named range?
16. What is the advantage to using named ranges rather than cell references?
17. Break-even analysis is used to compute the number of units of a product a company must sell before it starts making a profit on the item. The formula for the break-even point is

    Break-even Point = Fixed Costs / (Selling Price - Variable Costs per unit)

    Create a spreadsheet as follows to compute the break-even point. Use it to answer Problems 18 through 20.

    (NOTE: xxxxx represent numbers you enter.)

    ```
    FIXED COSTS
    ADMINISTRATIVE    xxxxx
    ADVERTISING       xxxxx
    INSURANCE         xxxxx
    OTHER             xxxxx
                      --------
    TOTAL             xxxxx

    VARIABLE COSTS PER UNIT
    LABOR             xxxxx
    MATERIAL          xxxxx
    OVERHEAD          xxxxx
                      --------
    TOTAL VARIABLE
    COSTS PER UNIT    xxxxx

    SELLING PRICE
    PER UNIT          xxxxx

    UNITS NEEDED TO SELL TO BREAK-EVEN   xxxxx
    ```

18. What is the break-even point in Problem 17 for the following costs:

Administrative	400.00
Advertising	175.00
Insurance	45.00
Other	22.00
Labor/unit	1.25
Material/unit	3.75
Overhead/unit	0.67
Selling Price/unit	7.22

19. What is the break-even point if Administrative costs drop from 400.00 to 350.00?
20. If administrative costs remain at 350.00, but labor/unit increases to 1.45, what will the break-even point be?

21. Create a spreadsheet to compute the cost of a picnic. On the menu are (1) hamburgers, (2) hamburger buns, (3) potato salad, (4) bean salad, (5) chocolate cake, and (6) lemonade. You have seven pounds of hamburger, costing $2.49 per pound, and with this you can serve 25 people. Twenty-four hamburger buns cost $4.25. There is also a large bowl of potato salad, which costs $5 and will serve 15 people, and a medium bowl of bean salad, which costs $8 and will serve 10 people. There is a cake big enough to serve 30, and it costs $12. Finally, you have three gallons of lemonade, which is 48 servings and which costs $3. How much does a meal of one hamburger with bun, a serving of bean salad, a slice of chocolate cake, and two servings of lemonade cost?
22. What will be the cost if the person wants potato salad instead of bean salad?
23. How much would a meal cost if a person asked you for one of everything?
24. If you sold everything at a mark-up of 25 percent over your cost, what is your selling price for each item on the picnic menu?
25. If you manage to sell everything at the 25 percent mark-up, what is your gross income (total income from sales)? What is your net income (gross income less expenses)?
26. What is your net income if you sell the following at 25 percent mark-up and everything else at 5 percent below your cost:

    18 hamburgers with buns
    2 hamburgers without buns
    12 servings of potato salad
    10 servings of bean salad
    24 slices of cake
    41 servings of lemonade

CHAPTER

BUILDING MACROS WITH ELECTRONIC SPREADSHEETS

12

CHAPTER OBJECTIVES:

Upon completion of this chapter, the student will:

- **Create and execute a command macro.**
- **Create and use a function macro.**
- **Create a macro to add a menu item to the Excel menu bar.**
- **Make a macro load and execute automatically when the spreadsheet is loaded.**

12.1 WHAT IS A MACRO?

Very simply put, a macro is a program. Macros are stored up commands, keystrokes and customized menus. In effect, you are storing the necessary actions in a separate macro spreadsheet that is connected to the spreadsheet itself. You then tell Excel to execute this sequence of stored instructions on demand. Your macros can manipulate the cells of the spreadsheet, use information found in them, format cells, print spreadsheets, and even create new menu bar entries or a new spreadsheet. You can write a macro program to automate the performance of any task that Excel can do.

12.2 WHY CREATE A MACRO?

You repeat many tasks when working with electronic spreadsheets. One action you perform with relative frequency is printing the spreadsheet. While this is not a difficult task, it is possible to automate the selection of print areas and the execution of the print command itself. You may also find it beneficial to take over control of the spreadsheet at times and not require the user of a model you have created to know a great deal about how to use Excel, or how to build spreadsheets. Again, automating spreadsheet functions through the use of macros is the answer.

A macro can be created to perform a variety of tasks, as simple or as complex as you desire. A macro may contain commands such as the Goto command, cursor movement commands such as moving the cell pointer with the arrow keys, cell entries, or anything else you might type from the keyboard. When you tell Excel to perform a particular macro, it executes the commands and keystrokes that have been stored for that macro one at a time. This type of macro is called a Command macro, since it is a sequence of stored commands.

You may also create a second type of macro, called a Function macro. You have used functions already. You have used functions such as SUM, AVERAGE and HLOOKUP. The function macro is a function that you create. For example, you may have a complex formula that you want to be able to use in several spreadsheets. You could put the formula into a function macro, and then use it whenever you want.

12.3 CREATING MACROS TO EXECUTE SIMPLE TASKS

Both command and function macros are placed in the cells of a special type of spreadsheet, called a Macro Sheet. Thus, to create a macro for a spreadsheet you must first create a macro sheet. The advantage of placing the macros on a separate document is that they may be used with multiple spreadsheets. All you have to do is keep cell references (or range names) consistent among the different spreadsheets.

Once you have created a macro sheet, you enter the commands and actions you want the macro to carry out into the cells of the macro sheet. After you have typed into the cells the actions you want performed, you may tell the macro sheet the name of the macro. This is done with the named range feature. From then on, when the spreadsheet is active, all you need to do is enter the macro name to execute the macro.

12.4 RETRIEVE THE SPREADSHEET

Before you begin to make a macro, start Excel and load the spreadsheet that you completed in Chapter 11. To do this, boot your Macintosh with a System Start-Up disk, then insert the Excel Program disk into one of the computer's disk drives. If you are using a machine with a hard disk you will not need to insert the Excel program disk into a disk drive. Rather, locate the Excel folder, and open it so you can see the Excel program icon. Place the disk that has your saved model into another one of your Macintosh's disk drives, if you have one available. This disk will be used for saving your work. If you do not have a free floppy disk drive, keep this disk available. You will need it for retrieval and storage.

In these instructions, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and double-click the mouse button. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.

Finally, if you want your work to match the figures in the text, be sure to use the Chooser DA to select a LaserWriter and not an ImageWriter. You may select a LaserWriter even if your computer is not actually attached to one. You will not, however, be able to print if this is the case.

In this section you will, after loading the spreadsheet, name several ranges. This will be done before you begin to actually create the macros. You will see that the macros created in this chapter will make use of the ranges you name.

If you are using a computer with a hard disk, begin here:

What To Do	*Why You Are Doing It*
Locate the icon for the spreadsheet you were working on in Chapter 11 and place the mouse pointer on the icon.	You are going to launch Excel by double-clicking on this icon. It is called Model9.
Double-click the mouse.	By double-clicking on an Excel spreadsheet, the Macintosh will look on all available disks for the Excel application program. If found, it will launch Excel and open the document. If the Macintosh is not able to locate the application program, you will get an error message. If you have the Excel application program on your hard disk, or on a floppy disk currently in one of the computer's disk drives, the program should start, and after a brief wait, the spreadsheet you saved at the end of Chapter 11 will appear.

If you are using a computer that has only floppy disks, then start here:

Locate the icon for the Excel program.	You will launch the Excel application program by double-clicking on it.
Move the mouse to the Excel icon and double-click.	The double-click will launch the application. If you have trouble with the double-click, you may also select the program's icon with a single click, then use the Open option on the File menu, or press ⌘O, the command key equivalent. After a brief wait, Excel will be running, and you will have a new spreadsheet, called Worksheet1, in the window.
Move the mouse to the window's close box.	Remember, the close box is the one found at the left of the title bar.
Click the mouse button once.	Close the worksheet. You are going to open an existing worksheet, and it will be less confusing to work with only one document active.
⌘O	Execute the Open command. This command is found on the File menu. After a brief pause, you will see the Open dialog box.
Click the mouse on the Drive button shown in the dialog box if your disk is not displayed in the dialog box.	The Drive button tells Excel to display the document and folder names found on a second disk currently in your computer. This may be a floppy disk, or a hard disk. If you do not have a second disk in the computer, then the Drive button will be dimmed, and you will not be able to use it. Continue clicking the Drive button until the name of the disk that contains your file appears in the dialog box.
Click on Model9.	You want to open the spreadsheet you named "Model9." By clicking the mouse pointer on the name in the dialog box, you are selecting this document.

Click on the Open button.	Execute the Open command. After a brief pause while the computer reads the spreadsheet, you will see the Excel spreadsheet in the current window. You should remember that the double-click is often a shortcut to the Open command. You could have double-clicked the mouse on the spreadsheet name, rather than selecting it and then click on the Open button in the dialog box.

Before you continue, you are going to create some named ranges. These will be used in the printing macro and the goto macros you are going to create in this chapter.

What To Do	*Why You Are Doing It*
Pull down the Formula menu.	This menu has the Define Name command located on it.
Drag the mouse down to select Define Name.	This command lets you name areas of the spreadsheet. Note that this command can be selected with the ⌘L key.

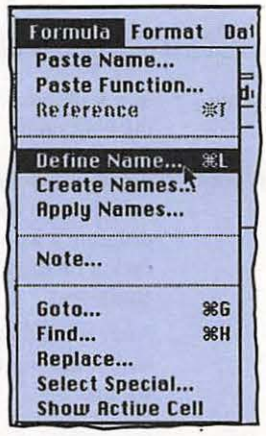


Figure 12.1
The Define Name command has been selected.

Release the mouse button.	Execute the Define Name command. You will see the Define Name dialog box. The text in the Name box should be selected, as it is in Figure 12.2.

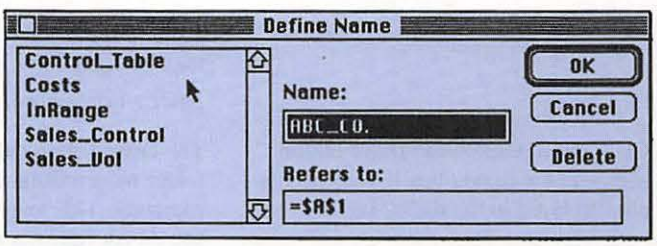


Figure 12.2
The Define Name dialog box.

HOME [TAB]	Type the word HOME into the Name box, then press the TAB key. You are going to name cell A1 "HOME".
=$A$1	If the "Refers to" box does not have this text in it, enter this text.

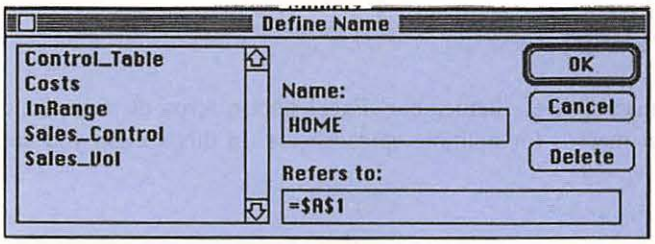


Figure 12.3
The current Define Name dialog box.

Click on the OK button.	Add the name HOME to the list of names.
⌘L	The Define Name command.
The_Model	Enter "The_Model" into the Name box of the Define Name dialog box.
[TAB]	Move the highlight to the Refers to box.
=$A$1:$P$11	You want this name to refer to the range A1:P11. Remember that the dollar signs make this a fixed reference.
Click on the OK button.	Add the name "The_Model" to the list of names.
⌘L	The Define Name command. You are going to define another name.
Model_Control	Enter "Model_Control" into the Name box of the Define Name dialog box.
[TAB]	Move the highlight to the Refers to box.
=$A$15:$H$17	You want this range to refer to the control table and to include the row labels found in column A.
Click on the OK button.	Add the name "Model_Control" to the list of names.
Pull down the File menu, select Save As and release the mouse button.	You want to save the changes to the model before you continue.
Model10	Name the model Model10.
Click on the Save button.	Execute the Save command.

These defined ranges will be used by the macros you are going to create. It is important to note that you do not have to define names in this fashion. You may use the cell addresses if you want. However, if for some reason the range definitions change, you would then have to modify the macro. By using range names in this fashion, the macro will not have to be changed if the ranges change. For example, consider what might happen if three more growth patterns and two more cost percent patterns are added to the range Model_Control. By using named ranges, all you need to do is make sure that the range reference is correct. No changes need to be made in any macro that uses this range.

12.5 CREATE THE MACRO SHEET

You are now ready to create the macro sheet. Remember, Excel puts macros on a separate document so that you may use your macros for multiple spreadsheets. In this section you are creating the special macro sheet.

What To Do	*Why You Are Doing It*
Pull down the File menu.	The File menu contains the New command.
Drag the mouse down to select the New command.	You are going to create a new document. There is no separate New command for macro sheets. All new documents (Spreadsheets, Macro sheets and, as you will see later in the text, Charts) are created with the New command. Note that you may use the ⌘N key to execute the New command, rather than using the pull down menu if you so desire.



Figure 12.4
The New command has been selected on the File menu.

Release the mouse button.	Execute the New command. After a brief pause, the New dialog box will appear.
Move the mouse to Macro Sheet and click the mouse button.	You want to create a Macro sheet. If you fail to do this, Excel will create a new spreadsheet, rather than a new Macro Sheet.

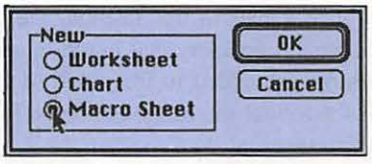


Figure 12.5
The New dialog box. The Macro Sheet button has been selected.

Click the mouse on the OK button.	Create the new Macro sheet. A new window, titled Macro1, will appear.

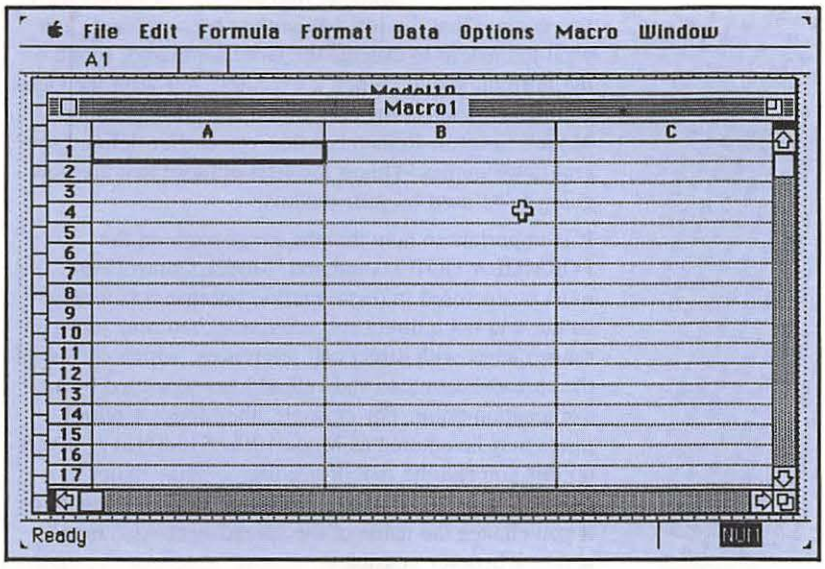


Figure 12.6
The Macro Sheet has been created. You can see part of the Model10 window behind the Macro1 window.

12.6 YOUR FIRST COMMAND MACROS

When you create a Macro, the commands are placed in a column of the Macro sheet. No empty cells are placed between commands, since that will stop the macro's execution. It is also a good habit to place the macro's name into the first cell of the macro.

In this text we are going to place all the macros in the A column of the Macro sheet. This is not, however, a requirement. You may place your macros in any column of the Macro sheet that you want.

In summary, a macro occupies multiple cells in a column of the macro sheet. The first cell should be the name you want to assign the macro. Below this cell are the cells of the macro. All the macro cells begin with an equals sign, indicating that it is a function or computation, and not simply text to be displayed. Each macro command is then a one-word action followed by information enclosed in parentheses. Some of the macro commands are made more readable by separating words with periods. Thus, rather than the command SETPRINTAREA, you will see the command SET.PRINT.AREA.

The first macro that you create will make use of the Goto command found on the Formula menu. Recall that this command, which can be executed with the ⌘G key, lets you jump the cursor to any location or named reference on the spreadsheet. The cursor should be in cell A1 of the Macro1 sheet.

What To Do	*Why You Are Doing It*
Control [cr]	This is the name by which this macro will eventually be known. You should get into the habit of assigning a name to all your macros, since it will make remembering them easier.
	By pressing the return key after entering this text, you will move the cursor to cell A2.

= FORMULA.GOTO ("Model_Control")

Enter this macro command into cell A2. In Figure 12.7 you can see that the [cr] has not yet been pressed. You want the macro to execute the Goto command, found on the Formula menu. When it executes, you want the Goto command to select the area of the spreadsheet called Model_Control. Remember that you earlier defined several range names. This is the first of these that are now going to be used by your macros.

It is important to note that the range name in the FORMULA.GOTO command, Model_Control here, must be enclosed in quote marks, because it is a range name, and not a direct cell reference. You may replace range names with direct cell references, which consist of the spreadsheet name and cell address separated by an exclamation point. For example, the Model_Control range may be entered as Model10!$A$15:$H$17. If you do this you run the risk of needing to make major changes on a macro sheet if range definitions change, or if you change the name of the spreadsheet. Use range names whenever possible.

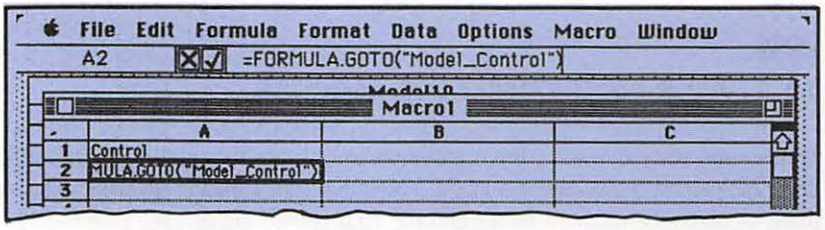


Figure 12.7
Cell A2 on the Macro1 macro sheet will contain this command. The return key has not yet been pressed.

[cr]

Enter the command into cell A2 and move the cursor down to cell A3.

= RETURN() [cr]

Enter the Return macro command into cell A4. All macros must end with either the RETURN or HALT command to return control of the spreadsheet to the user. If you forget this command you will receive an error message from Excel when the macro is executed.

Don't forget to include the parentheses after the RETURN command. Even though there is no information enclosed within them, they must be included. They are part of the command.

[cr]

Move the cursor down to cell A5.

You are going to write a second macro, starting in cell A5. You should **always** separate macros by at least one blank cell. Doing so makes the macro sheet a little bit easier to read. More important, the blank cell halts macro execution. The Cell A4 serves this purpose for us here.

Model [cr]

Name this macro Model. The cursor will move down to cell A6.

= FORMULA.GOTO("The_Model") [cr]

You are placing another Goto macro on the Macro1 sheet. The command is placed into cell A6.

=RETURN() [cr]	Complete this macro. You now have two macros on the Macro1 macro sheet.
[cr]	Move the cursor down to cell A9. Again, you are leaving a blank cell between two macros.
Home [cr]	This macro will be named Home. The cursor is moved to cell A10.
=FORMULA.GOTO("HOME") [cr]	The action of this macro starts in cell A10. The cursor will be moved to cell A11.
=RETURN() [cr]	Complete this macro. You now have three macros on the Macro1 macro sheet.

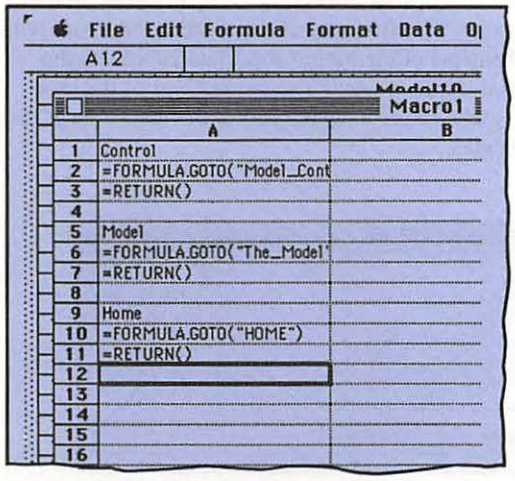


Figure 12.8
The current Macro1 macro sheet has three macros.

Pull down the Window menu, select Model10 at the bottom of the menu, and release the mouse.	Activate the window called Model10. When you release the mouse, the spreadsheet window containing your model will move to the front, on top of the Macro1 window. Remember that you may also click the mouse on any visible portion of an inactive window to activate it.



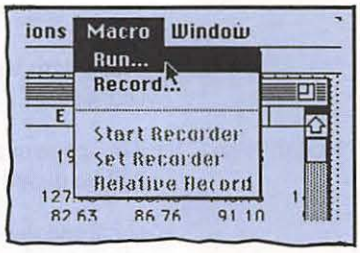
Figure 12.9
Model10 has been selected on the Window menu.

Pull down the Macro menu.	This menu contains the command you need to execute a macro.

Select the Run command.

This is the command needed to execute a macro. Note that it does not have a command key (⌘) equivalent.

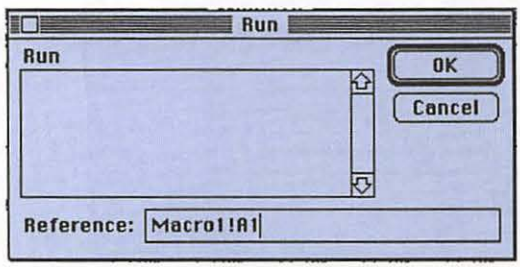
Figure 12.10
The Run command found on the Macro menu has been selected.



Macro1!A1

Enter the location of the macro that you want executed. This location consists of two parts, separated by an exclamation point. The first part of the location, Macro1, tells Excel the name of the Macro sheet that is holding the macro you want executed. The second part of the location, A1, tells Excel in which cell of the macro sheet the macro begins.

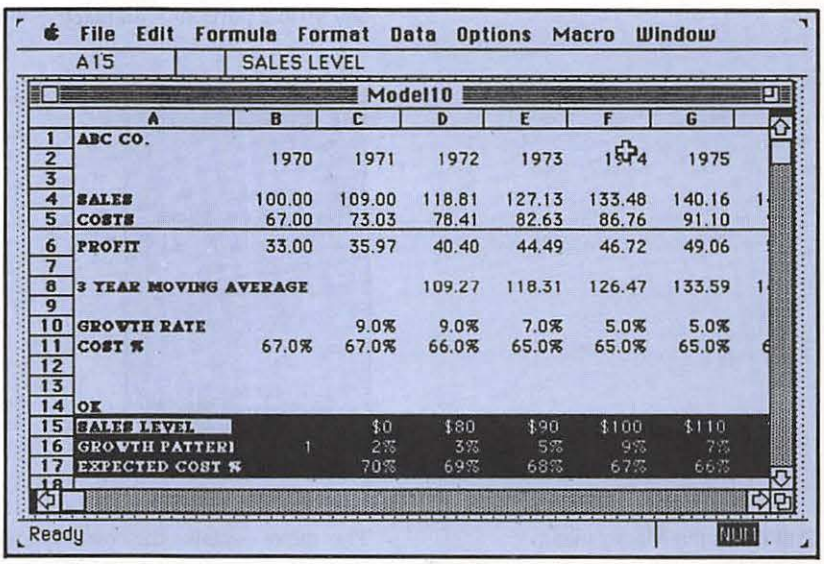
Figure 12.11
The Run dialog box. The macro to be executed has been entered in the Reference box at the bottom of the dialog.



Click the mouse on OK.

Execute the macro. The range Model_Control will be selected.

Figure 12.12
After the macro executes, the named range in the Goto command is selected.



Pull down the Macro menu, select Run and release the mouse.	You are going to execute another macro.
Macro1!A5	You want to execute the second macro you entered, which starts in cell A5.
Click on the OK button.	Execute the macro. The spreadsheet from cell A1 through cell P11 is selected.
Pull down the Macro menu, select Run and release the mouse.	You are going to execute your last macro.
Macro1!A9	The macro that starts at cell A9 of the macro sheet will return the cursor to cell A1.
Click on the OK button.	Execute the macro. The cursor will return to cell A1, which was named HOME.
Pull down the Window menu, select Macro1 and release the mouse.	You want to activate the Macro1 window.
Pull down the File menu, select Save As and release the mouse button.	You want to save this macro sheet.
Macs1	Name this macro sheet Macs1.
Click on the Save button.	Save the macro sheet you have created.

12.7 NAME THE MACROS

Just as you may name cells and ranges of your spreadsheet models, you may name the macros that you create. This will make it easier to run your macros, since you will not have to remember where you have placed them on the macro sheet.

What To Do	*Why You Are Doing It*
Use the mouse to select cell A1 of the Macs1 macro sheet.	You are going to assign a name to the macro that starts in cell A1. This macro will be called Control, since that name already appears in the cell.

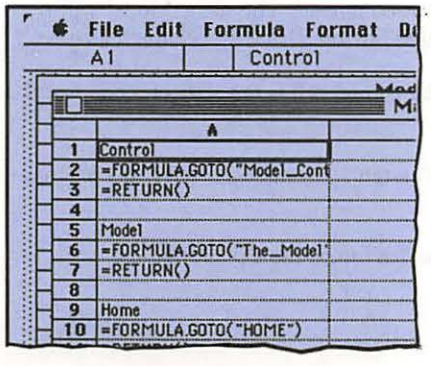


Figure 12.13
The first cell of the macro that you are going to name has been selected.

⌘L	Use the Define Name command. This command is found on the Formula menu. Notice the Define Name dialog box that appears has information that you did not see when you were using this command with a spreadsheet.
	The name "Control" appears in the Name area of the dialog box. Since you have selected cell A1, the refers to portion of the dialog does not need to be changed.
Click the mouse on the Command button.	This button is located in the lower portion of the dialog box in the area labelled Macro. You are doing this to tell Excel that you are defining a Command macro. A function macro can also perform some tasks, but when it is done it tells the spreadsheet some information, usually the results of computations.
	When you clicked on the Command button, the Option + ⌘ Key box of the dialog box became active. You may assign your own choice of command key equivalent for your macros. To distinguish your command keys from the ones normally used by Excel, you must use the Option key with the ⌘.
Move the mouse to the Option + ⌘ Key box and click the mouse button once.	You are going to enter a letter into this box.
c	Enter a lowercase "c" into the box.

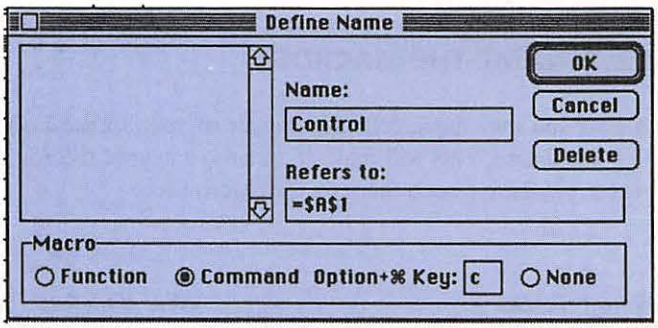


Figure 12.14
The Define Name dialog box used with the Macro sheet asks for additional information. This figure shows the name you have assigned this macro, and that the Command button has been selected.

Click on the OK button.	Complete the dialog box.
Use the mouse to select cell A5 of the Macs1 macro sheet.	You are going to assign a name to this macro.
⌘L	The Define Names command. The name Model will appear in the Name box on the Define Name dialog.
Click the mouse on the Command button.	Tell Excel that the named cell is the start of a command macro.
Click the mouse in the Option + ⌘ Key box.	You are going to assign a key equivalent for this macro.
m	Enter a lowercase "m" to be the Option + ⌘ key equivalent.

Click on the OK button.	Complete the dialog box.
Use the mouse to select cell A9 of the Macs1 macro sheet.	You are going to assign a name to this macro.
⌘L	The Define Names command. The name Home appears in the Name box.
Click the mouse on the Command button.	Tell Excel that the named cell is the start of a command macro.
Click the mouse in the Option + ⌘ Key box.	You are going to assign a key equivalent for this macro.
h	Enter a lowercase "h" to be the Option + ⌘ key equivalent.
Click on the OK button.	Complete the dialog box.
⌘S	Save the changes that you have made to the Macs1 macro sheet.
Pull down the Window menu, select Model10, then release the mouse button.	The worksheet must be active so that you can try using the names of the macros, rather than entering their cell addresses.
Pull down the Macro menu, select the Run command, then release the mouse button.	You want to run one of the macros. The Run dialog box now lists the macros you have named.

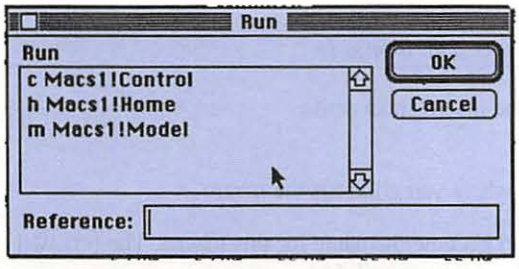


Figure 12.15
The Run dialog box shows the three macro names.

You can see the Option + ⌘ Key equivalent letters that you have assigned the three macros in front of each macro name.

Click the mouse on the third macro in the list.	This is the Model macro.

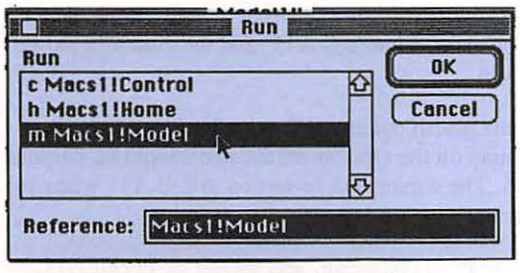


Figure 12.16
The Model macro has been selected.

Click on the OK button.	Execute the macro. The model will be selected.
[OPTION] [SHIFT] ⌘C	Hold down the option key, the shift key, and the command key, then press the letter "C". The computer will beep at you, and nothing will happen. When you defined the equivalent key, you used a lowercase letter "c". Holding down the shift key is telling Excel to look for a macro with a capital "C" as the equivalent.
[OPTION] ⌘c	Try executing the macro again. Hold down the Option and Command keys, then press a lowercase "c". The selected area of the spreadsheet should change to the table at the bottom of the window.
[OPTION] ⌘h	Use the macro you have defined to return the cursor to cell A1.

12.8 A MACRO TO PRINT

You are now ready to create a macro to print your spreadsheet. This macro will save the model before it begins the print process so that if you have problems your work will not be lost, then it sets the print area, and finally executes the print command.

What To Do	*Why You Are Doing It*
Pull down the Window menu, select Macs1 then release the mouse.	Make the macro sheet active.
Click the mouse in cell A13.	This is where you will start the macro.
Prt_Model [cr]	This will become the name for this macro. The [cr] will move the cursor to cell A14.
=SAVE() [cr]	This is the Save macro command, and should be entered into cell A14. It is the same as using the Save command found on the File menu, or as using the ⌘S key. The cursor will be moved to cell A15.
=FORMULA.GOTO("The_Model") [cr]	You are going to set the print area to be just the model showing the computations and the growth and cost rates. The control table will not be printed. This command should be entered into cell A15, and the cursor is moved to cell A16.
=SET.PRINT.AREA() [cr]	This is the macro command for the Set Print Area command found on the Options menu, and should be put into cell A16. The cursor will be moved to cell A17 when you press the [cr].
=PRINT(1,1,1,1,,FALSE,,,) [cr]	This is the Print command, and should be in cell A17. As you can see, there are several items of information you must supply this command.

The first of the four 1's controls whether you want to print all the pages, or a range of the pages. By entering a 1 as the first item here you are selecting the print all pages choice. Because of this, the next two 1's are ignored. If you had entered a 2 at this point, you would be telling Excel that you want to print a selected subset of the pages. The next two 1's then tell Excel at which page to start printing and at which page to stop.

The fourth one is the number of copies you want printed. In this case, just one!

There is no fifth value. It is reserved for the IBM-PC version of Excel. Thus the two commas with nothing between them.

The sixth position, in this case the word FALSE, controls whether you want to see the print preview. False means you do not, whereas entering TRUE means you want to see the print preview.

We want Excel to ignore the remaining arguments to this command. Their spaces must be reserved, however, and thus the three commas after the word False. The arguments correspond to the Parts option, the Print Using Color option, and the Sheet Feed option.

= FORMULA.GOTO("HOME") [cr]

After printing, you want the cursor to return to cell A1. This command should be entered into cell A18, then the cursor moved to cell A19.

= DELETE.NAME("Print_Area") [cr]

You should recall that, when you set the print area, a name called "Print_Area" is added to the defined names list. This macro command will remove this name from the names list. It is similar to using the Define Name command, selecting the name and then clicking on the Delete button. This command should be placed into cell A19.

= RETURN() [cr]

Remember, you must always end a macro with a RETURN command. This command should be in cell A20.

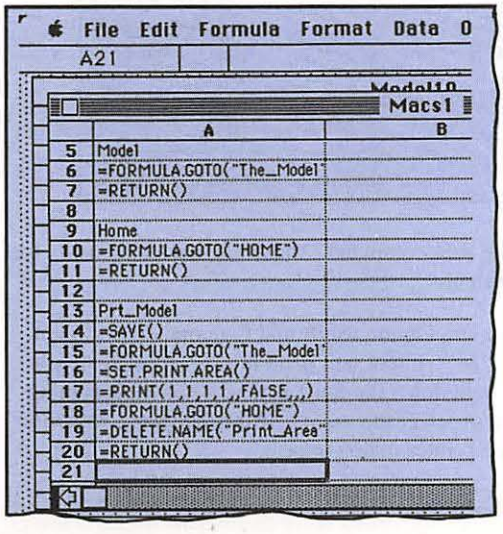
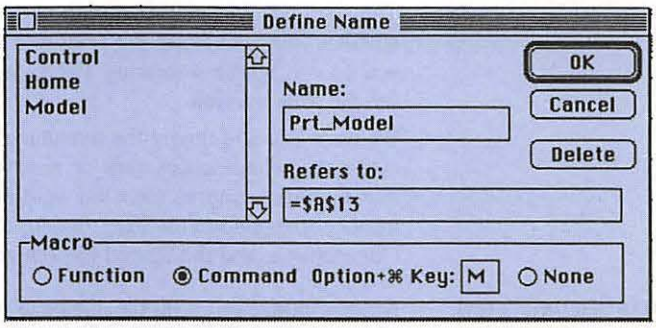


Figure 12.17
The A column of your macro sheet, called Macs1, should now look like this.

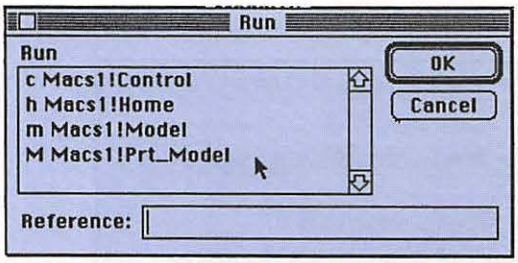
Select cell A13.	You are going to assign this macro the name Prt_Model, which is found in this cell.
⌘L	The Define Name command. The name Prt_Model, short for Print the Model, should appear in the Name box of the Define Name dialog box.
Click on the Command button.	Remember that you must tell Excel that you have created a command.
Move the mouse to the Option + ⌘ Key box and click the button.	You want to assign an equivalent key.
M	Use a capital letter "M", rather than a lowercase letter.

Figure 12.18
The completed Define Name dialog box.



Click on the OK button.	Complete the dialog box.
⌘S	Save the changes you have made to the Macs1 macro sheet.
Pull down the Window menu, select Model10 and release the mouse.	You want to try this new macro. The Spreadsheet window must be active.
Pull down the Macro menu, select the Run command and release the mouse.	Begin execution of a macro. You can see that the macro you have added is now in the list of macros in the Run dialog box.

Figure 12.19
The Run dialog box shows the new macro.



Click on the Cancel button.	Cancel the Run command. You are going to try using the key equivalent.
[OPTION] [SHIFT] ⌘M	Hold down the Option, Shift and Command keys, then press the "M". Excel will print the spreadsheet. If you forget to hold down the Shift key, you will be executing the macro to select the model. If this happens, you will not see the printer dialog appear.

	If you do not have a printer attached to your computer, or you have chosen the LaserWriter and you have only an ImageWriter, you will receive an error message from the Macintosh. To continue, click on the OK button. Excel will then give you a Macro error message. Click on the Continue button.

12.9 CREATING A FUNCTION MACRO

A function macro is used to simplify your model building. You may use a function macro to summarize an arithmetic formula on the spreadsheet and make it easier to use. When you do this, the function name appears in a cell of the spreadsheet. When the function is executed, information is sent to the macro sheet holding the function. The formula is computed by the macro sheet, and the answer is passed back to the cell in the spreadsheet that used the formula. For example, you may want to make a function called Profit that performs a subtraction equivalent to the computation found in cell B6 of the current spreadsheet. That is, the Profit function will take two values, called arguments, and subtract one from the other. The result of the subtraction is sent back to the spreadsheet by the RETURN command. The arguments are placed between the parentheses when you enter the function. For example, the IF function that you used in an earlier chapter has three arguments: the comparison, the computation if the comparison is true, and the computation if the comparison is false. The Profit function you will create will have only two arguments: sales and costs.

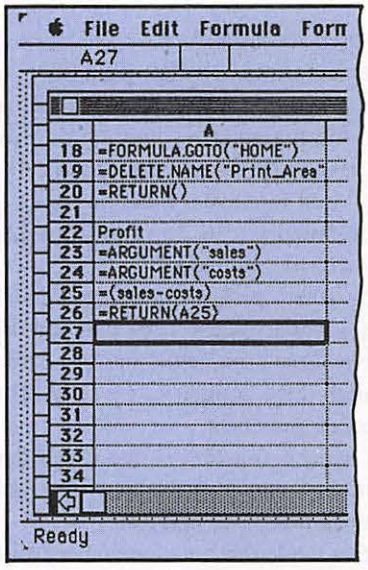
The advantage of using a function is that it can then be used in other spreadsheets. You do not have to recreate the formula. This can be a time saver when you build complex spreadsheets that use the same computations over and over.

You should note that while the function you are about to create will work, it is being created here to be an example of functions, and not of good style for creating spreadsheets. You will probably agree that the formula that is presently in cell B6 is easy to read, and not particularly difficult to enter. Keep this in mind as you work this section of the text.

What To Do	*Why You Are Doing It*
Pull down the Windows menu, select Macs1 and release the mouse button.	Make the macro sheet, Macs1, the active window.
Scroll the window so that you can see empty cells below the Prt_Model macro.	You are going to put this function into cells below the Prt_Model macro.
Move the mouse pointer to cell A22 and click the mouse.	You are going to start the function in cell A22.
Profit [cr]	Enter the word Profit into cell A22 and move the cursor to cell A23. Profit will be the name of the function.
=ARGUMENT("sales") [cr]	The first step to building a function macro is to define the arguments, or information, that it will need. Here, the first number accepted by the Profit function will be the sales value. When the function macro is executed, whichever value appears first in the list of arguments will represent "sales" to the function. The cursor should end in cell A24.

=ARGUMENT("costs") [cr]	The second number that appears in the argument list will be used by the Profit function to fill in the "costs" value. The cursor should end up in cell A25.
=(sales-costs) [cr]	Enter the computation that the function is to carry out into cell A25, and move the cursor to cell A26.
=RETURN(A25) [cr]	The RETURN command ends the macro. In this case, you want the function macro to report back the results of the computation that is carried out in cell A25.

Figure 12.20
The Profit function macro is in cells A22:A26.



Click the mouse on cell A22.	Select cell A22 before you name the macro.
⌘L	The Define Name command. Profit should appear in the name area of this dialog box.
Click on the Function button.	Remember that this is a function, not a command. The Option + ⌘ Key box will remain dimmed, since command keys are not appropriate for functions.
Click on the OK button.	You are done naming this function.
⌘S	Save the modified Macs1 macro sheet.
Pull down the Window menu, select Model10 and release the mouse button.	Reactivate the spreadsheet window.
Click the mouse pointer on cell B6.	This cell is where you will test the function you have just created.
=Macs1!Profit(B4,B5) [ENTER]	You must tell Excel where to find the function, Profit. It can be found on the Macs1 macro sheet. Remember to separate the location of the function from the function itself by the exclamation point. Use the enter key to keep the cursor on cell B6.

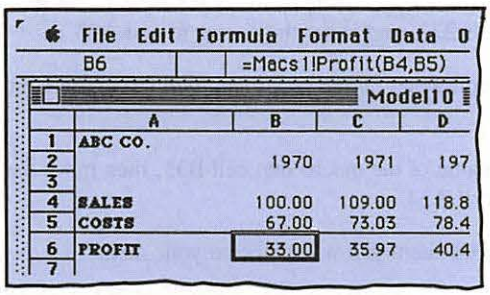


Figure 12.21
The Profit function has been entered. There is no change in the result, since the Profit function performs the same task as the original formula did.

12.10 ADDING AN ITEM TO THE MENU BAR

It would be nice to be able to access the macros that have been created through a menu. This is especially true if you create a large number of macros. While the Option + ⌘ key equivalent is handy, you may not always remember what to use for which macro. Thus, a menu would be valuable.

You may add an item to the menu bar by using a macro. To do this, you must first create the menu information in cells of the macro sheet, then create the macro to add the menu to the menu bar. The menu information uses two columns of the macro sheet. The first entry of the left column holds the name of the menu. Below the name are the cells holding the text which is to appear when the menu is pulled down, that is, the commands. To the right of each command description is the name of the command macro to be executed when the item is selected.

What To Do	*Why You Are Doing It*
Pull down the Window menu, select Macs1 and release the mouse button.	Activate the macro sheet window.
Move the mouse to cell A30 and click the mouse button.	Select cell A30. This is where you will begin the menu.
MyMenu [cr]	Enter MyMenu into cell A30 and press [cr] to move the cursor to cell A31. This is going to be the name of the menu when it is added to the menu bar.
Select cells A31:B34.	This is where you will enter the rest of the menu information.
Home the Cursor [ENTER]	The first command on the menu will return the cursor to cell A1. Place this text into cell A31, then press the [ENTER] key to move the cursor right to cell B31.
Home [ENTER]	This is the name of the macro you wrote to move the cursor to cell A1. It will be executed when you select the "Home the Cursor" command on the menu MyMenu. Press [ENTER] to move the cursor to cell A32.
Select the Model [ENTER]	The next command on the menu will select the Model. After you press [ENTER], the cursor should be in cell B32.

Model [ENTER]

This is the macro you wrote to select the model. Put its name in cell B32, and move the cursor to cell A33.

Select the Control Table [ENTER]

The third command on the new menu will select the Control Table.

Control [ENTER]

Place the name of the macro into cell B33, then move the cursor to cell A34.

Print the Model [ENTER]

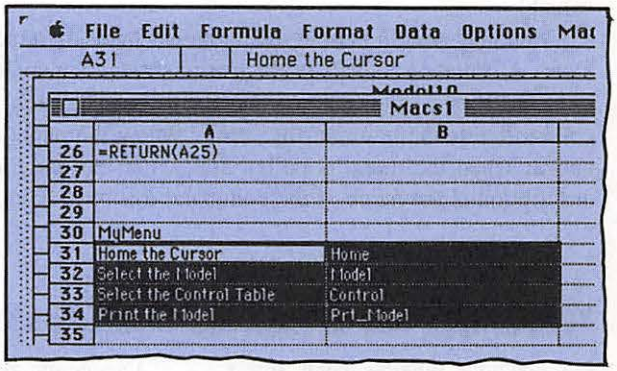
This is the last item you will place on your menu.

Prt_Model [ENTER]

The name of the macro to be executed is placed into cell B34.

You have now laid out the information for the menu. The left column of information are the commands as they will appear when the menu MyMenu is pulled down. The right column are the names of the command macros to be executed by each respective command on the new menu.

Figure 12.22
The menu information has been entered into the macro sheet.



You must now create the macro that identifies the menu to Excel, and makes the menu appear on the menu bar at the top of the Macintosh display.

Click the mouse on cell A36.

This is where you will put the macro to add the menu.

AddMyMenu [cr]

This will be the name of the macro. The cursor will move to cell A37.

=ADD.MENU(1,A30:B34) [cr]

The ADD.MENU command will add a menu item to the specified menu bar. The arguments of the command are, first, the number of the menu bar where the menu is to appear. The value 1, which you entered here, selects the menu you see when working with Worksheets and Macro sheets, and Full menus have been selected. If you want to add a menu to the Chart menu, you would use a 2 instead of a 1.

The second item, A30:B34, tells Excel where on the macro sheet to find the information that describes the menu. This range includes the cell that holds the name of the menu, cell A30.

=RETURN() [cr]

Don't forget the return command in cell A38 to indicate the end of the macro.

[cr]	Place the cursor into cell A40 on the macro sheet. You are going to create one more macro.
ZapMyMenu [cr]	This will be a macro to remove the menu from the menu bar.
=DELETE.MENU(1,"MyMenu") [cr]	Enter this command into cell A41. As you can see, there are once again two arguments for this command. The first tells Excel which menu bar has the menu you want to remove, and the second argument gives the name of the menu to be removed.
=RETURN() [cr]	End the macro in cell A42.

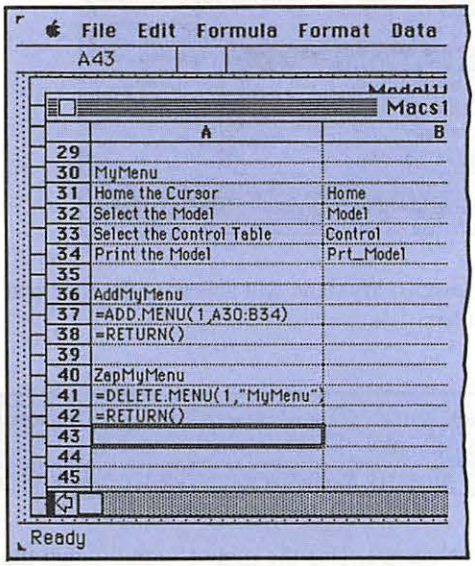
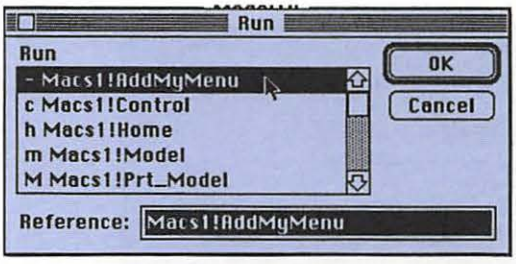


Figure 12.23
The macros to add and remove the menu item have been entered.

Click on cell A36.	Select cell A36. You are going to define the macro names for Excel.
⌘L	The Define Name command. AddMyMenu should appear in the Name box.
Click on the Command button.	This is a command macro, not a function macro.
Click on the OK button.	You do not want to assign an Option + ⌘ Key for this macro. It will not be used that often, so you are going to save your letters.
Click on cell A40.	Select cell A40. You are going to define this macro's name for Excel.
⌘L	The Define Name command. ZapMyMenu should appear in the name box.
Click on the Command button.	This is a command macro, not a function macro.
Click on the OK button.	You do not want to assign an Option + ⌘ Key for this macro. It will not be used that often, so, once again, you are going to save your letters.

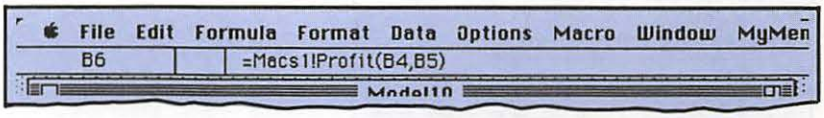
⌘S	Save the changes you have made to the Macs1 macro sheet.
	You are now ready to add the menu to the menu bar.
Pull down the Window menu, select Model10 then release the mouse.	Make the spreadsheet the active window.
Pull down the Macro menu, select Run and release the mouse.	You are going to execute the AddMyMenu macro. Since you did not assign this macro an Option + ⌘ Key, you must use the Run command to execute it.
Click on the AddMyMenu macro name.	This is the macro that you want to run.

Figure 12.24
The Run dialog box. Note that the AddMyMenu macro does not have a letter in front of it since you did not assign an Option + ⌘ Key to the macro.



Click on the OK button.	Execute the macro. MyMenu will appear at the right end of the menu bar.

Figure 12.25
MyMenu appears on the menu bar.



This menu works just like the standard Macintosh menus. Use the mouse to pull down the menu and select the item you want. Execute the item by releasing the mouse button. Let's try executing some of the commands on the menu to make sure that you have properly created the menu.

What To Do	*Why You Are Doing It*
Pull down MyMenu.	You are going to try the commands on the menu you have just created.
Drag the mouse down to the third option, Select the Control Table.	You are going to select the control table at the bottom of the spreadsheet.

Figure 12.26
The Command "Select the Control Table" has been selected.



Release the mouse button.	Execute the command. The control table at the bottom of the display should become selected.

[OPTION] ⌘h	This is the keyboard equivalent for the Home macro. The cursor will return to cell A1. Just because you have placed an item on an active menu does not disable the Option + ⌘ Key to activate that command.
Pull down the Macro menu, select Run and release the mouse.	You want to run a macro. Scroll the macro list window to make the ZapMyMenu macro name appear.
Select ZapMyMenu in the macro list.	You want to remove the menu.

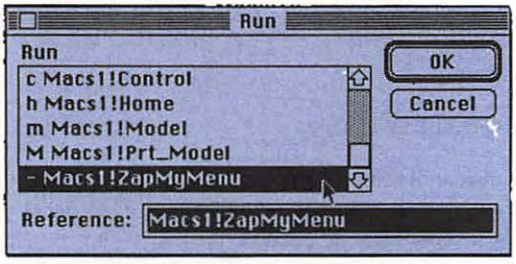


Figure 12.27
The ZapMyMenu macro has been selected.

Click on the OK button.	Execute this macro. The MyMenu menu will be removed from the menu bar.

12.11 MAKING A MACRO EXECUTE WHEN THE SPREADSHEET LOADS

Having a macro execute when the spreadsheet loads, called an autoexec macro, can be very helpful. For example, you may always want the menu MyMenu added to the menu bar. This can be done by making the macro AddMyMenu execute whenever the spreadsheet model is loaded into Excel.

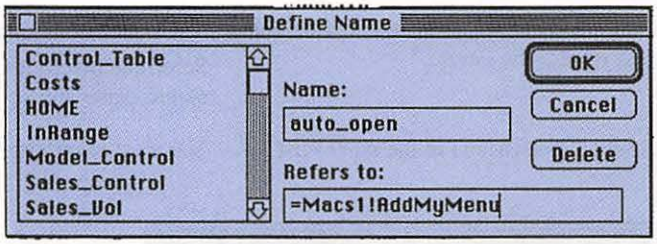
Additionally, since you have changed the formula in cell B6 to use a macro function (you remember the Profit function), it is desirable to have the macro sheet loaded so that the function can be used by the spreadsheet. Always keep this latter fact in mind when creating functions. That is, the macro sheet must be loaded with the spreadsheet for the functions defined on it to be available. If you load just the spreadsheet, and not the macro sheet, Excel will not know how to evaluate the function.

Making a macro into an autoexec macro simply requires that a special name be defined in the spreadsheet that is to load the macro. At present, you should have the spreadsheet Model10 displayed as the active window. If not, use the window menu to make Model10 the active window.

What To Do	*Why You Are Doing It*
⌘L	The Define Name command.
auto_open	This is the special range name that tells Excel to automatically load a macro sheet and execute a macro. Enter it into the Name box on the Define Name dialog. Make sure that you enter this name using lowercase letters and a single underscore to connect the two words. If you do not do this, the autoexec macro will not work.

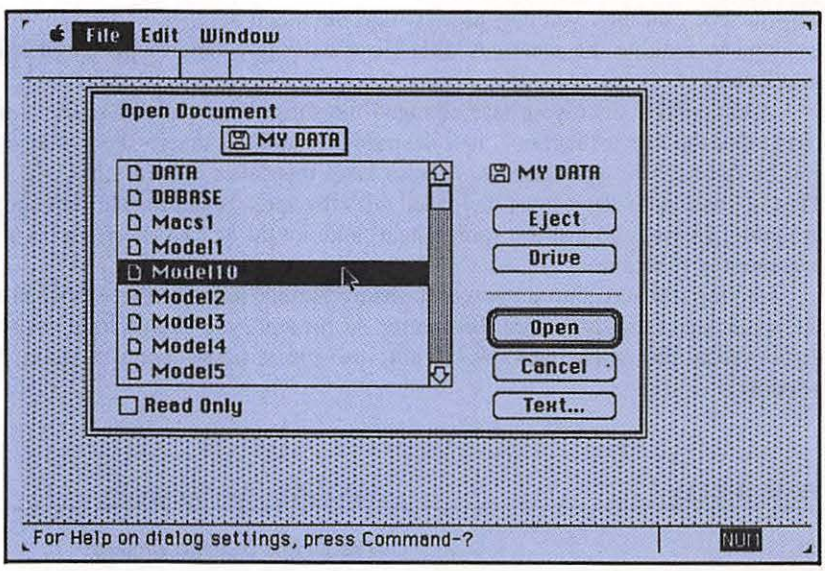
[TAB]	Move the selection to the "Refers to" box.
=Macs1!AddMyMenu	This is the name of the macro sheet, and the name of the macro to be executed.

Figure 12.28
The Define Name dialog box that you are creating.



Click on the OK button.	Save this name.
⌘S	Save the spreadsheet changes.
Click on the spreadsheet close box.	Put away this spreadsheet. You are going to try opening it to see if the menu gets loaded automatically. The Macs1 macro sheet should still be open.
⌘S	Make sure that the macro sheet has been saved.
Click on the macro sheet close box.	Put away the macro sheet. When the Model10 spreadsheet is opened the macro sheet also should get loaded by the autoexec macro feature.
⌘O	The Open command. Locate the spreadsheet called Model10 in the dialog box and select it.

Figure 12.29
Model10 has been selected in the dialog box.



Click on the Open button.	Open the Model10 spreadsheet. After a brief pause you will see a dialog box that asks "Update references to unopened document?" This message is a result of using the Profit macro function. The macro sheet has not yet been opened, so that the Profit function is not available to the spreadsheet.

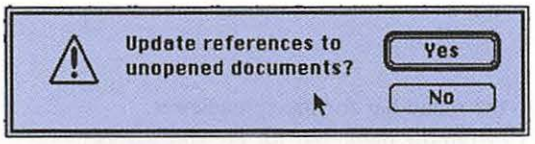


Figure 12.30
You will see this alert message because the Profit function macro has not yet been loaded.

Click on the Yes button.	Let Excel update the references. If you quickly look at cell B6 while the loading process continues, you will see the REF# error message appear. Don't worry. Once the spreadsheet has been updated, it will load the Macs1 macro sheet. You will see it become the active window. After another pause you will see MyMenu added to the menu bar, and the spreadsheet will return to being the active window. Finally, since the Profit function is now available in the computer's memory, the function is properly evaluated in cell B6.
⌘S	Save the model one more time.
⌘Q	Quit Excel and return to the Macintosh Finder.

EXERCISES

1. Where should you put the name of a macro?
2. Explain the difference between a Command macro and a Function macro.
3. Are macros placed on a spreadsheet document or a macro sheet document?
4. What is the advantage to placing macros on a macro sheet rather than on a spreadsheet?
5. Which menu command is used to create a macro sheet?
6. What is the macro statement used to execute the Goto command?
7. If you have defined a range called "Right_Side", write the macro that will select this range. Name the macro GoRight.
8. What command must end every macro?
9. What is the command used to name a macro?
10. If you have not assigned a name to a macro using the Define Name command, how can you get Excel to execute the macro?
11. When you enter the location of a macro that you want executed by Excel, what character separates the name of the macro sheet from the cell address that starts the macro?
12. What is an advantage to naming a macro?
13. Can you assign a Command Key (⌘) equivalent to your macros?
14. Can you assign an Option + Command Key (⌘) equivalent to your macros?
15. When you use a keyboard equivalent to execute your macro, does it matter if you press a capital letter when the name was assigned using a lowercase letter?

16. Using the spreadsheet you were working with in this chapter, create a macro to print only the first three years of the sales projection, rather than the complete sales projection.
17. Using the spreadsheet you were working with in this chapter, create a macro to print the range Model_Control.
18. Add the two macros you created in Problems 16 and 17 to the menu you created in this chapter.
19. Create a new menu for the spreadsheet you used in this chapter. The menu should be called PrintIt. On the menu should be the following commands:
    Print the Complete Spreadsheet
    Print the Sales Projection only
    Print the Sales Projection with costs/growth %
    Print the current Control Table
20. Create a macro that will add the print menu you created in Problem 19 to the menu bar for the spreadsheet.
21. Create a macro that will remove the print menu you created in Problem 19 from the menu bar for the spreadsheet.
22. What is the name you must assign a macro to have it loaded automatically when the spreadsheet is loaded?
23. Create a function macro, to be called BrkEven, for the break-even formula:

    Break-even Point = Fixed Costs / (Selling Price - Variable Costs per unit)

24. Use the BrkEven function you have created to compute the break-even when Fixed Costs are $2295.00, Selling Price is $14.95, and the Variable Cost per unit is $100.00.
25. When you define a menu, must the menu options be in adjacent columns or in consecutive rows of the macro sheet?
26. When you define a menu, where is the name of the macro to be executed by an option placed?
27. Must a named range be a unique range, or can it overlap with another named range?

CHAPTER

DATABASE MANAGEMENT SYSTEMS CONCEPTS

13

CHAPTER OBJECTIVES:

Upon completion of this chapter, the student will:

- **Define database.**
- **Define database management system (DBMS).**
- **Give at least three reasons why a database management system should be used.**
- **Differentiate among menu-driven DBMS, command language driven DBMS, and programming languages.**
- **Describe the difference between hierarchical/ network type DBMS and relational type DBMS.**
- **Define files, records and fields.**
- **Define key fields.**
- **Describe the different data types.**

13.1 WHAT IS A DATABASE?

A database is a collection of related information. You have probably been exposed to a database of one kind or another at some time, perhaps one like the simple database pictured in Figure 13.1, a mailing list that is stored on index cards, or one more complex such as as the database in Figure 13.2 on the next page, a filing cabinet containing personnel information. In either case, the purpose of the database is the same: to keep track of interrelated information in an organized fashion. Databases are generally organized so that it is simple to find the information you need within the database quickly.

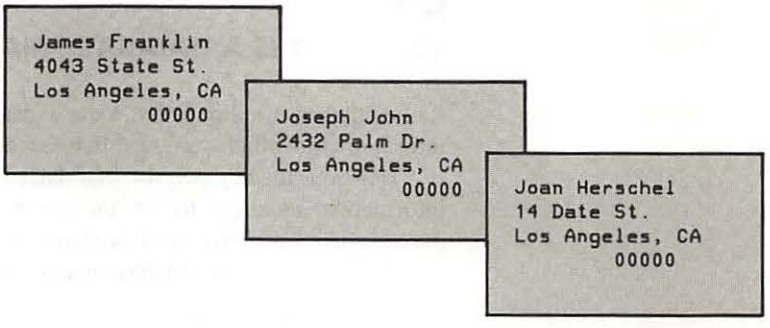
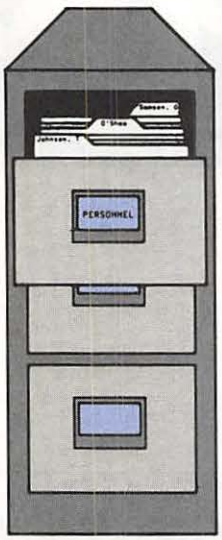


Figure 13.1
A mailing list database stored on index cards.

Figure 13.2
A common and extensive database.



In addition to keeping track of related information, you will frequently want to do things to or with the information maintained in the database. If, for example, the database consists of personnel information, you may want the computer to combine this information with a database that keeps track of hours worked to produce pay checks and tax information.

As the amount of information in your database grows, both in pieces of information being retained pertaining to a single item and to a number of related items, the difficulty involved in performing the needed operations on the data increases, as well as the time needed to perform the operations. For example, if the information in Figure 13.3 is used to create W-2 forms at the end of the year, the Internal Revenue Service will want to receive the data in taxpayer ID order, while the Postal Service will want the envelopes to be mailed to the employees in Zip Code order. While sorting the information found in Figure 13.3 into these categories is a small task, it becomes a huge, time-consuming chore for a large corporation. Enter the database management system!

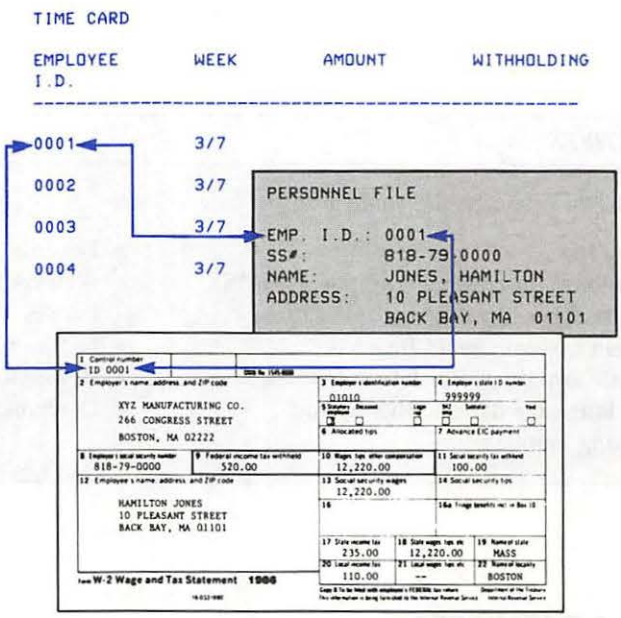


Figure 13.3
These are some items you may find in a personnel database. The arrows show how the items interrelate.

13.2 WHAT IS A DATABASE MANAGEMENT SYSTEM?

Rather than use index cards, today's database management systems utilize computers. All the information to which you must have access is stored in one or more computer data files.

However, the key purpose of a database management system is not to store but to manage the information, as suggested by the name of the system. The efficient management of the data makes using a computerized database management system worthwhile.

The computerized database management system gives you a simple way to:

1. Create data files.
2. Enter data into the files.
3. Remove data from the files.
4. Manipulate the data to obtain summaries, reports or other needed information in a timely fashion.

13.3 WHY USE A DATABASE MANAGEMENT SYSTEM?

Of course, you can collect and summarize data without the computer. The computer-run database management system, however, is capable of producing information for you when you need it. This is why a computer database management system can be valuable. It provides you with the same basic features as a manual information system. However, it can extract the exact information you need from the data much faster than it can be done by hand, and it can compile or rearrange the data in a different order for you equally as fast. Frequently these other "views" of your information will provide you with different insights into the meaning or relationships of the information with which you are working.

In addition to ease of access to the information, a database management system can produce other benefits. Because a good database management system is flexible, many different applications within an organization can be served by the same data file, thereby minimizing the duplication of stored data. This singular treatment will increase the accuracy of the information, because it needs to be entered into the system only one time and corrected or updated in only one place rather than in several files. The computer also imposes discipline that contributes to accuracy. For example, the typical database management program will not allow letters of the alphabet to be entered into portions of the database that are strictly numeric.

A good database management system can provide for data security, preventing sensitive information from being accessed by unauthorized personnel, by requiring passwords and data encryption schemes.

What many people like most about database management programs is the speed with which these applications can be made operational. The database management program performs some of the most difficult aspects of program writing—working with data files. This includes such tasks as reordering the data when needed, removing unneeded information, and recovering vacated disk space. Creating programs with a high level programming language such as COBOL, BASIC or PASCAL can be time-consuming, whereas a one- or two-word command in a database management system will accomplish the same thing.

13.4 TYPES OF DATABASE MANAGEMENT SYSTEMS

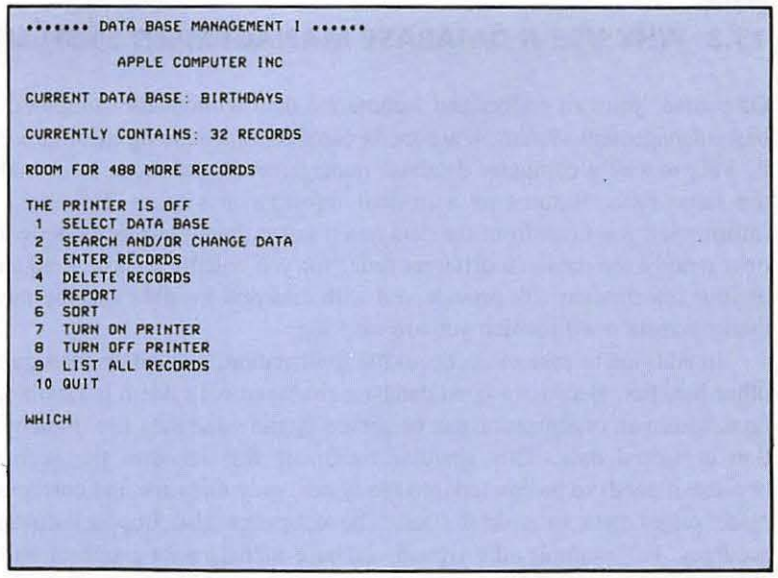
Several types of database management systems are available today:

1. Menu-driven systems.
2. Program-driven systems.
3. Command language driven systems.

13.5 MENU-DRIVEN SYSTEMS

Some database management systems are completely menu-driven. This means that you are constantly presented with a list of choices—a menu. You make a selection based on the activity you want to carry out at that time.

Figure 13.4
A menu-driven database management system.



Menu-driven systems are generally very simple to use. However, if you are limited to using the program only as the menus dictate, the program may be limited in its capabilities. If you are concerned only with the filing of bits of information, such as maintaining a telephone directory, this type of system is usually adequate.

13.6 DATABASE PROGRAMMING LANGUAGES

Some systems, in addition to the menus provided, also give you access to your database through programming languages. These languages are specific to the database management system. They usually feature statements that provide you with easy access to, and manipulation of, the data files. This is not usually true of a standard programming language, in which you may have to write a complex program to perform the task of a single statement in a database programming language.

Figure 13.5
A portion of a dBASE III PLUS program.

```
STORE .F. TO IS_READY
DO WHILE .NOT.IS_READY
  STORE ' ' TO GO_ON
  @ 20,18 SAY 'ENTER "X" TO EXIT NOW OR "P" TO PROCEED ) ' GET GO_ON PICT '!'
  READ
  IF GO_ON = 'X'
    CLEAR ALL
    RETURN
  ENDIF
  IF GO_ON = 'P'
    STORE .T. TO IS_READY
  ENDIF
ENDDO
@ 10,0 CLEAR
@ 10,38 SAY 'WAIT'
STORE 0 TO MSNG_COUNT
IF .NOT.FILE('CURMNTH.DBF')
  @ 12,14 SAY "UNABLE TO LOCATE THE WORK FILE!!! PLEASE RE-LOAD IT."
  STORE ' ' TO GO_ON
  @ 20,22 SAY 'PRESS A KEY TO RETURN TO THE MENU ) ' GET GO_ON PICT "!"
  READ
```

The database programming languages provide the user and the program author with the greatest flexibility possible for using and manipulating the data files. You can usually control what is displayed on the computer's display, how and when the information is used and manipulated, and who can gain access to the information. You can use this type of system to develop complex accounting systems, inventory management systems and more.

While total program development may take less time when you use a database management system, writing programs in a database programming language may be just as difficult as writing programs in a standard programming language. Many of the data file input, output, and manipulations are easier, but planning, documentation and development are still mandatory for writing in database programming languages.

13.7 COMMAND LANGUAGES

There is a point between the solely menu-driven system and the database programming language—the database management system command language.

A command language allows you to have access to, and to manipulate, the data files without the intervention of menus. This provides the more sophisticated user with a greater degree of control and more flexibility than the menu-driven systems. It does not, however, provide the total freedom available when writing a program in the database programming language.

13.8 FILE ORGANIZATION

The database management systems available today arrange their data files in one of two methods: hierarchical/network or relational.

The hierarchical/network systems form a strict relationship among the records making up a single file. This relationship is defined by a record pointer field. This system is fine if you have fully planned all desired elements of the data for recalling individual records that make up the database. For example, if a database consists of worker numbers, names, addresses and pay rates, the worker number, name and pay rate may be information by which you want to recall the data, while the address is not. However, if you require information (such as age in the example) from a hierarchical/network system to which you have not provided an access link, the database management system will not find it. To find this information, the person using the database must add new pointers to the file or restructure the existing pointers in the file so that the records can be recalled by the desired piece of information.

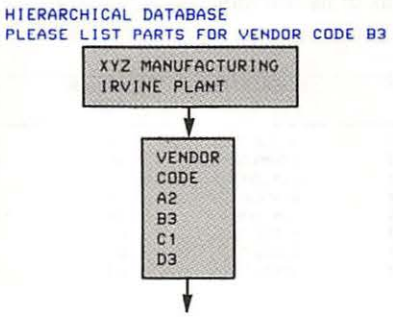
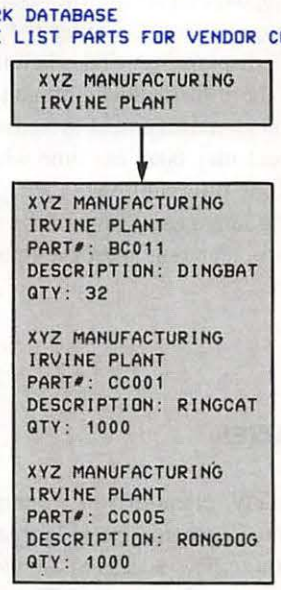


Figure 13.6
Hierarchical database structure.

Figure 13.7
Network database structure.



In contrast to the hierarchical/network system, the relational database management systems allow any relation you desire to exist among the several fields that constitute the database record. It is a simple matter to find existing information in such files after the initial creation of the database. Because of this, the relational database management system is simple to use. It is becoming very popular in businesses today.

Figure 13.8
Relational database structure.

PART#	DESCRIPTION	VENDOR CODE	QTY IN-STOCK	LAST QTY ORDERED	LAST COST
A0001	WIDGET				22.95
A0023	FRAMITE				12.37
BC011	DINGBAT				47.82
CC001	RINGCAT				43.00
CC005	RONGDOG				85.00
D1001	FIDGET				123.00
D1201	GIDGET				65.70
E3333	DOWSIT				135.99

PLEASE LIST PARTS FOR VENDOR CODE B3

PARTS REQUESTED BY VENDOR CODE B3

PART#	DESCRIPTION	QTY
BC011	DINGBAT	32
CC001	RINGCAT	10
CC005	RONGDOG	1000

13.9 FILES, RECORDS AND FIELDS

A database consists of data files of information. For example, a file may contain information about the items a company has in its inventory (Figure 13.9).

Figure 13.9
An inventory file.

PART#	DESCRIPTION	VENDOR CODE	QTY IN-STOCK	LAST QTY ORDERED	LAST COST
A0001	WIDGET	A2	455	1000	22.95
A0023	FRAMITE	A2	652	1000	12.37
BC011	DINGBAT	B3	32	100	47.82
CC001	RINGCAT	B3	10	500	43.00
CC005	RONGDOG	B3	1000	1000	85.00
D1001	FIDGET	C1	5	1500	123.00
D1201	GIDGET	C1	20	500	65.70
E3333	DOWSIT	D3	120	750	135.99

Files are built from records. A record contains all the information for a specific entry in the database. To continue with the inventory database example, a single record of this file represents the information for a single inventory item (Figure 13.10).

PART#	DESCRIPTION	VENDOR CODE	QTY IN-STOCK	LAST QTY ORDERED	LAST COST
A0001	WIDGET	A2	455	1000	22.95
A0023	FRAMITE	A2	652	1000	12.37
BC011	DINGBAT	B3	32	100	47.82
CC001	RINGCAT	B3	10	500	43.00
CC005	RONGDOG	B3	1000	1000	85.00
D1001	FIDGET	C1	5	1500	123.00
D1201	GIDGET	C1	20	500	65.70
E3333	DOWSIT	D3	120	750	135.99

Figure 13.10
An inventory record.

Finally, records are built up from fields, the specific items of information about the record. The fields of the inventory record include part number, cost, vendor code and quantity on hand (Figure 13.11).

PART#	DESCRIPTION	VENDOR CODE	QTY IN-STOCK	LAST QTY ORDERED	LAST COST
A0001	WIDGET	A2	455	1000	22.95
A0023	FRAMITE	A2	652	1000	12.37
BC011	DINGBAT	B3	32	100	47.82
CC001	RINGCAT	B3	10	500	43.00
CC005	RONGDOG	B3	1000	1000	85.00
D1001	FIDGET	C1	5	1500	123.00
D1201	GIDGET	C1	20	500	65.70
E3333	DOWSIT	D3	120	750	135.99

Figure 13.11
A field.

13.10 KEY FIELDS

When working with data you are usually most concerned with the information in specific fields. Some fields are more important than others; and most databases have a field or fields which uniquely identify the record you are working with. These fields are key fields. A part number field is usually a key field in an inventory database, and it is key for two reasons. First, to you it is an important, or key, item of information. Second, and this is more important to the database management system than it is to you, the part number field provides a unique access point to each specific record of the file much in the way a key opens a specific lock on a door.

The other fields of the record contain important information, but they do not provide a unique access point to the data for the database management program. The description of a part may be important to the customer, but it usually does not give easy or unique access to the data. A hardware store stocks many different types of nails. The word "nail" would not be suitable key field information.

13.11 DATA TYPES

Fields may be made up of one of several types of data. Every database management program has some standard data types. These are the numeric, text, and date data types. Additional data types that you may frequently encounter include picture (or graphic), calculation, logical, memo (or note) and summary.

Numeric fields will always contain data in the form of numbers and will never contain letters of the alphabet. Another characteristic of numeric fields is that they are used in computations.

Figure 13.12
Some typical numeric fields.

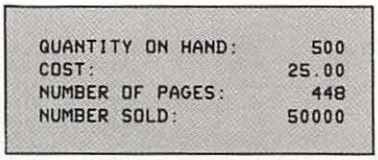
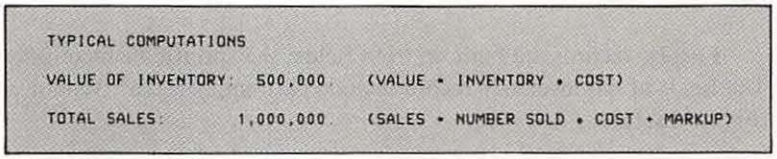


Figure 13.13
Some typical computations for a report.



Text fields, sometimes called character fields, contain information comprised mainly of letters of the alphabet. It is possible for a text field to contain numbers, but the numbers are not usable in computations. This is because computers store numbers in numeric fields differently from the way they store numbers in text fields. An example of a text field that is all numbers is a telephone number because you do not perform arithmetic with the information in the field. That is, if the phone number is 202–555–4567, you do not want the results of the computation ((202–555)–4567) stored as the phone number.

Date fields contain dates. While the dates are displayed on the computer's screen or printed report in a fashion people expect, such as 06/30/50 or January 6, 1987, they are not stored in the computer in this fashion. The dates are converted into a number, usually a julian date, which then allows date arithmetic. (Date arithmetic is especially important in accounting applications.)

Some database management systems have other special-purpose field types available. Some may include the data types already mentioned: picture (or graphic), calculation (or computed), logical, memo (or note) and summary.

Memo or note fields contain large amounts of text. The information in these data fields is printable, but frequently that is all that you may do with it. Thus, you may not search the large text field for keywords or other information. Because of this they have limited value.

Logical fields contain one of two values, either TRUE or FALSE. Clearly, these fields contain neither numbers nor characters, but a value, each of which represents a condition. Each item is in either the TRUE state or the FALSE state.

A picture field, as its name suggests, holds a graphic. You may want to put photographs of people into such a field if it is included in a personnel file.

Figure 13.14
Some typical character fields.

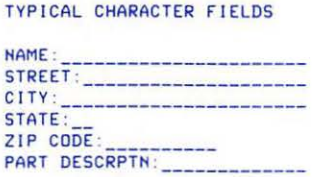
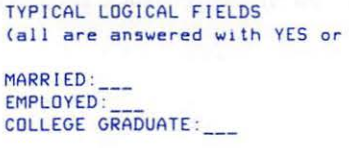


Figure 13.15
Some typical logical fields.



The calculation, or computed field holds the result of performing arithmetic operations between two or more existing fields of a record to create the contents of a third field in the record. Consider, for example, a database that is used to keep track of a meter. The "startvalue" field of this database is the meter reading at the beginning of the day. The "endvalue" field is the meter reading at the end of the day. Thus, the "amntused" field is the result of the computation "endvalue minus startvalue".

Other types of fields that a program may make use of include currency fields and time fields. Currency fields are used by some database management programs to readily identify that particular field type. Whenever a data item from a currency field is displayed, it includes a dollar sign. The user will know that the information being displayed is monetary in nature. If the dollar signs are not displayed, then the information may not refer to money. Time fields keep track of the time.

EXERCISES

1. What is a database?
2. What four things should a Database Management System let the user do?
3. What are the three types of database management systems generally available today?
4. There are two common types of file organization methods, what are they?
5. What is the key purpose of a Database Management System?
6. Aside from ease of access to information, what other benefits does a good database management system provide the user?
7. What is the difference between a hierarchical/network database system and a relational database system?
8. What is the unit of information that is combined to make up a database file?
9. What is the unit of information that is combined to make up a record?
10. There are several different types of data which may be contained in a field. What are the most common?

CHAPTER

DATABASE MANAGEMENT WITH EXCEL

14

CHAPTER OBJECTIVES:

Upon completion of this chapter, the student will:

- **Create a database in an electronic spreadsheet.**
- **Sort the data in a spreadsheet database.**
- **Extract records from the spreadsheet database.**
- **Access records in the spreadsheet database randomly.**
- **Print the spreadsheet database.**

14.1 SPREADSHEET DATABASES

The data management function of electronic spreadsheets is similar in concept to, but different in execution from, a disk-based database such as FileMaker II, the program you will be using later in this text, or one of the other database management programs available for the Macintosh, such as dBASE Mac, 4th Dimension or Omnis. The major differences are:

- The complete database is loaded into the computer's memory in the spreadsheet.
- Only one database may be active at one time.
- The database functions act more like list managers (hence the name data management functions, rather than database functions) and are not relational in nature.
- A user does not define data types (e.g., Text or Numeric).

Because the complete database is loaded into the computer's memory, some operations can be very fast when compared to disk-based databases. For example, sorting a database in the computer's memory takes much less time than sorting it on the disk. The amount of time required for the disk drive to turn, and the disk read/write heads to move, is eliminated with the spreadsheet data manager.

However, because the complete database is loaded into the computer's memory, the size of a spreadsheet or database with a sophisticated program such as Excel is limited to the available Random Access Memory (RAM) in your computer. A fair portion of your computer's RAM is occupied by the program, so expanding the memory of your Macintosh is strongly recommended if you intend to use a database of several hundred rows or more (or a large spreadsheet model).

14.2 CREATING THE SPREADSHEET DATABASE

Because Excel is primarily an electronic spreadsheet program, the database information is placed in the spreadsheet cells. The rows of the spreadsheet act as records of the database, and the columns act as the fields. Each field name is placed at the top of the column containing the field. Do not put any blank rows in the database, or between the row containing the field names and the first record. The sample database you will build places the database starting in the A column at row one, but this is not mandatory.

You start the creation of your spreadsheet database by defining the fields you want to use. You do this by placing the field names at the tops of the columns. Thus, the columns are the fields. After entering the field names, you enter the data into the columns. Each row is a record. When you are done, select the complete database range and, using the Define Name command, assign it the special name, "Database." You may use the formatting commands of the spreadsheet to adjust the display of numeric fields, or columns. Also, you may adjust the width of the columns to control the amount of information that can be displayed in any single column, especially text columns.

After you have entered the information, defined the range and made any aesthetic adjustments, you may perform a variety of operations on the data. You may perform ordinary spreadsheet type operations, such as computing a cell based on the values in other cells, or summing a range of cells. You may perform what-if operations if the cells are appropriately set up. You may graph the data, visually showing the relations among fields of the database. And you may perform database operations such as sorting and selecting data.

The example you will build will be to compute wages for hourly employees.

14.3 CREATING AN EXCEL DATABASE

After you boot your Macintosh with a System Start-Up disk, insert the Excel Program disk into one of the computer's disk drives. If you are using a machine with a hard disk you will not need to insert the Excel program disk into a disk drive. Rather, locate the Excel folder, and open it so you can see the Excel program icon. Place a disk (see Chapter 3 for how to initialize a new disk) with at least 200K available space into another one of your Macintosh's disk drives, if you have one available. This disk will be used for saving your work. If you do not have a free floppy disk drive, keep this disk available. You will need it for data storage.

In these instructions, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and double-click the mouse button. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.

What To Do	*Why You Are Doing It*
If the disk's icon is closed, double-click on it with the mouse pointer.	Open up the disk icon onto the desktop. If the Macintosh you are using has a hard disk, then open the folder containing the Excel program.

Locate the Excel program icon inside the disk window (Figure 14.1). If you are using a machine with a hard disk, locate the Excel program icon inside the folder's window.

Figure 14.1
The MS-Excel program icon.



Move the mouse pointer to the Excel icon and double-click the mouse button.

Launch Excel. Remember, if you are having trouble with the double-click, you may select the Excel icon with a single click, then use the Open command on the File menu (or ⌘O) to launch Excel.

[CAPS LOCK]

Press the Caps Lock key. This places the computer into all capital letters mode. Depending on which model of Macintosh and keyboard you are using, "CAPS" may appear in the lower right corner of the display.

LAST [cr]

Enter the field name LAST in cell A1 and move the cursor to A2 by pressing the [cr] or the down arrow (↓) key.

You will put people's last names into the A column of the spreadsheet and call this field LAST. The names of the fields do not necessarily need to be entered in all capitals, but it will be easier to remember this way.

SMITH [cr]
COOPER [cr]
JONES [cr]
DOE [cr]
CORNFELD [cr]

These are the values for the LAST field. The field name, LAST, is at the top of this column, and the data for the field are in the column below the field name.

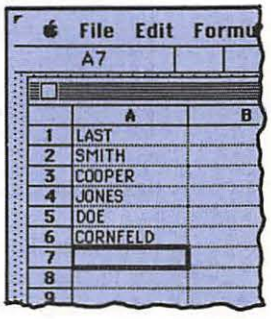


Figure 14.2
The first field has been entered for five records.

→

Move the cursor to the B column.

⌘↑

Hold down the command key and press the up arrow. This will jump the cursor to the top of the B column, cell B1. You may, of course, click the mouse on cell B1.

HOURS [cr]

This is the name of the second field. After you enter this field name, move the cursor down to cell B2.

35 [cr]
39 [cr]
37 [cr]
33 [cr]
36 [cr]

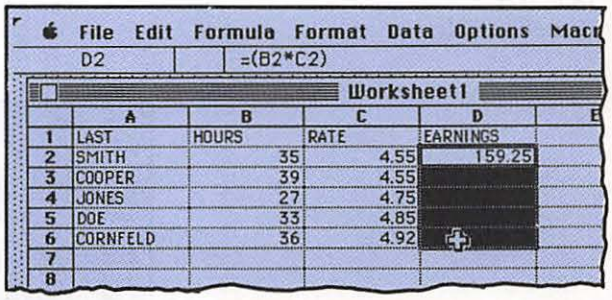
Enter the values for the HOURS field. This field represents the numbers of hours worked in a week by each employee.

→

Move the cursor to the C column.

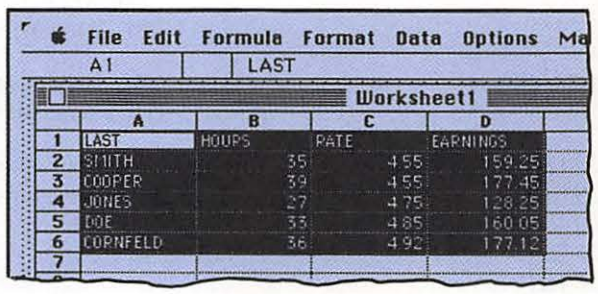
⌘↑	Hold down the command key and press the up arrow. This will jump the cursor to the top of the C column, cell C1.
RATE [cr]	This is the name of the third field. End by placing the cursor into cell C2.
4.55 [cr] 4.55 [cr] 4.75 [cr] 4.85 [cr] 4.92 [cr]	The RATE field is the hourly pay rate for each employee.
→	Move the cursor to the D column.
⌘ ↑	Hold down the command key and press the up arrow. This will jump the cursor to the top of the D column, cell D1.
EARNINGS [cr]	This will be the last field you will create.
=(B2*C2) [cr]	The EARNINGS field is computed. It is the hours times the rate.
Select cells D2:D6.	These are the cells that you will put the earnings value into.

Figure 14.3
Select this range of cells so that you can use the Fill Down command to complete the database.



⌘D	This is the Fill Down command. Recall that it is located on the Edit menu. It will copy the contents of the top cell of the range, D2, into the remainder of the range.
Select cells A1:D6.	This is the complete database. You must assign it the range name Database before continuing.

Figure 14.4
The complete database has been selected.



Pull down the Data menu.	This menu has many commands that operate on a database within Excel.
Drag the mouse down to Set Database.	This command will define the selected range as a database for Excel. After using it you will find that a range called "Database" has been defined in the Define Names list of range names.



Figure 14.5
The Data menu has been pulled down and the Set Database command has been selected.

Release the mouse button.	Define the selected portion of the spreadsheet as a database for Excel.
⌘S	The Save command.
DB1	Name this worksheet DB1.
	Before you click the mouse on the Save button, make sure that the proper disk has been selected. Use the Drive button in the Save dialog box and the Eject button as needed until your disk is showing.
Click on the Save button.	Complete the save process. If you have problems working with the database, you will be able to return to this point without having to recreate the information.

14.4 SORTING THE SPREADSHEET DATABASE

One of the most useful data management functions is to re-arrange the data into a different order. Disk-based database management programs perform this task, and so does the Excel database manager. When you do this, all the fields of the database records will become re-arranged along with the field on which the sort is based.

When you sort the rows of an Excel database, you must take care not to include the first row. This row holds the field names, and is not really part of the data. If you include the first row in the range when sorting the database, the field names will get sorted into the data.

What To Do	*Why You Are Doing It*
⌘G	The Goto command.

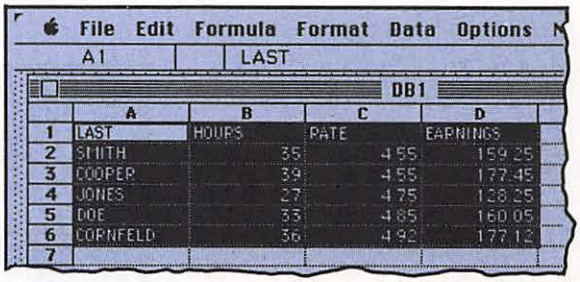
Click on Database.

You want to select the complete database. The first sort you will do will include the first row of the database. As previously mentioned, this is wrong.

Click on the OK button.

Complete the selection of the complete database.

Figure 14.6
The complete database has been selected.



Pull down the Data menu and select the Sort command.

The Sort command will let you sort, or rearrange, the information.

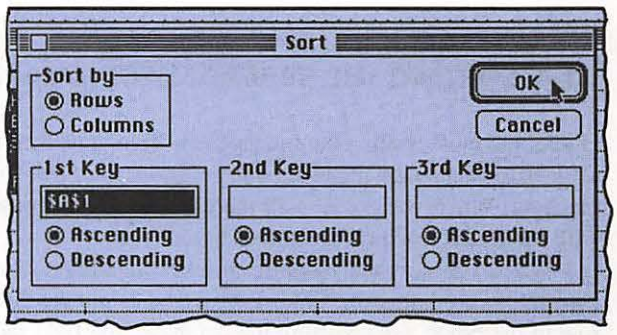
Figure 14.7
The Sort command has been selected.



Release the mouse button.

Execute the Sort command. After a brief pause you will see the Sort dialog box.

Figure 14.8
The Sort dialog box. Note that Excel does NOT give you any warning that the first row of the Database range has been included in the information to be sorted.



The initial Sort dialog box does not need to be changed.

The Sort By box lets you sort either rows or columns. Since a record of the database is in a row, we want to re-arrange the rows.

The three Key boxes control the order that the rows are to be sorted into. Only one key is necessary. The 2nd and 3rd keys produce secondary sorts. For example, if your data has 30 people named "Smith", you would make the field containing the First Name the 2nd Key. When the sort is done, all the Smiths would be together, and then alphabetized by their first name (the 2nd key).

The 1st Key box has been filled by Excel with $A$1, which is the column holding the Last Names (the A column) and the row starting the data to be sorted (the 1st row). Finally, we want the records sorted alphabetically, from A to Z. If you check the Descending button, the records will be sorted in reverse alphabetical order, from Z to A.

Click on the OK button.

Execute the Sort.

You can see the effect of including the row containing the field names in your sort. This row of information has been moved to row 5 of the database.

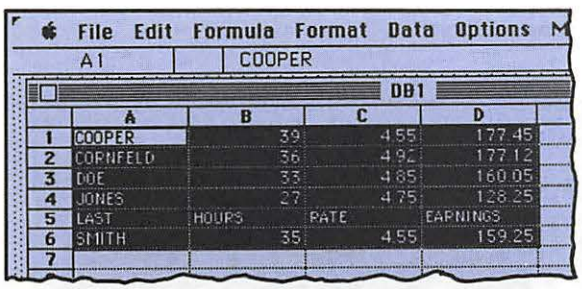


Figure 14.9
The first sort has been done wrong! Note that the field names are in row 5, rather than at the top of each field.

Pull down the Edit menu.

Recall that the Edit menu frequently has an Undo command.

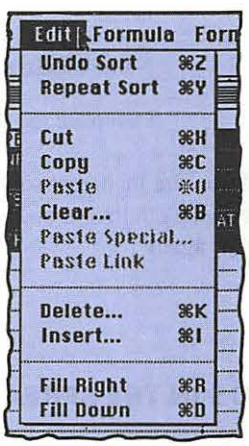


Figure 14.10
The top of the Edit menu shows the command Undo Sort.

Excel does include an Undo Sort command.

Drag the mouse down to Undo Sort and release the mouse button.

When you undo the sort, the database will return to its original order. Most important, however, is that the field names are returned to the top of the database where they belong.

Remember the Undo Sort command. It may come in handy in the future.

Select cells A2:D6.

This time you are going to correctly sort the records by not including the field names in the rows to be sorted.

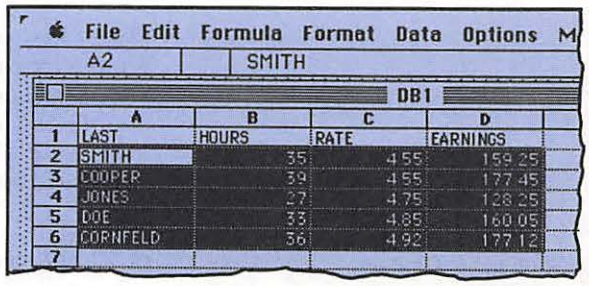


Figure 14.11
You are going to sort only the data this time. The Field names at the tops of each column are not included in the rows to be sorted.

Pull down the Data menu, select Sort and release the mouse button.

Once again you are going to execute the Sort command. The Sort dialog box now has cell $A$2 showing for the 1st Key.

Click on the OK button.

Execute the sort.

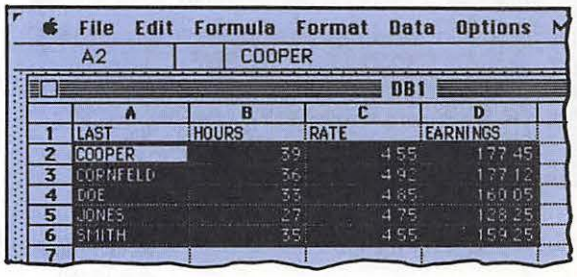


Figure 14.12
The correctly sorted database.

Pull down the File menu, select Save As and release the mouse button.

You are going to save the sorted database with a new name.

DB2

Name the database DB2.

Click on the Save button.

Complete the Save command.

If you have trouble with Undoing the incorrect sort, or you want to try the sort again, close the current worksheet and use the Open command on the File menu to load the initial file, saved as DB1. Then try the sort operation again.

14.5 SELECTING RECORDS IN THE SPREADSHEET

As you will see, a disk-based database manager also lets you select records from the database based on a selection criteria. For example, you may want to see only the records that include the word "nail" in a description field. At the same time, you may want to see only two or three of the fields of the complete database, which may include 25 to 30 fields. Both of these procedures are a simple task for the database management program.

In a similar fashion, you may have the Excel data manager select records out of the database for you. All you need to do is specify the field name upon which you are basing the selection and the value for which you are selecting. This information is, of course, placed into spreadsheet cells where the program can get at it. Finally, you must specify an area of the spreadsheet in which the selected records are to be placed. This area also defines the subset of the fields you want to see.

What To Do	*Why You Are Doing It*
Click the mouse on the 1 in the border to the left of the first row.	Select the first row of the spreadsheet. Remember, if you click in the border, you select the complete row or column.

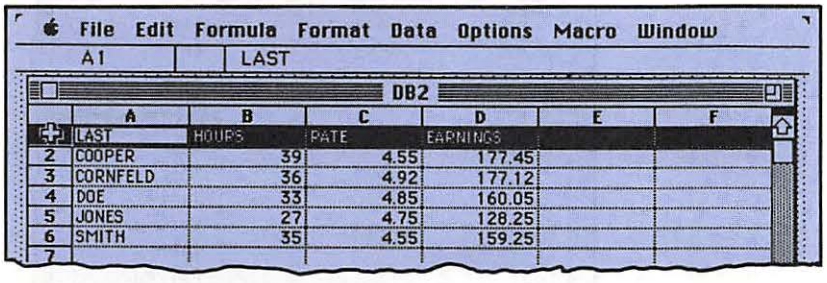


Figure 14.13
The complete first row has been selected.

⌘C	The Copy command. You are going to copy this row of the spreadsheet.
Click the mouse on the border at row 10.	Select the complete row 10 of the spreadsheet.
⌘V	The Paste command. You have now copied the field names to the tenth row of the spreadsheet.

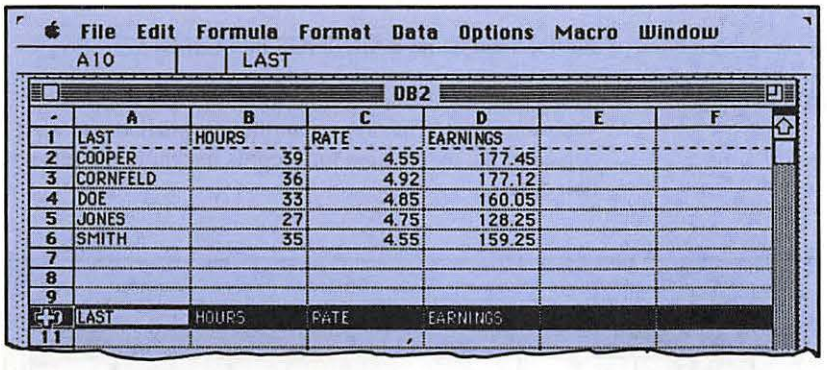
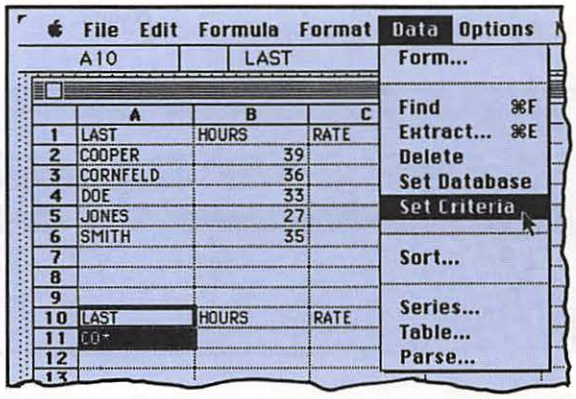


Figure 14.14
The field names have been copied to row 10 of the spreadsheet.

Click on cell A11.	Place the cursor into cell A11, directly below the cell which contains the text "LAST".
CO* [ENTER]	This specifies the values that you want to select for, and is sometimes called the **selection criteria**. The selection criteria is placed directly below the field name that is controlling the selection.

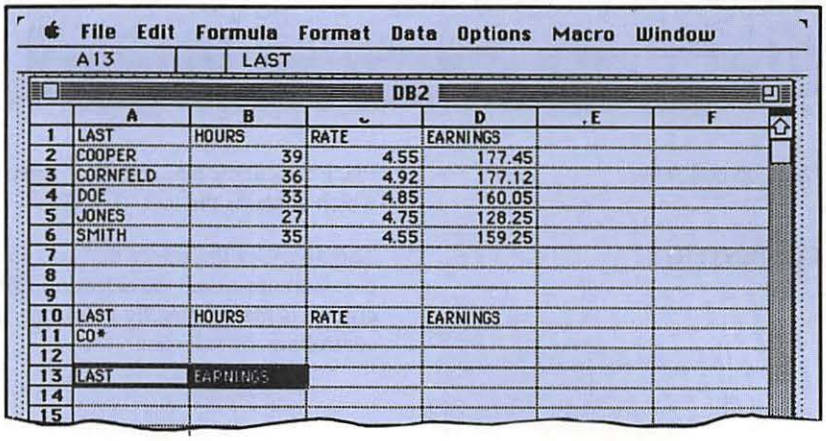
	Here you are telling Excel that you are looking for a value in the LAST field that starts with CO. The * is called a wildcard character. From the location of the *, any character matches. Thus, COABCDEF and COOPER and CORNFELD all match this selection criteria.
Select the cells A10:A11.	Now that you have entered information for the selection criterion, you must tell Excel the range that contains the criterion.
Pull down the Data menu and select Set Criteria.	This command will place a range into the Defined Names list called Criteria.

Figure 14.15
The Set Criteria command has been selected. You can see that cells A10:A1 are selected. They will be the criteria.



Release the mouse button.	Set the selection criterion to be the range A10:A11. You are looking for any records in the database in which the data in the LAST field starts with CO.
Move the mouse to cell A13 and click the mouse button once.	Move the cursor to cell A13.
LAST→	Put the field name LAST into cell A13 and move the cursor right to cell B13.
EARNINGS [ENTER]	Put the field name EARNINGS into cell B13.
Select the range A13:B13.	These two field names will be used to select the fields you want listed. They represent the information you want copied to the output area for records matching the selection criteria.

Figure 14.16
The database is ready to perform a selection.



Pull down the Data menu and select Extract.

The Extract command will copy the desired fields, LAST and EARNINGS in this case, for all the records that match the selection criteria that has been set up, LAST = CO*. Note that you can execute this command with the ⌘E key.



Figure 14.17
The Extract command has been selected.

Release the mouse button.

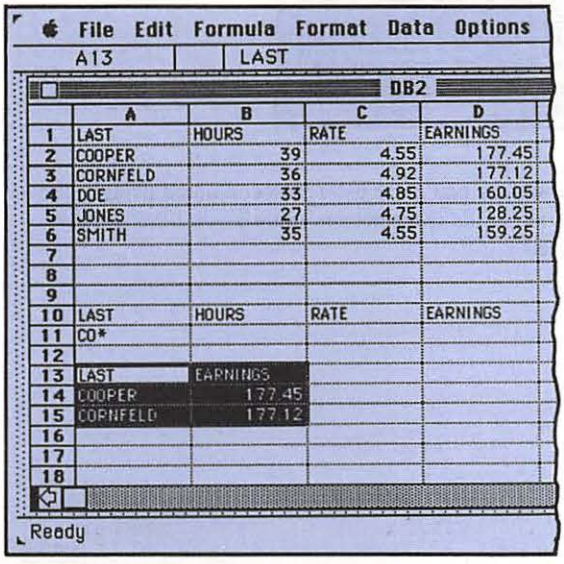
Execute the Extract command. You will now see the Extract dialog box.



Figure 14.18
The Extract dialog box.

Click on the OK button.

You are not worried about unique records at this time. Click on the OK button to execute the extract. After a brief pause, two records will be placed in the output area below the two field names in row 13.



	A	B	C	D
1	LAST	HOURS	RATE	EARNINGS
2	COOPER	39	4.55	177.45
3	CORNFELD	36	4.92	177.12
4	DOE	33	4.85	160.05
5	JONES	27	4.75	128.25
6	SMITH	35	4.55	159.25
7				
8				
9				
10	LAST	HOURS	RATE	EARNINGS
11	CO*			
12				
13	LAST	EARNINGS		
14	COOPER	177.45		
15	CORNFELD	177.12		
16				
17				
18				

Figure 14.19
The results of the Extract command.

Click the mouse pointer on cell B11.

This is the cell below the field name HOURS.

<35 [ENTER]

Enter the less than sign, followed by 35. You want to find all the records in which the hours worked are less than 35.

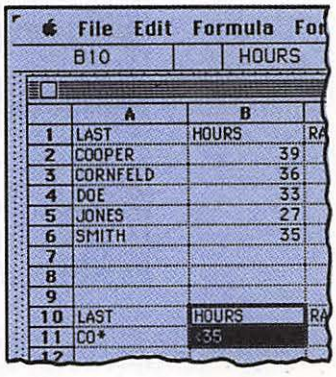
Select cells B10:B11.

You must select the cells you want for the criteria range.

Pull down the Data menu, select Set Criteria and release the mouse button.

Set cells B10:B11 as the new criteria range.

Figure 14.20
The new criteria range will be cells B10:B11.



Select the range A13:B13.

Once again select the two fields you have specified for the output area. Do not worry about clearing the contents of the cells below the two output field names.

⌘E

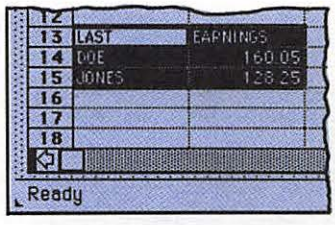
Execute the Extract command.

Click on the OK button.

Complete the Extract command.

After a brief pause, the two records that were selected by the first Extract command are replaced by two new records.

Figure 14.21
Two different records meet this selection criteria.



Select the range A10:B11.

You will try one more extraction command using a combination of the two selection criteria you have already created.

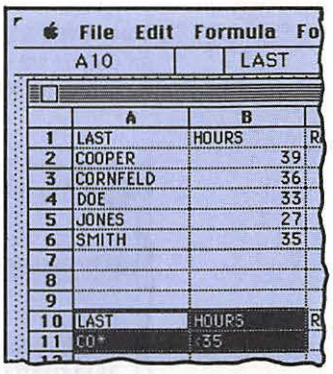


Figure 14.22
This range of cells will make the new selection criteria.

Pull down the Data menu, select Set Criteria and release the mouse.	Make these two criteria a combined selection criteria.
Select the range A13:B13.	Once again select the two fields you have specified for the output area.
⌘E	Execute the Extract command.
Click on the OK button.	Complete the Extract command. The output area will be erased. No records are selected because there are no last names beginning with CO for which the hours column contains a value less than 35.

14.6 RANDOM RECORD ACCESS IN THE SPREADSHEET DATABASE

The spreadsheet data manager is also able to locate records in the database without extracting them. As you may have surmised, the extraction process requires that you have a place to put the matching records that are located. This may, or may not, be a problem, depending on the actual size of the database and the amount of memory available to the spreadsheet.

The Find operation does not have this problem. It locates the desired records in the database area based on the selection criteria and highlights the desired records one at a time.

What To Do	*Why You Are Doing It*
Select the range B10:B11.	You are going to set the selection criteria to something that will result in records being found.
Pull down the Data menu, select Set Criteria and release the mouse.	Set the selection criteria to find records for people with hours less than 35.

Pull down the Data menu and select the Find command.

The Find command will locate the records in the database, but does not put a copy of the located records into an output area. Note that you may execute this command by using the ⌘F key.



Figure 14.23
The Find command has been selected.

Release the mouse.

Execute the Find command. The first record which meets the current selection criterion is found. The found record is highlighted (Figure 14.24). Notice that nothing has been placed in the output range. Find locates, but does not extract, records.

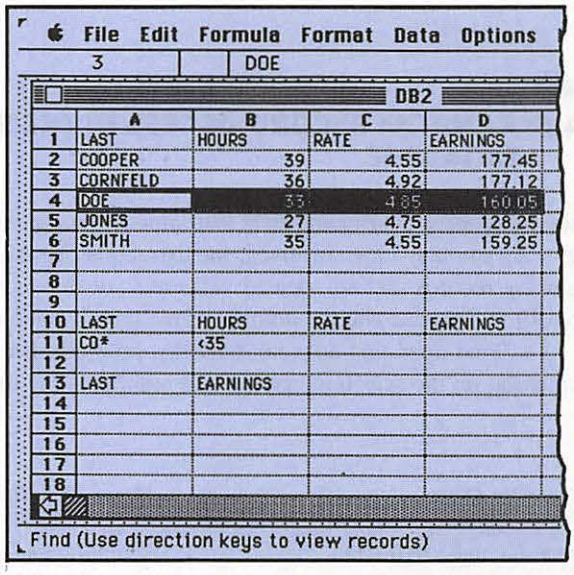


Figure 14.24
The first record has been found.

↓

The down arrow will find the next record which meets the current selection criterion.

↓

There are no more records which meet the selection criteria, so Excel "beeps" when you attempt another **FIND** at this time.

Pull down the Data menu.	Note that the Find command now reads Exit Find. It may still be executed by using the ⌘F key.

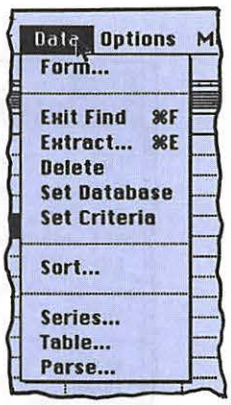


Figure 14.25
The Find command changes to Exit Find while a find is in process.

Drag the mouse down to Exit Find and release the mouse button.	Exit the find process.
Pull down the File Menu, select Save As and release the mouse button.	You are going to save the modified spreadsheet.
DB3	Name the spreadsheet DB3.
Click on the Save button.	Complete the save process.

To print the information in your Excel database, use the same sequence of steps that you use to print an Excel spreadsheet. Remember, to print everything, simply select the Print command found on the File menu. To print only a portion of the spreadsheet, select the desired range, then use the Set Print Area command before you execute the Print command. All you need to remember is that the Excel database is an enhancement of the spreadsheet, and all spreadsheet operations are allowed.

14.7 A DIFFERENT LOOK AT THE DATABASE

In addition to the way you have been working with the database, Excel will let you use a database form. This can sometimes be helpful, since you do not have to keep track of the database range. The database form lets you locate records, delete them, and add new ones to the database. To use the Form command, you must have a database range defined. You may do this with the Set Database command, or by using the Define Names command.

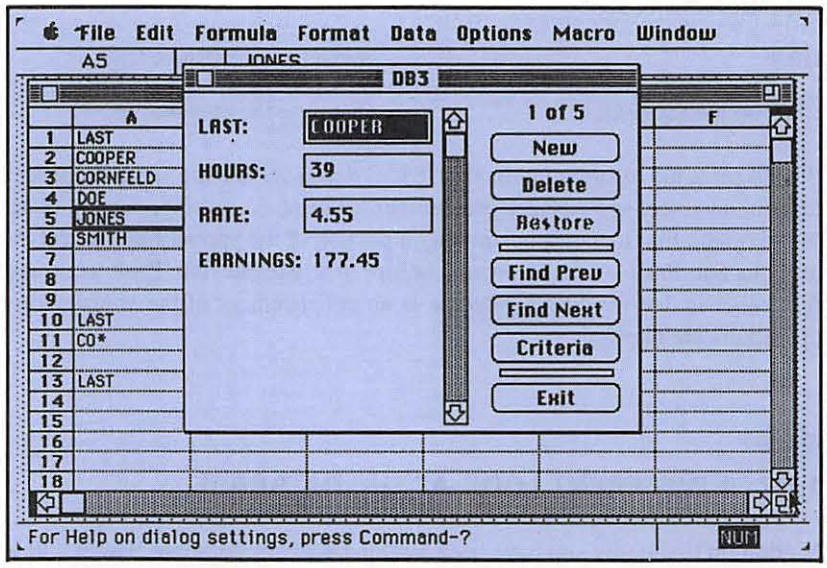
What To Do	*Why You Are Doing It*
Pull down the Data menu and select the Form command.	This command is the first one on the menu.

Figure 14.26
The Form command has been selected on the Data menu.



Release the mouse button.	Execute the Form command. It will take Excel a few seconds to build the form. Don't worry.

Figure 14.27
The Excel Database Form. You are looking at record one of the database. The top right corner of the Form window tells you 1 of 5, meaning record 1 is displayed and there are 5 records in the database.



	Note that the first three items of the database have boxes around them, while the last, EARNINGS, does not have a box. This last field is computed, while the first three are input by the user.
Click on the Find Next button.	When you activated the form, you were looking at the first record of the database. This button will move you to the next record. The Find Prev button will move you backwards through the database.
Click on the Criteria button.	You want to see what happens when you enter a selection criteria.
[TAB]	Move the blinking cursor to the HOURS field input box.

<35	Once again, you want to identify those people who have worked less than 35 hours.

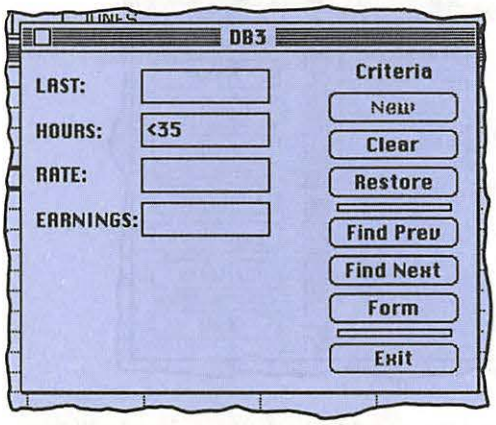


Figure 14.28
The Selection Criteria has been specified.

Click on the Form button.	Return to the Form from the Criteria specification screen.
Click on the Find Next button.	This will locate record 3 in the database. Note that the hours are 33, which is less than the specified 35.

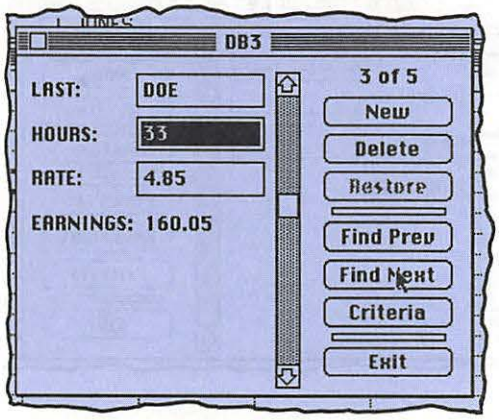
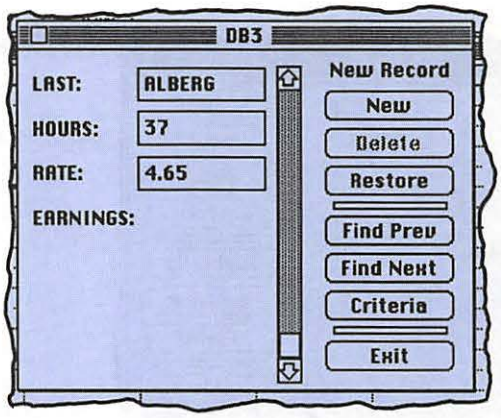


Figure 14.29
The third record matches the current selection criteria.

Click on the Find Next button again.	The next record that matches the selection criteria is record 4, with hours of 27.
Click on the Find Next button again.	The computer will "beep" at you. Even though you are looking at record 4, there are no more records that match the selection criteria. Thus, the beep.
Click on the New button.	You want to add a sixth record to the database.
ALBERG [TAB]	Enter the last name. Press the Tab key to move the cursor to the Hours field.
37 [TAB]	This person worked 37 hours. Press Tab to move the cursor to the Rate field.

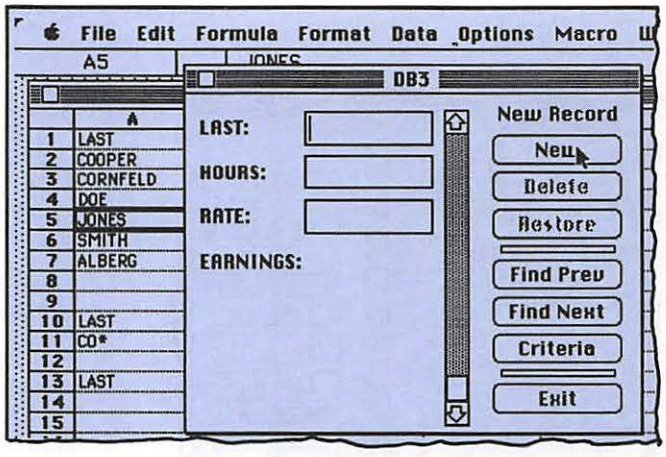
4.65	This person earns $4.65 per hour.

Figure 14.30
The database form has been filled out for a new record.



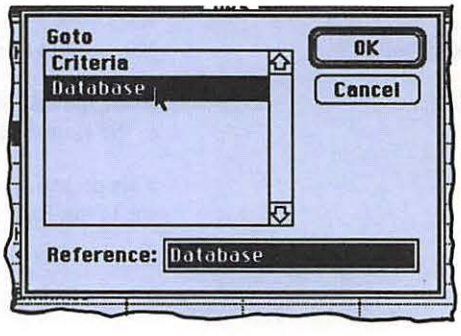
Click on the New button.	This will add the record to the database. Excel will then present you with the empty New Record form for another record.

Figure 14.31
The new record has been added to the database. It can be seen behind the input form in row 7 of the spreadsheet.



Click on the Exit button.	Exit the database Form mode.
⌘G	The Goto command.
Click on Database.	You want to select the complete database.

Figure 14.32
Database has been selected in the Goto names list box.



Click on the OK button.	Execute the Goto command. Because you added the new record through the database Form, the database range has extended itself automatically. It now includes row 7 of the spreadsheet.

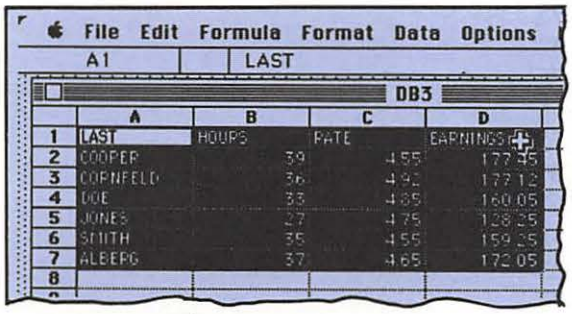


Figure 14.33
The complete database has been selected.

Pull down the File menu, select Save As and release the mouse button.	You want to save the modified database.
DB4	Name this database DB4.
Click on the Save button.	Complete the Save command.
⌘Q	You are through with the Excel database.

It is worth noting that if you continue to add records to the database through the database Form, you will run into occupied cells. When this occurs, Excel will tell you that it cannot extend the database, and you will not be able to add more records. If you are building a functional database, it is therefore a good idea to put criteria ranges and output areas either above or to the right of the actual database. With this design, the database should not run into any occupied cells of the spreadsheet.

Finally, remember that the form may be used for browsing through the database by using the Find Next and Find Previous buttons, and for locating subsets of the database by using the Criteria button.

EXERCISES

1. Does the database in the Excel spreadsheet program require that the data types be pre-defined?
2. How big can an Excel spreadsheet database be?
3. When creating an Excel spreadsheet database, where is the information stored?
4. Where are the field names placed in an Excel spreadsheet database?
5. How wide can you make a text column/field?
6. Must a database be in a specific location in the spreadsheet, or may it be placed at any location in the spreadsheet you desire?
7. When you sort an Excel spreadsheet database, are all the fields of the database re-arranged with the sort-key column, or is only the sort-key column re-arranged?
8. When selecting a subset of records from the Excel spreadsheet database, you must first use the Set Criteria command. What purpose does this command serve?
9. How does the Extract process know which fields of the Excel spreadsheet database you want displayed in the output area?
10. Is it possible to create selection criteria that select no records from the database?
11. How does the Excel spreadsheet database Find operation differ from the Extract operation?

12. Use Excel to create the following inventory database:

Part No.	Description	On Hand	Reorder	Cost
B877	Yellow Highlighters	3	2	1.95
B510	Red Permanent Markers	7	12	1.65
B302	Red Felt-tip Pens	16	12	0.75
C213	Phone Message Pads	26	24	0.87
C897	Inter Office Memo Pads	15	12	1.75
B512	Black Permanent Markers	11	24	1.65
B340	Black Felt-tip Pens	27	48	0.75
A902	9 x 12 Manila Envelopes	76	25	0.07
C878	8.5 x 11 White Unlined Pads	9	12	1.67
C764	8.5 x 11 Lined Writing Pads	31	48	1.55
D229	8 oz. Styro. Coffee Cups	62	100	0.05
C387	5 x 7 Yellow Lined Note Pad	28	12	0.95
A874	5 x 7 Manila Envelopes	21	25	0.05
C315	4 x 5 White Note Pads	13	24	0.73
A392	4 x 5 Manila Envelopes	53	25	0.04
A103	#9 Envelopes	1210	500	0.04

13. Sort the database you created in Exercise 12 so the information is listed in Part Number order.
14. Add another column to the database you have created, titled VALUE. The entries in this column are computed by multiplying the number in the ON HAND column times the number in the COST column. At the bottom of the new VALUE column, compute the sum of the values, giving the total value of the inventory on hand.
15. Use the extract feature to find the inventory items in the database with the number on hand below the reorder point.
16. Use Excel to create the following birthday database:

Last	First	Phone	Birth Month	Day
Jones	Mary Anne	415/678-1212	September	6
Ettinger	Alice	805/864-5741	January	11
Carey	Fredrick	415/339-1239	October	22
Ackerman	George	415/653-9640	April	27
Perryman	Edward	213/564-7686	June	18
Kemp	Robin	805/239-1282	May	3
Litton	Joseph	213/681-4760	February	21
Malone	Florence	415/931-3151	January	28
Diller	Janice	805/413-0891	October	3
Shepherd	Harold	213/872-1171	September	2
Berkett	Gregory	415/751-5476	September	19
Wong	Jenny	805/321-9812	March	17

17. Sort the database you created in Exercise 18 into order by Last Name.
18. Use the Extract operation to select the people with a birthday in September. How many are there?
19. Use the Extract operation to select the people with phone numbers in the 805 area code. How many are there?
20. Sort the database into order by birth month. What is the order that the months are displayed (January, February, March, etc., or some other order)?
21. Add a sixth column to this database, called MONTH NUMBER. Place in it the number of the birth month. That is, place a 1 in the column if a person's birth month is January, a 2 if it is February, and so on.
22. Sort the database into order based on the MONTH NUMBER column. Now in what order are the months displayed? Are the people's birthdays necessarily in chronological order?
23. Sort the database into order based on the MONTH NUMBER as the primary sort key and the day as the secondary sort key. Does this put people's birthdays into chronological order?

CHAPTER

BEGINNING DATABASE MANAGEMENT SYSTEMS CONCEPTS

15

CHAPTER OBJECTIVES:

Upon completion of this chapter, the student will:

- **Start FileMaker.**
- **Create a database file.**
- **Add entries into the database file.**
- **List/display the file contents.**
- **Edit/correct file entries.**
- **Print the file contents.**
- **Exit FileMaker.**

15.1 STARTING FILEMAKER II

FileMaker II is distributed on two disks, the Program disk and the Examples disk. On the Program disk you will find the FileMaker II program itself and the FileMaker help file. The Examples disk contains a variety of sample database files.

After you boot your Macintosh with a System Start-Up disk, insert the FileMaker II Program disk into one of the computer's disk drives. If you are using a machine with a hard disk you will not need to insert the FileMaker program disk into a disk drive. Rather, locate the FileMaker folder, and open it so you can see the FileMaker program icon. Place a disk (see Chapter 3 for how to initialize a new disk) with at least 200K available space into another one of your Macintosh's disk drives, if you have one available. This disk will be used for saving your work. If you do not have a free floppy disk drive, keep this disk available. You will need it for data storage.

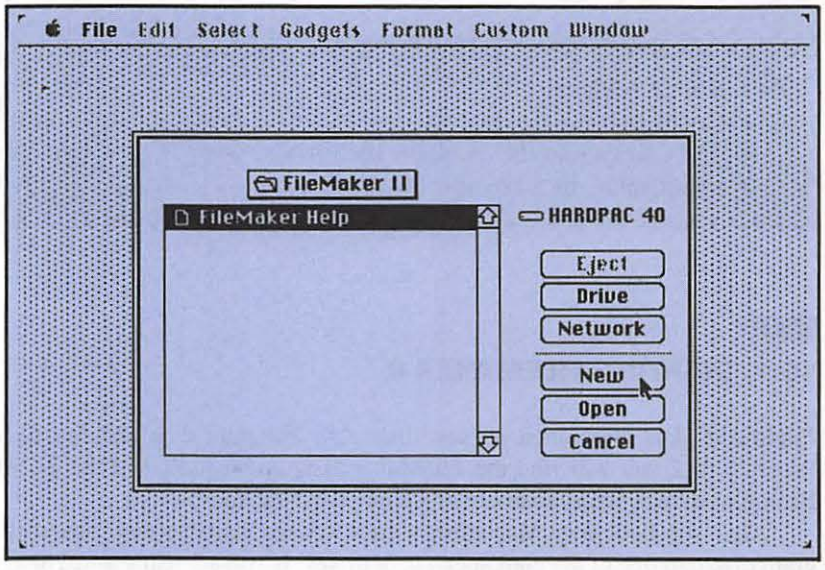
In these instructions, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter key*). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and double-click the mouse button. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.

What To Do	*Why You Are Doing It*
If the disk's icon is closed, double-click on it with the mouse pointer.	Open up the disk icon onto the desktop. If the Macintosh you are using has a hard disk, then open the folder containing the FileMaker II program.
Locate the FileMaker II program icon inside the disk window (Figure 15.1). If you are using a machine with a hard disk, locate the FileMaker II program icon inside the folder's window.	
Move the mouse pointer to the FileMaker II icon and double-click the mouse button.	Launch FileMaker II. Remember, if you are having trouble with the double-click, you may select the FileMaker II icon with a single click, then use the Open command on the File menu (or ⌘O) to launch FileMaker II. After a brief pause while the program loads, you will see a dialog box similar to the one shown in Figure 15.2. FileMaker wants to know the name of the database file to be opened.
Click on the New button.	Since you do not have a database file, clicking on the New button will tell FileMaker that you want to create a new database file. You will now see the New File dialog box. If your disk name does not appear at the top of this dialog box, click on the Drive button. If the Drive button is dimmed, insert a disk into the disk drive so that FileMaker can read it. If all the disk drives in your computer are full, then use the Eject button in this dialog box to free up one of the disk drives, then insert your data disk into the now empty disk drive.

Figure 15.1
The FileMaker II program icon.



Figure 15.2
The beginning FileMaker display.



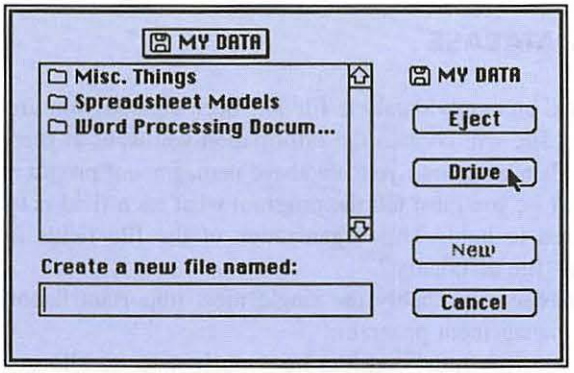


Figure 15.3
The New File dialog box shows the disk MY DATA is in one of this Macintosh's floppy disk drives.

Inventory File

Enter the name "Inventory File" into the name box at the bottom of the New File dialog box (Figure 15.4).

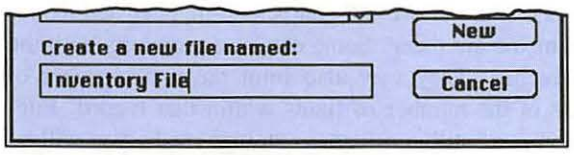


Figure 15.4
The file name "Inventory File" has been entered into the dialog box.

Click on the New button.

Clicking on the New button will create the file.

Because this is a new database file, you will now see the File Definition dialog box.

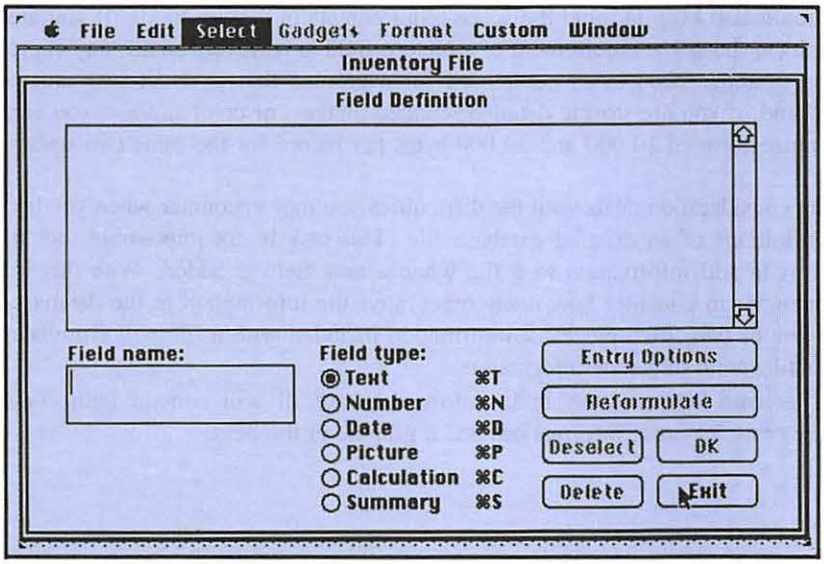


Figure 15.5
The File Definition dialog box is empty for a new file.

15.2. PREPARING TO DEFINE A DATABASE

Now that you have FileMaker II running, and an empty database file has been created, you are ready to define the contents of the file. This file will contain the information you want to keep track of. When you create a file, you must then enter into your database management program the structure or organization of the data. That is, you must tell the program what each field is to be called and the type of data it is expected to hold. This organization of the file fields is sometimes called the "file structure" or the "file dictionary."

How you define the fields of your database is probably the single most important factor affecting the successful use of the database management program.

Before you actually begin creating the file, you must consider how much space to allocate for each field on the computer's screen, the font characteristics of the fields, the type of data to put into each field and formatting of the information.

As you make your decisions about all these factors, you must balance your desires between wanting to plan for all possible information a field may hold (for example, if one of the fields is to hold last names, do you leave space for a last name of over 30 characters—hyphenated names can be long) and the limitations of the program you are using. Some database programs limit the number of fields you may use to build a record. They may also limit the total number of characters that make up a record, regardless of the number of fields within that record. FileMaker does not have these limitations, but you must still consider the storage media you will be using.

Frequently, the most important consideration when planning the file's organization is the capacity of the disk you are using combined with the anticipated number of records in the file. If each record requires 1000 bytes of disk storage, then a disk with 80K (81920 bytes) of free space will be able to hold a file with only 81 records. If the record requires only 750 bytes, this same free space will be able to store 109 records! Even a large-capacity hard disk does not have infinite space. You should also keep in mind the space requirements of picture fields. If you are using MacPaint® graphics, the space requirement of a picture field is relatively small, anywhere from about 500 bytes to about 2000 bytes per record for a graphic that is about two square inches. On the other hand, if you are storing detailed scanned images, or color images, you can expect the field to require between 10,000 and 30,000 bytes per record for the same two square inch image.

Another important consideration deals with the difficulties you may encounter when you try to change the field definitions of an existing database file. This task is not impossible, but it requires time and effort to add information to a file when a new field is added. With this in mind, you should remember to consider how many other ways the information in the database may be used. Maybe one or two small pieces of information included with a file will eliminate the need to keep other files with duplicate information.

The file you will create here will be an inventory database. It will contain item code numbers, descriptions, costs, re-order information, and a graphic of the item.

15.3 HOW TO DEFINE THE FIELDS FOR FILEMAKER II

You should still have the File Definition dialog box displayed on the Macintosh's screen. If not, redo the steps in the first section of this chapter until your screen matches Figure 15.5.

What To Do	*Why You Are Doing It*
Inventory Code	Enter the name of the first field into the Field name box. This field will hold unique information for each record of the database—a code number to identify each inventory item in the file. The button for the Text Field type should be selected. Since you want this field to be a text, or character, field, you do not have to do anything else to this field definition. You should note that in addition to being able to click on the Text button, ⌘T may be used to select the Text Field type.

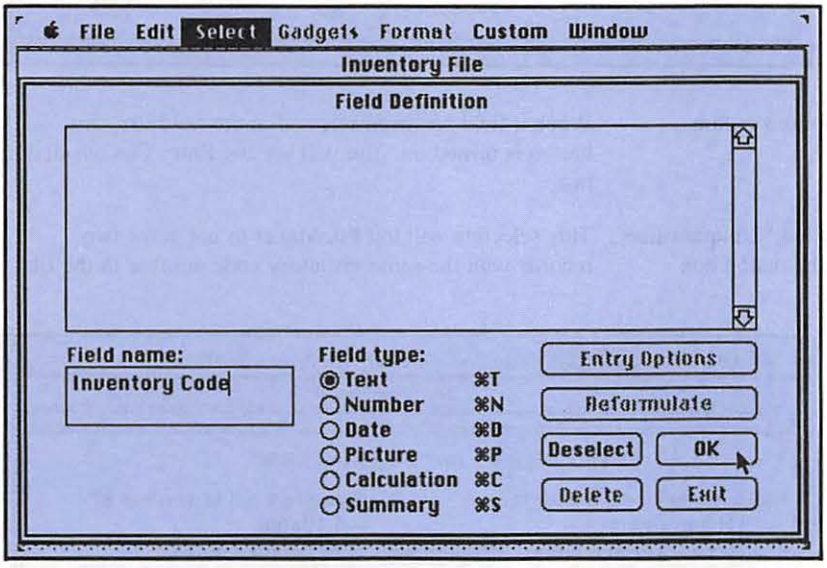


Figure 15.6
The Field Definition has been completed for the first field of the database.

Click on the OK button.	You are done defining the contents of this field. When you click on the OK button, the field name you have defined will appear in the field list box at the top of the current dialog box. "Text" appears after the field name to remind you of the data type assigned to the field.

Click on Inventory Code in the field list at the top of the dialog box.

You now want to tell FileMaker that the information in this field will be unique in each record. This will prevent the accidental entry of two items with the same part number.

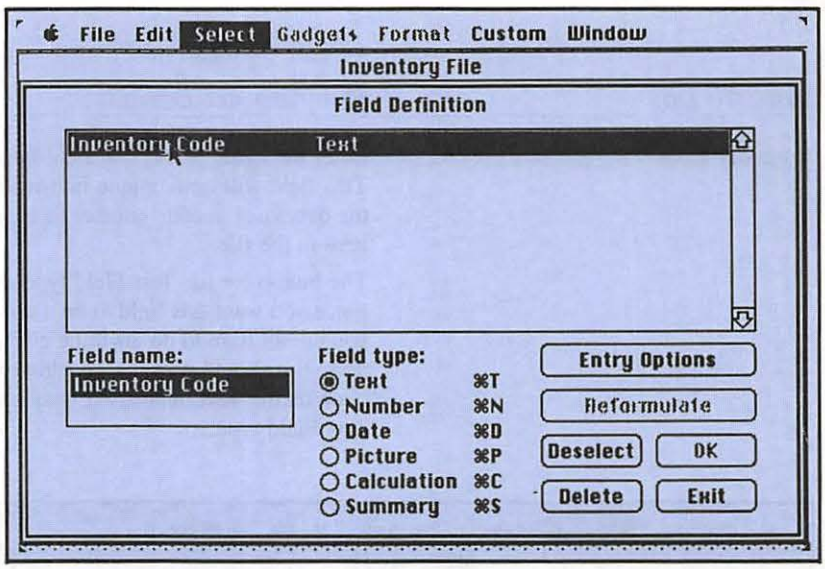


Figure 15.7
The field definition has been completed. The Inventory Code field is now part of the file, and has been selected in the field list at the top of the dialog box.

Click on the Entry Options button.

When a field has been selected in the field list, this button is turned on. You will see the Entry Options dialog box.

Click on the box labelled "Unique value only" at the right of the dialog box.

This selection will tell FileMaker to not allow two records with the same inventory code number in the file.

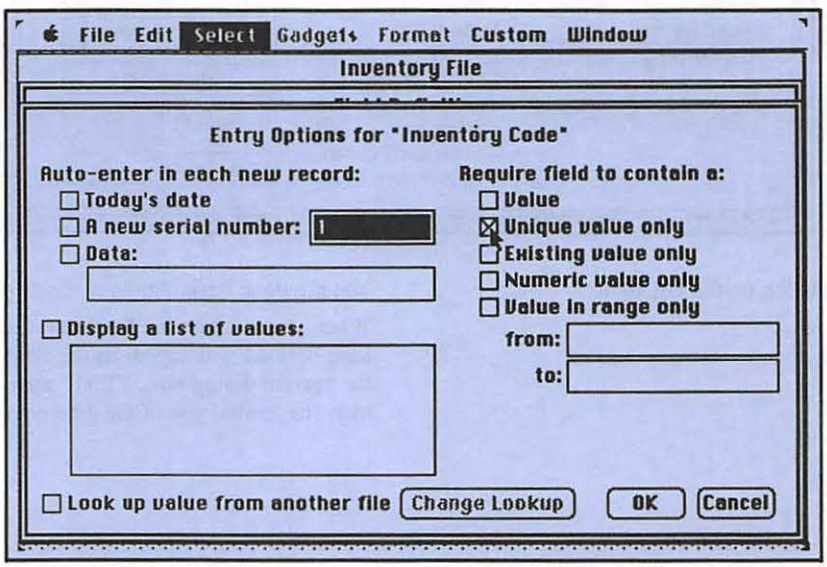


Figure 15.8
The Unique value only box has been checked on the Entry Options dialog box.

Click on the OK button.

Return to defining fields.

Description

Enter the name of the second field. This field will hold a long description of the item.

Click on the OK button.

This field is also a text field. You do not need to do anything else to this field.

Cost

Enter the third field name. This field will hold the cost of the item.

Click the mouse on the Number button.

This field will hold a number, rather than text. Note that you may optionally use ⌘N to select the Number field type.

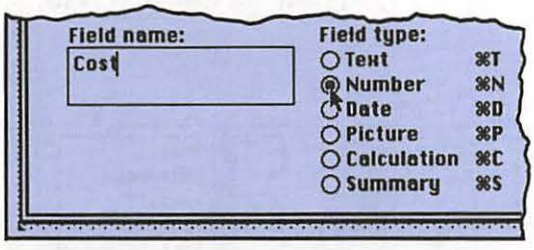


Figure 15.9
The Cost field will hold numeric information.

Click on the OK button.

Complete the field definition. You can see that Number appears as part of the field definition in the field list at the top of the dialog box.

Quantity On Hand

This is the next field name. This field will hold the number of units of the item that are in the stockroom.

The Number field type should still be selected, since that was the last field type you created.

Click on the OK button.

Add this field to the field list.

Minimum Stock

The fifth field being added to the database. This field will hold the value that represents the minimum number of the particular item that must be in the stockroom. When the number of units of this item in the stockroom falls below this value, it is time to order more.

Click on the OK button.

Again, this is a numeric field. No further changes to the field definition are necessary since the prior field was defined as a numeric field. Clicking on the OK button adds the field to the field list.

Reorder

The next field name. This field will tell us when the number of units of a particular item falls below the minimum stock level in the stockroom.

Click on the Calculation button.

This will be a calculated field. You want to have the database automatically tell you when a part should be reordered. You will see that you cannot enter the information into calculated fields, FileMaker computes the information for you.

Click on the OK button.

Enter the field name and type into the field list. You must now define the calculation for FileMaker in the dialog box that automatically appears.

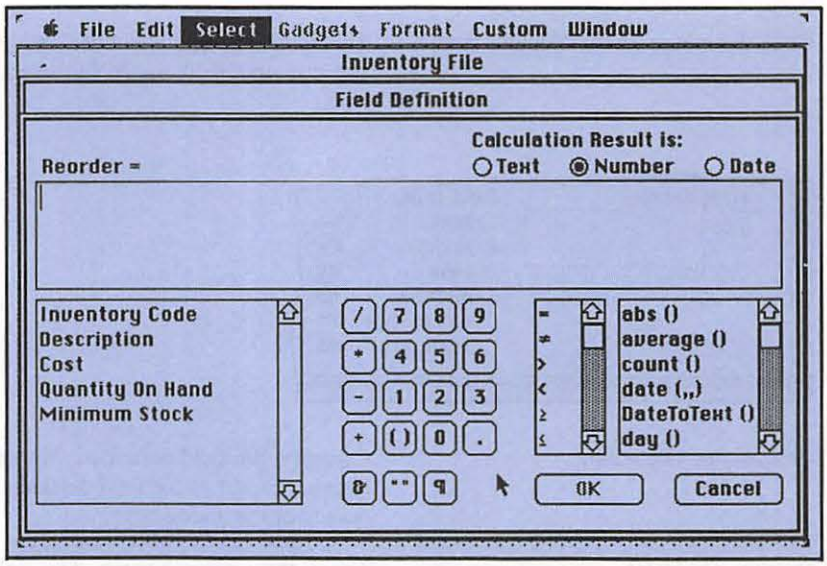


Figure 15.10
When creating a calculated field you must tell FileMaker how to calculate the information for the field. This dialog box lets you do this task.

The functions and comparison (or Boolean) operators that you may use are found in the two scroll lists at the right side of the dialog box. The one on the right is the list of functions, and the one on the left is the list of comparison operators.

Click on the Text button.

This button is at the top of the dialog box under the heading "Calculation Result is:". Even though the computation will be numeric, the information displayed will be text.

Use the scroll bar of the functions box until the "if(,,)" function appears.

The computation to be entered must determine if the stock on hand is below the reorder point. Thus, we want to use the IF function. You may either type the function, or use the functions list to have the computer enter a shell of the function for you. You want the computer to enter the function's shell for you.

Place the mouse pointer on the "if" function and click the mouse button once.

When you click the mouse, the "if(,,)" function will be added to the formula definition box at the top of the current dialog box.

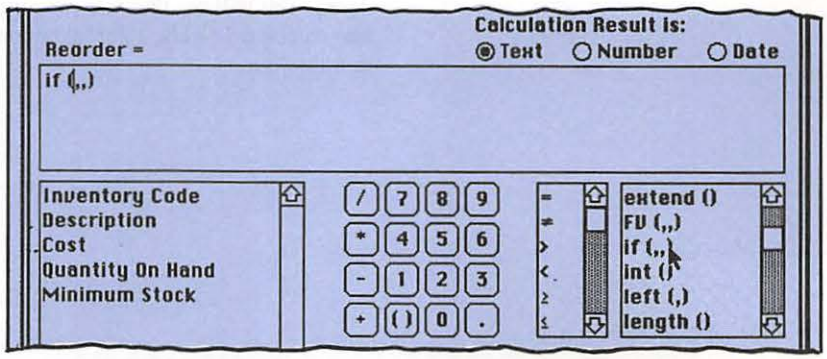


Figure 15.11
The "if(,,)" function has been added to the formula definition for this field. Note, also, that the Text button has been selected at the top of the dialog box.

The "if" function requires three items of input, called arguments, for it to operate. The first argument is a comparison, such as "Age greater than 45." The second argument tells FileMaker what to "do" when the comparison is true. Thus, if the information in the Age field for a specific record is 55, the second argument of this function will control what information is displayed. The final argument tells FileMaker what to "do" if the comparison is false. Thus if the Age field for a specific record is 28, this third argument will control what is displayed.

Click on the "( )" button on the image of the number pad.

The number pad, at the lower center of the dialog box, lets you enter parts of the formula without using the computer's keyboard. Using this button will keep the parentheses balanced. The cursor will be between the parentheses.

Click on the field name "Quantity On Hand" in the left scroll box.

By clicking on a field name you are adding that field into the computation.

Click on the minus sign (–) on the image of the number pad.

The field must perform some arithmetic.

Click on the field name "Minimum Stock".

Add this field name to the formula.

→

Move the cursor so that it is positioned between the right parenthesis and the first comma found in the "if" function.

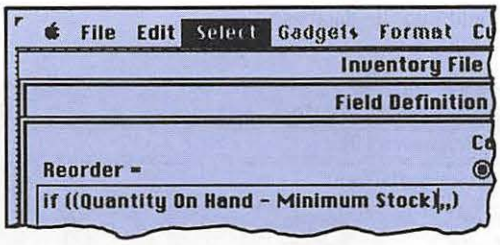


Figure 15.12
Note the position of the cursor between the right parenthesis and the first comma.

Click on the < sign at the bottom of the Boolean operators list.

This is the "less than" symbol.

Click on the 0 on the number pad.

The comparison is now complete. It will subtract the minimum desired stock level from the stock on hand, and compare the result to the constant value, 0.

→

Place the cursor between the two commas of the "if(,,)" function. This is where you will place what you want to have displayed in the field if the comparison is true, i.e., the result of the computation is less than zero.

"Reorder"

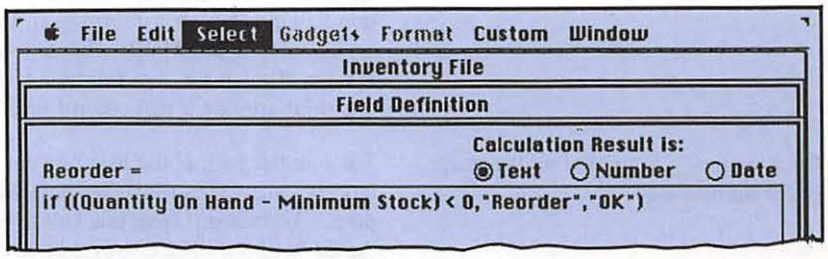
When the comparison is true, the number of units in stock of the particular item has fallen below the minimum number to keep on hand, and it is time to reorder. Thus, we want the word Reorder displayed. Be sure to enclose this word in quote marks as you enter it here.

→

Move the cursor right so it is positioned between the second comma and the closing parenthesis.

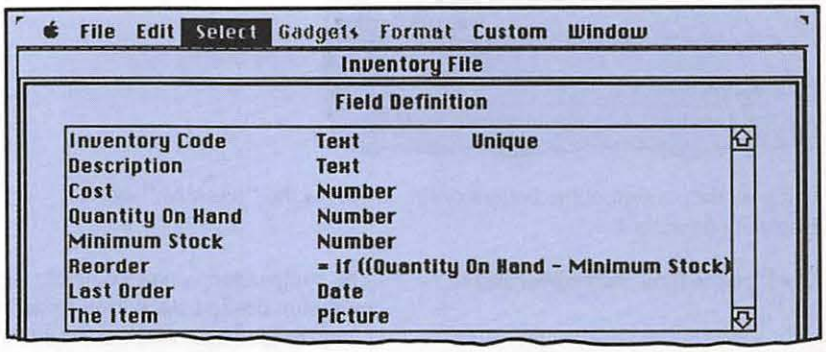
"OK"	This is the text to display when the comparison is false, meaning the stock level matches or is greater than the minimum number to keep on hand.
	This completes the formula for the Reorder field.

Figure 15.13
The formula for the field Reorder has been completed.



Click on the OK button.	You have defined the field and are ready to continue with the next field in the file.
Last Order	This is the seventh field. It will show the date the last time this item was restocked.
Click on the Date button.	This is a date field.
Click on the OK button.	Enter the field into the database.
The Item	Enter the eighth field name. This field will hold a picture of the item.
Click on the Picture button.	Make the data type for this field into Picture.
Click on the OK button.	Enter the field into the database.

Figure 15.14
The field definitions you have entered so far.



Value	Enter another field name. This will be a computed field, giving the value of the inventory item.
Click on the Calculation button.	Tell FileMaker that this will be a computed field.
Click on the OK button.	Enter the field name.
	You must now tell FileMaker the formula for this field.

Click on the Cost field.	This is the first item in the formula.
Click on the asterisk (*) on the number pad area of the dialog box.	The asterisk means multiply to the computer.
Click on the Quantity on Hand field.	Complete the formula with this field. The cost times the number in stock will tell you the dollar value of the inventory item.

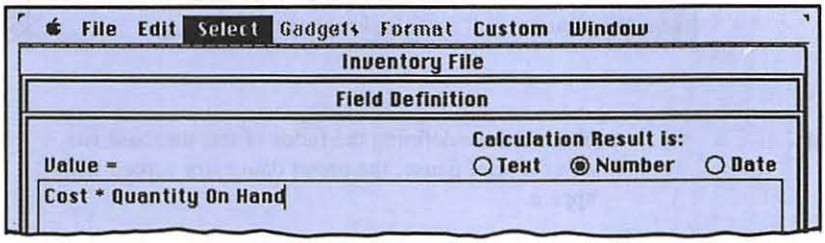
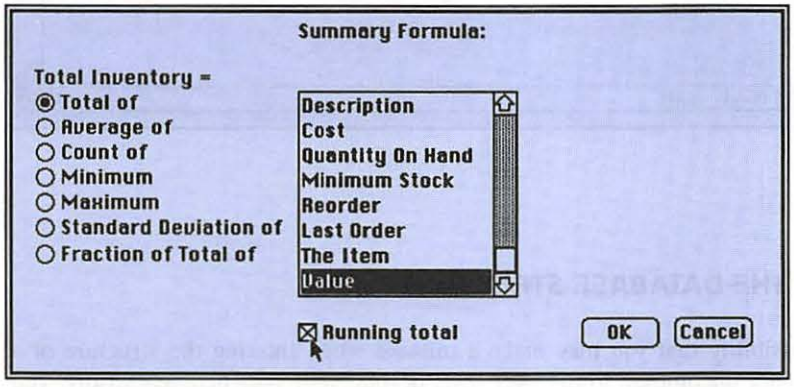


Figure 15.15
The formula for the Value field.

Click on the OK button.	Complete the field definition.
Total Inventory	This will be the last field in the database.
Click on the Summary button.	This field will hold summary information. The information computed by this field will come from a summary of the active records in the database, rather than from a single record of the database. Just like the calculation fields, you do not enter the information into the field, it is automatically computed for you.
Click on the OK button.	Enter the field into the database. You will now see the Summary Formula dialog box.



The Summary Formula dialog box.

Scroll the field list in the dialog box until you see the Value field.	You want to keep the total inventory value displayed on the computer's screen at all times.
Click on the Value field.	This is the field you want summarized.
Click on the Running total box at the bottom of the dialog box.	You want FileMaker to maintain the total as information is entered.

Click on the OK button.

Complete the definition of this field.

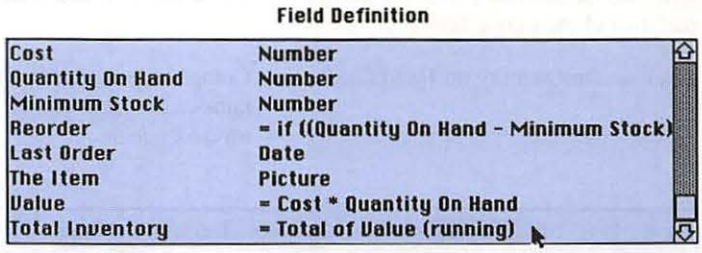


Figure 15.17
The current field list box now shows the two new fields.

Click on the Exit button.

You are done defining the fields of this database file. After a brief pause, the preset data entry screen will appear.

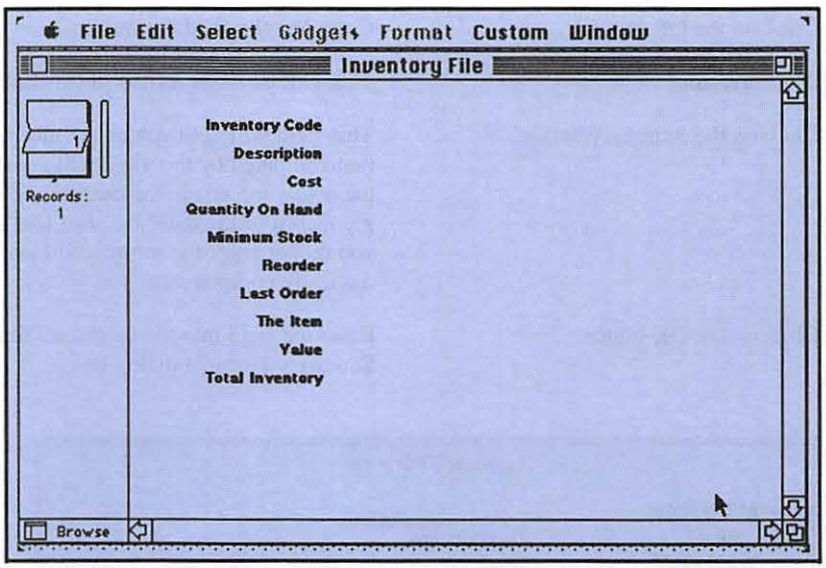


Figure 15.18
The data entry screen for the database file you have created.

15.4 CHANGING THE DATABASE STRUCTURE

There is always the possibility that you may make a mistake when entering the structure of a database file. It is also not uncommon to discover that, despite your best planning effort, you forgot a field, or you want to change the name of a field. This is relatively easy to correct.

What To Do	*Why You Are Doing It*
Pull down the Select menu.	This menu lets you select what you want to do with the database file.
Drag the mouse down to the Define command.	The Define command lets you return to the Field Definition dialog box.



Figure 15.19
The Define command has been selected on the Select menu.

Release the mouse button.	Return to the Field Definition mode. You may now add more fields to the file, or change the names of existing fields.
Click on the Cost field.	You want to change the name of this field.
Our Cost	Change the name of the field to Our Cost.

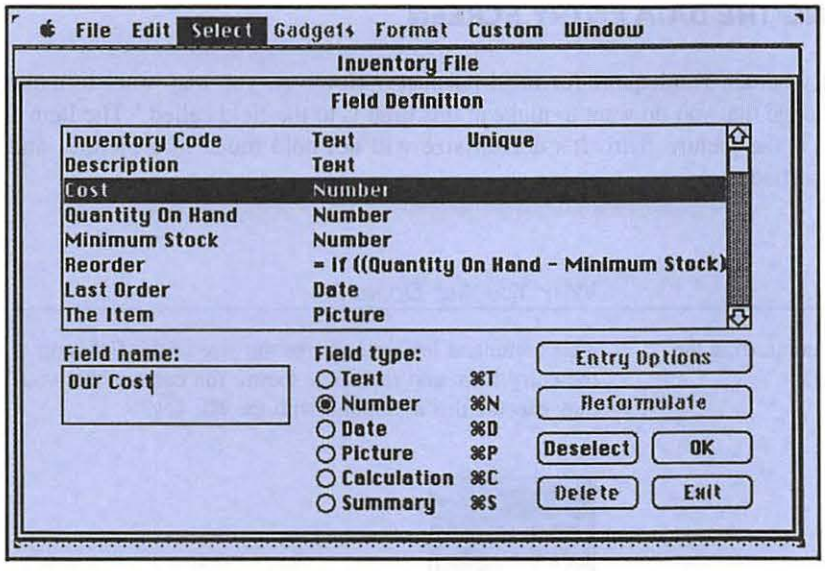


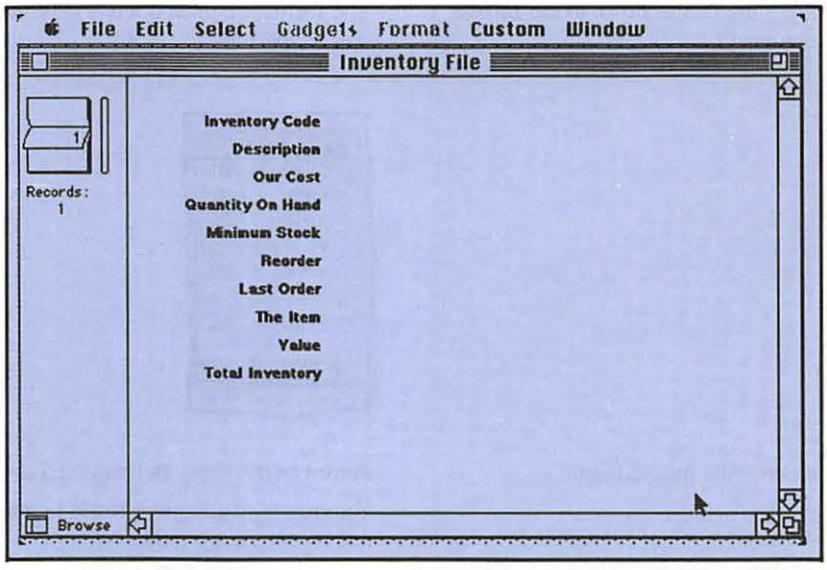
Figure 15.20
The field name will be changed.

Click on the OK button.	The field list now shows the change in the name.

Click on the Exit button.

Once again you are done defining the fields. Note that the default data entry screen now has the field Our Cost, rather than the field Cost.

Figure 15.21
The new data entry screen.



15.5 MODIFYING THE DATA ENTRY SCREEN

The default data entry screen is adequate for most purposes. However, you may want to make changes to it. One change that you do want to make at this time is to the field called "The Item." Recall that this field is the picture field. It's default size will not hold much of a picture, and must therefore be modified.

What To Do

Pull down the Select menu, drag the mouse down to Layout.

Why You Are Doing It

This command lets you change the size of the fields on the entry form and rearrange them. You can see that you may execute this command with the ⌘L key.

Figure 15.22
The Layout command has been selected.



Release the mouse button.

Execute the Layout command. The screen will immediately change to the Layout mode.

The Layout screen shows the current sizes of each field in the database. Inside the field you can see the field names. The font that appears at this time is the default font for each field. At the bottom right corner of each field is a black box. This is a handle that lets you change the size and shape of the field on the computer's screen.

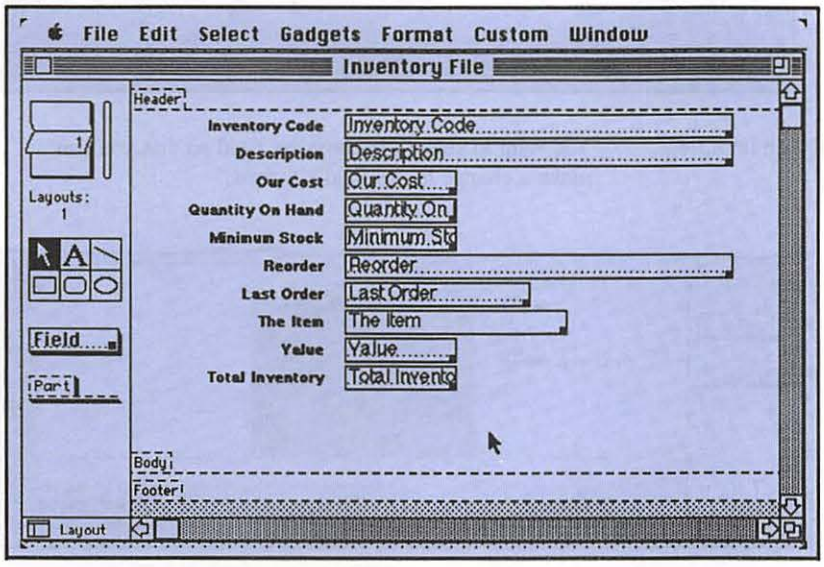


Figure 15.23
The Layout screen. You can now see the sizes of each field. The field names appear within each field. Note the handle at the bottom right corner of each field.

Place the tip of the mouse pointer on the black box of The Item field.

You are going to change the size of this field.

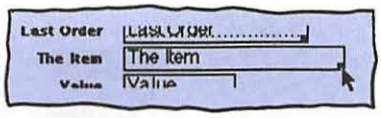


Figure 15.24
Note the position of the mouse pointer on the handle of The Item field.

Press and hold the mouse button.

You are going to drag the field's handle to reshape the field.

Drag the mouse down until the bottom border of the field touches the dashed line at the bottom of the screen.

You are making the field into a square on the screen.

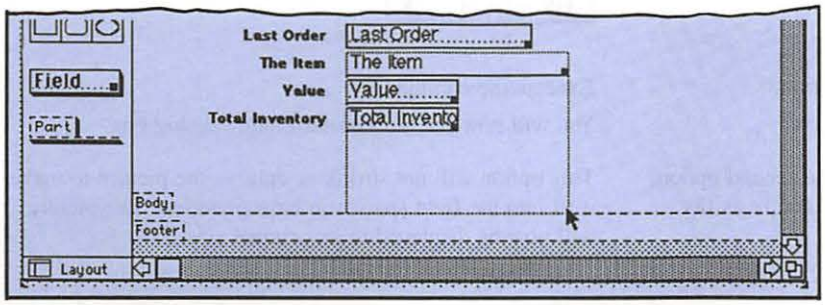
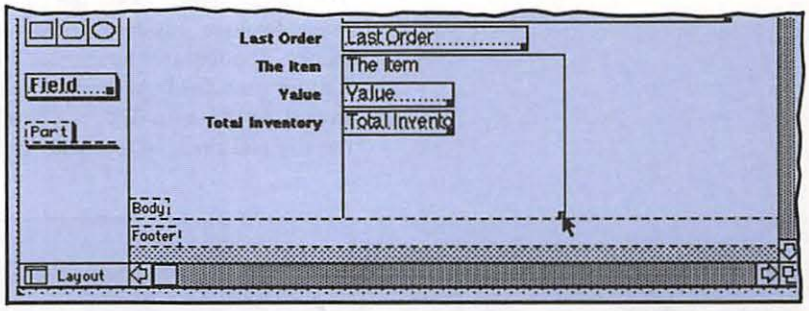


Figure 15.25
Drag the handle of The Item field to the dashed line above the bottom of the screen.

Release the mouse button.

Complete the reshaping of the field.

Figure 15.26
The field has been reshaped.



Click in the middle of The Item field.

You want to select the complete field so that you can make a change to the field's format.

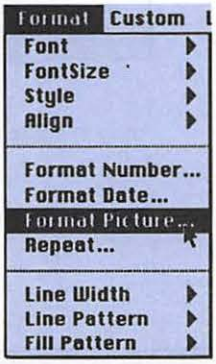
Figure 15.27
The complete field has been selected.



Pull down the Format menu and drag the mouse to the Format Picture command.

The picture field will do one of two things to your picture. It will either make the graphic fit into the space you have laid out, or it will leave the picture its original size, the field then acting as a window to the graphic.

Figure 15.28
The Format Picture command has been selected.



Release the mouse button.

Execute the command.

You will now see the Format Picture dialog box.

Click the mouse on the second option, Show as much of the picture as fits.

This option will not shrink or enlarge the picture to make it fit into the field space you have provided. The picture will now be displayed in its original size.

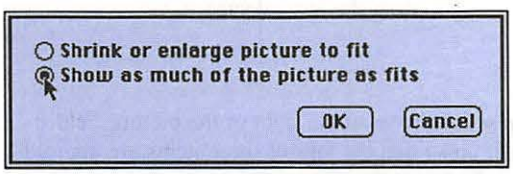


Figure 15.29
The Show as much of the picture as fits option has been selected.

Click on the OK button.	You are done with this dialog box.
Click the mouse on the side of the form.	You want to de-select the field you have been working with. You now have a minor problem. This field overlaps the Value field and the Total Inventory field on the screen. They must be repositioned.
Click on the Value field.	Select this field. If you position the mouse outside the field, you will not get it selected when you click the mouse.

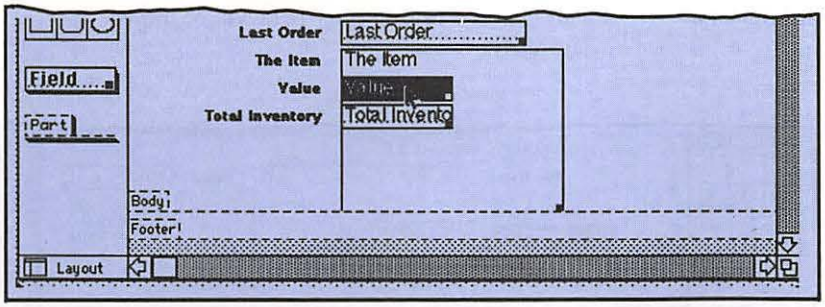


Figure 15.30
The Value field has been selected. Note the location of the mouse. This is where it was when the mouse button was clicked to ensure that this field was selected.

Press and hold the [SHIFT] key.	You now want to select more information, and keep the current field selected. Remember that the Shift-click will let you do this.
Click on the word Value to the left of the data entry area.	The field labels must also be moved.
Release the [SHIFT] key.	You no longer have to hold down the shift key. You are going to move these two items first.

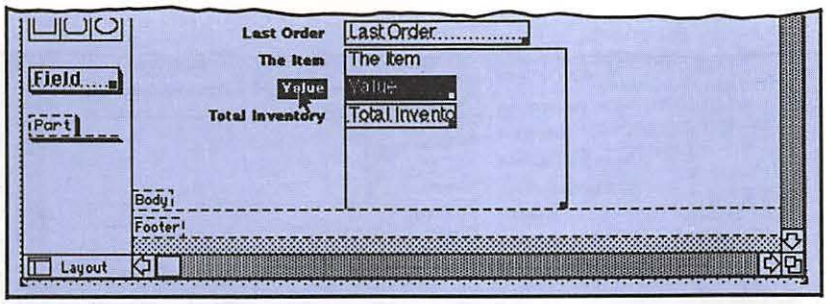
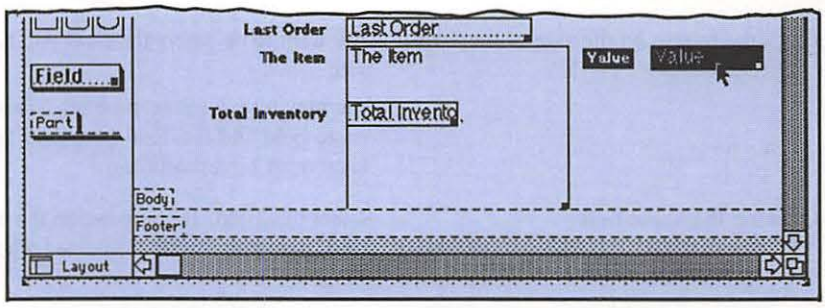


Figure 15.31
The information to be moved has been selected.

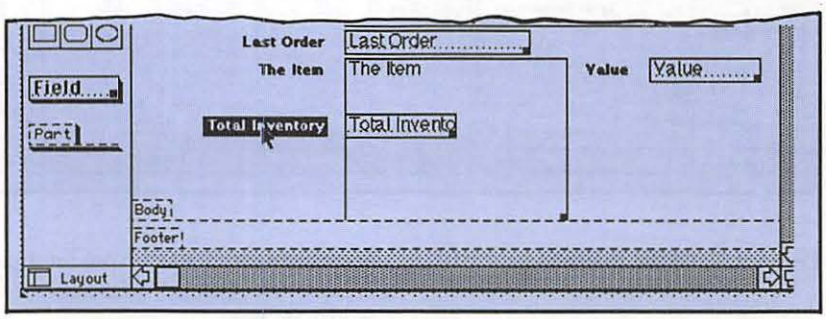
Place the mouse pointer on one of the two selected items and press and hold the mouse button.	You are going to drag the two selected items.
Drag the two items to the right of the picture field.	Place these two items to the right of the picture field. Line them up so that the tops of these items are approximately at the top of the picture field outline.

Figure 15.32
The Value field has been moved.



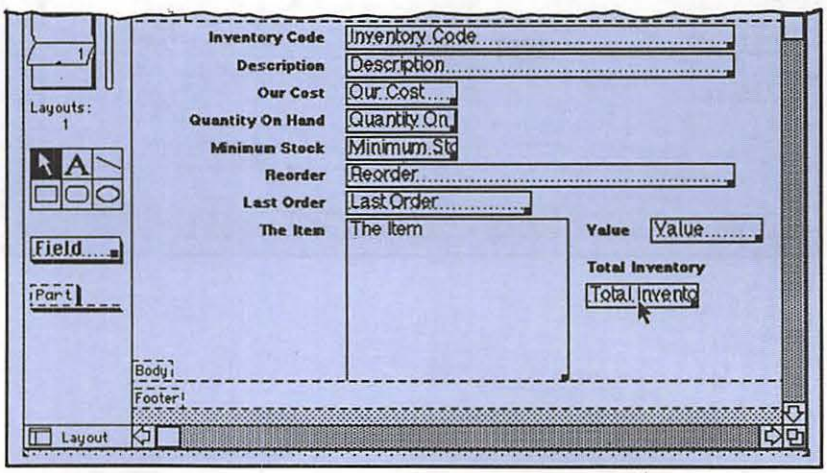
Click on the label Total Inventory.	This item and its data entry field will be moved separately.

Figure 15.33
The Total Inventory label has been selected.



Drag the label to the right, below the Value field.	Place this field label below the Value field.
Click on the Total Inventory field.	Select this field. It is the last item that must be moved.
Drag the selected field to the right, and below the field label.	Place this field below its label to the right of the picture field.

Figure 15.34
The completed file layout.



15.6 PUTTING INFORMATION INTO THE DATABASE

A database would not be of any value if it did not have information in it. After you have defined a database file, you are ready to enter the information you have on hand. When you enter the first group of information, you should attempt to enter it in a logical order. For example, if the key field of the file is a person's last name, you might want to enter the records in alphabetical order by last name.

15.7 ENTERING DATA INTO THE FILEMAKER II DATABASE FILE

You are still looking at the Layout for this file. Before you enter data, you must select the Browse mode, which lets you enter and modify the data.

What To Do	*Why You Are Doing It*
Pull down the Select menu and drag the mouse down to Browse.	The Browse command lets you enter new data into the file, as well as look through and change the existing data. It can be executed by using the ⌘B key.



Figure 15.35
The Browse command has been selected.

Release the mouse button.	Execute the Browse command. The Layout form will disappear and you will return to the Browse form. The field outlines will no longer be visible on the screen.
Place the mouse pointer about one inch to the right of the Inventory Code field label.	You must now activate the data entry mode.

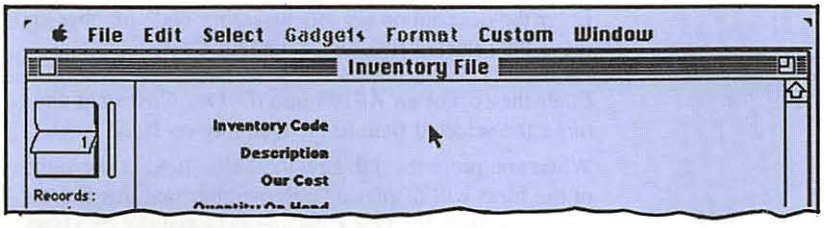


Figure 15.36
Note the location of the mouse pointer, about one inch to the right of the Inventory Code field label.

Click the mouse button.

The field outlines of the data entry form will appear. The first field will be outlined with a solid line, while the rest will be outlined by a dotted line.

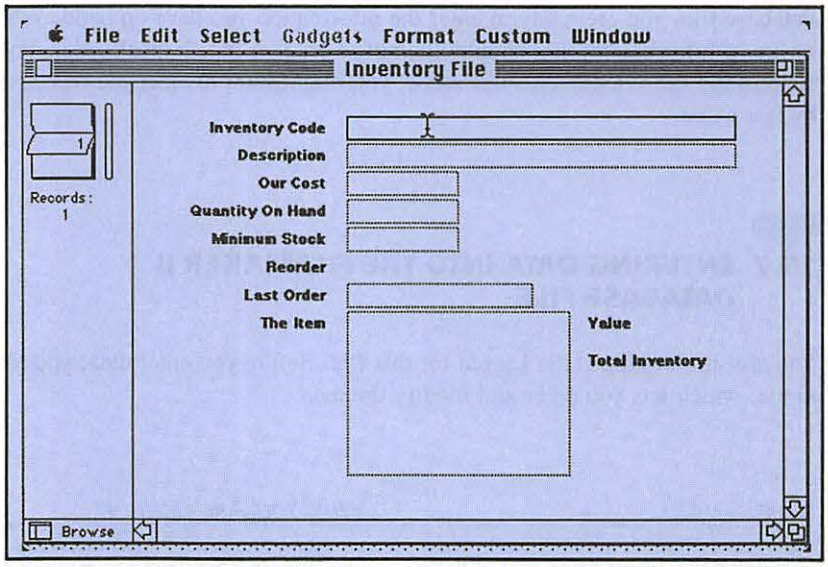


Figure 15.37
The data entry form. The cursor is in the data entry area for the first field of the database, Inventory Code.

As you use FileMaker, you will discover that you can click the mouse in any field to activate the data entry form. Be careful when doing this. The solid outline of the field indicates that it is the active, or selected, field. This is where information will be placed when you type. You should make sure that the correct field has been activated.

AF103

Enter the first inventory code number.

[TAB]

The Tab key will move the outline for the active field from the current field to the next one on the data entry form. The data entry area for the Description field should now have a solid outline.

If you make a mistake while entering data into a field, you may press the [SHIFT]-[TAB] key to move the selected data entry field backward to the previous field, or you may position the mouse over the desired field and click the mouse button. Once the solid outline is on the desired field, use the arrow keys to move the cursor left or right, or the backspace key to delete characters.

Hand Saw [TAB]

Enter the description for this inventory code number and move the selected field on to the Our Cost field.

13.87 [TAB]

Enter the cost of an AF103 into the Our Cost field and move the selected field to the Quantity on Hand field.

When you press the Tab key, the Value field at the right of the form will display a 0. Remember that this field is computed from the Our Cost and the Quantity on Hand fields. Partial information is now available, so the field is trying to compute the requested information, using a zero where data is not available.

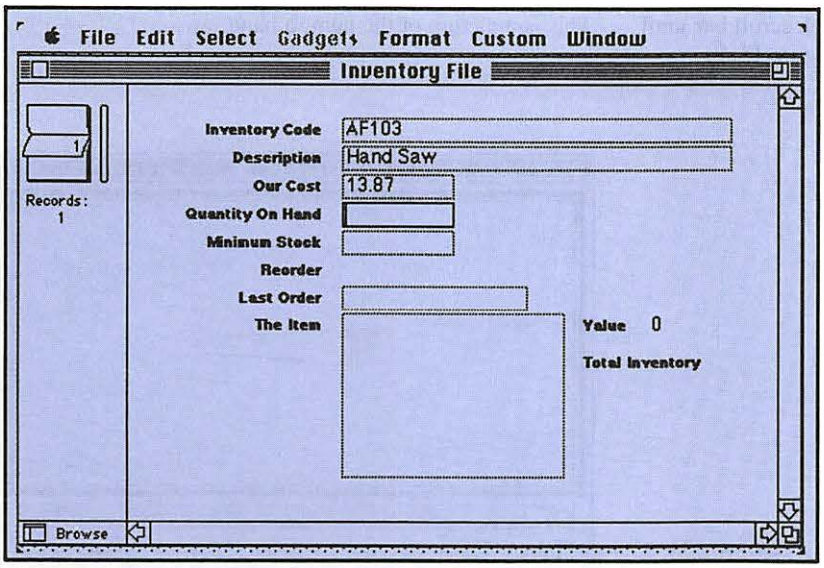


Figure 15.38
The data entry form you have filled out so far. Note the 0 to the right of the Value field label.

6 [TAB]

Enter the number of AF103s that are currently on hand. The Value field will, when you press the Tab key, change to 83.22, the result of the computation of cost times quantity on hand.

You should also note that the Reorder field now says OK. FileMaker is assuming a value of 0 for the Minimum Stock field, and 6 is greater than 0.

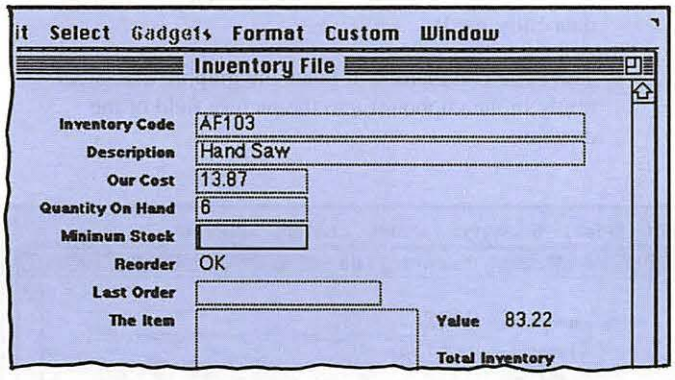


Figure 15.39
The Value field now shows 83.22, and the Reorder field says OK.

5 [TAB]

Enter the minimum stock value. The Reorder field should remain OK.

5/15/86 [TAB]

Enter the date of the last order. Note that you do not need to type the leading zero for a month or day number less than 10, but that you do need to type the slashes separating the parts of the date.

You are now ready to insert a graphic into the picture field. The graphics for this database are in the scrapbook file. If you are not able to locate the specific graphics, make sure that the scrapbook file supplied for this chapter is in the System Folder of your boot disk.

Pull down the Apple menu, select the Scrapbook and release the mouse.

The Apple menu holds the DAs. The Scrapbook is one of the desk accessories that you have already used.

Click on the Scrapbook scroll bar until the graphic seen in Figure 15.40 appears.	This is a picture of the item, a hand saw.

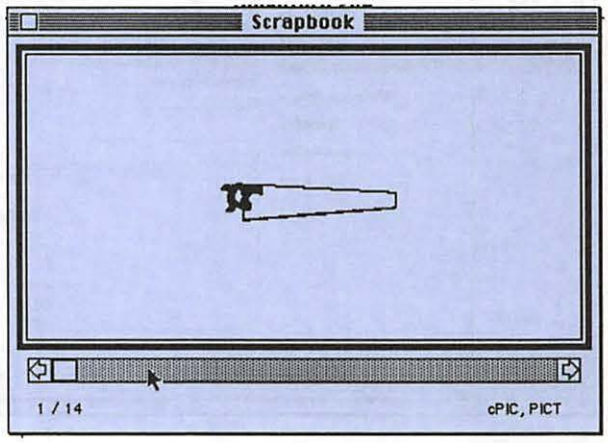


Figure 15.40
The scrapbook holds all the pictures for this database.

⌘C	The Copy command from the Edit menu. This will place the graphic into the clipboard file.
Click on the close box on the scrapbook title bar.	Put away the scrapbook.
Click the mouse on the picture field.	When you activated the scrapbook, the data entry mode of FileMaker was turned off. You must click the mouse at the location of the picture field to return FileMaker to data entry mode.
⌘V	The Paste command will place the graphic that is currently in the clipboard into the picture field of the database.

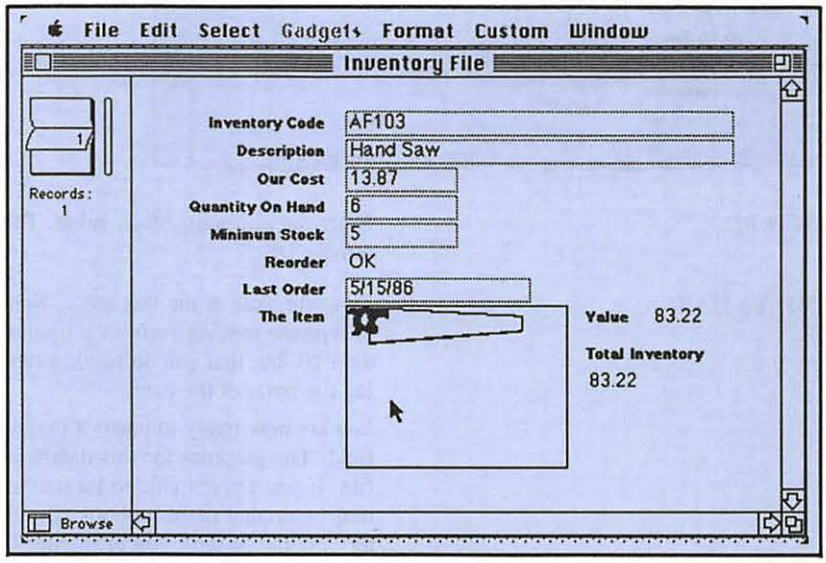


Figure 15.41
The graphic is now in the field, and the record is complete.

If you have made a mistake while entering data for this record, use either the Shift-Tab key, Tab key or the mouse to select the field with the error. Then edit the contents of the field by selecting and replacing the information, or backspacing to remove text.

Before you continue, look at the top left of the Inventory File window. This area tells you some information about the file you are using. The item that looks like a book on its side tells you how many records are available in the current browse view. At present you can see a 1 on the center page. The number that appears in this space indicates the current record number in the file of the entry that is displayed on the computer's monitor. You will also see, as records are added to the file, that the top and bottom pages of the book will have "writing" on them. This indicates that there are more records in the file. When one of these pages is blank, as they both are now, then there are no more records in that direction in the file. That is, there are presently no records in the file before the current record on the screen, and none after the current record on the screen.

Below the book icon is the word "Records:", and then, again, the number 1. This number always represents the total number of records in the database file, regardless of the status of a find command which selects a subset of the file, as will be discussed in a later chapter. Finally, to the right of the book is a vertical bar. When more records are in the database, and more than one are available in the current browse view, you will see a slider appear. This slider may be used to jump to records.

Figure 15.42
The book icon tells you the number of available records in the file.



What To Do	*Why You Are Doing It*
	You are now ready to add another record to the database file.
Pull down the Edit menu.	This menu contains the command for adding a new record.
Drag the mouse down to select the New Record command.	This is the command for adding records. It may be executed by using the ⌘N key.



Figure 15.43
The Edit menu has been pulled down and the New Record command selected.

Release the mouse button.

Execute the New Record command. A new, empty record will be placed into the file.

Note that the first field of the record has been selected for input. Also note that the book, at the left of the layout, now indicates that there are two records in the file. You can also see that the top page of the book has "writing" on it, meaning that there is at least one record in the database file available to you in front of the current record. Finally, note that a slider has appeared at the bottom of the slide bar to the right of the book.

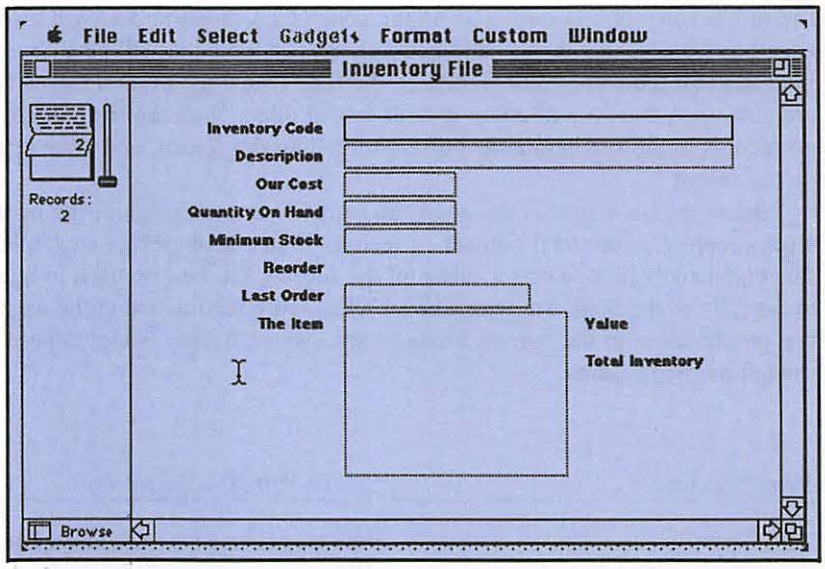


Figure 15.44
A second record has been created for the file. Note that the top page of the book at the left of the screen now has writing on it.

AF103 [TAB]

Try to enter a duplicate part number. FileMaker will display an error message (Figure 15.45).

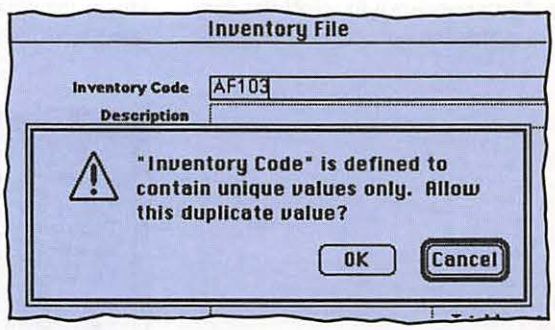


Figure 15.45
The Inventory Code field was set up to be unique, meaning that the file should not contain more than one record with any specific Inventory Code.

Click on the Cancel button.

You do not want to add a duplicate part.

Double-click on AF103.

Select this code so that it gets replaced.

PL208 [TAB]

Enter the second Inventory Code.

Hack Saw [TAB]

Enter the Description.

7.92 [TAB]

Enter the Cost.

3 [TAB]

Enter the Quantity On Hand.

7 [TAB]	Enter the Minimum Stock level. Note that the field Reorder now states "Reorder" rather than "OK" since the number of units in stock is below the minimum desired level.



Figure 15.46
The Reorder field now displays "Reorder".

5/27/86 [TAB]	Enter the Last Order date.
Pull down the Apple menu, select the Scrapbook DA and release the mouse button.	You are now going to get the picture of the Hack Saw out of the Scrapbook file.
Click on the scroll bar until the picture of the Hack Saw appears.	Locate the graphic of the Hack Saw.
⌘C	Copy the graphic to the Clipboard.
Click on the Close box at the top left corner of the scrapbook title bar.	Put away the scrapbook file.
Click the mouse in the area of the picture field.	When you executed the scrapbook, the data entry mode of FileMaker was interrupted. Clicking on a field entry location re-activates the data entry mode.
⌘V	Paste the Graphic into the picture field.

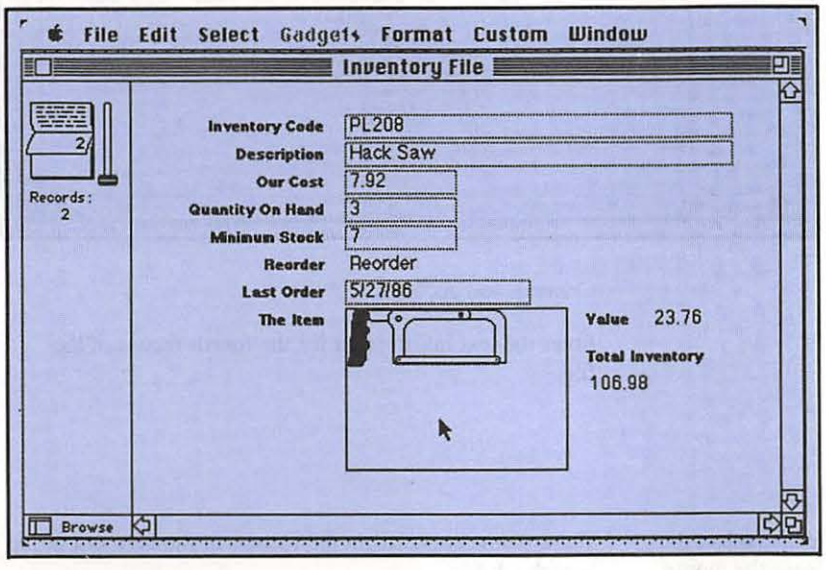


Figure 15.47
The second record is complete.

⌘N	Create a new record.

BT400 [TAB] Step Ladder [TAB] 39.95 [TAB] 2 [TAB] 1 [TAB] 4/30/86 [TAB]	Enter the text information for the third item.
Pull down the Apple menu, select the Scrapbook DA and release the mouse button.	You are now going to get the picture of the item out of the Scrapbook file.
Click on the scroll bar until the picture of the Step Ladder appears.	Locate the graphic of the Step Ladder.
⌘C	Copy the graphic to the Clipboard.
Click on the Close box at the top left corner of the scrapbook title bar.	Put away the scrapbook file.
Click the mouse in the area of the picture field.	Re-activate the data entry mode.
⌘V	Paste the Graphic into the picture field to complete the third record.

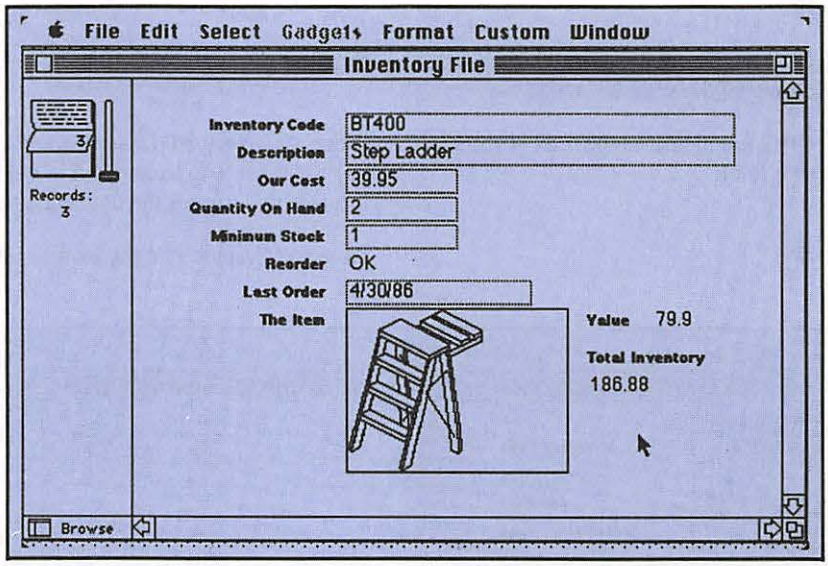


Figure 15.48
The third record of the Inventory File is complete.

⌘N	Create a new record.
RM305 [TAB] Hammer [TAB] 8.91 [TAB] 4 [TAB] 3 [TAB] 5/1/86 [TAB]	Enter the text information for the fourth record of the file.
Pull down the Apple menu, select the Scrapbook DA and release the mouse button.	You are now going to get the picture of the item out of the Scrapbook file.

Click on the scroll bar until the picture of the Hammer appears.	Locate the graphic of the Hammer.
⌘C	Copy the graphic to the Clipboard.
Click on the Close box at the top left corner of the scrapbook title bar.	Put away the scrapbook file.
Click the mouse in the area of the picture field.	Re-activate the data entry mode.
⌘V	Paste the Graphic into the picture field to complete the fourth record.

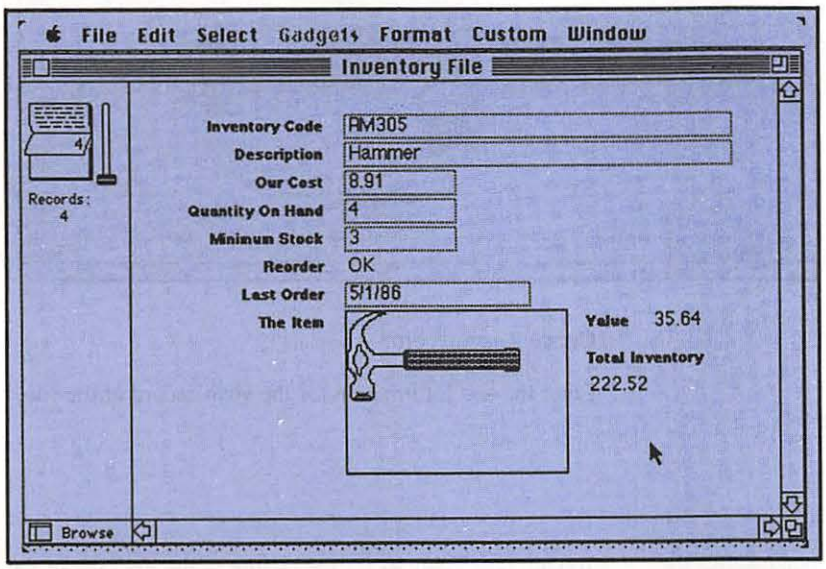


Figure 15.49
The fourth record of the Inventory File is complete.

⌘N	Create a new record.
JT131 [TAB] Paint Brush, 4" [TAB] 2.75 [TAB] 24 [TAB] 35 [TAB] 7/22/86 [TAB]	Enter the text information for the fifth record of the file.
Pull down the Apple menu, select the Scrapbook DA and release the mouse button.	You are now going to get the picture of the item out of the Scrapbook file.
Click on the scroll bar until the picture of the large paint brush appears.	Locate the graphic of the large paint brush.
⌘C	Copy the graphic to the Clipboard.
Click on the Close box at the top left corner of the scrapbook title bar.	Put away the scrapbook file.
Click the mouse in the area of the picture field.	Re-activate the data entry mode.

⌘V	Paste the Graphic into the picture field to complete the fifth record.

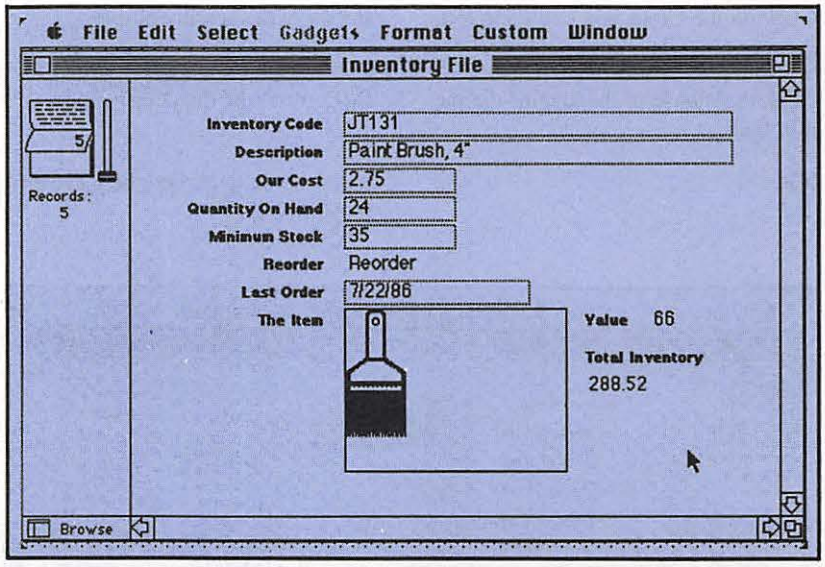


Figure 15.50
The fifth record of the Inventory File is complete.

⌘N	Create a new record.
JT031 [TAB] Paint Brush, 1"[TAB] 2.05 [TAB] 15 [TAB]35 [TAB] 7/22/86 [TAB]	Enter the text information for the sixth record of the file.
Pull down the Apple menu, select the Scrapbook DA and release the mouse button.	You are now going to get the picture of the item out of the Scrapbook file.
Click on the scroll bar until the picture of the small paint brush appears.	Locate the graphic of the small paint brush.
⌘C	Copy the graphic to the Clipboard.
Click on the Close box at the top left corner of the scrapbook title bar.	Put away the scrapbook file.
Click the mouse in the area of the picture field.	Re-activate the data entry mode.
⌘V	Paste the Graphic into the picture field to complete the sixth record.

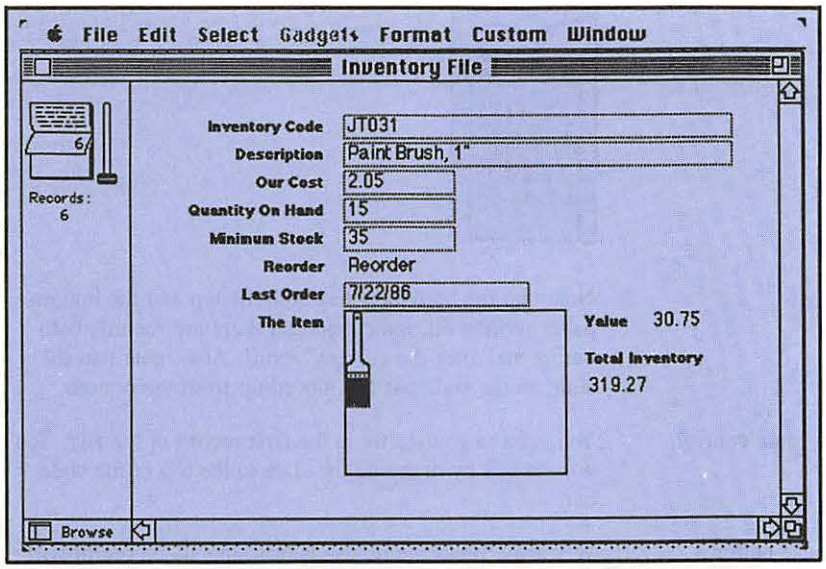


Figure 15.51
The sixth record of the Inventory File is complete.

You are now done entering the initial information into the Inventory file.

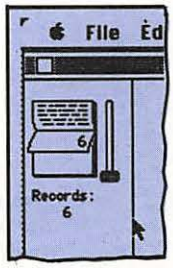
15.8 LOOKING AT YOUR FILE

Now that you have the information you want in your file, you can begin to make use of it. The most fundamental thing you can do with your database is to look at all the information it is presently holding. The typical database management program will spew back the information it is holding in the order it is entered, and FileMaker II is no exception. This order is called the physical order of the data. If you had entered the information into the part file in part number order, then it would be listed in part number order. As it is, the information in the part file will be displayed in the order in which it is presently found in the file.

The easiest way to look at your information is to browse through it by clicking the mouse on the pages of the book at the left side of the Inventory File window. This book now shows the top page as being "written" on, the bottom page blank, and the number 6 on the center page.

Recall that the written-on pages of the book indicate there are more records in the file in that "direction," and that a blank page means there are no more records in that particular "direction" in the file. Thus, the blank page at the bottom of the book in Figure 15.52 means that there are no more records available in the file after the one we are looking at. However, the written-on page at the top of the book suggests that there are records to be found by looking before the current record.

Figure 15.52
The book at the left side of the file's window.



What To Do	*Why You Are Doing It*
Click on the written-on page at the top of the book.	You may use the book to browse through the database file one record at a time. By clicking on the top page of the book you should now see record 5 in the window.

Figure 15.53
The book indicates that you are looking at the fifth record of the file. Note the location of the mouse pointer. This is where it was clicked to browse backwards in the file.



Note that the book now has both the top and the bottom pages written on, indicating that there are records both before and after the current record. Also, note that the slide on the slide bar has moved up from the bottom.

Figure 15.54
Note the position of the mouse pointer on the slide control.



Move the mouse to the slide control.

You want to go directly to the first record of the file. You will do this by dragging the slide to the top of the slide bar.

Press and hold the mouse button.

When you press the mouse button, the slide control will turn white (Figure 15.55), indicating that you have properly positioned the mouse to move the slide.

Figure 15.55
The slide control was "grabbed" by the mouse when the mouse button was pressed.



Drag the slide up to the top of the slide bar.

As you drag the slide control up, the current record number in the center of the book will change. When the slide control is at the top of the slide bar, the record number will read 1.

Release the mouse button.

While the record number changed, the record being displayed did not. Releasing the mouse button will tell FileMaker to display the desired record, number 1 in this case.

You may select any record in the file in this fashion by releasing the mouse button when the desired record number is displayed in the book.

You should now note that the book shows the top page blank, and the bottom page written on. This means that there are no more records earlier in the file to look at, but that there are some later in the file.

Figure 15.56
The book now appears as it will when you are looking at the first available record of the database file.



15.9 A SECOND WAY TO LOOK AT THE FILE

There may be times when you will want to look at, or use, the data in a different format than the layout you first created. Frequently, it is desirable to look at the information in a column form. FileMaker lets you create multiple layouts for your database files. You will now make a column layout for the Inventory file you have created.

What To Do	*Why You Are Doing It*
⌘L	The Layout command. Remember that this command is found on the Select menu.
Pull down the Edit menu.	Near the bottom of the Edit menu you should now see the command New Layout. This command has replaced the New Record command, since you are working in the layout mode, rather than the data entry mode. As you use FileMaker, note that the commands on the Edit menu change to reflect the current mode you are using.
Drag the mouse down to select the New Layout command.	Note that the New Layout command can be executed with the ⌘N key.



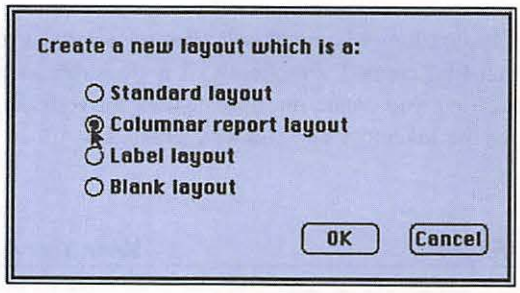
Figure 15.57
The New Layout command has been selected.

Release the mouse button.	Execute the New Layout command. You will now see the New Layout dialog box.

Click on the Columnar report layout button.

You want to build a columnar report.

Figure 15.58
The New Layout dialog box. The Columnar report layout button has been selected.



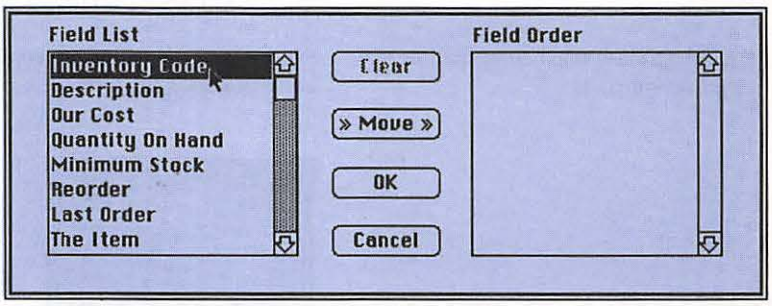
Click on the OK button.

Create the new layout. You must now select the fields you want to appear in the columnar report, and the order you want them placed on the layout.

Click on Inventory Code in the Field List window at the left of the dialog box.

This is the first field you want to include in your columnar layout.

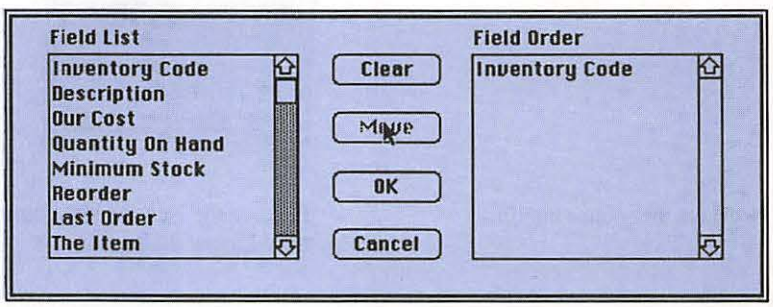
Figure 15.59
This dialog box lets you select those fields you want to have included in the columnar layout. Here, the Inventory Code field has been selected.



Click on the Move button.

Copy this field name into the Field Order list at the right side of the dialog box. You may double-click a field in the field list to select and move it to the field order list automatically.

Figure 15.60
The Inventory Code field will be the first field in the columnar layout. The Clear button is now active in the dialog box. Clicking it will clear all fields from the Field Order list at the right of the dialog box.



Click on Description in the Field List box on the left.	You want to add this field to the columnar layout.
Click on the Move button.	Place the field into the Field Order box.
Click on the Our Cost field in the left box.	You want this field in the new layout.
Click on the Move button.	Place the field into the Field Order box.
Click on The Item field at the bottom of the left box.	This is the picture field. You want to place it on the new layout.
Click on the Move button.	Place the field into the field order box.

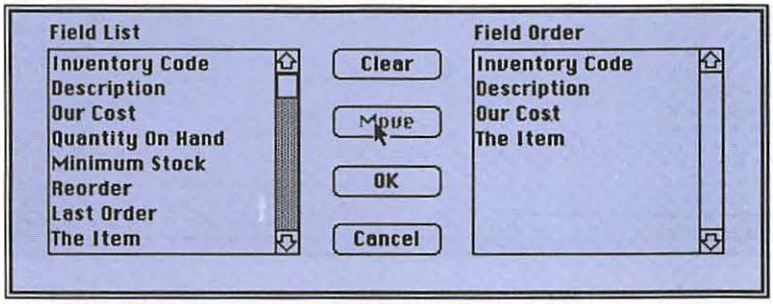


Figure 15.61
These are the fields you have selected for the new layout.

Click on the OK button.	You do not want to place any more fields on this layout at present. The new layout will be displayed on the screen.

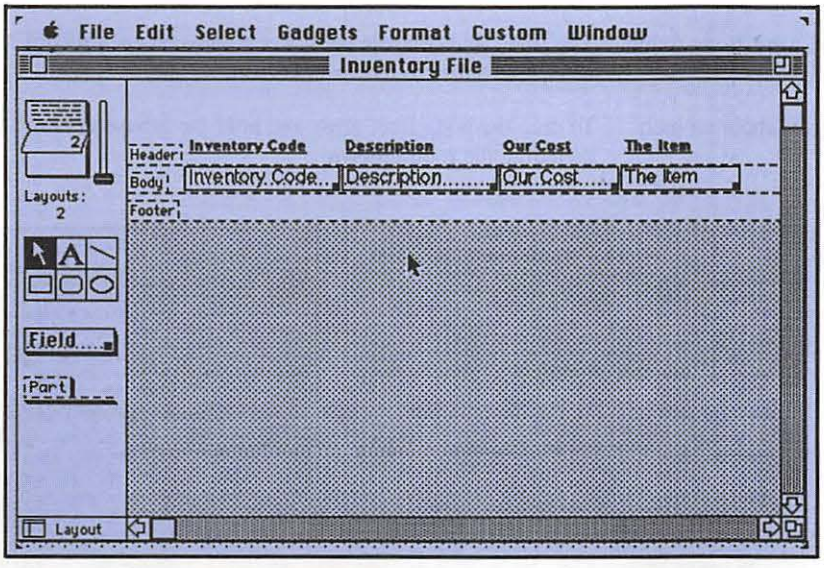
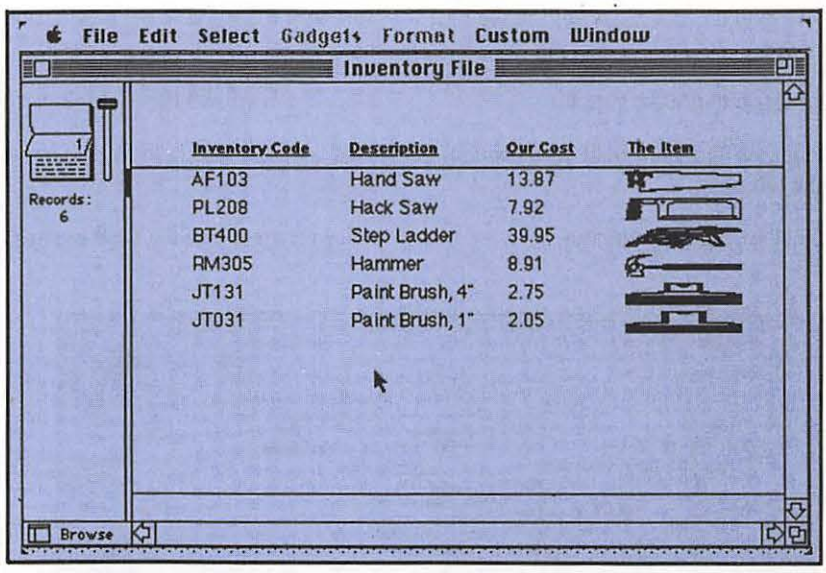


Figure 15.62
The layout has been created. Note that the book at the left of the layout has a 2 on the center page. You are looking at the second layout. You may browse through the layouts you create in the exact same fashion as you would through the records.

⌘B

This is the Browse command found on the Select menu. You are leaving the layout description mode and returning to the data entry and view mode using the current layout.

Figure 15.63
The initial column layout you have created.



Look at the picture field at the right side of the layout. The pictures are all squashed into the default space for the field in the layout.

Figure 15.64
Note the location of the mouse pointer.



⌘L

Return to the Layout mode, you are going to fix the appearance of the pictures.

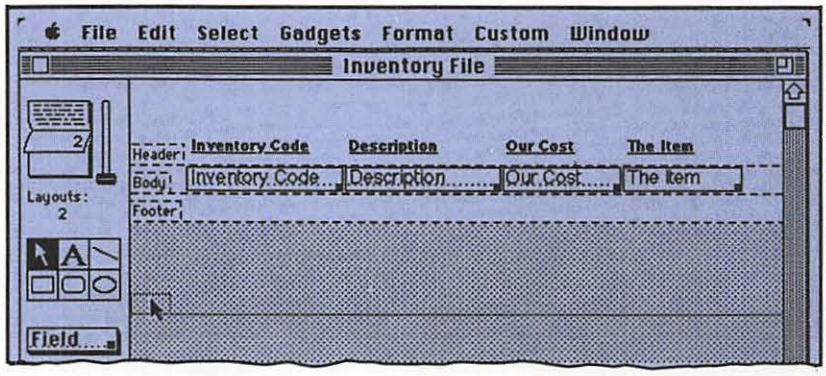
Move the mouse to the word Body found at the left edge of the layout.

The Body line controls the spacing between each record when you return to the Browse mode.

Drag the Body line down about an inch and a quarter.

To drag the body line, press and hold the mouse button, then drag the mouse down.

Figure 15.65
Drag the Body line down to about this point.



Release the mouse button.

When you release the mouse button, the white space representing a single line on the column layout will expand.

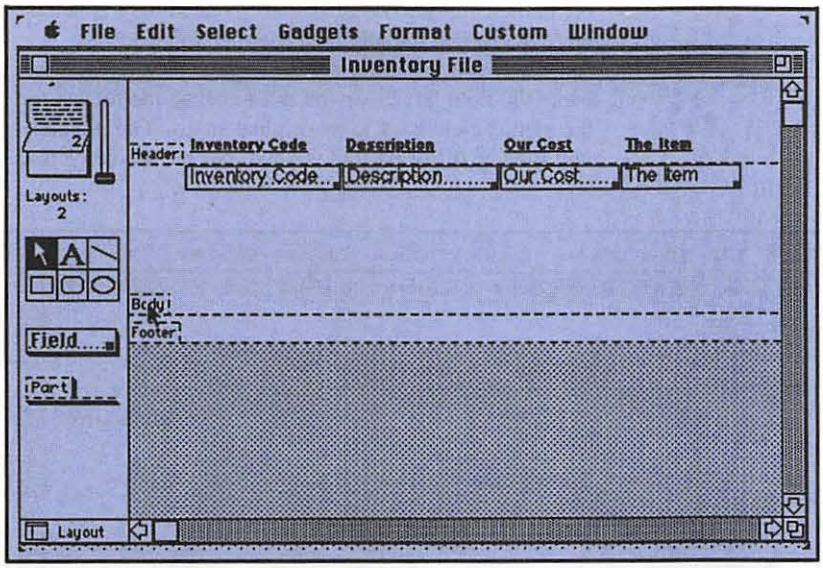


Figure 15.66
The space for a single line of the body has been expanded.

Move the mouse to the handle at the bottom right of The Item field.

Recall that the handle at the bottom right of the field space in the layout lets you adjust the shape of the field.

Drag the handle down to the Body line.

You want this field to fill the vertical space you have created.

Click in the middle of The Item field space.

Select the field. To change how the picture is formatted in the field, you must select the complete field.

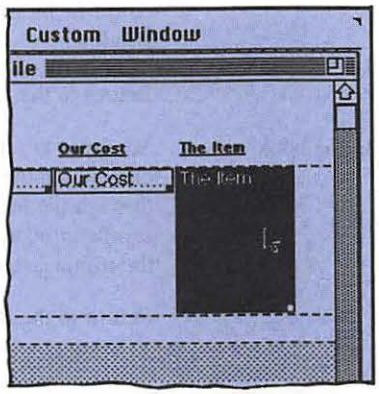


Figure 15.67
The Item field has been selected. Note the shape of the field.

Pull down the Format menu, select Format Picture and release the mouse.

You are now going to tell FileMaker that you do not want the picture adjusted to fit the space.

Click on the Show as much of the picture as fits button.

Recall that this button tells FileMaker to use the field as a window over the picture, and not to adjust the picture to fit in the window.

Click on the OK button.	Return to the Layout screen.
⌘B	Return to the Browse mode. Note that the pictures are cut off in their fields. The field space created here is not as large as the one initially created when this file was started. If you want to see the complete picture you must make the field larger, or you must change the format for the picture field back to its original status. The pictures will then be distorted, but you will see the whole picture.

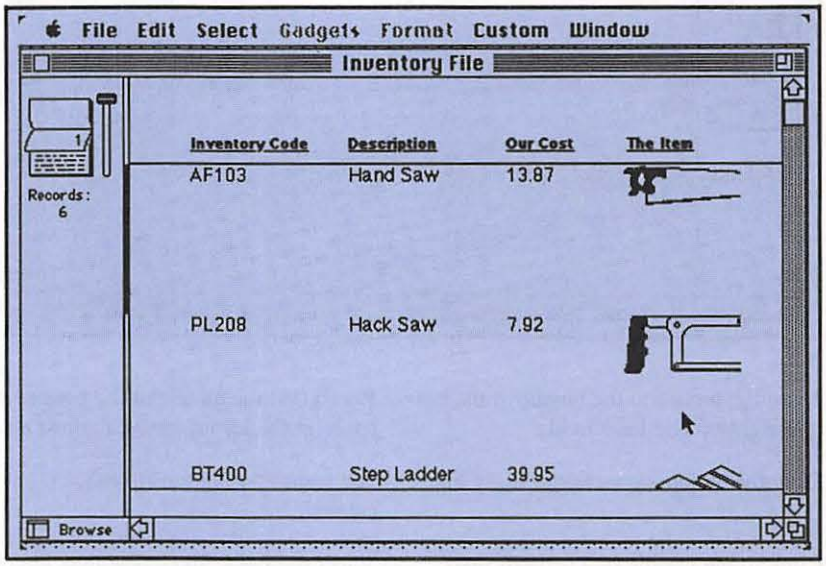


Figure 15.68
The modified Browse display of the file.

	You may click on the book at the left side of the window to scroll through the database, or you may use the standard Macintosh scroll bar found at the right side of the window.
⌘L	Return to the Layout mode.
Click on the top page of the book.	You want to return to the original file layout. Just as clicking on the book when in Browse mode scrolls through the records, clicking on the book in Layout mode scrolls through the file's layouts. You should now have the original layout back on the Macintosh's display.
⌘B	Return to the Browse mode.

15.10 EDITING/MANAGING THE DATA IN YOUR DATABASE FILE

Keeping the information in your database accurate and up to date is very important. If you are a decision maker, and if the database you are using does not have correct information, you cannot make correct decisions. (Your decisions may be purchase decisions if your database is your company's inventory. If your database is a birthday list with the last present you bought people, then you will be deciding on the next present you buy.) Surely, one of the most important activities involving the use of a database is correcting and updating the information it contains.

As you will see in a later chapter, it is possible to remove unwanted records completely from the database. Right now, however, we will content ourselves with editing the database you have created.

What To Do	*Why You Are Doing It*
Drag the slide on the slide bar to the first record.	You want to change the first record of the database.
Click the mouse on the word Hand in the Description field.	You want to change the description to read "Saw, Hand". Start by selecting the field.



Figure 15.69
The Description field of the first record has been selected.

Double-click on the word Saw. — Recall from what you learned about word processing that double-clicking on a word will select the word. Saw, and the remainder of the field, will be selected.



Figure 15.70
The word Saw has been selected.

⌘X — Remove the selected text with the Cut command from the Edit menu.

← ← ← ← ← — Position the cursor in front of the word Hand.



Figure 15.71
Note the position of the vertical cursor in front of the word Hand in the Description field.

⌘V — Paste the word you cut back into the description at the new location.

, [SpaceBar] — Add a comma and a single space to complete the edit of the field.



Figure 15.72
The Description field for the first record has been edited.

Click on the bottom page of the book.	You want to edit the next record of the database file. This is the record for the Hack Saw.
Double-click on the word Saw in the Description field.	You are going to perform the same edit. Select the word Saw.
⌘X	Cut the word from the field.
← ← ← ← ←	Position the cursor in front of the word Hack.
⌘V	Paste the word you cut back into the description at the new location.
, [SpaceBar]	Add a comma and a single space to complete the edit of the field.

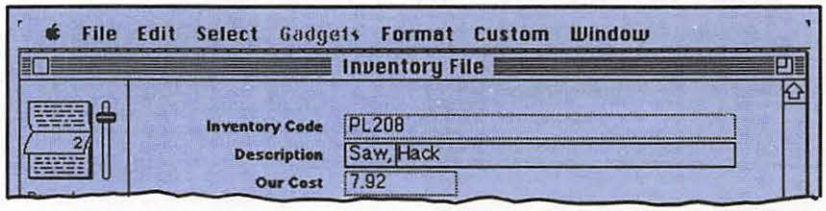


Figure 15.73
The Description field for the second record has been edited.

You should realize that you may edit the records of the database using any legitimate Macintosh editing technique. Thus, you may drag the I-beam cursor over text you want to replace or delete. Or you may position the cursor with the mouse, clicking the mouse button to insert the cursor in the desired location. As you have seen, the standard Edit menu commands of Cut and Paste are available, as well as the Copy command if you want to duplicate information from one field to another, or from one record to another.

15.11 PRINTING YOUR DATABASE FILE

While being able to have rapid access to the data on the computer is frequently enough for most uses, there are many times when you will want to have a printed copy of the information at which you are looking.

If you do not have a printer attached to your computer, executing the Print command will not harm you or the database, but it will waste some of your time while the computer looks for the printer (if you are using a LaserWriter) or attempts to print (if you are using an ImageWriter). You may, of course, execute the Preview command without a printer attached to your machine.

FileMaker formats the output to match the current layout in use. Since you are presently using the original layout, that is the format in which the file will be printed. If you want to obtain a columnar report, then you must switch to the columnar layout that you created.

What To Do	*Why You Are Doing It*
Pull down the File menu.	The File menu has both a Print and a Preview command.
Drag the mouse down to the Preview command.	Before you print the database, use the Preview command to see what it will look like on the printed page. Note that you can execute this command with the ⌘U key.



Figure 15.74
The Preview command has been selected.

Release the mouse button.	Execute the Preview command.

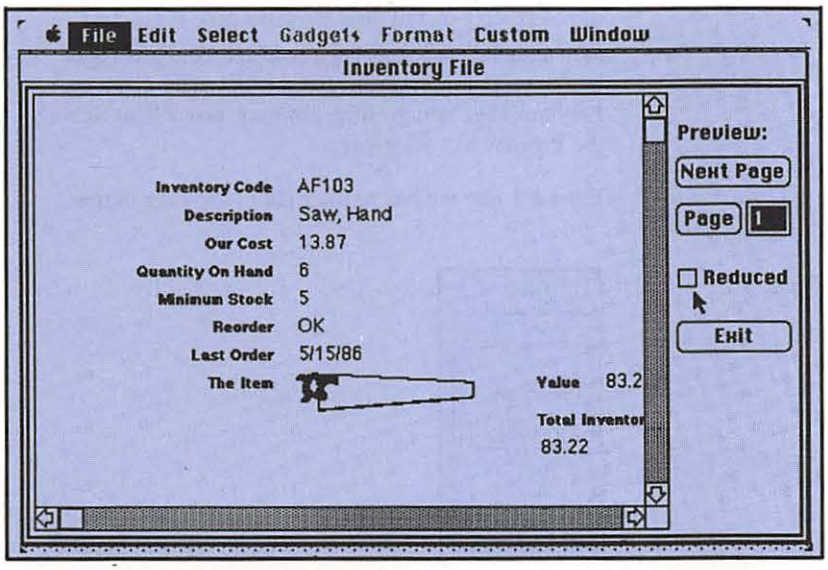


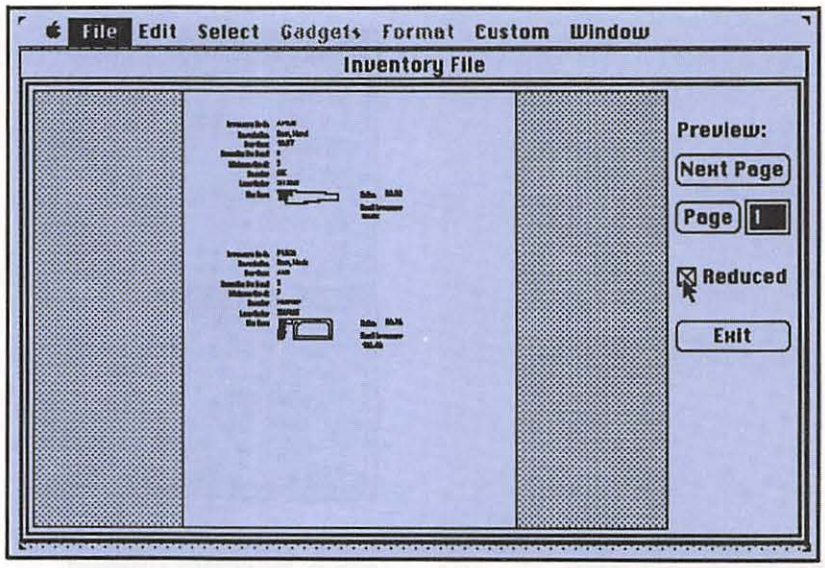
Figure 15.75
The initial Preview screen.

It is difficult to tell much from this initial preview screen. There is, however, a Reduce check box that will make the preview fit on the screen.

Click the mouse on the Reduce check box.

You want to look at a complete page at once.

Figure 15.76
The reduced page preview gives you a better idea of what the printed page will look like.



Click on the Next Page button.

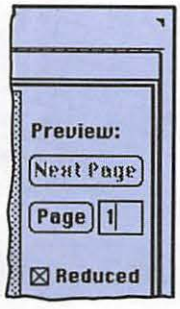
Look at page two of the Preview. Continue clicking on the Next Page button until the third page is reached.

When the last page has been reached, the Next Page button will dim. You can also see that there is not a Previous Page button. It is, however, possible to return the Preview to a prior page.

1

Enter a 1 into the box to the right of the Page button.

Figure 15.77
You are telling the Preview command which page you want to look at next.



Click on the Page button.

After a brief wait, the first page of the print preview will be displayed. You may use the page number box and page button to move around large reports by selecting the page you want to see and then clicking on the Page button.

Click on the Exit button.

Leave the print Preview.

⌘L

Select the Layout mode.

Click on the bottom page of the book.

You want to use the second layout that you created.

⌘U

Execute the Preview command. You do not have to return to Browse mode to print.

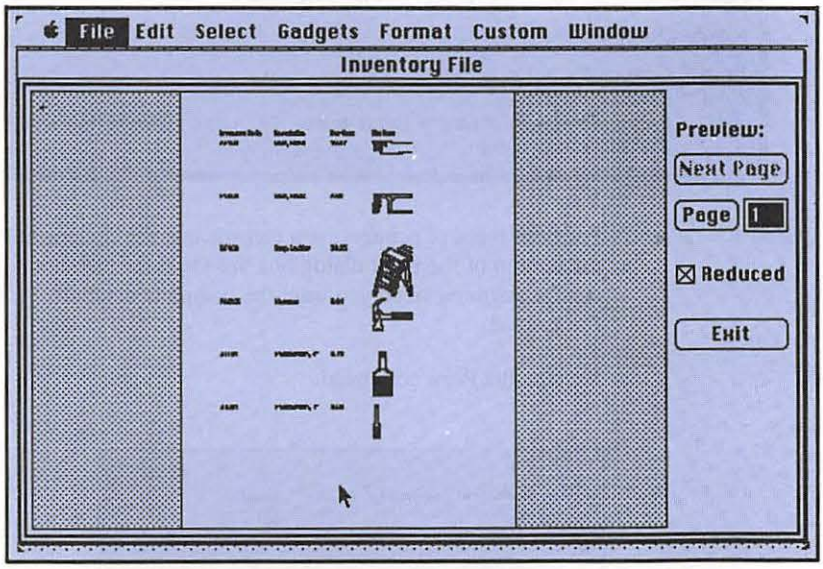


Figure 15.78
The Preview of the file in the second layout you created. Since you earlier checked the Reduce box, this preview is already reduced. If you click on the Reduce box now, the Preview will expand back to full size.

Click on the Exit button.

Return to the Layout mode.

Pull down the File menu, select the Print command and release the mouse button.

Now you are ready to print your database. You want to print the current layout. As with many other Macintosh programs, the Print command may be executed with the ⌘P key.

You will now see the Print dialog box. If you are using an ImageWriter, your Print dialog box will appear similar to Figure 15.79. If you are using a LaserWriter, your Print dialog box will appear similar to Figure 15.80 on the next page, although the name of the LaserWriter will probably be different from the name of the printer in this figure.

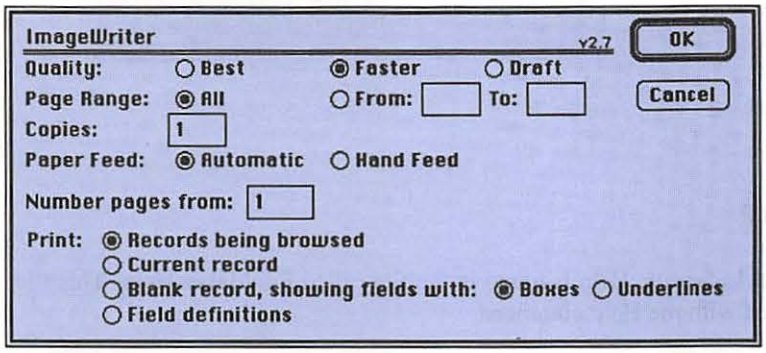
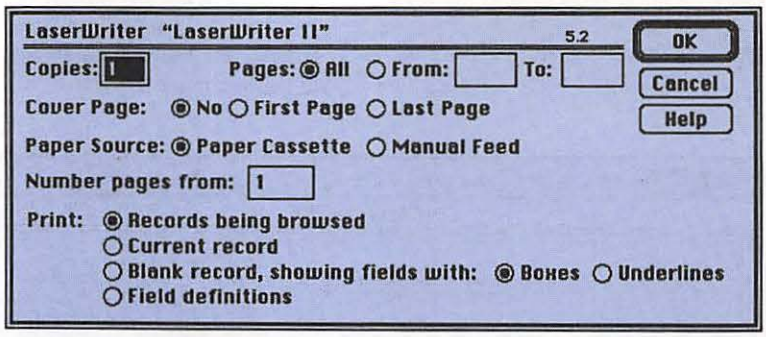


Figure 15.79
This is the dialog box you will see if you are using an ImageWriter.

Figure 15.80
This is the dialog box you will see if you are using a LaserWriter.

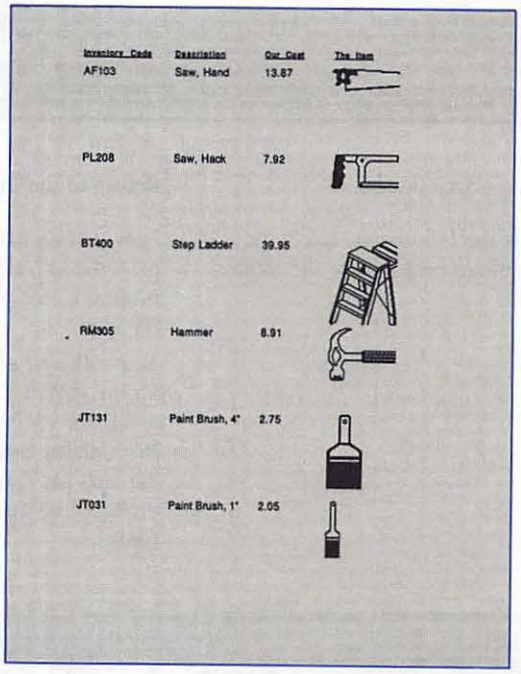


For both types of printers, you can see that the options at the bottom of the Print dialog box are the same. Do not change anything since you want the complete database file printed.

Click on the OK button.

Execute the Print command.

Figure 15.81
This is the output generated by the Print command above.



15.12 FINDING HELP

FileMaker has an on-line help facility. Help is found in the file called FileMaker Help. This file may be accessed at any time with the Help command.

What To Do	*Why You Are Doing It*
Pull down the Apple menu.	The Help command is found on the DA menu.

Drag the mouse down to select the Help... option.

You can see that Help can be accessed by using the ⌘/ key.



Figure 15.82
The Help option on the DA menu has been selected.

Release the mouse button.

Look at the initial help display. This dialog box gives you a brief overview of using FileMaker.

Click on the Open Help File button.

If the overview does not give you enough information, then you may open the Help file by clicking on this button.

Pull down the Custom menu.

This menu lists a variety of topics. Select the one you want, and FileMaker locates the correct records in the Help database file.

Drag the mouse down to Defining Fields.

You want the help for this topic.



Figure 15.83
The Custom menu as it will appear when the Help file is active. Defining Fields has been selected.

Release the mouse button.

Obtain the help for this topic.

Click on the close box at the left of the FileMaker Help window.

When you are done with help, close the help file by clicking on the close box found on the help file's title bar. The Inventory File you have been working with will once again be active.

15.13 QUITTING FILEMAKER II

You now know how to create a database file, display the contents of the file on the Macintosh's screen, print the file, and make corrections to the file. Unlike the other Macintosh applications discussed earlier in this text, FileMaker does not have a Save command. Because it is a disk-based database, information is constantly being saved. However, not all the data is necessarily on the disk. Some may be in temporary storage in the computer's memory.

To ensure that **all** the data is saved, all you have to do is close the file's window. This is done by using the Close command on the File menu, or by simply clicking the mouse on the close box found at the left of the window's title bar. If you are going to then Quit FileMaker, you may simply quit the program, since that, too, will close any open window.

What To Do	*Why You Are Doing It*
Pull down the File menu and select the Quit command at the bottom.	Since you are going to quit, let the Quit command close the database file window for you.

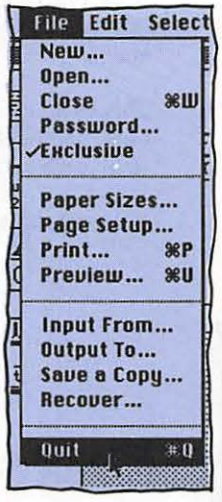


Figure 15.84
The Quit command has been selected.

Release the mouse button.	Execute the Quit command. After a brief pause, you will return to the Macintosh Finder.

EXERCISES

1. When defining a database file, must you tell FileMaker the type of data that a field will contain, or do you let the program figure this out for itself?
2. When defining a database file, must you tell FileMaker the number of characters or digits to allow for a specific data field?
3. When you list or browse through your database file, in what order will the records appear?
4. After you have entered information into your database file, is it possible to make changes to the data, or are you stuck with the information you entered?

5. Create a database, called MAIL LIST, with the following information/fields:

Last Name	City
First Name	State
Street Address	Zip Code

6. Enter the following information into this database:

LAST NAME	FIRST NAME	ST. ADDRESS	CITY	ST	ZIP
SMITH	FRED	123 ANY ST	LA	CA	90200
JONES	MARY	398 LOW AV	LA	CA	90313
RABINOWITZ	ABE	12 KILLDEER	NEW HAVEN	CT	20913
SMITH	MAY	317 E. 32 ST	NEW YORK	NY	10019
PETRO	CAROL	812 MAYNARD AV	NEW VILLE	CA	93013
ALEXANDER	JOAN	873 HIGH ST	NEW HAVEN	CT	20915
DOE	JOHN	931 NORTH ST	LA	CA	90203
ZABRISKI	FRED	120 PARK AVE	NEW YORK	NY	10017
KIELLOR	ARNOLD	205 BOARD WALK	SMOKE RISE	NJ	07321

7. What data type should the zip code be, numeric or text? Why?
8. What data type should the street address be, numeric or text? Why?
9. If a phone number field had been included in this database, what data type should it be? Why?
10. Make a printed list of the database you have just created.
11. Create a database, called VENDORS, with the following information/fields:

Vendor Code	Zip Code
Company Name	Phone
Address	Name of Contact Person
City	Date of Last Purchase
State	

12. Enter the following information into this database:

VENDOR	COMPANY	ADDRESS	CITY	ST	ZIP	PHONE	CONTACT	LAST PURCHASE
AA100	ADS ANNON	1333 W CAHUENGA BLVD	HOLLYWOOD	CA	90068	213/851-6333	JANE	06/10/87
OA100	OUTSIDE ADS	451 LOS ANGELES ST	LOS ANGELES	CA	90007	213/746-1212	ALEXANDER	06/15/87
SE100	STRAWS, ETC	1705 W. 28 ST	LOS ANGELES	CA	90007	213/473-7677	DON	05/11/87
PA100	PAPERS, INC	422 PASS AVE	BURBANK	CA	90059	818/841-5234	ALICIA	05/12/87
TT100	TRI-TONES	1895 RIVERSIDE BLVD	BURBANK	CA	90059	818/833-1092	ANNIE	07/02/87
BA100	BURBANK ARTS	105 ALAMEDA AVE	BURBANK	CA	90059	818/512-1212	MONTY	05/22/87
BW100	BARE WOOD	7755 SUNSET BLVD	HOLLYWOOD	CA	90068	213/876-4673	DAVE	06/11/87

13. Make a printed list of the vendor database you have just created.
14. What order are the records of the vendor database printed?
15. Is there a relation between the order the vendor records are printed and the vendor code? Why or why not?

CHAPTER

INTERMEDIATE DATABASE MANAGEMENT SYSTEMS CONCEPTS

16

CHAPTER OBJECTIVES:

Upon completion of this chapter, the student will:

- **Define the difference between the logical order of records and the physical order of records in a database file.**
- **Make a sorted list of a database file.**
- **Select specific records of the database for listing.**
- **Select specific fields of the database for listing.**
- **Delete records from the database.**

16.1 WHY USE A DATABASE MANAGEMENT SYSTEM REVISITED

A primary reason for using a database management system is to give you easy access to the information making up your database. In the last chapter you learned how to open a database file, how to enter information into that file and how to list back the information in the file, both on the computer's display and on the printer.

While these procedures are useful, you will rarely find that you always have the data in the order you want it. For example, you may have a database with people's names entered in alphabetical order by last name. This may be fine for most of your purposes. However, when you run a mailing list from this database, you will want the labels printed in zip code order. In this chapter you will learn how the data in your files may be reordered.

To carry the example above a little further, assume that your database consists of more than 100,000 names of people from all over the United States. You may want to send out a mailing to only those people living in a specific city or state. This chapter will teach you how to enhance your use of the database management system through record selection procedures to accomplish such tasks.

16.2 REARRANGING THE RECORDS OF THE DATABASE

In Chapter 15 you created a database that contained stock item codes and some related information. You did not enter this data in strict code number order. The first item code number was AF103, the second PL208, then BT400, RM305, JT131 and JT031. This order of information is the physical order of the data. As you could see when you browsed through or printed back your database, the records were listed by the physical order in which they were entered.

The present order of this file, however, makes little or no sense. The file is not in item code number order, nor is it in cost order, nor in order by any other field!

There are two methods of rearranging the data that are generally employed by database management systems—sorting and indexing the data.

16.3 SORTING THE DATABASE

Sorting the database is the process of physically reordering the information. The sort is based on a sort key, which is a field or combination of fields in the database, such as the last name field. Sorts may be in ascending order (smallest to largest) or descending order. When you use a database management system that sorts the database, you will see that frequently it will create a second copy of the file in sorted order. If this is the case, you should always check to make sure that the disk you are using has sufficient free space before you continue. You must have at least as much empty space on the disk as you have space in use by the files you are going to sort, because the sort procedure will double the space requirements on the disk. FileMaker, however, does not sort in this fashion.

16.4 INDEXING THE DATABASE

The indexing process is also based on a sort key. When a database management system indexes a file, it creates and manages a separate index of the data. This index tells the program what order to use records in the data file.

One useful result of indexing files rather than sorting them comes from the fact that the records in an indexed file do not change their physical order.

16.5 THE RELATIVE ADVANTAGES OF SORTING AND INDEXING

Both methods of rearranging the records in your database file have their own relative advantages and disadvantages.

The main advantage of sorting a large database is that the new physical order lets you access the information in the file sequentially (that is, in the sorted order) and very rapidly. The disk drive does not have to work hard to scan through the records.

The problem comes when you add a new record into the database file. If the new record is added onto the end of the file, it will most likely not be in the correct sorted location. Thus, to process the data, you will have to sort the file again. For large database files, the sorting/resorting process can take a long time.

Some database management programs let you insert records into the middle of the file. When you do this, the database management program must first add a new record onto the end of the file, then shift all the records that follow the desired location of the new record "down" one to make space for the new record in the middle of the file. Depending on the size of the file and the location of the new record, this can be relatively time-consuming. Regardless of the time this process must take, you are the one who must determine the proper location in the database for the new record. If you are careless and put the new record in the wrong location in the file, you will either have to re-sort the file, or in some other fashion rearrange the records to get them into the correct order. FileMaker, however, always adds new records onto the end of the database.

Indexing overcomes the problem of the new record. When you add a new record to an indexed file, the database manager will update the file's index so that the new record appears immediately in the proper "location," even though the record is usually added physically to the end of the file. You do not have to worry about your skills at alphabetizing, because the computer is taking care of this task for you.

Indexed files, however, are not ideal for sequential processing. The disk drive's read/write heads must constantly be moved between the index and data to locate the next sequential record. Thus, while the update time required is less when using an indexed file, sequential access of the indexed file is generally slower than sequential access of a sorted database.

FileMaker performs an operation that is partially indexing and partially sorting. When you sort the file, the records retain their original location in the database in the fashion of an index file. Thus the file can be "unsorted" if you want. However, unlike a true indexed file, when a new record is added to the file, the sorted list is not updated automatically.

16.6 RETRIEVING A DATABASE FILE

After you boot your Macintosh with a System Start-Up disk, insert the FileMaker II Program disk into one of the computer's disk drives. If you are using a machine with a hard disk you will not need to insert the FileMaker program disk into a disk drive. Rather, locate the FileMaker folder, and open it so you can see the FileMaker program icon. Place the data disk you used with Chapter 15 into another one of your Macintosh's disk drives, if you have one available. If you do not have a free floppy disk drive, keep this disk available.

In these instructions, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and double-click the mouse button. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.

There are three ways to open an existing database file when using FileMaker II.

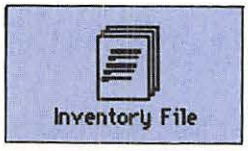
First, you may double-click on the file's icon on the storage disk. The Macintosh will figure out which application program created the file and will automatically launch the program for you. This will only work, however, if the program can be found in one of the computer's disk drives. If you are using a floppy disk-based computer, you may not always have the program disk in a disk drive, so this method will not work for you. If you have two floppy disk drives, it is possible to launch an application from one of it's documents if you eject the System Start-Up disk, and replace it with the program disk, leaving the document disk in the second disk drive. You will find, however, that the computer frequently requires information off the Start-Up disk, and that you will do several disk exchanges before the program is running. It is best to start the application, and then open the document.

Indeed, this is the second method for opening an existing database file. When you launch FileMaker you will immediately see the Open dialog box. You may recall when you first started FileMaker at the beginning of Chapter 15 that you were asked for a file, even though you had not yet created one. This was the Open dialog. Once FileMaker is running, you may use the Drive and Eject buttons on this dialog box to select the disk that has your file, and then open that file.

The third method available for opening existing files is to use the Open command found on FileMaker's File menu. This command will return you to the Open dialog box you are familiar with to let you access your database files. The advantage of this command is that you may open and use multiple files. Clearly, to use this option, you must first launch the FileMaker application.

If you are using a computer with a hard disk, begin here:

Figure 16.1
This is the icon you will see for FileMaker database files.



What To Do	*Why You Are Doing It*
Locate the icon for the database file you created in Chapter 15 and place the mouse pointer on it.	You are going to launch FileMaker by double-clicking on this icon. Figure 16.1 shows the icon that FileMaker creates for its database files. The name of this particular one is Inventory file.
Double-click the mouse.	By double-clicking on a FileMaker database, the Macintosh will look on all available disks for the FileMaker application program. If found, it will launch FileMaker and open the database. If the Macintosh is not able to locate the application program, you will see the dialog box shown in Figure 16.2.

Figure 16.2
You will see this dialog box if the Macintosh is not able to locate the FileMaker application program to open the file you are double-clicking.

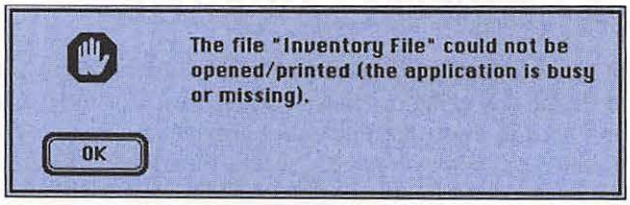
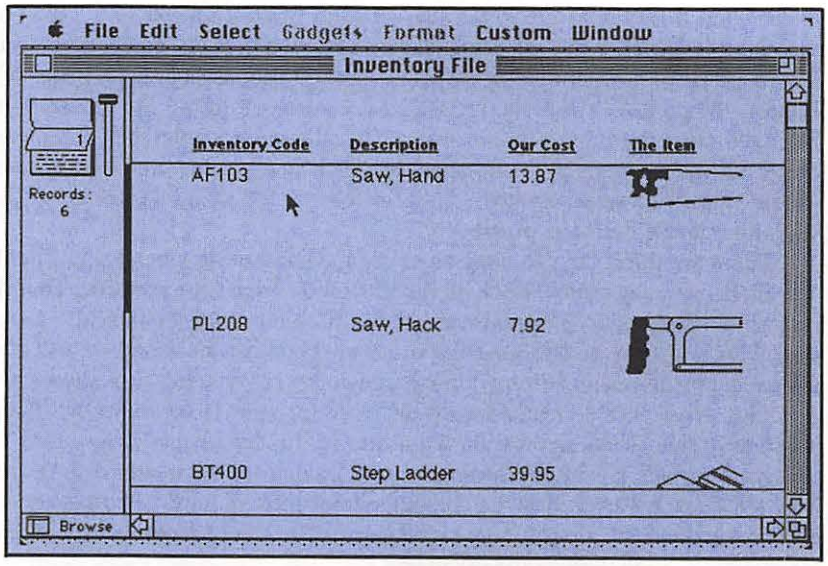


Figure 16.3
The retrieved database will return in the layout you last used.



If you have the FileMaker application program on your hard disk, or on a floppy disk currently in one of the computer's disk drives, the program should start, and after a brief wait, the database you prepared during the last session will appear. You are now ready to work with the file (Figure 16.3).

⌘Q

This is the Command Key equivalent for the Quit command found on the File menu.

You are quitting now so that you can learn how to use the Open command. Normally, you would not quit the FileMaker program after you open the file you want to use!

If you are using a computer that has only floppy disks, then start here:

Locate the icon for the FileMaker program.

You will launch the FileMaker application program by double-clicking on it.

Move the mouse to the FileMaker icon and double-click.

The double-click will launch the application. If you have trouble with the double-click, you may also select the program's icon with a single click, then use the Open option on the File menu, or press ⌘O, the Command Key equivalent.

After a brief wait, FileMaker will be running, and you will see the Open dialog box.

Click on the Cancel button

Do not yet open a file.

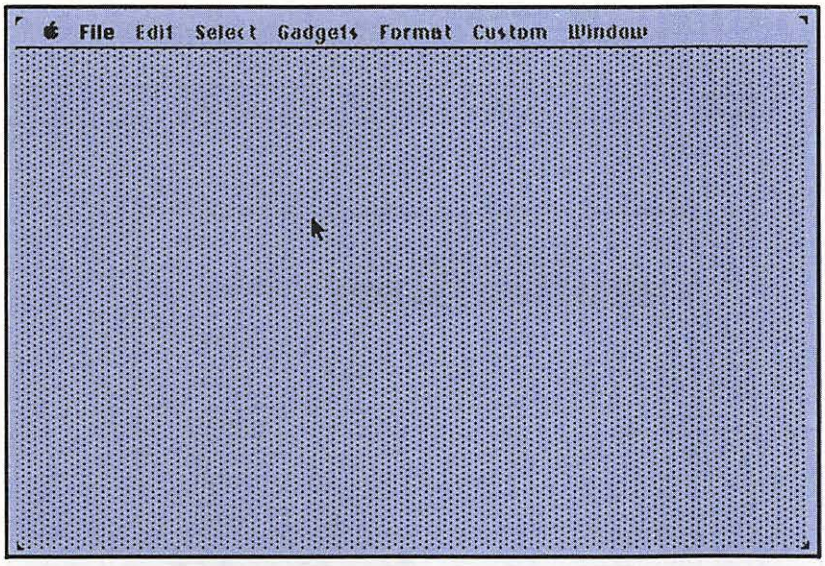


Figure 16.4
Your Macintosh after you have cancelled the dialog box. All that is showing is the current menu bar, with all the Menus dimmed, except for the File menu. If you are using MultiFinder, you may have other items showing on the desktop.

Pull down the File menu.

The File menu has the Open command.

Drag the mouse pointer down to the Open command.

The Open command lets you open existing database files found on disk. Unlike many other Macintosh applications, there is no Command Key equivalent for the Open command.



Figure 16.5
The Open command has been selected.

Release the mouse button.

Execute the Open command.

After a brief pause, you will see the Open dialog box that you just cancelled. It should appear similar to the one displayed in Figure 16.6, although the name of the disk being displayed and the free space on the disk will probably be different.

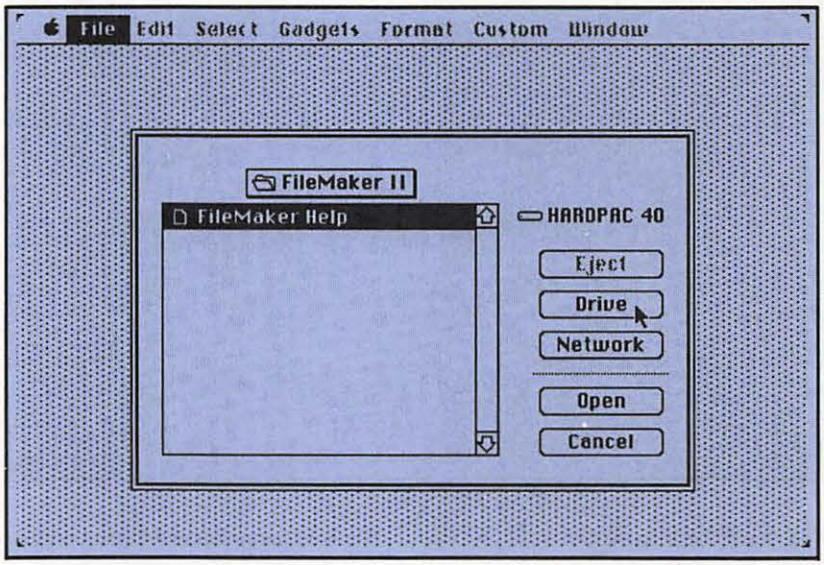


Figure 16.6
The Open dialog box. Since FileMaker was launched from the Hard Disk, this is the one showing in the current dialog box.

Click the mouse on the Drive button shown in the dialog box.

The Drive button tells FileMaker to display the database file and folder names found on a second disk currently in your computer. This may be a floppy disk, or a hard disk. If you do not have a second disk in the computer, then the Drive button will be dimmed, and you will not be able to use it.

Continue clicking the Drive button until the name of the disk that contains your file appears in the dialog box.

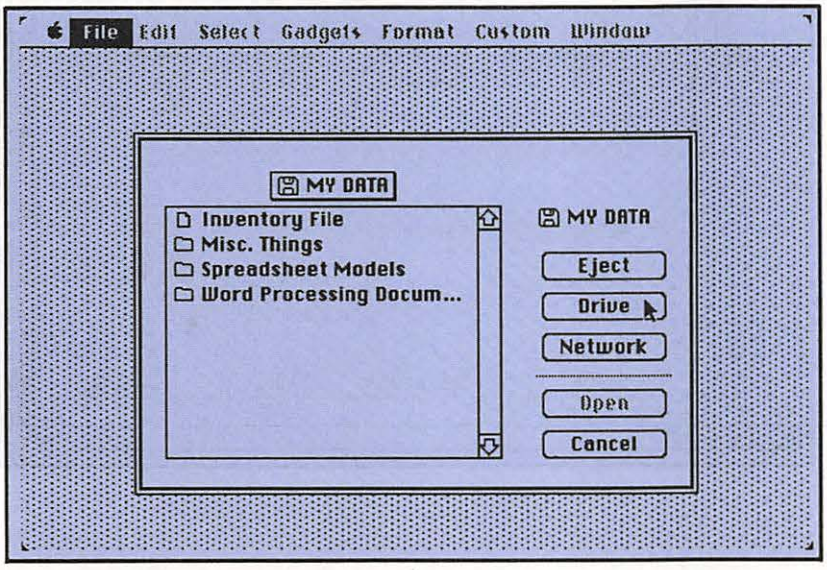


Figure 16.7
After clicking on the Drive box, the contents of the disk called MY DATA is displayed.

Click on Inventory File.

You want to open the database you named "Inventory File." By clicking the mouse pointer on the name in the dialog box, you are selecting this database.

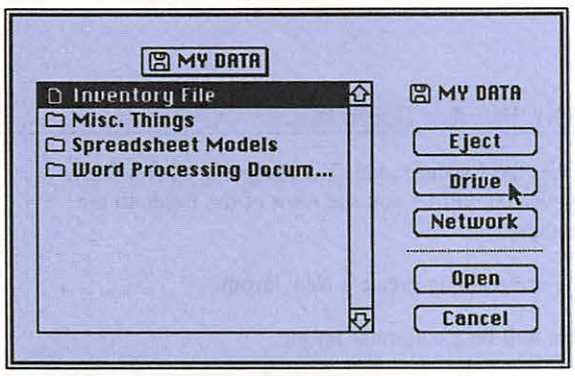


Figure 16.8
The database "Inventory File" has been selected.

Click on the Open button.

Execute the Open command. After a brief pause while the computer reads the database, you will see the database displayed in the last layout that you used.

You should remember that the double-click is often a shortcut to the Open command. You could have double-clicked the mouse on the database name, rather than selecting it and then clicking on the Open button in the dialog box.

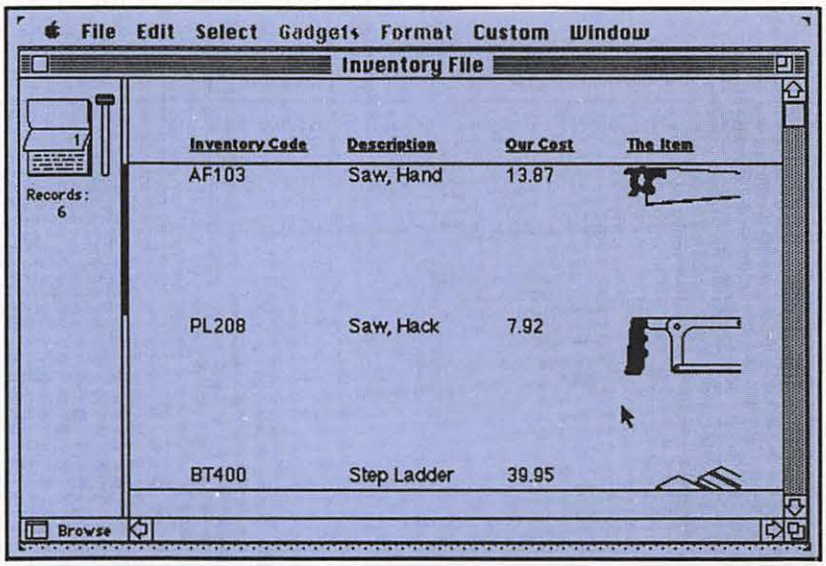


Figure 16.9
The database you created has been opened and is displayed in the second layout that you created.

16.7 CREATE A NEW LAYOUT

Before you begin sorting the database, you should create a layout that will let you see the majority of the fields in the database at all times. This format will make it easier to see what is happening in this chapter.

What To Do	*Why You Are Doing It*
⌘L	Select the Layout mode. You are going to create a new layout that will let you see most of the fields in the database.
⌘N	You are going to create a New layout.
Click on Columnar report layout.	This will be a columnar layout.
Click on the OK button.	You must now select the fields you want to include in this layout.
Click on Inventory Code in the Field List.	This is the first field you want in the layout.
Click on the Move button.	Put the field into the Field Order list.
Click on Description in the Field List.	The next field to be added to the layout.

Click on the Move button.	Put the field into the Field Order list.
Click on Our Cost in the Field List.	The next field to be added to the layout.
Click on the Move button.	Put the field into the Field Order list.
Click on Quantity On Hand in the Field List.	The next field to be added to the layout.
Click on the Move button.	Put the field into the Field Order list.
Click on Minimum Stock in the Field List.	The next field to be added to the layout.
Click on the Move button.	Put the field into the Field Order list.
Click on Reorder in the Field List.	The next field to be added to the layout.
Click on the Move button.	Put the field into the Field Order list.
Click on Last Order in the Field List.	The next field to be added to the layout.
Click on the Move button.	Put the field into the Field Order list.

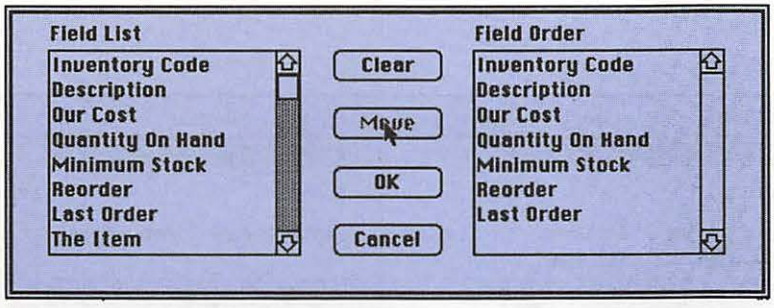


Figure 16.10
This is the list of fields you want to include in this layout.

Click on the OK button.	You are done defining this layout.

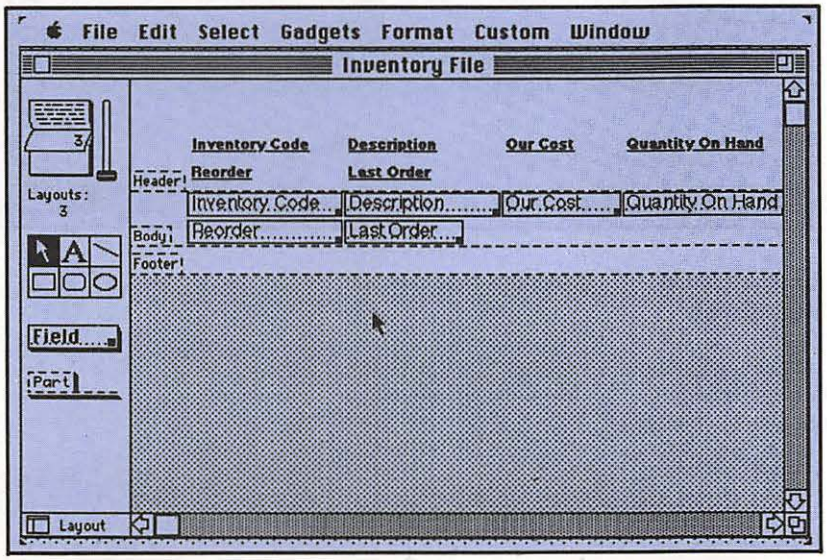


Figure 16.11
The layout that you have created. The Reorder and Last Order fields appear below the Inventory Code and Description fields. The layout is too wide to fit on a page at present. Depending on your printer, you may experience a slightly different initial layout at this point.

As you can see in Figure 16.11, the layout you have created shows two fields in the first two columns. The layout is too wide for the page. This needs to be fixed.

Figure 16.12
The Inventory Code field being made narrower.



Position the mouse pointer on the handle for the Inventory Code field, press and hold the mouse button.

Recall that the black box at the bottom right corner of the field box in the layout mode is called the handle and is used for changing the shape and size of the field.

Drag the handle left until only the word Inventory shows in the field.

You are making this field narrower.

Release the mouse button.

Complete the change of size for this field.

Drag the Description field left next to the Inventory Code field.

Move the next field left, but do not change its size.

Select the handle of the Our Cost field and drag it left so only the words Our Cost show in the field.

Make this field narrower.

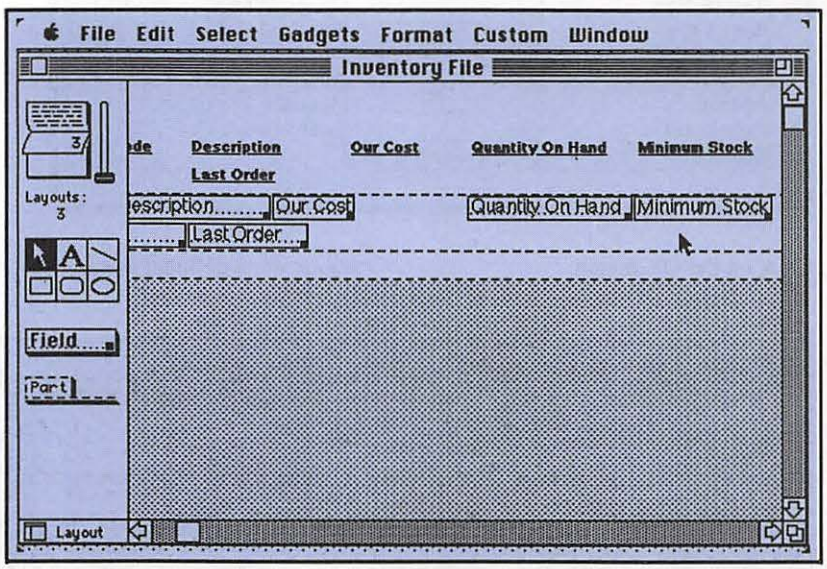
Drag the Our Cost field left next to the Description field.

Move the field over.

Use the scroll bar at the bottom of the window to slide the layout left until you can see the next fields.

You need to be able to see the fields to adjust their sizes.

Figure 16.13
The window has been scrolled so that the next two fields are in view.



Select the handle of the Quantity On Hand field and drag it left so only "Qua" shows in the field.

Make this field narrower.

Drag the Quantity On Hand field left next to the Our Cost field.

Move the field over.

Select the handle of the Minimum Stock field and drag it left so only "Mini" shows in the field.	Make this field narrower.
Drag the Minimum Stock field left next to the Quantity On Hand field.	Move the field over.
Drag the Reorder field up to the top line of fields and place it next to the Minimum Stock Field.	This field must be placed on the first line of the desired output.
Select the handle of the Reorder field and drag it left so only Reorder shows in the field.	Make this field narrower.
Scroll the window back using the scroll bar at the bottom.	You should now have all the fields in view.

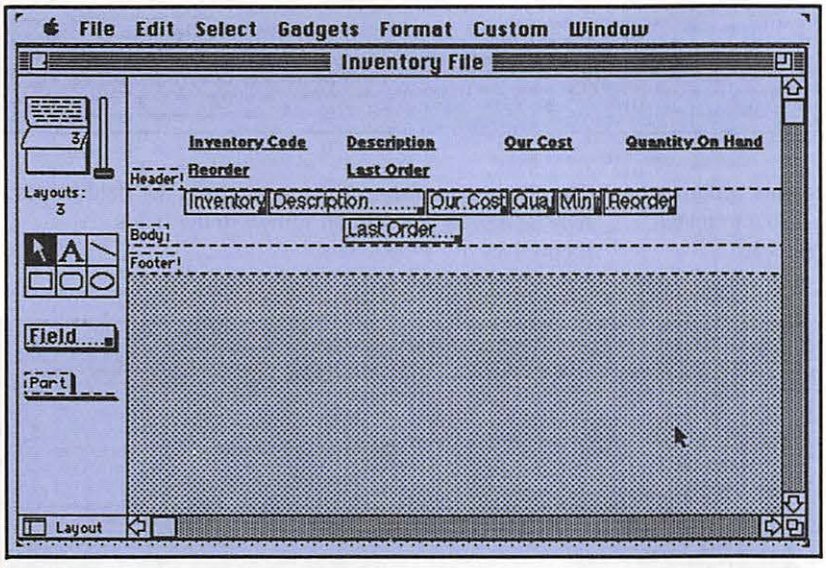


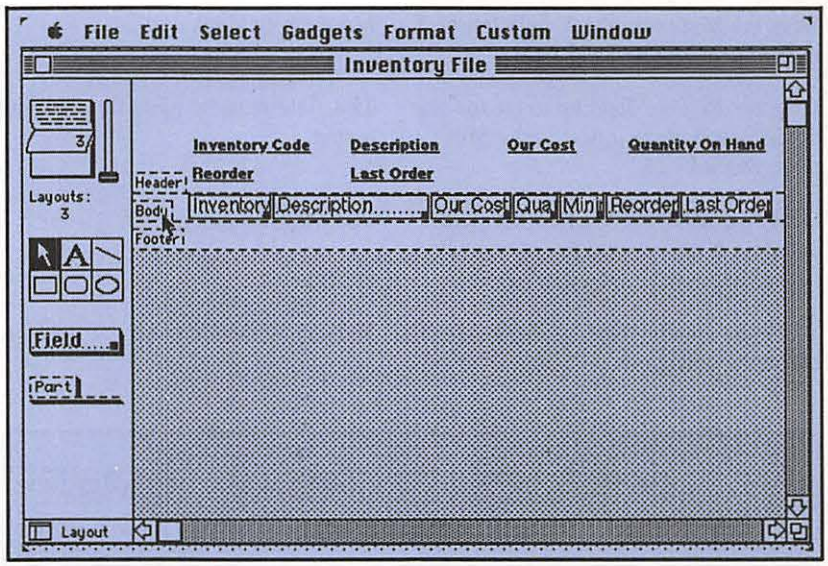
Figure 16.14
All the fields are in view in the window.

Select the handle of the Last Order field and drag it left so only Last Order shows in the field.	Make this field narrower.
Drag the Last Order field right and up, placing it to the right of the Reorder field.	Place this field on the same line as the other fields in the layout.
Move the mouse pointer to the word Body in the box at the left of the layout.	You are going to change the line spacing.

Drag the Body line up until only one line of text for the record is displayed.

Make the layout single spaced.

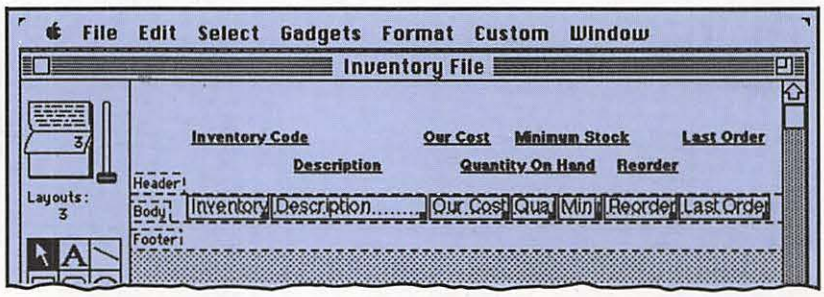
Figure 16.15
The modified layout.



Select and move the column headings in the header area of the layout to match what you see in Figure 16.16.

The column headings, which come from the field names, may be moved in a fashion similar to the fields themselves.

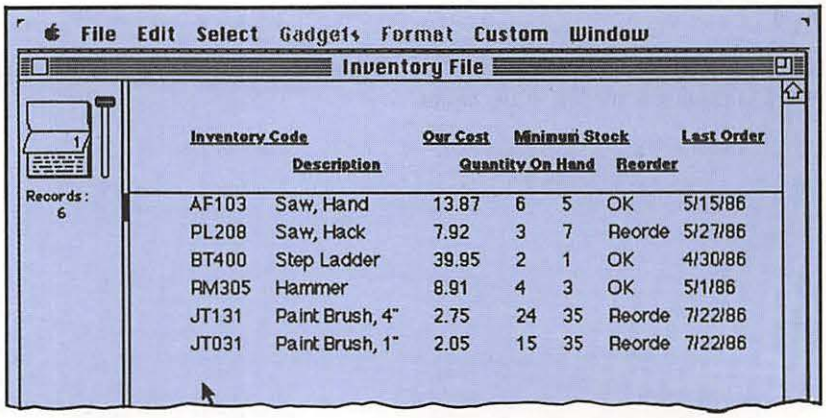
Figure 16.16
The column headings have been rearranged to be over the appropriate data.



⌘B

Leave the Layout mode and enter the Browse mode. All the selected fields of the database are now visible.

Figure 16.17
All the selected information is now visible in the current layout.



16.8 SORTING THE FILEMAKER II DATABASE

Now you are ready to sort your database. FileMaker uses an internal index to sort your database. No new files are created. However, even though an index is being created, the term used in the program is Sort. Do not confuse the term and the apparent outcome with what is actually happening. When you sort the database with FileMaker, the original physical order of the data is not lost, since you are, in fact, using an index to view the data in a new order. Thus, it is an easy task to return a FileMaker database to its original order by "unsorting" it, as you will soon see. More important, the sorted order is not kept up to date if new records are added to the database. You must then re-sort the file to have it displayed in the desired order.

What To Do	*Why You Are Doing It*
Pull down the Select menu.	This menu has the Sort command located on it.
Drag the mouse down and select the Sort command.	This command may be executed by the ⌘S key.



Figure 16.18
The Sort command has been selected.

Release the mouse button.	Execute the Sort command. After a brief pause you will see the Sort dialog box.
Click on the Inventory Code field name in the field list box at the left of the dialog box.	You want to order the file by the Inventory Code number. Note that the order of the sort is controlled by the two buttons at the bottom of the dialog box. Ascending Order is selected, which will sort the Inventory Code numbers from smallest number to the largest. Since they all start with a letter of the alphabet, this sort will be in alphabetical order.

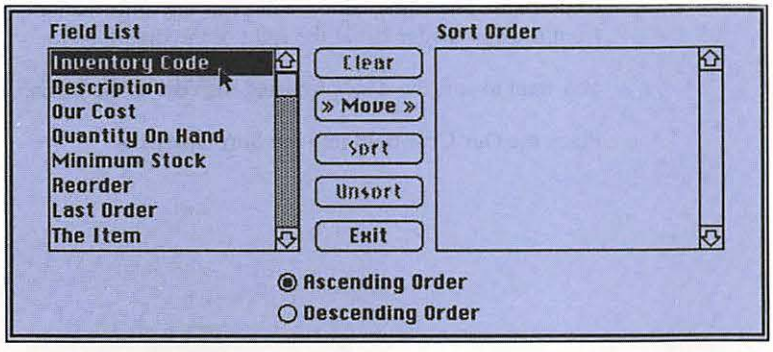


Figure 16.19
The Sort dialog box. The Inventory Code field has been selected in the Field List box.

Click on the Move button.

Place the Inventory Code field into the Sort Order list at the right of the dialog box. When you do this, you will see an icon in front of the field name. This icon shows that you have selected an Ascending Order sort for this field.

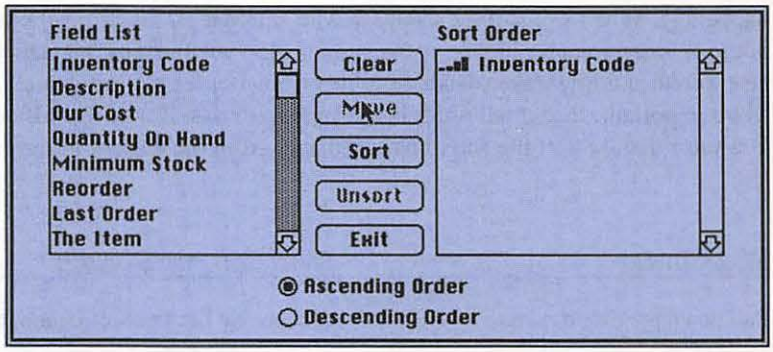


Figure 16.20
The Inventory Code field is in the Sort Order list. The Inventory Code will be sorted in ascending order.

Click on the Sort button.

Execute the sort. You will see a message telling you that the sort is in progress briefly displayed on the screen.

When the sort is done, the Browse mode will return. Note that the word Sorted now appears below the book at the left of the window.

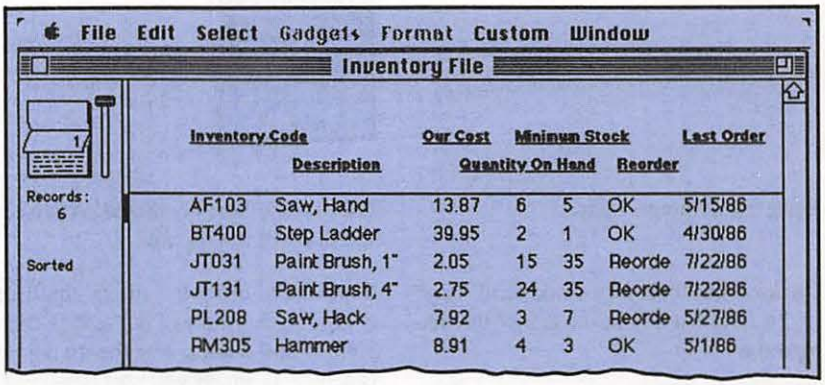


Figure 16.21
The database has been sorted in order of the Inventory Code field.

⌘S

You want to execute a new sort. The Sort dialog box will appear.

Click on the Clear button.

You do not want the file sorted based on the Inventory Code field. The Clear button will clear any information from the Sort Order list at the right of the dialog box.

Click on the Our Cost field.

You want to sort the database using the cost of the items.

Click on the Move button.

Place the Our Cost field into the Sort Order list.

Click on the Sort button.

Execute the sort. The file will now be displayed in order based on the cost of each item, least expensive to most expensive.

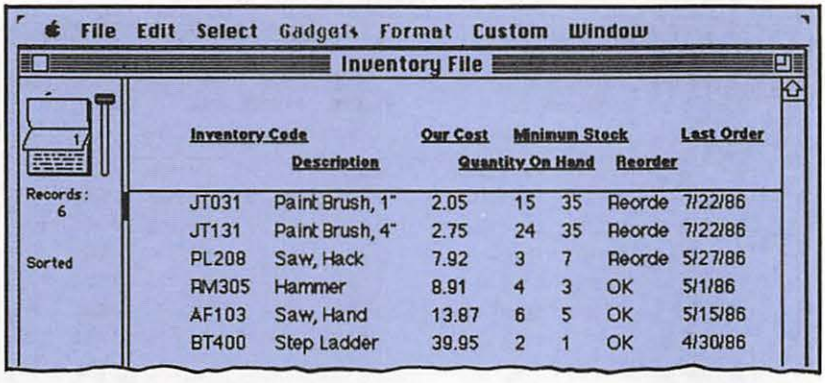


Figure 16.22
The new sorted database.

Drag the slide to the bottom of the slide bar.

You are going to add a new record to the database.

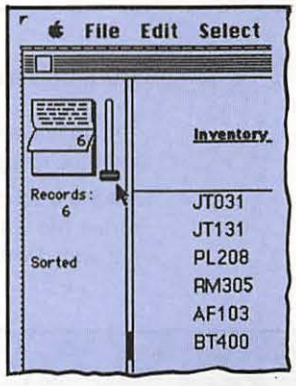


Figure 16.23
The slide control has been moved to the bottom of the slide bar.

⌘N

Add a new record. Note that as soon as you perform this command, the word sorted, shown under the book, is placed into parentheses. This indicates that the file is no longer totally in sorted order.

JA103 [TAB]
Saw, Coping [TAB]
2.50 [TAB]
7 [TAB]
10 [TAB]
6/11/86

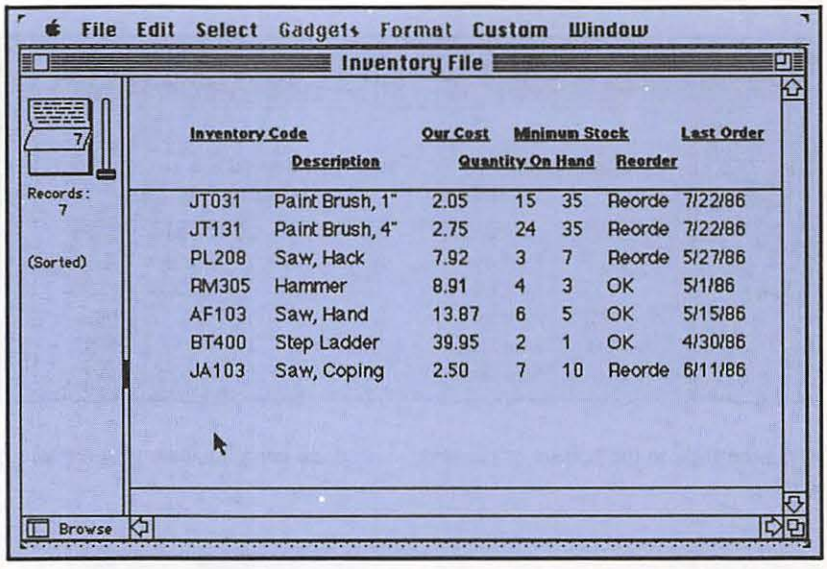
Enter the information for this new record. Since this layout does not include the graphic field, you are not able to add the graphic of the Coping Saw at this time. When you change the layout in use to the original one, you will be able to place the graphic, which is in the scrapbook.

Click the mouse in the white space below the list.

You want to be able to look at the file without making changes to the data. The outlines of the fields will disappear, indicating that you are no longer in data entry mode.

Look at the current list of the database on the Macintosh display. The newly added record is NOT automatically sorted into the correct place in the list.

Figure 16.24
The current database file has the new record at the end of the list. It is not in order.



Inventory Code	Description	Our Cost	Quantity On Hand	Minimum Stock	Reorder	Last Order
JT031	Paint Brush, 1"	2.05	15	35	Reorde	7/22/86
JT131	Paint Brush, 4"	2.75	24	35	Reorde	7/22/86
PL208	Saw, Hack	7.92	3	7	Reorde	5/27/86
RM305	Hammer	8.91	4	3	OK	5/1/86
AF103	Saw, Hand	13.87	6	5	OK	5/15/86
BT400	Step Ladder	39.95	2	1	OK	4/30/86
JA103	Saw, Coping	2.50	7	10	Reorde	6/11/86

⌘S

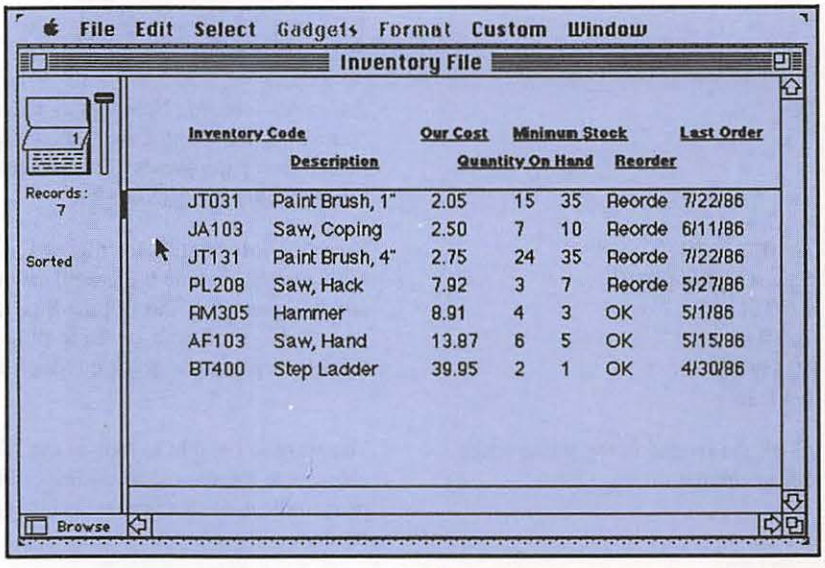
The Sort command from the Select menu.

Click on the Sort button.

You do not want to change the Sort Order list, you just want the computer to re-sort the file.

After a brief pause, the sort will be done and the newly sorted file will be displayed on the screen. The part you just added will be in the proper location based on its cost.

Figure 16.25
The coping saw appears as the second item in the list, since its cost falls between that of the one inch paint brush and the four inch paint brush.



Inventory Code	Description	Our Cost	Quantity On Hand	Minimum Stock	Reorder	Last Order
JT031	Paint Brush, 1"	2.05	15	35	Reorde	7/22/86
JA103	Saw, Coping	2.50	7	10	Reorde	6/11/86
JT131	Paint Brush, 4"	2.75	24	35	Reorde	7/22/86
PL208	Saw, Hack	7.92	3	7	Reorde	5/27/86
RM305	Hammer	8.91	4	3	OK	5/1/86
AF103	Saw, Hand	13.87	6	5	OK	5/15/86
BT400	Step Ladder	39.95	2	1	OK	4/30/86

⌘S	The Sort command from the Select menu.
Click on the Clear button.	Clear the sort order list.
Click on the Unsort button.	You want to look at the file in its original order. Clearing the sort order will not unsort the file. Only the Unsort button will return the file to its physical order.

Figure 16.26
The Unsort button is about to be pressed.



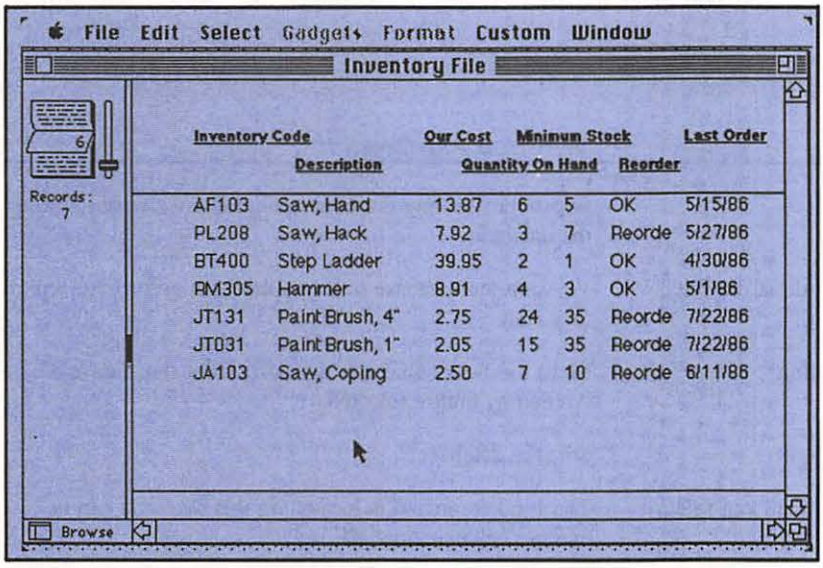


Figure 16.27
The file is now displayed in its physical order.

16.9 LOOKING AT SUBSETS OF YOUR FILE

So far you have looked at every record in your database. With a small file, this is not a problem. Unfortunately, a database may contain hundreds or thousands of records. When this is the case, it is not practical to look at the complete database when you may be interested only in the information contained in a few records.

You may tell FileMaker not to list the complete file by specifying a find criteria to be in effect for the browse process. A find criterion may be thought of as the decision rule you want the computer to use when deciding whether or not to display the contents of a particular record. You may specify criteria such as "part numbers that begin with the letter J." It is also possible to combine two or more field contents to create selection criteria, such as "quantity on hand less than minimum reorder point, and cost less than 10.75."

Depending on the strategy you use when creating your find criteria, you may have very few or very many records output. The idea behind find criteria is to develop them so that the program will display just the records you want. This can be done with a little bit of practice and thought on your part.

16.10 SELECTING RECORDS WITH FILEMAKER II

You will discover that FileMaker II is not case-sensitive when performing record selections. If you have entered all the records using lowercase letters in the Inventory Code field (such as "jt131" instead of "JT131"), then even if you enter your find criteria as a capital J, the records starting with a "J" will be found. Of course, the opposite is true. If you entered the information with all capital letters, and you enter the find criteria in lowercase, the records will still be located.

What To Do	*Why You Are Doing It*
⌘S	Before performing the Find operations, we want to order the database.
Click on Inventory Code in the Field list.	We want the database to be displayed in order by inventory code.
Click on the Move button.	Place the field name into the Sort Order list. Leave the Ascending button selected.
Click on the Sort button.	Sort the database.
Pull down the Select menu and select the Find option.	The Find command is located on this menu. It can be executed by using the ⌘F key.



Figure 16.28
The Find command has been selected.

Release the mouse button.	Execute the Find command. You will now see the Find dialog. The Find dialog makes use of the current layout. Note that the cursor is blinking in the Inventory Code field.

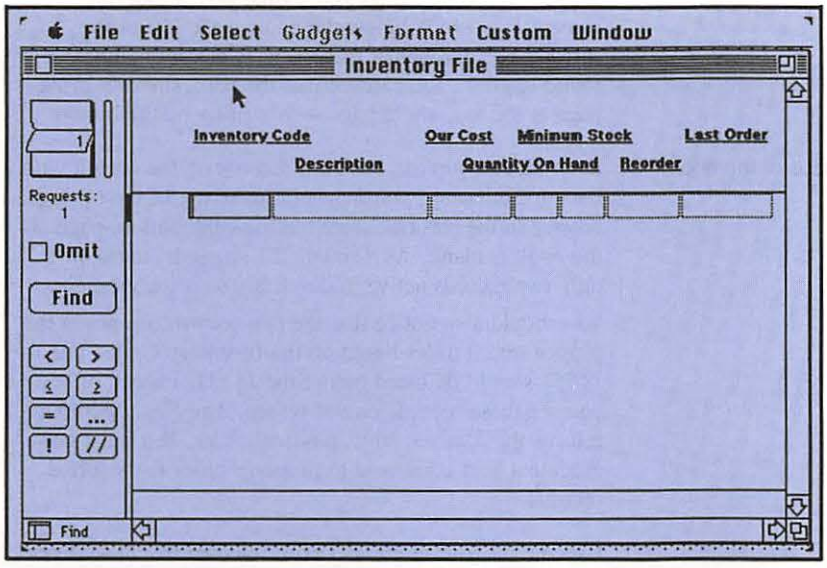


Figure 16.29
The Find dialog screen. It makes use of the current Layout. You can see that the selected field is Inventory Code, and that the cursor is in this field.

JT

Type the letters "JT" into the Inventory Code field. You are telling FileMaker that you want to see only those records with an Inventory Code that starts with JT. You are not yet using any of the Boolean symbols found under the Find button at the left of the display.

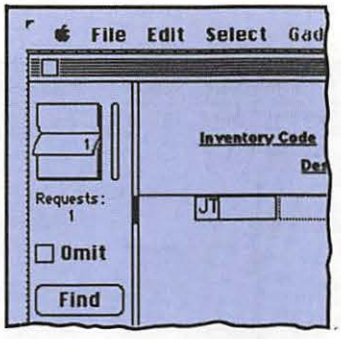


Figure 16.30
The letters JT have been entered into the Inventory Code field of the find screen.

Click on the Find button.

Execute the find. After a brief pause, two records will be displayed on the screen.

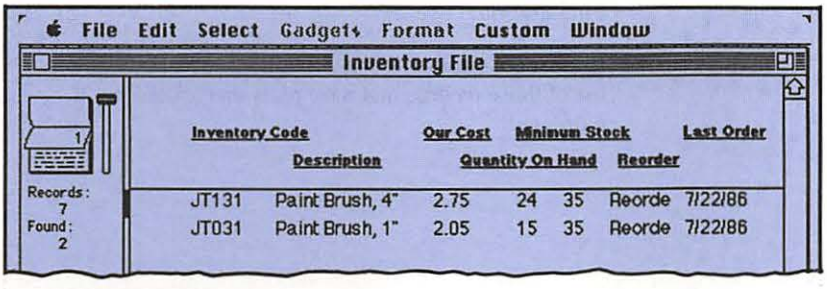


Figure 16.31
The Find command has selected two records.

There are several things you should note about this screen. First, look below the book at the left of the screen. The number of records is 7, but the number found reads 2. You can see that the book shows a blank page at the top, and a page with writing on the bottom.

Click on the bottom page of the book.

Even though you can see both records on the screen with the current layout, you may still make use of the book to browse in the records. Note that now the bottom page of the book is blank. As "Found: 2" suggests, there are only two records active in the database at the moment.

You should also notice that the two records are not in the proper sorted order based on the Inventory Code. The JT031 should be listed before the JT131, instead of how you see these records on the screen. The Find operation returns the database to its physical order. You must now execute a Sort command to properly order the selected records.

⌘S

Execute the Sort command. You selected Inventory Code to be the field on which to sort order earlier. It should appear in the Sort Order list.

Click on the Sort button.

Re-sort the list.

The two selected records are now listed in the correct order based upon their Inventory Codes. You can also see the word Sorted appear at the left of the window below the 2 that gives the number of records found.

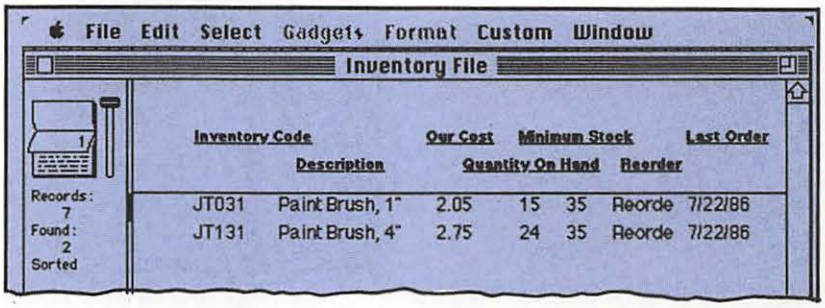


Figure 16.32
The word Sorted appears at the left side of the window with the other information about the database.

⌘F

Execute the Find operation again.

Click on the field for Reorder.

Even though this is a computed field, you may use it for Find criteria.

reorder

Enter the word Reorder into the field. You now want a list of those records that have parts that should be reordered.

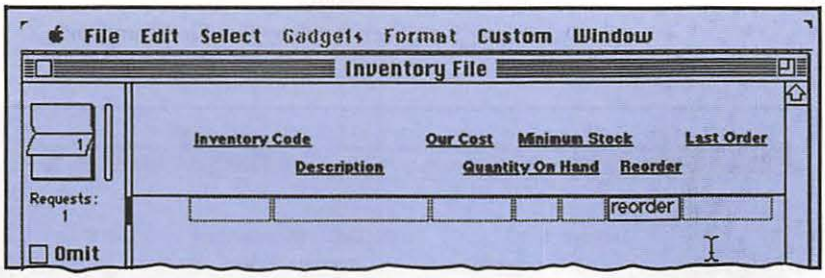


Figure 16.33
The word REORDER has been entered into the Reoder field, the second from the right in the current layout. Remember that the case of the letters does not matter to FileMaker.

Click on the Find button.

Complete the Find command. Four records will be selected, but again they will not be in sorted order. Since the only other information that will appear in the Reorder field is the word "OK," you could have performed this search by entering only an "R" in the field. That would have been enough to allow FileMaker to select the desired records.

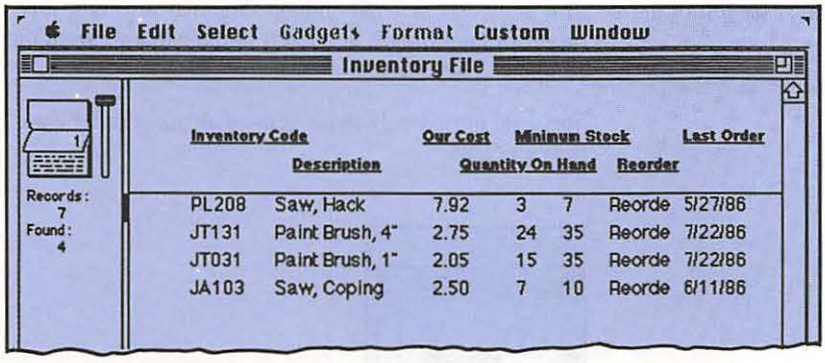


Figure 16.34
After the Find button has been clicked, four records are selected from the database for display.

⌘F

You are going to execute another find.

JT

Enter JT into the Inventory Code field.

Click the mouse on the Reorder Field.

You are going to use two Find criteria on a single search request. When you do this, the two criteria are combined with an "AND" operation by FileMaker.

reorder

Enter "reorder" into this field. You want to locate those records that have an Inventory Code that starts with "JT" **AND** must be reordered.

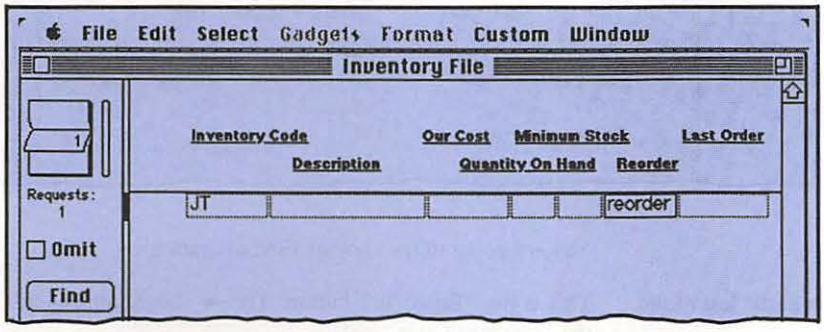
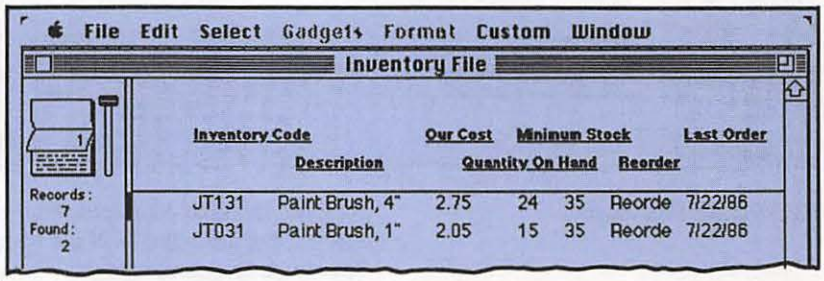


Figure 16.35
You are entering two Find criteria.

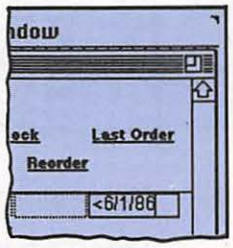
Click on the Find button.	Execute the Find operation. Two records have been found by this Find command.

Figure 16.36
Two records are found because both Find criteria must be true for a record before it is made available for browsing.



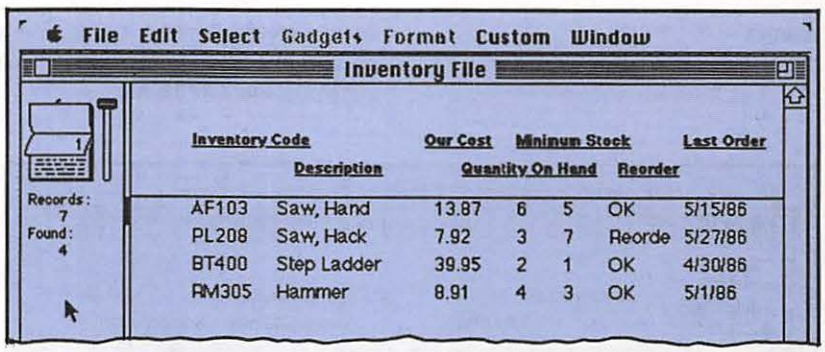
⌘F	You are going to try another Find operation.
Click on the Last Order field.	You are going to do a find based on the information in this field.
Click on the < button at the left of the screen.	This is the "Less Than" button. You may also type this, or any of the symbols at the left of the window, from the computer's keyboard.
6/1/86	You want to find only those items with a last order date before 6/1/86.

Figure 16.37
The Find criteria has been created.



Click on the Find button.	Execute the find. There are four records that contain a last order date prior to 6/1/86.

Figure 16.38
Four records have been found with a last order date prior to June 1, 1986.



⌘F	You are going to try another Find operation.
Click on the = button at the left of the screen.	This is the "Equal To" button. The = should appear in the Inventory Code field.

JT

You want to locate all the records that have an Inventory Code equal to JT.

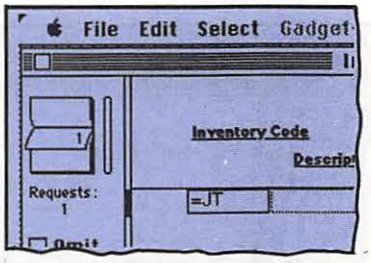


Figure 16.39
The current Find criteria.

Click on the Find button.

Execute the Find.

FileMaker will tell you that there are no records that match this Find criteria.



Figure 16.40
The Find criteria does not locate any records.

This happens because the equal operator told FileMaker to look for records in which the Inventory Code was exactly JT, and nothing else. There are no such records.

Click on the OK button.

You want to try again.

[BackSpace] [BackSpace] [BackSpace]

Erase the information in the Inventory Code field. You are going to try a new find with a new Find criteria.

A

Enter an A into the Inventory Code field, which should be the selected field.

Pull down the Edit menu and drag the mouse down to New Request.

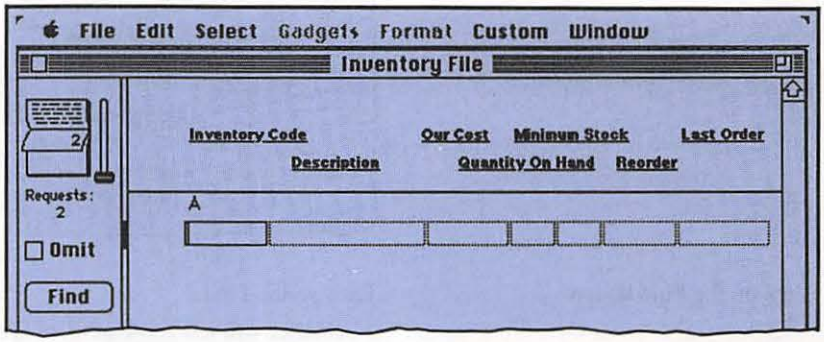
The New Request command lets you combine multiple Find criteria in an OR fashion, rather than in the AND fashion that you used earlier. You can see that the ⌘N key will execute this command.



Figure 16.41
The New Request command has been selected.

Release the mouse button.	Execute the command. A Find request form will be added to the display.

Figure 16.42
A second find criteria is being added to the current find criteria. The two will be combined in an OR fashion, not an AND fashion.



J	Enter a J into the Inventory Code field of the second find criteria.
Click on the Find button.	Execute the Find command. Four records will be found. One that starts with an "A", and three that start with a "J".
Pull down the Select menu and drag the mouse down to the Find All command.	This command will cancel the current Find criteria, and once again display the complete database. This command may be executed with the ⌘G key.

Figure 16.43
The Find All command has been selected.



Release the mouse button.	Execute this command. All the records of the database will be displayed.

It is important to remember that when you enter information into two or more fields of a single Find request form, the different items are combined using the Boolean AND operation. That is, each criteria must be met for a record to be selected. When you want to combine two or more criteria in an OR fashion, then you must add selection requests. A record that matches on any single selection request will then be selected. This should be evident from the last selection you made. It is impossible for an Inventory Code to start with both a J AND an A. Clearly, the selection that was made was for records that started with either a J OR an A. It is also possible to use the multiple requests to make a selection such as the records with an Inventory Code starting with A OR the records in which Our Cost is greater than 35.00.

16.11 MODIFYING THE FIELDS USED IN A LAYOUT

Just as you may want to look at selected records of the database file, you may want to look at selected fields. In addition to a database containing thousands of records, it may contain information you do not always want to see. For example, if you have a personnel file, you may want to list just employee ID numbers and names when creating an employee list, and not include the people's current salaries.

You have seen that you can, with relative ease, add a new Layout to a database file to meet specific needs. Sometimes it is easier to duplicate an existing layout and then modify it to obtain the information you want, rather than to create a completely new layout. In this fashion, you can easily select the contents of any given display.

What To Do	*Why You Are Doing It*
⌘L	Return to the Layout mode. You should have layout 3 displayed. If not, use either the book or the slide bar to display Layout 3.
Pull down the Edit menu and drag the mouse down to Duplicate Layout.	This command will make a copy of the current layout and add it to the file. It can be executed with the ⌘D key.



Figure 16.44
The Duplicate Layout command has been selected.

Release the mouse button.	Execute the command. The layout will appear unchanged, but by looking at the book and the information below it you can see that the number of layouts is now 4, and you are using the fourth layout.

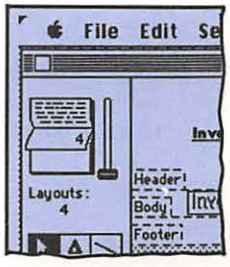
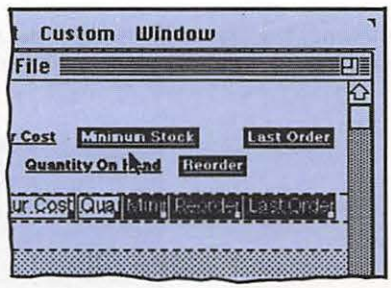


Figure 16.45
You are now using the fourth layout.

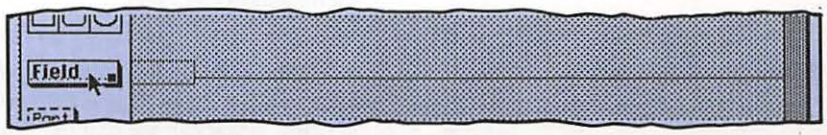
Click on the Last Order field.	Select the rightmost field of the current layout.
[SHIFT]	Hold down the shift key for the next group of mouse clicks. You are going to click the mouse on several other items. By holding down the shift key, you are extending the selection.
Click on the Reorder field.	Select this field.
Click on the Minimum Stock field.	Select this field.
Click on the label for the Last Order field.	Select the label at the top right of the layout.
Click on the label for the Reorder field.	Select this label.
Click on the label for the Minimum Stock field.	Select this label.
Release the shift button.	You are finished selecting items. You now have six items selected.

Figure 16.46
Note the six items of the layout that have been selected.



⌘X	This is the Cut command from the Edit menu. The selected items will be removed from the layout.
Move the mouse to the Field tool at the left of the window.	The Field tool is used to add fields to a layout.
Press and hold the mouse button.	When you press the mouse button, you will see a box and line displayed on the screen starting at the Field tool.

Figure 16.47
The mouse pointer is on the Field tool and the mouse button has been pushed. Note the outline of a box with the line going out of it to the right.



Drag the mouse to the right of the Quantity On Hand field in the layout.	As you drag the mouse, the box and line will disappear until the mouse is on the white area that is the usable space of the current layout.

It is important to place the box so that it is not touching the dashed line representing the bottom of the layout's header.

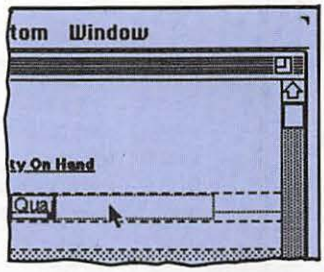


Figure 16.48
Note the placement of the box between the header and body dashed lines.

Release the mouse button.

Place the field holder on the layout. When you release the mouse button a field list will appear at the left of the screen.

Click on the Value field.

You want the field you have just placed on the layout to be the Value field. Remember that this field is computed by multiplying the Our Cost field times the Quantity On Hand field.

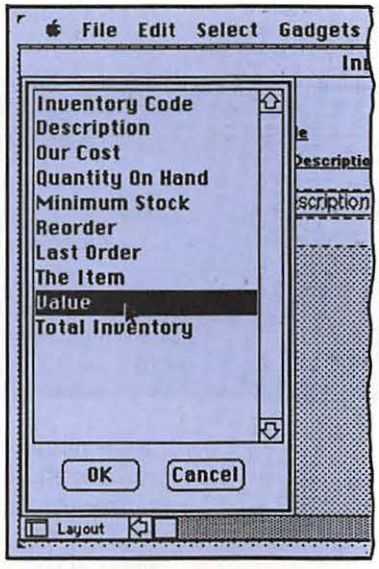


Figure 16.49
The field list has appeared and the Value field has been selected.

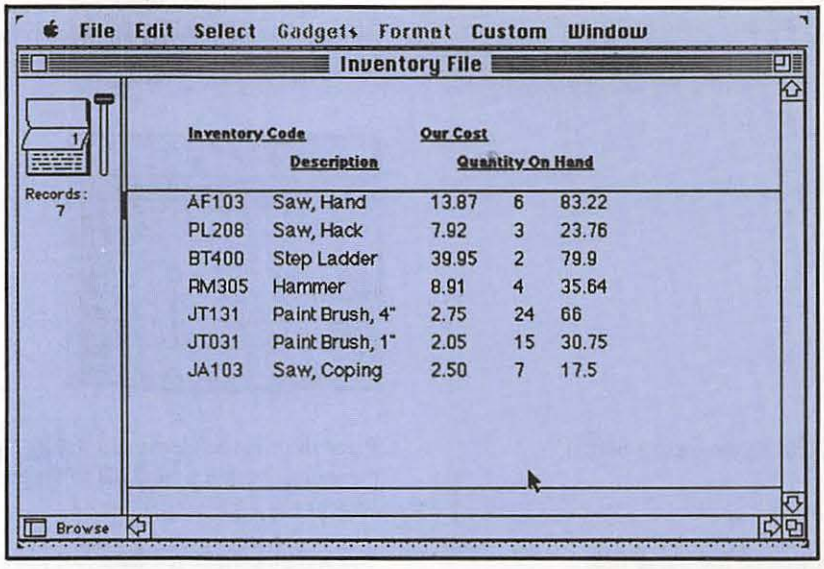
Click on the OK button.

Make the new field on the layout be the value field. The word Value will appear inside the field you have added to this layout.

⌘B

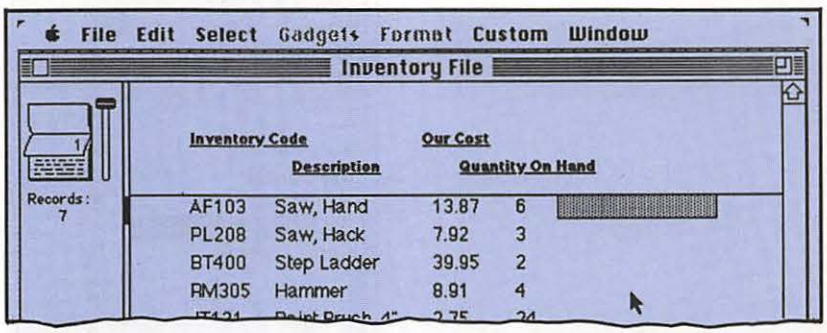
Return to the Browse mode. The value should now be the rightmost column on the report (Figure 16.50 on the next page).

Figure 16.50
The modified layout has some of the fields from the earlier layout and the field you just added.



It is important that you place the new field so that it is not touching the dashed line representing the bottom of the header. If your Browse mode view looks similar to Figure 16.51, then the field you have added is touching, or above, the dashed header line.

Figure 16.51
The shaded box represents the field you have just added. If your display looks like this, rather than like Figure 16.50, you have placed the field too high on the layout.



To fix this problem is easy. Return to the Layout mode by pressing ⌘L, then drag the field down. If you are having trouble placing the field in the exact location you want, then pull down the Gadgets menu and look at the Invisible Grid command.

If there is a check mark in front of this command, it is active. Drag the mouse down to select Invisible Grid, then release the mouse to turn off the Invisible Grid. The Invisible Grid causes new fields and other items you place on a layout to jump to certain locations. By turning it off, the items you are placing will no longer jump to the invisible grid. Note that you may turn the Invisible Grid on and off by using the ⌘Y key.

After you have re-located the new field, press ⌘B to return to the Browse mode.

16.12 REMOVING RECORDS FROM YOUR DATABASE

Sooner or later you will want to remove records from the database. This may be for any of several reasons. For example, a store may decide to stop stocking a particular item, and therefore it should be dropped from the inventory file. Or, you may need more space on the disk, forcing you to remove unneeded or unused information.

You delete a record by using the Delete Record command while it is the current record being displayed in the Browse mode. If you are looking at the file in a columnar list layout, you can tell which one is the current record by looking at the number displayed in the center of the book. It is also possible to tell the current record by observing the black bar in the space that separates the records from the book and other icons on the left of the window. This bar is placed opposite the current record. To observe the movement of this bar, click the mouse on the RM305 Inventory Code. The black bar moves down next to the fourth record. Now click on the AF103. The black bar will move to the first record. Finally, click in the white space below the last record of the file. The selection bar will move to the last record of the file. Of course, you may use the book or selection bar to change the current record number.

It is also possible to delete a group of records. This is done by using the Delete Multiple command. All the records selected and available for browsing are then deleted. You control which records are selected and active by using the Find command that you learned earlier in this chapter.

It is important to remember that, no matter how you delete the records, either singly or in groups, once they are deleted, the deleted records cannot be recovered. If you want some information restored, you must manually reenter the data.

What To Do	*Why You Are Doing It*
Move the mouse to the left of the Inventory Code BT400.	This is the record for the step ladder. It is the one you are going to delete.
Click the mouse.	Make the third record the selected record. This is the record you want to delete.

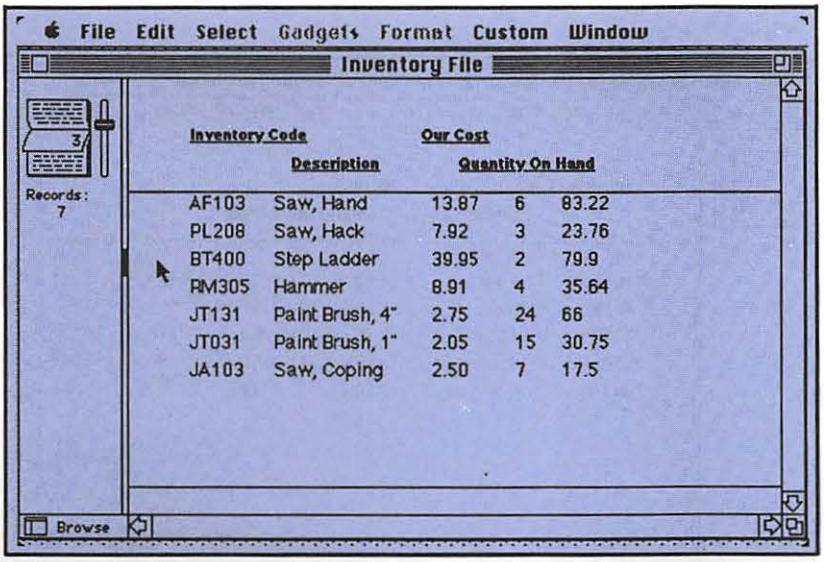


Figure 16.52
The third record is the active record. Note the location of the mouse pointer to the left of the BT400 code. This is where the mouse was clicked to move the selection.

Pull down the Edit menu and drag the mouse down to the Delete Record command.

This command will delete the currently selected record from the database. Note that you may execute this command by pressing the ⌘E key.



Figure 16.53
The Delete Record command has been selected.

Release the mouse button.

Activate the Delete Record command. You will now see a new dialog box. With this dialog box, you have the opportunity to cancel the current delete command.

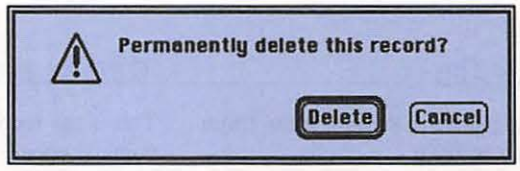


Figure 16.54
The dialog box you will see after you have executed the Delete Record command.

Click on the Delete button.

Confirm that you want to delete the current record. The record will be removed, and the database will return to six records in size.

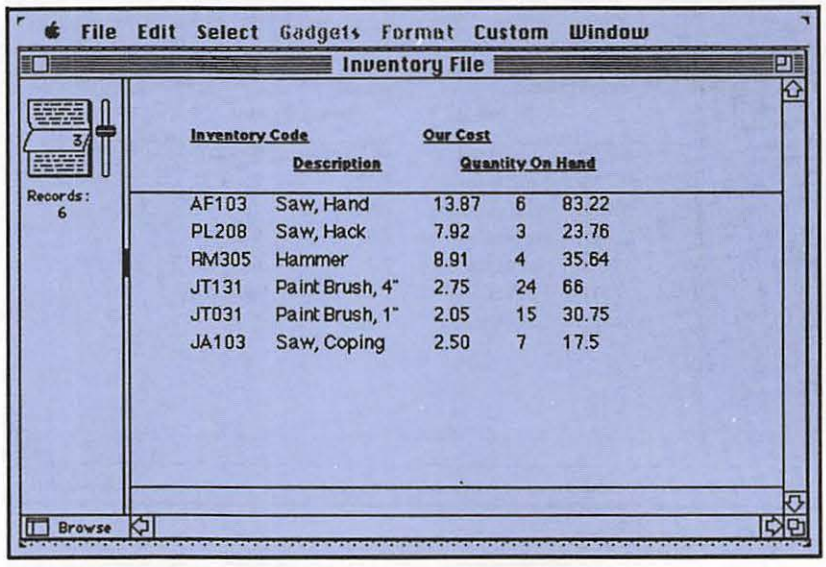


Figure 16.55
The database is once again only six records. Note that the BT400 no longer appears in the file.

⌘F	The Find command.
JT	Enter the text "JT" into the Inventory Code selection field.
Click on the Find button.	Return to the Browse mode. Only two records should now be displayed.
Pull down the Edit menu and drag the mouse down to Delete Multiple near the bottom of the menu.	This command, which does not have a command key equivalent, will remove from the database all the records that are currently active. At present, this is two records, since they were Found by the Find criteria.



Figure 16.56
The Delete Multiple command has been selected.

Release the mouse button.	Execute this command. You are asked if you really want to delete the two records that have been found.

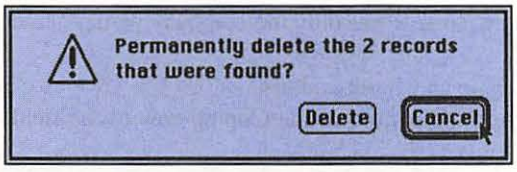


Figure 16.57
The Delete Multiple command deletes all the records that can be browsed through at the moment. If a Find is in effect, then the Find limits the number of records that can be deleted. If no Find is in effect, the Delete Multiple command will delete all the records in the database file.

Click on the Cancel button.	You do not really want to delete these two records. A word of caution when using the Delete Multiple command. If you have failed to specify a Find criteria, meaning that the complete database is active, this command will delete every record of the file.
⌘G	Execute a Find All command to activate the complete database file before you quit the program.
⌘Q	The FileMaker Quit command. You are done working with the database file and you are returned to the Macintosh Finder.

As previously mentioned, it is important to remember that, once a record has been deleted, it cannot be undeleted. The Undo command is not activated after you delete a record. When you are going to perform a Delete Multiple command, make sure that you look at the records that are to be deleted before executing the command. This will save you many hours of work re-building a file from which you have deleted the wrong records.

EXERCISES

1. When you browse a subset of the database, are the un-listed records deleted from the database?
2. Is it possible simultaneously to select a subset of the database for display and a subset of the database's fields, or are these selection processes mutually exclusive?
3. If a database file has a date type field called DATEINV, how do you select only those records with a date prior to 6/15/85?
4. If a database file has a text type field called CITY, how do you select only those records where the city is WORTHINGTON?
5. If a database file has a field called IS OK, how do you select only those records in which this field has the value TRUE? How do you select only those records in which this field has the value FALSE?
6. Are records that are deleted from the master database file stored in some other file for later use, or are they gone forever?
7. What should you do BEFORE you delete records from the database file?
8. In what situation is it possible to retrieve records that have been deleted from the database file?

If you did not create and enter the mailing list database in Exercises 5 through 10 of Chapter 15, do so now.

9. Print the MAILIST database in sorted order based on the last name field.
10. Print the MAILIST database in sorted order based on the zip code field.
11. Delete all the people from the MAILIST database living in CT and print the database in physical entry order.

If you did not create and enter the vendors database in Exercises 11 through 15 of Chapter 15, do so now.

12. Print the VENDORS database in sorted order based on the vendor code field.
13. Print the VENDORS database in sorted order based on the zip code field.
14. Print a list of the VENDORS database, in sorted order based on the company name. Print only the company name, name of the contact and the phone number.
15. Print a list of the vendors found in Burbank, CA. Print only the company name and street address.
16. Open the Inventory File that you have been working with in this chapter. Add the picture of the Coping Saw to the field The Item for the record with the Inventory Code JA103.

CHAPTER

ADVANCED DATABASE MANAGEMENT SYSTEMS CONCEPTS

17

CHAPTER OBJECTIVES:

Upon completion of this chapter, the student will:

- **Create custom layouts for the database.**
- **Create and modify a script to automate database processing functions.**

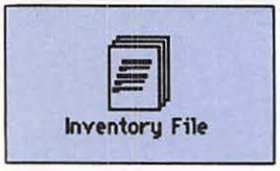
17.1 WORKING WITH YOUR DATABASE MANAGEMENT SYSTEM

After you boot your Macintosh with a System Start-Up disk, insert the FileMaker II Program disk into one of the computer's disk drives. If you are using a machine with a hard disk you will not need to insert the FileMaker program disk into a disk drive. Rather, locate the FileMaker folder, and open it so you can see the FileMaker program icon. Place the disk that has your database into another one of your Macintosh's disk drives, if you have one available. If you do not have a free floppy disk drive, keep this disk available.

In these instructions, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and double-click the mouse button. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.

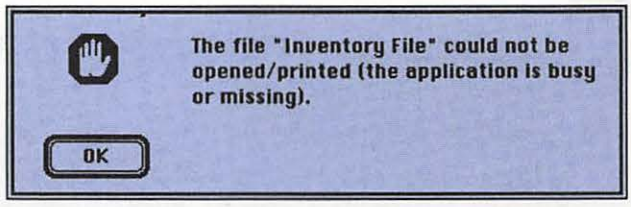
If you are using a computer with a hard disk, begin here:

Figure 17.1
This is the icon you will see for FileMaker database files.



What To Do	*Why You Are Doing It*
Locate the icon for the database file you created in Chapter 16 and place the mouse pointer on it.	You are going to launch FileMaker by double-clicking on this icon. Figure 17.1 shows the icon that FileMaker creates for its database files. The name of this particular one is Inventory file.
Double-click the mouse.	By double-clicking on a FileMaker database, the Macintosh will look on all available disks for the FileMaker application program. If found, it will launch FileMaker and open the database. If the Macintosh is not able to locate the application program, you will see the dialog box shown in Figure 17.2.

Figure 17.2
You will see this dialog box if the Macintosh is not able to locate the FileMaker application program to open the file you are double-clicking.



If you have the FileMaker application program on your hard disk, or on a floppy disk currently in one of the computer's disk drives, the program should start, and after a brief wait, the database you prepared during the last session will appear. You are now ready to work with the file.

If you are using a computer that has only floppy disks, then start here:

Locate the icon for the FileMaker program.	You will launch the FileMaker application program by double-clicking on it.
Move the mouse to the FileMaker icon and double-click.	The double-click will launch the application. If you have trouble with the double-click, you may also select the program's icon with a single click, then use the Open option on the File menu, or press ⌘O, the Command Key equivalent. After a brief wait, FileMaker will be running, and you will see the Open dialog box.
Click the mouse on the Drive button shown in the dialog box.	The Drive button tells FileMaker to display the database file and folder names found on a second disk currently in your computer. This may be a floppy disk, or a hard disk. If you do not have a second disk in the computer, then the Drive button will be dimmed, and you will not be able to use it.

Continue clicking the Drive button until the name of the disk that contains your file appears in the dialog box.

Click on Inventory File.

You want to open the database you named "Inventory File." By clicking the mouse pointer on the name in the dialog box, you are selecting this database.

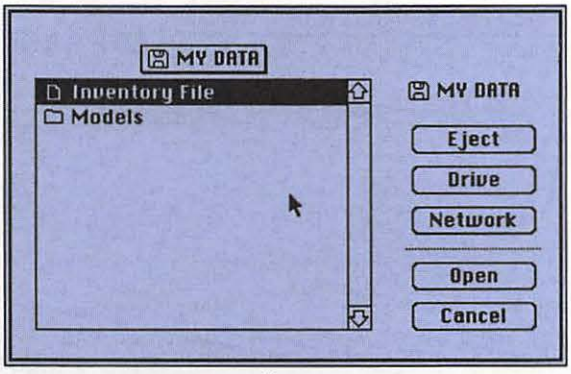


Figure 17.3
The disk MY DATA contains the Inventory File, which is selected here.

Click on the Open button.

Execute the Open command. After a brief pause while the computer reads the database, you will see the database displayed in the last layout that you used.

You should remember that the double-click is often a shortcut to the Open command. You could have double-clicked the mouse on the database name, rather than selecting it and then clicking on the Open button in the dialog box.

17.2 CUSTOMIZING THE LAYOUT SCREENS

It is not uncommon for you to want to have more information on the computer's screen when entering data than is displayed by the FileMaker standard layout screen. For example, you may want more descriptive information or a longer prompt than simply the field name. At other times you may want to enter or update only a selected subset of a database file's fields. You have already performed the latter task by defining multiple layouts for the database. Recall that in the last chapter you added a new record to the file using the third layout. This layout did not include the field called "The Item," which is the picture of the item. You should have discovered that you can return to the record using a different layout and add the missing information.

In this chapter you will make a new layout for this file. The layout will include graphics, text, and modifications of the way the data is displayed on the screen.

What To Do	*Why You Are Doing It*
⌘L	Activate the Layout mode.
Drag the slide next to the book to the top.	Select Layout number 1. This is the layout that was created when you first created this database.

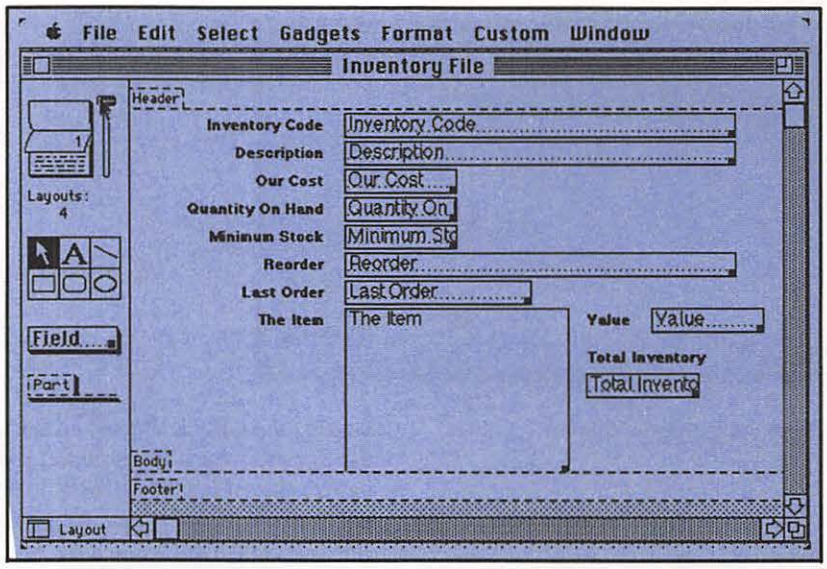


Figure 17.4
This layout will be used as the basis for a new layout.

Pull down the Edit menu, select Duplicate Layout and release the mouse button.	Make a copy of the default layout. Your file now has five layouts. When the duplicate process is complete, the new layout, number five, will be selected.
Click on the label Inventory Code.	Select the label for the first field.
⌘X	Use the Cut command to delete this text. Before you begin placing text, you are going to change the attributes of the font.
Pull down the Format menu and select the FontSize command.	When you select this command, a list of the available font sizes will be displayed to the right of the menu.

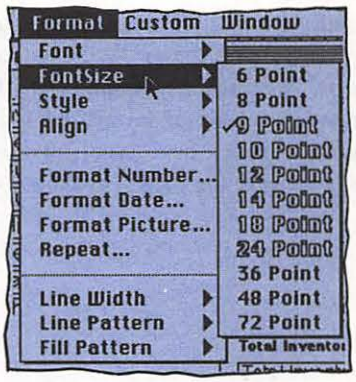


Figure 17.5
The FontSize command has been selected, and the list of available font sizes is displayed on a sub-menu.

Drag the mouse pointer right onto the list of font sizes, and then down to the 12-point option.

You want to make the text you are going to place on the layout into 12-point text.

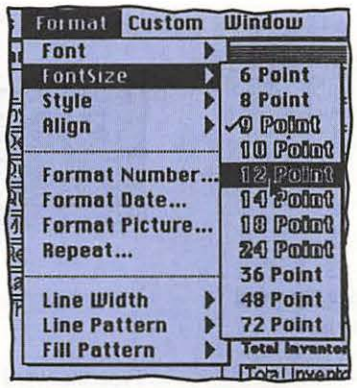


Figure 17.6
The 12-point option has been selected.

Release the mouse button.

Change the font size to 12 point.

Pull down the Format menu and select the Style command, then drag the mouse right to Plain Text.

You do not want the text you will be typing to be in boldface.

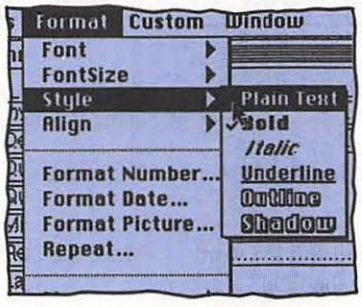


Figure 17.7
The Plain Text option on the Style sub-menu has been selected.

Release the mouse button.

Make the text Plain.

Pull down the Format menu and select the Align command, then drag the mouse right to the Left option.

You are going to change the text alignment from flush right to flush left. Thus, text will type for you in the normal fashion.

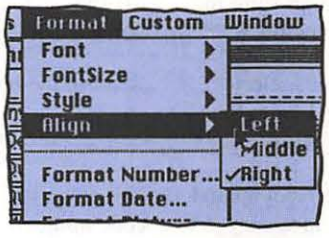
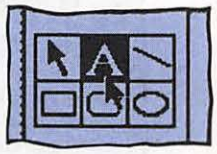


Figure 17.8
The Align Left option on the Align sub-menu has been selected.

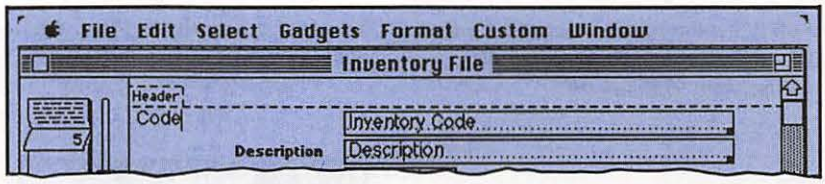
Release the mouse button.	Set the text alignment to left.
Click on the large A at the left of the screen.	This is the text tool. It will let you add text to the layout. The mouse pointer tool will no longer be selected. As you move the mouse over the layout, you will see an I-beam rather than the mouse arrow pointer.

Figure 17.9
The text tool has been selected.



Position the I-beam under the word Header and click the mouse.	You are going to enter text at this location.
Code	Type the word "Code". This text will be placed onto the current file Layout.

Figure 17.10
The label "Code" has been added to the current file layout.



Click on the mouse arrow tool.	You are done with the text, and you want to return to using the mouse pointer.
Place the mouse on the handle of the Inventory Code field.	You are going to adjust the size of this field.
Drag the handle left until just the word Inventory is showing in the field.	Make the field smaller.
Drag the field left and place it next to the label for the field.	Move the placement of the field left so that there is room for more information to the right of the field.
Click on the field label "Description."	Select this label. You are not going to delete it, but you do want to change the text style.
Pull down the Format menu, select FontSize, then select 12 Point from the sub-menu and release the mouse.	The change to the overall text style did not change the existing text. Change the point size for this text to 12 point.
Pull down the Format menu, select Style, then select Plain Text from the sub-menu and release the mouse.	Remove the boldface attribute to this text.
Drag the Description field label up and place it to the right of the Inventory Code field.	You are going to place the description to the right of the code number.
Drag the Description field up and place it to the right of the Description label.	Place the field next to the label on the top of the layout.



Figure 17.11
The first line of the layout has been completed.

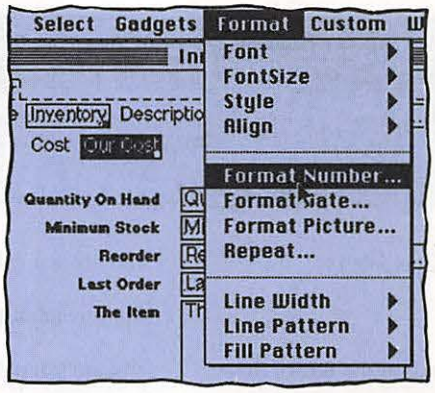
Select the Our Cost label.	You are going to delete this label.
⌘X	Cut this label from the layout.
Select the text tool at the left of the layout.	You are going to enter new text.
Pull down the Format menu, select FontSize, then select 12 Point from the sub-menu and release the mouse.	Change the point size for the text you are about to enter to 12 point.
Pull down the Format menu, select Style, then select Plain Text from the sub-menu and release the mouse.	Remove the boldface attribute to this text.
Pull down the Format menu, select Align, then select Left from the sub-menu and release the mouse.	You want the text left aligned as it is entered.
Click the I-beam under the Inventory Code field.	You are going to place this text beneath the Inventory Code field.
Cost	Type the word "Cost."
Select the mouse pointer tool at the left of the layout.	You are done typing this text.
Drag the handle of the Our Cost field left so only Our Cost is displayed.	Make the Our Cost field smaller.
Drag the Our Cost field up and left, placing it next to the Cost label.	Position this field on the layout.
Click on the Our Cost field so it is selected.	You are going to change the formatting of the field.



Figure 17.12
The Our Cost field has been selected so that a formatting change can be made to it.

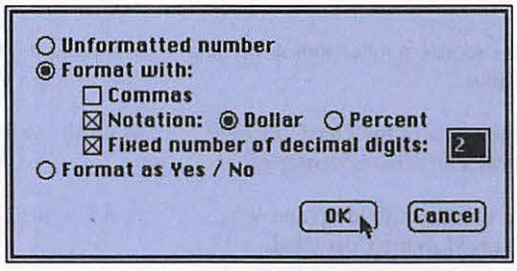
Pull down the Format menu, select Align, then select Right from the sub-menu and release the mouse button.	Change the formatting of the number to be right aligned in the field.
Pull down the Format menu and select Format Number.	You are going to change how the number is displayed, which is different from whether it is displayed at the left or right of the field (Figure 17.13 on the next page).

Figure 17.13
The Format Number command has been selected on the Format menu.



Release the mouse button.	Execute the command. You will now see the Format Number dialog box.
Click on the "Format with" button.	Change the formatting from none to a formatting option.
Click on the check box in front of Notation.	You want a dollar sign to appear in front of the number, since this is a dollar value. The Dollar button should already be selected.
Click on the check box in front of Fixed number of decimal digits.	You want all the values entered into this field to always display two digits to the right of the decimal point, even if the numbers are zeros. With these formatting changes, if you enter a 2 into this field, the value will be displayed as $2.00.

Figure 17.14
The completed Format Number dialog box.



Click on the OK button.	You are done formatting this number.
Select the Quantity On Hand label.	This is the next item you are going to change.
⌘X	Delete this label from the Layout with the Cut command.
Click on the text tool.	You are going to add new text to the layout.
Pull down the Format menu, select FontSize, then select 12 Point from the sub-menu and release the mouse.	Change the point size for the following text to 12 point.
Pull down the Format menu, select Style, then select Plain Text from the sub-menu and release the mouse.	Remove the boldface attribute to this text.
Pull down the Format menu, select Align, then select Left from the sub-menu and release the mouse.	You want the text left aligned as it is entered.

Click the I-beam to the right of the Our Cost field.	You are going to place the text next to the Our Cost field.
Number In Stock	Enter the text "Number In Stock" to be the label for the field on this layout.
Click on the mouse arrow pointer tool.	You are going to work with the mouse pointer tool.
Drag the Quantity On Hand field up and to the right of the label you just entered.	Position the field next to the new label.
Select the Minimum Stock label.	You are going to change this label.
⌘X	Delete this label from the Layout with the Cut command.
Click on the text tool.	You are going to replace the label with new text.
Pull down the Format menu, select FontSize, then select 12 Point from the sub-menu and release the mouse.	Change the point size for the following text to 12 point.
Pull down the Format menu, select Style, then select Plain Text from the sub-menu and release the mouse.	Remove the boldface attribute to this text.
Pull down the Format menu, select Align, then select Left from the sub-menu and release the mouse.	You want the text left aligned as it is entered.
Click the I-beam below the text "Number in Stock".	You are going to position this field beneath the Quantity On Hand field.
Minimum Needed On Hand	Enter the label for this field.
Click on the Mouse Arrow tool.	You are going to use the mouse to drag a field.
Drag the Minimum Stock field up and to the right of the label you just entered.	Position the field next to the new label. Your screen should match Figure 17.15.

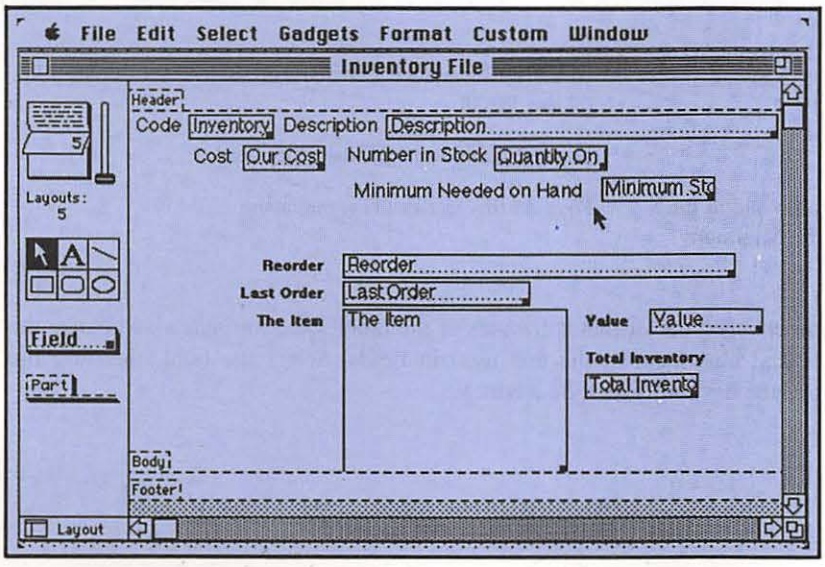
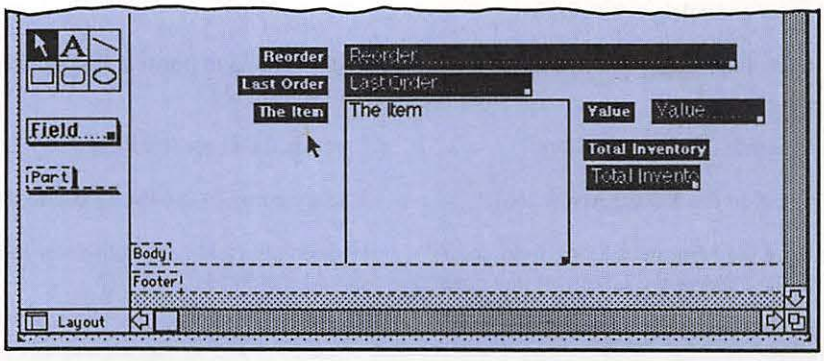


Figure 17.15
Your screen should appear similar to this figure.

Hold down the [SHIFT] key.	You are going to select several items. By holding down the shift key, you will be able to click on more than one item on the layout without losing prior selections. When you hold down the shift key and click the mouse on items, you are said to be "Shift-clicking" on the item.
Click on the Reorder field.	Select the Reorder field.
Click on the Reorder field label.	Select the field's label.
Click on the Last Order field.	Select the Last Order field.
Click on the Last Order field label.	Select the field's label.
Click on the Value field.	Select the Value field.
Click on the Value field label.	Select the field's label.
Click on the Total Inventory field.	Select the Total Inventory field.
Click on the Total Inventory field label.	Select the field's label.
Click on the The Item field label.	Select the label for the The Item field. Do NOT select the field itself.
Release the [SHIFT] key.	You are done selecting fields.

Figure 17.16
You should have selected all of these items on the layout.



⌘X	Cut all of the selected fields. You do not want them used on this layout.
Select The Item field.	You are going to re-position this field.
Drag the selected field up and to the right so it is beneath the Minimum Stock field.	Position this last field on the layout.

In this section you changed the display attributes of the label text. You may also change the font, point size, style and alignment of the text used in fields. Select the field, then use the Format menu to change the desired type style attribute.

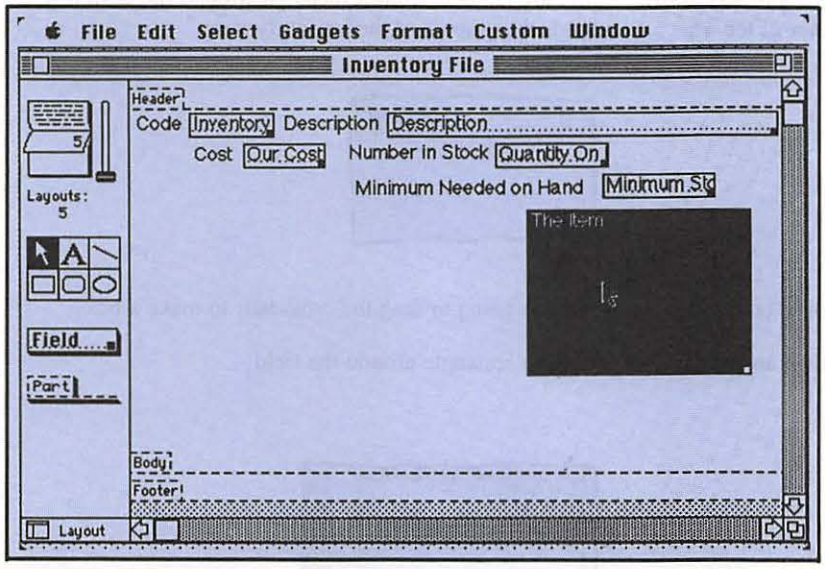


Figure 17.17
Your Macintosh's screen should look similar to this figure.

17.3 ADDING GRAPHICS TO THE LAYOUT

You have now seen how to rearrange a layout and how to change the labels that are placed by the fields. You may use the text tool to place any type of text on the layout. You are not restricted to placing labels for the fields.

In addition to the text tool that you used in the last section, there are four graphic tools available: the line, rectangle, rounded rectangle and oval. One potential problem that people may have is locating fields on the screen. You have seen that the field outlines are hidden unless you are in a data entry mode. In this section you will use the graphic tools to highlight the locations of the fields.

What To Do	*Why You Are Doing It*
Click on the rectangle tool.	You are going to start by drawing rectangles around the fields.

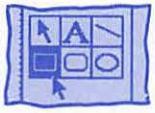


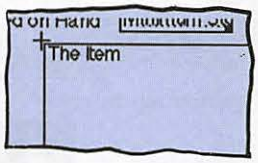
Figure 17.18
The rectangle tool has been selected.

As you move the mouse pointer onto the layout area, the mouse will turn into a cross hair.

Position the cross hair above and to the left of the top left corner of the The Item field.

You are going to draw a rectangle around the field that holds the graphic of the inventory item.

Figure 17.19
Note the location of the cross hair near the The Item field.



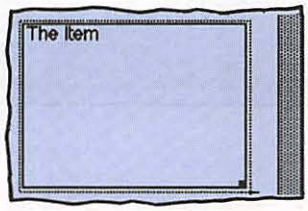
Press and hold the mouse button.

You are going to drag the cross hair to make a box.

Drag the cross hair down and to the right.

Make a rectangle around the field.

Figure 17.20
The cross hair has been dragged over the field, but the mouse button has not yet been released. The dotted line shows the outline of the rectangle you are drawing.

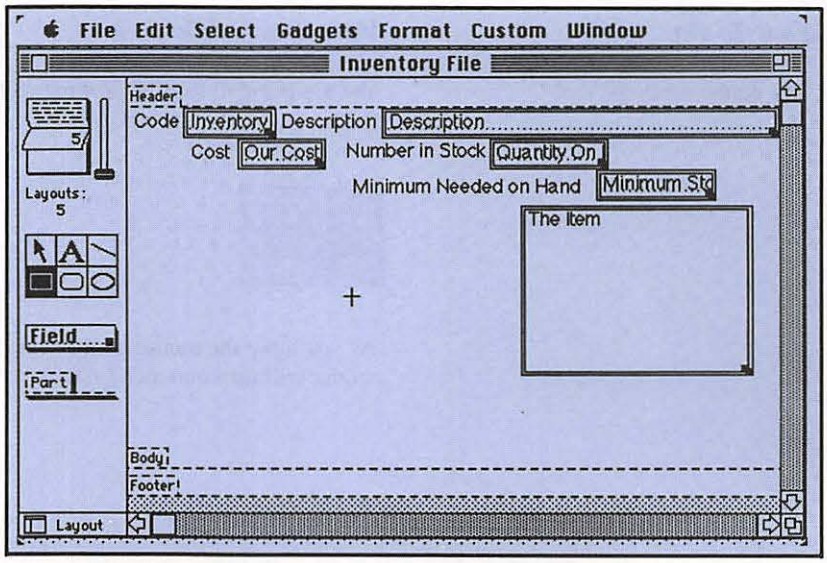


Release the mouse button.

Complete the rectangle. Note that you now have a double line around the field. The inner line represents the boundaries of the field, while the outer line is the rectangle you just drew. Both boxes have a handle with which you can change the item's size and shape.

Use this procedure to draw rectangles around all the fields on the data entry form. When you are done, your layout should appear similar to Figure 17.21. Note the double lines around each field. The inner lines represents the boundaries of the fields, while the outer lines are the rectangles.

Figure 17.21
The rectangles have been placed around all the fields.



⌘B — Return to the Browse mode.

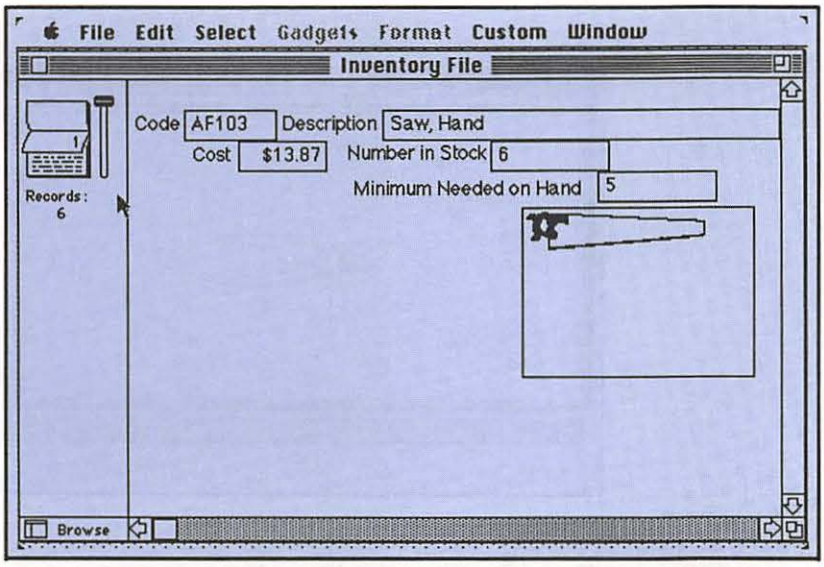


Figure 17.22
When you first return to the Browse mode you will see a single outline for each field. This is the rectangle that you have created around them.

Click the mouse pointer inside one of the fields. — Activate the data entry mode. Note that the double line around each field returns.

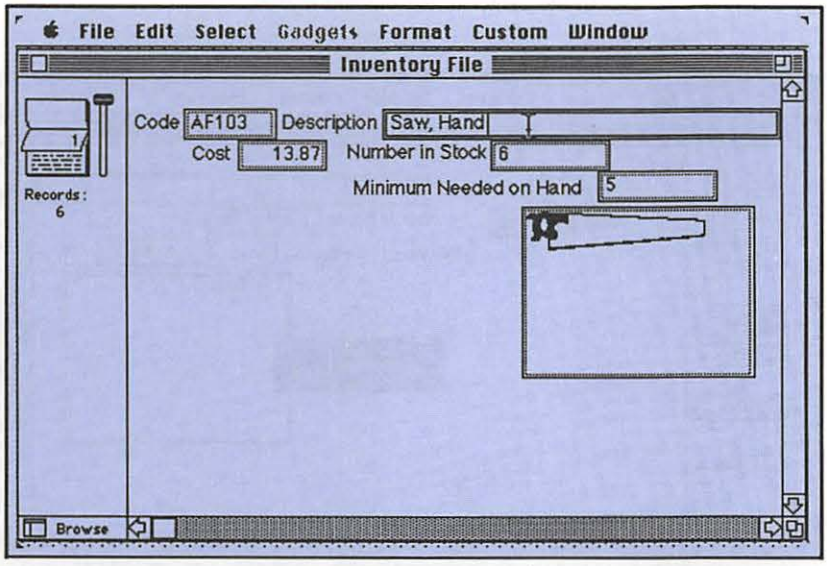


Figure 17.23
FileMaker is in data entry mode, and the fields are now outlined and displayed inside the rectangles you created.

If you are careful, you can place the rectangles directly on top of the field outlines. When you do this you will not see the double lines when you are using data entry mode.

⌘L — Return to the Layout mode. You are now going to add a graphic to the layout.

Pull down the Apple menu, select the Scrapbook and release the mouse button.	Activate the scrapbook. Use the scroll bar to locate the picture of the pliers (Figure 17.24).

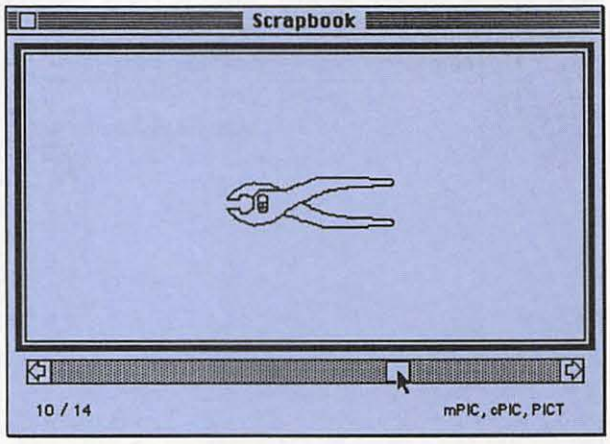


Figure 17.24
The pliers has been located in the Scrapbook.

⌘C	Copy the picture to the clipboard.
Click on the Scrapbook close box.	Put away the scrapbook file.
⌘V	Paste the picture onto the layout. The graphic will appear in the center of the current layout.

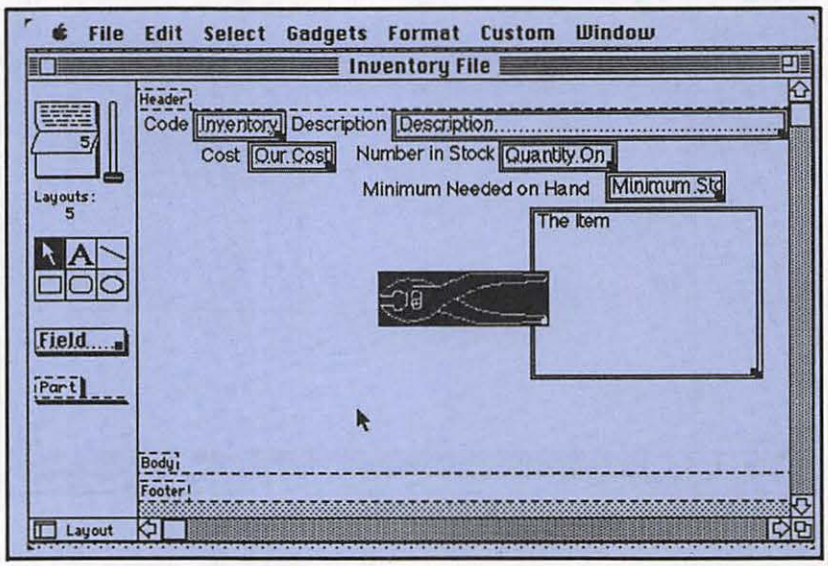


Figure 17.25
The graphic of the pliers has been pasted onto the current layout.

Use the mouse pointer to drag the graphic left to the center of the white space.	Place the graphic in the center of the unoccupied space on the layout.

Click on the text tool at the left of the layout.	You want to add some text, as well as the graphic, to the layout.
Pull down the Format menu, select the FontSize option, then a size of 18 point.	You want to make the lettering large.
Pull down the Format menu, select the Style option, then the Outline option.	You want the text to be outlined.
Click the mouse pointer above the graphic.	Place the beginning of the text you want to type.
J-M-R HARDWARE	Type this text.
Click on the mouse pointer tool.	You are done typing text. Use the mouse pointer to drag the text you have entered and position it above the graphic of the pliers. The layout you have created so far should appear similar to Figure 17.26.

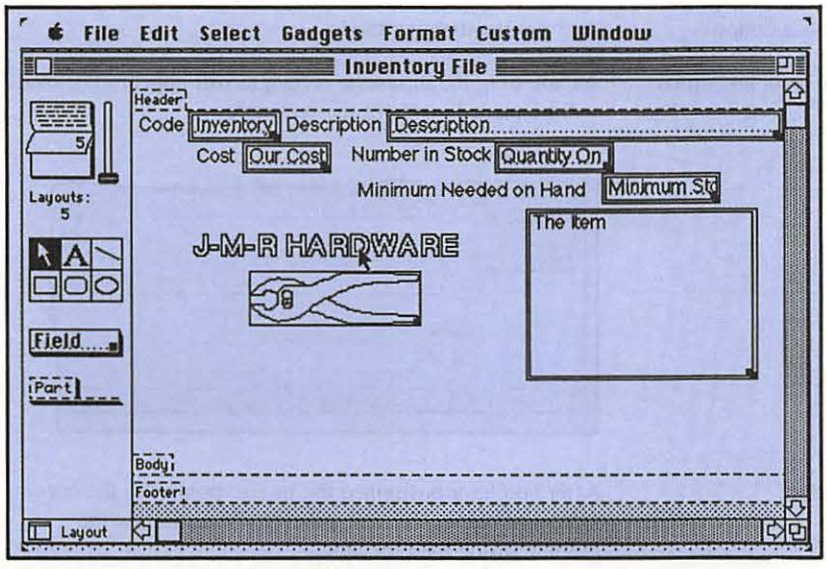
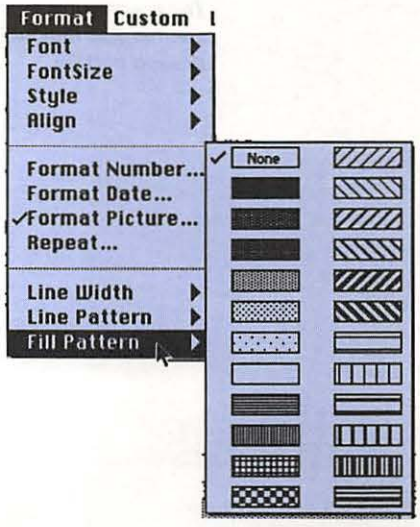


Figure 17.26
The current layout.

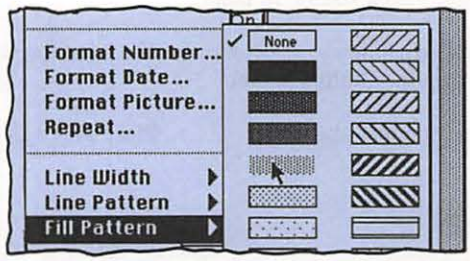
Click on the oval tool.	You are going to add an oval to the layout.
Pull down the Format menu and drag the mouse down to Fill pattern.	The Fill patterns will appear to the right of the menu. These are the patterns available to "color in" the inside of objects, such as rectangles and ovals. The check mark is next to the None option, which is why the rectangles you placed around the field entry areas are transparent. You may apply a fill pattern to an object after it is created by selecting the object, then changing the fill pattern. Right now you are setting the fill pattern before creating the graphic object.

Figure 17.27
The fill patterns you may select from for "coloring in" graphic objects.



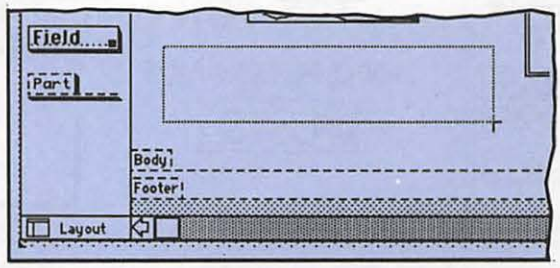
Drag the mouse right to the patterns, then down to the fifth pattern in the left column.	You want to fill the oval with this pattern.

Figure 17.28
The fifth pattern is being selected.



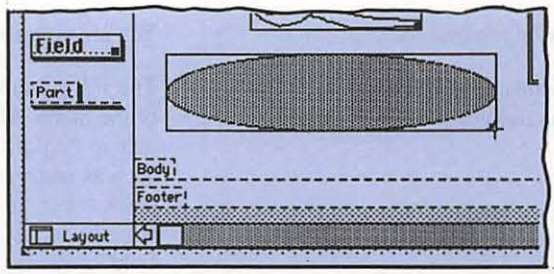
Release the mouse button.	Select this pattern for filling graphic objects.
Position the mouse pointer below and to the left of the graphic of the pliers.	You are going to begin drawing the oval at this point.
Press and hold the mouse button.	Activate the drawing mode.
Drag the mouse to the right and down.	As you drag the mouse, a rectangle will appear. The oval will be placed inside of the rectangle.

Figure 17.29
As you draw a graphic object, you will see a rectangle. The object will be drawn inside the rectangle.



Release the mouse button.	After you have positioned the mouse pointer to the bottom right corner, releasing the mouse will draw the graphic inside the rectangle.

Figure 17.30
The graphic has been created and filled with the desired pattern.



If you do not like the position or size of the object you have created, you may click on the mouse pointer arrow tool, and use it to move the object, or to grab the object's handle to change its shape. You may also change the fill pattern of an existing object by selecting it, then selecting a new fill pattern using the Format menu.

Click on the text tool.	The text tool is the large letter A in the tools box. You are going to add more text to the layout.
Pull down the Format menu, select the FontSize option, then select 24 point from the FontSize sub-menu.	You want to make the text you are about to type 24 point.
Pull down the Format menu, select the Style option, then select Bold from the Style sub-menu.	You want the text to be boldfaced.
Pull down the Format menu, select the Style option, then select Outline from the Style sub-menu.	In addition to boldfaced, you want the text you are going to type to be outlined.
Click the I-beam cursor below the oval you have created.	You are going to type the text below the oval.
J-M-R	Type this text.
Click on the Mouse Pointer tool.	You are going to move this text with the mouse pointer tool.
Click on the text you just typed.	Select the text.



Figure 17.31
The text has been selected using the mouse pointer tool.

Drag the text up and position it in the center of the oval.	You want the text to be placed in a location other than the one where you originally typed it.
Click the mouse pointer outside the oval.	You want to de-select the text.

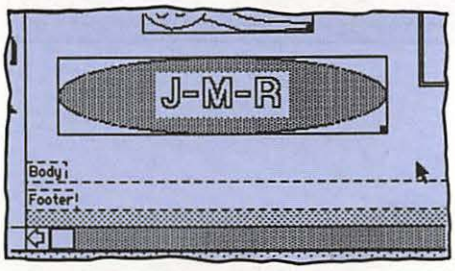


Figure 17.32
The completed graphic.

	You may add other graphic items to layouts when appropriate, or design on-screen forms or output forms.
⌘B	Return to the Browse mode. Use the book or slide bar to look through the database. Note that the graphics you have added (the rectangles around the fields, the pliers and the text) do not change as you go from one record to the next.
⌘N	You want to add a new record to the database using the current layout. You should be adding record seven.

AB101 [TAB] Pipe Wrench [TAB] 8.62 [TAB] 6 [TAB] 3 [TAB]	Enter the text data for the seventh inventory item, the pipe wrench.
Pull down the Apple menu, select the Scrapbook and release the mouse.	Activate the Scrapbook. You need to get the picture of the pipe wrench for this record. Locate the picture of the pipe wrench using the scrapbook's scroll bar.
⌘C	Copy the picture to the clipboard.
Click on the scrapbook's close box.	Put away the scrapbook.
Click on the picture field.	Recall that the data entry mode is terminated when you activate the scrapbook. Click on the destination field at this time to reactivate the data entry mode.
⌘V	Paste the picture of the pipe wrench into the field.

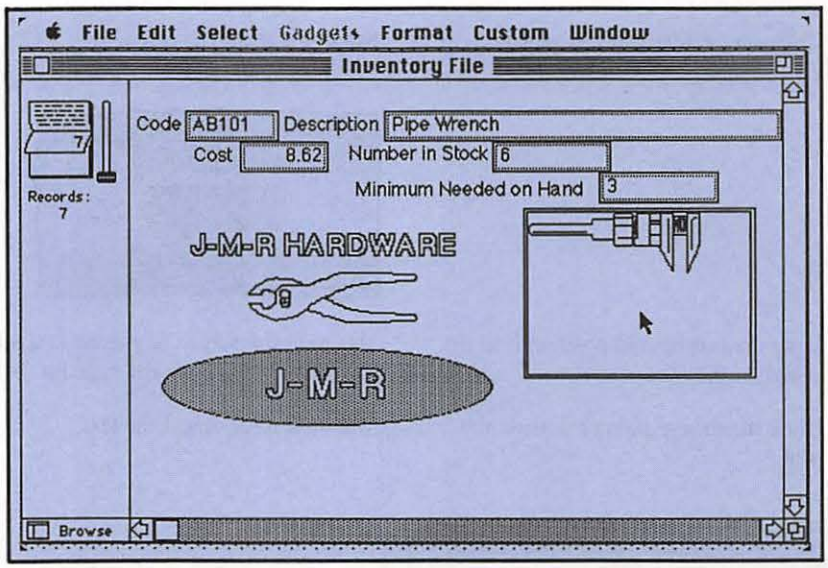


Figure 17.33
The completed record.

17.4 CUSTOMIZING A LAYOUT FOR A REPORT

In addition to being able to customize a layout for an input or browse display, you may customize a layout for output purposes. Here you will create a layout that will be used to list the items that need to be re-ordered.

What To Do	*Why You Are Doing It*
⌘L	Return to the Layout mode.
⌘N	It is possible to modify an existing layout, but this time you want to create a new layout. The New Layout command may also be found on the Edit menu. You will see the first Layout design options dialog box.
Click on Columnar report layout.	This will be a columnar report.
Click on the OK button.	After telling FileMaker that you want a columnar report, you must specify the fields to be in the report. The Field selection dialog box will appear.
Click on Inventory Code in the Field List box.	This will be the first field you want to have appear in the report.
Click on the Move button.	Place the field into the Field Order list.
Click on the Description field in the Field List box.	This is the second field you want on the report.
Click on the Move button.	Place the field into the Field Order list.
Click on the Our Cost field in the Field List box.	The third field for the report.
Click on the Move button.	Place the field into the Field Order list.
Click on the Quantity On Hand field in the Field List box.	The fourth field for the report.
Click on the Move button.	Place the field into the Field Order list.
Click on the Last Order field in the Field List box.	The fifth field for the report.
Click on the Move button.	Place the field into the Field Order list.

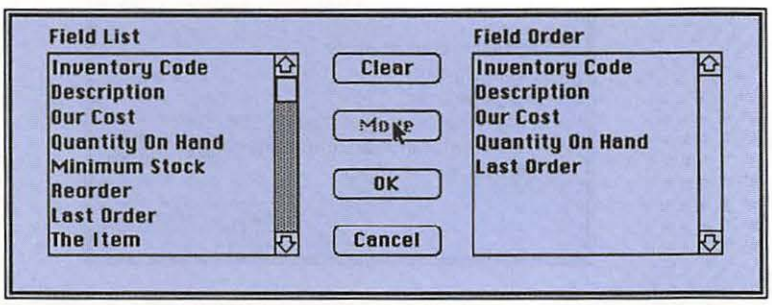
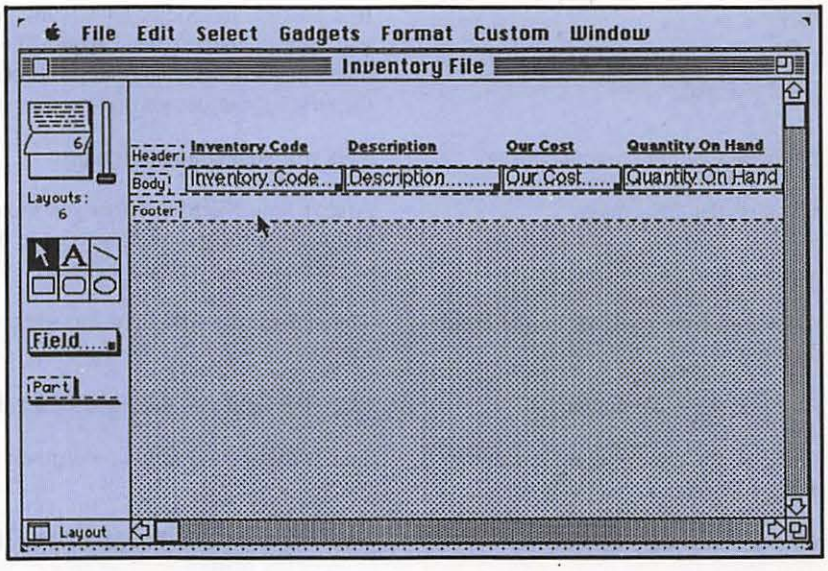


Figure 17.34
Your Field Selection dialog box should appear similar to the one shown here.

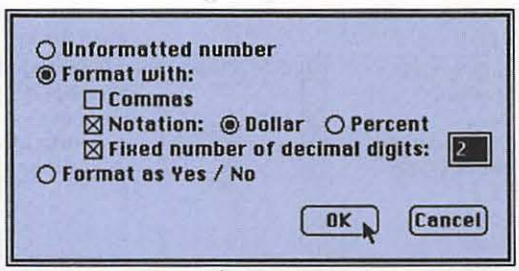
Click on the OK button.	You are done selecting fields. Layout number six will be created.

Figure 17.35
The sixth layout has now been created.



Click on the Our Cost field.	You are going to change the formatting for this field.
Pull down the Format menu and drag the mouse down to the Format Number option, then release the mouse button.	You want to change how the numbers are displayed in this column of the report. The Number Format dialog box will appear.
Click on the Format With button.	You want formatting to be done.
Click on the Notation check box.	You want dollar signs to be placed in front of the numbers. The Dollar button should already be selected.
Click on the Fixed number of decimal digits check box.	You want two digits to the right of the decimal point. Thus, values such as $2 will appear as $2.00

Figure 17.36
The completed Format dialog box.



Click on the OK button.	
Hold down the [SHIFT] key and click on the Quantity On Hand field.	You are simultaneously going to apply a formatting change to both the Hour Cost and Quantity On Hand fields.

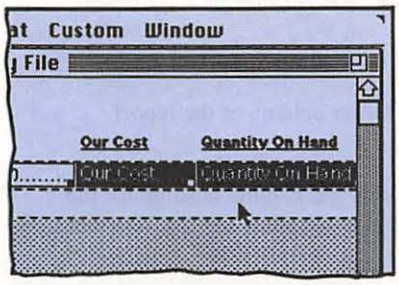


Figure 17.37
Two fields have been selected for formatting.

Pull down the Format menu, drag the mouse down to the Align option, then select the Right option.

You want these numbers to be right justified in their columns.

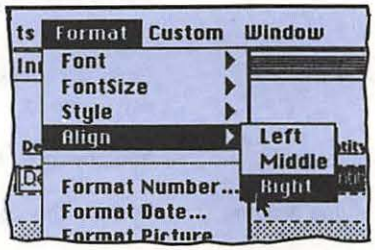


Figure 17.38
The Align Right option has been selected.

Release the mouse button.

Complete the formatting of the columns.

Scroll the window using the scroll bar at the bottom of the layout window.

You need to see the last two fields in their entirety to complete the next task.

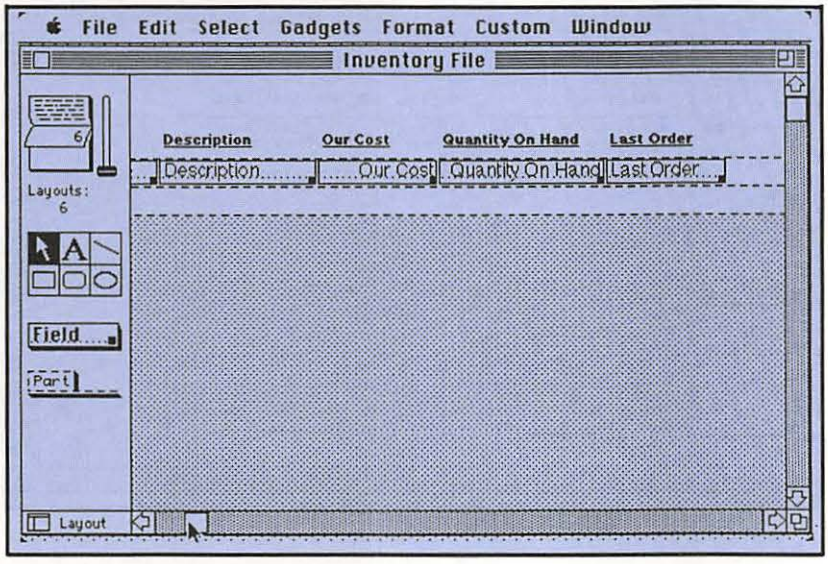
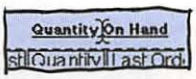


Figure 17.39
The layout window has been scrolled so that the last two columns of the report are visible. You can see that the text in the Hour Cost and Quantity On Hand fields is now right aligned.

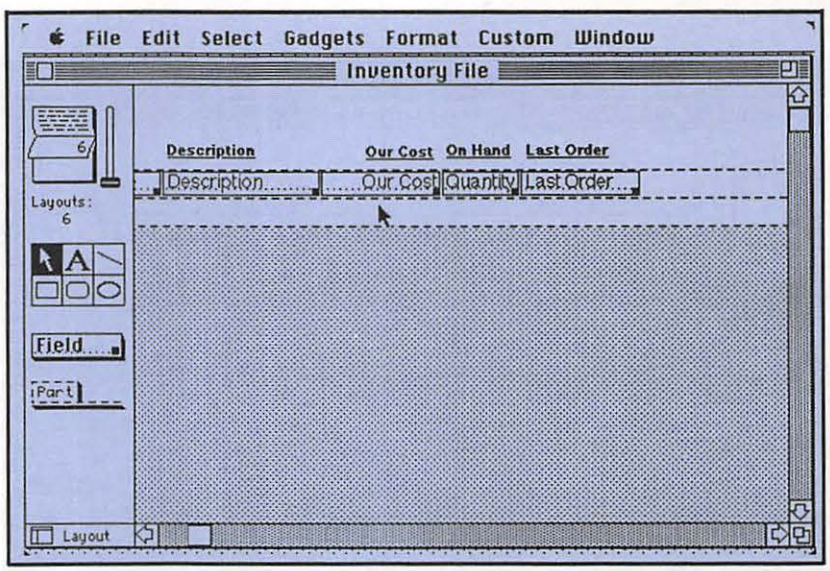
Grab the handle on the Quantity On Hand field and drag it left so only the word Quantity shows.	This field is too wide. You are making it narrower.
Drag the Last Order field left next to the Quantity On Hand field.	Reposition the Last Order column of the report.
Click on the Text tool.	You are going to modify the column heading for the Quantity On Hand field. You must use the Text tool to do this.
Click the I-beam mouse just to the left of the word "On" in the Quantity On Hand field label.	You are going to delete the first word of this column heading.

Figure 17.40
Note the location of the I-beam. Click it here.



[BackSpace] [BackSpace] ...	Press the backspace (or delete) key until the word Quantity is erased.
Click on the Mouse Pointer tool.	You now need to reposition several column headings.
Drag the Last Order column heading left.	Position this column heading over its field.
Drag the Our Cost column heading right.	Position this column heading over the right side of its field.

Figure 17.41
The right side of the layout you are working on.



Scroll the window back to its original position.	You now need to see the left side of the layout.
Position the mouse pointer over the Header box at the left side of the layout.	You are going to change the size of the space reserved for the report header.

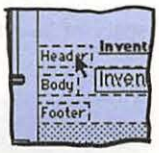


Figure 17.42
Note the location of the mouse pointer.

Press the mouse button, then drag the Header box down to the location of the footer and release the mouse button.

You are adding about half an inch to the header.

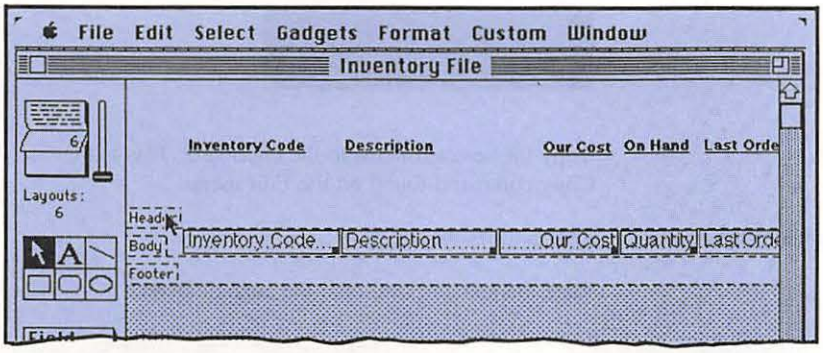


Figure 17.43
The header has been made larger.

Hold down the [SHIFT] key and click the mouse on all the column headers.

You are selecting all the column headers.

Drag the column headers down about one half inch.

Reposition all the column headers, making space for new items above them in the header area.

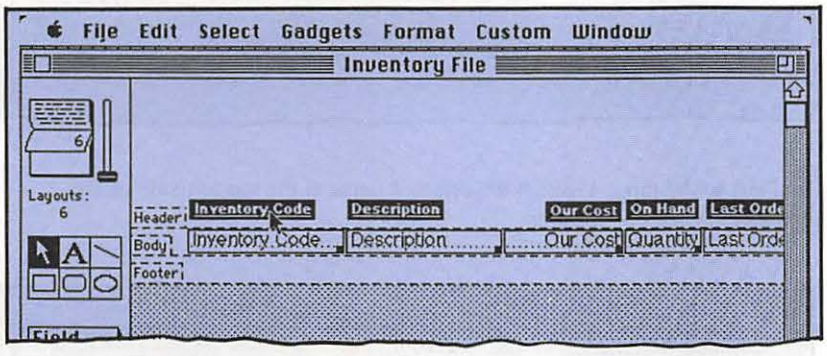


Figure 17.44
There is now room for new items in the header above the column headings.

Click on the top of the book.

Return to Layout 5. You are going to copy some items from this layout.

Click on the "J-M-R" inside the oval.

You are going to copy the text and oval to the header space of layout 6. Start by selecting the text.

Figure 17.45
The J-M-R text has been selected.



[SHIFT]-click on a part of the oval.

Hold down the shift key and click the mouse on part of the oval to simultaneously select it with the text.

Figure 17.46
Both items are now selected.



⌘C

Copy the selected items to the clipboard. This is the Copy command found on the Edit menu.

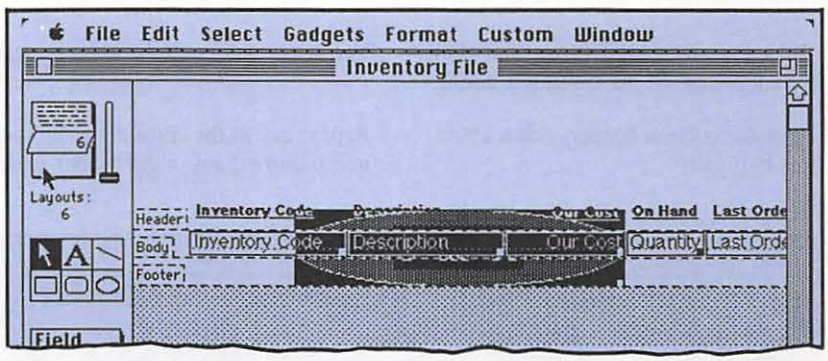
Click on the bottom page of the book.

Return to layout six.

⌘V

Paste the text and oval onto the current layout.

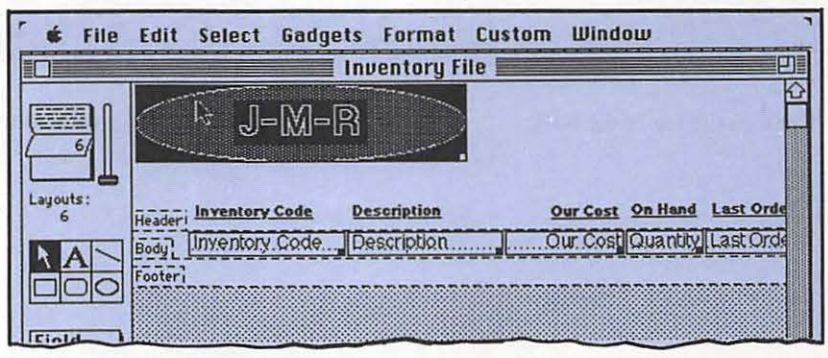
Figure 17.47
The oval and the text are now on the current layout.



Drag the selected oval and text to the top left corner of the header space.

Position the selected items at the top left side of the header.

Figure 17.48
The oval and text have been repositioned.



Click the mouse pointer to the right of the copied graphic.

De-select the "logo" you have just added to this layout. You are next going to make some text formatting changes, and you do not want them to modify the text displayed on the logo.

Click on the Text tool.	You are going to add text to the header.
Pull down the Format menu, select the FontSize option, then select 14 point from the size sub-menu.	You want the text to be in 14 point.
Pull down the Format menu, select the Style option, then select Plain Text from the style sub-menu.	Make sure that you do not have boldface, or other style options chosen.
Click the I-beam to the right of the logo.	Position where you want the text to be placed.
REORDER LIST	Type this text.
Click on the Mouse Pointer tool.	You are done with this layout.
⌘B	Select the Browse mode. All seven records of the database should be displayed at this time.

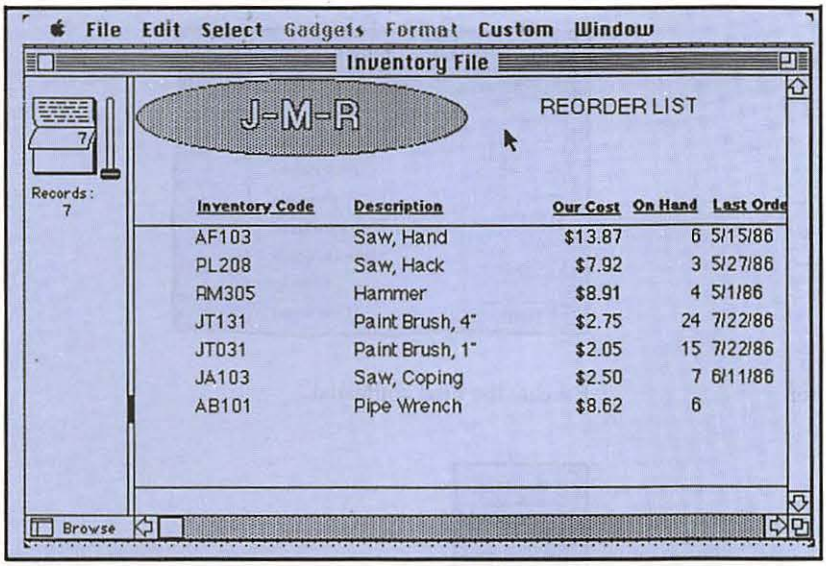


Figure 17.49
The Reorder List as it is currently displayed.

17.5 COMPLETING THE REPORT

You are now faced with a minor problem. You must execute a Find command to have FileMaker select only those records that display REORDER in the Reorder field. Recall that the Find command requires that you enter information into the fields to be used in the command. Reorder is not one of the fields displayed or used in this layout. To have FileMaker select the correct records, you will have to return to a layout that contains the Reorder field, execute the find, and then return to layout 6 to see the results.

What To Do	*Why You Are Doing It*
⌘L	Return to the Layout mode.
Drag the slide control on the slide bar up to the top of the slide bar.	The slide bar is next to the book. It is a fast way to move among the different layouts. You want to select the first layout, which includes the Reorder field.
⌘F	The Find command, found on the Select menu. Note that you do not have to return to the Browse mode to begin the Find command. This happens automatically.
Click on the Reorder field.	You are going to make a selection based on the content of the Reorder field.
R	Enter just the letter "R". If an item is to be reordered, this field will start with an R, otherwise it will start with an O. This Find command will select only those records that contain the word reorder in this field.

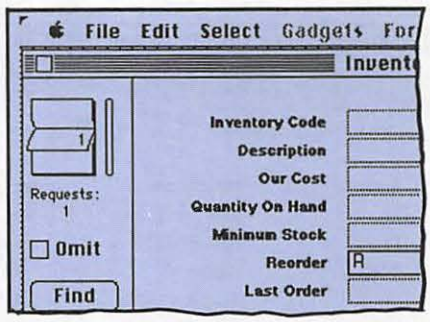


Figure 17.50
The criteria for the Find command has been specified.

Click on the Find button.	Execute the Find command.



Figure 17.51
After the Find executes, four records are selected.

	After the Find command completes, four records will be selected. You are, however, looking at layout 1.
⌘L	Return to the Layout mode.

Drag the slide control on the slide bar down to the bottom of the slide bar.	Return to the sixth layout, the Reorder List.
⌘B	Return to the Browse mode. Since a Find is in effect, only the four active records will be displayed on the Reorder List.

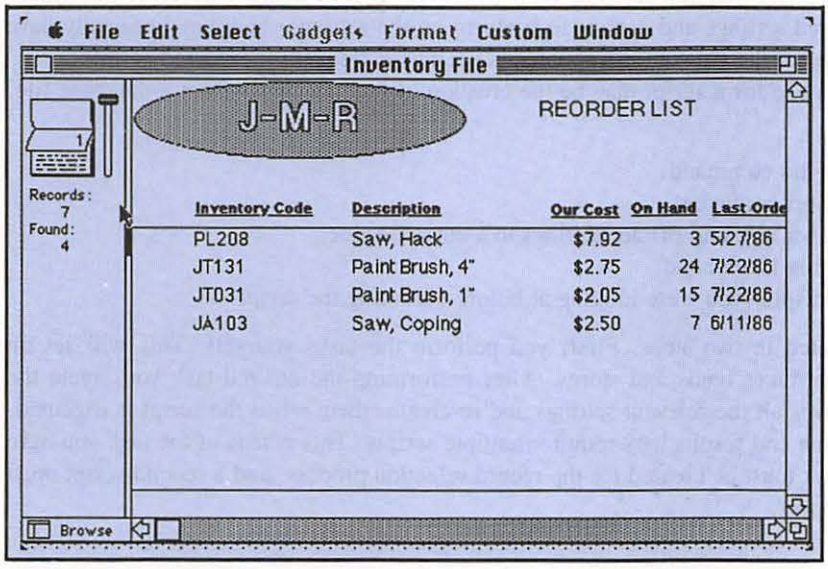


Figure 17.52
There are now only four records shown on the Reorder List.

⌘S	You want to sort the list into Inventory Code order. Inventory Code should already appear in the Sort Order field. If not, click on the Clear button, then Inventory Code in the Field list and finally the Move button.
Click on the Sort button.	Execute the sort and return to the Browse mode.

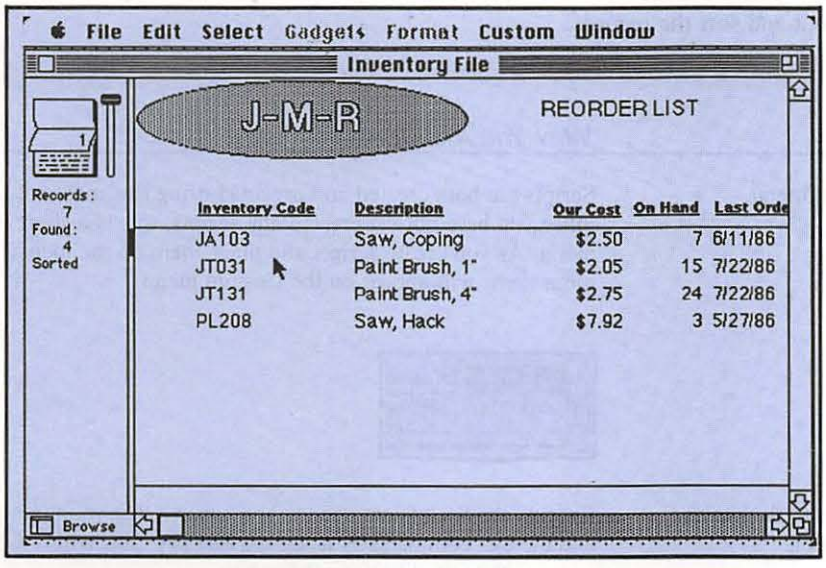


Figure 17.53
The sorted Reorder List.

If you have a printer available, you can print this layout to generate a hardcopy report of the Reorder List.

17.6 SCRIPTING AND THE CUSTOM MENU

It is certainly easy to select the sixth layout to create a Reorder List for the hardware store. However, you must take care to remember to execute the correct Find command before you make the list. If you forget, you will be telling the owner of the store the wrong information.

One way to make sure that you generate the correct report is by using a script. A FileMaker script is a set of stored settings and actions to perform on the settings. You may optionally have the script name added to the Custom menu. This is useful for frequently executed scripts.

An example of a use for a script may be the creation of mailing labels from a database file. The script can:

- re-execute a Find command,
- re-execute a Sort command,
- change the paper size and printer settings to a custom value,
- print the mailing labels, and
- return to the display you were looking at before executing the script.

A script is created in two steps. First, you perform the tasks yourself. This will set up information that FileMaker reads and stores. After performing the desired task you create the script. The script saves all the relevant settings and re-creates them when the script is executed. You will see that some end results may require multiple scripts. This is true of the task you have completed. One script must be created for the record selection process, and a second script must be created for the report.

17.7 CREATING A SCRIPT

You should currently have the sorted Reorder List displayed on the computer's screen. You will create a script to duplicate this report. It will take two scripts to complete. Just as you had to change the layout to perform the selection of records for the reorder list, your scripts will have to perform the same task. After the records have been selected, you will have the script return to the Reorder List layout and sort the records.

What To Do	*Why You Are Doing It*
Pull down the Custom menu.	Scripts are both created and executed using this menu. Since you have not yet created any scripts, this is a short menu. As you create scripts and place them on the menu, more items will appear on the Custom menu.



Figure 17.54
The initial Custom menu.

Drag the mouse down to Scripts and release the mouse button.	Execute the Scripts command. You can see that you may execute this command by using the ⌘H key. You will now see the initial Scripts dialog box.

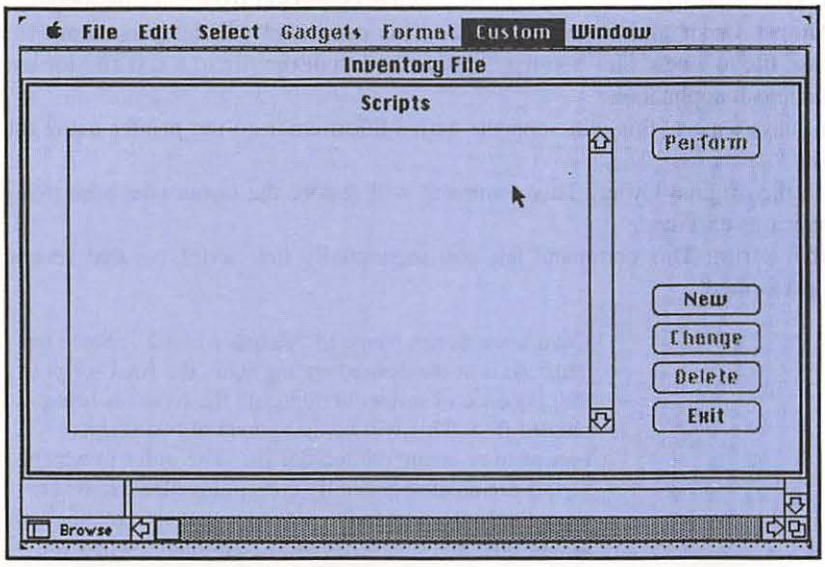


Figure 17.55
The initial Scripts dialog box is empty.

Click on the New button.

You are going to create a new script. You will now see the Script Control dialog.

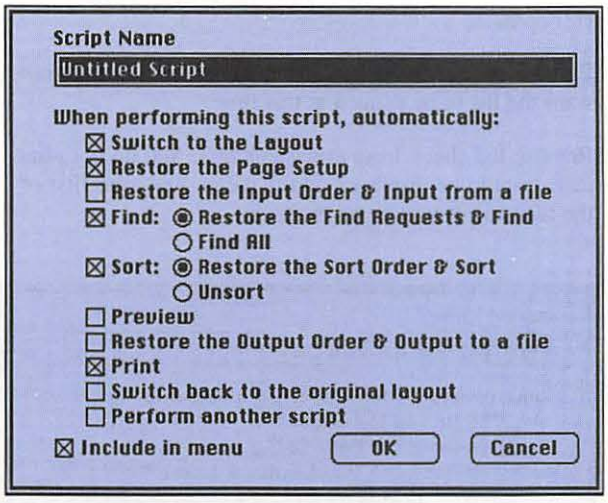


Figure 17.56
The starting Script Control dialog box.

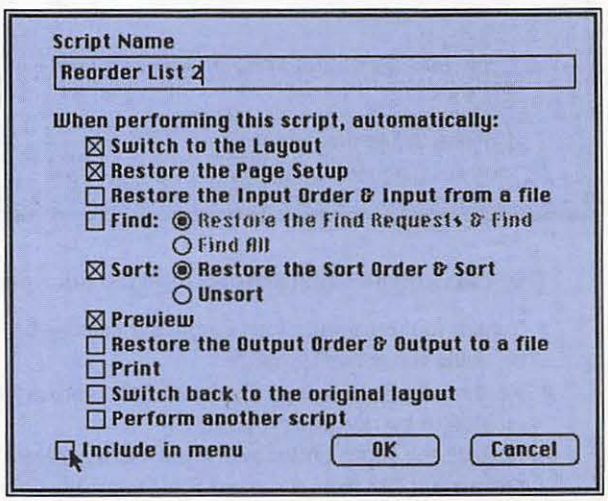
The script control commands perform the following tasks:

- Switch to the Layout: This command causes the layout in use when the script is created to be made the active layout.
- Restore the Page Setup: This command causes any printer setup in use when the script is created to be restored.
- Restore the Input Order and Input from a file: This command is used to input records to the current file from a second FileMaker file. You may also use it to input records into the current file from a text file.
- Find: You may optionally have all the records found by selecting the Find All button, or have the Find that is in effect when the script is created be restored and executed.
- Sort: You may unsort the records, or activate the sort that is in effect when the script is created.

- Preview: This command will activate the Print Preview command from the File menu.
- Restore the Output Order and Output to a file: This command will let you output the current database file to a new file. You may optionally output the file to a text file for use in another Macintosh application.
- Print: As you may suspect, this will send the active information to the printer using the selected layout.
- Switch back to the original layout: This command will restore the layout you were using before the script was executed.
- Perform another script: This command lets you sequentially link scripts so that several tasks may be performed.

Reorder List 2	Change the Script Name to "Reorder List 2". Since the database is at the desired ending state, the final script in the sequence of scripts to duplicate the report is being created first. This will be the second of two scripts needed to re-create the reorder list. The order in which scripts are created generally does not matter. However, since the first script in the sequence you are creating will link to this one, this script must be available when you ultimately create the first one in the sequence.
Click on the Find check box.	Turn off the Find command. The Find will be performed by the first script in the sequence.
Click on the Preview check box.	This check box will cause the Print Preview to be activated.
Click on the Print check box.	Remove the check from the Print check box. You do not want the list to be printed at this time.
Click on the Include in menu check box.	Remove the check from this check box. You do not want this script to be displayed on the menu. Only the first of the two scripts will be on the menu.

Figure 17.57
The completed Reorder List 2 script.



Click on the OK button.	You are through creating this script. You will be returned to the initial Script dialog. Reorder List 2 now appears on the list of scripts.

Click on the Exit button.	Before you create the first script in the sequence you must set it up.
⌘L	You must change the Layout in use.
Drag the slide control up to the first layout.	You are going to use the first layout again. Remember, the slide bar is next to the book at the top left of the file's window.
⌘F	Execute the Find command.
Click on the Reorder field.	You are going to place the selection criterion into this field.
R	Enter an R into the Reorder field.
Click on the Find button.	Execute the Find command. You are re-executing the Find command to re-do the first part of the script. Beneath the book at the left of the window you should now see that four records have been found. If you have trouble with this Find command, remember that it is the same one you performed for the prior section of this text. You may want to look back at that part of the text and at the figures to check your work.
⌘H	You are now ready to create the first script in the sequence. This is the Script command. It is still the only option you can see on the Custom menu if you elect to use the pull down menu at this time.

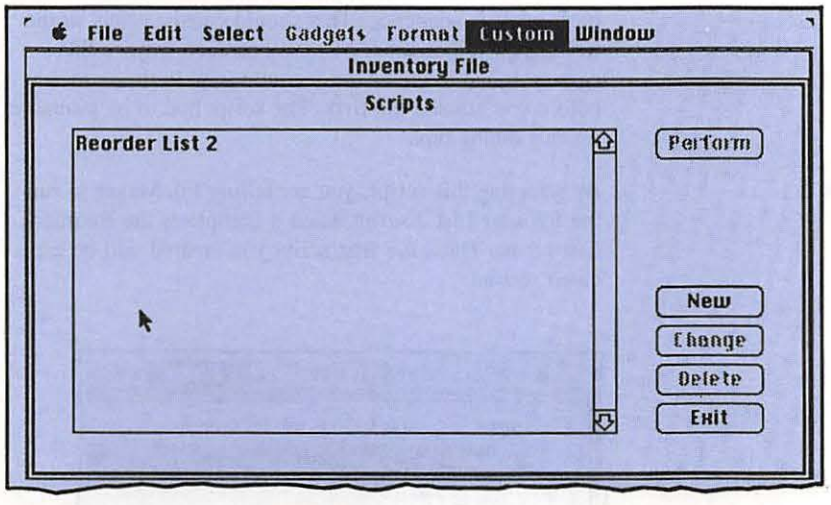


Figure 17.58
The Scripts dialog box shows the Reorder List 2 script.

	The initial script you created, "Reorder List 2", will show in the Scripts lists of the Scripts dialog box.
Click on the New button.	You are going to create a New script.
Reorder List	Enter the Script Name.
Click on the Sort check box.	You do not want this part of the sequence of scripts to perform the sort. You will let the second script perform this task.
Click on the Print check box.	You do not want this script to print the records.

Click on the Perform another script box.

You want to link this script to the second part of the Reorder List scripts.

Leave the Find check box marked. The main purpose of this part of the script is to perform the record selection. Also, leave the Include in the menu box checked. This is the script title that you want to have appear on the Custom menu.

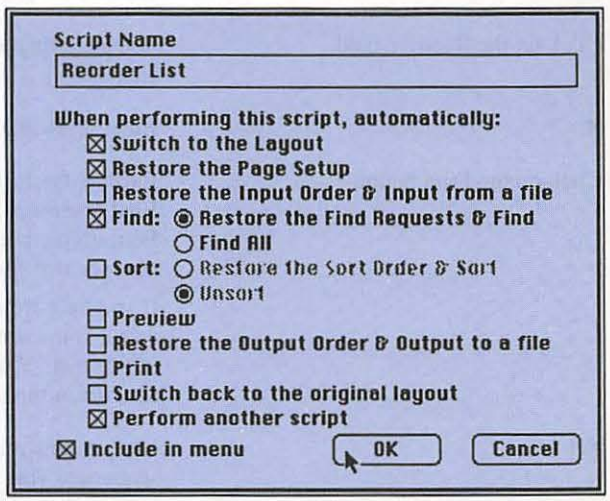


Figure 17.59
The completed Reorder List script.

Click on the OK button.

You are done with this script. You will now see a list of available scripts to select from for the next script to be performed in sequence. This should consist solely of the first script you created. Now you can see why, in this case, you had to create the second script in the sequence before you created the first. The script had to be available for this dialog box.

Click on Reorder List 2.

By selecting this script, you are telling FileMaker to run the Reorder List 2 script when it completes the Reorder List script. Thus, the first script you created will be executed second.

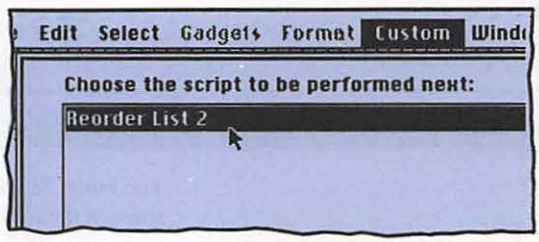


Figure 17.60
Reorder List 2 has been selected as the script to automatically follow the Reorder List script.

Click on the OK button.

You are done selecting scripts.

Click on the Exit button.

You are done creating the scripts. You will be returned to the current browse display.

17.8 EXECUTING A SCRIPT

Scripts may be executed in two ways. If you directed FileMaker to put the script on the Custom menu, you may execute the script by selecting it from the menu. You may also execute a script by using the Scripts command on the Custom menu.

What To Do	*Why You Are Doing It*
⌘G	This is the Find All command found on the Select menu. All the records in the database should now be active.
⌘L	Change to the Layout mode.
Click on the bottom page of the book.	Change the active layout to layout 2.
	You are now going to test the script you have created. To make sure that it performs as you expect, you have changed the status of the database to something other than the starting or ending point of the script.
Pull down the Custom menu.	You want to execute the script. Note that the Custom menu now has the script name "Reorder List" added to it. This script can be executed by using the ⌘1 key. The first nine scripts that you add to the menu are assigned the command keys ⌘1 through ⌘9.



Figure 17.61
The Custom menu now has a new entry.

Drag the mouse down to the Reorder List command and release the mouse button.	Execute the script that you have created.
	After a brief pause, the Print Preview will appear, with the Reorder List report displayed. If you had selected the Print command as a script option, then the reorder list would now be printing.

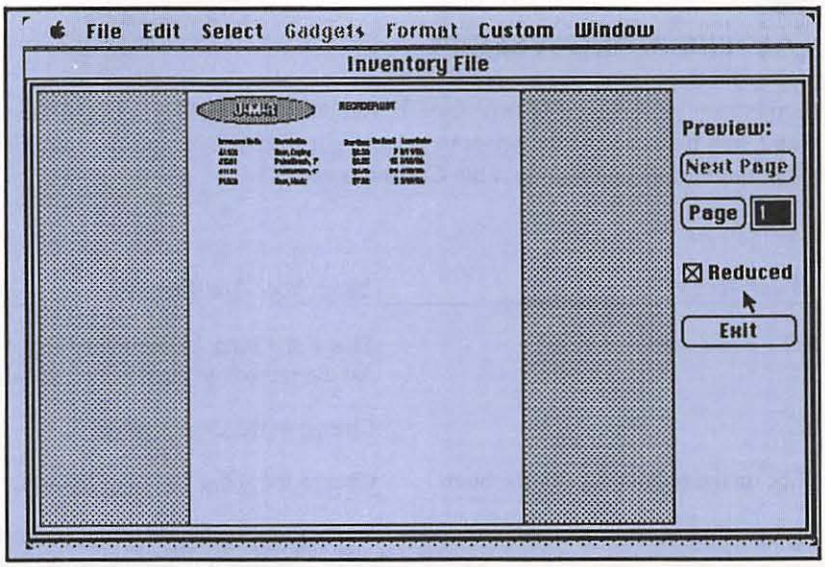


Figure 17.62
The Print Preview screen generated by the script. In this case, the Reduced box has been checked by the user.

Click on the Exit button.	You are done with the Print Preview.
⌘H	Execute the Scripts command. Recall that this command is on the Custom menu. You will now see the Scripts dialog box.
Click on Reorder List.	This is the name of the script you want to execute. When you select this script, the Perform button will become active.

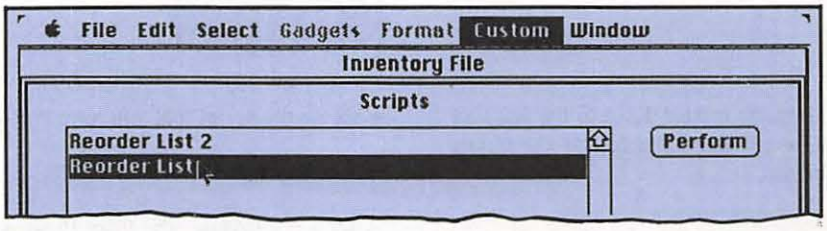


Figure 17.63
The Reorder List script has been selected and the Perform button is now active.

Click on the Perform button.	This is the second method for executing scripts. You may not want to put all your scripts onto the menu. By using the Scripts command, you can execute any script you have created. After a brief pause while the scripts execute, the Print Preview screen will once again be displayed.
Click on the Exit button.	Exit the Print Preview and return to the browse mode.

17.9 EDITING SCRIPTS

There are times when you will want to change a script. You may want to change the sort order, de-activate or activate printing, or change the Find criteria. To do one or more of these tasks you may either delete the script and re-create it, or you may simply edit it.

What To Do	*Why You Are Doing It*
⌘S	You want to change the sort order that this script uses. Before editing the script, you must perform the desired task. Remember, this sets up the information that the script stores for later play-back.
Click on the Clear button.	You are going to completely change the sort order. The Clear button removes all prior sort information.
Click on Our Cost in the Field List.	You want to sort the Reorder List based on the cost field.
Click on the Descending Order button.	Before you place the Our Cost field into the Sort Order list, change the order in which the sort will happen. You want the items listed from most expensive to least expensive.
Click on the Move button.	Place the Our Cost field into the Sort Order list.

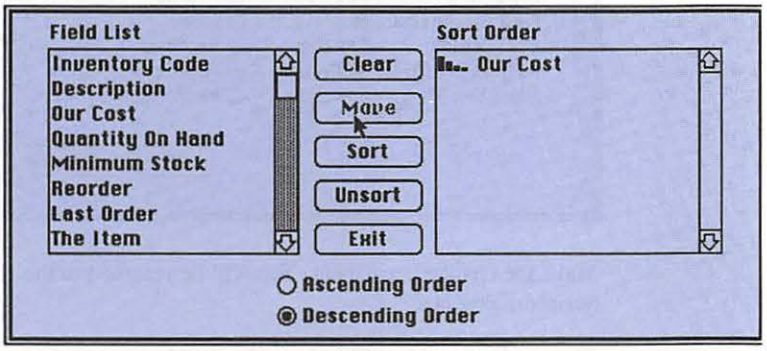


Figure 17.64
The new sort has been defined. Note that the Descending Order button has been selected for this sort.

Click on the Sort button. Execute the sort.	The four records will now be listed in a new order.
⌘H	The Scripts command.
Click on Reorder List 2.	You are going to make a change to the Reorder List 2 script.

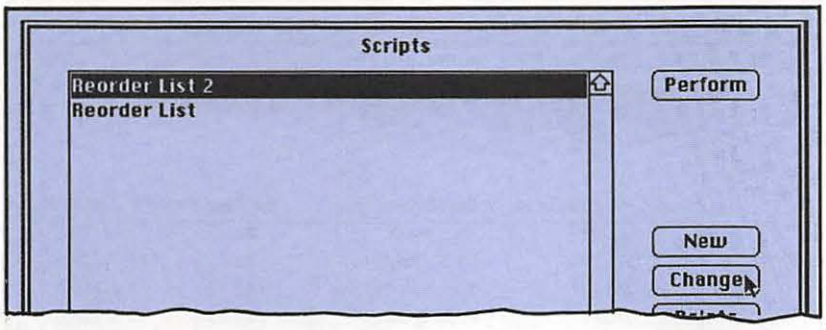


Figure 17.65
The Reorder List 2 script has been selected.

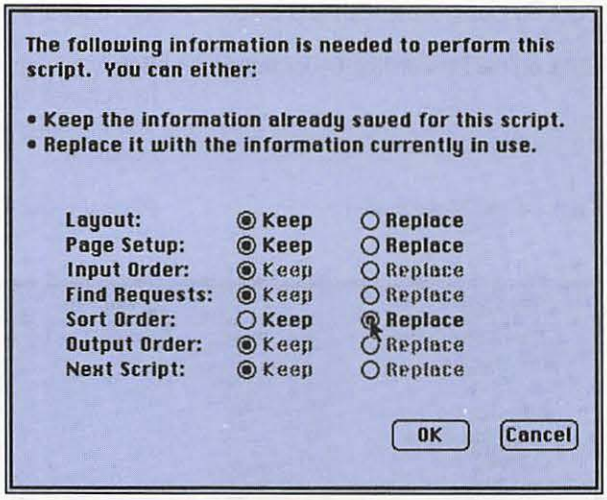
Click on the Change button.	You want to change the script. The script options dialog box will be displayed.
Click on the Continue button.	You do not want to change any of these options (unless you want to activate the Print option). You may, of course, elect to change some of these items in the future.

When you click on the Continue button you will see a new dialog box. This dialog box lets you select which changes you want to implement. To make a change you click on the appropriate Replace button.

Click on the Replace button for Sort Order.

You want to replace the original sort order with the current sort order, descending based on the Our Cost field. All other settings are left unchanged.

Figure 17.66
Make the change in sort order take effect by clicking on the Replace button for the Sort Order option.



Click on the OK button.

Make the change permanent. You will be returned to the Scripts dialog box.

Click on the Exit button.

You are done making changes to the scripts.

⌘1

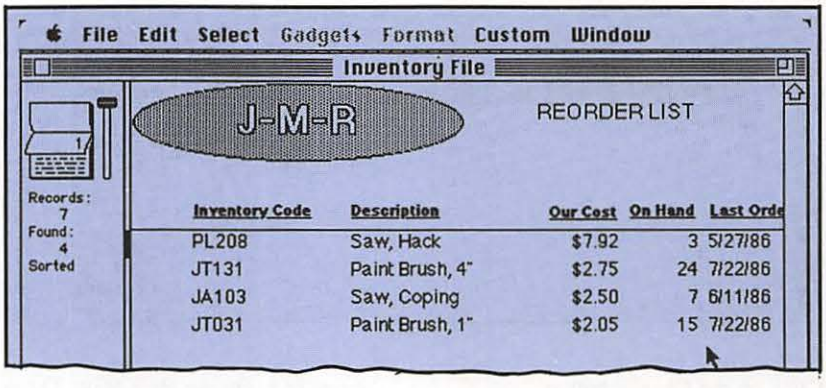
Execute the edited script.

After a brief pause, the Print Preview will be displayed.

Click on the Exit button.

Leave the Print Preview and return to the Browse mode. You can see that the four selected records are sorted in descending order based on the item cost.

Figure 17.67
The Reorder List is now sorted based upon the Our Cost field and in descending order.



⌘Q

Use the Quit command, which may be found on the File menu, to exit FileMaker and return to the Macintosh Finder.

EXERCISES

1. What can you do to find out the names of the fields and their associated data types in a database file if you know only the name of the database?
2. Can the data entry screens you create be used for reports as well as for adding more records to the database?
3. Can the data entry screens you create be used for editing the database file as well as for adding new records to the database?
4. Can a report format be used when selecting a subset of records to be printed, or must all the records of the database be printed with a report?
5. How many times may a report format be used to generate a report before you have to re-create it?
6. Can you use line drawing tools to put boxes on a custom designed data entry screen?
7. Is there a limit to the amount of text that you put on a custom designed data entry screen?
8. Create a script to print mailing labels from the database you created and worked with in the exercises at the end of Chapters 15 and 16.
9. Design a data entry form for the mailing list database.
10. Use your mailing list data entry form to change the address for May Smith to 417 E. 32 St.
11. Use your mailing list data entry form to change the zip code for John Doe to 90212.
12. Modify the script you created in Exercise 8 to print the mailing labels in zip code order. How did you accomplish this task?
13. Modify the script you created in Exercise 8 to print the mailing labels in last name order. How did you accomplish this task?
14. Create a report of the vendor file you created in the exercises at the end of Chapters 15 and 16 listing the company name field, the name of the contact and the vendor code.
15. Create a report of the vendor file to list first the vendor code, then the company and address. Report the vendor file using this form in vendor code order.
16. Create a data entry form for the vendor file.

CHAPTER

BUSINESS GRAPHICS CONCEPTS

18

CHAPTER OBJECTIVES:

Upon completion of this chapter, the student will:

- **Explain the difference between business graphics and freeform graphics.**
- **Explain the meaning of freeform graphic art, bar charts, line charts, pie charts, and text graphics.**
- **Explain why graphics are useful in a business environment.**
- **Explain the different computer graphic display methods presently available, and when to use the various types.**
- **Explain what slideshow computer graphics are.**

18.1 WHAT IS A GRAPHIC?

You can see examples of graphics everywhere you look around you. For example, the station identifiers on TV shows are graphics, as are the illustrations in magazines and the comic strips in newspapers. Most of the graphics you see are either drawings, photographs, or some similar type of picture (Figure 18.1) and are called freeform art or commercial graphics. They are intended to convey a message about a specific product or idea, and are often intended to sell that product or idea.

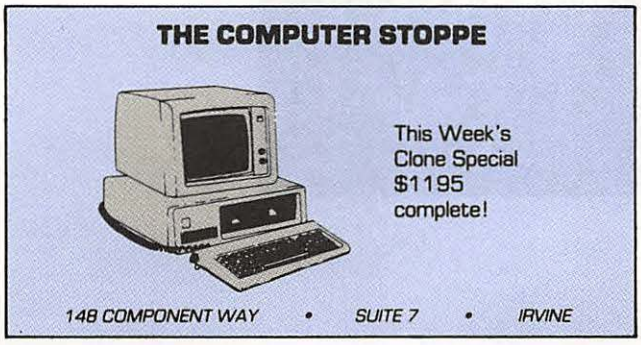


Figure 18.1
You might see this type of advertisement—a graphic—in a magazine or newspaper.

Business graphics are also intended to convey information. The purpose of a business graphic, however, is to convey relationships between or among kinds of numeric information.

For instance, a pie chart (Figure 18.2) shows the relative proportions of items making up a whole. Line charts (Figure 18.3) show trends. A bar chart can show trends or relationships among values (Figure 18.4). In all these cases, however, as different as the graphs may be, the purpose is to convey to the viewer information about numbers. In short, commercial graphics sell ideas or present information, while business graphics present numbers so that large amounts of information may be taken in at a single glance and those numbers can be compared.

Figure 18.2
A pie chart.

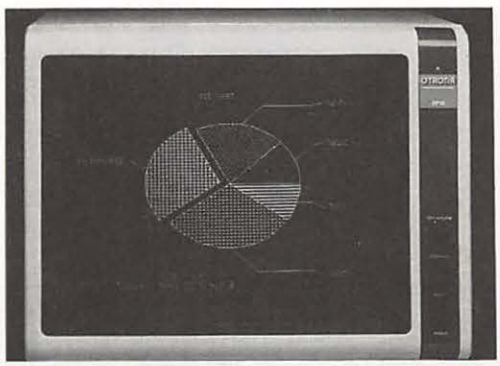


Figure 18.3
A line chart.

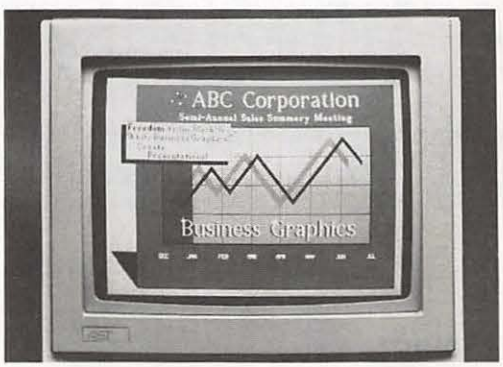
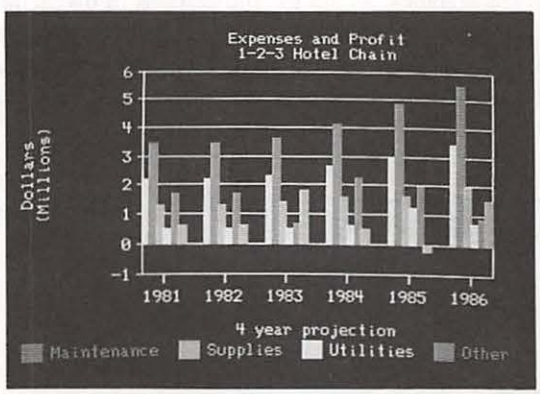


Figure 18.4
A bar or column chart.



18.2 WHAT ARE THE BASIC BUSINESS GRAPHICS?

Besides the pie chart, the line chart, and the bar chart some other types of business graphics you may want to employ include the X-Y or scatter graph (Figure 18.5) and the area fill graph (Figure 18.6).

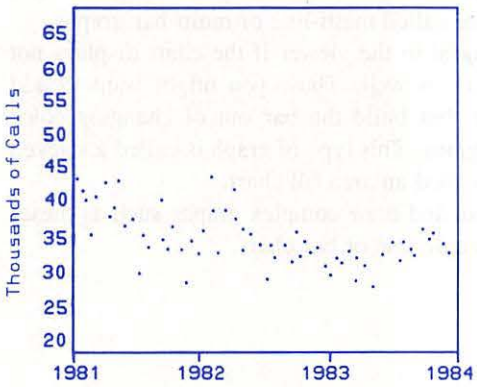


Figure 18.5
A scatter graph.

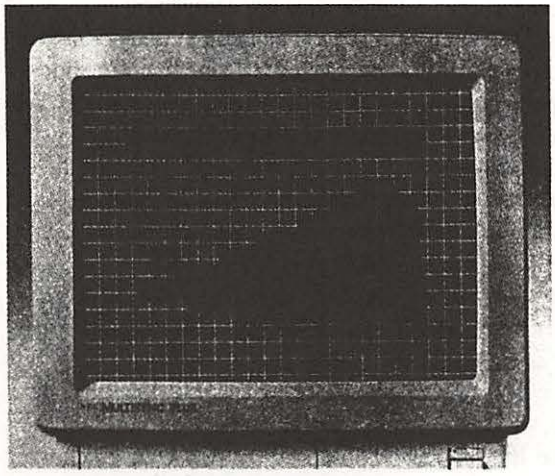


Figure 18.6
An area fill graph.

A nonnumeric business graphic is the text or word graph, which is a graphic composed primarily of words. These graphics are used as title pages in presentations, as substitutes for note cards for the presenter (Figure 18.7), or to put the key ideas of a presentation in front of an audience.

SALES LEADERS

PRIMARY CHARACTERISTICS OF SALES LEADERS

- **Thorough knowledge of product**
- **Know how to build rapport with the customer**
- **Resourceful**
- **Can establish priorities**
- **Follow-up**

Figure 18.7
A text graphic.

The easiest numeric business graphic to create involves only a single set of information, and transforms those values into either a line or bar chart: for example, the number of new housing starts per month for the last 24 months. This single group of 24 numbers can be plotted as a line graph or as a bar graph.

Sooner or later, however, you can expect to need a graph comparing two sets of information: for example, comparing the number of new housing starts per month with the Consumer's Price Index. A single line or set of bars cannot show the desired comparison. Another requirement for this type of graph may result if you want to compare the sales of an item by sales regions for a period of several months or quarters. These graphs are called multi-line or multi-bar graphs.

Frequently the information can be more meaningful to the viewer if the chart displays not only the comparative data, but the totals of the data as well. Thus, you might want to add together the regional sales figures into a single bar, but build the bar out of changing color segments, each color representing one of the sales regions. This type of graph is called a stacked bar. When a line chart is used for this purpose, it is called an area fill chart.

While it can take many hours for a person to plan and draw complex graphs such as these, they are as simple for the computer to create as the single line or bar chart.

18.3 MULTI-LINE/MULTI-BAR GRAPHS

A multi-line or multi-bar graph is, as suggested above, a graph showing more than one set of numbers.

When such a graph is created, the computer must scale the X- and Y-axis ranges of each set of numbers in the graph to the largest and smallest common values. For example, if the largest value found in one set of numbers is 150, and the largest value found in the second set is 250, then you can expect the Y-axis scale to extend to a value of 250.

Once the computer determines the common scales of the two or more sets of numbers to be graphed, each line or bar is drawn. To help you distinguish between the lines, especially if they cross one another, the points of each line are marked with different symbols, such as boxes for one line and plus signs for another. It is also possible for the lines to be drawn with different patterns, such as dots for one line and dashes for another. If you are using a color output device for your graphs, the lines may be of different colors.

If you are looking at a multi-bar graph, each set of bars will be filled with a different pattern of lines, called crosshatching. Thus, the line, or bars, representing the sales of widgets in the West will have one hatching pattern while the line, or bars, for the East will have a different pattern. A legend, or key, is then created by the computer to show which pattern is which.

When you create a multi-line or multi-bar graph, you must take care to ensure that the magnitude of the values in each set of numbers is the same. If the range of one set of numbers is from 90 to 110, while the range of the second set is from 0 to 1, the second line, or set of bars, will almost merge with the Y-axis near zero. The two ranges are several magnitudes apart, creating this problem.

When you encounter a situation such as this, you can adjust one set of values so they more closely match the other set. For example, you may use logarithm functions, or multiply the smaller set of numbers to make them larger, or divide the larger set to make them smaller. In the end, the relative magnitudes of the sets of numbers are the same. This tactic is a compromise. The resulting graph cannot show the magnitude of the difference between the two ranges.

18.4 STACKED BAR AND AREA FILL GRAPHS

The multi-bar/line type of graph shows a comparison of sets of values on the same scale. Another way to compare the values in two or more sets of numbers is to show their relative impact on the total of the numbers. As mentioned earlier, you may want to show the relative amount of sales by a given region when compared to total sales for all the regions. This is the function of the stacked bar and area fill graphs.

With the stacked bar and area fill graphs, the values in the multiple sets of numbers are summed to find the extent of the scale. After the first set of values is graphed, the values are added to the values of the second set of values. This gives the points to be graphed on the Y-axis for the second set of numbers. This process continues until all the sets of numbers are graphed, each set on top of the prior one. That is, the bars, instead of appearing side by side, are stacked one on top of another. With an area fill graph, two lines may touch if a value in the second (or third, and so on) set of numbers is zero. They will never, however, cross. The scale is still cumulative.

18.5 WHY USE GRAPHICS?

But why should you go to the trouble of creating a single business graphic, let alone a complete slideshow, for a presentation?

The phrase "a picture is worth one thousand words" can be as true in business presentations as it is in any other field. Many people feel that a single graphic is worth a thousand pages of computer output.

Figure 18.8 displays the numeric information that makes up the chart seen in Figure 18.9. If you have only two minutes to discuss the information in a meeting, which graphic will convey the information in a fashion so that the viewers will both understand and retain the highlights, the list of numbers or the chart? The chart, of course. The important values stand out, and your viewers can easily evaluate the remainder of the information in relation to these important values. Consider how much more value this same process would have if the numbers filled several pages of computer output. The ease with which the graphic information can be digested makes its value immediately apparent.

Annual Rainfall

	1978	1979	1980	1981
Los Angeles	25	28	18	22
New York	137	149	182	129
New Orleans	210	302	331	287
Seattle	195	209	233	222
Las Vegas	15	19	19	17
Rapid City	208	315	320	299

Figure 18.8
The columns of numbers make it difficult to spot trends, abnormalities, or make quick comparisons.

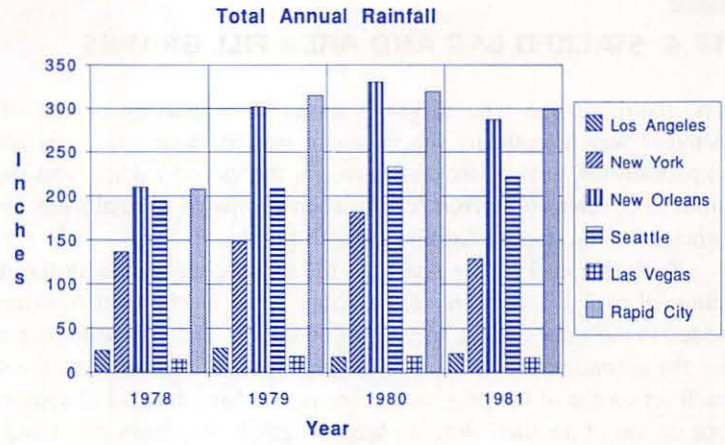


Figure 18.9
The chart lets the viewer quickly interpret the information.

18.6 CREATING GRAPHICS

There are several ways to create business graphics with a microcomputer. One way is to write a program to draw exactly the graphic you desire. This, however, is time-consuming, and the graphics commands vary greatly among the computers and output devices available. This means that every time you use a different computer or a different output device, you will have to make potentially major modifications to the program you have written.

For almost every microcomputer capable of supporting graphics there are many programs available that will allow you to create freeform art. Additionally, many programs create business graphics for these machines. Some of these programs do nothing but create graphics, while in others the graphics available are part of a multifunction program. These graphics programs, which may cost three to five hundred dollars, are usually able to create many different types of graphs from the same data, and can output the graph on many different output devices. The money you spend in your time to custom write a program to draw a graph and output it to a printer or plotter will probably match, if not pass, the cost of buying a program to perform these tasks for you.

As a rule, the programs that do nothing but graphics (which will be referred to as stand-alone graphics programs) have greater graphics capabilities and more flexibility when it comes to the creation of business graphics. However, the graphics modules of the multifunction programs are very easy to use, and the data to be graphed is readily available.

Regardless of the type of graphic program you use, before you can create a business graphic, you must know what the numbers are to be graphed. If you are using a multifunction program, then the values to be graphed are probably available or can be easily created through spreadsheet manipulations. Once the values are displayed, then they may be graphed.

If you are using a stand-alone graphics program, your data will have to be entered by hand or come from some other source. Many stand-alone graphics programs are capable of reading data from the more popular electronic spreadsheet programs, thereby eliminating the need to hand enter data and giving you relatively easy access to the extended capabilities of this type of program.

Regardless of whether you are using a multifunction program or a stand-alone business graphics program to draw your charts, once the numbers are in the computer, the machine does all the rest of the work for you. Possibly the most important of the things that the computer does for you is scaling, which is the determination of the low and high values for the Y-axis (the vertical axis) and the space between the marks on the Y-axis, both physically on the graph as it is drawn and numerically. You will probably find that the scale the computer selects is close to, if not even exactly, the one you would select, although some graphics programs always select 0 as the low value for the Y-axis, even if all the values are in the thousands or millions. Most business graphics programs will allow you to make major changes in the appearance of the Y-axis scale, if you so desire.

18.7 METHODS OF PRESENTATION

There are several methods available for displaying graphics in a meeting or classroom setting. The hand drawn flip chart (Figure 18.10) will probably never disappear. However, there is not presently a method available for easily and inexpensively transferring computer-generated graphics to the display page without losing some detail. Thus, we will concentrate on other methods of displaying computer-generated graphics.

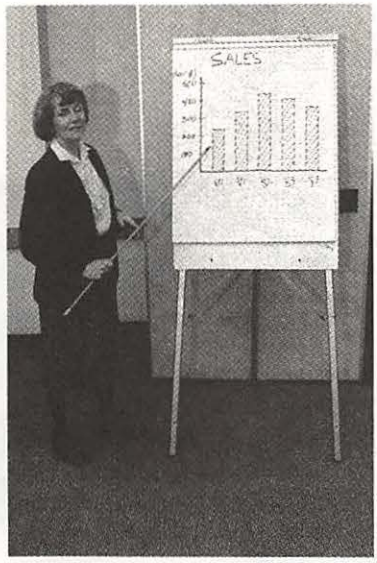


Figure 18.10
The hand drawn flip chart.

18.8 COMPUTER DISPLAY

The first, and generally readily available, method of displaying computer graphics is on the computer's monitor. Some computers are capable of creating graphics directly on the primary display, such as the Macintosh family of microcomputers. Others, such as the IBM-PC, require a graphics display monitor.

The major disadvantages of using the computer to display the graphics in a meeting or classroom are the need to move in and set up the computer, and the small size of the computer display, which limits visibility when group size is more than about three people. Additionally, there is a potential delay when drawing complex graphics. This problem, however, depends greatly on the business graphics program in use. The advantage of using the computer in this fashion is the ability to generate new graphics, or to modify existing ones, to meet the dynamic needs of the meeting participants.

Closely related to the use of the computer in the meeting or classroom is the use of large screen video projection (Figures 18.11, 18.12, 18.13, and 18.14) to supplement or replace the computer's small monitor. One still has the disadvantages of the need to supply a computer in the meeting and potential delays in drawing the graphics. However, with large screen projection, the viewing problem is eliminated, and the advantage of dynamically adjusting the graphics used is available. Relatively new to the video projection market is the Liquid Crystal Display (LCD) panel (Figures 18.13 and 18.15). This is a device which simply sits on top of a standard overhead projector. The graphics screen of the computer is displayed on the LCD, which acts like an overhead transparency.



Figure 18.11
Sony 1020Q projector...a full color projector costing around $8000.



Figure 18.12
Electrohome EDP-57...a monochrome projector costing around $5000.

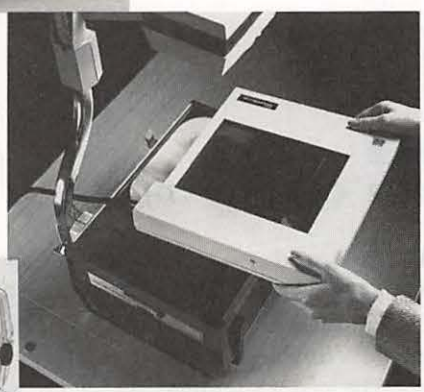


Figure 18.13
A Liquid Crystal Display (LCD) projection pad being placed on an overhead projector.



Figure 18.14
The Electrohome ECP Graphics data/graphics and video projection system designed for use with CAD/CAM systems. It costs about $12000.



Figure 18.15
The Kodak Datashow LCD Panel System. LCD panels cost between $800 and $2000.

18.9 PHOTOGRAPHIC TECHNIQUES

If using the computer is not desirable, or the hardware and/or needed software are not available, there are also photographic methods available. These methods produce a 35mm slide of the computer's display. This slide is then used in a standard 35mm projector, such as a Kodak Carousel Projector.

There are several different methods for taking a photograph of the computer's graphic display. First, simply point a camera at the screen and click away. This method, however, can give poor results if it is not done with some care (Figure 18.16). The best way to do this is to work in a darkened room, with the camera on a tripod, and use a slow shutter speed to compensate for the TV scan rate (use 1/30th or 1/25th). The results will be dramatically improved (Figure 18.17).

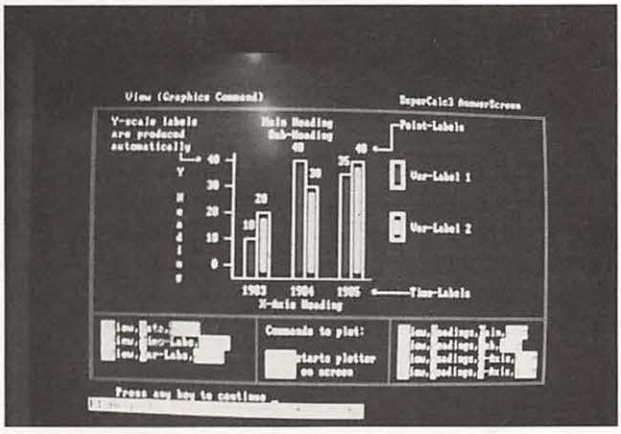


Figure 18.16
It is easy to take a poor photograph of a computer display.

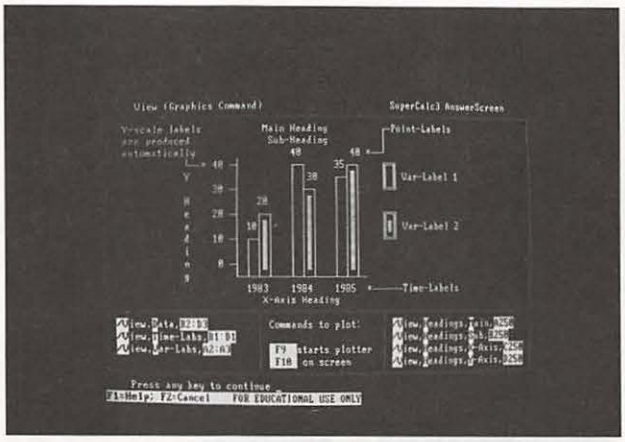


Figure 18.17
With a tripod, slow shutter speed, and a darkened room you can obtain an acceptable photograph of your computer's display.

Making a room dark to photograph a computer display may not always be convenient or possible. It is then time to invest in a little hardware. The least expensive device available for simplifying the taking of photos from the computer's monitor is a simple cone made by Kodak (Figure 18.18). To take a photograph, the cone is held over the computer display with a camera attached on the end. There are several similar devices available, with the primary difference being the quality of the standard camera that comes with the unit.



Figure 18.18
The Kodak Cone can be used to photograph the monitor of any computer.

A minor benefit of using one of the cone devices, or of simply taking pictures in a darkened room, is that a special graphics display is not necessary if you wish to photograph the text display of your computer. However, when it comes to color graphics, you may want more control over the situation. Photographing the computer display will give you a picture exactly as it appears on the screen. If you are unhappy with the color balance of your graphics display monitor, there is nothing that can be done.

For more control of the results, you must acquire a computer video recorder, usually called a film recorder. Again, there are several available ranging in cost and capabilities (Figures 18.19 and 18.20 are typical).

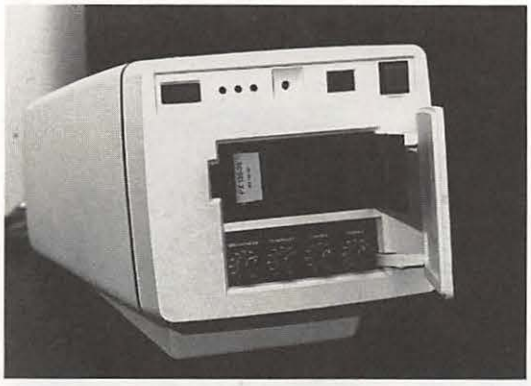


Figure 18.19
Celtic Technologies Video Recorder — $2500–$3000.

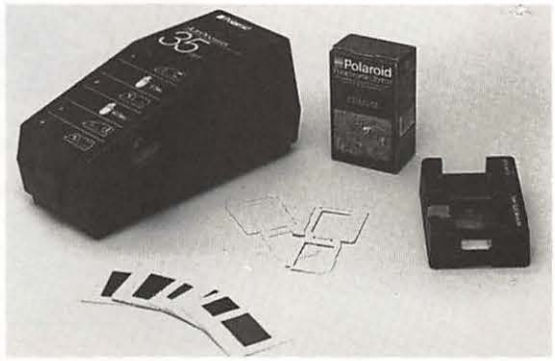


Figure 18.20
Polaroid Pallette — $1500–$2000.

The film recorder uses a video signal taken directly from the computer. The camera and lensing are built in. With these devices, you have control over color balance, hue and tint, just as with a television. You cannot, however, see the results of your adjustments until the film is developed. This is because these devices use a high quality black and white data monitor, which is photographed through colored filters. When you make a color adjustment, you are simply adjusting the relative exposure time through the various filters.

One of the advantages of using graphics with a microcomputer is the speed with which they can be created and modified. With the photographic technology available today it is even possible to have your slides ready in less than ten minutes. Polaroid makes 35mm slide film, which is processed in one minute (Figure 18.21). The extra time is needed to put the resulting slides into slide mounts. There is an initial investment in a processor and slide mounter of under $100, and an ongoing investment in film. However, the unit can come in very handy for those last-minute reports or classroom presentations.

Figure 18.21
A polaroid processor and instant film.



If you prefer to use an overhead transparency projector rather than 35mm slides, there are ways of creating the overhead slides from your computer graphic. The first is to blow up your 35mm slide. Again, Polaroid makes a device called a PolaPrinter (Figure 18.22), which can take any 35mm slide and give you an eight-by-ten print or transparency in a matter of minutes. Again there is an initial investment in hardware of several hundred dollars, and an ongoing expense of about $15 per print or transparency.

Figure 18.22
The PolaPrinter.

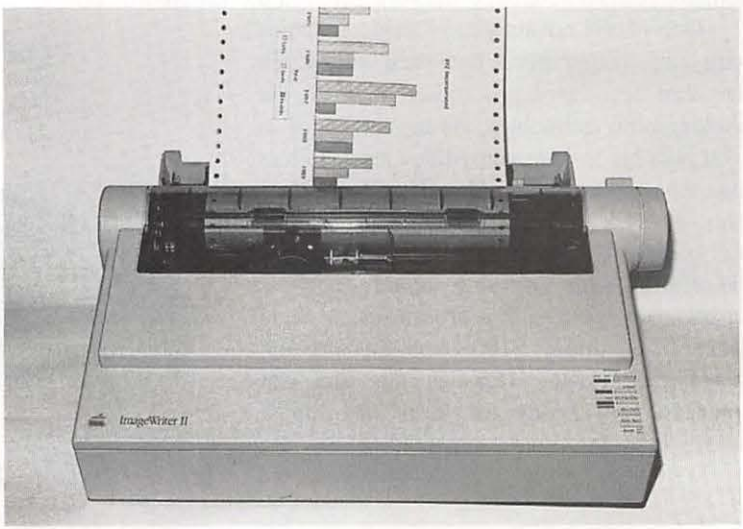


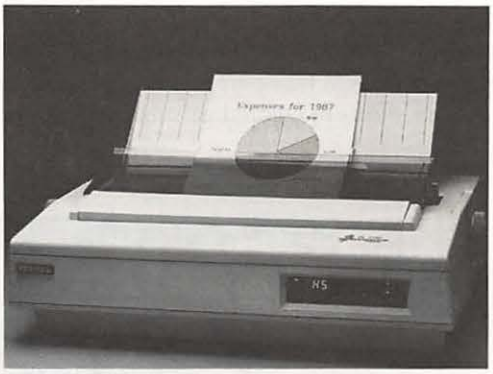
18.10 HARDCOPY GRAPHICS OUTPUT

Of course, there are alternative methods for creating overhead transparencies. They all involve some hardware and some patience, but you are likely to have access to some of the needed items.

The most common graphics hardcopy output device is the dot-matrix graphics printer, such as an Apple ImageWriter printer (Figure 18.23). These printers are relatively common, and most graphics packages and multifunction programs are able to print graphics using them.

Figure 18.23
An Apple ImageWriter II dot-matrix printer.





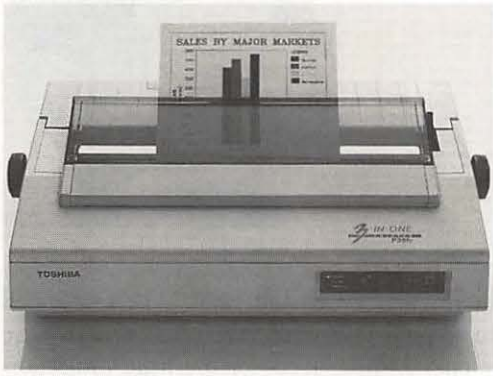




Figure 18.24
A variety of graphic printers.

The graphics printer takes the lines and bars of a graph and prints them on standard paper in black and white (Figure 18.24). Depending on the program and the speed of the printer, printing a business graphic may be a brief or time-consuming process. The quality of the output is also dependent upon the ribbon and the weight of the paper. While the majority of graphics printers in use today are able to print only one color (black), multicolor printers are beginning to appear. They are capable of creating acceptable color graphic output, although the colors tend to have a flat and un-saturated appearance.



Figure 18.25
A color graphics printer.

After you have printed the graphic, you may, of course, include it directly in the report. Additionally, through xerographic or thermal processes, it is possible to create an overhead transparency of the graph (Figure 18.26). Once you have made a transparency, it is possible to add colors with transparency pens (Figure 18.27) or with sheets of colored gels that stick to the transparency (Figure 18.28).

Figure 18.26
Xerox and thermofax graphics.

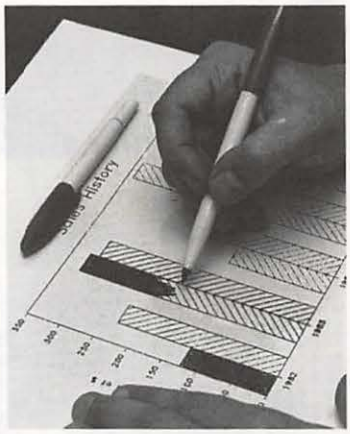
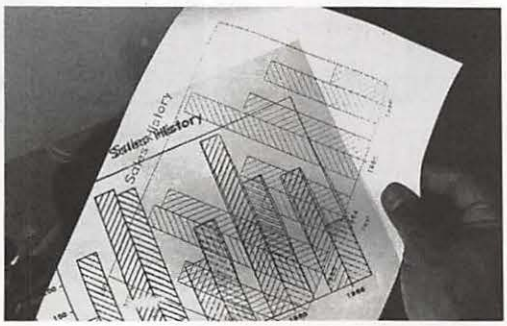


Figure 18.27
Vis-a-vis pens are used to hand color an acetate transparency.



Finally, you may have access to a digital plotter (Figures 18.29 and 18.30). These devices draw the graphic on a sheet of paper using multicolored pens. There are even pens, available for most plotters, which are designed to draw directly onto plastic sheets for overhead projection (Figures 18.31 and 18.32).

Figure 18.28
Color may be added to a transparency with Zip-O-Tone stick on gels.

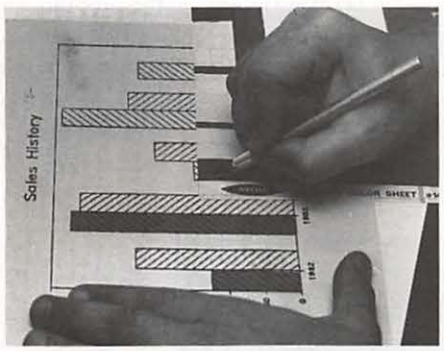


Figure 18.29
H/P 7470A two-pen plotter.

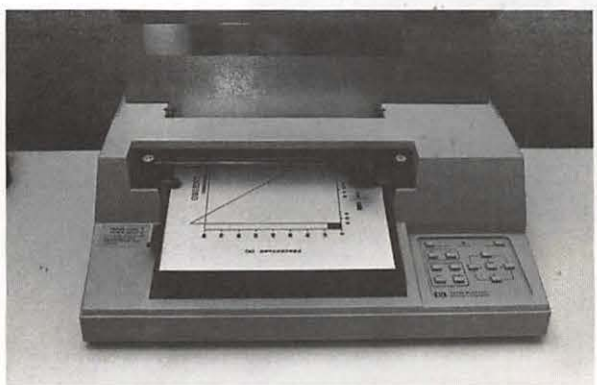




Figure 18.30
Tektronix Plotter.

Figure 18.31
Paper plot of a bar chart.

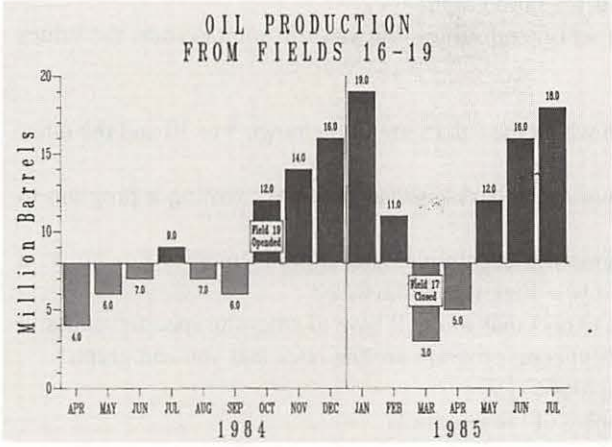


Figure 18.32
The advantage of plotting directly onto acetate is that you do not then have to color the pies/bars by hand.

18.11 SLIDESHOW GRAPHICS

A useful way of presenting graphics is the slideshow. When you hear this term, you may think of the 35mm slide and slide projector. While this type of visual aid is far from obsolete, the computer display and the wide variety of video projection technologies available today make it possible to use the computer as the slide projection system. In essence, the graphics on the computer's disk are the slides in the slide tray, and the computer and video display system are the slide projector.

The advantage of projecting by computer over using 35mm slides is the ease with which you can update your presentation. Once you understand how to generate computer graphics, all you need is a few minutes before a presentation to make a change or create a new graphic for a specific audience.

To do this you must use a slideshow-type program (such as PowerPoint from Microsoft, Aldus Persuasion, or Cricket Presents), which lets you create and store a series of graphics on your floppy diskette. Some of the programs let you enter numeric information and specify a graph type; the program then draws the graphs on request. Other types of programs let you create freeform graphs and text charts, which require that you draw your charts by hand. Some slideshow programs combine both of these capabilities, and will draw graphs from numbers you provide or let you enter freeform graphics and text. All of these programs will let you import graphics through the Macintosh clipboard.

When you use one of these programs, the computer stores all the graphic information on a diskette. When you need to make your presentation, the computer's monitor acts as the projection screen, and the program projects the graphics on it. You have full control over the presentation and can use the computer's keyboard, or, with some programs and projection systems, a 35mm slide projector remote control, to advance to the next slide. Some of the slideshow graphics programs allow you to back up slides or even jump around in your slide tray (the floppy disk) randomly picking the pictures to fit the flow of the presentation.

EXERCISES

1. Why should anyone want to use business graphics instead of simply displaying the numbers the graphs represent?
2. Give three examples of graphics that you might encounter on a daily basis.
3. Name three of the basic business graphic types.
4. When trying to compare data, should you use a single- or multi-bar (or line) graph?
5. If the information from several sets of data is more meaningful as a set of total values, but you still want to show the values of the individual sets, which type of graph should you prepare?
6. What is meant by the term "scaling"?
7. What do you think will happen if you graph two sets of data, one in which the values are in the range 5 to 10 and the other in which the values are in the range 2700 to 3000?
8. Why use a business graphics program, which may cost several hundred dollars, instead of simply writing a program to draw the desired graph on you computer?
9. From which type of program would you expect to have greater graphics capabilities and overall graphics flexibility: a multifunction program or a stand-alone graphics program? Why do you think this is the case?
10. If you are using a multifunction program to create graphics, do you expect that you will have to enter the specific values to be graphed, or do you expect that the values displayed by the multifunction program are the ones that you can graph?
11. What are three possible methods for displaying your computer graphics?
12. What are the disadvantages of using the computer itself for the display of the graphics?
13. What is an advantage of using the computer itself for the display of the graphics?
14. If you are photographing the computer's display to produce slides, is a special graphics monitor required? If so, which type is best?
15. Do you think that you will have more control over the photographic process if you use a film recorder or if you use a photographic cone? Why?
16. Can graphics be printed on dot-matrix type printers?
17. After you print a graphic, can anything be done with the output other than include it in your report or document?
18. What do you think the advantage of using a digital plotter may be over using a dot-matrix printer for creating hardcopy output of your graph?
19. What are the similarities between a computer slideshow system and a 35mm slide presentation system?
20. What are the differences between a computer slideshow system and a 35mm slide presentation system?

CHAPTER

USING SPREADSHEET BUSINESS GRAPHICS

19

CHAPTER OBJECTIVES:

Upon completion of this chapter, the student will:

- **Create single line and single column graphs.**
- **Create multi-line and multi-column graphs.**
- **Create stacked column charts.**
- **Create pie charts.**
- **Copy a chart to the Scrapbook.**
- **Print the charts.**

19.1 CREATING GRAPHICS WITH YOUR ELECTRONIC SPREADSHEET

It is fairly easy to create business graphics with Excel. Before you can create a business graphic with Excel, you must create a spreadsheet so that you have numbers to graph. This is the most difficult part of the graphing process! If you do not have the numbers, there is nothing to be done.

If you have not yet used Excel, return to Chapter 9 and become familiar with the program before you begin creating graphics. If you have not used Excel for several weeks, and you are a bit unsure about its operations, you will benefit from a review of the earlier chapters detailing its use.

19.2 BUILD THE SPREADSHEET

After you boot your Macintosh with a System Start-Up disk, insert the Excel Program disk into one of the computer's disk drives. If you are using a machine with a hard disk you will not need to insert the Excel program disk into a disk drive. Rather, locate the Excel folder, and open it so you can see the Excel program icon. Place a disk (see Chapter 3 for how to initialize a new disk) with at least 200K available space into another one of your Macintosh's disk drives, if you have one available. This disk will be used for saving your work. If you do not have a free floppy disk drive, keep this disk available. You will need it for data storage.

In these instructions, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and double-click the mouse button. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.



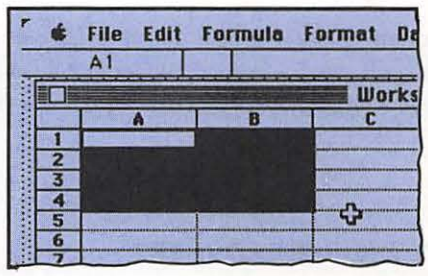
Figure 19.1
The MS-Excel program icon.

What To Do	*Why You Are Doing It*
If the disk's icon is closed, double-click on it with the mouse pointer.	Open up the disk icon onto the desktop. If the Macintosh you are using has a hard disk, then open the folder containing the Excel program.
Locate the Excel program icon inside the disk window (Figure 19.1). If you are using a machine with a hard disk, locate the Excel program icon inside the folder's window.	
Move the mouse pointer to the Excel icon and double-click the mouse button.	Launch Excel. Remember, if you are having trouble with the double-click, you may select the Excel icon with a single click, then use the Open command on the File menu (or ⌘O) to launch Excel.

After a brief pause you will see an empty spreadsheet on your Macintosh's screen. Before creating a graph, you must create a spreadsheet from which the graphics portion of Excel will work. This is what follows.

What To Do	*Why You Are Doing It*
Select the range A1:B4.	This will be the initial input range.

Figure 19.2
The initial input range has been selected.



[cr]	Move the cursor to cell A2. You will be using row 1 for the year column headings.
SALES [cr] COSTS [cr] PROFITS [cr]	Enter the row labels in column A and move the cursor to cell B1.
1980 [cr] 105 [cr] =(0.75*B2) [cr] =(B2–B3) [cr]	Enter the first year's information. The cursor will end up in cell A1.

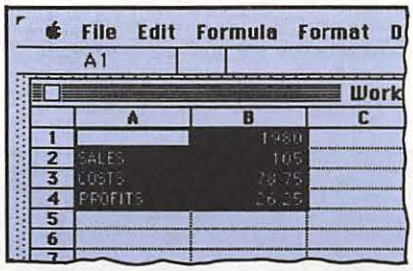


Figure 19.3
The spreadsheet you have created so far.

Click the mouse pointer on cell C1.	You are going to continue entering information in this cell.
=(1+B1) [cr]	Enter a formula for the year. 1981 will appear in cell C1.
Select the range C1:F1.	You are going to use the Fill Right command to fill in the year column labels.
⌘R	The Fill Right command. Remember that this command may be located on the Edit menu. You should now have the years 1980 through 1984 in row 1.
Select the range C2:F2.	You are going to use this range to enter the sales growth computations. Each year will be different, so you are not going to use the Fill Right command.
=(1.04*B2) [cr] =(1.11*C2) [cr] =(0.91*D2) [cr] =(1.03*E2) [cr]	Enter the sales for the years 1981 through 1984 as a percentage of the prior year's sales. These formulas are entered into cells C2, D2, E2 and F2, the selected range.
Select the range B3:F4.	You are going to use the Fill Right command to complete the spreadsheet model.
⌘R	Once again execute the Fill Right command to complete the entry of all the values.

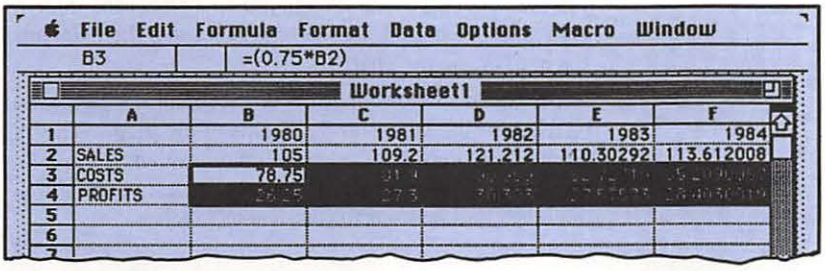
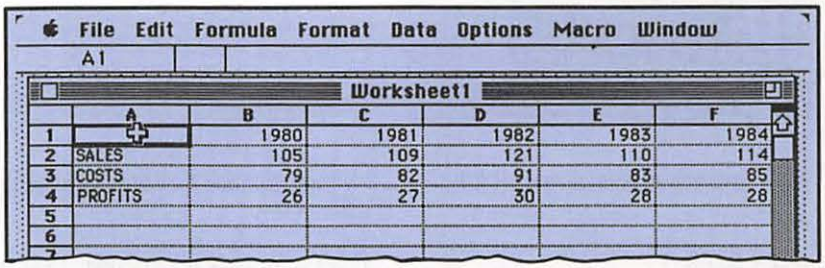


Figure 19.4
The spreadsheet you have created so far.

Click on the Select All box.	Remember that the box to the left of the A column indicator and above the row 1 indicator will select the entire worksheet.
Pull down the Format menu, select the Number option and release the mouse button.	You want to format all the numbers so the spreadsheet is easier to read.
Select the second item in the Format Number list of options, the 0 format.	You want to apply the integer format to the complete spreadsheet.

Click on the OK button.	Apply the format to the complete spreadsheet.
Click the mouse pointer on cell A1.	De-select the spreadsheet. You are now ready to begin graphing.

Figure 19.5
The completed spreadsheet.



	A	B	C	D	E	F
1		1980	1981	1982	1983	1984
2	SALES	105	109	121	110	114
3	COSTS	79	82	91	83	85
4	PROFITS	26	27	30	28	28
5						
6						

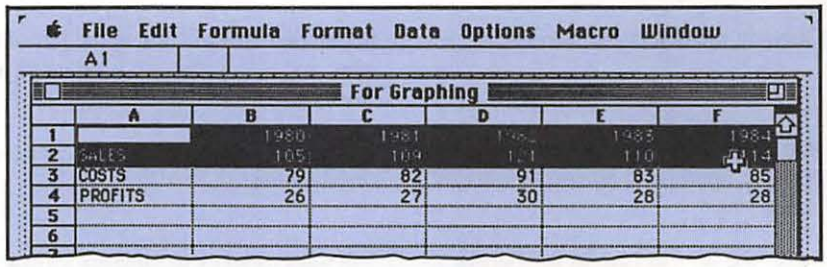
⌘S	The Save command from the File menu. Save your work so that you do not have to re-create it in the future.
For Graphing	Name this spreadsheet "For Graphing". Click on the Drive and Eject buttons as necessary to make your disk appear in the dialog box.
Click on the Save button.	Complete the Save command.

19.3 CREATING A SINGLE VARIABLE CHART

You are now ready to begin creating graphics with Excel.

What To Do	*Why You Are Doing It*
Select the range A1:F2.	This represents the information that you will chart. When you create a chart with Excel, you first select the information to be charted, as you have here, and then you tell Excel to create the chart. Excel knows that the first row of the selected range will be used for the labels on the X-axis of the graph. This is because you have selected more columns than rows. If you select more rows than columns, the left column of the range will be used for the X-axis labels.

Figure 19.6
The selected range will be graphed.



	A	B	C	D	E	F
1		1980	1981	1982	1983	1984
2	SALES	105	109	121	110	114
3	COSTS	79	82	91	83	85
4	PROFITS	26	27	30	28	28
5						
6						

Pull down the File menu.

Note that the New command is on this menu. You have seen that this command is used to create new spreadsheets and macro sheets. It also is used to create charts.

Drag the mouse down to the New command.

The New command may be executed by using the ⌘N key.



Figure 19.7
The New command has been selected.

Release the mouse.

Execute the New command.

After executing the New command you will see the New dialog box.

Click on the Chart button.

You are going to create a new Chart at this time.



Figure 19.8
The New dialog box. The new Chart button has been selected.

Click on the OK button.

Create the chart. After a brief wait you will see the chart.

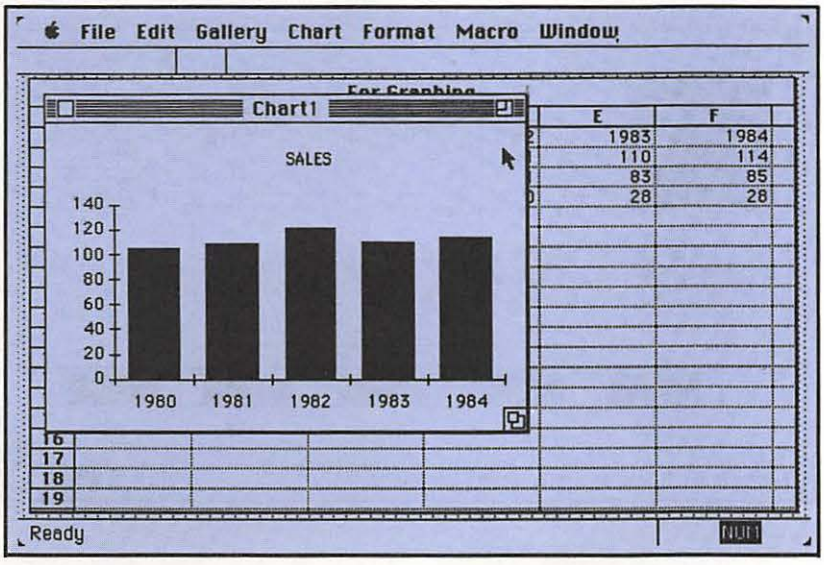


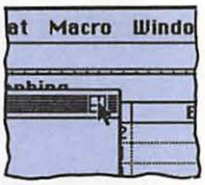
Figure 19.9
The chart has been created. You can see that the years, the top row of the range being graphed, are labeling the X-axis.

As you look at the first chart, also notice that the Menu bar across the top of the Macintosh screen has changed. Several options are gone, and Gallery and Chart now appear.

Click on the Zoom box at the top right corner of the Chart1 window.

Clicking on this box will make the chart fill the complete Macintosh screen.

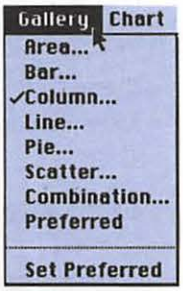
Figure 19.10
The Zoom box is found at the top right corner of the current window's title bar.



Pull down the Gallery menu.

Note that there is a check mark in front of the Column option indicating that this is the current chart type.

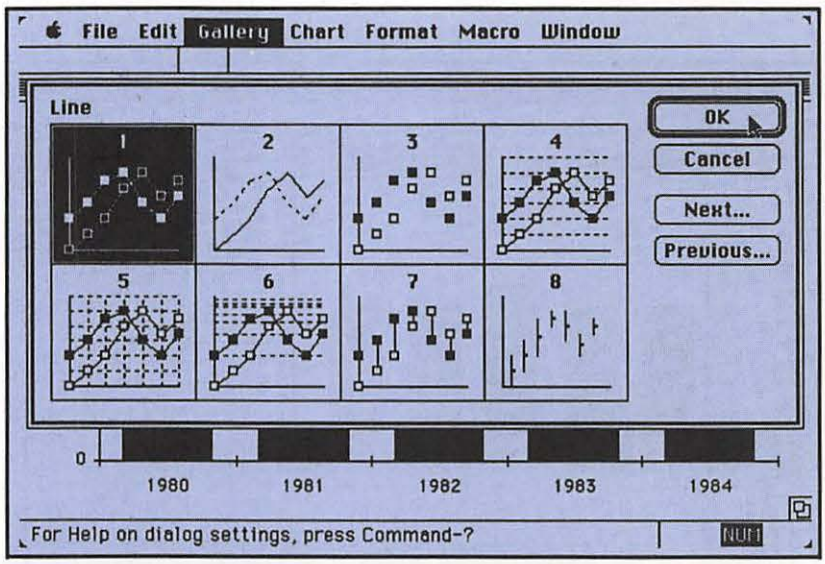
Figure 19.11
The Gallery menu has been pulled down.



Drag the mouse down to the Line options and release the mouse button.

You want to change the chart type to Line. You will now see a gallery of several different line chart types from which to choose.

Figure 19.12
The Line chart gallery.



Click on the OK button.

The first line chart is currently selected, and this is the one you want to use. After a brief pause, the chart will change from a Column chart to a Line chart.

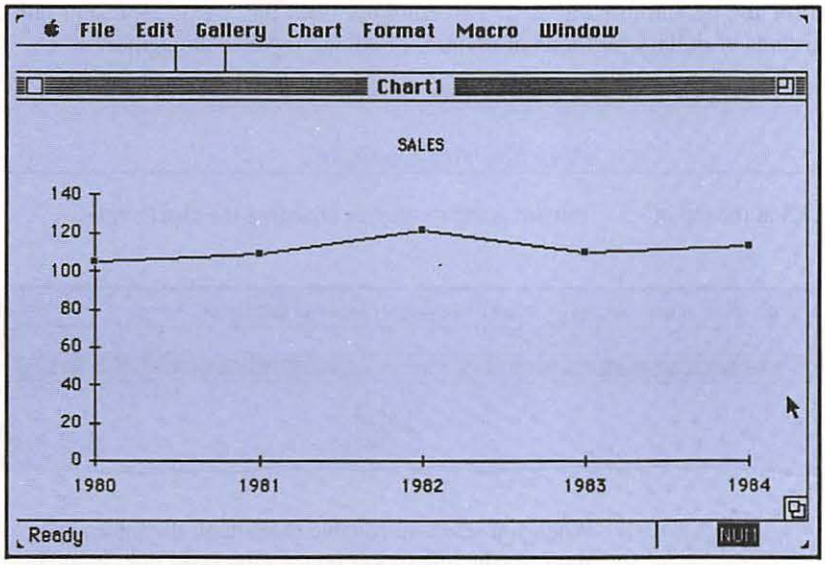


Figure 19.13
The chart has been changed to a Line chart.

Pull down the Gallery menu, select the Column option and release the mouse button.

You want to return the chart to a Column chart format. The Line chart is fairly dull.

The Column gallery will now be displayed.

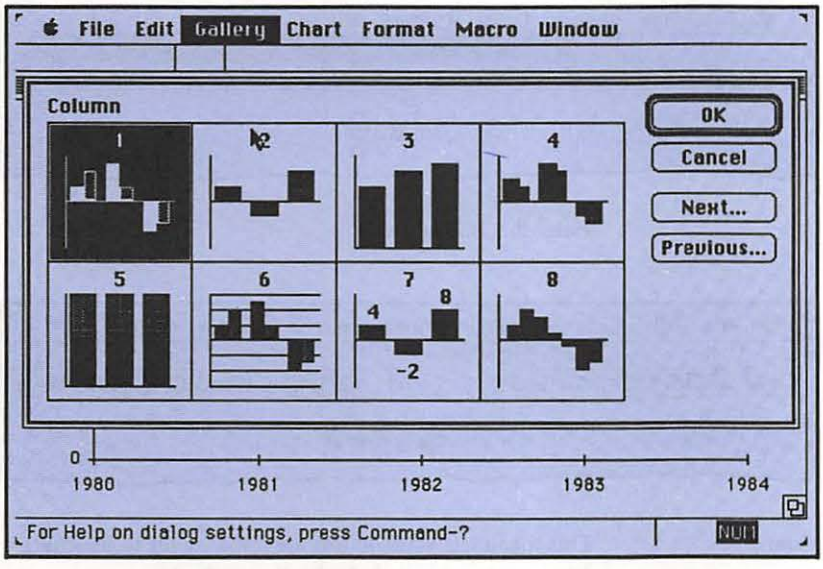


Figure 19.14
The Column chart gallery.

Click on the OK button.

The first column chart is selected, and the original chart will return.

19.4 LABELING THE CHART

This chart was easy to create, but it is lacking labels and other identifying information to make it more understandable for the person looking at it. For example, does the Y-axis represent hundreds of dollars, thousands of dollars, millions of dollars, or something else altogether?

What To Do	*Why You Are Doing It*
Click on the title SALES at the top of the chart.	You are going to start by changing the chart's title.

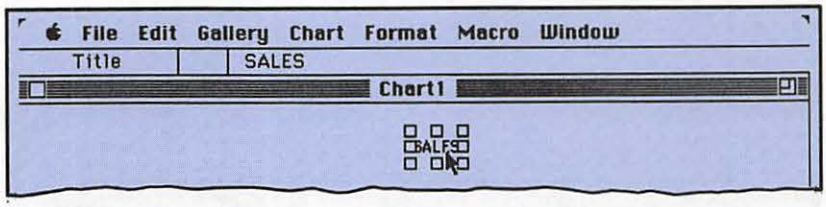


Figure 19.15
The chart title has been selected, and the text appears on the edit line below the menu bar.

When you select an editable chart item, the information you can edit will appear on the Excel edit line, immediately below the menu bar.

Double-click on the word SALES on the edit line.	Select this text. You are going to change it.

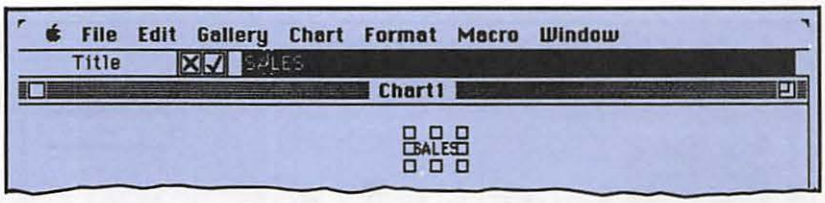


Figure 19.16
The chart title has been selected on the edit line.

Sales History [cr]	Enter this line of text.

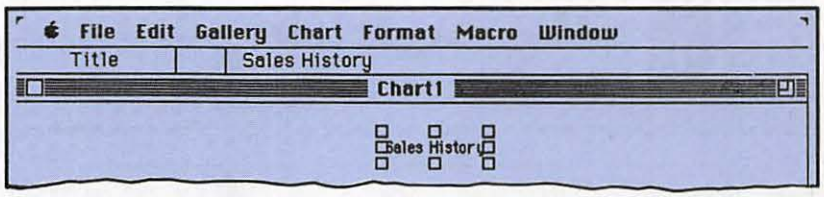


Figure 19.17
The chart title has been changed.

Pull down the Chart menu.	This menu lets you add text and other items to the chart. You want to add labels to the X- and Y-axes.
Drag the mouse down to the Attach Text command.	This command will let you create a chart title, an X-axis label, a Y-axis label and even attach a label to a point on the chart.

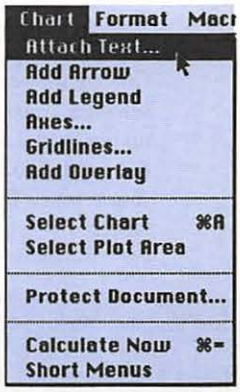


Figure 19.18
The Attach Text command has been selected.

Release the mouse button.

Execute this command.

You will now see the Attach Text To dialog box.

Click on the Value Axis button.

The Value Axis is the Y-axis for the current chart. Excel refers to the Value and Category axes, rather than the X- and Y-axes because it is possible to rotate the charts, changing the meaning of the X- and Y-axes. However, the Value axis and Category axis meaning will never change.

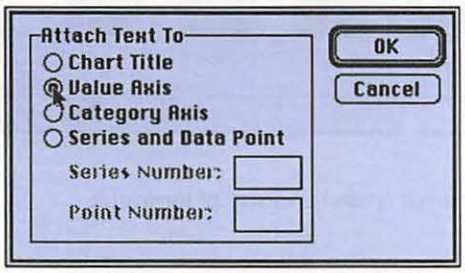


Figure 19.19
The Value Axis button has been selected.

Click on the OK button.

Create the Value axis (Y-axis at this time) label.

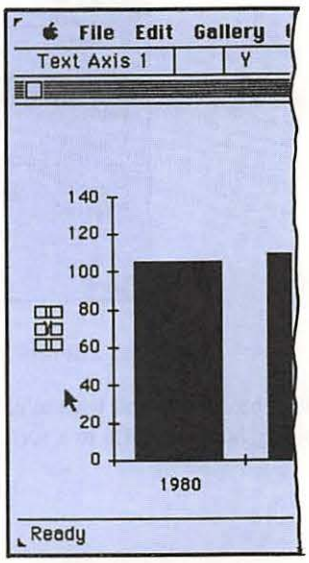


Figure 19.20
The Y-axis label has been created. It's preset value is "Y".

Double-click on the "Y" on the edit line.

You are going to change the Y-axis label.

Millions of $ [cr]

Change the text to "Millions of $". Leave the label selected. You can see that the label you have added takes up horizontal space. At this time a horizontal label does not create too much of a problem. However, it may at a future time. Take the time now to change it to a vertical label.

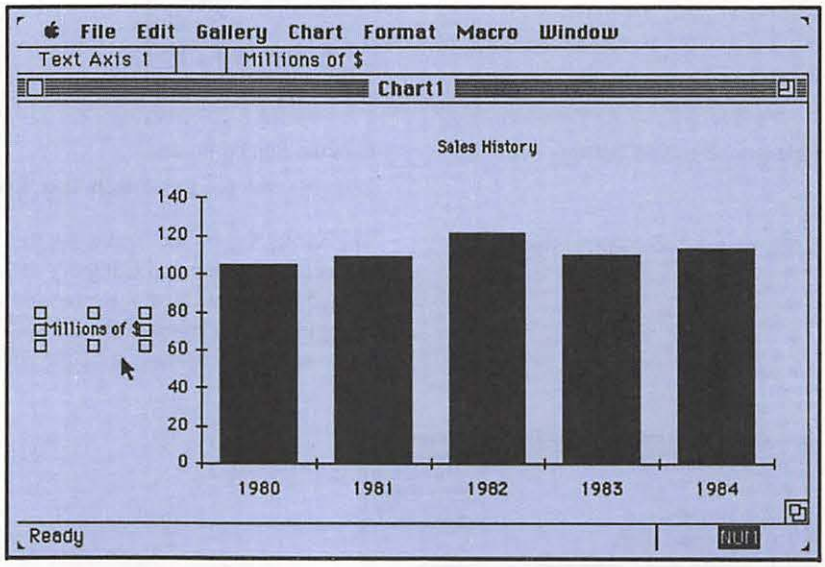


Figure 19.21
The label you have just added is horizontal, taking up space.

Pull down the Format menu.

This menu lets you control a variety of formatting options.

Drag the mouse down to the Text command.

You want to modify the format of the selected Y-axis label.



Figure 19.22
The Text option has been selected on the Format menu.

Release the mouse button.

You will now see the Text Alignment dialog box.

Click on the Vertical Text check box at the lower left corner of the dialog box.

You want to change the text from its present horizontal form to a vertical form.

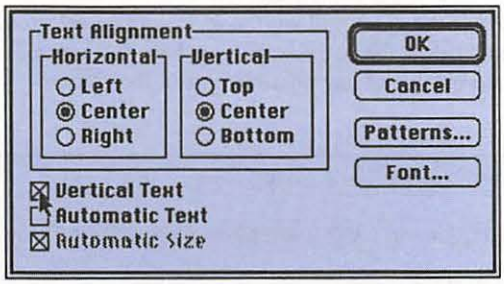


Figure 19.23
The Vertical Text check box has been selected.

Click on the OK button.	Execute the change of formatting. The Y-axis label will change to vertical.

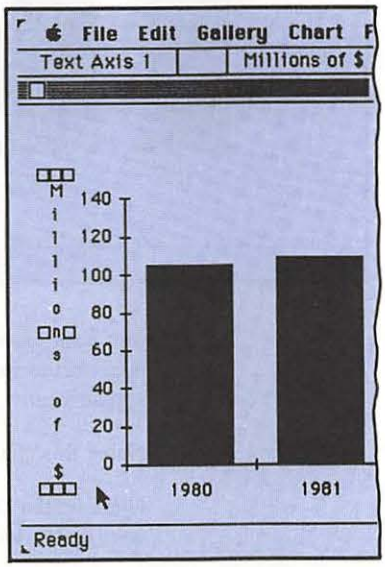


Figure 19.24
The Y-axis label is now vertical.

Pull down the Chart menu, select the Attach Text option and release the mouse button.	You now want to label the X-axis.
Click on the Category Axis button.	You are going to attach a label to the X-axis.
Click on the OK button.	The preset X-axis label will appear below the X-axis.
Select the X on the edit line.	You are going to change the label from X to something else.
Year [cr]	Change the X-axis label to read "Year".

Click the mouse below the newly created X-axis label.	You want to de-select everything. Clicking the mouse in the middle of the chart will still leave something selected. If you click below the X-axis label you have just created you will be outside of any possible part of the chart.

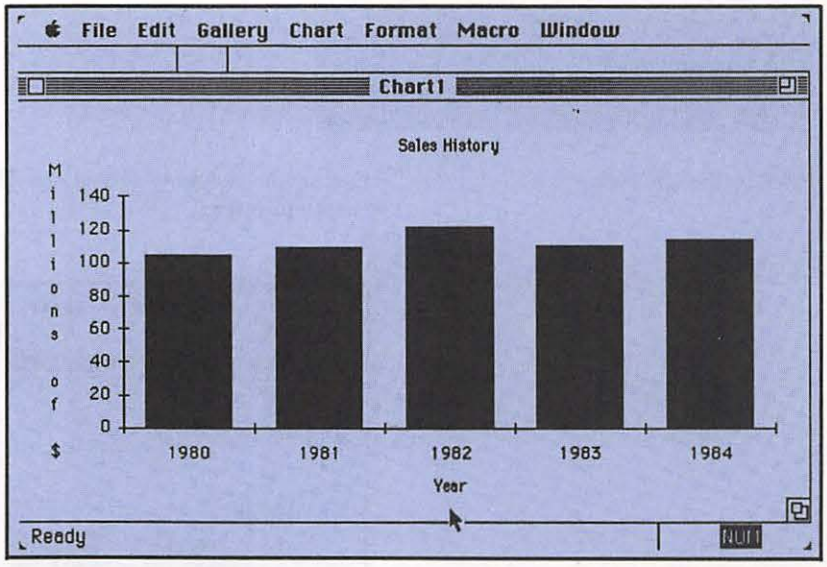


Figure 19.25
The complete chart. Note the location of the mouse pointer below the X-axis label.

⌘S	You want to save this chart. Charts are created in their own document and must be saved independent of the spreadsheet.
SALES HISTORY	Name this chart Sales History. Click on the Drive and Eject buttons as needed to have your disk drive name show in the dialog box.
Click on the Save button.	Complete the Save command.
Click on the zoom box at the right side of the title bar.	Return the chart window to its original size. You should now be able to see the spreadsheet window beneath the chart window.
Click on the spreadsheet window.	Make the spreadsheet the active window.

19.5 CREATING A PIE CHART

Remember that a pie chart is used to show the relative proportions of items to the whole.

What To Do	*Why You Are Doing It*
Select the range A1:B4.	You will create a pie chart from this range.
⌘N	The New command. The New dialog box will appear.

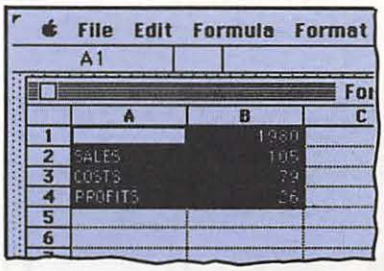


Figure 19.26
The selected range, A1:B4, will be used to create a pie chart.

Click on the Chart button.

You want to create a new chart.

Click on the OK button.

Create the chart. This chart will be titled Chart2, and will be a column chart.

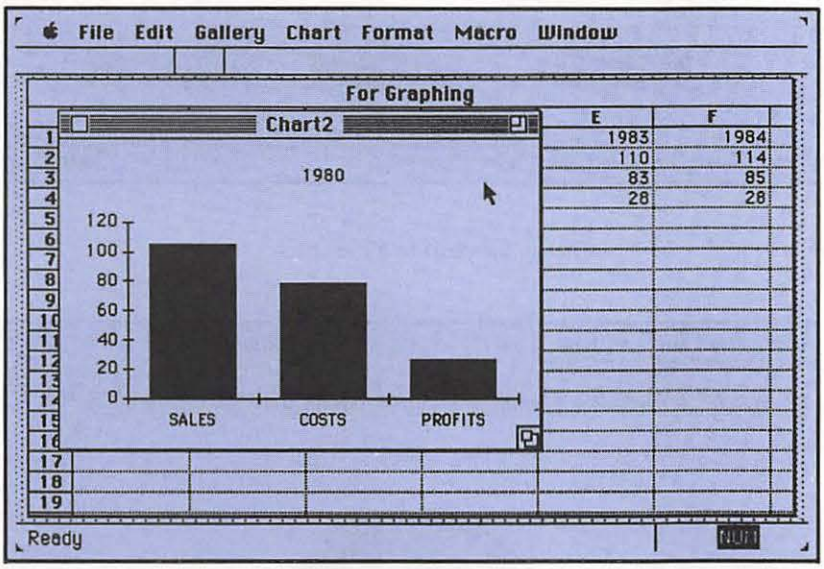


Figure 19.27
The current chart. Since there were more rows selected than columns, the left column was used to label the X-axis points.

Click on the zoom box at the right side of the chart title bar.

Expand the chart to fill the window.

Pull down the Gallery menu and select the Pie option.

You want to change the chart into a pie chart.

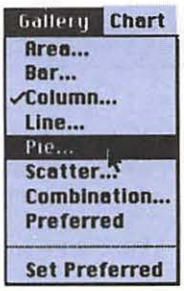
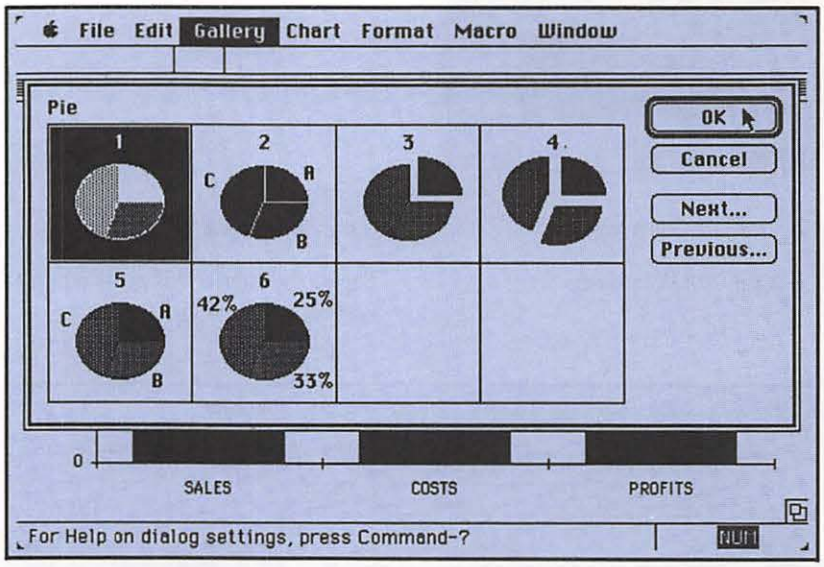


Figure 19.28
The Pie option has been selected on the Gallery menu.

Release the mouse button.

You will now see the Pie chart gallery. Pie type number 1 will be selected.

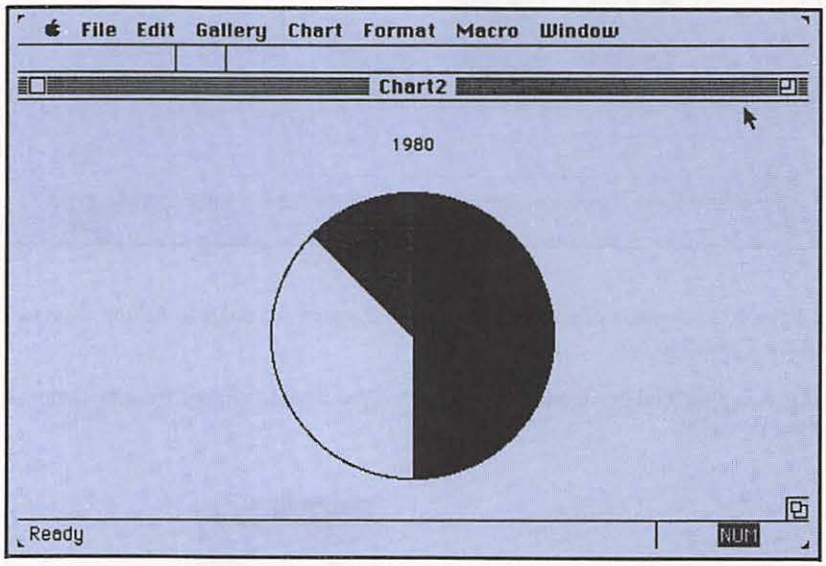
Figure 19.29
The Pie chart gallery. Pie type 1 is selected.



Click on the OK button.

Change the chart to a Pie chart.

Figure 19.30
The chart is now a pie chart.



Pull down the Gallery menu, select the Pie option and release the mouse button.

You want to change the pie type to one with exploded slices. An exploded slice is one pulled out of the rest of the pie for emphasis.

Click on pie chart type 3.

Pie chart types 3 and 4 have exploded slices.

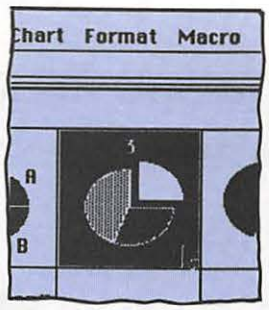


Figure 19.31
Pie chart type 3 has been selected.

Click on the OK button.

Create the pie chart.

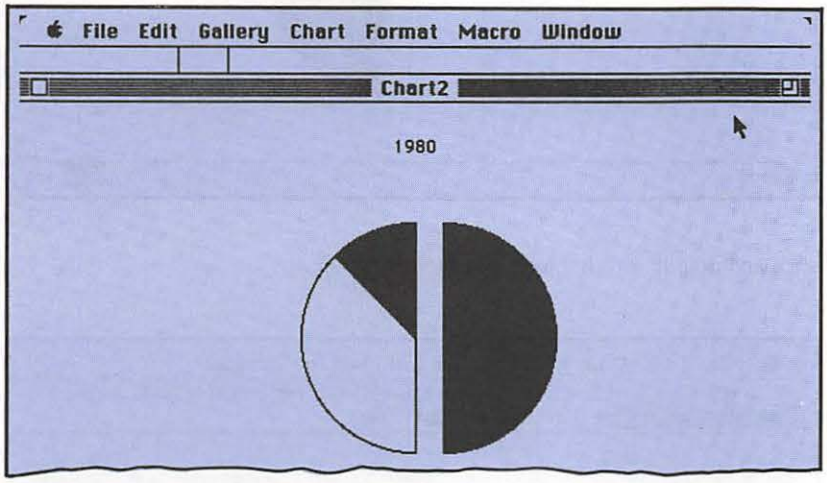


Figure 19.32
The pie now has an exploded slice.

The slice that has been exploded is not the one you want to have exploded! You want the smallest slice, representing the profits, to be the exploded slice.

Click on the right-hand slice.

Select the exploded slice. Handles will appear around the slice.

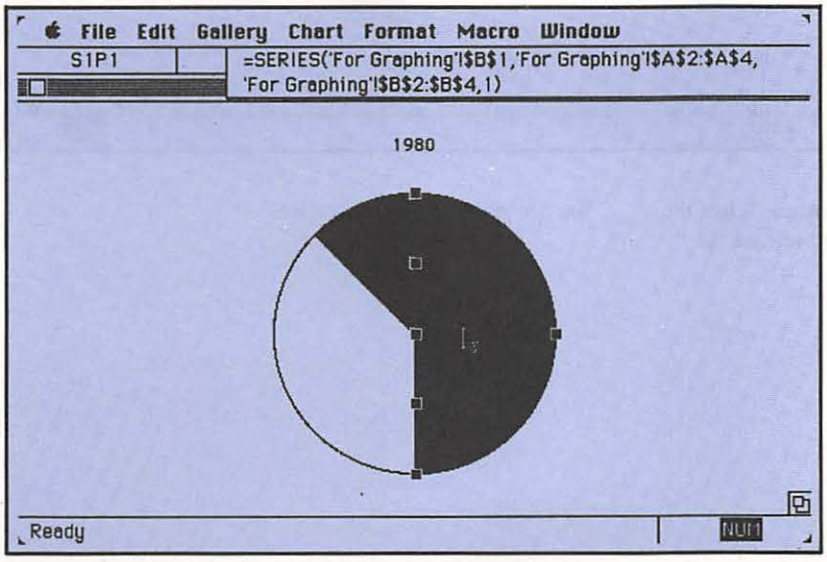


Figure 19.33
The exploded slice has been selected.

Drag the slice left.

Return the exploded slice to the rest of the pie.

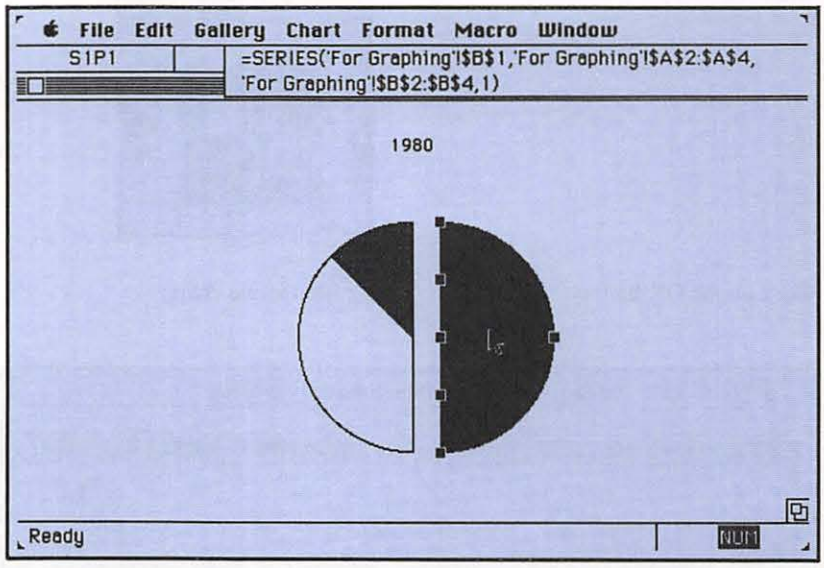


Figure 19.34
The exploded slice has been returned to the rest of the pie.

Click on the smallest slice and drag it out of the pie.

Explode this slice of the pie.

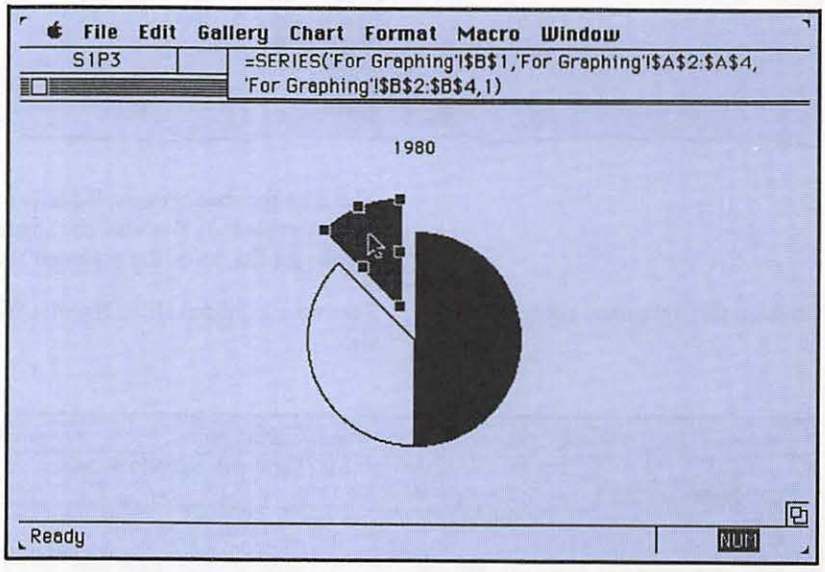


Figure 19.35
The smallest slice has been exploded out of the pie.

Pull down the Chart menu, select the Attach Text option and release the mouse button.

You are going to label this slice.

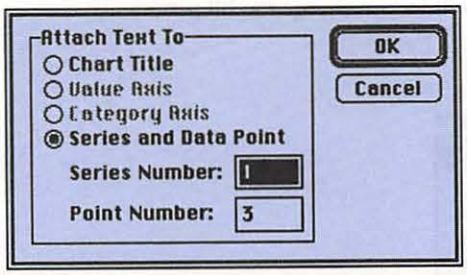


Figure 19.36
The Attach Text dialog box.

	The Series and Data Point button has been selected. You are labeling the third point of the first series.
Click on the OK button.	Add the label. The value 26 will appear, which is the number that the slice represents.
Double-click on the 26 on the edit line.	You want to change the text.
Profits	Enter the text "Profits" for the slice label.

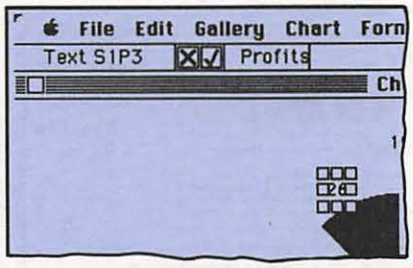


Figure 19.37
The label is going to be changed from "26" to "Profits".

[cr]	Make the change.
Click on the largest slice.	You are going to label this slice.
Pull down the Chart menu, select the Attach Text option and release the mouse button.	You are going to label this slice.
Click on the OK button.	The label 105 will appear by the largest slice.
Double-click on the 105 on the edit line.	You want to change the text.
Sales [cr]	Change the text to read "Sales".
Click on the Sales pie slice a second time.	You want to make another change affecting this slice.

Pull down the Format menu and select the Patterns option.

This option will let you change the fill pattern used for a slice.

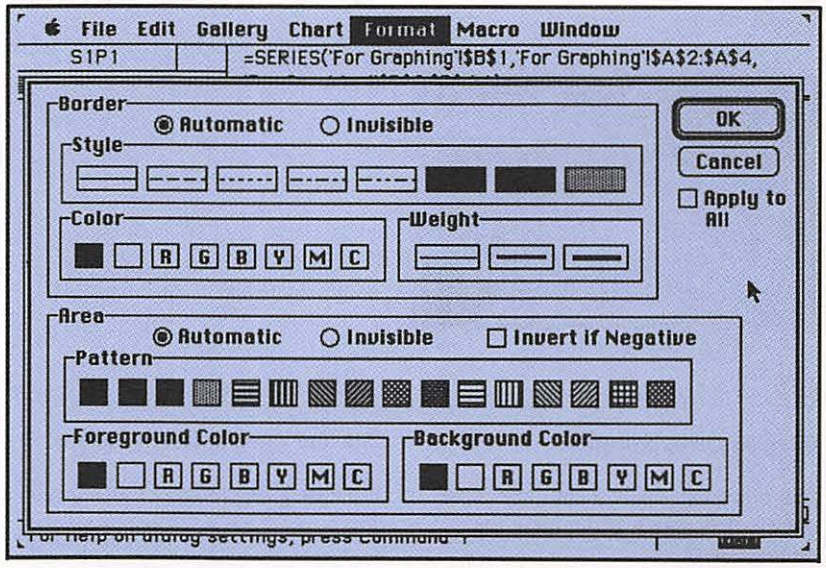
Figure 19.38
The Pattern option has been selected.



Release the mouse button.

Execute the Patterns command. After a brief pause, the Patterns dialog box will be displayed.

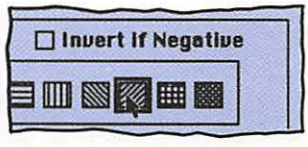
Figure 19.39
The Patterns dialog box.



Click on the third pattern from the right in the Area Patterns portion of the dialog box.

This dialog box lets you control the border of the selected item on the top half of the dialog, and the fill pattern on the bottom half. If you are using a color monitor, you may change the colors of items and see the result on the Macintosh's screen. You are changing the fill pattern so it is not solid black.

Figure 19.40
A new fill pattern has been selected.



Click on the OK button.	Change the pattern of the selected slice.

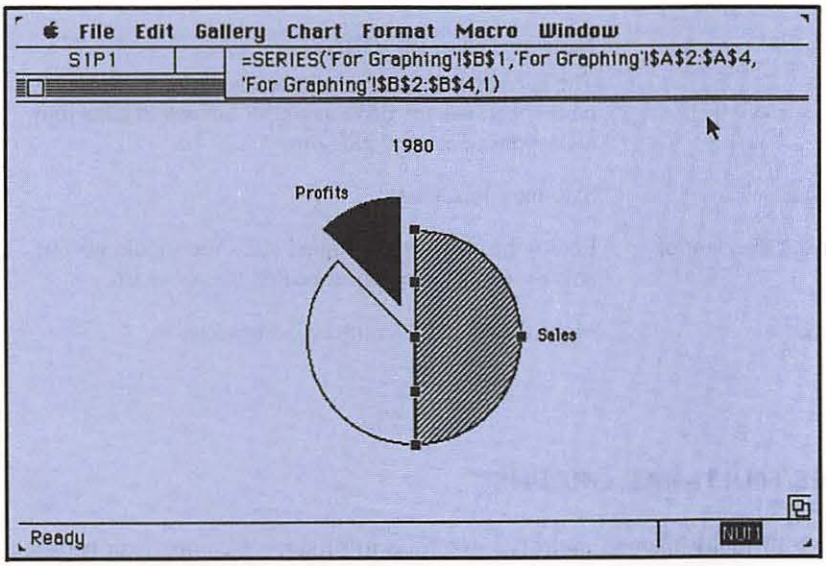


Figure 19.41
The Sales slice now has a new fill pattern.

Click on the remaining pie slice.	You want to label the last slice.
Pull down the Chart menu, select the Attach Text option and release the mouse button.	You are going to label this slice.
Click on the OK button.	The label 79 will appear by the slice.
Double-click on the 79 on the edit line.	You want to change the text.
Costs [cr]	Change the text to read "Costs".
Click at the left edge of the window.	De-select all parts of the chart.

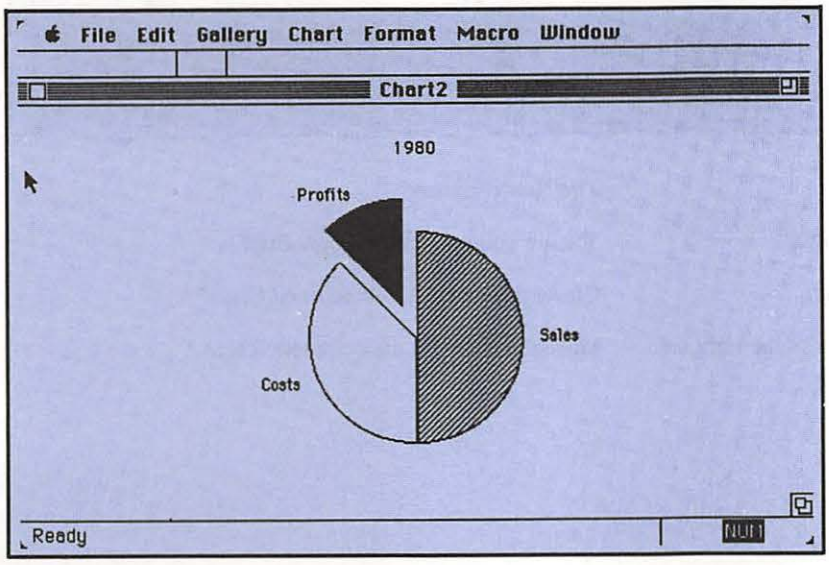


Figure 19.42
The completed pie chart. Note where the mouse pointer was clicked to de-select the complete chart.

⌘S	The Save command. Remember, a chart is a separate entity from the spreadsheet and must be independently saved.
PIE CHART	Name this chart PIE CHART. The correct disk drive should be displayed in the dialog box. If not, use the drive and eject buttons to have your disk showing in the dialog box.
Click on the Save button.	Save the spreadsheet.
Click on the Zoom box at the right of the title bar.	Return the chart to its original size. You should now be able to see the spreadsheet behind the pie chart.
Click on the spreadsheet.	Make the spreadsheet the active window.

19.6 MULTI-LINE/MULTI-BAR GRAPHS

Recall that the purpose of multi-line and multi-bar graphs is to produce a comparison between two or more sets of data, or to show a relationship among two or more sets of data.

In the section that follows you will create a multi-data set graph to show the relationship among sales, costs and profits.

What To Do	*Why You Are Doing It*
Select the range A1:F4.	You are going to chart all the data.

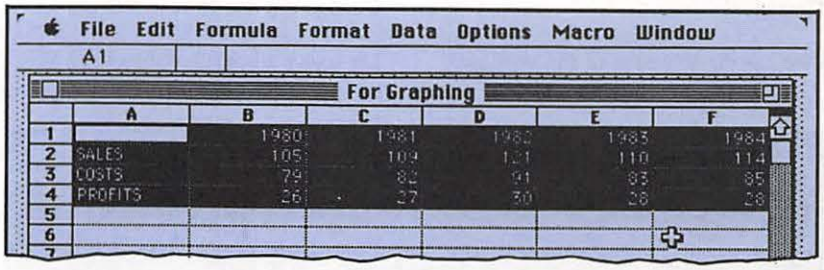


Figure 19.43
All of the work on the spreadsheet has been selected.

⌘N	The New command.
Click on the Chart button.	You are going to create a new chart.
Click on the OK button.	Create the chart. It will be titled Chart3.
Click on the zoom box at the right side of the title bar.	Make the chart fill the complete screen.

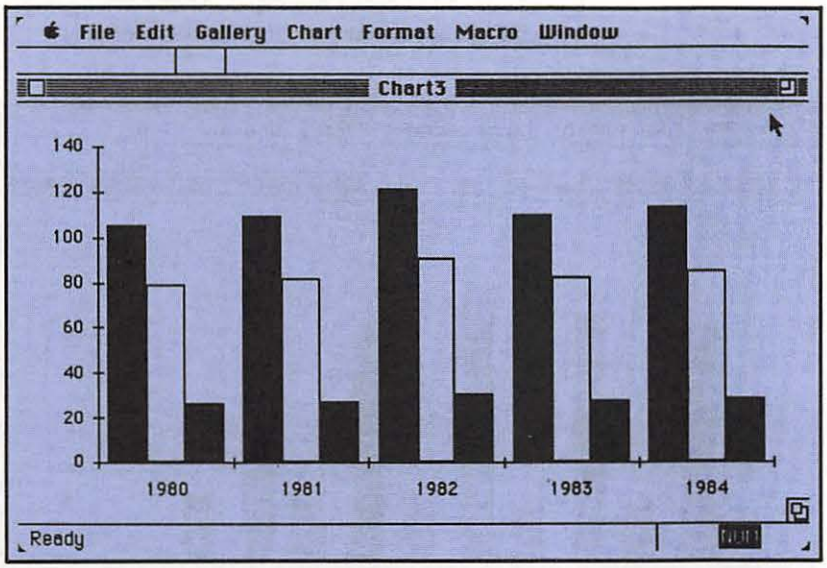


Figure 19.44
The chart has three sets of data plotted.

With several different columns (as you have created here), bars or lines, it may become confusing as to which column, bar or line represents which set of numbers. This situation is rectified by the addition of a legend to the chart.

Pull down the Chart menu and select the Add legend option.

This command is used to add a legend to a chart.

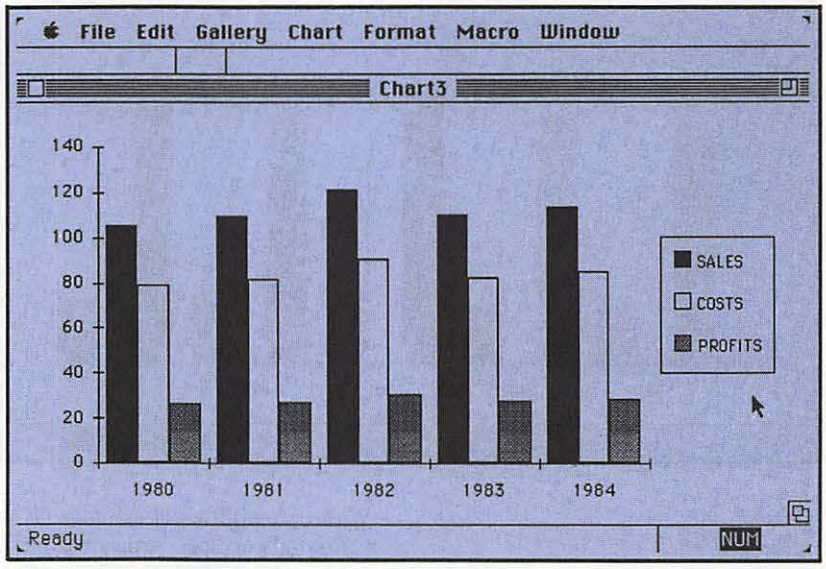


Figure 19.45
The Add Legend option of the Chart menu has been selected.

Release the mouse.

Execute the Add Legend command. After a brief pause, a legend will appear on the right side of the display.

Figure 19.46
A legend has been added to the graphic.

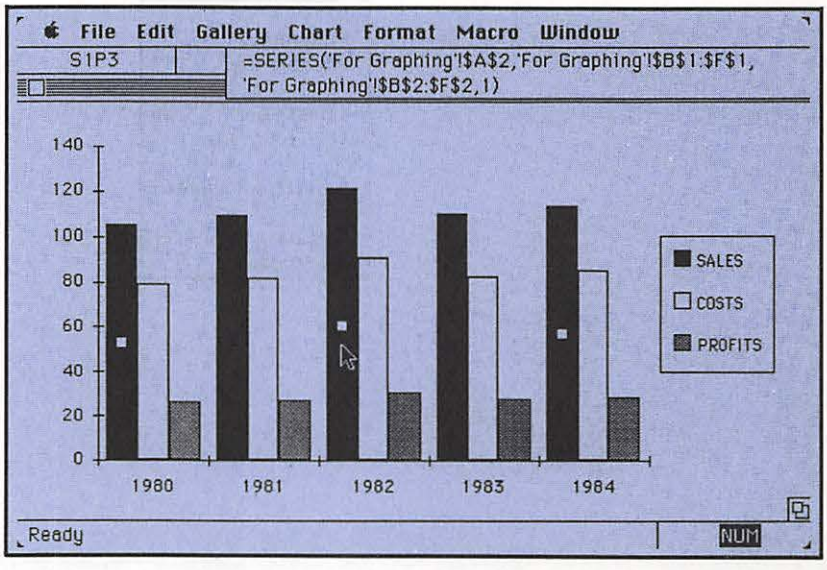


The legend labels of sales, costs and profits were taken from the text information found in the first column of the range used to create the chart. In this case the legend labels are found in cells A2, A3 and A4. As with the first chart you created, the X-axis labels, the years, are taken from the first row of the range used to create the chart.

Click on one of the bars displayed for the Sales figure.

Select the first data series.

Figure 19.47
The first data series has been selected. Note the white boxes on the columns representing the Sales figures.



Pull down the Format menu, select the Patterns option and release the mouse button.	You want to change the fill pattern.
Click on the third fill pattern from the right in the lower portion of the display.	You are removing the solid black pattern.
Click on the OK button.	Complete the change of fill pattern. The Sales columns will take on the new fill pattern.

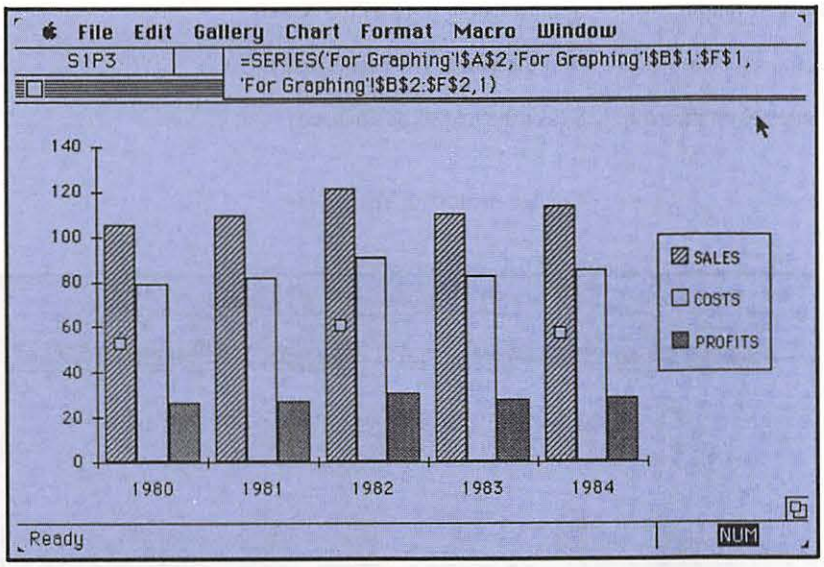


Figure 19.48
The fill pattern for the Sales values has been changed.

Pull down the Chart menu, select Attach Text and release the mouse button.	You are going to add text to the chart.
Click on the Chart Title button.	You are going to place a title on the chart.
Click on the OK button.	Add the title. The preset text is "Title".
Double-click on the word Title on the edit line.	Select the text to be changed.
Sales History [cr]	Change the text to Sales History.
Pull down the Chart menu, select Attach Text and release the mouse button.	You are going to add more text to the chart.
Click on the Value Axis button.	You are going to label the Y-axis
Click on the OK button.	Add the label. The preset text is "Y".
Double-click on the letter Y on the edit line.	Select the text to be changed.
Millions of $ [cr]	Change the text to Millions of $.

Pull down the Format menu, select the Text command and release the mouse button.	You are going to change the Y-axis label to vertical positioning.
Click on the Vertical Text box.	Set the text to vertical.
Click on the OK button.	Exit the dialog box.
Pull down the Chart menu, select Attach Text and release the mouse button.	You are going to add more text to the chart.
Click on the Category Axis button.	You are going to label the X-axis
Click on the OK button.	Add the label. The preset text is "X".
Double-click on the letter X on the edit line.	Select the text to be changed.
Year [cr]	Change the text to Year.

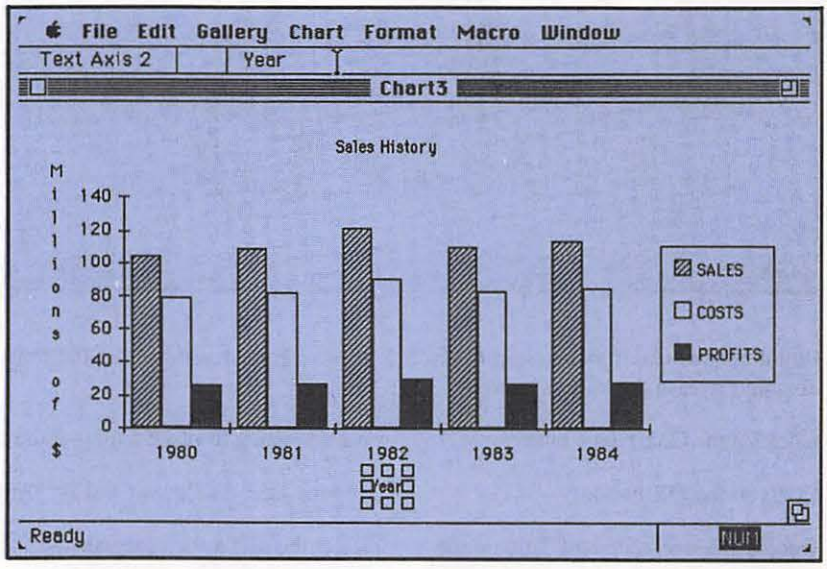


Figure 19.49
The chart has been labeled.

⌘S	The Save command.
BAR CHART	Name this chart BAR CHART.
Click on the Save button.	Complete the Save command.
Pull down the Gallery menu, select the Line option and release the mouse button.	You want to look at this chart in another format.

Click the mouse button on line chart type 4.

This line chart includes gridlines.

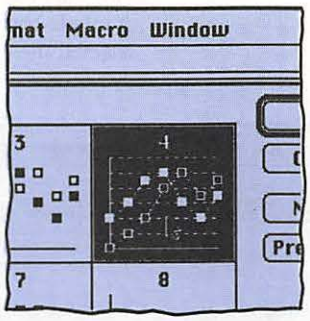


Figure 19.50
Line type 4 has been selected.

Click on the OK button.

Create the multi-line chart from the multi-bar chart.

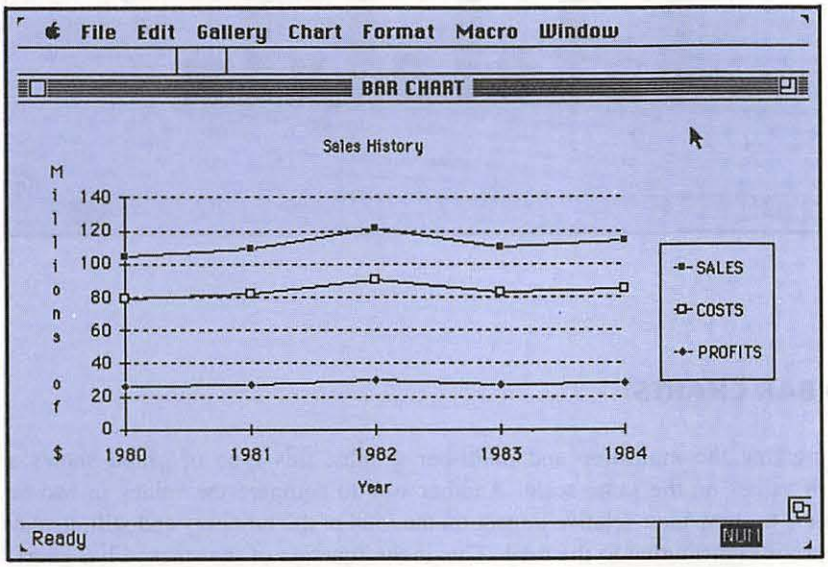


Figure 19.51
The same data is now displayed as a multi-line chart.

Pull down the Gallery menu, select Column and release the mouse button.

You are going to return the chart to a Column format.

Click on Column chart type 4.

This format will overlap the columns of the chart.

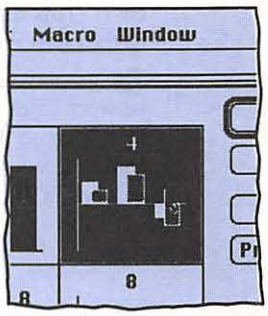


Figure 19.52
Column type 4 has been selected.

Click on the OK button.

Create the overlapping column chart. Note that the fill style change you made for the Sales values has been lost. This happens whenever you change chart types. Keep this in mind. You should change fill styles after you have selected the chart type.

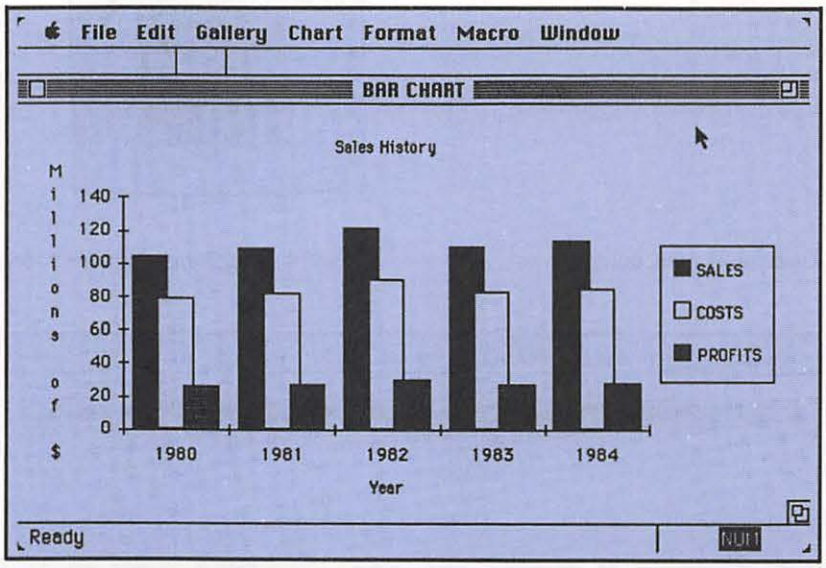


Figure 19.53
The overlapping column chart format has been selected.

19.7 STACKED BAR CHARTS

As you saw when creating the multi-line and multi-bar graphs, this type of graph shows a comparison of sets of values on the same scale. Another way to compare the values in two or more sets of numbers is to show their relative impact on the total of the numbers and still display the amount each figure is contributing to the total. This is the function of the stacked bar chart. This is the type of graph you will create in the following section.

What To Do

Click the mouse on one of the columns representing Sales.

Why You Are Doing It

You want to remove this series of information from the chart. This series represents a row of data in the middle of the chart range.

The graph you are now creating, to show the relation between sales and costs, should not include the sales values, because the cost value plus the profit value should equal the sales value. You do not want to double count a number in the graphing process.

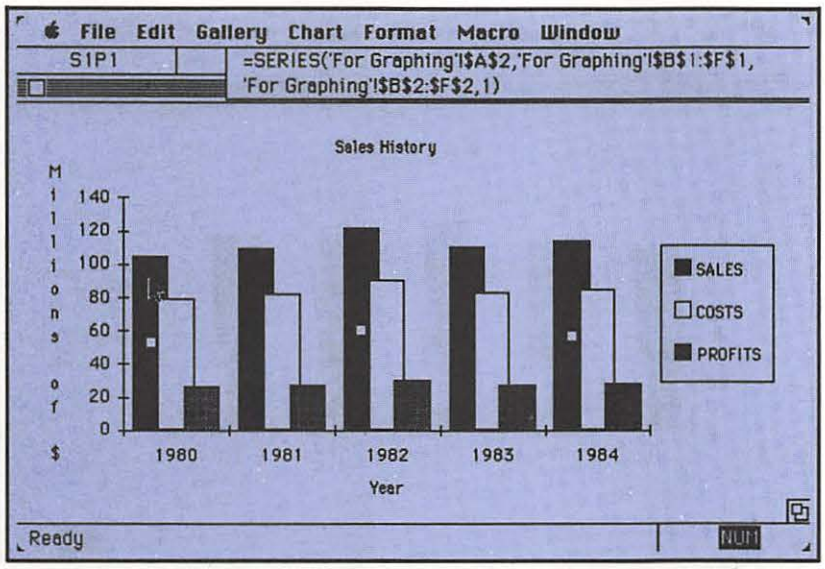


Figure 19.54
The Sales columns have been selected

Select the series description on the edit line.

You are going to edit the complete description for this column of the graph.



Figure 19.55
The complete series definition has been selected.

[BackSpace]

Press the backspace or delete key on the keyboard to erase the description of the column.

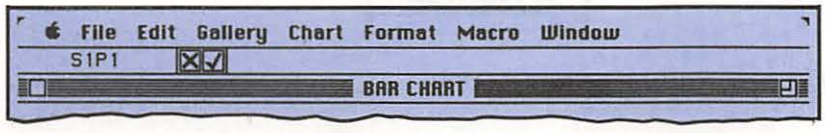
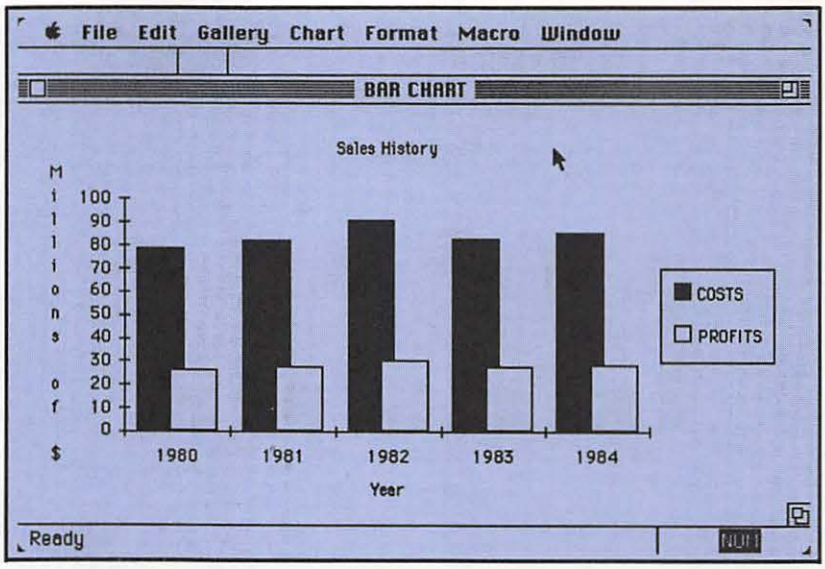


Figure 19.56
The series definition has been removed.

[cr]

Enter the empty line as the description for this series of data. The chart will change to display just Costs and Profits.

Figure 19.57
The chart now has only two sets of data displayed, Costs and Profits.



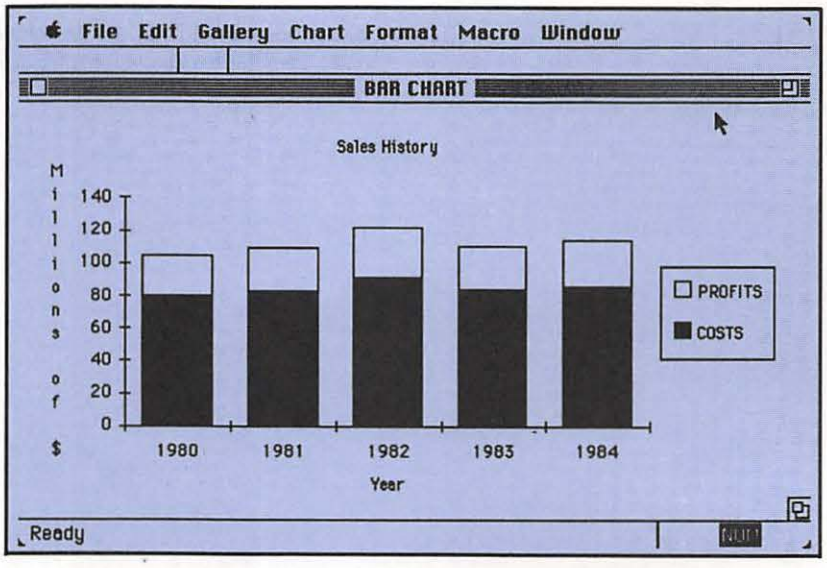
Pull down the Gallery menu, select Column and release the mouse button.	You are going to use a new Column chart type.
Click on Column type 3.	This is a stacked column chart.

Figure 19.58
The third column style has been selected.



Click on the OK button.	Create the chart.

Figure 19.59
The stacked column chart.



Pull down the File menu, select the Save As command and release the mouse button.	You do not want to use the Save command, since that will change the saved chart called BAR CHART to the current chart.
STACKED	Name this chart STACKED.
Click on the Save button.	Complete the Save command.

19.8 SAVING A CHART IN THE SCRAPBOOK

You should recall that it is possible to add a graphic to your Word documents. You did this task earlier in the text by importing the graphic through the scrapbook. It is possible to include an Excel chart in a Word document by first placing the chart into the scrapbook, and then retrieving it while using Word.

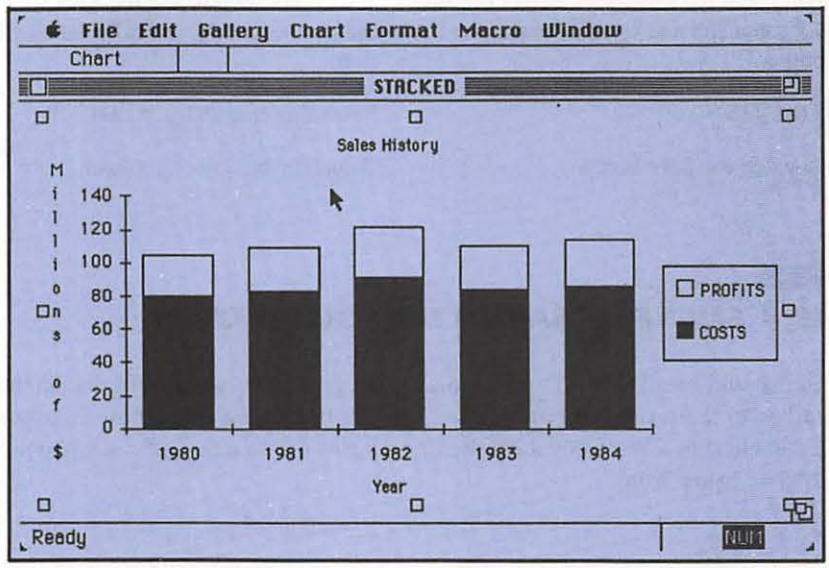
What To Do	*Why You Are Doing It*
Pull down the Edit menu.	Look at the Edit menu. Since you have not selected any part of this chart, the Cut, Copy and Paste commands are all dimmed. There is nothing available on which these commands can operate.



Figure 19.60
The commands on the Edit menu are all dimmed.

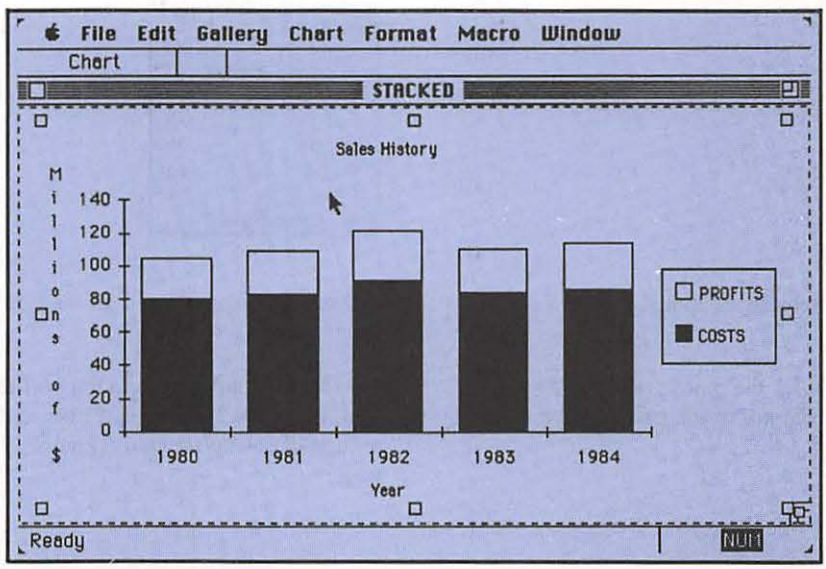
Release the mouse button.	You cannot do anything with the Edit commands at this time.
Click the mouse pointer above the columns of the current chart.	Select the complete chart. You will see the word Chart appear to the left of the edit line, and handles will appear around the complete chart (Figure 19.61 on the next page).

Figure 19.61
The complete chart has been selected. Note the location of the mouse pointer in this figure. This is the area that the pointer was positioned when the mouse button was clicked.



⌘C	The Copy command. If you pull down the edit menu, you will see that this command is no longer dimmed. When you execute this command, a dashed line will appear around the complete chart, indicating that it has been placed into the clipboard for copying.

Figure 19.62
The dashed line surrounding the complete chart indicates that it has been copied to the clipboard.



Pull down the Apple menu, select Scrapbook and release the mouse button.	Activate the Scrapbook.

⌘V	The Paste command from the edit menu. This will place the chart into the scrapbook.

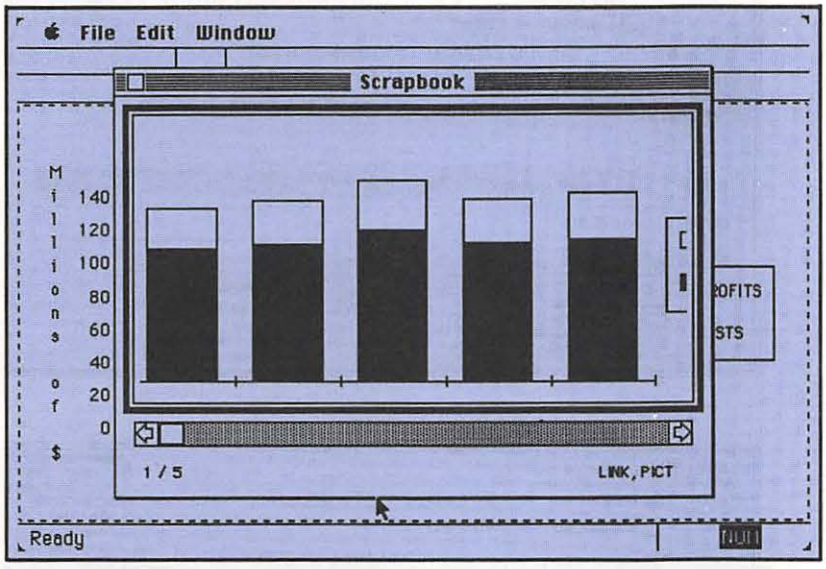


Figure 19.63
The chart is now in the scrapbook.

Click on the close box on the scrapbook's title bar.	Put away the scrapbook. This chart is now available to you to paste into a Word document or any other application that accepts graphic information from the scrapbook.

19.9 PRINTING YOUR CHARTS

The value of the graphics you have created would be greatly reduced if you could not output them onto paper or some other form of hardcopy, such as acetate film for an overhead transparency.

This last section helps you generate the printed copy of your graph.

To continue with this section, the computer you are using MUST have a printer or plotter attached. If you attempt to print/plot without one of these devices attached, you will waste some time while the computer looks for the printer.

You are going to print the current chart first. This is the Stacked chart that you have been working with.

Figure 19.64
Page Setup on the File menu has been selected.



What To Do	*Why You Are Doing It*
Pull down the File menu and select Page Setup.	You want to make a change in the page setup before printing the chart.
Release the mouse button.	Activate Page Setup (Figure 19.65 on the next page).

Figure 19.65
This is the Page Setup dialog box you will see if you have selected an ImageWriter printer using the Chooser.

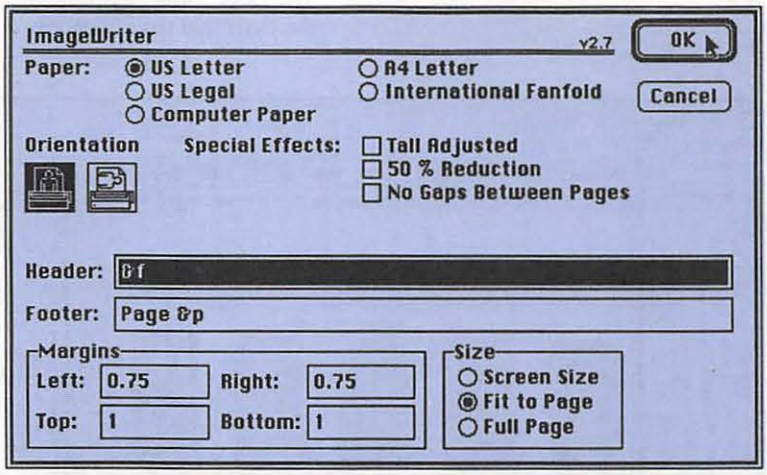


Figure 19.66
This is the Page Setup dialog box you will see if you have selected a LaserWriter printer using the Chooser.

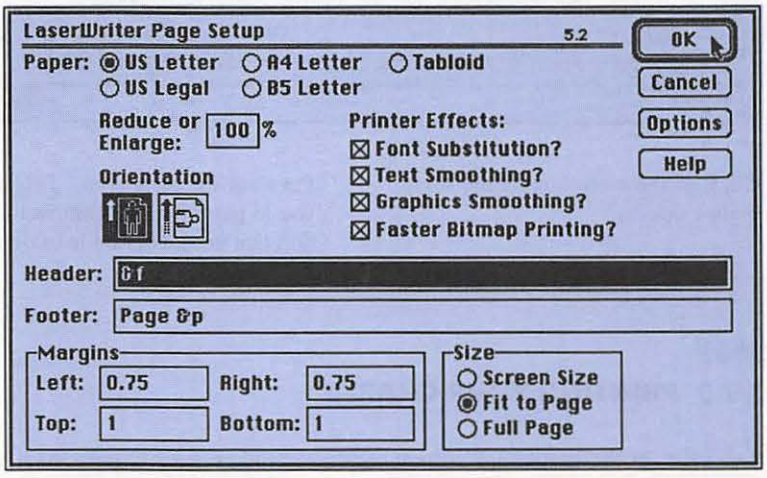
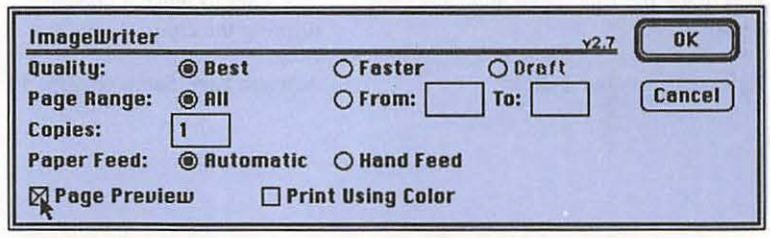


Figure 19.67
The Landscape orientation has been selected.



Click on the sideways orientation icon.	This orientation, called Landscape orientation, will print the charts sideways on the page. The original orientation, called Portrait orientation, will print a smaller chart on the page.
Click on the OK button.	Leave the Page Setup dialog box.
⌘P	The Print command, found on the File menu.
Click on the Page Preview check box at the lower left corner of the dialog box.	You want to see what your output will look like before printing it.

Figure 19.68
This is the Print dialog box you will see if you are using an ImageWriter printer.



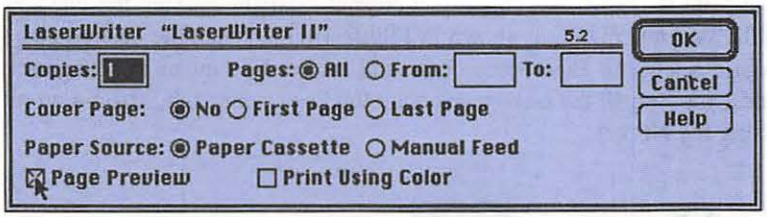


Figure 19.69
This is the Print Dialog box you will see if you are using a LaserWriter printer, although your printer name may be different.

Click on the OK button.

You want to see what the chart will look like.

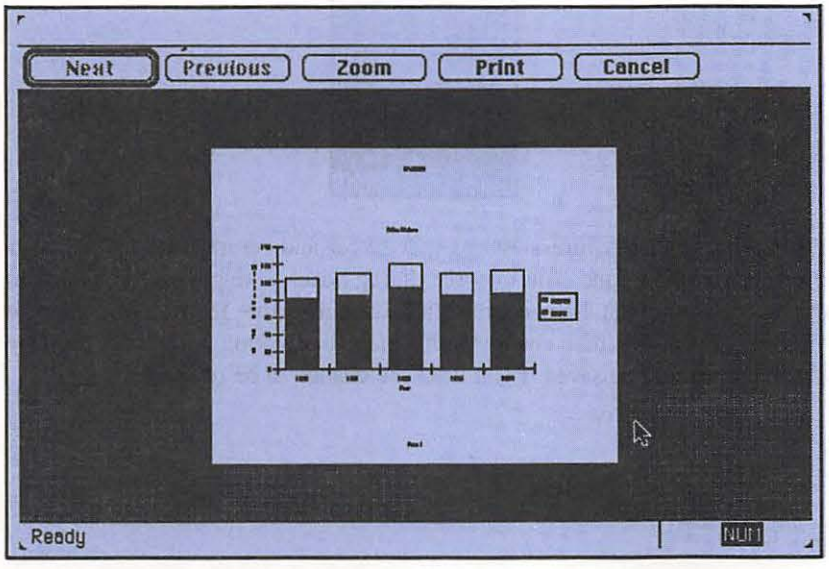


Figure 19.70
The Page Preview display for the current chart.

Click on the Print button.

If you have a printer attached to your computer, print the chart. Otherwise, click on the Cancel button.

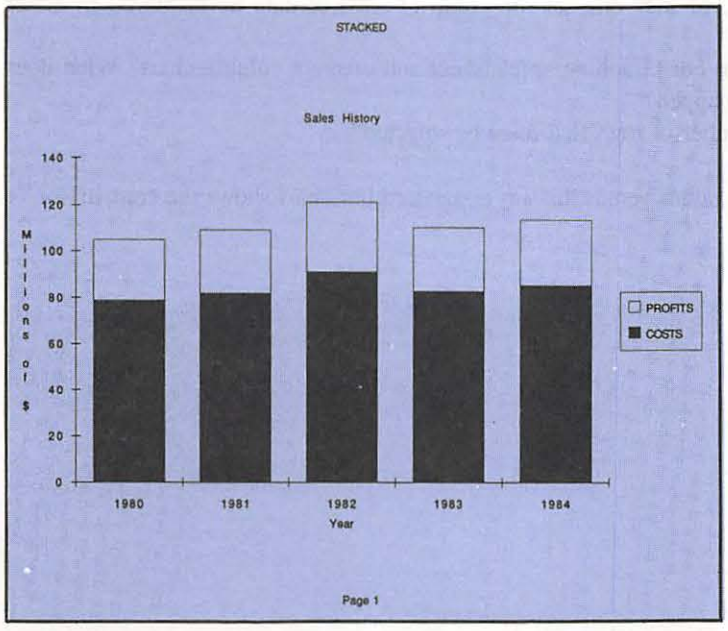


Figure 19.71
The output generated when you print the chart.

It is a simple matter to print the other two charts you created. Start by making the one you want to print active using the Window menu, as shown in Figure 19.72. When the desired chart is active you must once again select the Page Setup command on the File menu to change the printing orientation to Landscape. Finish the task by selecting the Print command, also found on the File menu, or by pressing the ⌘P key.



Figure 19.72
The Window menu has been pulled down. The check mark in front of STACKED indicates that it is the currently active window. The Sales History chart has been selected, and will become active when the mouse button is released.

When you are done printing charts, press ⌘Q to quit Excel and return to the Macintosh Finder. Depending on what you have done, you may see dialog boxes asking you if you want to save changes to some of the items you have open. Click on either the Yes or No button to complete the Quit process. Be aware that changing the print orientation to Landscape is a modification to the graph and should be saved if you want the change to be retained.

EXERCISES

1. Must the values you want to graph be entered on the spreadsheet before you may view or display the graph?
2. Are the main graph titles placed above or below the graph?
3. What data range is used to supply the labels for the X-axis?
4. What data range is used to supply the names of the slices for a pie chart?
5. Are the data values different for line and bar charts, or may one set (or group of sets) of data be displayed in either format?
6. What will happen if you select the range A2:F3 of the For Graphing spreadsheet and create a column chart? What does this chart look like? Is this what you expected would happen?
7. To create a multi-line chart, what is the minimum number of rows that must be selected?
8. What purpose do legends serve on a graph?
9. How does a stacked bar chart show the comparison of values versus the way a standard bar chart shows the comparison of values?
10. Create a line graph of the following data:

Year	Sales
1978	$ 51,000
1979	$ 54,500
1980	$ 62,500
1981	$ 69,000
1982	$ 79,250
1983	$ 85,875

11. Create a bar graph of the following data:

Year	Profit
1978	$ 1,121
1979	$ 2,302
1980	$ 3,265
1981	$ 4,100
1982	$ 4,877
1983	$ 5,541

12. Turn the line chart you made in Exercise 10 into a bar chart.
13. Turn the bar chart you made in Exercise 11 into a line chart.
14. Create a pie chart of the following data:

Sales by Division in Millions of Dollars

Division	Sales
Northwest	$ 1.5 million
Southwest	$ 2.2 million
Midwest	$ 1.8 million
Northeast	$ 2.1 million
Southeast	$ 1.1 million

Create the following spreadsheet for Problems 15 through 19.

	A	B	C	D	E	F	G	H
1		TOTAL		TOTAL		PERCENT	PERCENT	PERCENT
2		CURRENT		CURRENT	CURRENT	CHANGE	CHANGE	CHANGE
3	YEAR	ASSETS	INVENTORY	LIAB.	RATIO	ASSETS	INVENTORY	LIAB.
4	1980	1327.0	542.8	889.3	1.492	---	---	---
5	1981	1418.4	583.7	970.0	1.462	6.89%	7.54%	9.07%
6	1982	1432.7	578.6	976.8	1.467	1.01%	-0.87%	0.70%
7	1983	1575.9	603.4	1059.6	1.487	10.00%	4.29%	8.48%
8	1984	1703.0	656.9	1163.6	1.464	8.07%	8.87%	9.82%
9	1985	1778.5	663.9	1232.7	1.443	4.43%	1.07%	5.94%
10	1986	1886.6	691.6	1316.5	1.433	6.08%	4.18%	6.80%
11	1987	2001.3	720.5	1406.1	1.423	6.08%	4.18%	6.80%

The cell formula for E4 is (B4/D4), or Current Assets divided by Current Liabilities. This cell should be copied for the E column. The formula for F5 is ((B5–B4)/B4). This can be copied into cells G5 and H5, and then down the F, G and H columns. Use Range formatting to make the Year column display as an integer; the Current Assets, Inventory and Current Liabilities columns display as fixed decimal with one digit to the right of the decimal point; the Current ratio as fixed decimal with three digits; and the three percent change columns display in percent format with two digits to the right of the decimal.

15. Create a line chart of the current ratio column.
16. Create a multi-bar chart of the Total Current Assets, Inventory and Total Current Liabilities columns.
17. Create a multi-line chart of the three percent change columns.
18. Create a pie chart of the 1983 current assets, inventory and current liabilities values.
19. Print the graphs you created in Problems 15 through 18.

CHAPTER

AN INTRODUCTION TO HYPERCARD

20

CHAPTER OBJECTIVES:

Upon completion of this chapter, the student will:

- **Create a new stack.**
- **Create buttons.**
- **Create fields.**
- **Add graphics to a card.**
- **Link cards.**
- **Create and modify a HyperTalk script.**
- **Print a stack.**

20.1 WHAT IS HYPERCARD?

HyperCard is an application that in some ways resembles a database management program. It lets you create files, called stacks in HyperCard, that contain records, called cards, that in turn contain fields.

Like a database manager, HyperCard lets you sort its cards based on the contents of a field. You may find specific cards based on the contents of its fields. Of course, you can generate printed copies of cards or a report of the whole stack.

This is where the resemblance between a database management program and HyperCard ends.

HyperCard lets you link cards in any way you feel is appropriate for the information with which you are working. For example, you may have a stack in which you are recording the history of the development of artistic styles. It is possible to link a card that contains information about a particular artist to cards that contain:

- samples of his work,
- information about the style of printing used,
- information about other artists of the same time period, and
- information about the society and culture of the time in which he lived.

Another stack might be a your address book and appointment calendar. The links you might see for this stack are illustrated in Figure 20.1.

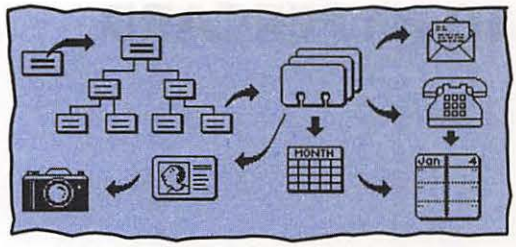


Figure 20.1
The arrows show the possible links among the various cards of this stack.

All of these different types of information may be in one single stack, or in several different stacks. It does not matter to HyperCard. It can get information from multiple stacks as easily as it can from a single stack.

It should be apparent that, since a stack can hold different formats of information, there are no fixed rules regarding the fields of a stack. You will see that no two cards of a single stack necessarily have the same fields. The ability to vary the contents and layout of each card in a stack is a very powerful feature of HyperCard.

Another powerful feature of HyperCard is the button. Buttons should be familiar to you as a Macintosh user. You know about the Yes and No buttons, Cancel and OK buttons, and several others that may appear in dialog boxes.

A HyperCard button can serve the same functions as these traditional Macintosh buttons. Additionally, a HyperCard button can be made to perform any task you want. This is because you may attach a series of commands to the button. These commands are written in the HyperCard language, called HyperTalk. A group of commands attached to a HyperCard item is called a script.

The final feature that makes HyperCard a powerful tool is that scripts may be attached to any HyperCard item. You may attach a script to stacks, cards, fields or buttons. Thus, not only can you make HyperCard perform a task when you click on a button, but when you click on a field, open a stack, click on a card, go to a different card, or at almost any time you want.

HyperCard performs these tasks when an event occurs. The most common event is the mouseUp. The mouseUp event is detected by HyperCard whenever you release the mouse button. Another event is openStack, which is the event that can cause something to happen when the stack is opened. Both these events will be used later in this chapter.

20.2 LAUNCHING HYPERCARD

HyperCard works easiest on a computer that has a hard disk. If your Macintosh does not have a hard disk, boot it with the disk labelled HyperCard StartUp. HyperCard is set as the start-up program on this disk, and will start running automatically. If you do not have a disk labelled HyperCard StartUp, then boot your Macintosh with a System Start-Up disk, and insert the HyperCard and Stacks disk into one of the computer's disk drives.

If you are using a machine with a hard disk you will not need to insert the HyperCard program disk into a disk drive. Rather, locate the HyperCard folder, and open it so you can see the HyperCard program icon. Place a disk (see Chapter 3 for how to initialize a new disk) with at least 200K available space into another one of your Macintosh's disk drives, if you have one available. This disk will be used for saving your work. If you do not have a free floppy disk drive, keep this disk available. You will need it for data storage.

In these instructions, [cr] means to push the *Return* key on your computer's keyboard (remember, this is NOT the *Enter* key). A ⌘ in front of a letter (e.g., ⌘X) means to hold down the *Command* key while pressing the given letter. Letters enclosed in square brackets (e.g., [TAB] or [ENTER]) mean to push that key on the keyboard, and not to type out the word. Finally, the phrase "Click the mouse on ..." means to move the mouse pointer to the specified item and push the mouse button once. The phrase "Double-click the mouse on ..." means to move the mouse pointer to the specified item and double-click the mouse button. The word "drag" means to select an item, be it an icon or the menu selection bar, and move the mouse while the mouse button is pressed.

WHAT TO DO	WHY YOU ARE DOING IT
If the disk's icon is closed, double-click on it with the mouse pointer.	Open up the disk icon onto the desktop.
Locate the HyperCard folder on the desktop. If it is closed, double-click on it with the mouse pointer.	Open the folder containing the HyperCard program.
Locate the HyperCard program icon inside the disk window (Figure 20.2).	
Move the mouse pointer to the Hyper-Card icon and double-click the mouse button.	Launch HyperCard. Remember, if you are having trouble with the double-click, you may select the Excel icon with a single click, then use the Open command on the File menu (or ⌘O) to launch Excel. After a brief pause you will see the HyperCard Home card. Note the hand icon pointing to the words Home Card at the top of the screen. This is the mouse icon, and is called the Browse tool in HyperCard.

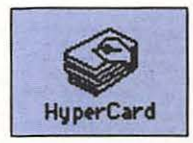


Figure 20.2
The HyperCard program icon.

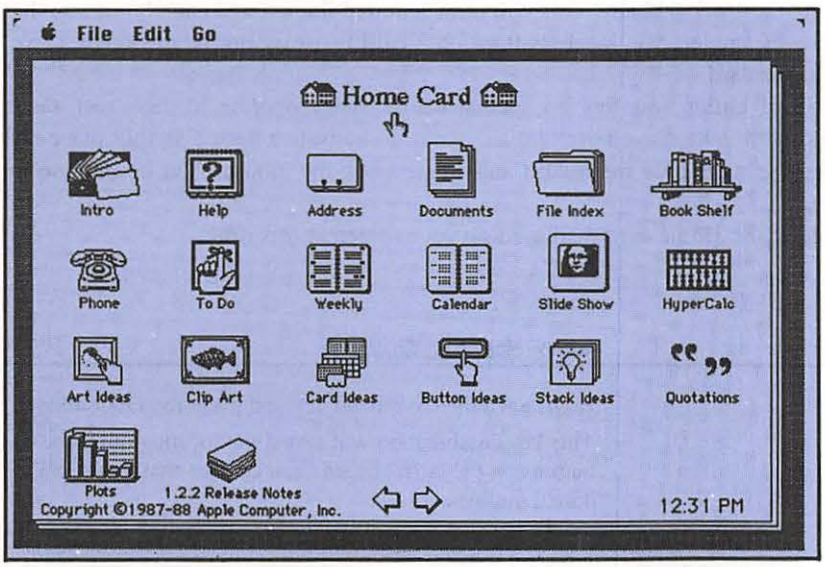


Figure 20.3
The initial Home card. The Browse tool is pointing to the words Home Card.

20.3 THE HOME CARD AND HOME STACK

Everything that you do with HyperCard revolves around the Home card. The Home card is the first card of a small stack called the Home stack. The Home card that is shipped with HyperCard has several buttons on it that link it to other stacks. Most HyperCard stacks have buttons that take the user back to the Home card. There is even a command on one of the HyperCard menus to return you to the Home card. As a result, it is very difficult to get totally lost when using HyperCard. You can always return to Home.

In addition to the Home card you are looking at, the Home stack contains several other cards used by HyperCard. Some of these cards are used to tell HyperCard the names of folders that contain other stacks, applications and documents. As you use and modify HyperCard, the contents of these cards will change. Either you will make changes, or HyperCard itself will make changes.

The last card of the Home stack is the User Preferences card. With this card you can tell HyperCard how much control you want to have over it. By setting the User Preferences level to the lowest possible level, called Browsing, you severely limit what can be added or changed on a stack. In fact, at the Browsing level, all you can do is look at the contents of stacks and click on buttons. The opposite of the Browsing level is the Scripting level. This level of HyperCard user is able to create new cards and stacks, change the information on cards and write scripts for items on the cards.

20.4 FINDING AND USING HYPERCARD BUTTONS

Generally you will find that HyperCard buttons that are intended for your use are easy to locate on any given card. For example, the Home card has 22 buttons. There is a button underneath each of the 20 icons on the card, and the two arrows at the bottom center of the card are buttons.

If you are ever in doubt about the location of a button on any particular card, you may quickly find it by using the Option-⌘ key. This will draw a dotted line around each button on the card. Using the Option-⌘ key lets you locate buttons on a card that may not be obviously there when you first look at the card.

To use a HyperCard button requires no special effort. They operate in the exact same fashion as all the Macintosh buttons you are familiar with. To activate a button simply place the mouse pointer, or Browse tool, over the button and single click the mouse. You never have to double-click a button.

You should still have the Home card displayed on your screen at this time.

What To Do	*Why You Are Doing It*
⌘ [OPTION]	Hold down the Command key and press the Option key. This key combination will reveal the location of all the buttons on the current card. You can see that they have dotted outlines.

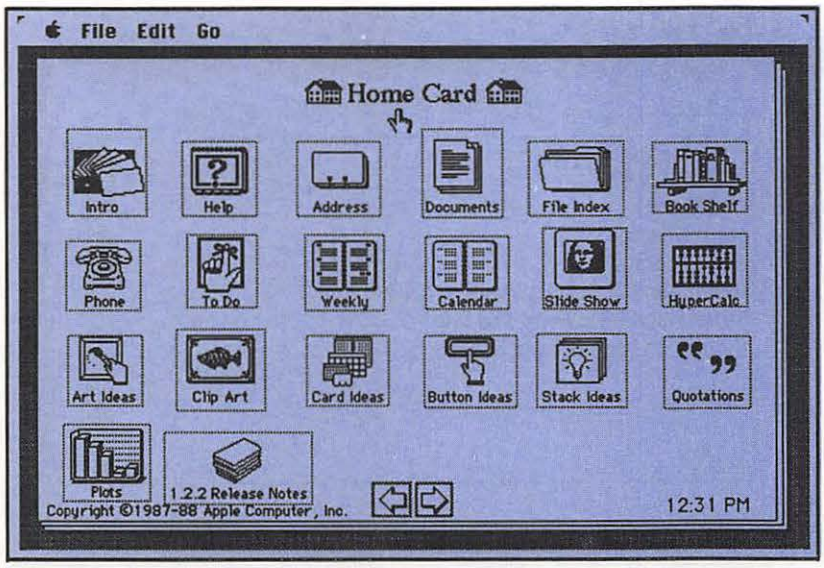


Figure 20.4
The 22 buttons on the Home card have been outlined.

While HyperCard recognizes both a first and last card on all stacks, they are functionally connected to each other. Thus, the card previous to the first card on any stack is the last card of that stack. The card after the last card is the first card of that stack. The Home stack is like all other stacks in this regard.

Position the Browse tool on the right-pointing arrow at the bottom of the card.

You are going to move forward in this stack. This is a typical "next card" button. The next card button can have any icon associated with it, just as any button may have any icon. Generally, however, you will find that a next card button somehow points to the right, suggesting movement in that direction.

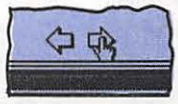


Figure 20.5
The Browse tool has been placed on the arrowhead at the bottom of the card.

Click the mouse button.

The right arrow is a button that will move HyperCard to the next card in the stack. In fact, this button has a small script associated with it that tells HyperCard to go to the next card in the stack. You will see this script later in this chapter. At present, you should see the card that tells HyperCard where to look for stacks.

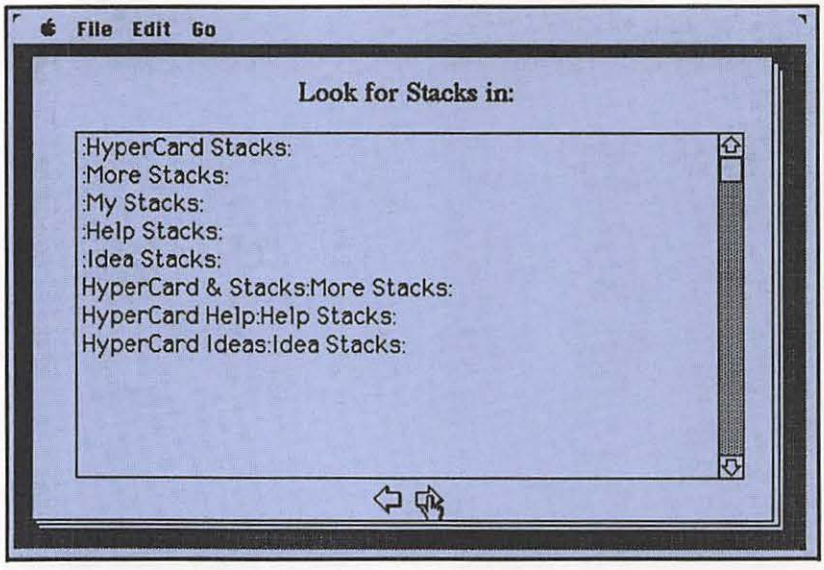


Figure 20.6
The second card of the Home stack.

Click on the next card button three more times.	You should now be on the card called User Preferences. This is the last card of the Home stack.

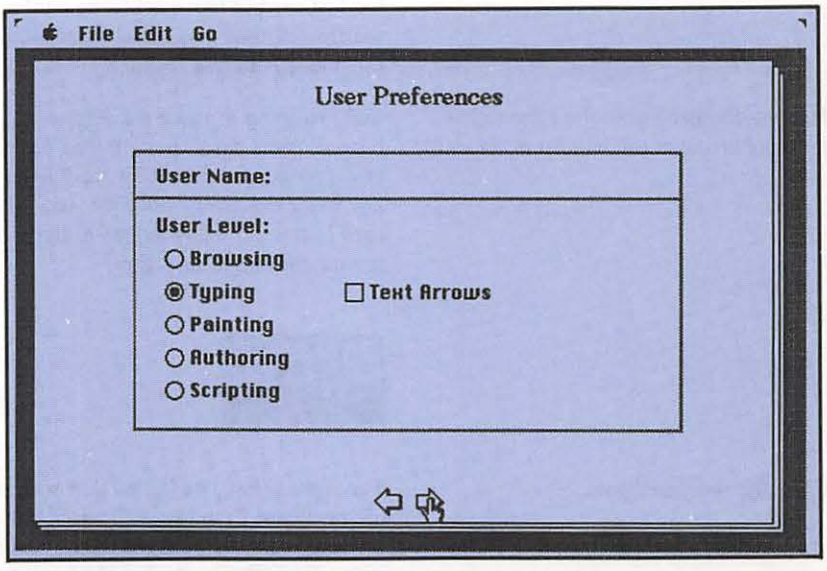


Figure 20.7
The User Preferences card is the last card of the Apple Computer, Inc. distributed Home stack.

Click on the next card button once.	Since the User Preferences card is the last card in the stack, the next card button will return you to the first card of the stack.
Position the Browse tool on the left pointing arrow head.	This is a previous card button. Just as the typical next card button suggests moving in a forward direction, the typical previous card button suggests movement in the backward direction.

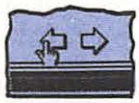


Figure 20.8
The Browse tool is positioned on the previous card button.

Click the mouse button.

Since you were on the first card of the stack, the previous button will take you to the last card. Its script is to go to the previous card in the stack. You should once again see the User Preferences card.

Click on the previous card button four more times.

After clicking on the previous button four times, you should once again have the Home card displayed.

Now you are ready to try using a button that has been linked to another stack.

Figure 20.9
The Browse tool is on the Address icon.



Place the Browse tool on the icon labelled Address.

You are going to go to the Address Book.

Click the mouse button once.

This button has a script that tells HyperCard to go to a specific stack. After clicking on this button you should see the first card of the Address stack.

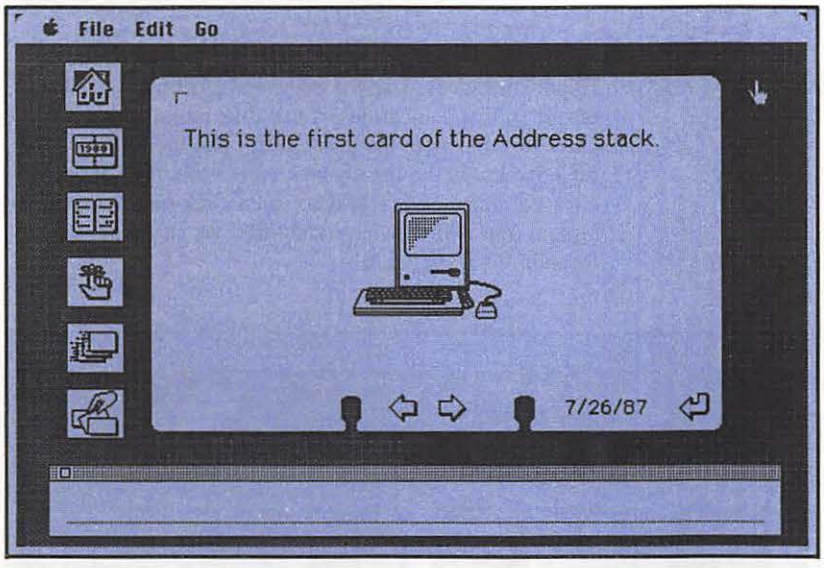


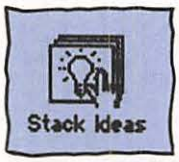
Figure 20.10
The first card of the Address stack.

Note that there are six icons on the left side of this card. They are all buttons. The top one, a picture of a house, will return you to the Home card.



Figure 20.11
The Browse tool is positioned on the house icon. This button will return you to the Home card.

Figure 20.12
The Stack Ideas button.



Click on the house icon at the top left of the card.

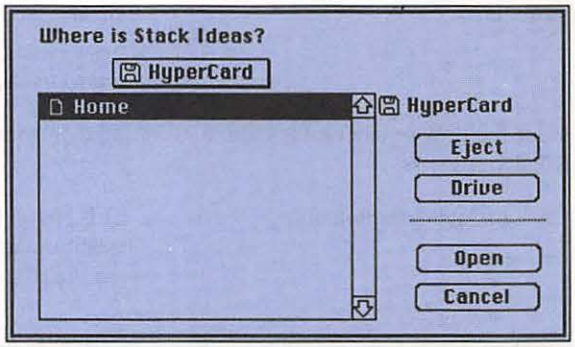
Return to the Home card.

Click on the Stack Ideas button.

Take a look at another stack.

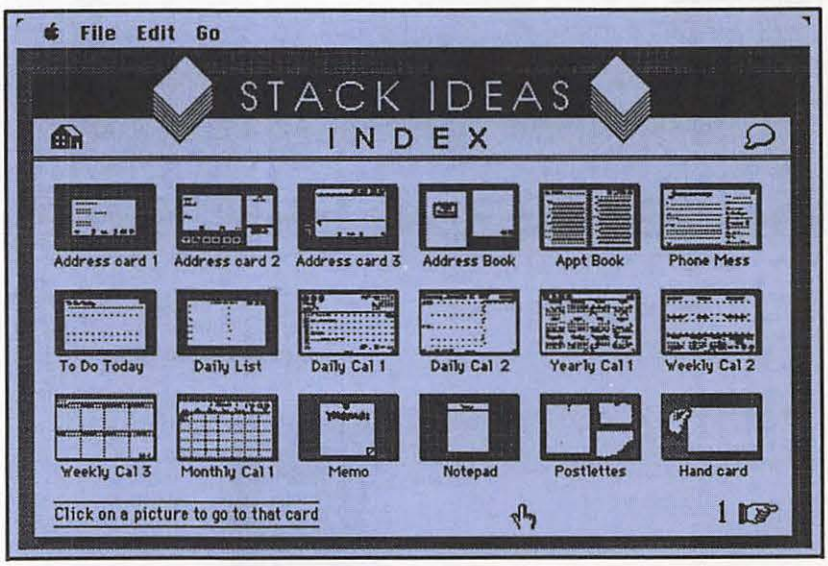
If you are using HyperCard without a hard disk, then HyperCard will not be able to immediately locate this stack. Instead, you will see a dialog box similar to the one shown in Figure 20.13, asking where to find this stack.

Figure 20.13
This dialog box appears when HyperCard is unable to locate a stack that it has been told to open.



To open this stack you must insert the disk labelled HyperCard Ideas. Use the drive and eject buttons as necessary so that you can insert this disk into a disk drive. Once this disk is in the disk drive, open the folder called Idea Stacks. In the list of stack names that then appears, click on the name Stack Ideas, then click on the Open button. You will now have identified the stack and its location for HyperCard.

Figure 20.14
The first card of the Idea stack. It is one of several cards that make up the index to the complete stack.



Note that this card also has an icon of a house on it, although it is different from the one found on the Address stack. The house icon, which is a button, is found at the top left of the card. There is also a next card button at the bottom right corner of the card. It is not an arrow, but rather a hand pointing to the right.

You can see that there is not a previous card button on this card. The designer of this stack did not want to give you direct access to the previous card from the first card of the stack. The reason for this is that the last card of this stack is not part of the index. It is, in fact, the card displayed if you click on the balloon at the top right of the current card.

Click on the balloon at the top right corner of the Idea Stack card.

This button will take you to a card that tells you about the Idea stack, and a little bit about how to use the stack.

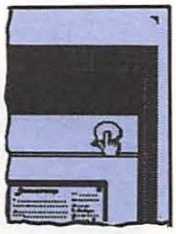


Figure 20.15
The Browse tool is on the balloon at the top right corner of the Idea Stack card.

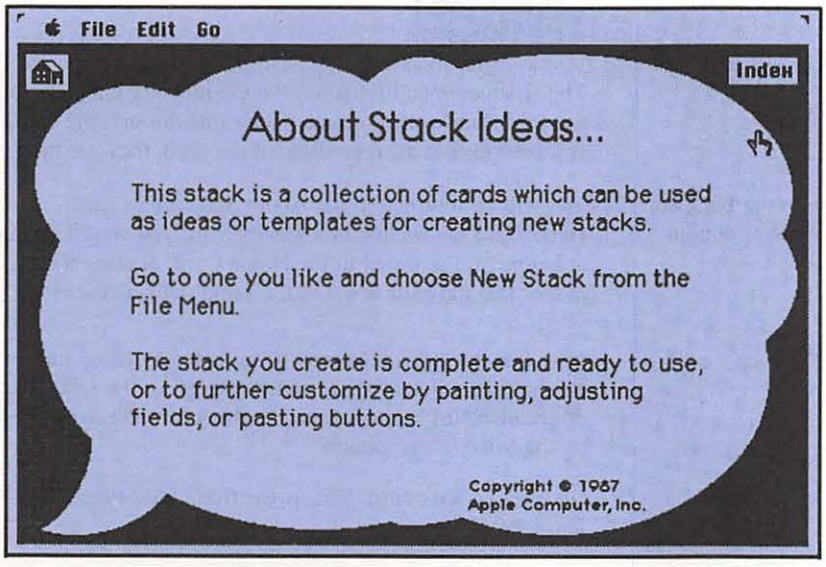


Figure 20.16
This is the About card of the Idea Stack.

Click on the Home button at the top left of this card.

You are done with this stack for the time being.

20.5 OTHER WAYS TO MOVE AROUND IN STACKS

As you saw on the first card of the Ideas Stack, there is not always a previous card button displayed or available on a card. The previous and next card buttons are items that are placed on a card by the person who creates the stack. Thus, it is reasonable to assume that the creator of the Ideas Stack did not want you to be able to go backwards in the stack from its first card.

When you are creating stacks yourself, you may forget to place a previous or next button onto a card. Fortunately, HyperCard provides other ways for getting around in your stacks through the Go menu. You will try them now.

What To Do	*Why You Are Doing It*
Pull down the Go menu.	The commands on this menu are used for moving around in stacks.

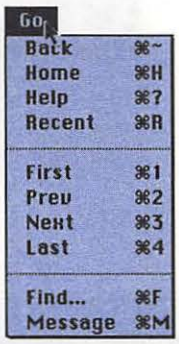


Figure 20.17
The Go menu has been pulled down.

	The first command found on the Go menu is Back. With this command you can trace backwards through the cards you have looked at, regardless of the stack they are in.
Drag the mouse down to the Back command and release the mouse button.	You will be returned to the About Stack Ideas card. HyperCard knows that this was the card you were looking at before you returned to the Home Card. It does not matter that the card is not in the same stack as the Home Card. Note that this command may be executed by using the ⌘~ key. The tilde (~) is found to the left of the space bar on the standard keyboard, and to the left of the numeral 1 on the extended keyboard.
⌘~	Go back another card. This is the first card of the Stack Ideas stack.
⌘~	Go back another card. You should return to the Home card, since that was the card you were looking at when you decided to use the Stack Ideas stack.
⌘~	Go back one more card. You should now be on the first card of the Address stack.
Pull down the Go menu.	Once again look at this menu.

Drag the mouse down to the Home command.

The second command is Home. Note that you may use the ⌘H key to execute this command.



Figure 20.18
The Home command has been selected.

Release the mouse button.

The Home command will return you to the Home Card.

Pull down the Go menu and drag the mouse down to the Recent command.

This command will take you to the Recent display. On this display, HyperCard will show you miniature versions of the last 42 unique cards you have looked at. Note that this command may be executed with the ⌘R key. Card images are placed on this display automatically. You do not have to do anything special when you create your own stacks.

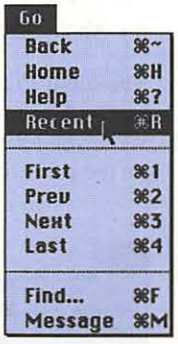


Figure 20.19
The Recent command has been selected.

Release the mouse button.

Execute the recent command.

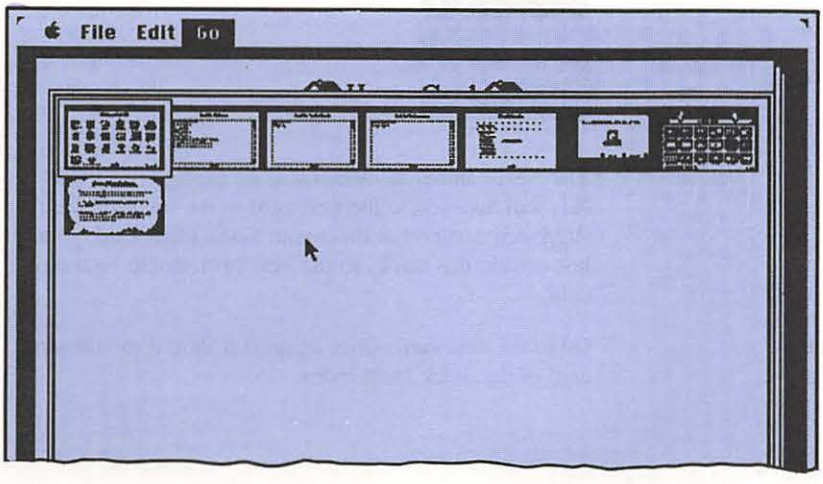


Figure 20.20
The current Recent display. The border around the image of the Home card means that that is the card you were looking at when you executed the Recent command.

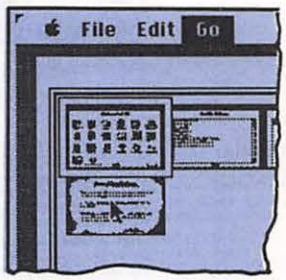
There are eight cards displayed here at this time. Even though several cards have been viewed more than once, they are displayed here only once. To maximize the number of cards that appear on the recent display, only unique occurrences of cards appear here. Thus, even though the Home card has been viewed several times, it appears here only once.

You can see that the Home card has a frame around it, indicating that it is the current card.

Position the mouse on the image of the About Stack Ideas card.

This card image appears directly below the Home card image. You want to go to this card.

Figure 20.21
The mouse pointer is now positioned on the card you want to go to.



Click the mouse button.

By clicking on the card image, you are instructing HyperCard to go to that card. Once again, you are looking at the About Stack Ideas card.

Pull down the Go menu and drag the mouse down to the Next command.

The First, Prev, Next and Last commands on the Go menu also provide you with a way to get around stacks when you have not put buttons to give you these functions on the cards of your stack.

Figure 20.22
The Next command has been selected.



The Next command, which may be executed by using ⌘3, will take you to the next card in the stack. It was suggested earlier that the About Stack Ideas card is the last card in this stack, so the next card should be the first card.

Release the mouse button.

Go to the next card. Once again you should see the first card of the Stack Ideas index.

⌘3

Go to the next card. This command key has the same effect as pressing on the next card button that is located at the bottom right of the card. You should now be on card 2 of the Stack Ideas index.

⌘3 ⌘3

Two more presses of the Next command will bring you to the fourth card of this stack. You can see that this card of the Stack Ideas Index has a previous button, but not a next button at the lower right corner of the card.

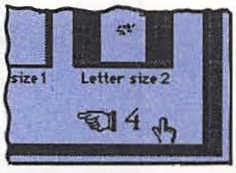


Figure 20.23
The fourth card of the Stack Ideas index does not have a next card button.

⌘3

Go to the next card, even though there is no next card button. This appears to be another form of the address card, with several buttons placed at the bottom of the card, rather than on the left side of the card.

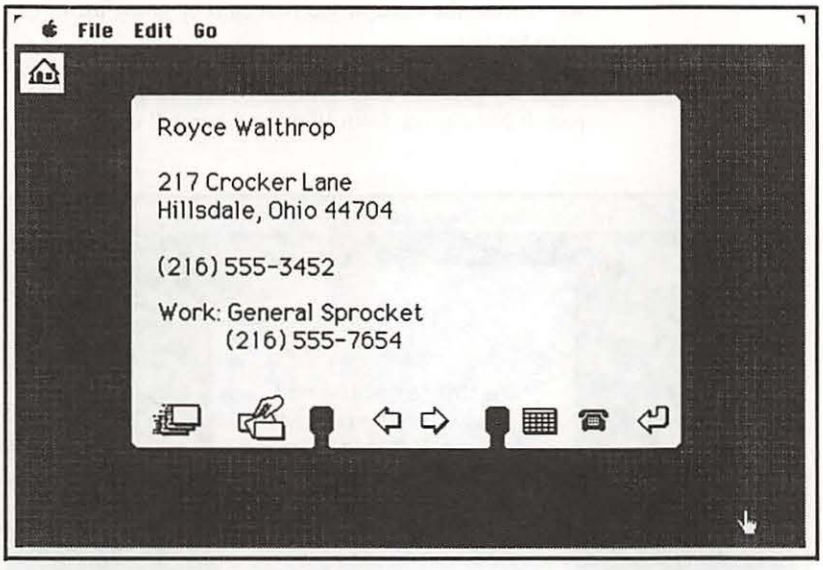


Figure 20.24
This is the fifth card of the Stack Ideas stack. You got to it by using the Next command.

Pull down the Go menu and drag the mouse down to the First command.

The First command, which may be executed by using the ⌘1 key, will take you to the first card in the current stack.

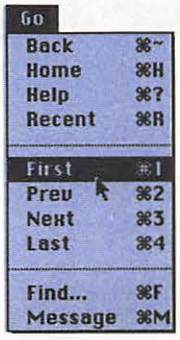


Figure 20.25
The First command has been selected.

Release the mouse button.

You will return to the first card of this stack.

Pull down the Go menu and drag the mouse down to the Prev command.

The Prev command will take you to the previous card in the stack. It may be executed by using the ⌘2 key.

Figure 20.26
The Prev command has been selected. Prev is short for the word previous.



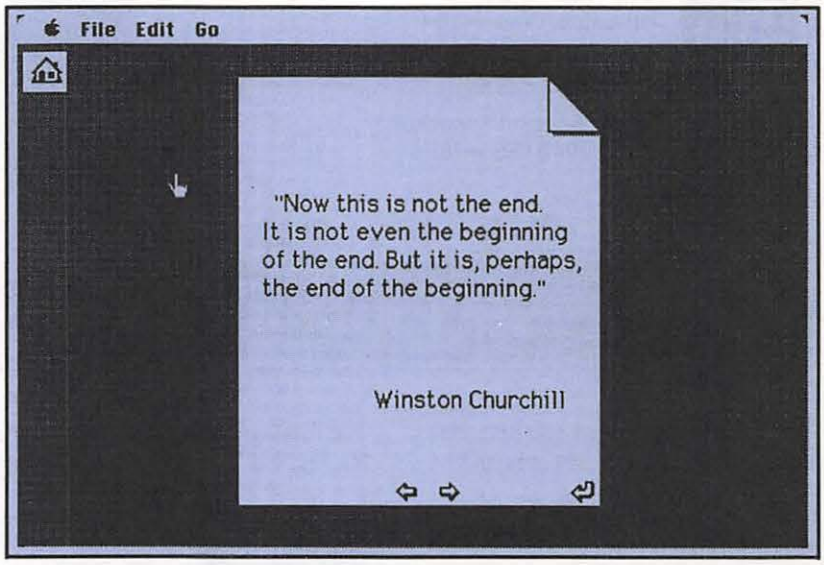
Release the mouse button.

You will now, once again, be on the About Stack Ideas card. You already knew that this card was the last card of the stack, which is why it is previous to the first card. Always remember that the cards in all stacks "wrap around", so you can get to the last card by going backwards from the first, or the first card by going forwards from the last.

⌘2

Go to the previous card. This is a suggestion for a note pad. It has a quote from Winston Churchill on it.

Figure 20.27
The current card, a note pad suggestion.



Pull down the Go menu and drag the mouse down to the Last command.	This command will take you to the last card in the current stack. It may be executed by pressing the ⌘4 key.



Figure 20.28
The Last command has been selected.

Release the mouse.	Once again, the About Stack Ideas card will be displayed.
⌘H	Use the Home command to return to the Home card. You may, of course, click on the home icon at the top left corner of this card to accomplish the same thing.

20.6 SETTING THE HYPERCARD USER PREFERENCE LEVEL

Before continuing, you should modify the User Preference level at which you are working. There are five user levels, each incorporating all the capabilities of the previous level, and adding capabilities of its own. By setting the highest possible user level, Scripting, you will have complete control over HyperCard and the stacks you use. At this level you are able to use the painting tools and their associated menus, create new buttons and fields, and add scripts to the stacks. The lowest possible level, Browsing, simply lets you look through stacks, but not make any changes.

What To Do	*Why You Are Doing It*
Click on the previous card button at the bottom of the Home card.	You want to go to the last card in the Home stack. This card lets you set the User Preferences level. You saw this card when you were exploring the Home stack.

Click on the Browsing button.

Set the user level to the lowest possible level.

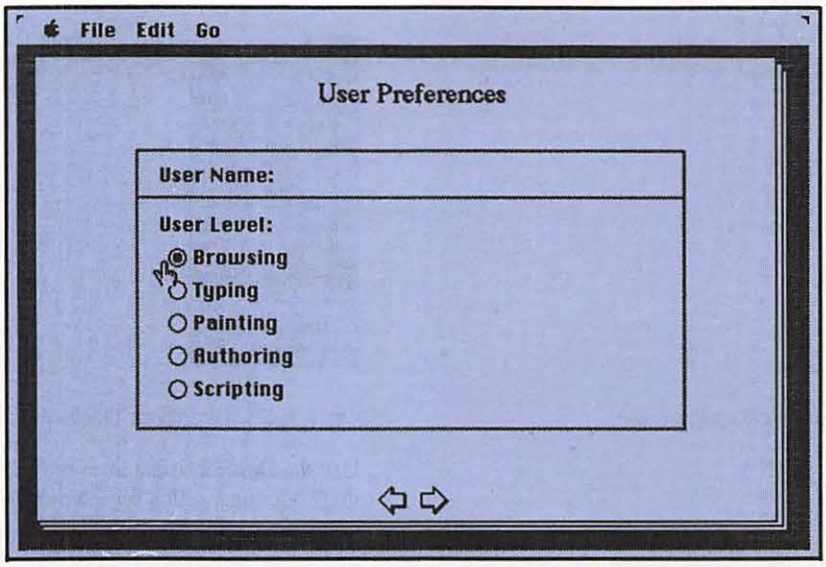


Figure 20.29
The Browsing user level has been selected. Only three items now appear on the menu bar.

When you select the lowest possible user level, only three options will appear on the menu bar, File, Edit and Go.

Move the Browse tool to the User Name area on this card.

The User Name is a text field on this card. You are allowed to enter your name into the Home Card. However, the Browse user level does not allow changes to anything on any card. The Browse tool does not change to the I-beam that lets you enter text into text fields, as you will see in a moment.

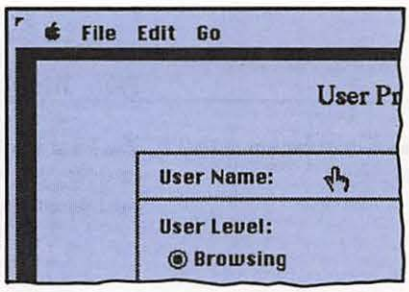


Figure 20.30
The Browse tool will not change to an I-beam when the User level is set to Browsing.

Click the Browse tool on the Scripting button.

Give yourself full powers. The menu bar now has the Tools and Objects menus added to it, and other options appear in the User Preferences box.

Move the Browse tool back to the User Name field.

Note that the mouse now changes to the I-beam, indicating that it is located inside a field, and that you may type into the field.

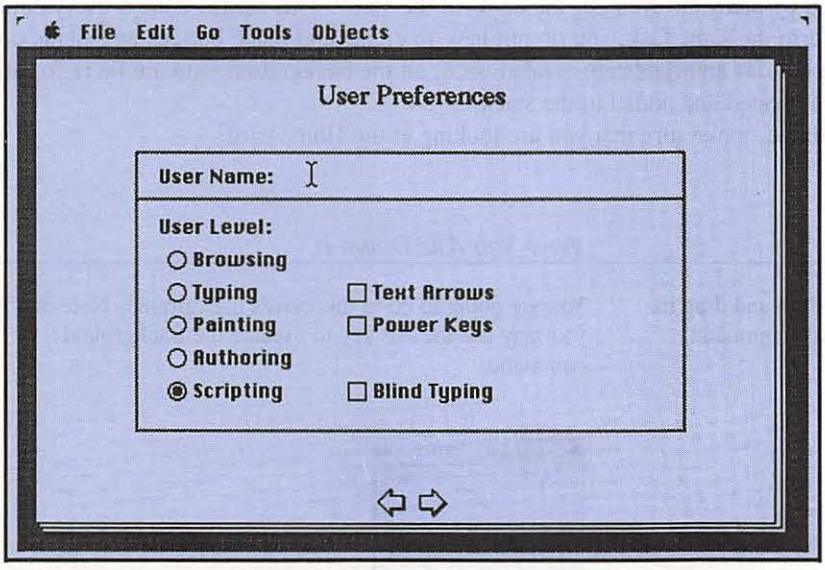


Figure 20.31
The User Level has been changed to Scripting, adding Tools and Objects to the menu bar. The Browse tool has changed to the I-beam, since the mouse has been positioned over a text field into which you may type information.

If you want to enter a User Name, click the mouse button once to get a blinking cursor in the User Name field. Once you have the blinking cursor, you may type an entry for User Name.

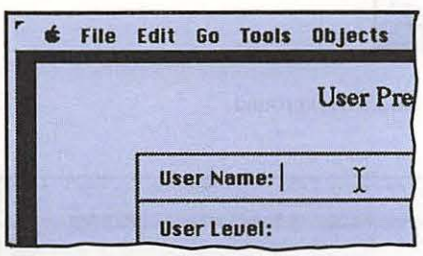


Figure 20.32
The mouse button has been clicked, making the blinking cursor appear in the User Name field. Once the cursor is showing in a field, you may type text into that field.

Click on the Next Card button.

Return to the Home Card.

20.7 THE CARD BACKGROUND

HyperCard works in layers, as well as in User Preference levels. So far you have been looking at HyperCard's card layer. This is the layer that most of the HyperCard activity you have seen so far happens. There is, however, a second layer called the background.

The background is beneath the card. Think of the card as being transparent. This means that anything placed on a background can be seen when you look at the card. The exception to this is when you place an opaque object on the card over part of the background. The the background may hold buttons and fields, just as the card over it does. The advantage of the background is that it may be shared by many, or even all, the cards of the stack. This means that, if every card in a stack is to perform the same task, you do not have to create and place buttons and fields on each new card. The buttons and fields are created once, on the background, and are there for all the cards as they are created and added to the stack.

Before you continue, make sure that you are looking at the Home card.

What To Do	*Why You Are Doing It*
Pull down the Edit menu and drag the mouse down to the last command, Background.	You are going to go to this card's background. Note that you may use the ⌘B key to execute the Background command.

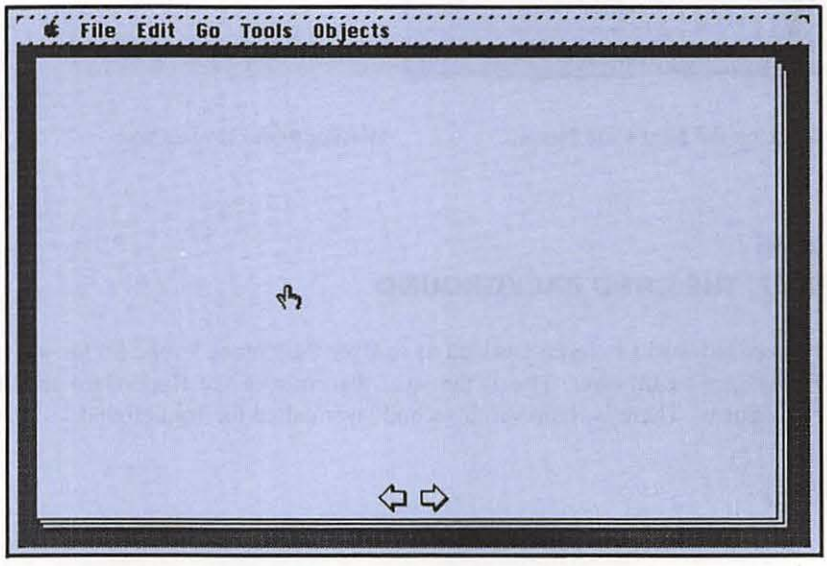
Figure 20.33
The Edit menu has been pulled down and the Background command selected.



Release the mouse button.

Go to the Home card's background.

Figure 20.34
The Home Card's background. Only the previous and next card buttons remain. The menu bar is striped, indicating you are working on the background.



The first thing you should notice about the background of the Home card is that nearly all the buttons that connect to other stacks are gone. Only the previous and next card buttons remain at the bottom of the card.

Next look at the menu bar. It is striped. This is a visual indication that you have selected the background.

The image of a stack of cards on a gray background that you are now looking at is in the background. If it was on the card itself, it, like the buttons, would have disappeared when you executed the background command.

⌘[OPTION]

Hold down the Command and Option keys. Remember that these two keys will cause HyperCard to display the outlines of the buttons on the current card.

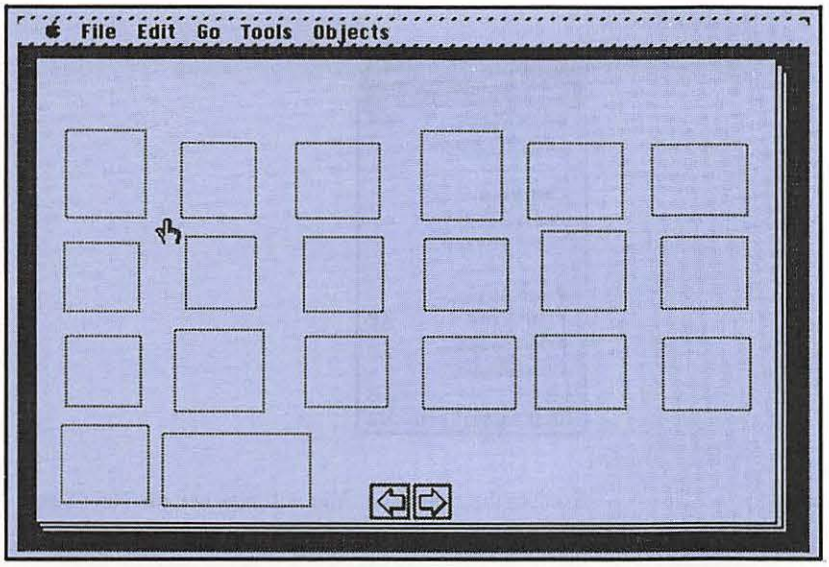


Figure 20.35
The card buttons are outlined.

Note that the outlines around the Next and Prev card buttons are heavier than all the rest of the button outlines. This indicates that these two buttons are on the background of the card.

⌘B

You are done looking at the card background for now. The Background command is a toggle. If you are already looking at the background, executing the command again will cause you to leave it.

20.8 CREATING A NEW STACK

Now that you know how to move around in stacks and you know about the background, it is time to create a stack of your own. You will then learn how to place graphics, buttons and fields onto cards and backgrounds. The stack that you create will be used to keep track of people's birthdays.

When you create a new stack you may have HyperCard duplicate the current card's background. This is helpful when you want to make a stack of a single card, such as those found in the Ideas Stack, or if you want to make an empty copy of an existing stack, retaining all the background information.

At this time you will not copy the background when you create a new stack. Even though the Next and Prev card buttons are of value, and might be worth copying, we want to create a stack with no graphics on the background card. Thus, when you create the stack, you will not copy the background.

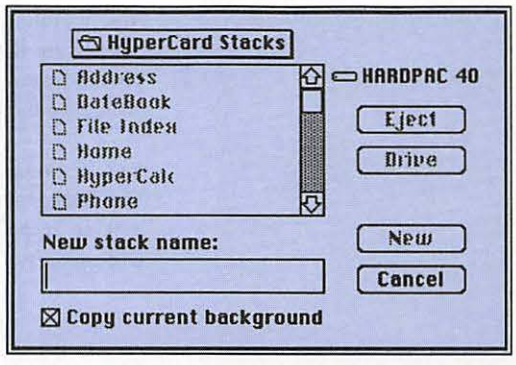
What To Do	*Why You Are Doing It*
Pull down the File menu and drag the mouse down to the New Stack command.	This is the first command option found on the File menu.

Figure 20.36
The New Stack command has been selected.



Release the mouse button.	Execute the command. You will now see the New Stack dialog box.

Figure 20.37
The New Stack dialog box.



Note that beneath the New Stack name box is a check box that lets you retain the current card's background. It is presently checked, which tells HyperCard to copy the background.

Click on the check box in front of Copy current background.	Remove the check from this checkbox. You do NOT want the current background to be copied.

Click on the Eject and Drive buttons as needed to located your disk in a disk drive.

MY STACK

Name this stack MY STACK.

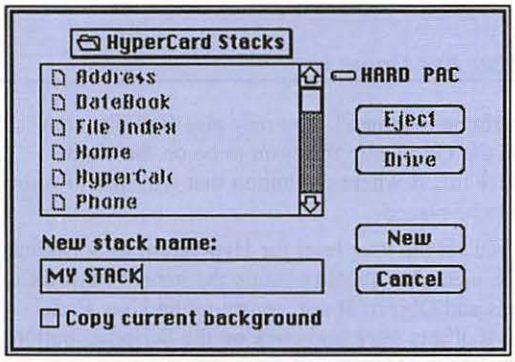


Figure 20.38
The dialog box has been completed. Note that the checkbox has been cleared. You do NOT want to copy the current card's background.

Click on the New button.

Create the stack.

Since you did not copy the background, you should now have a completely empty display, except for the menu bar and Browse tool.

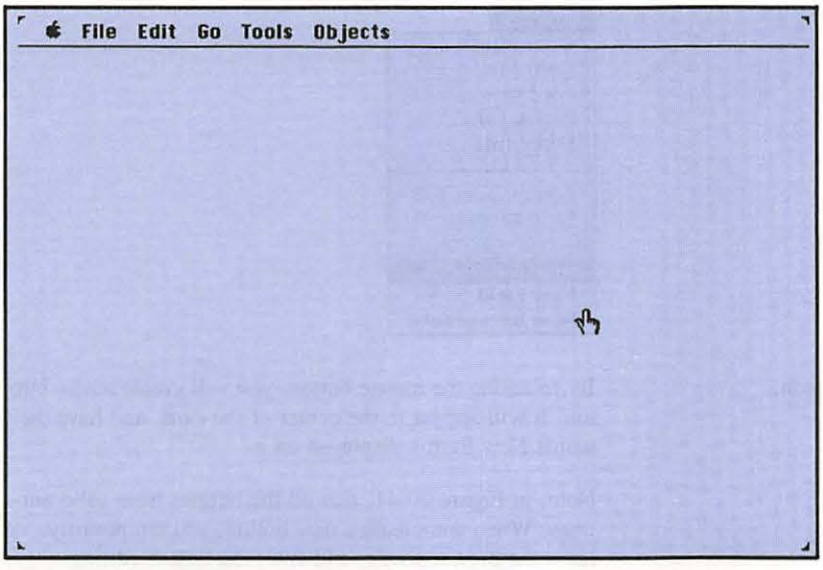


Figure 20.39
Your new stack has nothing on it.

20.9 CREATING A NEW BUTTON AND ESTABLISHING A LINK

Creating a button is a simple task. All you do is use the New Button command found on the Objects menu. As you will see later, you must take care when you create a new button, or any object for that matter, to place it on the desired "surface", either on the card or the card's background.

A Link is a button that, through its script, links the current card to another card. Generally, you link to a card other than the next or previous one in the current stack, although these would be legitimate links. In this section, you will add a new button to the Home card so that it can be linked to the stack you have just created. This button will then let you go directly to your stack.

What To Do	*Why You Are Doing It*
⌘H	The Go Home command. You may also find this command on the Go menu. You want to be on the Home card, since this is where the button that will link to your stack is to be placed. Earlier you set the user level for HyperCard to Scripting. Thus, the menu bar should contain the items File, Edit, Go, Tools and Object. If not, return to the User Preferences card of this stack and click on the Scripting button, then return to the Home card.
Pull down the Objects menu and drag the mouse down to New Button.	The New Button command will create a new button on the current card. Since we have NOT selected the background, this button will be placed on the card. We will create a background button later in the chapter.



Figure 20.40
The New Button command has been selected on the Objects menu.

Release the mouse button.	By releasing the mouse button, you will create a new button. It will appear in the center of the card, and have the words New Button displayed on it. Note, in Figure 20.41, that all the buttons have solid outlines. When you create a new button, you temporarily leave the browse mode, and enter the button editing mode. When in this mode, all the buttons are identified by the solid outlines.

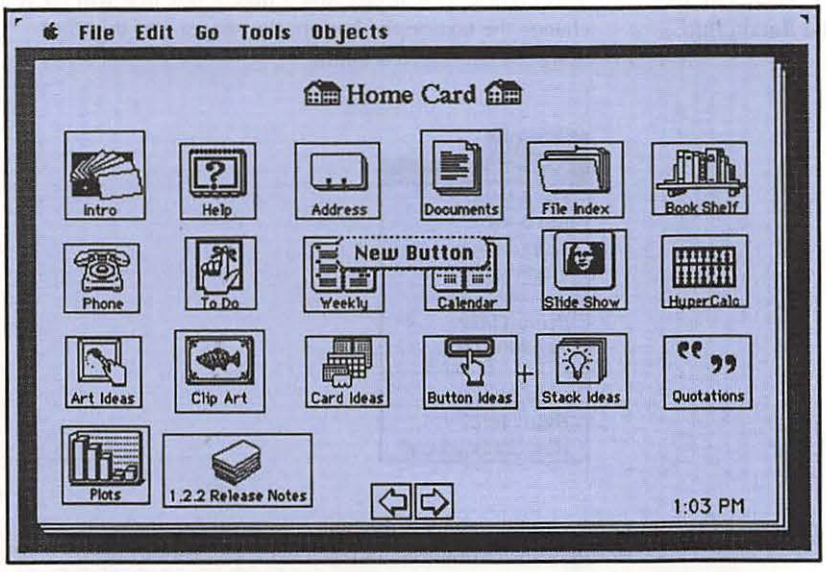


Figure 20.41
The New Button has been placed at the center of the current card.

Drag the New Button to the lower right side of the card.

Perform this drag as you normally would. Place the mouse pointer on the center of the new button, press and hold the mouse button and then drag the item to its new location. You will see later that if you try to drag a button using one of its corners you will re-shape the button, rather than dragging it.

You should notice two things. First, the New Button outline is a moving dashed line. This is to let you know which particular button has been selected. Selected buttons do not appear in inverse.

Next, you should notice that the mouse pointer is no longer the hand, or browse tool. When you are working in either the button editing mode as you are now, or the field editing mode, the mouse pointer returns to the familiar arrowhead. The pointing hand browse tool is displayed only when you are in HyperCard's browse mode.

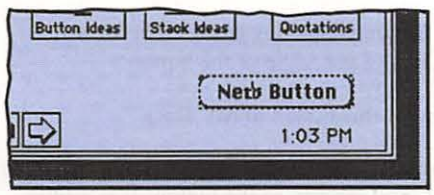


Figure 20.42
The new location of this button is the lower right corner of the Home card.

Pull down the Objects menu and drag the mouse down to the Button Info... command.

This command will give you a dialog box that will let you change the text on the button, the shape, and do other things to the selected button.

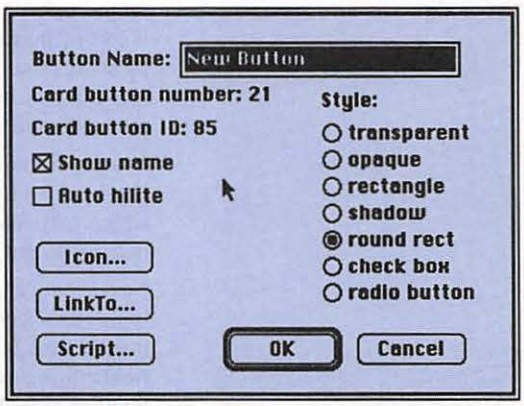
Figure 20.43
The Button Info command has been selected.



Release the mouse button.

You will now have the button information dialog box for the selected button. In the future, you should try to double-click on the selected button to get this dialog box.

Figure 20.44
The New Button dialog box.



At present, the Button Name box is selected. We will start here by changing the name of the button.

My Stack

Change the name of this button to My Stack.

Click on the Shadow style button on the right side of the dialog box.

You want to have the button shown on the card. This style will add a slight drop shadow to the button. It is a little bit more visually interesting than a plain rectangle.

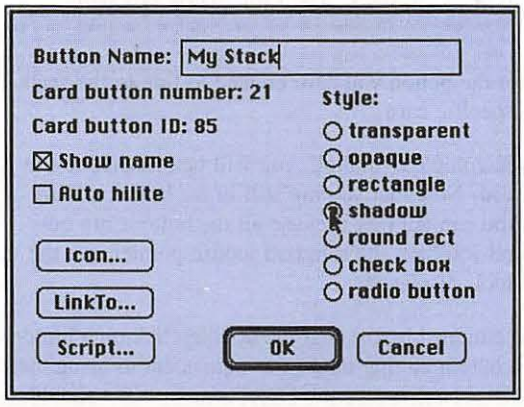


Figure 20.45
Note the two changes in the dialog box.

Click on the LinkTo... button.

You are now going to tell HyperCard what you want it to do when this button is pressed. Your desired action is to go to another stack, MY STACK, when this button is pressed. The LinkTo button creates a small script to perform this task.

When you click on the Link To button, you will see a small dialog box, which instructs you to "Go to destination, then aim link at" followed by some options (Figure 20.46).

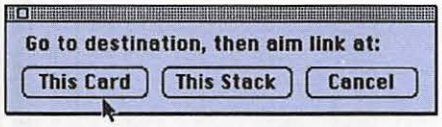


Figure 20.46
The Link dialog box.

⌘R

Select the Recent command. You should be able to identify your stack on the recent screen. It is the only miniature card that is completely blank. If you have been following the instructions exactly as presented, the MY STACK card should be at the extreme right of the second row of miniature cards.

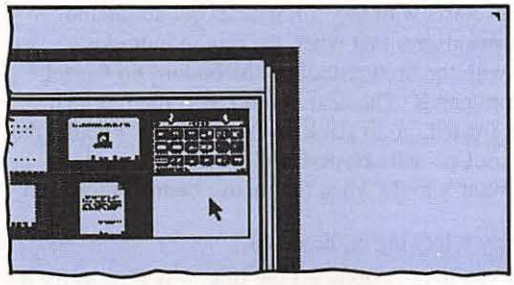


Figure 20.47
The mouse pointer is positioned on the blank card of MY STACK.

Click on the blank card on the recent page.

This will open the stack. The Link dialog box will return.

Click on the This Stack button.

You want the button you have created to link to the stack, not the specific card.

After you complete the link, you will be returned to the Home card. Note that you are still in the button editing mode. You can tell this because all the buttons are outlined, and you have the standard mouse pointer, not the browse tool, displayed.

Double-click on the My Stack button.

It was mentioned before that the double-click on a button while in button editing mode was equivalent to using the button info command on the Objects menu. You should now see the button dialog box.

Click on the Script button.

You want to look at the script created by the Link button.

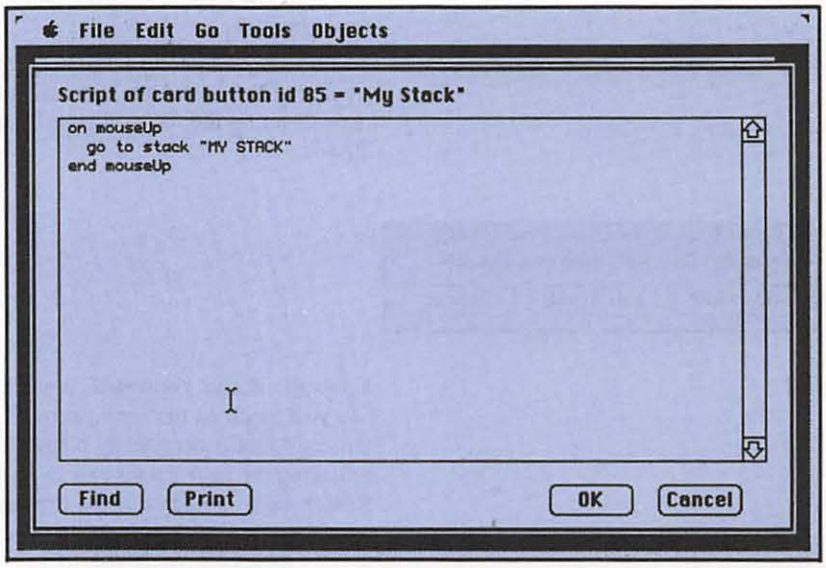


Figure 20.48
The script of the My Stack button.

This script starts with the "on mouseUp" command. This command says that when the mouse button is released with the browse tool on the button, do the following commands. The next command is the link that you have created, go to stack "MY STACK". Finally, the "end mouseUp" tells HyperCard that there is nothing else you want it to do when the mouse button is released.

Click on the OK button at the bottom right of the screen.

You are down looking at the script.

Now that you have established the link, it is time to try it to see if it works. To do this, you must leave the button editing mode and return to the browse mode. This is done by using the Tools menu.

Pull down the Tools menu.

This is a different type of menu, in that it is not words. It is also a "tear off menu". You will see this feature in a moment.



Figure 20.49
The Tools menu has been pulled down. In this figure the Button tool is selected.

This menu is one of the most important HyperCard menus. Across its top are the three tools used to manipulate and build stacks. From left to right they are the browse tool (which you have been using), the button tool (used for editing and manipulating buttons) and the field tool (used for editing and manipulating fields).

Select the browse tool and release the mouse.

Below these tools are the graphic tools, used for drawing graphic images on cards and backgrounds. The browse tool is the pointing hand at the top left of this menu. A tool is selected by pointing at it with the mouse pointer. You can tell when a tool has been selected because the border around it will flash.

When you release the mouse button, the browse tool will return.

Click on the My Stack button.

You are going to test the link you have created. You should now be on your stack.

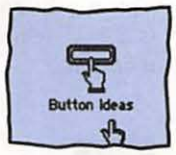
20.10 COPYING EXISTING BUTTONS

You can see how easy it is to create a new button, and create a link for that button. Sometimes, however, it is more efficient to copy an existing button. For example, it is easier to copy the button to return to the Home card, or the next card or previous card buttons, with their associated icons and scripts, than to create these buttons from scratch.

You will copy three buttons to place on the background of the current card of MY STACK. You will copy a Home button, a Next Card button and a Previous Card button.

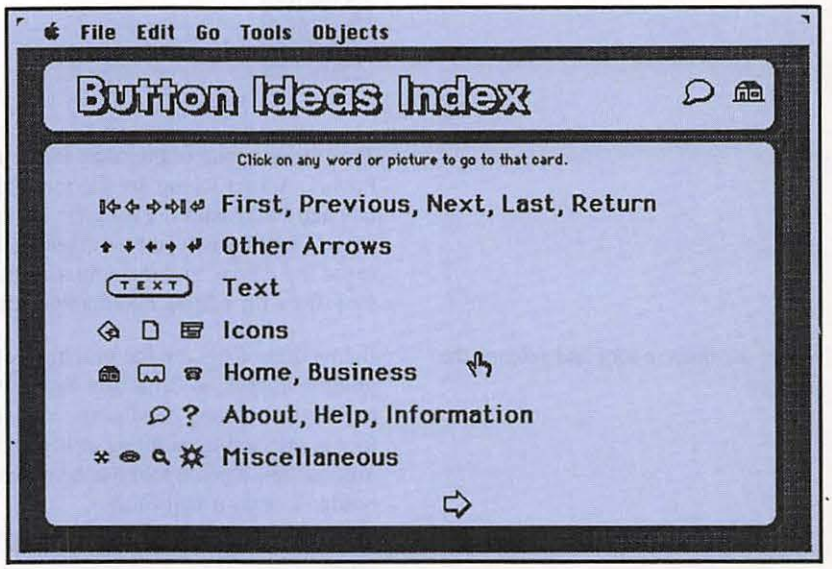
What To Do	*Why You Are Doing It*
⌘H	Return to the Home card.
Click on the Button Ideas button on the Home card.	This button will link you to a stack with many buttons that may be copied.

Figure 20.50
The Button Ideas button on the Home card.



After locating the stack, you will see the Button Ideas Index card.

Figure 20.51
The button ideas stack index card.



Click on the first row of icons.

This row, labelled First, Previous, Next, Last, Return, is a button that will take you to a card that holds a variety of different buttons for moving around in a stack.

Pull down the Tools menu.

Before you can copy a button, you must be operating in button editing mode, and not the Browse mode. All the buttons on this card will execute their scripts if you click the browse tool on them.

With the Tools menu pulled down, drag the mouse pointer over the Return buttons.

This menu is a tear off menu. When you move the mouse pointer far enough, an outline of the menu will start to flash.

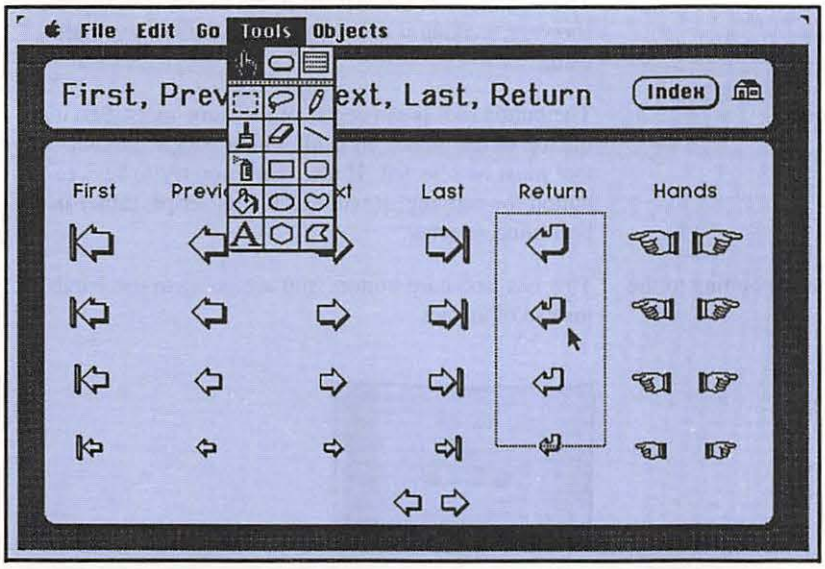


Figure 20.52
The Tools menu is going to be torn off the menu bar and placed on top of the current card.

Release the mouse button.

The menu will be torn off the menu bar and placed at a location on the card permanently in view. It is NOT part of the card, but really above it in a convenient location.

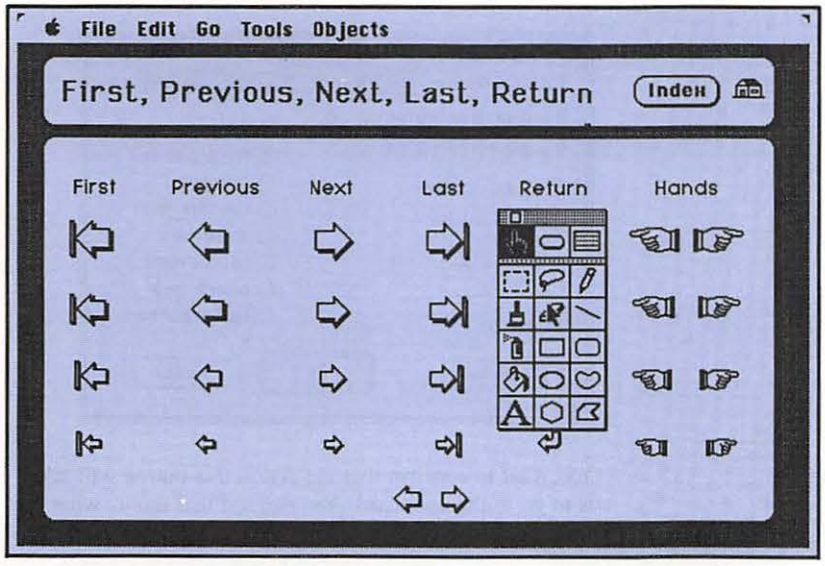


Figure 20.53
The Tools menu is now permanently available.

You may move the torn off menu around on the screen by dragging it with its menu bar. It may be put away by clicking on its close box. You may tear off this menu as often as you want, but only one copy of it will remain displayed at any time.

The advantage of the tear off menu is that it is always showing, making it easier to change the tools you are using.

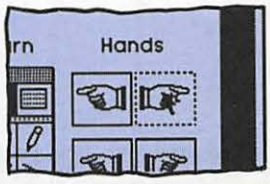
Click on the button tool.

The button tool is the center of the three tools shown at the top of the menu. To work with a button, the button tool must be selected. If not, when you try to select a button for copying, it will execute its script, rather than becoming selected.

Click on the largest hand pointing to the right.

This is a next card button. You are going to use hands instead of arrows.

Figure 20.54
The Next Card hand button has been selected.

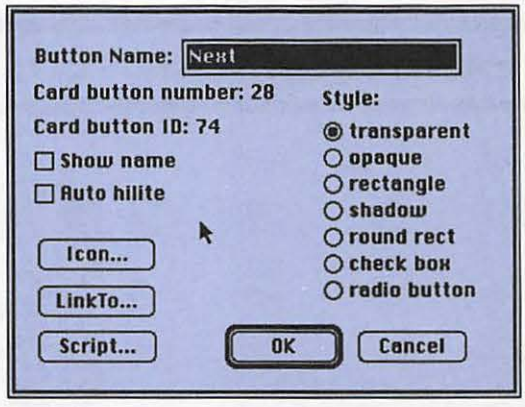


If you are unsure of the action this button will take when clicked on, then you should check its script. Let's do this now for this button.

Double-click on the selected button.

The double-click will open up this button's dialog box.

Figure 20.55
This button is called Next.



Click on the Script button.

You want to confirm that the action this button will take is to go to the next card. You can see that this is what the script tells it to do.

Figure 20.56
The script of the Next button.



Click on the Cancel button.

You are done looking at the information for this button. You will now return to the card.

Pull down the Edit menu.

Because you have a button selected, this menu will have references to buttons, such as Cut Button, or Copy Button.

Drag the mouse down to the Copy Button command.

You can see that the Copy command may, as with most Macintosh applications, be executed by using the ⌘C key.

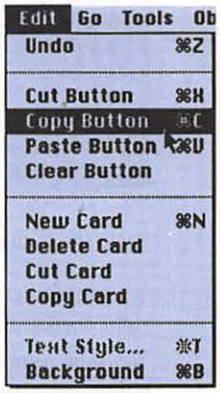


Figure 20.57
The Copy Button command has been selected.

Release the mouse button.

The selected button will now be copied to the clipboard.

⌘R

Go to the recent cards display.

Locate the card that represents the stack you are creating. It is still the completely blank card at the end of the second row.

Click on the card for your stack.

You are returning to your stack. It is worth pointing out that the Tools menu, which you tore off the menu bar earlier, remains on the display, even though you have changed stacks.

⌘B

The Background command. You want to put this button onto the card's background so that it appears on all the cards you create in this stack. The menu bar should become striped.

Pull down the Edit menu and select Paste Button.

The Paste command, which may be executed by the ⌘V key, reads Paste Button, since a button is currently in the clipboard for pasting.

Figure 20.58
The Paste Button command has been selected on the Edit menu.



Release the mouse button.

Paste the button onto the card's background.

Drag the new button to the lower right corner of the card.

You want to position the next card button at the bottom right corner of the stack.

You now want to copy the previous card button from the button ideas stack, and place it at the bottom left corner of this background. To do so, you could return to the Home card, then select button ideas and then the desired card from the stack's index. This is all time-consuming. It would be faster to use the Recent command to return directly to the card holding the button you want. An even easier way to return to the card with the buttons is by using the Back command. Remember that this command, ⌘~ or use the Go menu, returns to the previous card you looked at.

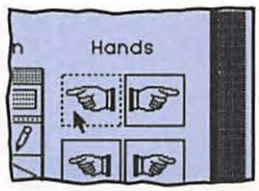
⌘~

Use the Go Back command to back up one card. You should once again have the card with the next and previous buttons displayed. This was the last card you looked at before going to the blank card in MY STACK.

Click on the largest left-pointing hand.

You should still be in the button editing mode. That is, the button tool should be the selected one on the torn off Tools menu. If not, select the button tool before you click on the left-pointing hand.

Figure 20.59
The left-pointing hand will be used for the Previous Card button.



⌘C	The Copy Button command from the Edit menu.
⌘R	The Recent command. You are not using the Back command to get to your card at this time.
Click on the image of the MY STACK card.	Go back to your new stack.
⌘B	Go to the card's Background.
⌘V	The Paste Button command from the Edit menu. Paste the card onto the background.
Drag the previous card button to the lower left corner of the card.	Place the previous card button at the lower left of this card's background.
⌘R	Go to the Recent cards display.
Click on the index to the Button Ideas stack.	This card should be the first card image of the third row of cards on the Recent display. You are returning to the index because you are going to get a home button, rather than a next or previous card button. The Button Ideas index should now be displayed.

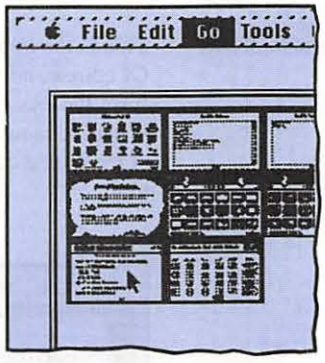
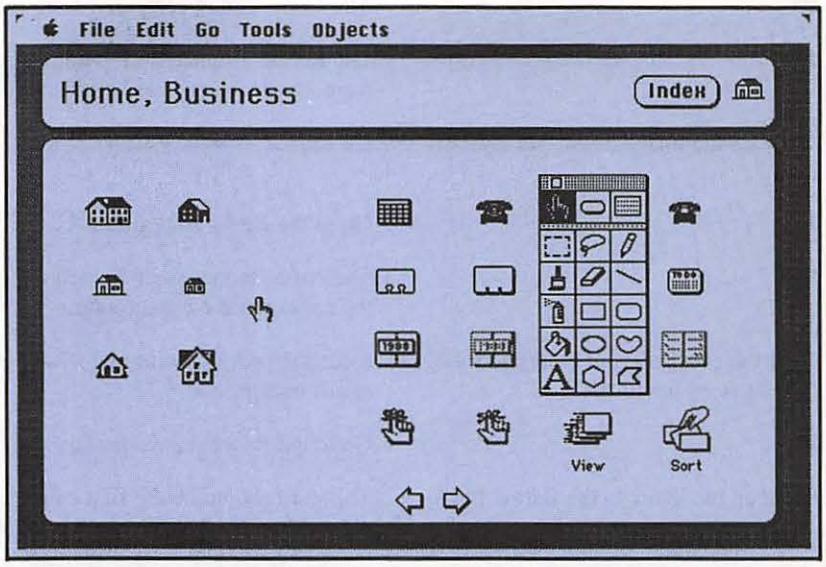


Figure 20.60
The mouse pointer is on the Button Ideas Index card in the recent display.

Click on the Browse tool at the top left of the torn off Tools menu.	Before you can go to the Home and Business buttons card, you must change from editing buttons to browsing.
Click on the Home, Business line of the Button Ideas index card.	You want to get a Home button.

Figure 20.61
This is the Home, Business buttons card. The torn off Tools menu is still displayed.



Click on the Button tool at the top center of the torn off Tools menu.	You must select the Button tool before you can copy a button. When you do this, all the buttons on the current card will become outlined.
Click on the top left Home icon of the six displayed.	This is the home button you want to use on your stack. Of course, all six of the home buttons you see here perform the exact same task. When you click on this button, it will become selected. If you find that you are looking at the Home card, then you failed to click on the button tool.

Figure 20.62
A Home button has been selected.



⌘C	The Copy Button command.
⌘~ ⌘~	You must go Back two times to get to your stack. Of course, you may use the Recent command at this time if you want.
⌘B	Don't forget that you want to place this button on the card's background.

⌘V	The Paste Button command from the Edit menu.
Drag the Home button to the bottom center of this card.	Place the Home button.
Click on the Browse tool on the Tools menu.	You are going to try the buttons. This cannot be done when you are editing buttons. When you select the Browse tool, you will automatically leave the background. You should no longer see striping on the HyperCard menu bar.
Click on the close box at the top left corner of the Tools menu.	Put away the Tools menu. You may tear it off the menu bar again whenever you need it.

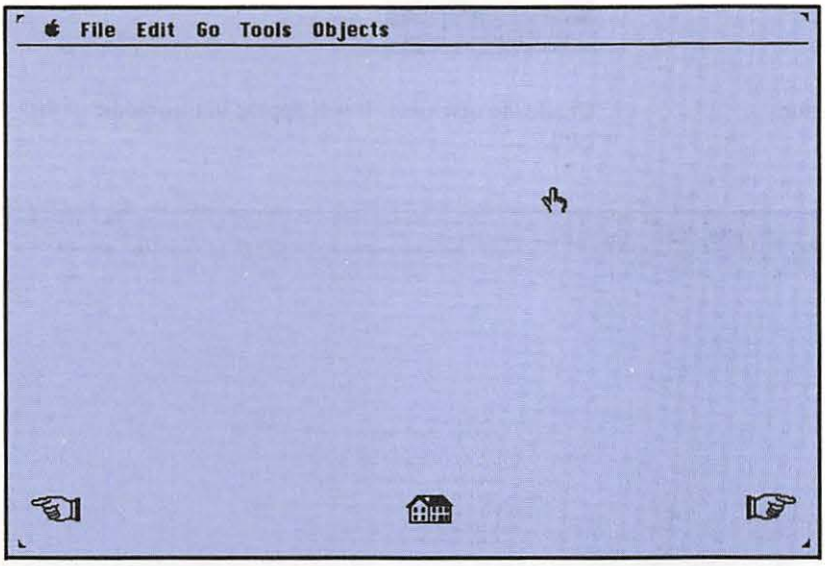


Figure 20.63
The stack that you have created so far.

Click on the Home button at the bottom center of the MY STACK card.	You should now be returned to the Home Card.

20.11 CREATING NEW FIELDS

Fields are created in the exact same fashion as buttons. Simply pull down the Objects menu and select the New Field command. It is possible for a text field to have a script associated with it, just as do buttons. At this time, however, we will not create scripts for the text fields created.

What To Do	*Why You Are Doing It*
Click on the MY STACK button.	You are going to add the field to your stack, not to the Home card.
⌘B	You are going to add this field to the card's background. The menu bar should now be striped.

Pull down the Objects menu and drag the mouse down to the New Field command.

You want to create a new field on the background of your stack.



Figure 20.64
The New Field command has been selected.

Release the mouse button.

Create the new field. It will appear in the middle of the card.

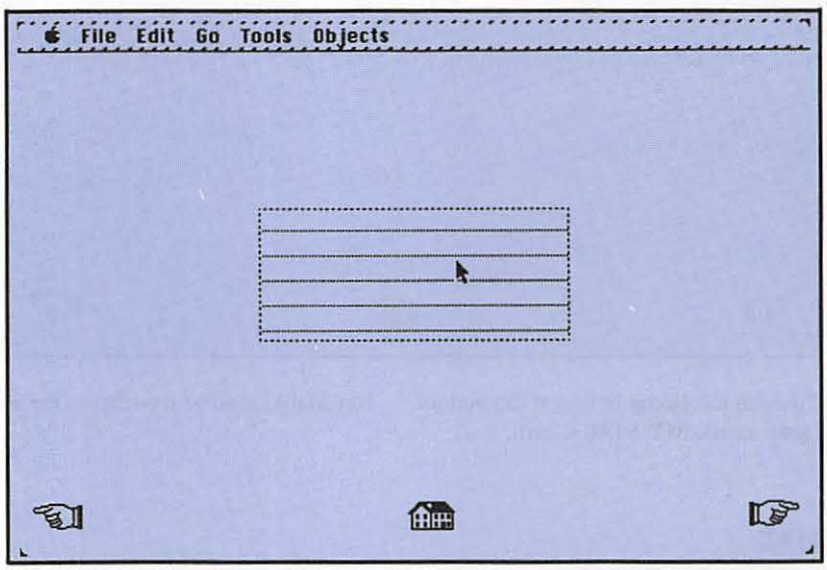


Figure 20.65
A new field has been created. If you pull down the Tools menu you will see that the Field tool has been selected.

Pull down the Objects menu and select the Field Info command.

This command will let you set the field style, change the field's font, and modify the field's script. Just as you may double-click on a button with the button editing tool to get to the Button Info dialog box, you may double-click on a field with the field editing tool to get to the Field Info dialog box.

Release the mouse button.

You want to use the Field Info dialog box.

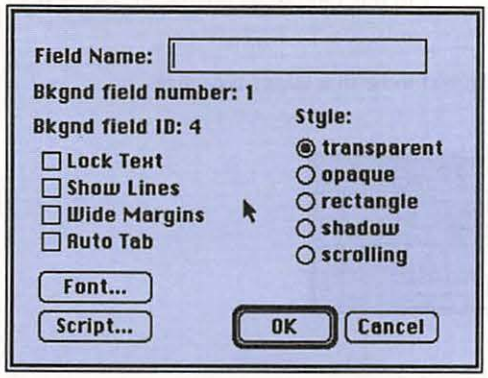


Figure 20.66
The initial Field Info dialog box.

Click on the Shadow style button on the right side of the dialog box.

You want to have the field visible on the card, and have a drop shadow.

Name

Type the word Name into the Field Name box.

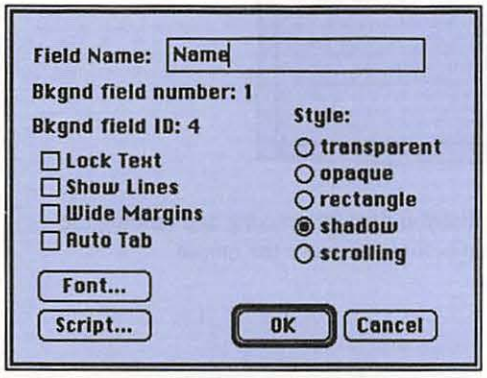


Figure 20.67
The Field Info dialog box has been changed.

Click on the Font button at the lower left of this dialog box.

You want to change the way text will be displayed in this field. You should now have the Font dialog box.

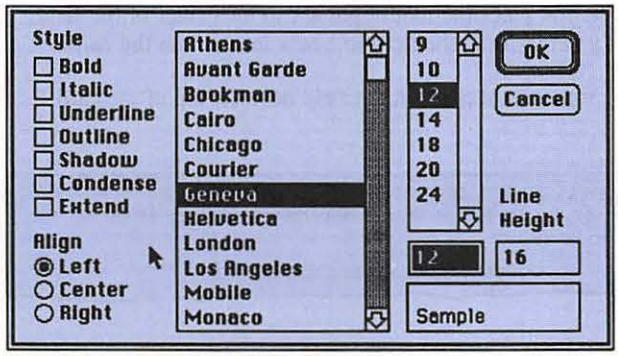


Figure 20.68
The Font dialog box. You may change the style, alignment, size, line height and the font to be used by the field with this dialog box.

Click on the Bold check box.

You want the text in this field to be boldfaced, rather than plain.

Click on the 18 size.

You want the text to be in a larger type size.

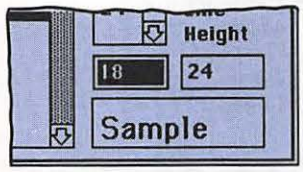


Figure 20.69
The font that will appear in this field has been changed. You can see the results of the change by looking at the sample at the lower right side of the dialog box.

Click on the OK button.

You are finished making changes to this field.

Position the mouse pointer at the lower right corner of the field.

If you place the mouse pointer on any one of the field's corners, you may change the size and shape of the field.

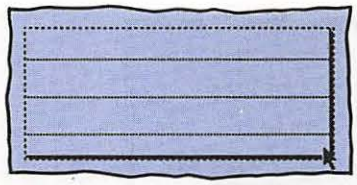


Figure 20.70
Note the location of the mouse pointer on the field that has been created.

Drag the corner of the field up so that only one line is showing, and right so that the field is about three inches wide on the screen.

Remember that you drag by pressing and holding the mouse button before you move the mouse.

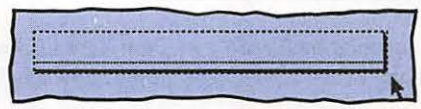


Figure 20.71
The shape of the field has been changed.

Position the mouse pointer in the center of the field.

If you place the mouse pointer in the center of the field, you may drag the field to a new location on the card.

Drag the field up to be about a quarter of an inch below the menu bar.

You want to position the field near the top of the card.

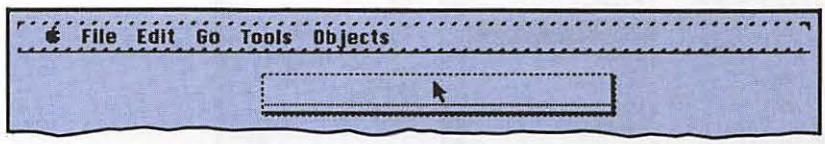


Figure 20.72
The field has been placed near the top of the card.

Pull down the Objects menu, select the New Field command and release the mouse button.	You want to create a second new field on the card. You should still be working on the background of this card. Remember, if you are working on the card's background the menu bar will be striped.
Double-click on the field you have just created.	You should now have the Field Info dialog box for this field.
Click on the Rectangle button.	You want the style of this field to be a rectangle. That is, you want a box around the field.
Birthday	Enter Birthday for the Field name.
Click on the OK button.	You are done with the Field Info dialog box.
Drag the lower right corner of this field up so you can see only one ruler line in the field, and left to make the field about one inch wide.	Change the size of this field.
Drag this field up so it is about half an inch below the first field you created.	Reposition this field on the card.

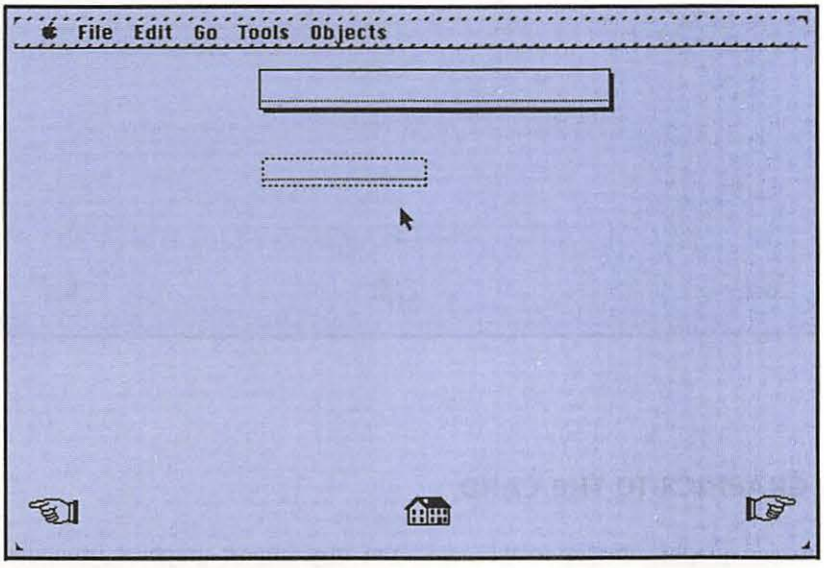


Figure 20.73
The current card.

Pull down the Objects menu, select the New Field command and release the mouse button.	You want to create a third new field on the card.
Double-click on the field you have just created.	You should now have the Field Info dialog box for this field.

Click on the Show Lines check box on the left side of the dialog box.	You want lines to appear in the field so that it appears similar to ruled paper. The lines that you have seen in the two fields you have created already will not be displayed when you are using the browse tool.
Click on the Rectangle style button.	You want this field to be a rectangle.
Misc Info	Type this text into the Field Name box.
Click on the OK button.	You are done with the Field Info dialog box.
Drag the lower right corner of this field down and to the right to fill the bottom portion of the card.	You want this field to cover the majority of the card.

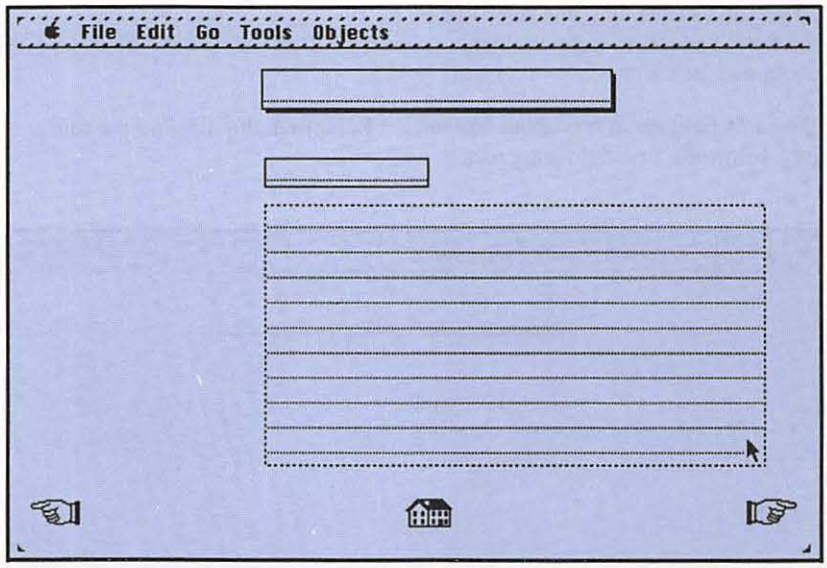


Figure 20.74
The card now has three fields.

20.12 ADDING GRAPHICS TO THE CARD

You are now ready to add graphic images to the card. You may import graphics from the scrapbook or through the clipboard, from other cards or stacks, or you may draw them using the painting tools that are part of HyperCard.

What To Do	*Why You Are Doing It*
Pull down the Tools menu and tear it off.	You want to have access to the tools on the Tool menu. A good place to put this torn off menu is on top of the field you just created. Do not place it on the left side of the card, since that is where you are going to add graphics and other items.

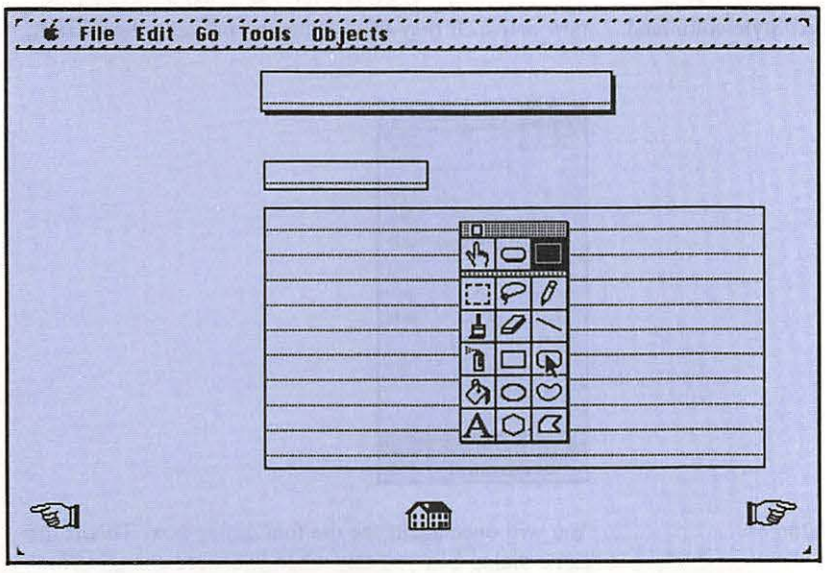


Figure 20.75
The Tool menu has been torn off the menu bar and placed where it can be easily used.

Click on the large A at the bottom left of the Tools menu.

This tool will let you place text on the card, or, as in the present case, on the card's background. The text can not be edited, since it is turned into a graphic image.

Since the A tool is one of the graphic tools, the menu bar will change. The Objects option will disappear, to be replaced by Paint, Options and Patterns.

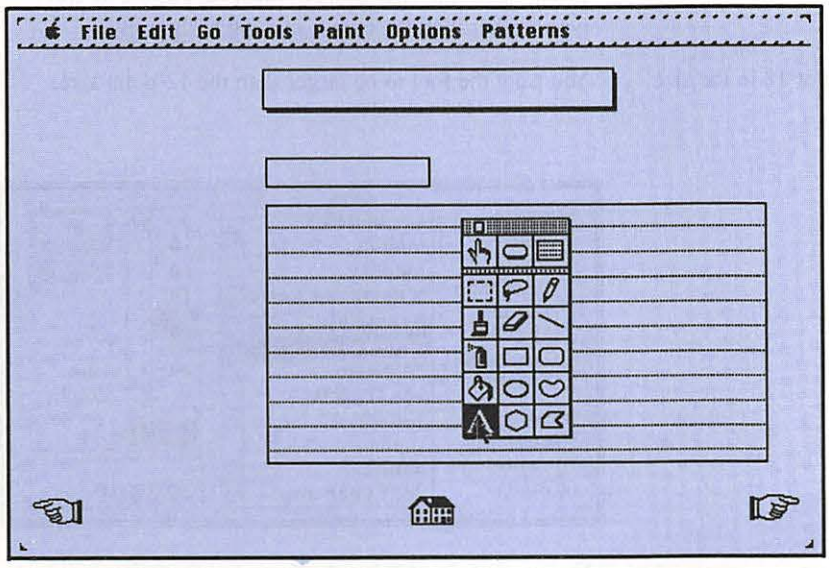


Figure 20.76
The menu bar has changed since you have selected a graphic tool.

The mouse pointer should now be the familiar I-beam. This cursor shape is used when you are entering text.

Pull down the Edit menu and drag the mouse down to the Text Style command.

This command, since you have selected a text tool, is now active. It may be executed by pressing the ⌘T key.

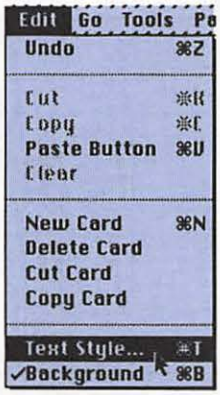


Figure 20.77
The Text Style command has been selected.

Release the mouse button.

You will once again see the font dialog box. This is the same dialog box you saw when you were changing the font to be used in the Name field.

Scroll the font list until you locate the New York font.

You want to type using this font.

Click on the New York font in the font list.

By clicking on this font you are making it the active font for the text tool you have selected.

Click on the Align Right button.

This button is at the lower left corner of the dialog box. It will cause the characters to push backwards as you type, rather than the cursor moving to the right.

Click on a point size of 18 in the size box.

You want the font to be larger than the 12-point size.



Figure 20.78
The Font dialog box before you complete it with the OK button.

Click on the OK button.

You are done modifying the font you want to have appear.

Position the I-beam just to the left of the left edge of the first field on the card.

This is where you want text to start appearing as you type.

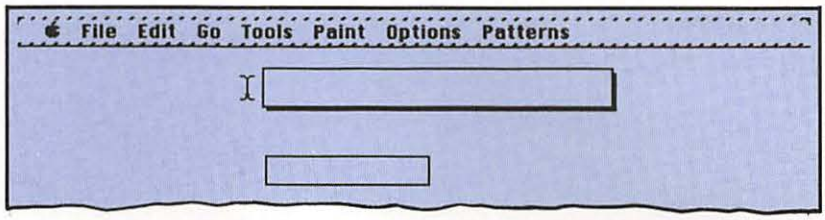


Figure 20.79
Note the position of the I-beam cursor.

Click the mouse button.

When you click the mouse button, the blinking insertion cursor will appear. You are now ready to type.

Name

Type the text "Name". As you type, the letters will move left from the insertion point.

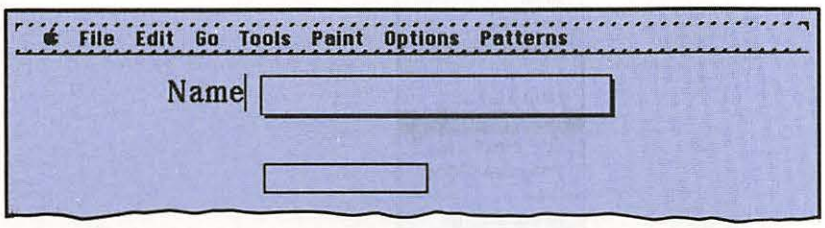


Figure 20.80
The word "Name" has been added to the background of this card.

Click the I-beam to the left of the second field on the card.

You are going to label this field.

Birthday

Type the text "Birthday".

Click the I-beam to the left of the third field on the card, level with the top of the field.

You are going to label the last field.

Misc

Type the text "Misc".

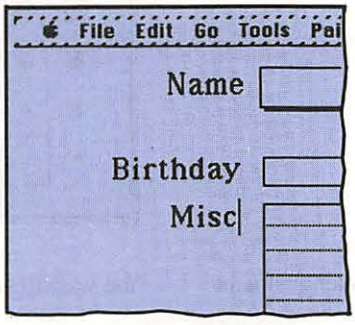


Figure 20.81
The three text items have been created on the card's background.

Click on the paint brush tool.

This tool lets you draw shapes as if you had a Paint Brush. You may vary the size and shape of the brush. This is different from the pencil tool, which only draws fine lines.



Figure 20.82
The Paint Brush tool has been selected.

Pull down the Options menu and drag the mouse down to the Brush Shape command.

This command will let you change the shape of the brush with which you are going to paint.

Figure 20.83
The Brush Shape command has been selected.

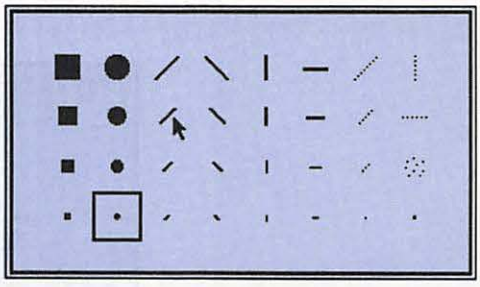


Release the mouse button.

You are going to change the shape of the paint brush.

You will now see the brush shape choices. Note the box around one, indicating the current brush shape in use by HyperCard. The mouse pointer is pointing to the brush shape we want, third from the left and second down.

Figure 20.84
The brush shape options. The mouse pointer is pointing to the brush shape we want to use.



Position the mouse pointer as it is in Figure 20.84.

You want to select this brush shape.

Click the mouse button.

Select this brush shape.

Position the brush to the right of the Birthday field.

This is where you want to start drawing.

Drag the brush in a wavy pattern to the right of the card.

To drag the brush, press and hold the mouse button while you move the mouse.

If you do not like the results of your work, click on the eraser tool, which is to the right of the paint brush on the Tools menu. Drag the eraser over the portion of your work you want to erase. You must press the mouse button as you drag the eraser to have it erase your art.

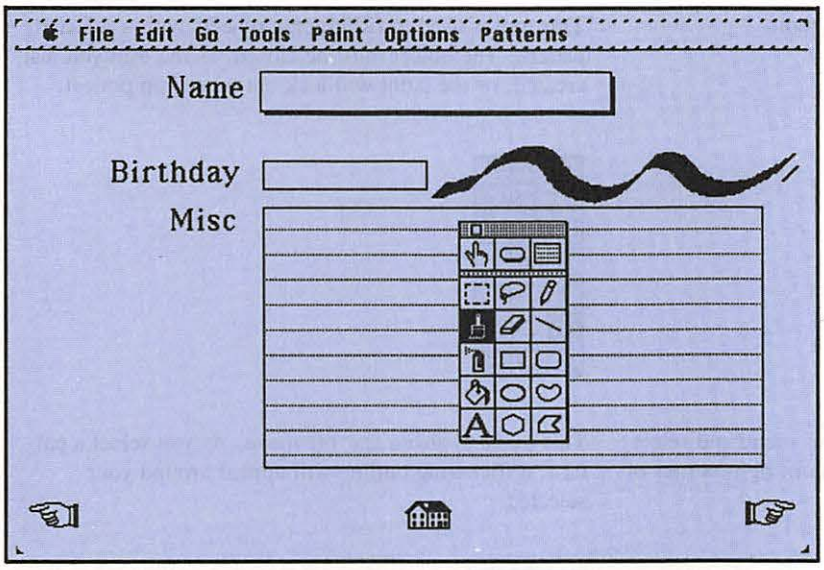


Figure 20.85
Some art has been added to the card.

Click on the oval tool.

This tool will let you make circles and ovals on the card.



Figure 20.86
The oval tool has been selected.

Position the mouse above the wave.

When you move the mouse, it will become a cross hair.

Drag the mouse down and to the right, making an oval.

Once again, you must press the mouse button before moving the mouse to obtain the desired result.

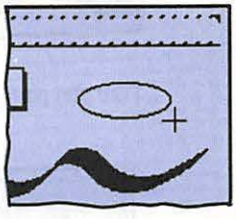


Figure 20.87
An oval has been created.

Select the Paint Can tool.

This tool is used to fill graphic objects with a selected pattern. The object must be closed, as the oval you just created, or the paint will leak out when you pour it.

Figure 20.88
The paint can tool has been selected.



Pull down the Patterns menu and select the pattern at the bottom right corner of the menu.

This menu is also a tear off menu. As you select a pattern, a flickering outline will appear around your selected.

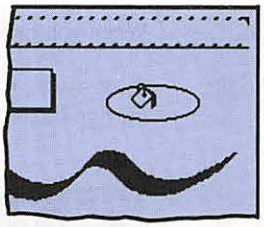
Figure 20.89
The bottom right pattern is being selected.



Position the paint can mouse pointer inside the oval.

You are going to fill the oval with the selected pattern.

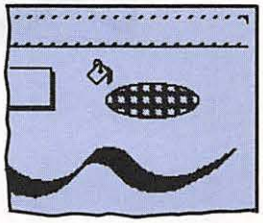
Figure 20.90
Note the location of the paint can mouse pointer.



Click the mouse button.

Pour the paint.

Figure 20.91
The oval has been filled with the selected pattern.



Click on the Selection tool.

This tool lets you select and manipulate graphic items on the card.



Figure 20.92
The Selection Tool has been selected.

Position the selection tool cross hair mouse pointer above and to the left of the filled oval.

You are going to select the oval.

Press and hold the mouse button, and drag the mouse down and to the right so that a box surrounds the filled oval. Then release the mouse button.

When you select an item, a moving dashed line will be around it.

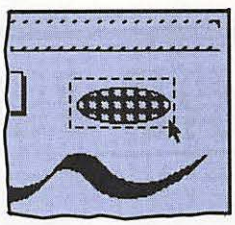


Figure 20.93
The oval has been selected.

⌘C

The Copy command from the Edit menu. Since you are working with a graphic, the menu actually reads Copy Picture.

⌘V

The Paste command from the Edit menu. Again, the menu actually reads Paste Picture.

You have pasted a duplicate of the filled oval on top of the original.

Place the mouse pointer inside the moving dashed box.

When you position the mouse pointer inside the selected area, it will return to the familiar arrowhead. You may now use it to drag the selected item.

Drag the selected area left on the card, placing it next to the graphic "Name".

When you drag this graphic, the original will remain in place. If you had selected the graphic and moved it, without the copy and paste process, then you would be moving the original graphic, rather than a copy of the graphic.

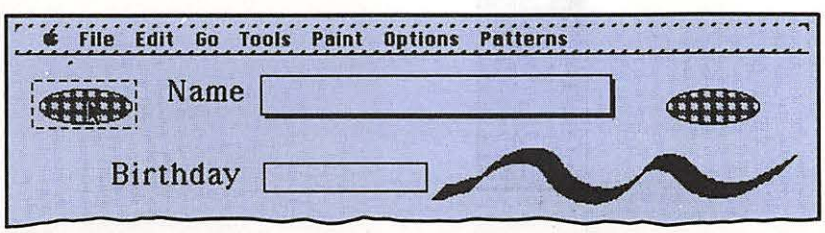


Figure 20.94
The graphic has been duplicated and moved.

Click on the Browse tool.

You are now going to return to the Home card and select a graphic from another stack to add to your current card.

Click on the close box on the Tools menu.

This menu will be in the way, so return it to the menu bar by clicking on its close box.

Click on the Home button.

Return to the Home card.

Click on the Art Ideas button.

This stack has a variety of drawings that can be copied into your stacks.

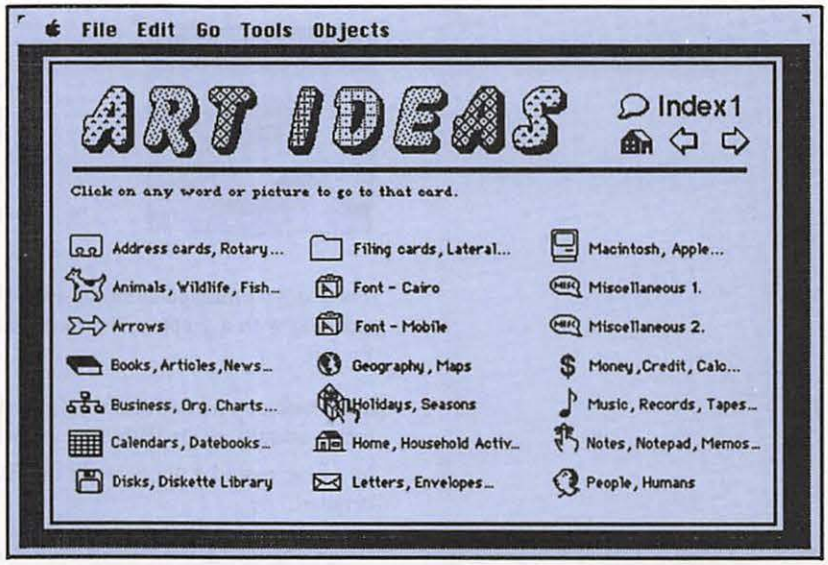
Figure 20.95
The Art Ideas button is going to be pressed.



Click on the Holidays, Seasons button in the center column of items on this card.

We are looking for an appropriate picture to copy onto our stack.

Figure 20.96
The Browse tool is on the Holidays, Seasons button.



Note that there is a birthday cake pictured near the center of this card.

Pull down the Tools menu and select the Lasso tool.

This tool lets you select irregular shapes.

Figure 20.97
The Lasso tool will be selected.



Drag the lasso around the cake.	As always, you must press the mouse button while dragging it to get the desired effect.



Figure 20.98
The mouse button is being held down, so that the line that the lasso has traced surrounding the cake image can still be seen. When you release the mouse button, the edge of the cage will start to flicker.

⌘C	Copy the picture into the clipboard.
⌘R	Go to the Recent display. Note that the image of your stack, at the right side of the second row, now includes the information that has been placed on it. The recent display is dynamic. It shows the current status of the cards on it.
Click on the card image representing your stack.	You will return to your stack.
⌘B	Go to the card's background.
⌘V	Paste the object from the clipboard into the current stack.
Drag the graphic left and place it in the space to the left of the third field.	Do not leave this graphic under the third field! If you lose it, then you will have to change the size of the third field so that the graphic becomes visible. Then use the lasso to select the graphic and reposition it. Finally, you will have to re-size the field back to what it should be.
⌘B	Leave the background. The menu bar should no longer be striped.
Pull down the Tools menu and select the Browse tool.	You are finished putting graphics on the card.

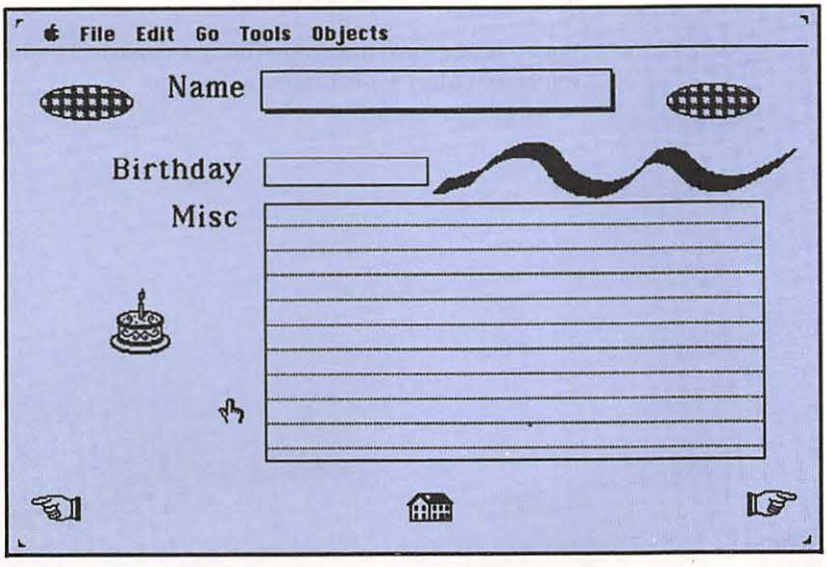


Figure 20.99
The card you have created.

20.13 USING THE STACK

You are now ready to use the stack you have created. You will enter several people's names and birthdays. To do this, you will learn how to add new cards to the stack you have created. Since all the buttons, fields and artwork you have placed on this card are on the background, they will appear on any new card you create. If you want fields, buttons or graphics to be shared by several cards, then they must be placed on the background.

If, when you create a new card, something disappears, then it was not placed on the background. To fix this, start by returning to the first card. Next, select the item using the appropriate tool (button, field or graphic). Use the Cut command (⌘X or use the Edit menu) to remove it from the card and place the item onto clipboard. Activate the background with the ⌘B key. Finally, Paste the item onto the background (⌘V or use the Edit menu). If the item is a field, any text it contains will be deleted when it is placed onto the background.

What To Do	*Why You Are Doing It*
Position the mouse pointer in the Name field and click the mouse button.	When you place the mouse into the field, it will turn into an I-beam. When you click the mouse button, the blinking cursor will appear at the left of the field.

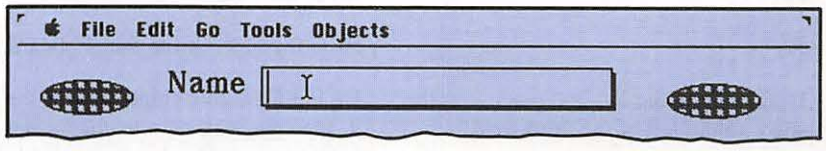


Figure 20.100
The mouse is inside the Name field. Note the cursor at the left edge of the field.

Mary Smith	Enter the name.
[TAB]	Use the Tab key to move the blinking cursor to the next field, Birthday. You may, of course, use the mouse to position the I-beam in the field and click the mouse button to place the cursor in the field.
07/18/81	Enter Mary's birthday.
[TAB]	Move the cursor to the last field.
poster	Enter "poster" into this field. This is a reminder of what you bought Mary for her birthday last year.

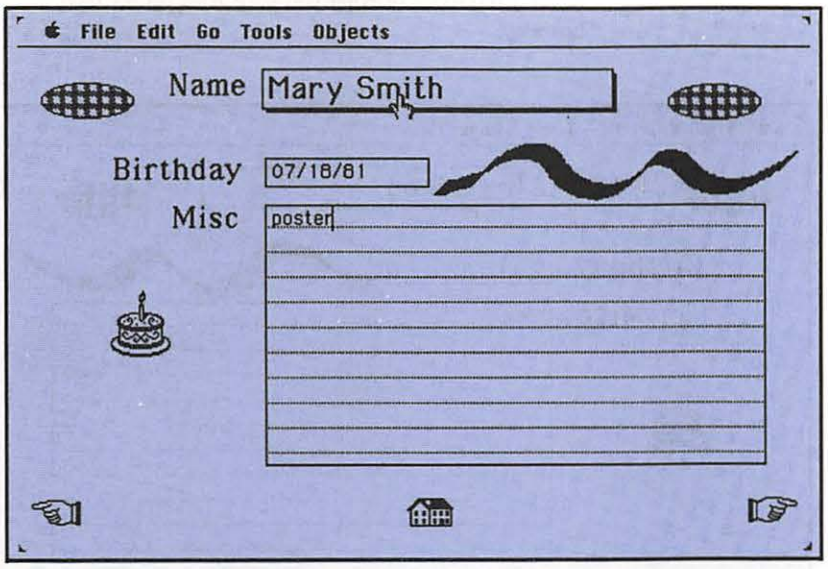


Figure 20.101
The completed card.

Pull down the Edit menu and select the New Card command.

You are ready to add a second card to the stack. Note that the New Card command may be executed with the ⌘N key.



Figure 20.102
The New Card command has been selected.

Release the mouse.

Create a new card. If any parts of the card, other than the text you have created, disappears, then you created that item on the card layer, rather than the background layer. See the comment at the beginning of this section for instructions on how to fix this.

Click the mouse in the Name field.

You are going to add another Name.

Alex Jones [TAB]

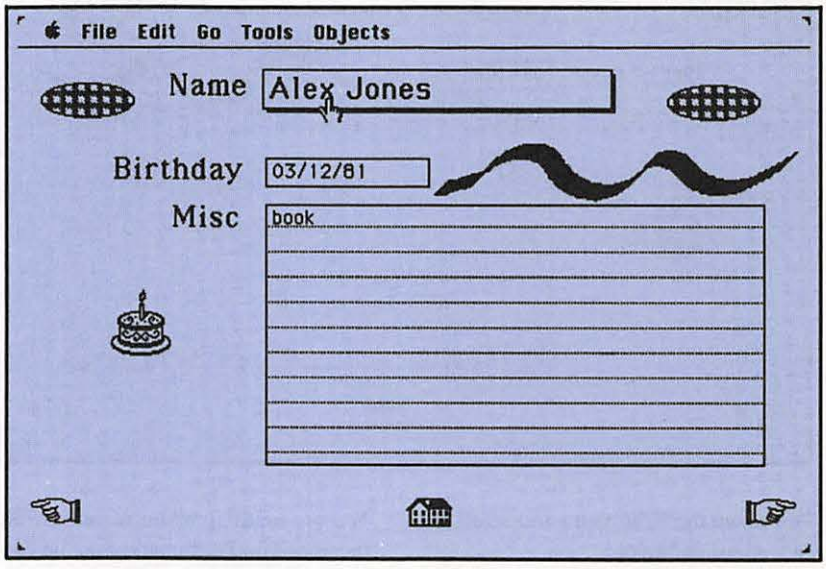
Enter a name and move the cursor to the next field.

03/12/81 [TAB]

Enter a birthday and move the cursor to the next field.

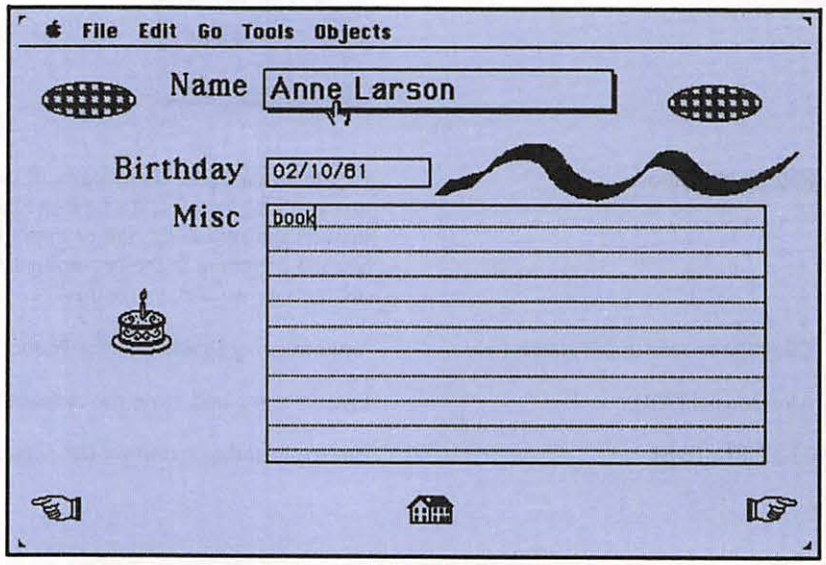
book	Enter a reminder of what you gave Alex on his last birthday.

Figure 20.103
The completed card.



⌘N	Create a third card.
Click the mouse in the Name field.	You are going to add another Name.
Anne Larson [TAB]	Enter a name and move the cursor to the next field.
02/10/81 [TAB]	Enter a birthday and move the cursor to the next field.
book	Enter a reminder of what you gave Anne on her last birthday.

Figure 20.104
The completed card.



Click on the Next Card button at the bottom right corner of the card.	You should now see Mary Smith's card. As you add new cards, they are placed after the card you have showing. You have been placing new cards at the end of the stack, thus the next card is the first one in the stack at this time.
Click on the Next Card button two more times.	You have cycled through the stack, and you are once again looking at Anne Larson's card.
Click on the Next Card button one more time.	You once again are looking at the first card.
⌘N	Add a new card. Since you are looking at Mary Smith's card, this new card will be physically placed into the stack after her card and before Alex Jones' card. You may want to click on the Next and Previous buttons to verify this. When you are done, return to the blank card.
Click the mouse in the Name field.	You are going to add another Name.
Peter Zarnak [TAB]	Enter a name and move the cursor to the next field.
10/22/80 [TAB]	Enter a birthday and move the cursor to the next field.
necktie	Enter a reminder of what you gave Peter on his last birthday.

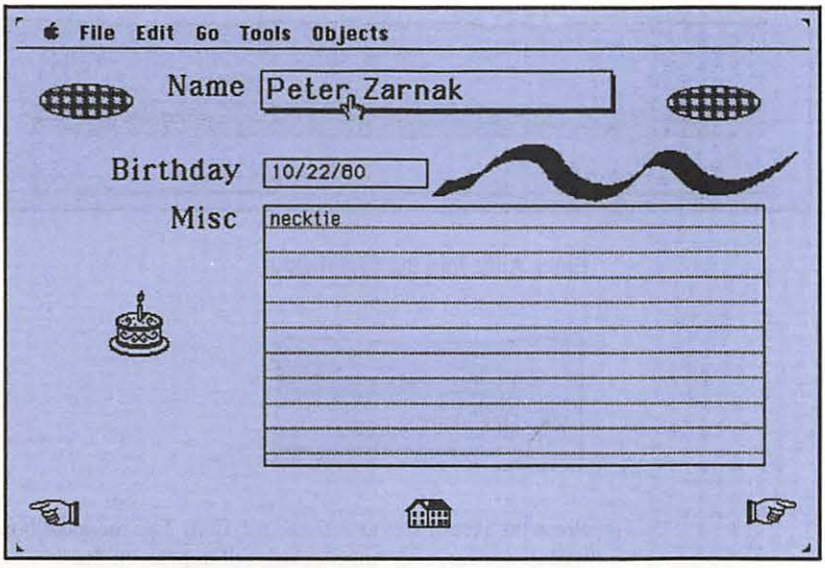


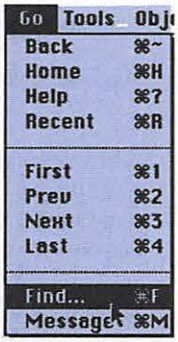
Figure 20.105
The completed card.

20.14 THE MESSAGE BOX

The Message box is a way for you to give commands to HyperCard, and for HyperCard to give you messages. Many of the capabilities of HyperCard are not found on any menu, and must be entered as a command through the message box. One command that is on a menu is the Find command. It, however, makes use of the message box to ask you what you want to find. In this section, you will learn how to use the message box, and the Find command.

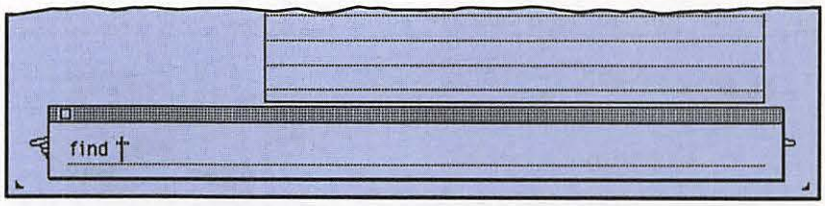
What To Do	*Why You Are Doing It*
Pull down the Go menu and drag the mouse down to the Find command.	This menu has both the Find and Message commands on it. They are the last two commands on this menu.

Figure 20.106
The Find command has been selected.



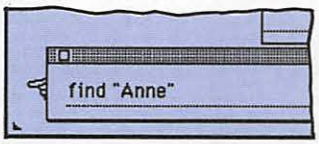
Release the mouse button.	Execute the Find command. When you do this, the message box will automatically appear, since HyperCard needs some information from you—what it is you want found. In the message box is the word find and a pair of double quote marks. The cursor is blinking inside the quote marks.

Figure 20.107
The message box appears at the bottom of the screen.



Anne	Enter Anne into the find dialog.

Figure 20.108
The object of the Find has been entered into the dialog box.



[cr]	Press the return key to activate the find. The message box will disappear, and Anne's card will appear on the screen. Note that a box surrounds the name Anne. This is the target of the Find command.

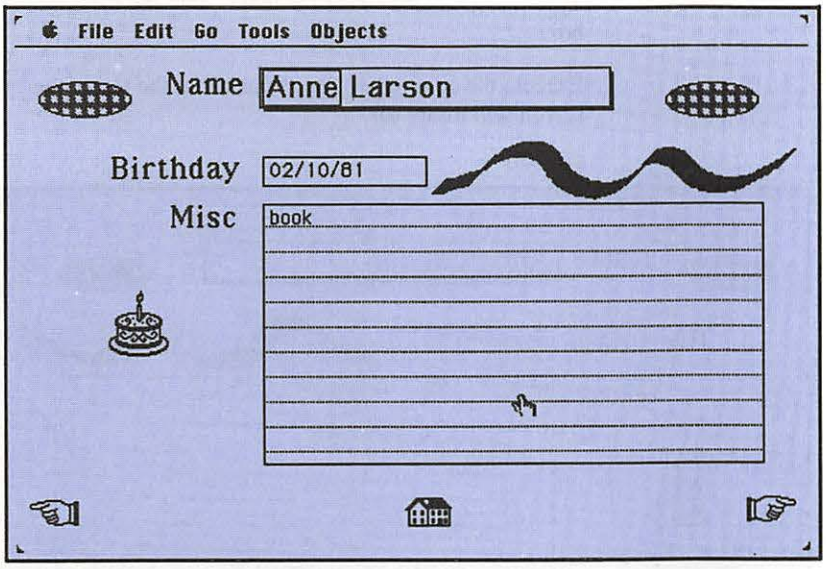


Figure 20.109
Anne's card has been found. The text that was searched for has been enclosed in a box.

⌘F	You want to do another find. The message box will re-appear with the last item you search for selected. By typing now, the selected text will be replaced.
book	You want to locate the people to whom you have given a book.
[cr]	Do the find. Anne's card stays on the screen, since you gave her a book.
[cr]	Press the return again. This signals HyperCard to perform the last Find command again. Alex Jones' card should now be on the screen.
[cr]	Tell HyperCard to once again repeat the Find command. You will return to Anne Larson's card.
⌘M	Recall, when you had the Go menu pulled down (Figure 20.106), that the Message command can be executed with this key. The message box should appear.
Select the complete contents of the message box.	You want to completely change the instruction you are giving HyperCard.

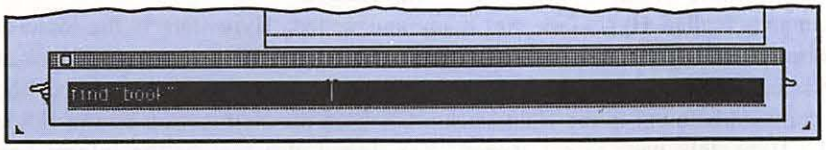


Figure 20.110
All the text in the Message box has been selected.

hide menubar	Type the command "hide menubar" into the message box.
[cr]	Execute the command. The menu bar at the top of the screen will disappear.

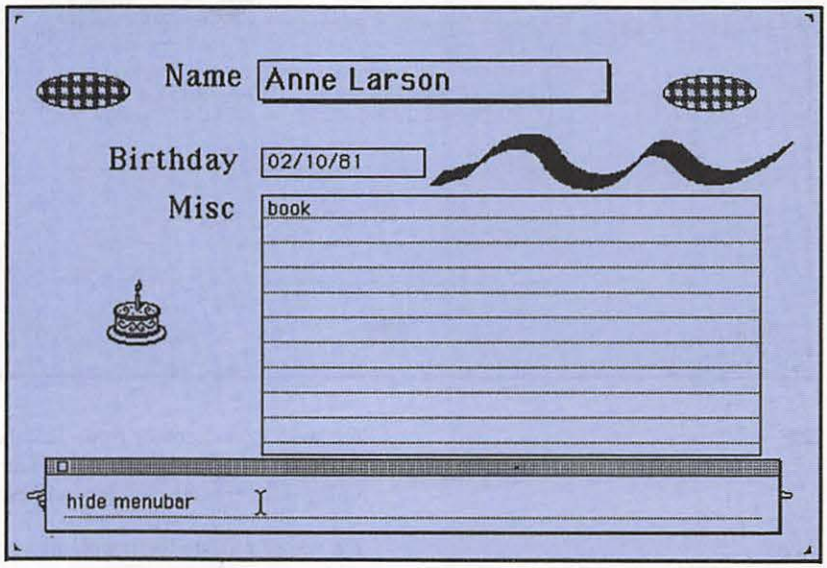


Figure 20.111
The menu has been hidden.

Click on the message box's close box.	Put away the message box.
Click on the Home button.	Return to the Home card. The menu bar will return. There is a command associated with returning to the Home card that turns on the menu.
	You may turn on the menu if it is missing with the command "show menubar".

20.15 SCRIPTS

The Hide menuBar command and Show menuBar command are examples of script commands. You may execute script commands one at a time by entering them into the message box, as you have seen. You may also create a script that belongs to a particular HyperCard item. This item, when the correct action is take, will then perform the script for you.

The script commands, called HyperTalk, are many and varied. HyperTalk is the topic of several commercial books, and will not be covered in great detail here. However, we will look at a few simple scripts and make modifications to them. There is some information about the various HyperTalk commands found in the Help stacks. Click on the Help button on the Home card, then select the HyperTalk page to get started. You should also look at the information found in the Release Notes stack for the version of HyperCard you are using. This stack includes information that is not in the HyperCard manuals.

What To Do	*Why You Are Doing It*
Click on the Button Ideas button.	You are going to copy a button that has a pre-written script.
Click on the Home, Business button.	This card has a Sort button at the bottom right. It will let us sort the cards in the stack into alphabetical order.
Pull down the Tools menu, select the button tool and release the mouse.	To copy a button, you must be editing buttons and not browsing.
Click on the Sort button.	This button is found at the lower right corner of this card.

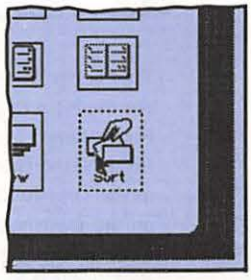


Figure 20.112
The Sort button has been selected.

⌘C	Copy the button.
⌘R	Select the Recent display.
Click on one of the cards of the stack you have created.	It does not matter which card you select, since you will be placing this button on the stack's background. This will make it available to all the cards you have created.
⌘B	Select the Background. The menu bar should become striped.
⌘V	Paste the button onto the card.
Drag the Sort button down and place it between the Home and Next Card buttons.	Place this button at the bottom of the screen with the other buttons you have on the background.

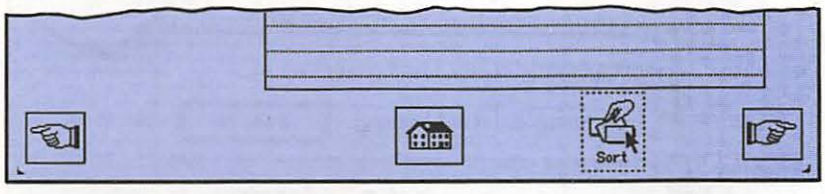
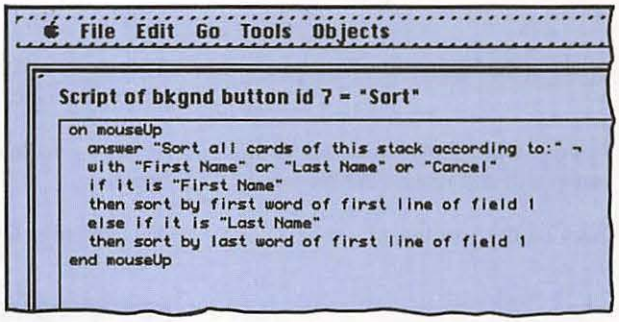


Figure 20.113
The Sort button has been placed between the Home and Next Card buttons.

Double-click on the Sort button.	You want to look at the script for this button. This double-click will access the Button Info dialog box. If you have trouble, use the Objects menu to get this dialog.

Click on the Script button.	You want to look at the script for sorting.

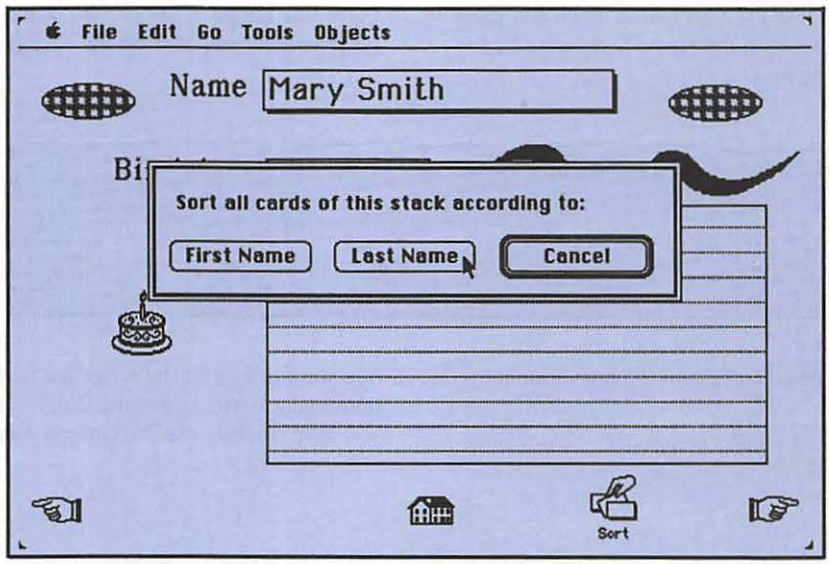
Figure 20.114
The script associated with the Sort button.



This script is reasonably self-explanatory. The Answer command will generate a dialog box with three buttons: First Name, Last Name and Cancel. If you click on the First Name Button, the stack is sorted by the first word in the first field on the card, the name field. If you click on the Last Name button, the stack is sorted on the last word in the first field. There is no command to be carried out if the cancel command is selected, so nothing will happen.

Click on the OK button.	You are done looking at the script.
⌘B	You are done with the background.
Pull down the Tools menu, select the Browse tool and release the mouse button.	You want to use the stack.
Click on the Sort button.	Try this button. The dialog box described above will appear.

Figure 20.115
This dialog box is created by the script found on the Sort button.



Click on the Last Name button.

You want the cards ordered by last name.

After a brief pause, Alex Jones' card will appear. It is now the first card in the stack.

⌘1

This is the Go First command. Nothing should change, since you are already looking at the first card.

Click on the Next Card button.

Anne Larson's card follows Alex's card.

Click on the Next Card button.

Here is Mary Smith's card.

Click on the Next Card button.

The last card in the stack is now Peter Zarnak's.

Click on the Next Card button.

You have returned to the beginning of the stack.

Now you are going to create a new button and write a simple script.

⌘B

You want to place the button on the background.

Pull down the Objects menu, select the new button command and release the mouse button.

Remember that when you create a new button, HyperCard automatically selects the button tool for you.

Drag the new button to the space between the Previous Card and Home buttons.

You are keeping all the buttons on this card on the bottom.

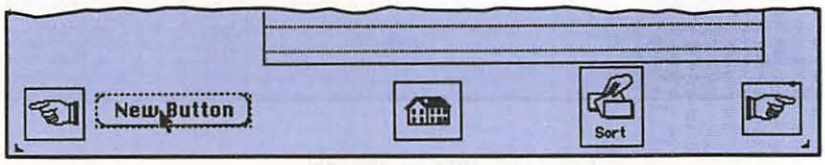


Figure 20.116
The new button has been created and placed at the bottom of the card.

Double-click on the new button.

You want to make changes to the button using the button info dialog box.

Find

Change the name of this button to Find.

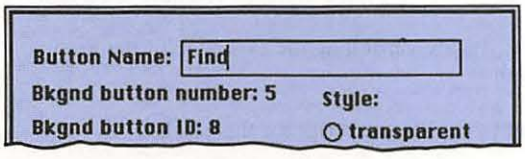


Figure 20.117
The button has been renamed.

Click on the Script button.

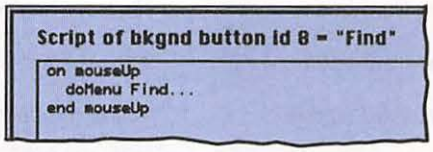
You are going to edit the script for this button. The script for a new button automatically supplies you with the "on mouseUp" and "end mouseUp" commands used to activate the script when the button is clicked.

doMenu Find...

This is the command you want HyperCard to execute.

You may have HyperCard perform any menu command by giving it the command doMenu followed by the menu item exactly as it appears on the menu. If you pull down the Go menu, you will see that the Find command is followed by three periods. These three periods **must** be included here.

Figure 20.118
The script you are creating.



Click on the OK button.

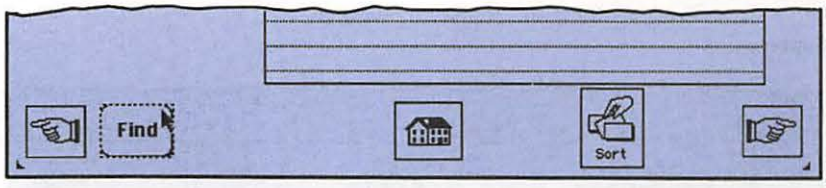
You are done with this script.

You will return to the card background.

Use the mouse to change the shape of the button.

Just as you changed the shape of fields by grabbing them on a corner, you may change the shape of the button. Make this button narrower and taller.

Figure 20.119
The new button has had its size changed and its position adjusted.



⌘B

Leave the card's background.

Pull down the Tools menu, select the Browse tool and release the mouse button.

You are ready to try the button.

Click on the Find button.

If you have properly created this button, the Message box will appear with the Find command you have used in it.

Click on the message box's close box.

In effect, you are cancelling the execution of the Find command.

Pull down the Objects menu and select the Stack Info command.

You want to modify the script for this stack.

Figure 20.120
The Stack Info command has been selected.



Release the mouse button.

Look at the Stack Info dialog box.

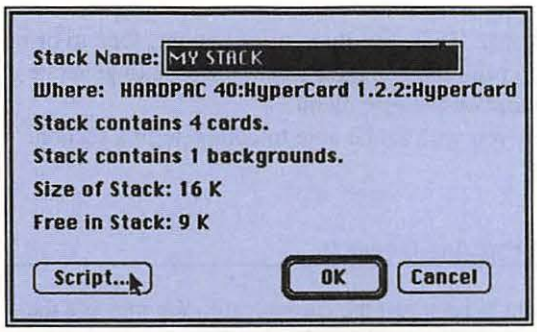


Figure 20.121
The Stack Info dialog box.

Click on the Script button.

You are going to add a script to the stack. Since this is not a button, there is no command shell already displayed on this script.

on openStack [cr]
hide menuBar [cr]
end openStack [cr]

Type this three line script. Press return at the end of each line. HyperCard will create indentations for you as the script is typed.

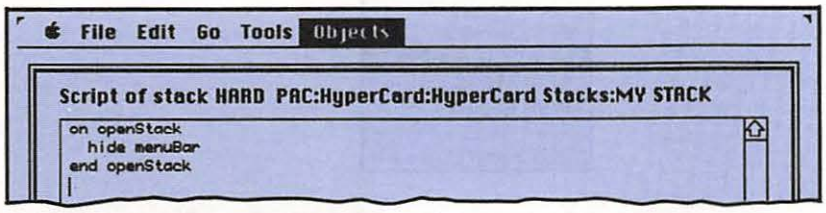


Figure 20.122
The completed script.

Click on the OK button.

You are done with this script.

Click on the Home button.

Return to the Home card. The script you just created will execute only when you first open the stack. To test it, you must leave the stack and return to it.

Click on the MY STACK button.

Return to your stack. The menu bar should now be hidden.

⌘M

Tell HyperCard to give you the Message Box. At present, we want to use the menu bar.

Select any text in the message box.

You want to completely replace the current content of the message box.

show menubar [cr]

Enter this command. The menu bar should now return to the top of the screen.

Click on the message box's close box.

Put away the message box.

20.16 PRINTING YOUR STACK

It is a simple task to print the stack you have created. There are three print options. One to print the card presently displayed on the screen, one to print the complete stack, and one to generate a columnar report. All the print commands are found on the File menu.

If your computer is not attached to a printer, you will not be able to complete this section.

What To Do	*Why You Are Doing It*
Pull down the File menu and select the Print Card command.	You want to print just the current card. You may use the ⌘P key to print a single card at any time.

Figure 20.123
The Print Card command has been selected.



Release the mouse button.	Print the card. No printer dialog box will appear. The card will simply be printed. When the printing is done, continue.
Pull down the File menu and select the Print Stack command.	This command will print all the cards in the stack.

Figure 20.124
The Print Stack command has been selected.



Release the mouse button.

Execute this command. The Print Stack dialog box will appear.

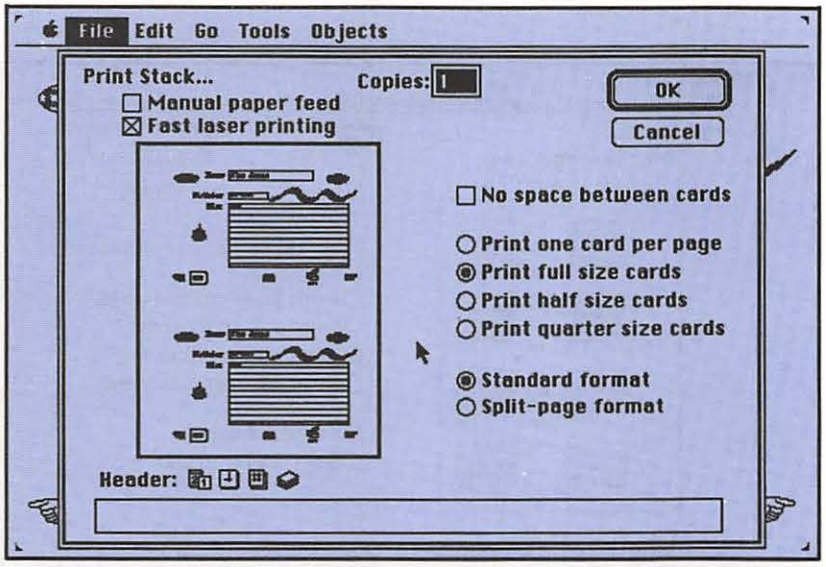


Figure 20.125
The initial Print Stack dialog box.

You can see that you have several options as to how the cards will be printed. The initial format prints two full sized cards on a page.

Click on the quarter size cards button.

This format will put 32 cards on a page. This is a great paper saver. If, however, your cards have a lot of fine detail, or you selected a small type font for some of the fields, you will find the output difficult to read.

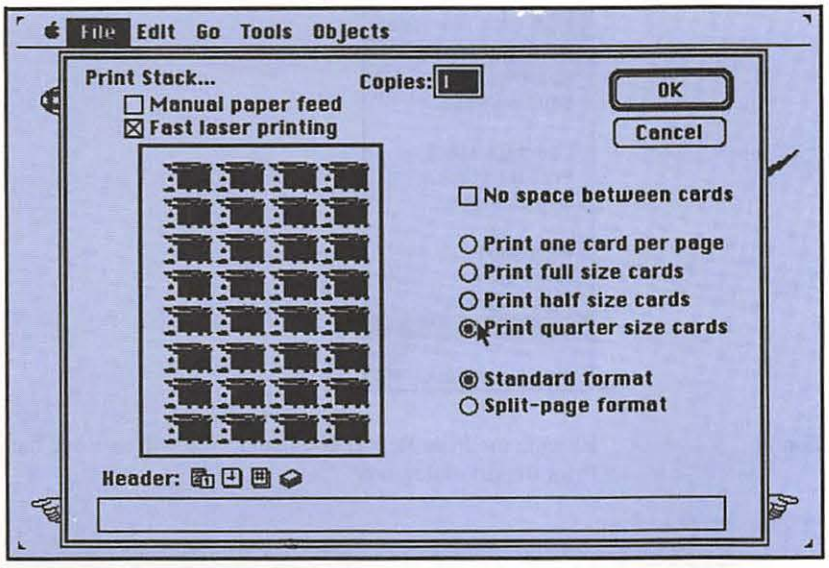
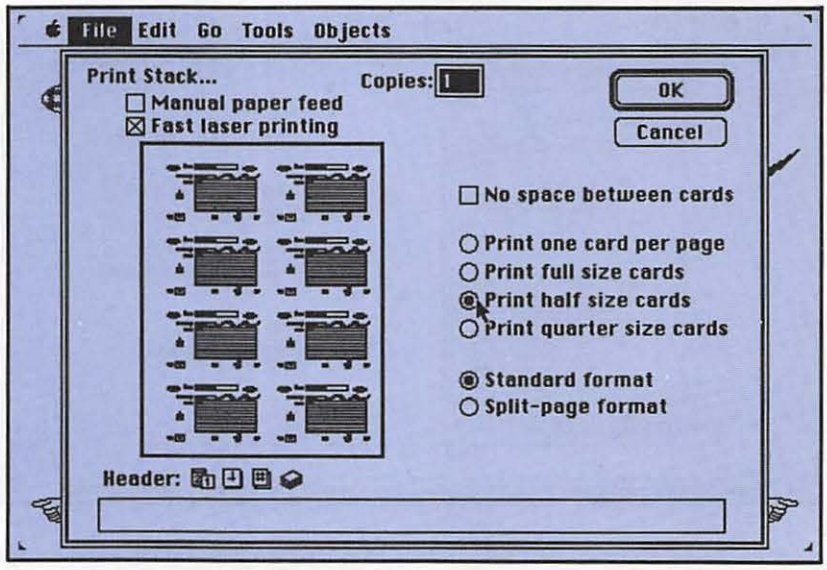


Figure 20.126
The quarter size cards option has been selected.

Click on the Half size cards button.

This format will put eight cards on the page. It is a reasonable compromise between two cards on a page and 32. Even cards with fine detail will be legible, although there may be some loss of detail.

Figure 20.127
The half size cards option has been selected.



If you want to see what your stack looks like when printed in this format, click on the OK button. Otherwise, click on the Cancel button.

Pull down the File menu and select the Print Report command.

This command will print a columnar report of the fields in the stack.

Figure 20.128
The Print Report command has been selected.



Release the mouse button.

Execute the Print Report command. You will now see the Print Report dialog box.

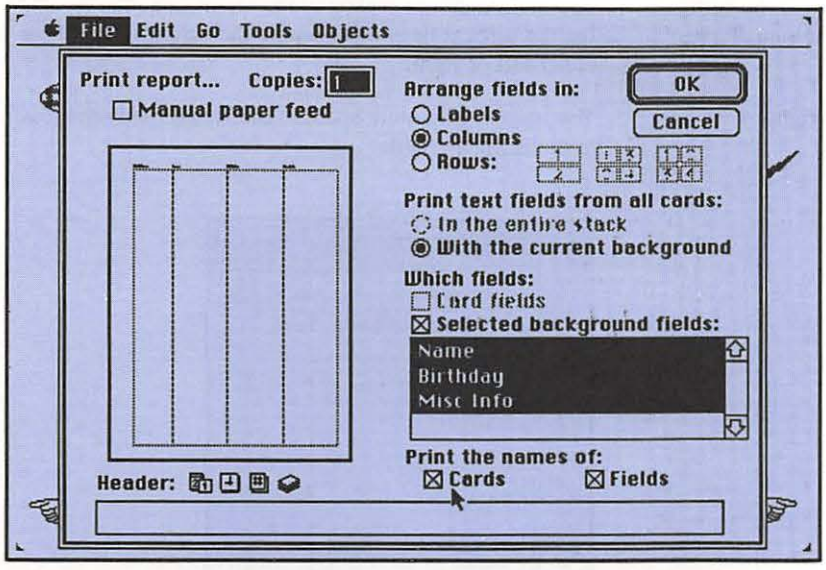


Figure 20.129
The initial Print Report dialog box.

You can see that initially, HyperCard will select all the fields for printing, and that it divides the page into even-width columns.

Click on the Cards check box at the bottom right of the dialog box.

You do not want the name of cards to be included in the report. The report layout will change, now showing only three fields to be printed.

Shift-click Misc Info in the field list.

Hold down the shift key before you click on the Misc Info field name. This will leave the other two fields selected. If you forget to hold down the shift key, simply click on the Name field, then shift-click on the Birthday field.

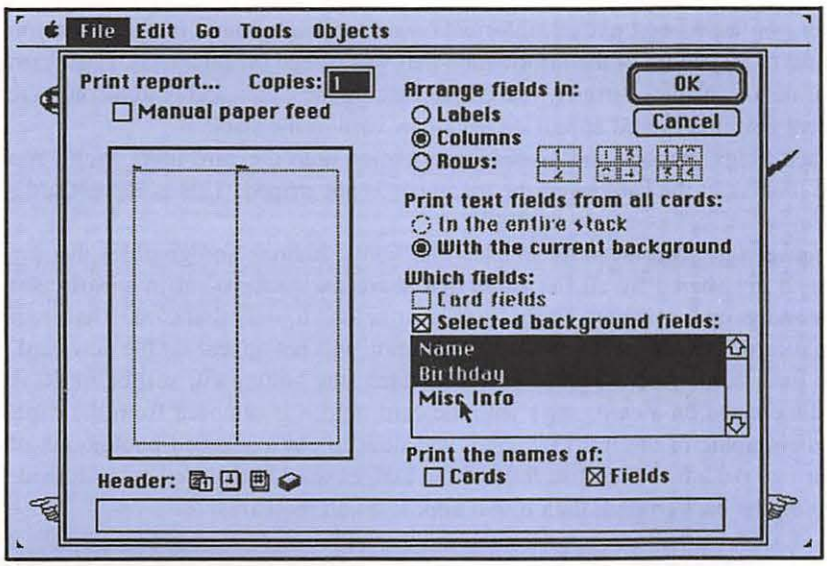


Figure 20.130
The two fields to be printed are selected, and the Print the names of Cards box has been unchecked.

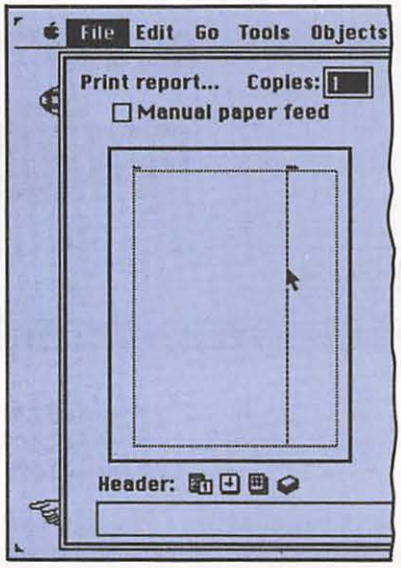
Use the mouse to point at the vertical line in the center of the sample page layout.

You may adjust the widths of the report columns by dragging the vertical lines representing the column boundaries either left or right.

Drag the column line right.

You want to give more space to the Name field, and less to the Birthday field.

Figure 20.131
The column widths of the report have been changed.



Click on the OK button.

Print the report.

20.17 BEFORE YOU QUIT

This complete chapter you have been placing information on the background of the stack you created. This is because of the nature of the information that was placed on each card. Each card needed the same information: Name, Birthday and Misc. Placing the fields and buttons onto the background layer meant that they would appear on each new card in the stack.

You may also place fields, buttons and graphic information onto the card layer itself. You can tell when you are looking at the card layer, the menu bar is not striped. This is HyperCard's normal state.

The difference between the two layers is simple. The fields, buttons and graphics that are placed on a background are shared by all the cards that share the background in a particular stack. Fields, buttons and graphics that are on the card layer belong to only that card. That is, if you place a button on a card, then create a new card, the button will not appear on the new card. If you go back to the prior card, where the button was created, the button will still be on it! A button, field or graphic created on a card, stays with the card until it is removed from the card. Thus, if rather than the graphic of the birthday cake, you want to put a scanned photograph of each person in the space to the left of the Misc field, those images would be placed on each card. If you place an image on the background, then it will appear on all the cards.

The key issue when deciding if you should place something onto the background or the card layer is to determine which information should be common to all the cards that share a particular background, and which information is applicable only to a single card. If the information (or information category) is common, such as the Name field or the next card button, then it belongs on the card background. If the information is unique to a particular card, such as the person's photograph, or a button to play digitized speech by the person, then it belongs on the card itself.

20.18 QUITTING HYPERCARD

All the work you have done has automatically been saved by HyperCard. When you quit, you do not have to execute a save command.

This complete chapter you have been putting these items onto the card background. Before you quit, you may want to try putting buttons, fields or graphics onto a card. Try this to see what happens.

What To Do	*Why You Are Doing It*
Pull down the File menu and select the Quit HyperCard command.	You are ready to leave HyperCard. Note that the Quit HyperCard command may be executed with the ⌘Q key.



Figure 20.132
The Quit command on the File menu has been selected.

Release the mouse button.	Execute the Quit command. You will be returned to the Macintosh Finder.

EXERCISES

1. What does the User Preferences card of the Home Stack control?
2. What two keys do you hold down to locate all the buttons on a card?
3. When looking at the outlines of all the buttons on a card, how can you tell a background button from a card button?
4. What is the command key used to select the card's background?
5. What is the advantage of using a background?
6. Are Next and Previous card buttons required on all cards?
7. When you create a new stack, is it possible to duplicate the background of an existing stack, or must you re-create a background?
8. What does the Go Recent command display, and what does it let you do?
9. Do you think that you could manually write the script created by the Link To command on the button information dialog box, or must the script be created by the Link To button itself?
10. Add a button to the stack you created to sort the cards based on the birthday field. When sorted, what is the order of the cards? Why?
11. Do you think that it is possible to give the Sort command to the stack by using the message box? Why or why not?
12. Add a button to MY STACK to create a new card so that you do not have to use the menu command.
13. Why do you think all the buttons and fields on the stack you created were placed on the background? Why do you think almost all the buttons on the Home Card are on the card, and not the background?
14. Create a stack to help you keep track of your tape, LP or CD library. You may want to include on the cards information such as the title of the recording, the artists, the songs and a brief evaluation of it.

THE FINDER MENUS



File

New Folder	⌘N
Open	⌘O
Print	
Close	⌘W
Get Info	⌘I
Duplicate	⌘D
Put Away	
Page Setup...	
Print Directory...	
Eject	⌘E

Edit

Undo	⌘Z
Cut	⌘X
Copy	⌘C
Paste	⌘V
Clear	
Select All	⌘A
Show Clipboard	

View

- by Small Icon
- by Icon
- by Name
- by Date
- by Size
- by Kind
- by Color

Special

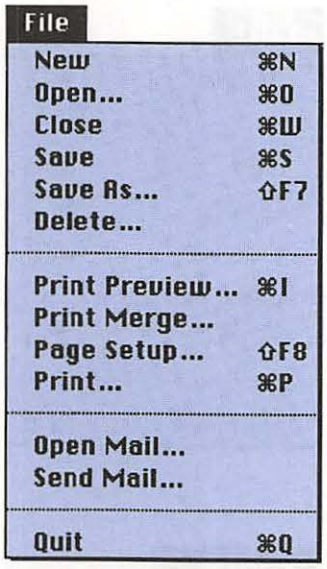
- Clean Up Selection
- Empty Trash
- Erase Disk
- Set Startup...
- Restart
- Shut Down

NOTES

MICROSOFT WORD 4.0

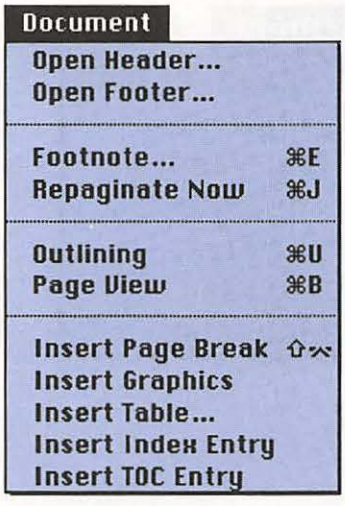
B

NOTES

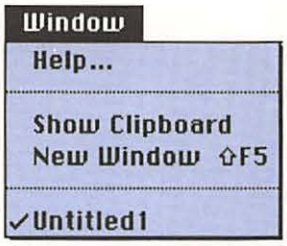


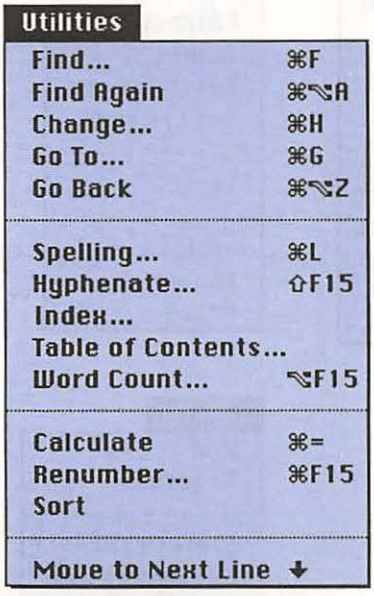






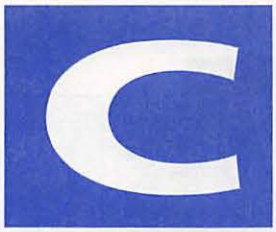

Font
9 Point
10 Point
12 Point
14 Point
18 Point
24 Point
Athens
Avant Garde
Bookman
Cairo
Chicago
Comic
Commando
Courier
Crypt
Geneva
Helvetica
Hollywood
London
Los Angeles
Mobile
Monaco
N Helvetica Narrow
New Century Schlbk
✓New York


Window
Help...
Show Clipboard
New Window ⇧F5
✓Untitled1


Utilities
Find... ⌘F
Find Again ⌘⌥A
Change... ⌘H
Go To... ⌘G
Go Back ⌘⌥Z
Spelling... ⌘L
Hyphenate... ⇧F15
Index...
Table of Contents...
Word Count... ⌥F15
Calculate ⌘=
Renumber... ⌘F15
Sort
Move to Next Line ↓

NOTES

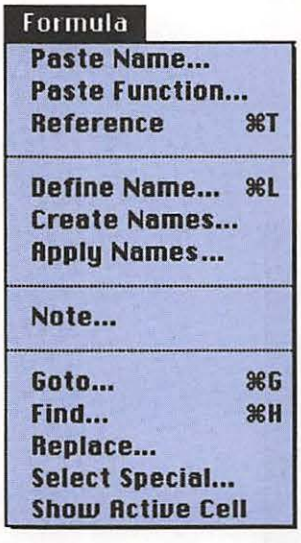
MICROSOFT EXCEL 2.2



NOTES

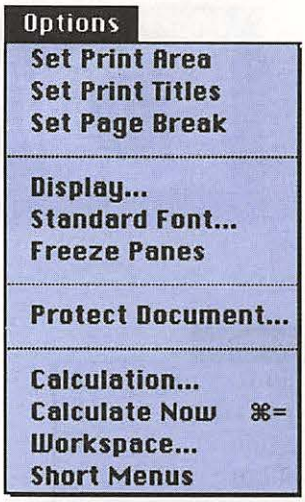






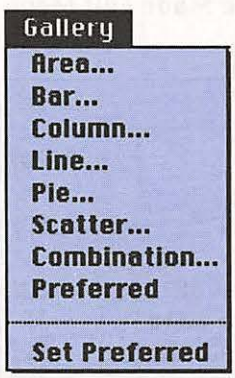


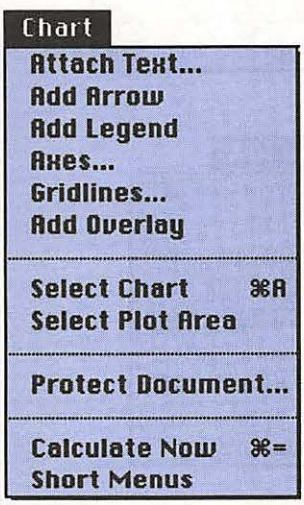






C.1 CHART MENUS





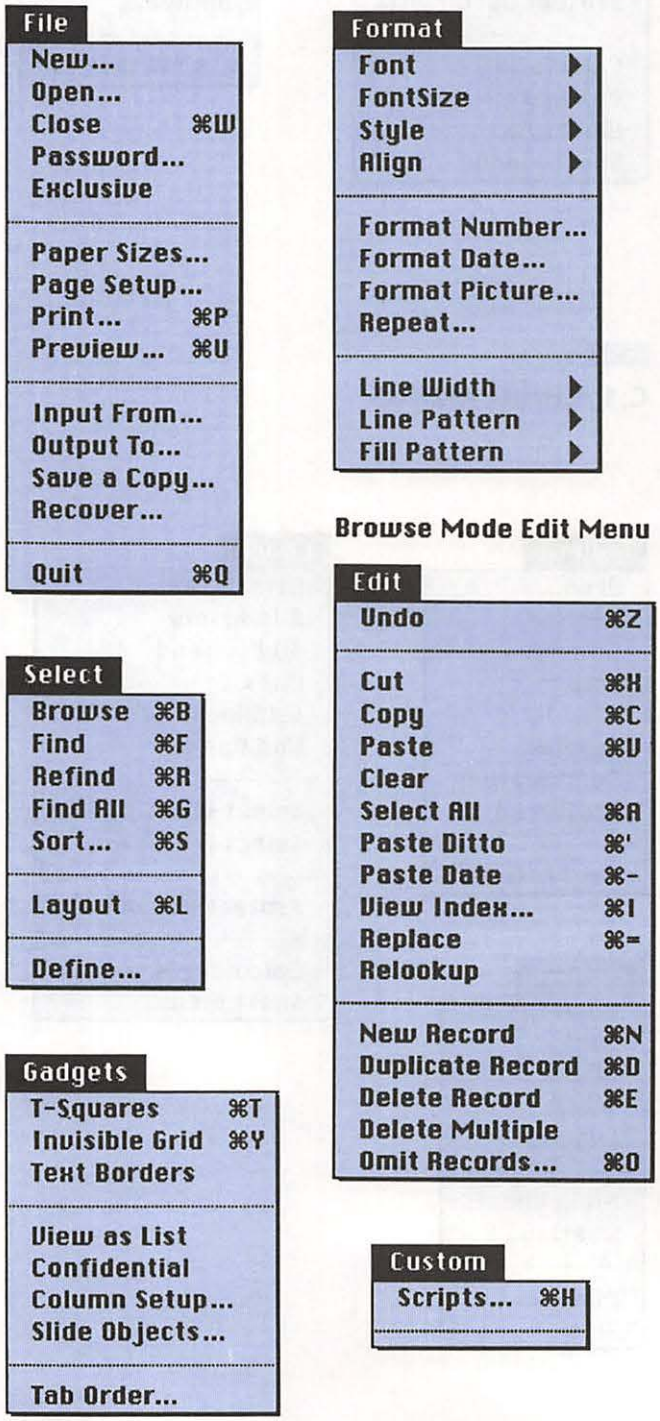


NOTES

FILEMAKER II

D

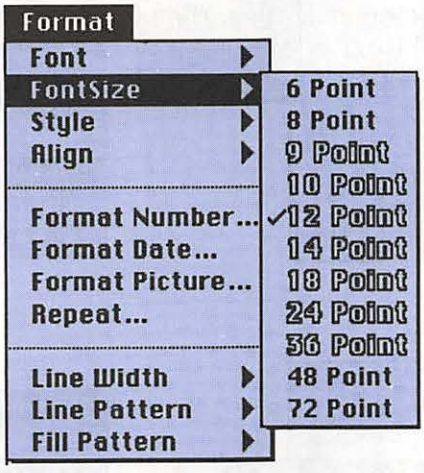
NOTES



Layout Mode Edit Menu



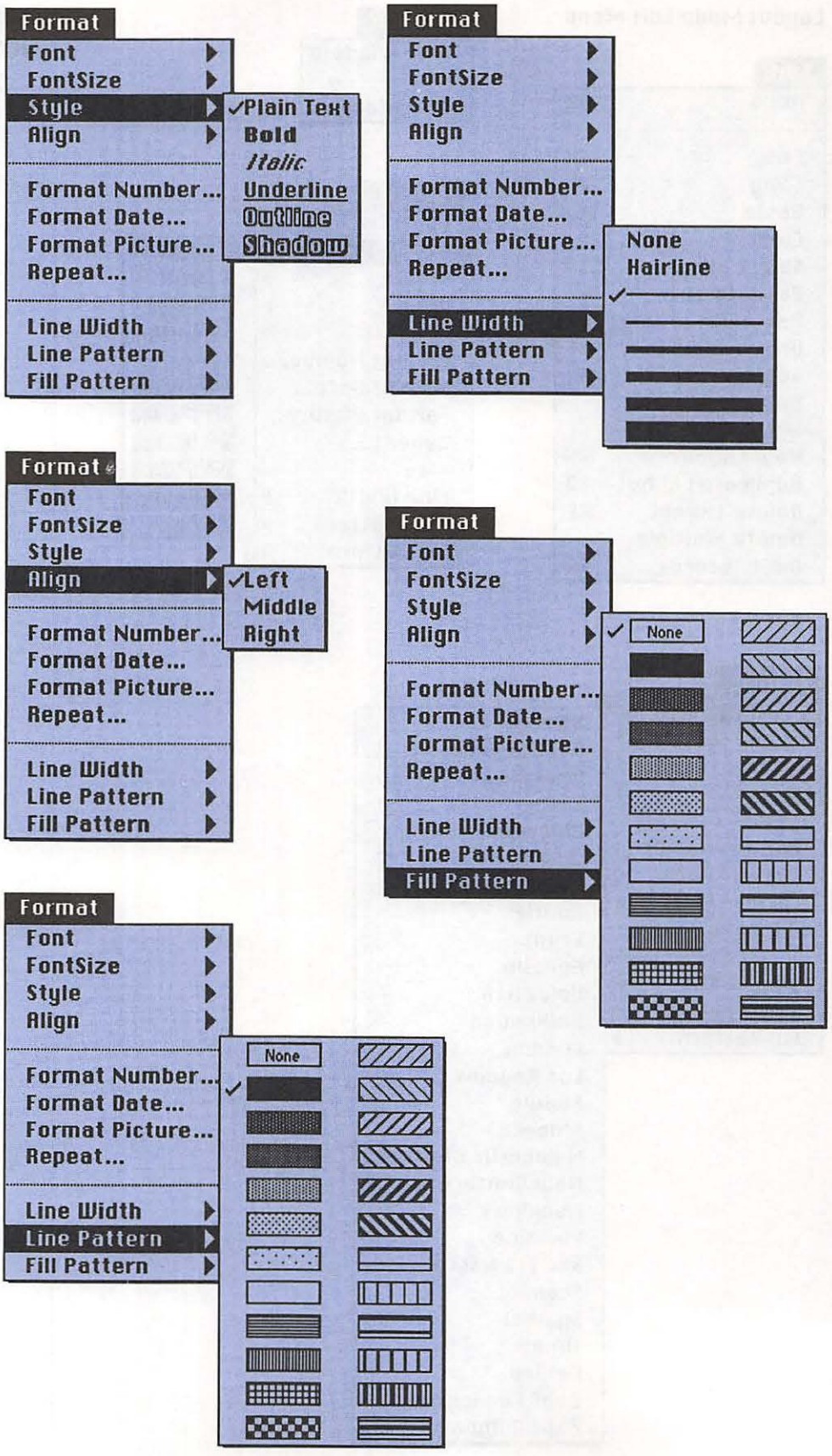






NOTES

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Format
Font
FontSize
Style
Align
Format Number...
Format Date...
Format Picture...
Repeat...
Line Width
Line Pattern
Fill Pattern
✓Plain Text
Bold
Italic
Underline
Outline
Shadow
None
Hairline
✓Left
Middle
Right

HYPERCARD 1.2.2



File

New Stack...	
Open Stack...	⌘O
Save a Copy...	
Compact Stack	
Protect Stack...	
Delete Stack...	
Page Setup...	
Print Card	⌘P
Print Stack...	
Print Report...	
Quit HyperCard	⌘Q

Edit Menu in Field Mode

Edit

Undo	⌘Z
Cut Field	⌘X
Copy Field	⌘C
Paste Picture	⌘V
Clear Field	
New Card	⌘N
Delete Card	
Cut Card	
Copy Card	
Text Style...	⌘T
Background	⌘B

Edit Menu in Browse Mode

Edit

Undo	⌘Z
Cut	⌘X
Copy	⌘C
Paste Picture	⌘V
Clear	
New Card	⌘N
Delete Card	
Cut Card	
Copy Card	
Text Style...	⌘T
Background	⌘B

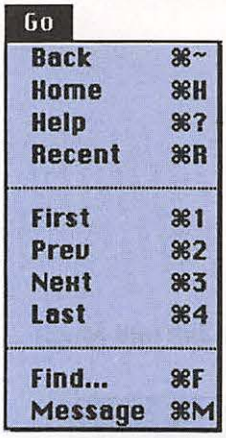
Edit Menu in Button Mode

Edit

Undo	⌘Z
Cut Button	⌘X
Copy Button	⌘C
Paste Picture	⌘V
Clear Button	
New Card	⌘N
Delete Card	
Cut Card	
Copy Card	
Text Style...	⌘T
Background	⌘B

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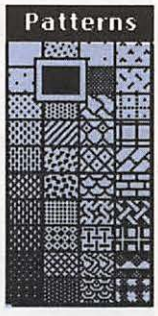




E.1 PAINT TOOLS MENUS







GLOSSARY

Abandon To stop work on a document without first saving it. Thus, any changes, additions to or deletions from the document are discarded, or abandoned.
Absolute cell address Applies to electronic spreadsheets. When a cell containing the address of another cell is copied, the copy retains the exact same cell reference address in the copy. *See also* Relative cell address.
Applications Software Programs created to perform a specific task, such as accounting or word processing.
ASCII American Standard Code for Information Interchange. Pronounced "ASK-EE." It defines the meaning of each eight-bit pattern than makes up a byte.
Binary Digit (BIT) The most fundamental unit of information dealt with by the computer. It may be compared to an on/off switch. Either a bit is on, or it is off. Bits are combined to represent information in the computer.
BIT *See also* Binary Digit.
Bit Map A graphic image in which the picture is composed of on or off bits on the page or computer screen.
Bit-Map font A type font that has a particular point size defined with instructions for the printer to tell it exactly which dots to print and which not to print. If you use a bit-map font in a nonoutline size, you will have jagged edges and generally poor results. *See also* Outline fonts, Laser fonts.
Boilerplate To combining prewritten paragraphs to create a document, filling in only the appropriate name or other customizing information.
Boot disk A disk containing the information necessary to load the computer's operating system and to start a computer running.
Boot up Derived from "pull oneself up by one's bootstraps." This means to start the computer and have it load a new copy of it's operating system.
Business graphics Charts and graphs intended to display numeric information, such as bar, line and pie charts.
Byte A single character of information composed of eight BITs. The on/off pattern of the bits define what any given byte means.
Cell A fundamental portion of an electronic spreadsheet capable of holding text, numbers or instructions for arithmetic computations.
Cell address The name given to each cell of an electronic spreadsheet. Each cell has a unique address composed of the name of the column in which the cell is located and the number of the row in which the cell is located.
Central Processing Unit (CPU) The portion of the computer that carries out most of the work. It performs all the calculations and controls the flow of information within the machine through the use of the Operating System.
Character field A field in a database that holds text information. Numbers placed into a character field are treated as if they were words and may not be manipulated arithmetically.
Circular reference This occurs when spreadsheet cell references form a circle. For example, cell A1 uses cell F3 in its formula, cell F3 uses cell H2, and cell H2 uses cell A1.
Click To press and immediately release the button on the mouse. Used to select items on the display after positioning the mouse pointer on top of the desired item. *See also* Double-click, Shift-click and Drag.
Column heading The information at the top of a column of information in a database or other report that describes the content of the column.
Command Key A key on the computer's keyboard that behaves in a fashion similar to the shift key in that it works in conjunction with other keys. It creates a character that may or may not be displayed, but that the computer recognizes and acts on regardless. It has ⌘ on it on the Macintosh keyboard.
Compiler A special program that turns what a programer writes in a specific programming language into the machine language required by the computer for program execution. The compiled program is stored as object code by the computer and executed on demand by the user. Program execution is fast when compared to execution of an interpreted program.
Computed field A field in a database that is the arithmetic result of two or more fields in the database.
CPU *See* Central Processing Unit.
Date fields A field in a database that will hold only calender dates. Date fields let the user perform date arithmetic, such as determining how many days have passed since an invoice was mailed.
Database A collection of related information.
Database Management System (DBMS) A program for creating, manipulating and generating reports of the contents of databases.
DBMS *See* Database Management System.
Desk Accessory (DA) A program that is always available on demand, even when another program is running. It is activated through the Apple menu. Typical desk accessories are: calculator, key caps, find file, alarm clock, chooser and control panel.
Desktop On the Macintosh, the working area of the screen. You can see icons on it.
Development Software Programs used to create and maintain programs for general and/or specific purposes.
Dialog Box A dialog box is the text that the Macintosh, or a program, places on the screen with information or with requests for action. The computer is carrying on a dialog with the user through this box.
Directory The area of the disk reserved during the format process to hold the information about the contents of the disk. Sometimes called the VTOC.
Disk Operating System (DOS) System software that has overall control of the computer. It controls the communication and flow of information between the CPU and the rest of the computer and peripherals, (i.e. disk drives and printers).
Dot-matrix printer An impact printer that forms letters with a series of pins rather than with a fully formed letter such as used by a standard typewriter.
Double-click To press and release the mouse button two times in rapid succession. Used to open selected icons or activate items on the display after positioning the mouse pointer on top of the desired item. *See also* Click, Shift-click and Drag.
Drag To press and hold the mouse button after positioning the mouse pointer on an item, and then moving the mouse, thereby moving the item on the desktop. *See also* Double-click, Click and Shift-click.
EPROM Erasable Programmable Read Only Memory. Programmable Read Only Memory that may be erased and reprogrammed.
FAT *See* File Allocation Table.
Field The smallest unit of information in a database. One item of information about a complete unit. *See also* Record.
File A collection of records. One or more files comprise a database.
File structure The combination of field names, the type of information the fields will hold, and the size of each field that defines a database file.
File Allocation Table (FAT) The FAT is a portion of the disk reserved by the operating system to keep track of those sectors of the disk that are presently in use (allocated) storing information, and those sectors that are not in use, or available.
Filling lines The process of adding blanks between words to make the right margin of the text even, or right justified. The line becomes "filled" with blanks to accomplish justification.
Film recorder A device used to photograph a computer's display.
Font A typeface.
Format *See* Initialize.
Global Referring to the complete document, database or spreadsheet.
Global command An action or command that operates on the complete spreadsheet or document.
Hard sector A type of floppy disk. Hard-sectored disks have more than one index hole punched in the disk media. *See also* Soft sector.
Hidden file A file stored on a disk, but the file's icon does not appear in the disk's window.
Icon A graphic representation of items in the computer, such as programs, data files or disk drives.
Impact printer A printer that causes the letters to appear by physically pressing the ribbon onto the page with the print head. A typical impact printer is a dot-matrix printer. *See also* Nonimpact printer.
Index A method of organizing the records of a database for rapid access based on the information contained in one or more fields of the database.
Initialize The process of preparing a floppy disk for use by the computer by placing information magnetically onto the disk for its future use.
Input The act of entering information into the computer so the machine may process the information.
Input Devices Hardware used to send information into a computer for processing.
Insert mode When word processing, the typing mode in which existing text moves aside to make room for new characters as they are typed. *See also* Replace mode.
Install The process of telling a computer program about your specific hardware setup.
Integrated software A program or group of programs that are specifically designed to share information and files.
Interpreter A special program that translates a program for a computer to execute "on the fly." Program execution is slow when compared to execution of a compiled program.
Keyboard template A piece of plastic or cardboard that fits over or sits next to the computer's keyboard with summary information describing what action keys (especially the Function keys) perform when the keys are used within a specific program.
Key field A field in a database record that gives the user direct access to specific records, such as part numbers or social security numbers.
LAN *See* Local Area Network.

Laser font A type font designed to work with one of the Apple laser printers. They send PostScript commands to the printer to draw the letters. This means that you may use any point size you want and not have the letters printed with jagged edges. *See also* Bit-Map fonts and Outline fonts.
Line editor A type of word processor that allows the user to make changes to the text. The text must then be processed by a formatter to create the desired output.
Local Area Network Commonly referred to as a LAN, the Local Area Network provides a physical link between several microcomputers, allowing them to send data to one another and to share devices such as hard disk drives and printers. Most LANs are within a single building or offices. Some, however, are as large as a college campus.
Logical fields A field in a database that can hold one of two values, true or false.
Macro A series of commands or other typing that is played back by the computer when you press a single key. If the macro consists of commands, the computer follows the commands as if you were typing them at the keyboard.
Memo field A field in a database that holds large amounts of text but generally cannot be searched or manipulated in the same fashion as character fields.
Microsecond One millionth of a second.
Millisecond One thousandth of a second.
Mother Board The main printed circuit board inside the computer into which most of the parts are inserted.
Mouse The physical device that sits on the top of your desk, attached to the computer and used to move the mouse pointer arrowhead and other cursors on the Macintosh display.
Nanosecond One billionth of a second.
Nonimpact printer A printer that causes the letters to appear without physically touching a ribbon to the paper, such as a laser printer. *See also* Impact printer.
Number crunching Performing a large volume of arithmetic computations.
Numeric Field A field in a database that will hold numbers only.
Object Code The output, or results, of compiling a program. It is an unchangeable version of the program in machine code. If there is an error in the program, the program's source code must be modified, then compiled again, producing a new version of the object code.
Operating System Utility A program used to help you manage the overall operations of the computer and your information.
Outline fonts A font size that has a bit-map definition. When looking at font size lists on pull down menus, the outline fonts are the desirable ones to use, since the Macintosh screen is bit-mapped.
Output Computer display or printed results of a computation or other computing process, or sending those results to another computer or internal process for further action.
Output devices Hardware used by the computer to send information to other computers or to display the information in human readable form.
Pane When you split the main spreadsheet text window into two parts, each part is called a window pane.
Password A word or phrase used to gain access to a computer system.
PC Board Printed Circuit Board.
PROM Programmable Read Only Memory. Once the PROM has been programmed, it may not be changed and acts like a ROM.
Pull Down menu A menu as found on the menu bar at the top of the Macintosh display. By positioning the mouse pointer on the menu name and pressing the mouse button, the menu will appear to be pulled down from the top of the screen.
RAM *See* Random Access Memory.
Random Access Memory (RAM) Memory in the computer used to store the program and active data (such as a word processing document or electronic spreadsheet) while the program is executing. Some programs require more RAM than others.
Range A rectangular group of cells in a spreadsheet that represents a subset of the complete spreadsheet.
Read Only Memory (ROM) Computer memory in which programs are permanently encoded. Programs stored in ROM execute very fast. Only parts of the computer's operating system are stored in ROM.
Recalculation Recalculation occurs when one or more cells of an electronic spreadsheet is changed. The electronic spreadsheet updates all the values displayed as a result of a change in the contents of one or more cells. Recalculation may be automatic or manual. The former takes place whenever any spreadsheet cell is changed. The latter only when the user tells the spreadsheet to recalculate.
Record A collection of fields that completely describe one item in a database.
Relative cell address Applies to electronic spreadsheets. When a cell containing the address of another cell is copied, the copied reference retains the same relative distance in rows and columns between the copy and the newly referenced cell. *See also* Absolute cell address.
Replace mode When word processing, existing text is typed over, or replaced, as you type new text.
ROM *See* Read Only Memory.
Root directory The master directory of a disk. It may contain data files, programs, and folders.
Scaling Determining the low and high values of the Y-axis on a chart and the amount of space, both in numeric units and in physical display, to be placed between the intermediate values displayed on the axis.
Screen Editor A type of word processor, typically of the what you see is what you get genre.
Shift-click To press and release the mouse button while holding down the shift key. Used to select multiple icons or items on the desktop or in some dialog boxes. *See also* Double-click, Click and Drag.
Soft sector The type of floppy disk. Only one index hole is punched in a soft sectored disk. *See also* Hard sector.
Software Sets of instructions for the computer to carry out are called programs. Programs generically are referred to as software.
Sort A method of organizing the records of a database into a logical sequence based on the information found in one or more fields.
Source code The original, uncompiled list of program statements. The source code is the input to a compiler, which produces object code for the computer to execute. Source code may also be input into an interpreter for execution.
Spreadsheet model An interdependent group of spreadsheet cells that perform computations to provide the user with information. The model may be one to forecast sales or to estimate the impact of a price change on manufacturing costs.
Spreadsheet template A prewritten spreadsheet model that performs a specific task into which you place your own data.
Stand-alone graphic program A program that does no task other than creating graphics.
Stream Editor A program that scans files for every occurrence of a particular character combination and changes it into another character combination.
Structure *See* File structure.
Synchronize The two panes of a split spreadsheet window scrolling together.
Systems Software Programs which supervise the overall operation of the computer and how it communicates with the rest of the world.
Text window The portion of the monitor used to display the document on which you are working. Typically, the complete document is larger than the window.
Template *See* Spreadsheet template and Keyboard template.
Throughput The amount of information that is processed by a single computer. The faster the computer works, the more information in can process, the greater the throughput.
Unsynchronize The two panes of a split spreadsheet window scrolling independent of one another.
User friendly This term is applied to software which behaves the way the novice user expects it to behave without long hours of study of the manuals. It implies that the software is easy to use, yet still very powerful.
Utility Software Program development aids and hardware/software management aids. Named because they perform utilitarian tasks, such as copying disks, or unerasing erased files.
Video recorder *See* Film recorder.
Volume Table of Contents (VTOC) Pronounced Vee-Talk. The area of a floppy disk reserved by the Disk Operating System to hold the information about what is stored on the disk.
VTOC *See* Volume Table of Contents.
What if Term applied to the manipulation of cells of an electronic spreadsheet model to determine the effect of changes on the overall model.
Window *See* Text Window.
Write-protect Physically modifying a floppy disk so that the computer cannot change or erase the contents of the disk. If the disk is not write-protected, the contents of the disk may be changed, added to or deleted.
Write-protect tab The small rectangular slide on the side of a disk. If not covering the hole, the disk is write-protected. If the hole is covered, the disk is not write-protected.
WYSIWYG Stands for "What you see is what you get." A type of word processor in which the way text is displayed on the screen is exactly the way it will be printed.

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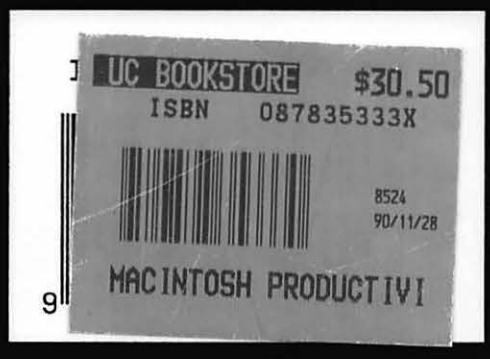
Macintosh Productivity Tools offers outstanding coverage of beginning, intermediate, and advanced concepts in word processing, database management, spreadsheets, and business graphics. A hands-on approach helps the reader learn by doing, to better understand the concepts. The book also contains hundreds of screen images to check user progress and results.

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