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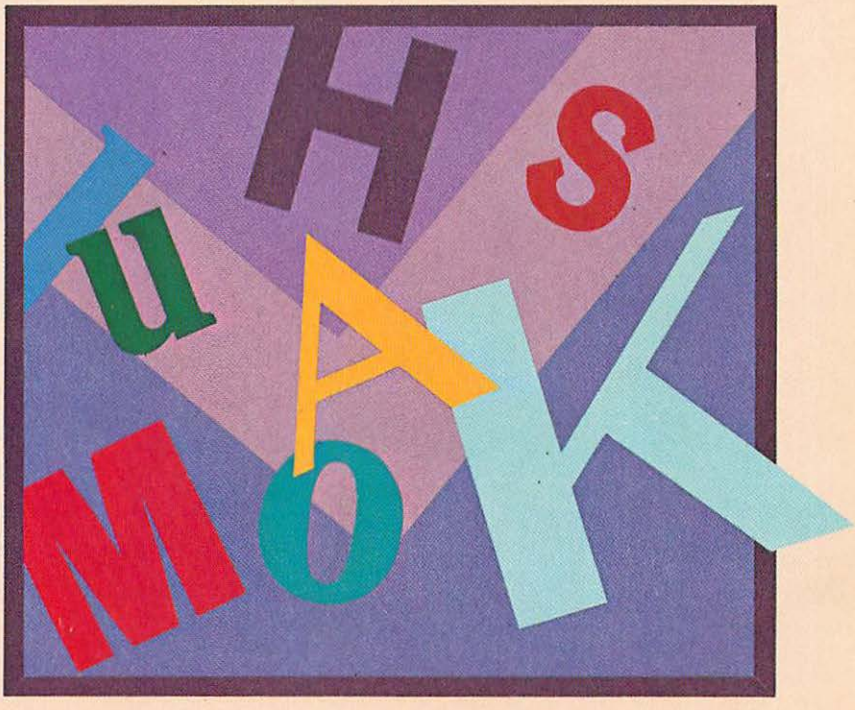
Macintosh™ PAPERWORK

INTEGRATING MICROSOFT® PRODUCTS



INCLUDES MICROSOFT™ WORD, MULTIPLAN,™ CHART & FILE

PAUL HOFFMAN

Macintosh™ Paperwork:
Integrating Microsoft® Products

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Paul Hoffman

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Contents

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Preface

This book shows you the methods you can use to transfer information between Microsoft Word, Multiplan, Chart, and File. You will learn many advanced features of the programs that make your work easier when you combine the packages, and the paperwork that you produce with your Macintosh will look better and take less time.

If you use two or more Microsoft applications, you can pass data from one program to another. Because you can use the same information, you don't have to retype it each time you want to run a different program.

The Microsoft documentation, however, does not cover in any detail the methods for transferring information among programs, even though most users find this capacity to be one of the best features of the programs. This book contains many tricks and hints that will help you move data quickly and efficiently.

Who Should Read This Book

Businesses, both large and small, use the Macintosh for such traditional computer tasks as accounting, personnel record-

keeping, and inventory. Multiplan, Word, Chart, and File are excellent programs for these kinds of business computing, and Microsoft's Business Pack (the four programs sold together) is a popular method for meeting most of a user's program needs.

In business, you often need to create memos, reports, and presentations based on the data you keep in your computer. You often combine data from many sources to produce paperwork like quarterly reports, status memos, and financial presentations. This book will help you take data from all four of the Microsoft programs and produce professional documents.

Although the book covers Word, Multiplan, File, and Chart, you will find the information useful even if you only own two of the programs. The in-depth coverage of passing data between the programs will help you to better understand the concepts used in the programs, and the examples in the second half of the book will show you many novel applications.

This book will also help you if you own some of the Microsoft applications and are not sure whether you want to buy more. The business capabilities of each program are covered in depth, especially as they relate to the other programs. By evaluating these capabilities, you can determine your needs for the other programs.

While this book goes into detail about some of the features of the Microsoft applications, you may want to read more about individual applications. Osborne/McGraw-Hill's Macintosh editions of *Microsoft Word Made Easy* by Paul Hoffman and *Multiplan Made Easy* by Walt Ettlin give you step-by-step introductions to these two products.

Hardware and Software Requirements

The Microsoft applications described in this book run on any Macintosh. You can use a 128K Macintosh with a single disk drive, but 512K (or larger) and a second disk drive are recommended. If you have a great deal of data, a hard disk or a network (such as the Macintosh Office) will be very helpful. This book covers all versions of the Microsoft programs at the date of printing.

Organization of the Book

Part I of the book shows you each of the Microsoft applications in detail and covers all of the methods for passing data between them. Chapter 1 is an overview of the programs and the concepts used in connecting them. Chapters 2 through 5 cover Word, Multiplan, File, and Chart, respectively. Chapter 6 gives you details about how to make your data and text look better with MacPaint and MacDraw.

Part II shows many finished examples that you can create by passing data between the programs. These practical business and scientific models include reports and memos covering a wide variety of data.

Part III contains the appendices. Appendix A covers how to use Word, Multiplan, Chart, and File to their fullest extent on a variety of Macintosh hardware, and how to use other Apple software such as the Switcher with the Microsoft applications. Appendix B discusses many other programs (such as Microsoft's Excel and Lotus' Jazz) that can handle the data you produce with the Microsoft applications.

When you are finished with the book, you will know how to make the task of producing paperwork with your Macintosh less time-consuming. You will also be using Microsoft applications more efficiently and creatively.

Paul Hoffman

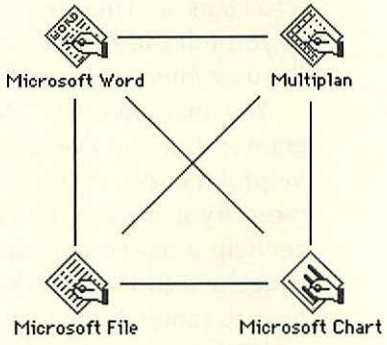
Part 1

Connecting The Applications

The six chapters in Part 1 review some important Macintosh concepts and familiarize you with the Microsoft products and how they relate to one another. Chapter 1 is an overview of the Macintosh concept and the design elements that go into all software for the Macintosh. Each of the remaining five chapters discusses how one Microsoft program can be integrated with the others. Chapter 2 discusses Word, while Chapter 3 talks about Multiplan. The topic of Chapter 4 is File, and the topic of Chapter 5 is Chart. Chapter 6 discusses both MacPaint and MacDraw.

1

Before the Macintosh, personal computers could exchange data between applications programs in only limited ways. The Macintosh's advanced integration capability has provided new opportunities for developing fully integrated applications programs. Microsoft took advantage of this powerful feature to integrate Word, Multiplan, Chart, and File. Using your Macintosh, you can transfer data among these programs to enhance your business productivity. This book explores some of the possibilities open to you to get the maximum efficiency from these Microsoft products and your Macintosh.



The Macintosh Concept

Apple designed the hardware and software of the Macintosh well aware of the problems that microcomputer users faced. The other microcomputers in the world (including Apple's) required time to learn to use them. In addition, information created by one program could not easily be used in others. As the Macintosh

design progressed, Apple decided to give software companies such as Microsoft an easy method for making their software easy to use and integrate—a standard user interface.

The Standard User Interface

Every program performs a different task, and the computer user must learn how to use each one. If the instructions differ from program to program (as they often do), learning to use each program is a long and tedious job. The more programs you buy for your computer, the more commands you are forced to remember.

Apple decided that the best way to reduce this learning time was to design a *standard user interface* that was easy for every software manufacturer to include in its programs. A user interface is the method by which software communicates with the user; in the case of the Macintosh, the user interface includes the menus, scroll bars, and mouse. Each time a program tells you something, or you tell the program something, you communicate through the user interface.

You may take the Macintosh's standard user interface for granted, but if you've used other microcomputers, you know how helpful it is. For example, your word processing program might require you to press the 1 key to quit the program and the 2 key to get help, while your spreadsheet program might require the 1 key to get help and the 9 key to exit. When you run each program, you have to remember which key does what.

With Macintosh software, you tell a program what to do by pressing the Mouse button on a menu title, dragging the mouse down to the option you want to execute, and releasing the Mouse button.

All Macintosh programs have menus that are used in the same way. For example:

In addition, many programs, including all of the Microsoft products, also allow you to use *command keys* to specify some of

their operations. Holding down the command key (⌘) while pressing another key is often easier than selecting functions from the menus.

All this means ease of use. For example, if you use Word for word processing and you buy Multiplan to do spreadsheet calculations, you will already know how to use many of Multiplan's features, since they are invoked the same way in Word.

The standard user interface goes well beyond the use of menus and command keys, but it is not important to enumerate all of its advantages here. You should remain aware of it, though, so you will appreciate how it helps you learn to use applications programs quickly.

The Clipboard


Clipboard File

Quickly learning to use many applications programs is fine, but there is still another major hurdle in using software: getting your programs to share data. If you cannot use the results from your database program in your spreadsheet program, you haven't used your time efficiently.

Apple designed a method that allows any program to read and write data used by any other program. The *Clipboard* is an area of the disk that a program can use to read and write information. If you quit a program when there is information in the Clipboard and then run another program, the second program can read the information from the Clipboard and use it. In this way, programs can pass along almost any type of data.

The Clipboard is discussed in depth later in this chapter since it is central to integrating the Microsoft products. As you learn more about the Clipboard, remember that it is useful not only for Microsoft applications, but for all applications that run on the Macintosh. Appendix B discusses other manufacturers' programs that can read and write information in the Clipboard.

Document Files

Word document


Chart document


Multiplan document


File document

Applications programs store data on disk in *documents*. A document file may contain text (for a word process-

ing program such as Word) or pictures (for a drawing program such as Chart). However, most programs store data in formats that only they understand, so that a database program cannot read the text in a normal word processing document.

Microsoft Word, File, Chart, and Multiplan each have their own internal formats for their documents. Word and File, though, can write documents in *text-only* mode, which means that the documents they create can be read by other programs. A text-only document is often not useful to the program that created it, since it does not contain any of the special information that the program needs to know to perform enhanced operations. For example, if you save a Word document in text-only mode, it does not contain any information about boldface or underlined characters or special tab settings.

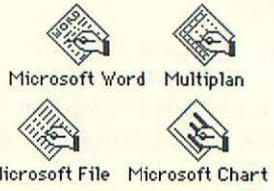
The purpose, then, of text-only documents is to allow a program to write data that can be read by other programs at a later time. This is similar in concept to the Clipboard, but text-only documents are more convenient than the Clipboard if you are not going to use the data immediately.

Methods for saving text-only documents are discussed in more detail later in this chapter. Both Word and File store their text-only files on disk with this icon:

Word text-only

Multiplan and Chart can write files in a format known as *SYLK files*. These are specially formatted text (ASCII-representation) files that can be used for telecommunication and for transferring data from some applications (usually from Microsoft) on other computers. Although these are text files, Word and File cannot use the information in a SYLK file.

The Microsoft Products



Microsoft Word Multiplan

Microsoft File Microsoft Chart

The four Microsoft programs have many uses, and some of their capabili-

ties overlap. In addition, each program uses different kinds of data, so you need to be aware of how to format your data to move it easily from program to program.

The following sections give you an overview of the purpose, scope, and type of output of the four Microsoft programs. The main features of these programs are discussed in more detail later in the book. As you read these sections, think about different uses that you may find for the programs in your normal work. Because each of the programs has many functions, you may trigger new ideas about what it can do for you.

Word

Microsoft Word

The largest single use of microcomputers is word processing. Because the Macintosh includes a word processing program, MacWrite, many Macintosh users work with word processing before any other application.

In most aspects, Microsoft Word is a superset of MacWrite, meaning that it performs all of the operations of MacWrite in a similar manner, but it has many other advanced features that make it a better choice than MacWrite for serious business use.

Consider these features:

- You can see and edit many parts of a document at the same time, or you can see and edit more than one document on the screen. This makes cross-referencing much easier and allows you to see immediately how changes in one part of a document affect other parts.
- The *merge* capability of Word lets you prepare a form letter into which you can insert names, addresses, and other information from a mailing list. You can use a File database as the source of the mailing list or prepare it in Word. Word's merge feature is more advanced than the merge features available on almost all other word processors, in that you can include information in the middle of paragraphs and the program will reformat the text.
- The tab styles in Word make tables in reports appear more professional and easier to read. You can take tables from

Multiplan and File and make some of the columns right-justified (for whole numbers) or centered (for text headings).

- Most reports have different sections that are formatted differently (such as the title and table of contents pages, main text, and appendixes). With Word you can format each section (called a *division*) in the style you want.
- Typing the main text of reports is easier in Word than it is in MacWrite, even though they use similar techniques. With Word's glossaries, you can avoid typing repetitive phrases by using abbreviations and expanding the abbreviations with the press of a single key. If you don't want to take your hands off the keyboard to use the mouse, you can use command-key combinations. You can also select blocks of text easily in Word.

You will use Word not only for entering text, but also for showing information and results from the other Microsoft programs. Word, like MacWrite, can read both text and pictures from the Clipboard. Data and charts from File and Multiplan can be used as is or enhanced with Word's text-formatting capabilities. Drawings from Chart (and, to a lesser extent, from MacPaint and MacDraw) can be shown and given elaborate labels in Word.


Multiplan

Multiplan

Multiplan allows you to easily perform calculations on numeric data and immediately view the results. For example, you could instantly figure out your company's total income by combining the income from many different sources or determine its future value by using growth equations on current income figures.

Multiplan can work on many kinds of data. For instance, if a table contains columns showing sales by department and rows representing a period of months, you can perform calculations on both the columns and rows, as well as get cumulative totals. You can also use Multiplan to perform complex calculations on data and see the results of each step of the calculations; this helps you check that your equations are valid and in the correct order. You'll

find that Multiplan speeds up calculations so you can easily experiment with hypothetical data.

When used by itself, Multiplan generates tables that you view by scrolling around the Multiplan window. You can save parts of the Multiplan window in the Clipboard or as text-only documents. This allows you to use Word to format and edit the results. And, of course, you can transfer data from your Multiplan spreadsheets into Chart, graph it, analyze it, and copy the results into your Word document. You can also copy Multiplan data directly into your File database.

File

Microsoft File

Most companies handle a great deal of numeric data. This data may be related to cash flow (such as costs and income) or concern the company's services or goods (such as inventory). It is common to keep customer lists and sales analyses in databases as well as personnel records. Any individual company has many different needs for the information it keeps.

File provides a fair amount of flexibility in how it displays the data in your database. You can specify the exact method for displaying your records or have File generate reports with totals of numeric data. File will also handle non-numeric data (often called text or *string* data), such as names and addresses, in your databases.

A database can become very large, holding thousands of pieces of information. Instead of having to wade through the entire database each time you want to look at a few specific pieces of information, you can ask File to find the data for you. For example, you can ask File to look through a customer database for all people living in Massachusetts. If you want to see who in this group has the largest outstanding invoice, you can sort the information in order of amount owed. File selects and sorts information to help you find what you are looking for; you request either operation with only one command.

You can use File to generate many types of reports. You can select records, sort them, and put them on the Clipboard, or save records in a text-only document for other programs to read. You can also write a full report that summarizes the data and save the

report in a text-only file. Thus, you can use File to collect data and format it for other programs, or you can use File to summarize large amounts of data and use that summary in other programs.

Chart

Computer graphics have become popular in the business community in the last few years since graphs with a professional appearance are easier to analyze and have more visual impact than a table of numbers. Graphics software turns a set of numbers into a graph or picture that shows what the data "means."

Chart will produce a wide variety of drawings from the set of data you enter. You can customize the charts by adding labels and special identifying marks. The data can be entered either while running Chart or from the Clipboard. You can also scale the size of the drawing.

You will find that there is a tradeoff between the graphic depiction of numeric data and the subtleties that become hidden by turning numbers into pictures. For example, a pie chart showing that each of four divisions of a company earned about the same amount may help someone who is looking at the overall picture (that each division performed nearly as well), but it could hinder someone trying to tell how the divisions differed (a five percent difference would probably not show up in the chart). You will probably find that you often label Chart's drawings with the data that generated them. The combination of numbers and pictures is the best way to depict numeric data clearly.

Since you can generate the data for Chart in other programs (such as Multiplan and File), you will find that it is most often used in conjunction with the other Microsoft products. When you use Chart with Word, you will most often pass information from Chart to Word through the Clipboard.

Using the Clipboard And the Scrapbook

The easiest way to transfer information from one Microsoft application to

another is with the Clipboard. In fact, the Clipboard is the easiest way to transfer information between almost any two Macintosh applications. Apple designed the Clipboard so that it is useful to almost any program; Microsoft took advantage of its features to make it especially easy to transfer data from one Microsoft application to another.

This section discusses some of the concepts basic to the Clipboard and Scrapbook. Being familiar with these concepts will make you more proficient at integrating the functions of the Microsoft applications. Even if you think you know a great deal about the Clipboard, you should at least skim this section.

Clipboard Concepts


Clipboard File

Basically, the Clipboard holds data. The data can be put in the Clipboard by almost any Macintosh program, and data from the Clipboard can be used by many programs as well. Programs that draw pictures (such as Chart, MacPaint, or MacDraw) can put pictures in the Clipboard; programs that use numeric data and text (such as File, Multiplan, and Word) can put numbers and text in the Clipboard. The Macintosh and your applications programs will properly distinguish between these types of information when you read the data from the Clipboard to another program.

When you use the Microsoft applications, it is important to remember that the Clipboard is used for handling data in the program as well as for handling data that will be used by other programs. For example, you might use the Clipboard in Multiplan to copy part of a spreadsheet from one Multiplan document to another, and then use it to copy a different part of the spreadsheet to Word.

Data moves to and from the Clipboard with three commands: Cut, Copy, and Paste.

Any application that uses the Clipboard, including all of the Microsoft applications, always uses these three commands in

exactly the same way. The commands are usually under the Edit menu and almost always use the same three command-key combinations as shortcuts for the commands. For example, Word's Edit menu looks like this:

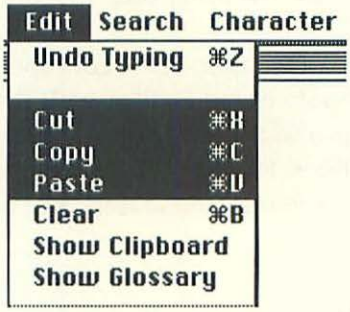


Table 1-1 summarizes the commands and their command-key equivalents.

The Cut and Copy commands move information to the Clipboard. Before moving information, however, you must tell your applications program which data you want to move. For example, you must select text in your document to put it on the Clipboard. This is done with *selection commands*, which you use to select the data before giving the Cut or Copy command. When you select information, it usually becomes highlighted (the background becomes black instead of white). Table 1-2 shows the items that you can select in the Microsoft applications.

Cutting selected data removes it from your document and inserts it in the Clipboard; copying data leaves it in your document and makes a copy of it in the Clipboard. You will never lose data if you copy it.

To insert information that is in the Clipboard into your document, use the Paste command. The Paste command will insert the information in one of these ways, depending on what is selected:

- If there is nothing selected in your document, the data in the Clipboard will be inserted at the insertion point. (One exception: File ignores the insertion point if the data in the Clipboard consists of records and instead inserts everything at the end of the datafile.)

Table 1-1.
The Clipboard Commands

Command	Key	Action
Cut	COMMAND-X	Removes selected data from your document and puts it in the Clipboard
Copy	COMMAND-C	Copies the selected data from your document into the Clipboard, leaving the data in the document
Paste	COMMAND-V	Copies the contents of the Clipboard into your document

Table 1-2.
Items That Can Be Selected in the Microsoft Applications

Program	Item
File	A field (or part of a field) One record Many records
Chart	A data value A group of data Text in the Chart window A label in the Chart window An entire chart (with labels)
Multiplan	A cell Any rectangle of cells
Word	Any amount of text An in-line picture (full picture only)

- If you have made a selection, the data from the Clipboard will replace the selected data. This is like deleting the selected information first and then pasting the new information in its place.

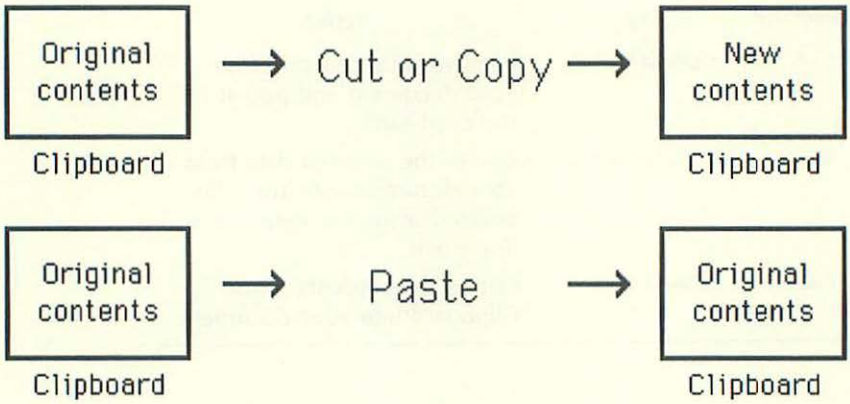


Figure 1-1.
The Clipboard holds only one item at a time

After a Paste command, the same data remains in the Clipboard. You can give another Paste command somewhere else in your application, or even leave the application, and the Clipboard will contain the same data. You will see many uses for this feature as you read the following chapters.

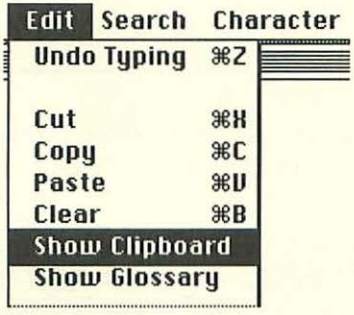
So far you have seen how to move data to and from the Clipboard, but what is in the Clipboard at any given time may be unclear to you. The Clipboard has a limitation that somewhat restricts its usefulness, but at the same time, makes it more predictable: *There is always only one item in the Clipboard at a time* (unless, of course, there are no items at all). This is an absolute rule that will never be violated.

What it means is that if you store some data on the Clipboard, select some other data, and give the Copy command, the first items are lost from the Clipboard forever. You can think of the Clipboard as a tape recorder: if you record over another recording, the original will be lost. However, you can copy the recording as many times as you want without losing it. Figure 1-1 illustrates this concept.

It is important to remember whether or not you have anything important on the Clipboard before you give a Cut or Copy command. If you give a command and the Clipboard contains needed data, you usually can't get it back.

(Actually, some programs provide an Undo command that allows you to reverse the effects of your last command, for example, if you cut or copy information to the Clipboard and wipe out the old contents. However, each program's implementation of the Undo command is different. For example, File won't allow you to undo a Cut command if you selected one or more records. In other words, don't rely on an Undo command: learn its effects first.)

It would be useful, of course, to know what is on the Clipboard before you use a Cut or Copy command that wipes out its contents. For this reason, each Microsoft application has a Show Clipboard command in the Edit menu that lets you see the contents of the Clipboard. For safety's sake, you should probably give the Show Clipboard command before giving a Cut or Copy command. It is also useful to give the Show Clipboard command before giving a Paste command, just to be sure that you are inserting the correct material.



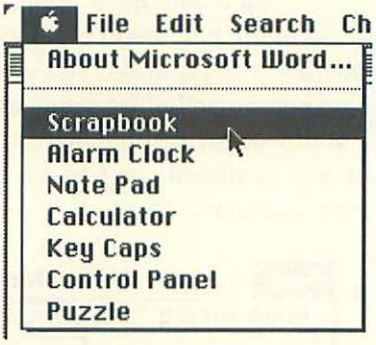
Scrapbook Concepts

There will be many times when you will want to hold more than one item in the Clipboard. For instance, you may want to save one part of a Multiplan spreadsheet for use in Chart and another part for use in Word. Since it is impossible to keep two items on the Clipboard, you need some way to juggle them.

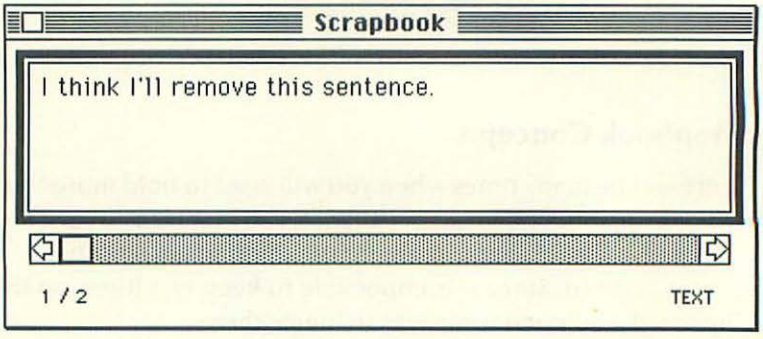
The Scrapbook is like an extension of the Clipboard, in that you move data to and from the Scrapbook through the Clipboard. The Scrapbook can hold many items in separate "pages"; like a book, each page has a number. The only way to put information into the Scrapbook, or get information out of the Scrapbook, is through the Clipboard.

Since the Scrapbook is a Macintosh *desktop accessory*, you can access it while you are running any application. While you are using the Scrapbook, the Scrapbook transfer program will prevent your other program from operating (you'll notice that most of the menu items for your application are dimmed).

To transfer the information that is in the Clipboard to the Scrapbook, first pull down the Apple menu (the menu at the left of the menu bar) and select Scrapbook.

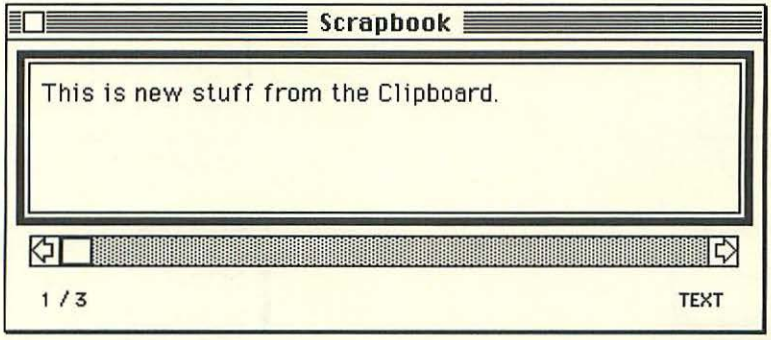


A window will open on top of the screen you were working with. This window will probably show the data in the first page of the Scrapbook.



If there is nothing in the Scrapbook, the window will contain a message such as "Empty Scrapbook".

Next, give the Paste command from the Edit menu. This pastes the information in the Clipboard into the Scrapbook (not into your document). Just as with the normal Paste command, the information in the Clipboard remains the same after the Paste command. The Scrapbook now contains a copy of the Clipboard.



It is now easy to see how the pages in the Scrapbook are organized. The message in the lower left, which previously said "1/2", now says "1/3". The first number is the page of the Scrapbook, and the second number is the total pages in the Scrapbook. Pasting a new page in the Scrapbook always inserts the data at the current page. Any pages that are after the current data are renumbered with a higher page number. You can view the pages by clicking the left and right arrows or dragging the thumb in the scroll bar.

Getting information out of the Scrapbook is just as easy as putting it in. If you give the Copy command while the Scrapbook is open, the current page is copied into the Clipboard, replacing the current Clipboard contents. The Cut command also transfers information to the Clipboard, but it removes the page from the Scrapbook at the same time. Use the Cut command to move data that you no longer want in the Scrapbook. Figure 1-2 shows how information is moved into and out of the Scrapbook.

As you can see, the Scrapbook eliminates the Clipboard's major drawback. If you find that you often lose information by accidentally wiping out data in the Clipboard that you meant to save, you should use the Scrapbook more often. Cleaning out old data from the Scrapbook is simply a matter of using the Cut command while the Scrapbook is open.

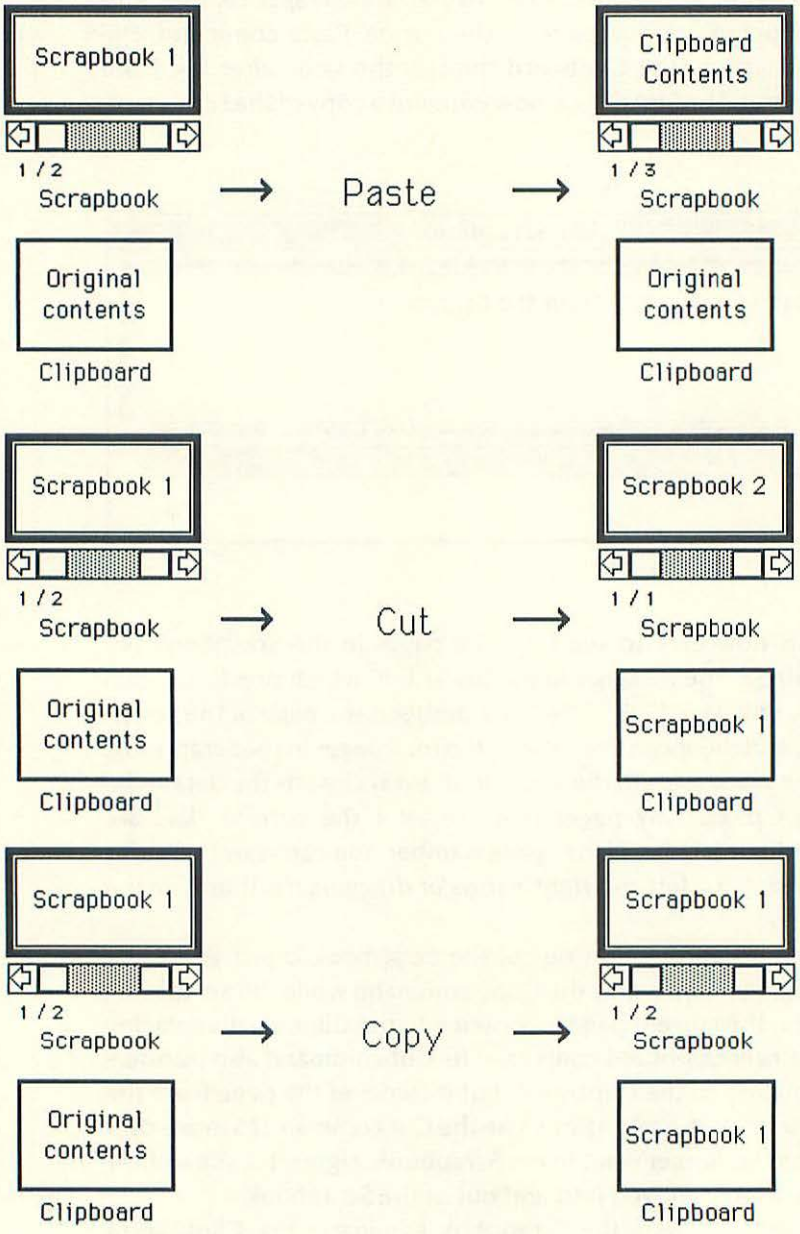


Figure 1-2.
Passing data to and from the Scrapbook

The Scrapbook and Clipboard On Disk


Diskette

The information in the Clipboard and Scrapbook is kept on disk in files called Clipboard File and Scrapbook File. These files are usually kept in the System folder on the disk. When you put data in the Clipboard or Scrapbook, there must be enough room on the disk to hold the new data. If you don't have much room on a disk, you may not be able to put a large selection into the Clipboard. Of course, copying lots of data into the Scrapbook, or not clearing out old data, can fill up a disk as well.

If you use some of the methods described in Appendix A for saving space on disks or using other types of disks, the Clipboard or Scrapbook files may end up on other disks. If you are using the Microsoft disks in their normal fashion (that is, booting off the master disks), the Macintosh will transfer the Clipboard and Scrapbook files as you start each application. If you are using other disks for booting, see Appendix A for hints about moving the Clipboard and Scrapbook files as you boot each application.

Storing Data In Text-Only Files

Word text-only

The Clipboard and the Scrapbook are the most convenient methods for transferring information between the Microsoft applications. There are times, however, when using the Clipboard is inconvenient or even impossible. In these cases, you should save your data in a *text-only file.*

Most applications have two forms of documents that they can read: normal, or *preferred,* documents and text-only documents. Some applications, such as MacPaint and Chart, can read only preferred documents. When an application reads a preferred document, it can get all of the special information that the program normally saves, such as formatting or special data attributes. A text-only document, on the other hand, does not contain formatting or special information. For this reason, data read from a text-only document ends up with no special features and will probably look very plain next to output from a preferred document.

You will use text-only documents when you are transferring information from a Microsoft application to a non-Microsoft application. For instance, you may be using a database management system (DBMS) other than File. Most DBMS's available for the Macintosh can read data from text-only documents; so integrating the other Microsoft products with a non-Microsoft DBMS is fairly easy if you use text-only files.

You may be able to use data from the Clipboard instead of text-only files with some non-Microsoft applications. However, these programs may expect the data to be in a different format than Microsoft's, so you will often get more predictable results using text-only files.

Only Word and File can write text-only files. If you want to pass the text-only version of a Multiplan file to another program, you must follow these steps:

1. Select the part of the spreadsheet you want to save.
2. Copy it to the Clipboard with the Copy command in the Edit menu.
3. Quit Multiplan and run Word.
4. Paste the data from the Clipboard with the Paste command in the Edit menu.
5. Save the data with the Save Only command in the File menu. Check the Text Only button before saving the file.

Figure 1-3 summarizes the methods you can use to pass information between the Microsoft applications.

Format of Text-Only Files

Although it is not necessary to understand the internal format of text-only files, it is, fortunately, quite simple. Knowing how to make your own text-only files will be useful if you use Word or if you need help integrating Microsoft applications with non-Microsoft applications.

Basically, the information in Microsoft text-only files looks very similar to the information you see on the screen when you run an application. The vertical lines that separate the columns in

your application are replaced by tab characters in your text-only file. A tab character is the character that you create when you hit the TAB key on the keyboard. Each line ends with a carriage-return character.

For instance, if you save four records that each have three fields from a File database in a text-only file, each row of information in the file will have a tab character between the first and second columns and another tab character between the second

	Word	File	Multiplan	Chart
Word		Clipboard & Text-only	Clipboard & Text-only	Clipboard
File	Clipboard		Clipboard & Text-only	Clipboard
Multiplan	Clipboard	Clipboard		
Chart	Clipboard	Clipboard	Clipboard	

Figure 1-3.
Passing information between Microsoft applications through the Clipboard and text-only files

and third columns. The character after the third column is a carriage-return character.

With this information you can create your own text-only files if necessary. For instance, you can type a table in Word by separating each column with the TAB key. If you save this file as text-only, you can use it in any place that a text-only file is required. Other word processing programs on the Macintosh, such as MacWrite, can also create and use these files.

How the Microsoft Programs Relate

This chapter has presented an overview of how you can transfer information between Word, Multiplan, File, and Chart. The next step is to recognize the types of data you will be handling. Since the programs can handle a wide variety of data, the information that you pass between the programs will also vary.

Remember that the meaning and content of the data that you transfer between programs depends on you, not on the programs or the method you use for transferring the information between them. For instance, if you use Multiplan for what-if calculations, the information that you pass to Chart is the result of your assumptions, not of real data. This turns Chart into a what-if tool too. Similarly, if your File mailing list contains computed fields that are used in your Word form letters, you are really using Word as a word processor that can compute.

Although this may seem esoteric, it is essential for getting the most out of the Microsoft applications. The applications are just tools for your projects. The fact that you can transfer data back and forth between the applications is not as important as the way that they read each other's data.

The next four chapters cover each of the program's capabilities. These chapters have many goals. First, if you already use the program, the information will help you focus on the features that you will use in combination with the other programs. If you don't already have the program, you can see what sort of tasks it

performs so you can follow the rest of the book. Each chapter also contains general examples of how the application can be used with the others. There is also a chapter on MacPaint and MacDraw to show how these versatile tools can enhance the presentation of data from the other programs.

2

Word

Microsoft Word

Businesspeople spend a great deal of time communicating with co-workers, managers, and clients. While written reports and memos often must substitute for face-to-face discussions, many people find the writing process to be the most frustrating part of their work.

For example, your monthly sales report might include information from several sources: actual month-to-date figures that your assistant collects daily in a simple spreadsheet model; the budgeted sales that were prepared six months ago in a different spreadsheet model; and the shipping department's list of the number of returned products by category. The text of your report needs to include these exact figures. Furthermore, since you didn't make budget, you decide that a graph comparing this month's sales to the first quarter's sales would visually demonstrate the progress of your department. In this example, much of the information you need for your report already exists—but it's in different places and different formats. Gathering and presenting it in a single document could be a tedious process. In addition, the mechanics of writing are time consuming: typing complex names and phrases over and over, looking up addresses and proper spellings, and locating a document that used the exact phrasing you need to insert—all these tasks

make writing more difficult than it has to be.

Microsoft Word—especially combined with Multiplan, File, and Chart—can help take some of the pain out of writing in a number of ways. Some of Word's features are advancements over basic word processing programs—for example, Word makes entering and moving text simpler, allows you to see various parts of your report at once, and even lets you work with other documents you've written. In addition, Word lets you incorporate data from the other Microsoft applications directly, saving you time in transcribing spreadsheet data, creating tables, and presenting charts. Since most of your work with Multiplan, File, and Chart results in information that will be transmitted to other people, you will find that the ability to transmit data to Word and include it in memos and reports will greatly simplify the writing process.

These features make Word the central program of the Microsoft applications. Being the central program does not mean that it is the most important of the applications, though, only that it will be used most often to show the results of the other programs. You will also use Word with the other programs. As you will see later, you can use Word to add a few explanatory sentences to a graph from Chart, to a spreadsheet from Multiplan, or to data from File.

Word document

Features For Writing Reports

Most of the examples in this book will show you how to transfer data to Word from other Microsoft applications. First of all, though, you should become familiar with Word's special report-writing features, since you will probably be using this application the most. The following section focuses on the features of Word that are different from MacWrite.

Split-Screen and Multi-File Editing

If you are writing a long report, you will probably want to refer to earlier sections. You may also want to look at an old memo

or report but don't have a copy of it, or you may want to transfer text from one document to another. Word gives you these capabilities.

The *split bar,* at the top of a Word window, is used to see two views of a document as you edit it.

By dragging the split bar down the screen you get two separate views of a file (see Figure 2-1). Each view of the file can be scrolled with its own scroll bar and thumb. (By the way, this is very similar to the split bars in Multiplan, as you will see in Chapter 3.)

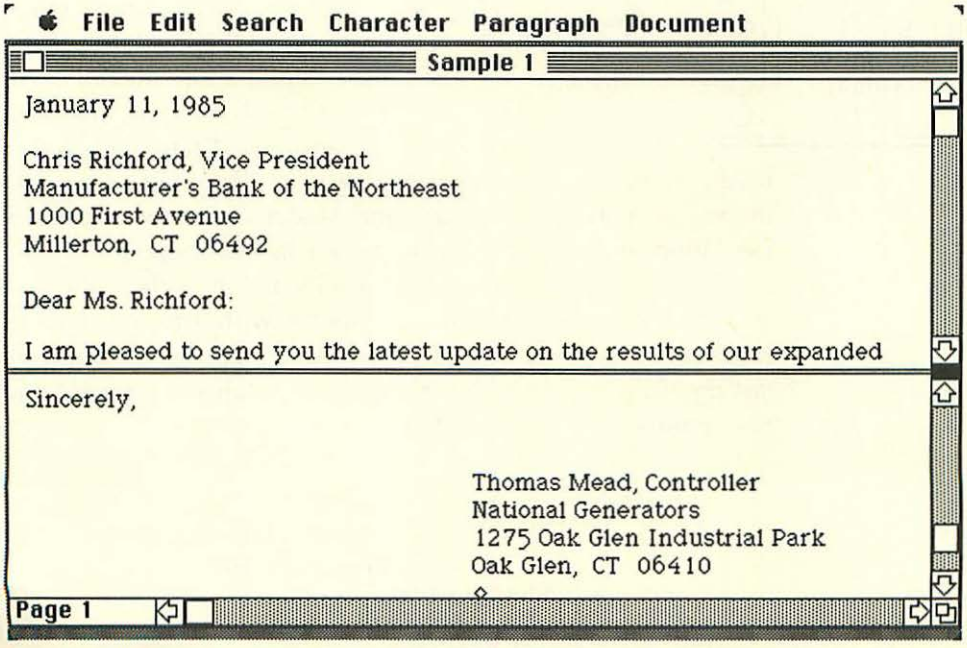
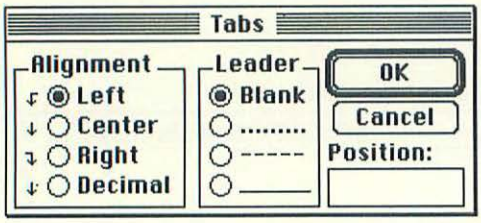


Figure 2-1.
Two views of one file

Word also allows you to edit as many as four separate files at once in separate windows. To do this, simply give the Open command from the File menu. Each file opens a separate window that can be sized and moved around. To switch from window to window, you simply click in the window that you want to work in. Figure 2-2 shows two files being edited at once; the top window is active.

These two features of Word make the typical writing job much easier. Since many business writing tasks involve either reviewing or revising material that was previously written, being able to see the original material as you write and lift sections from it makes writing new reports and memos much quicker.

Advanced Table-Making With Tabs and Leaders



Creating tables is another tedious writing chore that often slows you down. You can create tables much faster with Word than with MacWrite and have much more flexibility in the way you show data, because Word's handling of tab characters is much more advanced than MacWrite's. The major improvements are new types of tabs and leader characters; they are described here and shown again later in the chapter.

There are four types of tabs in Word: left, right, centered, and decimal. You are probably familiar with left and decimal tabs from MacWrite. In Word you use a right tab to align the last digit of a number to the right of the tab stop. A centered tab centers the text around the tab stop.

```
The tab is set here -->|

                                This is a left-aligned tab
                        This is a center-aligned tab
This is a right-aligned tab

                        Decimal tabs:
                              $9327.44
                                 12.0
The tab is set here -->|
```

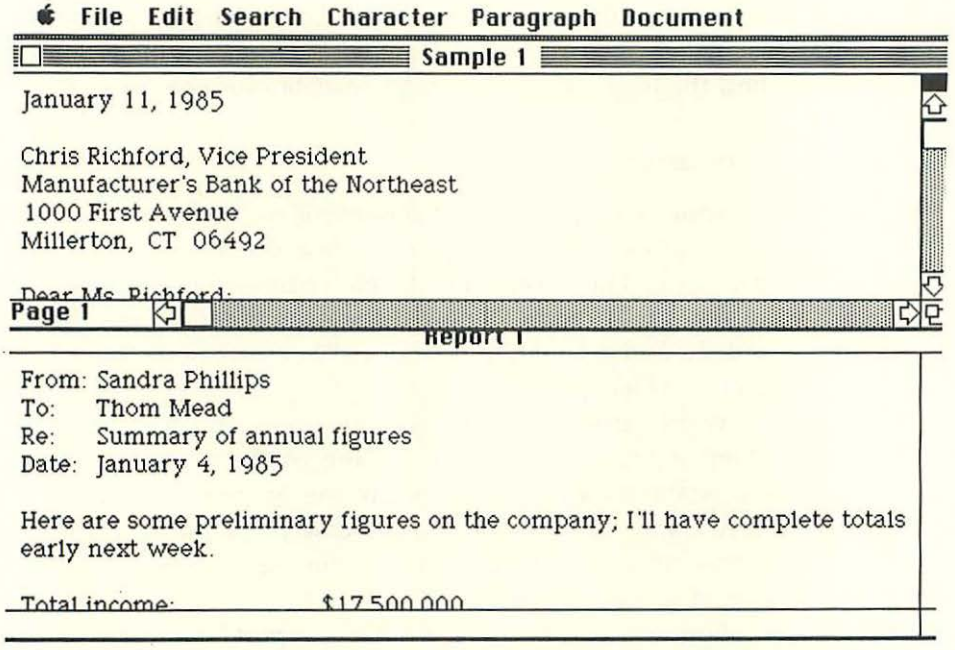


Figure 2-2.
Editing two different files at once

Using decimal tabs makes tables of numbers much easier to read, especially if the numbers are summed at the bottom of the table. Center tabs are useful in column headings.

In addition, you can use leader characters to fill the space between text and tab stops to create easy-to-read tables. For instance, many tables of contents have a line of dots, called leader characters, between the chapter titles and page numbers. Word lets you use leaders of dots, dashes, or underlines. If you don't specify a leader character, Word assumes you want blanks. The following table shows the three types of leaders:

Leaders:
Dots..... 123
Dashes--------123
Underlines_____123

Using leader characters can make a table with wide columns much clearer, since the reader is not straining to match up the

columns. Although dots are the most commonly used leader characters, you can experiment with dashes and underlines to find the leader that is the most readable for your purpose.


Standard Glossary

Glossaries

Particular words, names, and phrases will probably recur throughout your business writing. For instance, the name of your company or certain phrases and people's names may appear dozens of times in a report. Typing these each time you use them is tedious and prone to error, especially in the case of long names and complex spellings.

Word's glossary feature lets you type in an abbreviation and then replace it with a full spelling of the word by pressing COMMAND-BACKSPACE. You specify the abbreviations and what they stand for with the Show Glossary command in the Edit menu. You can create a glossary for each report or type of report you write.

Suppose that you are writing a report about a company named International Generators, Inc., and its new product, the Model N5TURBO. You could make an entry in the glossary equating "ig" with "International Generators, Inc." and "n5" with "N5TURBO." You can then simply type "ig" or "n5" followed by COMMAND-BACKSPACE, and Word replaces "ig" with "International Generators, Inc." and "n5" with "N5TURBO."

Multi-Column Output

Word can format your text into two or three columns on a page. If you are preparing a company newsletter or flyer, this is, of course, much simpler than using scissors and glue. To specify multi-column output, select the Division Layout command in the Document menu. The two choices you see in the lower-right corner are

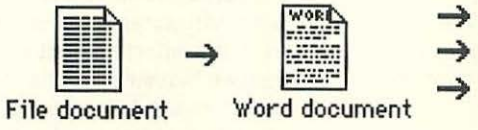
Number of Columns:	1
Column Spacing:	0.5"

Although Word will print multi-columns, they will not show on the screen. You have to print your document to see how it

looks. Figure 2-3 shows part of a page that is formatted with two columns.

Mailmerge

Word's mailmerge feature lets you create custom form letters and memos, inserting variable text and data wherever you specify. Because you can directly access the databases that you have already created with File, Word gives you great flexibility and speed in creating form documents. As this capability is a very powerful business productivity tool, you'll look at it in detail in this section.



Word's merge feature is fairly simple. Your *main document* is the letter or memo you want to send and has special place holders (*fields*) for the parts that change from letter to letter (like the recipient's name and address). Your *datafile* contains the information that Word puts into the fields in the main document; all the fields for each letter are on one line of the datafile. You can create your datafile in Word, but if you are working with many variables, you will find it much more convenient to take information directly from your File databases.

Your main document tells Word which file is the datafile. When you print your file with the Print Merge command in the File menu, Word reads the first record from the datafile, substitutes the fields into your main document, formats your letter, prints it, reads the next record from the datafile, and so on. You can have as many as 256 fields in a letter, as long as each field matches the information in the datafile.

If you include fields in the middle of a paragraph, Word will reformat the paragraph with the new information in it. (Few other programs will reformat the paragraph after putting in the new information.) Thus, if a field called Amount contains two-, three-, or four-digit numbers, Word adjusts the spacing for each and reformats the paragraph if necessary. For example, if

Excerpts from a Proposal for Bank Funding

I. Introduction

National Generators has the opportunity over the next five years to take a commanding lead in our established markets and to penetrate a new market, the construction industry, where our products will be particularly attractive. This report is intended to provide an overview of the company's business development strategies along with a description of those areas for which we require funding.

National Generators can become the premier producer of electrical generation equipment for the entertainment and exposition industries. Our portable yet sturdy generators have acquired a solid reputation in these fields. As the number of outdoor concerts, large conventions, and other events that use portable generators continues to increase each year, we will be better able than our competitors to satisfy the demand for reliable equipment.

While accelerating efforts aimed at our existing base of industrial users, we propose to enter the construction industry. We have already begun developing a small, quiet generator for this market. Research is also under way to design a larger, more efficient generator for heavy construction projects that can replace several smaller ones.

II. Market Analysis

National Generators currently has a 42% share of the markets we now serve. Our nearest competitor, Regional Outdoor Electricity, has 34%, with the rest divided among other manufacturers. We believe that our superior products will ensure that we will increase our share of sales to the entertainment and exposition industries. Some of our competitors will be unable to match our new technology, and we will pick up their business.

Over the next five years, we anticipate gaining 15% of the market for generators in the construction industry.[1] Two important trends favor our planned new products over any now available or known to be coming on the market. Anti-noise pollution legislation restricts the level of noise at urban construction sites, while OSHA legislation protects workers from damage to their hearing caused by equipment.

III. Expansion Costs

[1]Based on trends and growth in the construction industry, detailed in U.S. Department of Labor projections for 1985-1990.

Figure 2-3.
Word printing in two columns

one record of your datafile contains the number 1553, Word will reformat a paragraph containing the sentence "You still owe us $1553, which we would like you to send immediately."

You can include the fields in your main document in any order you want; the order of the fields in the datafile is unimportant.

Setting Up Your Letter


Word document

There are two types of special text in a Word main document. *Field names* are the names you give the fields in the datafile; *instructions* are special commands that tell Word what to do. All special text in Word is enclosed in double-angle brackets; for example:

«DATA Payment 1 Data»

These are typed as OPTION-\ and OPTION-SHIFT-\.

The first instruction you need to know is the DATA instruction, which tells Word where the datafile is. This instruction appears at the beginning of your main document. For example, if your datafile were called "Payment 1 Data," your main document would begin with

«DATA Payment 1 Data»

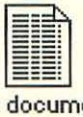
The files of most letters contain only a DATA instruction and field names in addition to their text. Figure 2-4 shows a simple letter that informs customers of the balance due. The fields are "company", "name", "address", "city", "state", "zip", "amount", and "last-payment". Note that you can use a field more than once in your main document; the field "name" is used twice in this letter.

As Word reads through your datafile, it fills in the fields in the main document to produce a letter. Figure 2-5 shows a sample letter produced by the main document in Figure 2-4.

Setting Up Your Datafile

The first record in a datafile is the *header* record, which lists the field names in the order in which they


Word document


File document

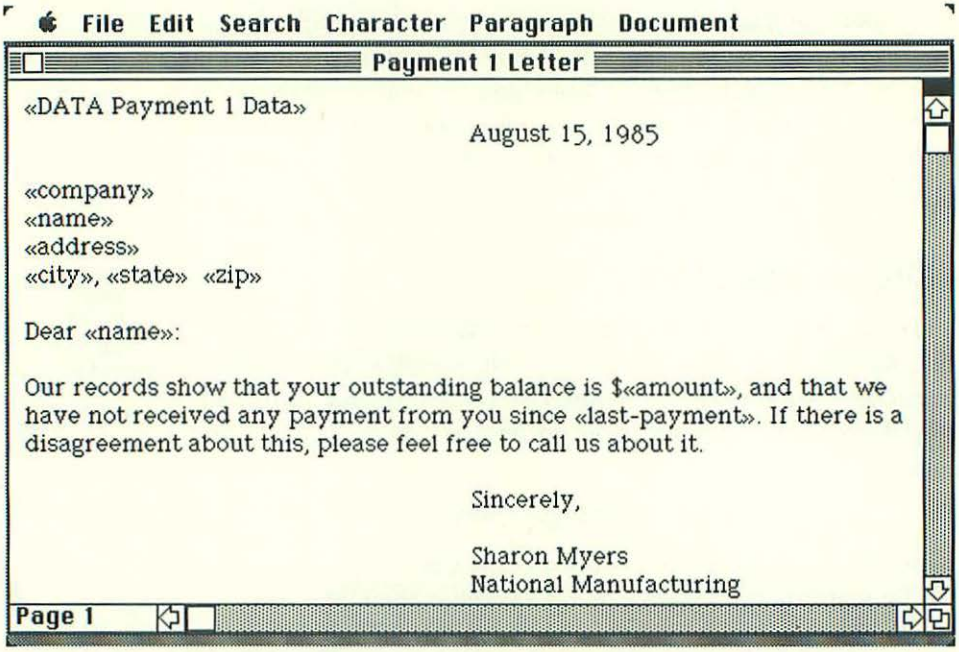


Figure 2-4.
Example of a main document

August 15, 1985

Industrial Mining Co.
Michael Townsend
P. O. Box 4110
Cambridge, MA 02139

Dear Michael Townsend:

Our records show that your outstanding balance is $127.53, and that we have not received any payment from you since 7/21/84. If there is a disagreement about this, please feel free to call us about it.

Sincerely,

Sharon Myers
National Manufacturing

Figure 2-5.
Sample letter from main document in Figure 2-4.

appear in all of the records. This record is followed by your data records. The format of the header record is simply a list of the field names separated by commas. For instance, the first record in the Payment 1 Data file for the main document in Figure 2-4 would be as follows:

```
company, name, address, city, state, zip, amount, last-payment
```

The data in the file can be separated by either commas or tab characters (a file using tabs is called *tab-delimited*). Since File saves a tab-delimited file for you, the following discussion assumes that your file is tab-delimited.

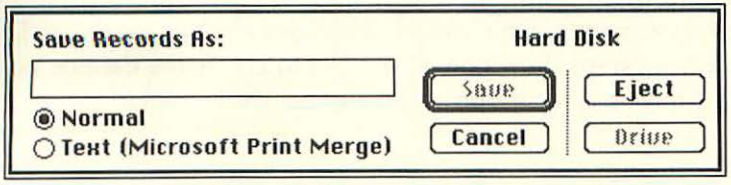
It is often a good idea to create the main document in Word before saving your data from File, so you can be sure that you are including all the data you want. Use the following steps to create the datafile for a Word merge document from a File database:

1. Be sure that the fields in the form match the fields in your main document. If you do not want to use some fields in your main document, you can put them in the hide area.

2. Decide the format you want for each field. If you want numbers to be entered in your main document as numbers, you must use the General format and not include commas. If you select Dollar, Percent, Decimal, or Scientific, or use commas, the numbers will be passed to Word as formatted text. (You will see shortly why it is advantageous to pass numeric data as numbers, not formatted text.)

3. Use the Find command in the Organize menu to select the records you want to include. If you want, you can also sort the records; this may be useful for different reasons, for example, saving postage costs by sorting and then bundling mail by ZIP code.

4. Be sure that the Form window is closed. Give the Save Records As... command in the File menu. You will see the following dialog box:



Enter the file name you want (this will be the same as the name you gave in the DATA instruction in your main document). Be sure to click the Text (Microsoft Print Merge) button; then click the Save button.

File will save the header record using the names that you specify in the form. Note that if the names in the form contain spaces, the results will be unpredictable when you merge the file; so be sure that the form uses the names you specify in the main document.

Your File data will be saved in a format compatible with the rules for Word. (The datafile that File creates is a text-only file, so you can also use it with applications programs from other manufacturers.) However, File will not save any of the formatting of the text fields (such as bold or underline styles and any font information). Also, File will not save picture fields.

Up to this point, you have seen how to set up a datafile containing the header record. However, if you are using data from a source that cannot write out the header record, you can use a *separated datafile.* A separated datafile is actually two files: one containing only the header record, and one containing only the data. If you use a separated datafile, the DATA instruction must tell Word where both files are. You simply give both names, which are separated by a comma. Thus, if your header record is in the Payment 1 Head file and the data is in Payment 1 Data, the Data instruction in your main document is changed to

«DATA Payment 1 Head, Payment 1 Data»

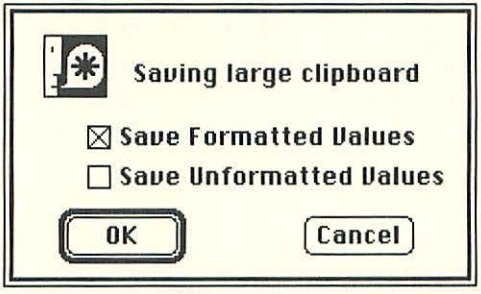
Using a separated datafile might be useful to you in two situations: if you are using a database manager other than File to create the data, or if you are saving File records on the Clipboard instead of a text-only file. If you are using a non-Microsoft product to create the data, a separated datafile allows you to avoid creating a unique header record.

There is no advantage to using the Clipboard to create your datafile when using File. Other database management systems, however, may not be able to write out the text-only file. The following steps show how to use File to create the datafile from the Clipboard; other programs are probably similar:

1. Select the records in File by clicking in the record number bar. You can select a group of records either by dragging in the record number bar or by selecting the first record in the group you want to select and then shift-clicking the last record in that group.

2. Give the Copy command in the Edit menu. After you have copied the records into the Clipboard, you can check what you have done by giving the Show Clipboard command in the Edit menu. This will tell you how many records you just copied.

3. Quit File. If you have selected a large number of records, you may see this dialog box:



Be sure to click the OK button.

4. Run Word by clicking on its icon. This will open up a new file window.

5. Paste the contents of the Clipboard into the window with the Paste command from the Edit menu.

6. Save this file as the datafile you specified in your main document.

Integrating Information From Other Files

So far you have seen how to use the merge feature of Word to produce form letters and memos. You can also use the merge INCLUDE instruction to read information from another file.

The INCLUDE instruction causes Word to insert the contents of a file into your output. You can use it to include new information in your output without having to change your main

document. Suppose, for example, that you send a weekly status report to many people. The report is in a file called WEEKLY MEMO and contains fields for the recipient's name and mail-stop, a standard heading, and some information that changes from week to week. You could alter the WEEKLY MEMO file each week before you merge it, but this would be tedious. A better method is to use the INCLUDE instruction.

The format of the INCLUDE instruction is similar to the DATA instruction: INCLUDE followed by a file name. For instance, if the text that changes is stored in a file called New Weekly Info, your INCLUDE instruction would look like this:

```
«INCLUDE New Weekly Info»
```

Figure 2-6 shows the Weekly Memo file.

The file that you include can be any text file. As in the case of the memo in Figure 2-6, it might be a text file that you created in Word. It could also be a text-only file created by File

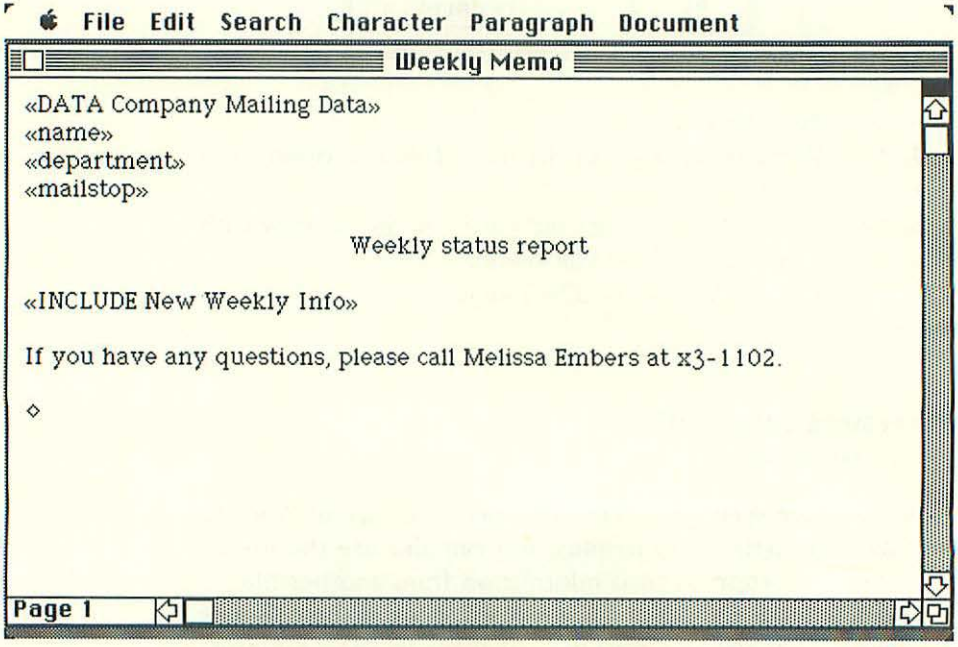


Figure 2-6.
Example of the INCLUDE instruction

or Multiplan. For example, if you created a table of weekly sales figures in Multiplan that you want to include in a memo, create the table in the other program (File or Word) and save the text-only version in a file with the same name as that in the INCLUDE instruction.

Other Merge Instructions

A unique feature of Word that makes your letters look even more personalized is *conditional insertion.* Word allows you to check the values of fields in each record and insert different text depending on the values of the fields. For instance, if the Amount field is over 1000, you can insert a sentence describing the dire consequences of not paying promptly. Or your File database might include a field called Regular Customer that contains "Y" or "N"; you can use this to decide what type of salutation to include in the letter. In other words, you can compare a numeric field to a value specified in your main document, or you can test a text field against a specified string.

The main document in Figure 2-7 contains an IF instruction used with a text field. The IF instruction checks the value of the "sales-rep" field and prints one of two possible sentences, depending on whether "sales-rep" is "none" or some other value (the sales rep's name).

The IF instruction can also be used to check whether there is anything in the field or not. For example, the following instruction determines whether there is any value in the "owner" field:

```
Dear «IF owner»«owner»«ELSE»Store Owner«ENDIF»
```

This prints out the contents of the "owner" field if it exists, or the phrase "Store Owner" if it does not.

You can also use the IF instruction with integer fields to test whether a number is greater than, less than, or equal to a field value. Such a test could be used, for example, with a field "cust-years," the number of years a customer has been with your firm. If "cust-years" is greater than a certain amount, you might include the following sentence in a letter:

```
«IF cust-years>5»We value your long-standing relationship.«ENDIF»
```

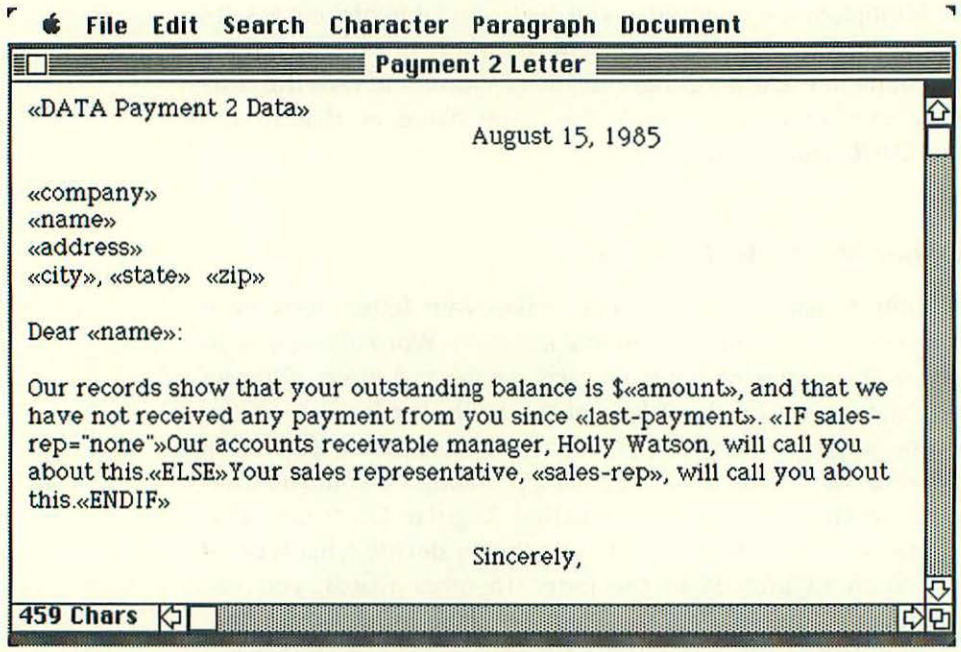


Figure 2-7.
Example of the IF instruction

This brings up a few salient points about the interaction of File and Word. Remember from before that the formatting you use for number fields is important. You must use the General format with no commas if you want to use the IF test on a number. Also remember that you can hide fields in File that you do not want to save in the new dataset, the set of data you are creating. As an alternative, you can include these fields in the datafiles and simply not use them in your main documents if that is easier than hiding, saving, and then un-hiding them.

The merge feature has a number of options that you can use; these are listed in Table 2-1. Three—SET, ASK, and NEXT—may be new to you. The SET and ASK instructions allow you to enter information when you print. The SET instruction sets a field once for all letters, while the ASK instruction prompts you for a new value for each record. You can also create your own prompts with the SET and ASK instructions.

The NEXT instruction is used for reading a number of

Table 2-1.
Merge Instructions in Word

Instruction	Use
ASK	Has Word prompt you to fill in a field when each letter is printed
DATA	Identifies the datafile
IF...ENDIF or IF...ELSE ...ENDIF	Conditionally inserts text if a field in the datafile has a particular value. You can use the =, >, and < operators for numeric fields or the = operator for string fields
INCLUDE	Inserts another Word file into the main document
NEXT	Has Word read the next record in the datafile
SET	Sets the contents of a field or has Word prompt you for the value once at the beginning of printing

records from a file into one letter; it is useful only for reading groups of related records together. For example, if a File database has a pair of records for each client (such as highest and lowest bids on a job), and those records were sorted so that each set was a properly ordered pair in the datafile, you would use the NEXT instruction to read the second record into the letter.

Further Applications

As you can see, the merge capability of Word has wide-ranging applications. Some other examples are

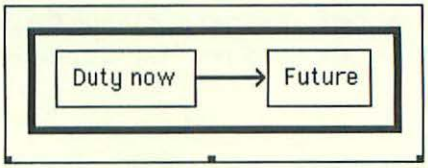
- Sending letters that suggest clients upgrade their current position (for example, purchase more insurance or a better model, or make a bigger investment). These would use complex IF instructions with lists of the different current positions and the next steps.
- Targeting parts of letters by ZIP code. For instance, you can use known attributes of certain ZIP codes or ranges of ZIP codes to trigger messages about the nearest sales office.

- Inter-office memos that include information based on the interests of the person receiving the memo. Your File database could include yes/no check items relating to the committees on which the person serves and include information about only those committees.

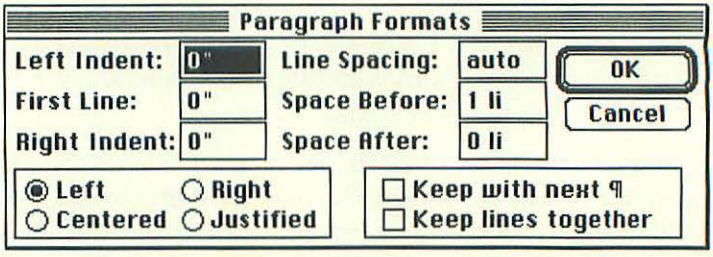
Pasting Drawings From Chart

Word acts just like MacWrite when you paste a picture from the Clipboard into a memo or report. Using the Clipboard is the only way to include drawings from Chart in a Word document, so you should be familiar with some of the considerations of using Chart drawings in Word.

Both Word and MacWrite consider each picture to be a paragraph; each paragraph must start and end on a new line. Thus, you cannot wrap text around the sides of a Chart drawing. You can, however, move the picture around in your Word document and shift it left or right on the lines that it occupies. When you select a paragraph, Word highlights it; when you select a picture, Word surrounds it with a box:



To move a picture up or down, you can change the number of lines before or after the picture by selecting the picture and giving the Formats... command in the Paragraph menu. You see the following dialog box:

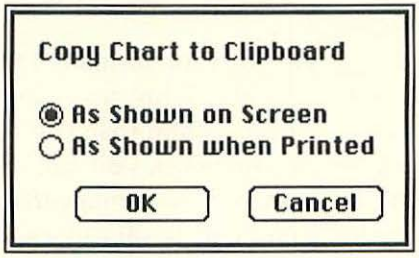


Change the number of lines before or after to add the correct amount of white space to the picture.

You move the picture left or right by dragging on either of its sides. For instance, to pull the picture to the right, point at the right border. Now click and drag the picture to the desired position.

You can also resize the picture by dragging on one of the squares and stretching in any direction. However, you will notice that this often distorts patterns and letters in an unnatural fashion.

Instead of resizing the picture in Word, you can have Chart save the picture on the Clipboard in various sizes. When you select the drawing and give the Copy command in the Edit menu, Chart prompts



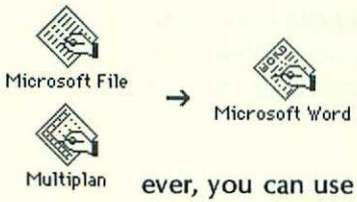
Choose to save the picture as it would be printed. Chart then saves the picture proportioned for printing.

The trick to getting the picture larger or smaller is to use the Page Setup command in the File menu before copying the picture to the Clipboard. Chart uses the size of paper that you select to determine how big to make the drawing and in what proportion for printing. For example, A4 paper is bigger than 8 1/2 × 11-inch paper, legal size is bigger than A4, and so on. You can experiment by copying a number of different-sized charts through the Clipboard to the Scrapbook, quitting Chart, running Word, and then pasting them into a Word document and printing it out. (In fact, because of a bug in many versions of Word, you must copy the drawings to the Scrapbook first.)

You will notice two things: the text labels almost always look incorrect, and pie graphs do not look round. You can fix the text labels by reading the drawing into MacPaint or Mac-

Draw first and removing all of the misproportioned labels and adding new ones. If the drawing is bigger than the MacPaint window, you will have to paste it in pieces, which is tedious. Unfortunately, there is nothing you can do about the uncircular pie graphs.

Formatting Tables From File and Multiplan



As you have seen, pasting in the graphs from Chart into Word documents does not give you a great deal of leeway for creativity. When reading data from File or Multiplan, however, you can use many of Word's features to make your tables clearer and easier to read.

Note that you can get correctly formatted File output (that is, with tab characters between fields) from saving as text-only or from the Clipboard. You can also read File reports that you saved to disk as text-only. However, you can only read Multiplan tables from the Clipboard; remember that Word can not read a SYLK-formatted file, and Multiplan cannot generate a tab-delimited file.

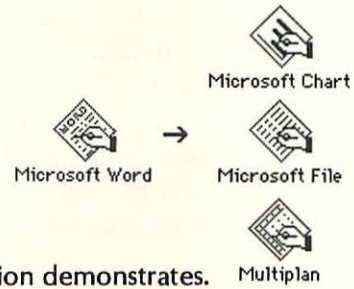
You do not need to use the same tab settings throughout a table. You can center headings above columns even if the columns are right- or left-aligned. The labeling row (or any other row) may have different tab settings from the rest of the table.

Figure 2-8 shows some of the advanced features you can achieve by reading from a Multiplan spreadsheet. This table uses

- right-aligned tabs for the numbers
- leader characters for ease of reading
- a different font for the caption
- boldface type for emphasis
- underline to indicate summation
- extra tab characters for indentation.

As you can see, you can use many different features to make what started out as a simple three-column spreadsheet into an interesting report.

Word Input To Other Applications



You can transfer data from Word to other Microsoft applications as well as to programs by other manufacturers. However, since Word is a word processing program, this use is limited, but important nonetheless, as this section demonstrates.

Planning Ahead for Labels

When you are writing a report that includes input from another Microsoft application, you probably want the information they

File Edit Search Character Paragraph Document

Apple Annual Report

Apple Computer, Inc.
Annual Report for 1983
Consolidated Statements of Income

(Dollars in thousands)	**1983**	**1982**
Net sales	982,769	583,061
Costs and expenses		
Cost of sales	505,765	288,001
Research and development	60,040	37,979
Marketing and distribution	229,961	119,945
General and adminstrative	57,364	34,927
	853,130	480,852
Operating income	129,639	102,209
Interest, net	16,483	14,563
Income before taxes on income	146,122	116,772
Provision for taxes on income	69,408	55,466
Net income	**76,716**	**61,306**

Page 1

Figure 2-8.
Multiplan chart embellished by Word

share to be the same. Mistakes can be introduced when you copy the data, or the information may be changed as you analyze it. For instance, while you are writing a report, you may realize that the names you gave to the fields in a database are not accurate within the meaning of the report. If you had written the report first, you could copy the labels from the report and paste them into File or Multiplan before copying the data back into Word. Or you could just edit the labels in your report, but they would then not match the data. Thus, if you are generating labeled columns of File or Multiplan data that will be used in your report, it is probably best to generate the data after you write the report.

Quick Data Entry

You can also use Word to generate data for the other programs while you are writing. If you write out a series of numbers with tab characters between them and then save the series to the Clipboard, you can paste these into File, Multiplan, or Chart as data.

This is often useful if you are calculating results as you write. For example, assume that you have just written about some data that you received from an outside source, such as a telecommunications database. Instead of having to quit Word, run the other application, and re-enter the numbers (potentially causing transcription errors), you can select the numbers in your Word document and copy them to the Clipboard. When you run the other application, you can paste them in and perform the calculations.

If you are using Word for this type of quick data entry, be sure that you use tab characters between the values, not spaces. Also be sure that you do not use any other characters, such as dollar signs. Either of these may cause unpredictable results.

Word text-only

Text-Only Word Files

Even though you can transfer data to the other Microsoft applications through the Clipboard, you cannot transfer information through text-only files. This is because the other Microsoft

applications can only read SYLK files (except in the case of Print Merge, as mentioned earlier). However, many other programs can read text-only files produced by Word. Appendix B covers many of these programs and the valuable functions that you can perform with them.

Word, as the central program for presenting information, can perform many more tasks than simply adding text to the input of other programs. Using Word as your information gatherer will help you organize your thoughts about the other information that you are compiling in your documents.

Word's merge capabilities can take mailing-list data from File and produce top-quality letters. It can also read complex pictures generated by Chart to enhance your documents. When formatting tables and reports from File and Multiplan, Word helps shape the information in those tables to be more attractive and understandable. And, to a limited degree, Word can produce text that can be used by the other programs.

3

Multiplan


Multiplan

Many people still think of personal computers as "number crunchers" and assume that their main function is making calculations. This view is quite limited, of course, but it is also true to a great extent—you should not underestimate the power of your Macintosh for processing numbers.

Multiplan is one of the most popular applications programs for the Macintosh because of the ease with which you can make calculations or experiment with different assumptions: you can change some of the data or equations, and Multiplan will immediately recalculate all the results.

Your Multiplan results can be transferred directly to Word as a table of numbers, or you can graph them in Chart for easy comparison and analysis before including them in your report or memo. In addition, you can pass data directly from Multiplan to your file database, or you can bring in data from Chart and File and use it in advanced math functions from within Multiplan. Using Multiplan as your central calculator for data from the other applications makes it a very powerful tool. This chapter discusses some of the possibilities for using Multiplan, Chart, and File as integrated software and tells you how to set up your data to avoid common pitfalls.

Setting Up Your Multiplan Spreadsheets

Multiplan organizes data in rows and columns to form a spreadsheet. Each intersection of a row and column is a *cell.* Cells may contain labels, numbers, or formulas.

Figure 3-1 shows a common spreadsheet format with these typical features:

- Labels are placed along the top and left sides of the spreadsheet.
- Columns are often used for periods of time, while rows show categories of items.
- Derived cells (the results of formulas) are placed below or to the right of the data on which they are based.

Although most spreadsheets are more complex than the one shown in Figure 3-1, the format is usually the same. This figure will be used throughout this chapter.

When you perform calculations in a spreadsheet, you make assumptions about the validity and completeness of your data. You also make assumptions about the ability of cells to be compared. In other words, two items that you are adding may seem similar but still be very different; adding them may yield misleading results.

For example, the following spreadsheet lists the number of salespeople in a company:

Sales force

	1	2	3	4	5
1		NY	NY	Conn	Total
2	Staff	23	15	17	55

Columns 2, 3, and 4 contain data by region, and the number on the right is the total, as the label states. But what if some salespeople belonged to more than one region; would the total be correct?

Remember, the results displayed in a derived cell are only as valid as the assumptions you made about the data when you set

Sales

	1	2	3	4	5	6
1		First quarter	Second quarter	Third quarter	Fourth quarter	Total
2	Pacific	12,593	16,200	15,467	16,850	61,110
3	Southwest	8,300	16,825	13,690	15,303	54,118
4	Mountain	7,231	14,293	13,994	12,089	47,607
5	Central	10,173	14,872	10,842	14,220	50,107
6	South	4,219	9,024	10,429	7,757	31,429
7	Northeast	9,311	11,554	8,333	10,632	39,830
8	Total	51,827	82,768	72,755	76,851	284,201
9						

Figure 3-1.
Typical Multiplan spreadsheet

up the formula. If the calculation is based on faulty assumptions, the information in the derived cell may not be valid. This situation can have a domino effect later if you transfer the calculated data between programs and either perform further calculations on it or change some of your assumptions.

Remember that once a computed cell is passed to another program through the Clipboard, the cell will look like data in the other program and will not change if you change the data upon which it was based. When you are setting up spreadsheets to be transferred to other programs, you may find it convenient to put the cells that contain data (numbers) in a separate section of the spreadsheet from those that have derived (calculated) results, to identify those values that may have to be changed.

When you pass data from Multiplan to other programs such as File or Chart, you must keep in mind the structure of the data. If you are making database records in File, you should consider whether you really want a record to contain both data and a computed cell such as the total, since File can create its own computed fields that will change as the data changes. (As you will see later in the chapter, the use of computed cells in a File database is helpful in some situations.

If you are using both Multiplan and File, you should also consider which program should store your data. Multiplan is meant for dynamic, changing data, while File is better for static data, and it is easier to enter data into File than it is into Multiplan. In general, most of your data that will not change (such as

previous sales records) should be entered into File databases and then transferred to Multiplan spreadsheets.

Summary Data

Since Multiplan allows you to summarize data, you can make a spreadsheet of the summaries by copying them into a different area of a spreadsheet or a new spreadsheet (linked to the original).

For instance, the company described in Figure 3-1 records the sales figures for each of its products in an individual spreadsheet. Once the sales for each product are entered by region and quarter, it calculates the total of all the products sold in each region and quarter to produce a summary spreadsheet like that in Figure 3-1.

Using Multiplan to Compute File Data

Multiplan's computation abilities can sometimes be used to fill in for deficiencies in the other Microsoft applications. For example, although File can sum a group of fields, it cannot find the maximum value in the group. Figure 3-2 shows a spreadsheet similar to Figure 3-1, except that the summary information is the region or quarter with the highest sales.

The equations in the summary columns and rows are very similar to the equations for the totals. Instead of the SUM( ) function, the MAX( ) function was used. For instance, the formula for the row summaries is

```
=MAX(RC[-4]:RC[-1])
```

The "grand maximum" is the maximum of the matrix (you can also use the maximum of either the bottom row or the right column).

Passing this array to File to create a database can be very useful; however, File can only find the maximum of a column of numbers, not of a group of fields in a record. Instead, you can use Multiplan to set up records that include the maximum for a group of fields. This should only be done for historical

	1	2	3	4	5	6
1		First quarter	Second quarter	Third quarter	Fourth quarter	Best sale
2	Pacific	12,593	16,200	15,467	16,850	16,850
3	Southwest	8,300	16,825	13,690	15,303	16,825
4	Mountain	7,231	14,293	13,994	12,089	14,293
5	Central	10,173	14,872	10,842	14,220	14,872
6	South	4,219	9,024	10,429	7,757	10,429
7	Northeast	9,311	11,554	8,333	10,632	11,554
8	Best sale	12,593	16,825	15,467	16,850	16,850

Figure 3-2.
Spreadsheet showing maximums

data that does not change; remember that once the data has been transferred to File, the computed field (in this case, the maximum) will not be changed if you change a data field in the File record.

Multiplan Summary Functions

Table 3-1 lists the functions that can be used to summarize groups of cells.

If you are passing data and summary cells to File, remember not to use Multiplan calculations in your spreadsheet that can be performed by File's calculated fields. This will help prevent the problem of static data in your database appearing dynamic. Thus, a row in a Multiplan spreadsheet that computes the product of two cells should not be passed to File; instead, set up your File database to have a calculated field that finds the product of the two cells passed from Multiplan.

When mixing data and summary cells, the Multiplan functions to avoid are AVERAGE, NPV, and SUM. These can be replicated with the standard math operators in File, since File can add, subtract, multiply, and divide the values of fields in a record. In fact, you shouldn't pass any calculations from Multiplan that use only these simple operators.

There will be times when you will want to write out summary cells without their underlying data, and in these cases, you should feel free to use all of Multiplan's summary functions. For example, Figure 3-3 shows a spreadsheet of summary

Table 3-1.
Summary Functions

Function	Purpose
Mathematical	
AVERAGE(list)	Average
COUNT(list)	Counts elements in list
MAX(list)	Maximum
MIN(list)	Minimum
NPV(rate, list)	Net present value
STDEV(list)	Standard deviation
SUM(list)	Sum
Logical	
AND(list)	Checks for all values true
OR(list)	Checks for any value true
Spreadsheet	
INDEX(area, subscripts)	Picks a value
LOOKUP(number, table)	Picks a value

data that you can pass to File or Chart without worrying about confusing data and computed cells. The four columns use calculations from the data portion of the spreadsheet and the functions MAX, MIN, AVERAGE, and STDEV.

The logical functions are very useful for checking a list of cells that you have used as indicators. For instance, the example below is an inventory spreadsheet in which each row shows the stock levels of a product in a particular warehouse.

	1	2	3	4
1	Los Angeles	140	3270	85
2	Denver	110	2175	420

Cells containing formulas that compare existing stock levels and the lowest acceptable levels of stock could be included in a portion of the spreadsheet 10 rows lower than the data rows. The contents of the cells beginning at row 11, in column 2, might be compared with the formula

```
=R[-10]C>125
```

This will evaluate to TRUE if there is enough stock (greater than 125 units).

The other columns could each compare existing stock with a minimum acceptable level. You could then produce a summary cell in column 6 that would contain the text "OK" or "Low" depending on the level of stock. To do this, you would use Multiplan's AND function. The AND function returns TRUE only if every value in the list of cells is TRUE. The formula in cell R2C5 would be

```
=IF(AND(R[+10]C[-3]:R[+10]C[-1]), "Ok","Low")
```

The result would be passed to File as a text field that indicated if any of the items needed restocking. To find all the warehouses that needed restocking, you could simply select all the records having "Low" in that field.

The OR function returns TRUE if any of the values in the cells are TRUE. If you expect an entire row or column of logical values to be FALSE, you can use the OR function to tell you if any cells had a value other than FALSE.

The LOOKUP function is an excellent method for changing data from one form to another. If you want to turn numeric values into text, for example, you can input a table of the text equivalents of the values and use the LOOKUP function to pick values out of the table (the logical functions will return only one of two values).

For instance, you might want a text cell to contain "Small" if another cell contains 0 through 29, "Medium" if it contains 30 through 75, and "Large" if it contains 76 or more. To get the text equivalent for the value in cell R3C1, use the formula

```
=LOOKUP(R3C1,R1C10:R3C11)
```

	1	2	3	4	5
1		High	Low	Average	Std. Dev.
2	18-24	58	40	47.8	6.7970582
3	25-38	65	25	37.4	16.149303
4	39-55	81	46	57.4	14.808781
5	55-65	62	29	42.8	12.173742
6	65+	42	15	31.4	10.644247

Figure 3-3.
Spreadsheet with only summary data

This refers to a table in R1C10 through R3C11, which looks like this:

```
 0  Small
30  Medium
75  Large
```

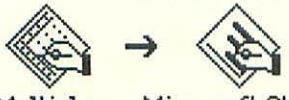
Other Multiplan Functions

Since File and Chart do not have any advanced math functions, you may find yourself wanting to use Multiplan's math functions to calculate values in your database or graphs. And although you come up against the familiar problem of static versus dynamic data, it is not hard to use Multiplan to perform these calculations.

Table 3-2 lists the functions that work on individual values or on limited sets of cells. These functions, with the power (^) operator, can be used to compute derived cells that you pass to File or Chart.

The mathematical functions are very helpful if you are using Multiplan and File for scientific data. You might use the SQRT function in business if you are performing least-squares averaging. The text functions can be used in combination with the LOOKUP function for producing formatted text fields based on values.

Seeing Results in Chart



Multiplan Microsoft Chart

When you transfer data from Multiplan to Chart through the Clipboard, you will find it important to pay attention to whether you are passing simple rows or columns or arrays of various types of data because Chart handles them very differently.

Chart document

Transferring Rows Or Columns

Chart provides a quick way to look at the relationship between numbers in your Multiplan file by making them into a graph. To

Table 3-2.
Multiplan Math Functions

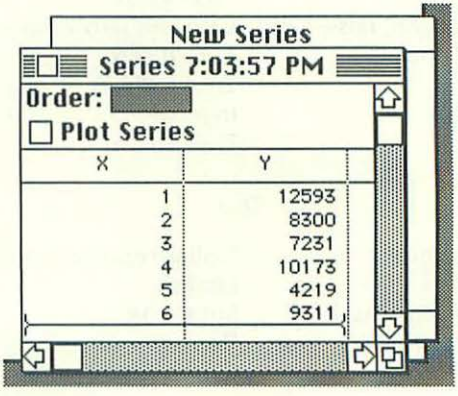
Function	Purpose
Mathematical	
ABS(number)	Absolute value
ATAN(number)	Arctangent
COS(number)	Cosine
EXP(number)	e raised to a power
FIXED(number, digits)	Truncates
INT(number)	Integer portion
LN(number)	Natural log
LOG10(number)	Log base 10
MOD(dividend, divisor)	Remainder of division
PI( )	3.14159
ROUND(number, digits)	Rounds a real number
SIGN(number)	Positive or negative
SIN(number)	Sine
SQRT(number)	Square root
TAN(number)	Tangent
Logical	
FALSE( )	False value
IF(expr., true-val, false-val)	Chooses two values
ISERROR(value)	True if error
ISNA	True if #N/A
NOT(expr.)	Inverse
TRUE( )	True value
Text	
DOLLAR(number)	Dollar representation
LEN(text)	Length
MID(text, start, length	Substring
REPT(text, number)	Repeats
VALUE(text)	Changes to number
Spreadsheet	
COLUMN( )	Column number
DELTA( )	Changes between recalculations
ITERCNT( )	Iteration count
NA( )	Value #N/A
ROW( )	Row number

transfer a row or a column of data to be formed into a graph, simply select the data and copy it to the Clipboard with the Copy command in the Edit menu. For instance, to select the data for the first quarter, position the cursor over cell RC2 (whose value is 12,593) and drag down to R7C2:

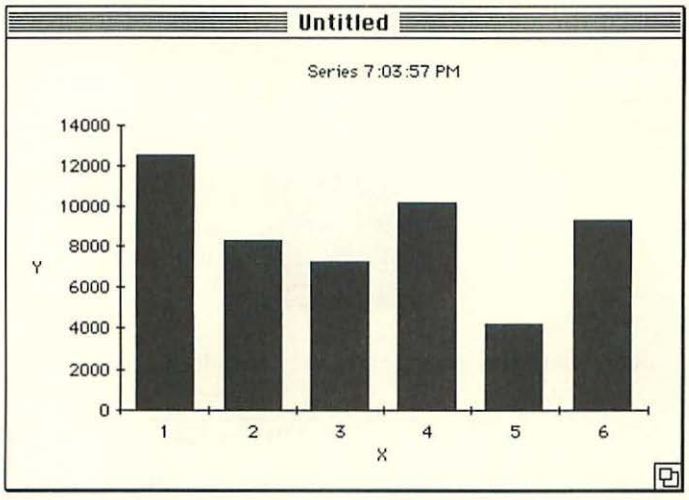
	1	2	
1		First quarter	Se
2	Pacific	12,593	
3	Southwest	8,300	
4	Mountain	7,231	
5	Central	10,173	
6	South	4,219	
7	Northeast	9,311	
8	Total	51,827	

The keyboard shortcut for copying the selection to the Clipboard is COMMAND-C.

When you run Chart, simply give the Paste command from the Edit menu (keyboard shortcut: COMMAND-V). Chart will open a series window for the new data:



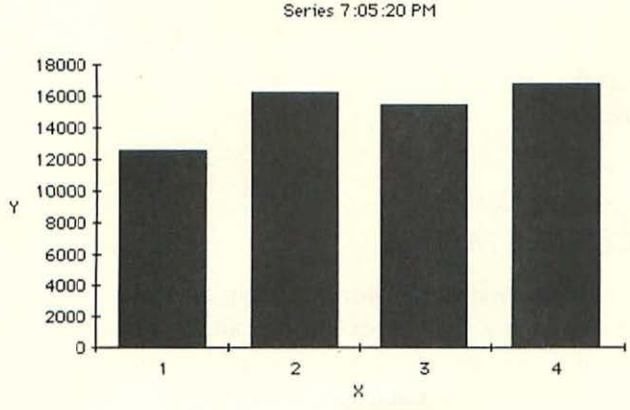
Choose a chart type and then click the "Plot Series" button. For instance, if you use the default chart type (Column type 1), you will see



You can also make drawings from Multiplan rows. To see the sales for the Pacific region, select

2	3	4	5	6
First quarter	Second quarter	Third quarter	Fourth quarter	Total
12,593	16,200	15,467	16,850	61,110
8,300	16,825	13,690	15,303	54,118

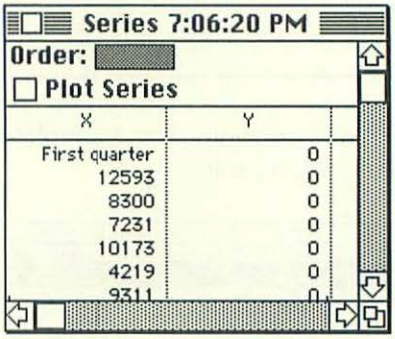
Paste this into Chart and plot the series:



Be sure that you do not include a column label with the Multiplan data. If you accidentally include it, Chart will assume

that all of the data is text data and will make a useless series window. For example, copy column 2 including the "First Quarter" label:

When you paste this into Chart, your data looks like this:



This is clearly not what you wanted.

Of course, you should also be sure not to include any computed cells in the Multiplan selection, since the derived values are not related to the other values and the drawings will misrepresent the data.

Chart document

Transferring Rows And Columns (Arrays)

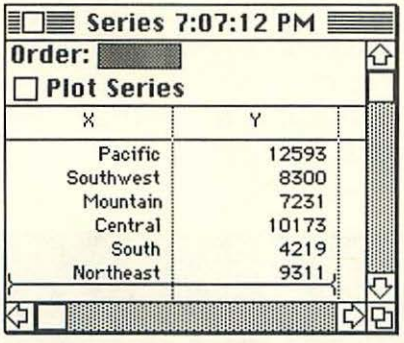
Chart handles two-dimensional Multiplan data fairly well, although beginning users sometimes cannot make their graphs show what they want. If your Multiplan data includes one set of labels and one set of data, Chart works as you might expect. However, if you have more than two rows or columns of data, an array, you need to explain to Chart how to plot all the data together.

The simplest case of transferring arrays from Multiplan to

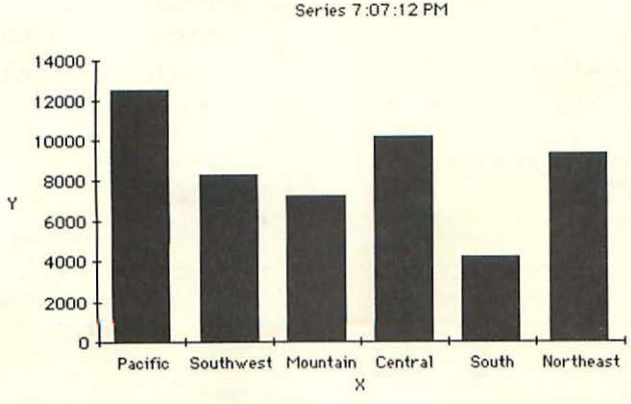
Chart involves a column of data and a block of rows. For instance, copy columns 1 and 2 (not including the totals) to the Clipboard:

	1	2	
1		First quarter	Sec
2	Pacific	12,593	
3	Southwest	8,300	
4	Mountain	7,231	
5	Central	10,173	
6	South	4,219	
7	Northeast	9,311	
8	Total	51,827	

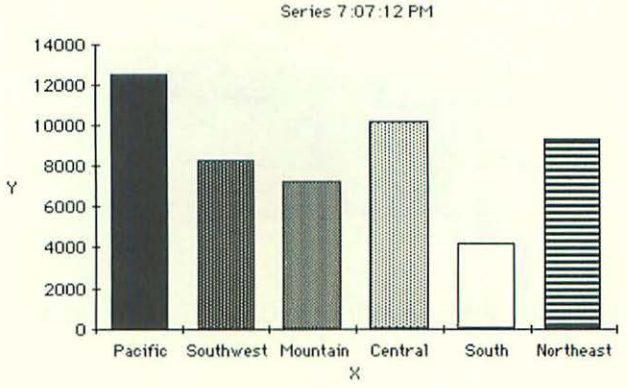
When you paste this selection into Chart, it opens up one series window:



Plotting this with the default chart type will yield



If you are using only one series of data (as you are here), a slightly more attractive plot is Column type 2:

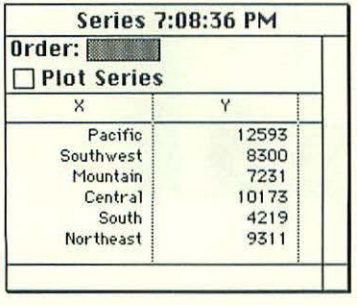


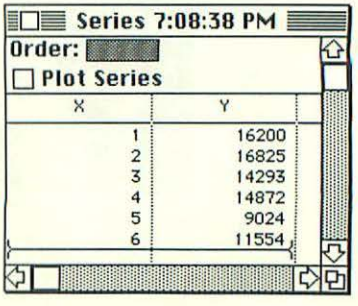
If you select two-dimensional data that is not one series, Chart will split the data into separate series windows. To plot these in the same order as their respective columns, you must plot the left-most column first, then the one to its right, and so on.

To see how this works, copy columns 1, 2, and 3 to the Clipboard:

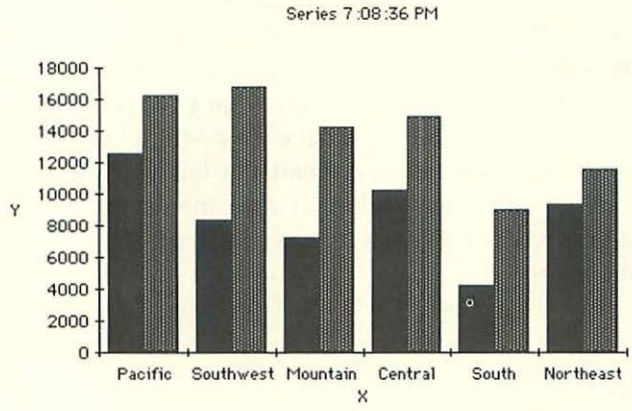
Pacific	12,593	16,200
Southwest	8,300	16,825
Mountain	7,231	14,293
Central	10,173	14,872
South	4,219	9,024
Northeast	9,311	11,554

Quit Multiplan, run Chart, and give the Paste command. Two series windows will appear. The first will have the data from columns 1 and 2, and the second will have the data from column 3. The title on the first window will have a time of a few seconds less than the second window. The two windows look like this:





To plot the two columns side by side, click in the "Plot Series" button in the first window (the one with the plot labels). The Order box will read "1". Next, click in the barely visible part of the second window to bring it to the top. Click the "Plot Series" button in the second window; its order box will read "2". Click on the graph to bring it to the top:



Notice that even though the "X" column in the second window contained numbers, not labels, Chart knew that this data was related to the data in the first window and kept the labels at the bottom of the chart.

If you had selected columns 1 through 5, Chart would have brought up four windows: the first with the labels and the first column of data, and the other three with only data. Again, the order in which you plot the data will determine the order in which the columns in your graph appear. Of course, if you choose a different type of graph, the order may not be important. You can change the order of the columns after you have plotted them by editing the numbers in the Order boxes.

Since Multiplan does not let you select two columns that are not contiguous, you may have a hard time making the charts you want. For instance, you may want to make a graph of the data in Figure 3-1 that contains just the locations and the totals columns. Since you can't select just these two columns from the spreadsheet, you should first copy the two columns to a pair of adjacent columns in an unused portion of the spreadsheet and then select them.

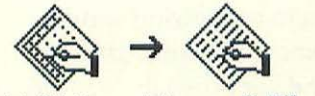
If you pay attention to the type of data that you give Chart, the

series windows that it presents will not surprise you. All of the graph styles in Chart can show two-dimensional data (except pie charts). You should experiment with different types and orientations of graphs before you produce a final drawing.

Chart reveals one unfortunate feature when you paste a spreadsheet from Multiplan. If you have more columns than rows in the Clipboard data, Chart will create series from the rows, not the columns that you have seen here. Thus, if you have five columns and only three rows of data, Chart will form the series windows by rows. Since this is rarely what you want to happen, you must be careful when you make your Multiplan selections.

Linking a spreadsheet to a Chart file lets you get the most current data from your Multiplan documents each time you create a graph. Since this is a feature of Chart, it is discussed in detail in Chapter 5.

Creating Records for File



As you saw at the beginning of the chapter, Multiplan can create many kinds of records for File. There are two situations in which you might use this capability:

- You want to create a new File database from information in Multiplan. This is often done if you use Multiplan extensively for financial data and inventory. After passing data to File, you can use File's sorting, selecting, and reporting capabilities on the information.

- You want to modify the data in a File database with Multiplan's math and logic functions. This involves copying data in File, pasting it in Multiplan, moving columns, creating new calculated columns, copying the spreadsheet, and pasting the records back in File. Using almost identical steps, you can also create a new database with the values from a previous database.

Creating New Databases


Multiplan document

The most common type of File databases that you will create in Multiplan are summary databases. These often contain totals from rows or columns of Multiplan data. Remember that you should perform whatever calculations you can in File so that your totals always reflect the current data, unless, of course, your procedure is only to update your Multiplan spreadsheets, not your File databases.

The rows you want to turn into records can form a database simply by copying them from Multiplan to the Clipboard and pasting them into a File database. If there are columns that you do not want in your database, either remove them or copy all the ones that you do want to a free area of the spreadsheet and arrange them as you wish.

If you are selecting many rows in your Multiplan spreadsheet, you may run out of memory on your Macintosh. Of course, the more memory you have, the less likely this is to happen. But even if you have enough RAM to copy the rows to Multiplan's Clipboard, you may not have enough space on disk to write the records out as you switch applications. If this is the case, select fewer records, write them into your File database, switch back to Multiplan, select more records, and so on.

Modifying Existing Databases

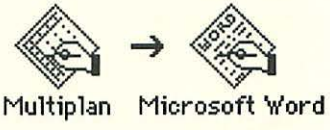

Multiplan document

The steps for using Multiplan to add or change a field in a File database are quite straightforward. If you are modifying an existing database, you must cut the File records to the Clipboard, modify them in Multiplan, and copy them back to the Clipboard for File. If you are creating a new database with different information, you do not need to cut the original records. Since cutting information to the Clipboard permanently removes it from your database, it is wise to make a complete backup of your datafile before following the steps below.

Before you start the process of moving data back and forth, review the following list and be sure you are prepared for each step. The first three steps are covered in more detail in Chapter 4.

1. Back up your File database.
2. Select the File records you want to modify. Remember that you cannot move more than 255 rows at a time, since that is the limit of the number of rows in Multiplan. Many versions of Multiplan have a bug that causes Multiplan to go into an endless loop if you move a large amount of File data into Multiplan.
3. If you are creating a new database, use the Copy command from the Edit menu to put the records from the database into the Clipboard. If you are modifying an existing database, use the Cut command.
4. Quit File. When you are prompted to save formatted or unformatted values in the Clipboard, select Unformatted. Be sure that only the Save Unformatted Records button is checked.
5. Run Multiplan. Be sure that cell R1C1 is selected and give the Paste command from the Edit menu. If you have copied many records, it may take Multiplan up to 15 minutes to store them all in the spreadsheet.
6. For safety's sake, immediately save the spreadsheet with the Save As command in the File menu.
7. If you are going to create a second database from the first, remove any rows that you do not want.
8. Create the derived cell in the top of the columns where you want it to appear in the database. Copy it downward with the Fill Down command in the Edit menu.
9. Select all the rows and give the Copy command.
10. Save the new spreadsheet and quit Multiplan. Again, save the Clipboard as unformatted.
11. Run File. If you are adding the new records to your database, select that database in the initial dialog box. If you are creating a new database, select New Datafile.
12. Select New record at the end of the displayed records and give the Paste command. It may take File several minutes to create the new records.
13. Verify that the computed cells translated the way you expected.
14. Save the new database with the Save command.

Multiplan Spreadsheets In Word



Chapter 2 described many of the ways that Word can present Multiplan output as formatted tables. There are a few more issues that you should consider before you pass Multiplan data to Word for display.

Since much of your work with Multiplan is meant to be viewed on the Multiplan screen, you will want to adjust column widths so that text labels can be seen completely; and you probably will want to put short text in labels to save space on the screen. Of course, once you transfer a spreadsheet to Word, you can change the labels any way you want; you can use multi-line labels or labels with different fonts and styles. Because of this, you do not need to copy the labels when you move your data: simply fill in what you want after you have pasted the data in Word.

Word also gives you the flexibility to annotate Multiplan data in a fashion that is not available in Multiplan. For example, you may have an annual report spreadsheet that shows net income. However, if this income is altered because your company is buying its own stock, you should annotate that when you present the spreadsheet. Even though you can't do this in Multiplan, you can in Word; Word's footnoting capability works very well here.

When you get a feel for the types of data that Multiplan can pass to other Microsoft applications, you can see how powerful it is. Its math capabilities allow you to prepare records for File that you would normally have to do by hand (or, as you will see in Appendix B, with a programming language). It is much easier to enter data in Multiplan than it is in Chart, and you can experiment with different types of calculations and see the results quickly. As you saw in Chapter 2, Word can help display Multiplan's results in a text document and spruce up the looks of the spreadsheets you produce.

4

File

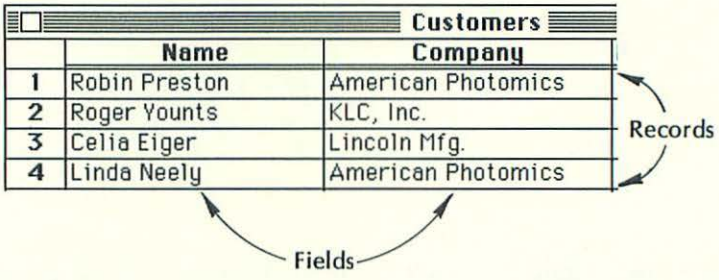
Microsoft File

Before Apple introduced the Macintosh, database software for business microcomputers had a reputation for being clumsy and hard to use. The instructions you used to tell the software about your datafile resembled a programming language, and you needed to remember the names of fields if you wanted to sort or select records. Using the Macintosh's standard user interface, Microsoft was able to make File much simpler to use than the old-style database management systems (DBMS's). Although more limited in scope than some other database systems, File can handle many routine record-keeping functions, and its usefulness is enhanced when it is integrated with the other Microsoft products. File stores data in a simple format; so like Multiplan, it can be used for customer lists, inventory, general ledger bookkeeping, and similar applications. Used with Multiplan's calculating capabilities, File can improve your business record-keeping. With Chart you can graph your File data and see summaries of your databases. File can also store information generated by Word for use in customized form letters, reports, and memos.

The Elements of File

Like other databases, File works with information ordered as *fields* and *records*.

Each field in File can have almost any length (it can contain more than 32,000 characters), each record can have more than 1000 fields, and a datafile can have more than 65,000 records In other words, you can create a database with File for almost any application you can think of.



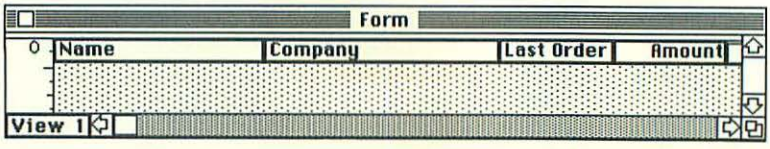

File form

Creating Forms

To show File how you want your data organized, use the Show Form command in the Form menu. You use this fill-in template to give a name to each of your fields and to tell File where to show the fields on the screen. When you give a definition for a field, you also specify the type of data that will go into that field and any special formatting characteristics. (Data types are discussed later in this chapter.)

There are two types of File forms, List Helper forms and the forms you create and customize yourself. List Helper forms always show as many of each record's fields as possible along one line. The name of each field is shown at the top of the datafile display.

The following is a form for a sales database. Part of its datafile window is shown in Figure 4-1.



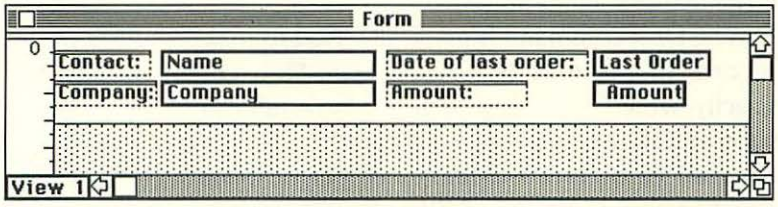
Customers

	Name	Company	Last order	Amount
1	Robin Preston	American Photomics	3/2/85	$3,517.00
2	Roger Younts	KLC, Inc.	7/6/85	$230.75
3	Celia Eiger	Lincoln Mfg.	8/18/85	$827.00
4	Linda Neely	American Photomics	6/9/85	$2,050.00
5	Skip Vasquez	Fuller Parts	5/4/85	$720.50
6	Greg Bianchi	Haselton Computers	7/18/85	$4,900.00
7	Jennifer Mahler	KLC, Inc.	7/6/85	$1,400.00
8	S. Shell	National Service, Inc.	4/30/85	$512.75
9	Marty Davis	KLC, Inc.	1/24/85	$2,805.00

17/17

Figure 4-1.
Datafile window for a List Helper form

Without List Helper, you can arrange fields so they appear on a form much like a paper form. You can have many fields on a line, and some of the fields can be more than one line tall. For instance, you may want to set up a form like this one:



Using such a form makes data entry easier, or at least more pleasant, for most people. The datafile window for this form is shown in Figure 4-2.

You can keep as many forms for a datafile as you want. If you want to save a form for future use, open the Form window and give the Save Form command in the File window.

Displaying Records

When you begin working with a database, all of the records are shown in the datafile window; you can view them all by scrolling. The actions that affect records (except those involving the Clipboard) affect all records in the datafile window. If

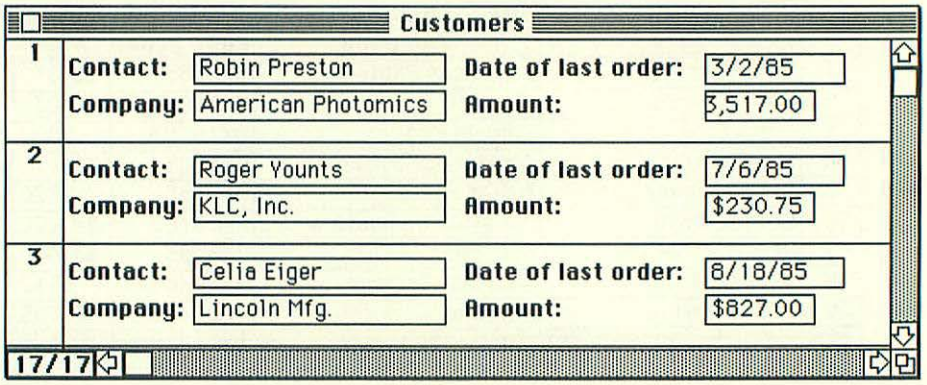
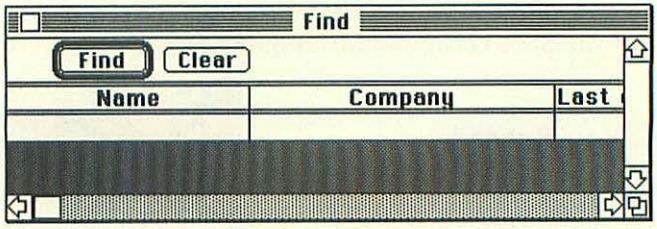


Figure 4-2.
Datafile window for a general form

you want to work with less than the full set of records, you display just those records with one of the commands in the Organize menu.

The Find command is generally used to make a subset of the records in the datafile window. The Find command lets you specify which records you want by establishing a condition, such as "all records whose Amount field is greater than 1000." You can easily create complex display criteria such as "every record that has a Stock field below 25 and the Purchase Date field before 8/1/85."

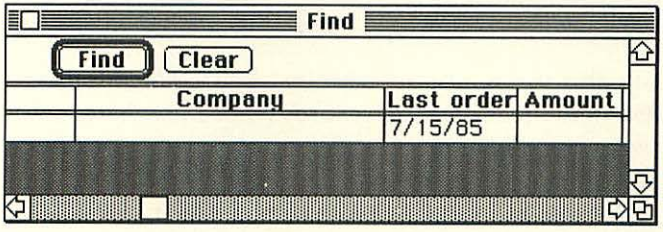
When you give the Find command from the Organize menu (the shortcut is COMMAND-F), File displays the Find window:



The window consists of two buttons, Find and Clear, and a form identical to the form for your database. To specify the display you want to see, you fill in the fields in the Find window and

click the Find button. The Clear button clears all of the display criteria you have entered in the window.

To find all records with a field equal to a specific value, simply enter that value in the Find window field. For example, to find all customers whose last order was on 7/15/85, enter this in the Last Order field:



When you click the Find button, File searches through the entire file for records with that date. The number in the lower-left corner of the window shows the number of records in your display subset and the number of records in the datafile.

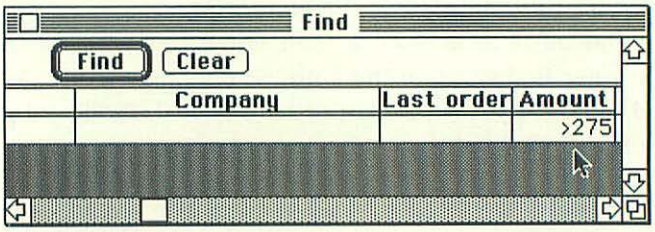
17/17

You can also find records based on whether the fields are greater or less than a particular value. To do this, put an *operator* in front of the value in the Find window. Table 4-1 lists the operators you can use. For example, to find all records whose

Table 4-1.
Find Operators

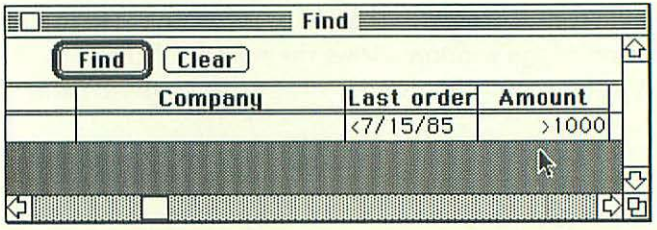
Operator	Meaning
=	Exact value
<> or ><	Not equal to
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to
...	In a range

Amount field is greater than or equal to 275, enter



You can also use operators with text fields. For instance, ">N" in a text field means *find all records whose first letter starts with a letter in the alphabet after "N".*

You can specify more than one field criterion in your Find command. For example, to find records with Last Order before 7/15/85 and Amount over 1000, enter



File will find all records that meet both criteria.

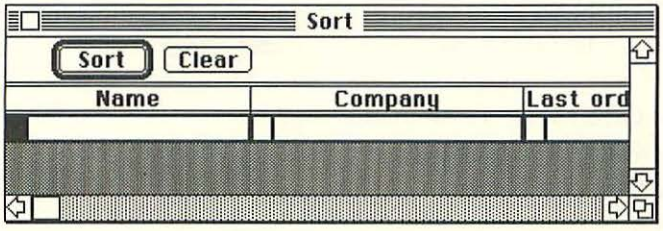
After you have given a Find command, if you want to display all the records again, give the Show All Records command in the Organize menu. You can also choose, one by one, which records to show in the display, by clicking in the record-number bar of each record. It may be faster to select the records you do *not* want to appear in the display and give the Hide Records command (shortcut: COMMAND-H) in the Organize menu.

Sorting

Once you have chosen the records you want to display, you may want to sort them in a particular order. File normally stores the records in your datafile in the order you entered

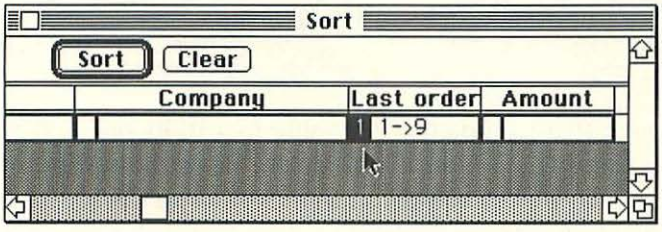
them, which is not very useful in most situations. You will probably want to view the records in sorted order based on one or more of the fields, such as by date or by name.

To specify the fields on which you want the displayed records ordered, give the Sort command in the Organize menu (shortcut: COMMAND-S). File brings up a Sort window, which is similar to the Find window:



This window also uses the current form.

Instead of filling in values in the fields, you click on the box at the left of the field to specify that you want to sort on that field. For example, to sort the displayed records by the Last Order field, click on its box:



File automatically fills in "1-9", which indicates that the field will be sorted in ascending order. Click the Sort button to see the result.

You can also sort in descending order. To switch the sort order, give the Sort command again and click on the "1->9" portion of the field. The field changes to "9->1". File uses "A->Z" and "Z->A" in text fields to indicate the sort order.

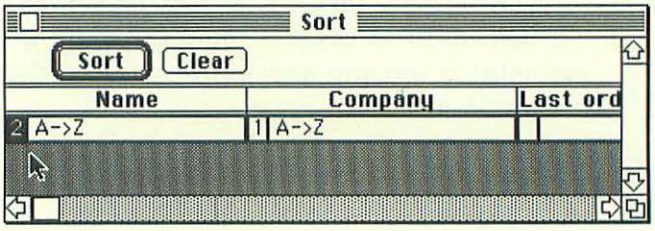
You can sort by more than one field if you wish. Sorting on two fields means that if there is more than one record with the same value for the first field, those records will be put in order for the second field. If you had a field for first name and a field

for last name, you would sort all the people who have the same last name also by first name, as in the phone book. The field that you sort by first is the *primary* field; the second sorted field is the *secondary* field, and so on. You can sort on as many fields as you want.

You would probably use the Company field as the primary field and the Name field as the secondary field to sort the customer list in the sales database example. In addition, you would probably want to sort both fields in ascending alphabetical order. To tell File you want this sort order:

1. Give the Sort command.
2. Click on Company.
3. Click on Name.

The Sort window will show:



Notice that Company has a value of 1 in its box and Name has a value of 2; as you might guess, this is the sorting order. You can edit these boxes if you want to change the sort order. If you decide not to sort a field that you have already selected, select it and press the BACKSPACE key.


File Index

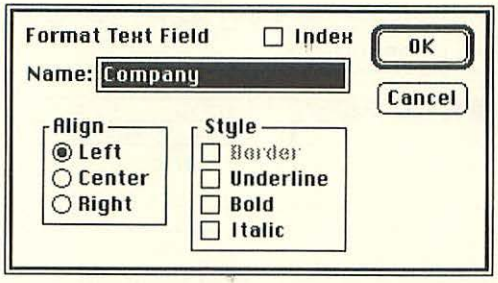
Indexed Fields

When File reads or sorts records, it accesses the disk often. Since the Macintosh floppy disks are somewhat slow, the Find and Sort commands can take a long time to execute. If you know that you are often going to use certain fields for finding or sorting, you may want to *index* those fields.

Indexing a field causes File to store a special table on disk that lists all of the records and the values of the indexed fields

(sometimes called *keyed fields*). File can read through the index file much faster than it can read through the records, which makes the Find and Sort commands work much faster. The trade-off is that the index file takes up room on the disk.

To index a field, click anywhere in one of the field's input boxes. This makes the Format command in the Form menu available (it will say "Format Text Field", "Format Number Field", and so on). Give the Format command in the Form menu, and File presents a dialog box with many formatting choices; these are discussed later in this section. For example:



A square check box near the top right of the box is labeled "Index". Click this box and then the OK button. File will then sort the records as it creates the index file.

After a field is indexed, you will notice that sorting or finding values in that field is much faster. If your database is on a standard Macintosh disk, sorting will probably take less than a third of the time it took before the field was indexed.

Reports

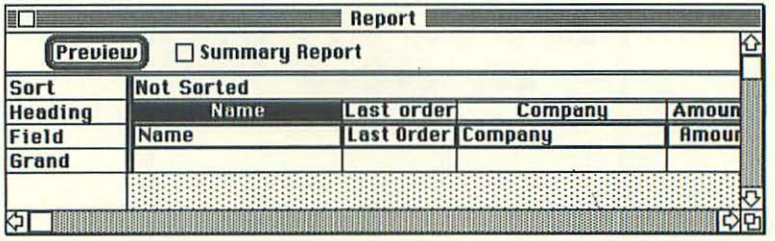

File Report

The main reason for choosing records and sorting them is to organize them for use with other programs or for a report. File's report facility lets you set up a report form that can be used on any subset of your database. Setting up a report is almost as easy as setting up your input screen to create a form.

Reports are most often written to summarize the data in a database. For example, you may want to know how many contacts you have at each company. After sorting the records on the Company field, File's report facility will start reading the records, looking for the first company's name in that field.

When the value in the Company field changes (meaning that there are no more records that contain the first company's name in the Company field), File prints out a summary showing the number of records with that Company value. These steps can be repeated for each value you specify. You can then tell File to show a grand total, which is a summary of all the summaries, at the end of the report.

To set up a report, give the Report command from the Organize screen. File opens a Report window similar to the List Helper form window:



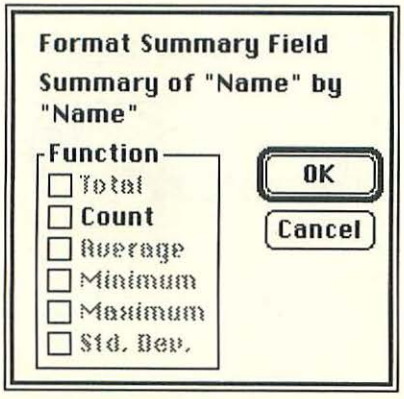
The three horizontal portions of the window correspond to the possible ways of presenting the fields:

- **Sorted**—Move any fields that you want to sort into this area. Like the Sort command, the Report command lets you decide the order in which the fields will be sorted.
- **Not Sorted**—If you want to show values for fields other than those that are sorted, move the fields into this area.
- **Not Shown**—These are the fields that you do not want to show in a report.

You can choose to show all the records in a report or just the summaries. For example, assume that a list of clients is sorted by state (primary) and city (secondary). If you print a summary report, File will print one line summarizing all the records for each city. A general report would include all the records between each summary.

To specify the type of summary you want, select the field name and give the Format Summary Field command in the

Form menu. You will see the following dialog box:



If the field is a text field, your only choice is Count. The types of summaries are shown in Table 4-2. You can select more than one type of summary for the records (such as Total and Average).

You can see a report on the screen by clicking the Preview button. To print a report on your printer, keep the Report window open and give the Print Report command. If you want to save the report as a text file that can be read by Word, give the Save Report command instead.

Table 4-2.
Types of Summary Fields

Type	Meaning
Total	Sum of all the values
Count	Number of records
Average	Average of the values
Minimum	Smallest value
Maximum	Largest value
Std. Dev.	Standard deviation of the values

For example, assume you want a report on your contacts by company and a count of the companies. You would specify the following:

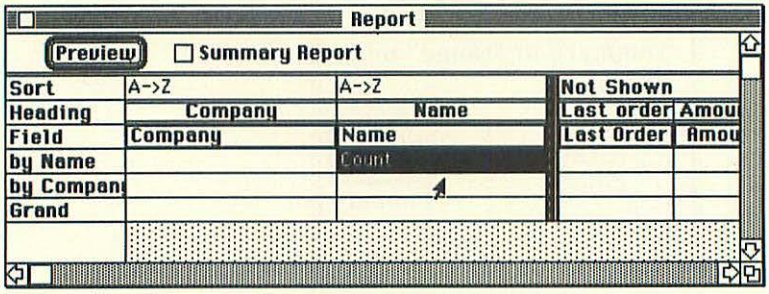


Figure 4-3 shows part of the report.

Types of Data

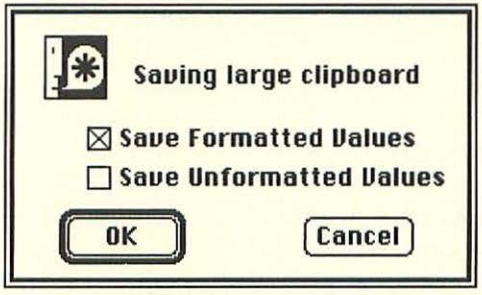
File can handle four types of data: numeric, text, date, and picture. You can have any mix of these data types in your databases. When you enter data into your database, you type text,

Company	Contacts
American Photomics	2
Dan Fenster	1
Elliot Motors	2
Fuller Parts	1
Haselton Computers	1
KLC, Inc.	3
Lincoln Mfg.	2
Linotest	2
National Service, Inc	1
Paul Thomas	1
Telacomp	1

Figure 4-3.
Sample File report

dates, and numbers into the fields. You can edit fields just like you edit in Word or MacWrite. Picture data must be pasted into fields from the Clipboard. It is likely that you will also use the Scrapbook if you use picture fields.

Each type of data is formatted in different ways. The formatting you use will affect the way in which File displays records on the screen. However, before you pass information to other Microsoft programs, you should remove the formatting so that numbers are not mistaken for text fields. When you save records to the Clipboard, File will ask whether you want to save the records with or without formatting:

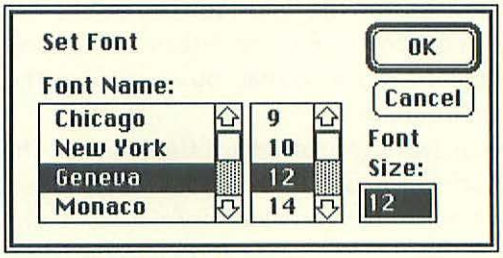


Be sure to check only the Save Unformatted Values button. Text-only files will have the same formatting as the current form.

Remember that the formatting you specify is the display formatting only. You are not required to enter formatting characters such as commas when you are adding or changing formatted data. If you have a number in dollar format, you do not need to add the dollar sign; File adds it for you when you have finished the entries in a field.

Numbers, dates, and text have two formatting characteristics in common: *alignment* and *style*. Alignment can be left, center, or right, the same as the tab alignment in Word. If you want to use a special type style, you can choose underline, bold, or italic. If you are not using the List Helper form, you can choose whether the field has a border around it (so you can see where to enter data).

The data and headings in a form are not limited to one type font and size in File: when you give the Set Font command in the Form menu, File presents a window listing four fonts and sizes:



The following sections describe the types of data that File handles and the formatting you can apply to each type. You need not be concerned about how File handles the data on your disks, only how you enter and produce reports.

Numeric Data

Any data on which you want to perform calculations must be numeric. You can enter numbers in their regular form or in scientific notation (such as "4.2E7"). File sorts numeric data from negative to positive.

There are two types of numeric fields: *data* and *calculated.* You enter numbers into a data field just like a text field. A calculated field, however, never accepts data from you. Instead, File fills in the field with the results of a formula that you entered when you set up the form. For instance, you can have a field called Tax calculate the sales tax on the values in an Amount field. If the tax rate is 5.2%, your formula in the database form would be

```
Amount*.052
```

Both the formatting and formula are entered in the Format dialog box:

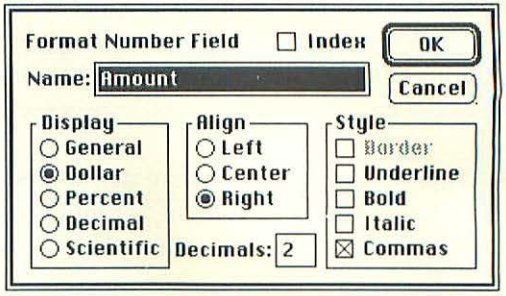


Table 4-3.
Numeric Display Types
With Decimals Set to Two Places

Display	Example
General	723.9
Dollar	$723.90
Percent	72390.00%
Decimal	723.90
Scientific	7.24E+02

The possible types of displays are shown in Table 4-3. As you can see in the illustration, you can specify the number of places after the decimal point (although File always remembers more if necessary). The additional style choice, Commas, inserts commas in numbers.

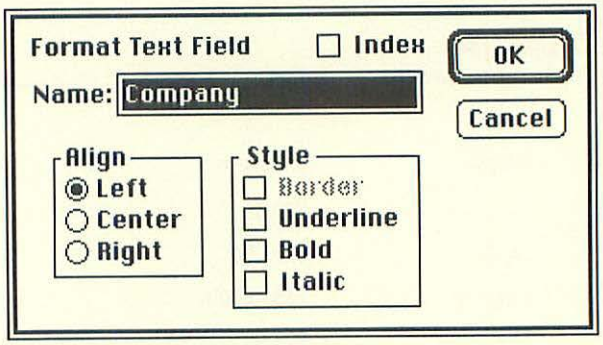
Your formulas can use addition, subtraction, multiplication, and division, and can group calculations with parentheses. Just a few of the uses for calculated fields are

- Tax, commission, or other rates based on a field.
- Totals of other fields. For example, if a record has quarterly sales, a computed field might calculate annual sales.
- Difference between fields, such as net profit or amount left.

Text Data

Text fields can be sorted but not calculated. Names and addresses are common text fields in databases. You may want to store numeric items that you will never use in calculations, such as part numbers, telephone numbers, or ZIP codes, in text fields as well.

The only formatting you can select for text fields is alignment and style:



Dates

File's date fields make it easy to store time-based information. Dates can be entered in conventional formats (such as "12/14/84" and "December 14, 1984") and can be correctly sorted with the Sort command, which often is not the case in other DBMS's. The formatting for dates is

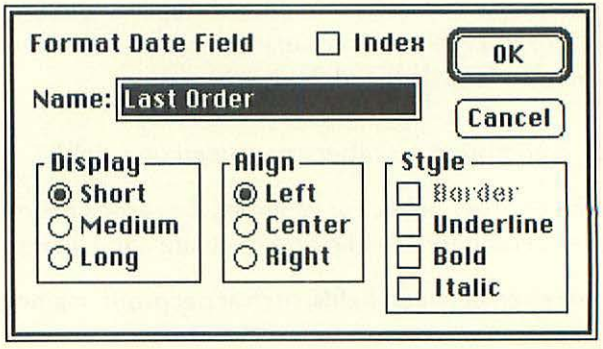


Table 4-4 shows examples of the three display formats.

When entering dates, you can use a shortcut if you are entering the current year. If you just enter a number between 1 and 31, File assumes that you are entering the current day and supplies the month and year for you. If you enter two numbers with a slash (example: 12/31), File assumes that you are entering a date in this year and supplies the year for you.

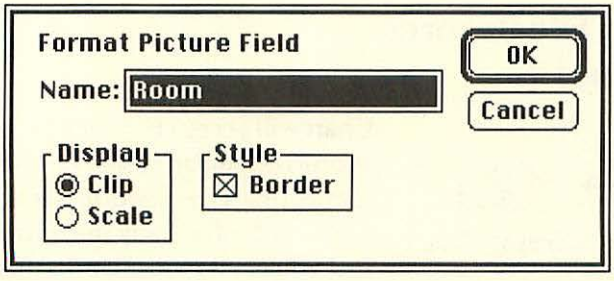
Table 4-4.
Date Formatting

Format	Example
Short	11/2/85
Medium	Nov 2, 1985
Long	November 2, 1985

Picture Data

File's use of picture fields is novel. A picture field can hold a picture created with Chart, MacPaint, MacDraw, or some other program that can store pictures in the Clipboard. You cannot sort or find records based on a picture field.

As you might imagine, the formatting for picture fields is different from the other data types. The Format dialog box looks like this:



If the picture in the record is larger than the display field in your form, File must decide whether to clip the picture (show only a portion of the whole) or scale the picture to fit in the field. You may enlarge the field in the Form window to show the whole picture, if you like.

If you copy records into the Clipboard or save them as text-only, File will eliminate the picture fields. Thus, they are not of much interest to people who use File in conjunction with other products that do not use pictures.

Moving File Records Into Multiplan

As you saw in Chapter 3, Multiplan has more mathematical capabilities than File. You can transfer records from File to Multiplan for processing and then move them back to File.

Since Multiplan cannot read a File text-only datafile, you must transfer records through the Clipboard. You should not transfer too many records at a time, however, since Multiplan reads them in very slowly, and some versions of Multiplan have bugs that make them stop if they are reading too many File records from the Clipboard. Transferring about 100 records at a time seems to be an acceptable level.

The records from your database are stored in the Clipboard in the order in which they are selected. Thus, if you are going to produce column totals in Multiplan, you must sort the records before pasting them into the Clipboard.

Moving File Records Into Chart

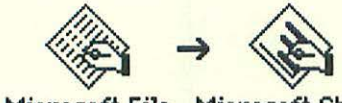


Chart will accept File records just as it accepts Multiplan rows. The only problem is that you need to set up your forms to contain only the information that you want to display in Chart. This usually means you must hide all of the text fields and the number fields that you are not interested in.

To set up a special form for transferring records to Chart,

1. Open the Form window.
2. Give the Save Form command in the File menu to copy the form you were already using. (Unfortunately, there is no New Form command.)
3. Hide all of the fields that you do not want by dragging them into the shaded area of the form. Rearrange the other fields to be in the order in which you want to pass them to Chart. A label field

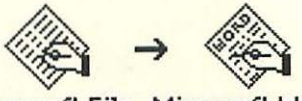
for numeric data should be in the first column.

4. Give the Save Form command in the File menu. When you later want to transfer data to Chart, you can reuse this form instead of having to re-create it.

When you paste the records into Chart, it will open a series window for each column of numbers. Like Multiplan data, if the first field is text, the first series window will be for the text field and the first numeric field.

You can transfer summary reports to Chart for graphing, but you must use a somewhat roundabout method. First, save the report as a text-only file, as described in the next section. Quit File, run Word, and open the file. Remove all the headers so there is only data in the file. Select all the data and copy it to the Clipboard. Quit Word, run Chart, and paste the data into the series windows. The step of editing out the headings in Word is, unfortunately, not automatic, but it is necessary so the data will be transferred correctly to Chart. You should also be sure that your numeric fields are not formatted so that Chart knows that they are numeric, not text.

Transferring File Output To Word



Word can handle many kinds of File output. Since File can put text-only files as well as records into the Clipboard, you can use either method to transfer data to Word. For reports, however, File will only write to a text-only file, not to the Clipboard.

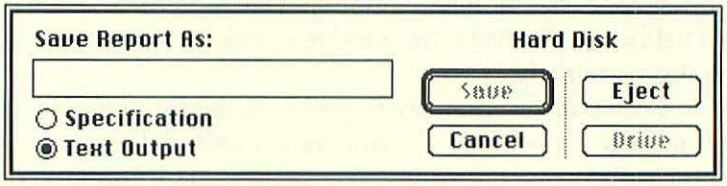
The simplest kind of data to transfer from File to Word is plain records. For instance, you may want to show a group of records in a Word document. This is done with the Save Records command in the File menu or by copying the records to the Clipboard. Word can format the records with the table features, which is similar to formatting Multiplan output.

Word can also read a text-only report file. Any report can be saved as a text-only file and opened in Word. To save a report as a

text-only file:

1. Open the Report window and select the fields you want to report on. You can display the report with the Preview button.

2. With the Report window open, give the Save Report As . . . command in the File menu. Word presents a dialog box:



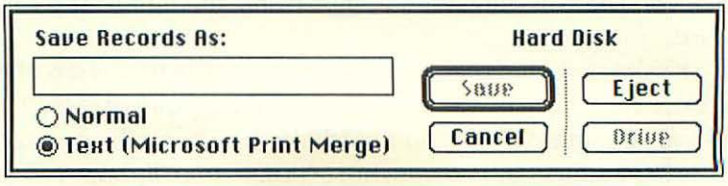
Click the Text Output button, give the report a name, and click the Save button. File then runs the report.

3. If you will want to use this same report form in the future, give the Save Report As . . . command again and click the Specification button. This saves the items in the Report window.

4. Quit File and run Word. Open the report file and add any formatting you want, such as new tab rulers.

You can also save records in a text-only file for use with Word's merge facility. To save space, remember to hide any fields that you do not need to use in your merge letter. Chapter 2 suggested ways you can creatively use numeric fields in your form letters.

The Save Records As . . . command in the File menu saves all the records in the datafile window in the order of appearance (remember to sort them first). The command's dialog box looks like this:



Click the Text button, give the file a name, and click the Save button. Remember that this file will have a header containing the field names so that Word can use this file by itself.

As you have seen in this chapter, File's record-storing capability is a good match for the other Microsoft applications. It can be used with Multiplan to get the latest results from a static database or it can produce its own reports. Like Multiplan, File can pass data to Chart so you can see drawings of your numeric data or summaries of your databases. It can also be used as a mailing list for form letters in Word. You will find that File is an easy-to-use data handler for many of your business needs.

5


Microsoft Chart

Numeric data from File and Multiplan often needs to be presented in a clear, easy-to-read format. In Chapter 2 you saw how Word could help with this task by arranging numeric data into tables. To turn numbers into graphs, however, you need Microsoft Chart.

Chart is based on the "data as pictures" concept to which many Macintosh owners have become accustomed. If you haven't used any computer other than a Macintosh, you may be surprised to discover that almost all other computers do not support graphics as a standard feature. If you also have Chart, you can produce a wide variety of sophisticated graphics on your Macintosh. To make graphs like those of Chart, users of other computers often need to spend hundreds or thousands of dollars.

Chart's Advantages

Chart produces graphs that can be used in Word documents or by themselves. The previous two chapters discussed many of the methods used to transfer information to Chart. Chart's greatest asset when used with File and Multiplan data is the speed with which you can produce results. Once you have run Chart, pasting the data from the Clipboard or the Scrapbook goes very quickly,

and selecting the kind of graph to produce usually takes less than a minute. The most tedious part is usually getting the labels, legends, and other text on the drawing in exactly the right way, but you'll see in the next chapter how MacPaint and MacDraw can make this much easier.

Making graphs with Chart is so easy that you can feel freer to make mistakes, since correcting them does not take long. For example, if you accidentally include an extraneous piece of data (such as a total in a totals column), you can quickly remove it after you see that your drawing is incorrect. If a pie chart is lopsided, you can quickly fix it without leaving Chart. You can also fix problems and do touch-up work in MacPaint or MacDraw.

Design Considerations

When you make a graph of your data with Chart, the type of graph you use will affect how the viewer sees the information you are presenting. If you show the data in only one way, the viewer may not think of other relationships that a different kind of graph might have shown. For example, two series graphed in a column or bar chart show comparison and contrast much more dramatically than the same series shown as two line graphs, which are better for showing trends over time.

In addition, certain kinds of charts are based on assumptions that your data may not share. For instance, pie charts present data as adding up to 100 percent of a certain value, while line graphs don't assume that data is added together. Thus, choosing one type of graph can hide some potentially useful interpretations of the data or be inappropriate for the data.

Still another consideration is that graphs can hide a poor selection of data or can present data that is not really related. A combination chart, for example, may look correct even though the data from which it is created may not be related at all.

The following guidelines may help you choose the types of charts best suited for your data; you'll look at each type in detail later in the chapter:

- *Line graphs* are often used to show trends over time in data such as physical measurements, temperatures, and percent-

ages. This kind of chart can also illustrate the relationship between two or more series, such as advertising expenses and sales, by graphing them together.

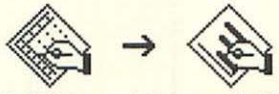
- *Scatter charts* illustrate the distribution of individual data points.
- *Pie charts* show the contribution of each part to the whole. Like any type of graph, they should not be used for series whose values are not related to each other.
- *Bar, column,* and *area charts* are used to compare information such as sales, inventory, or population growth. By stacking bar and column charts, you can present the cumulative total of each series, whereas comparative bar and column charts (side-by-side) can illustrate the differences between series or present several different series of information for contrast.

Entering Data Into Chart


Chart document

The previous two chapters showed you how to transfer data from Multiplan and File into Chart through the Clipboard. As you saw, Chart simply transfers each field of data into a series window. You can, of course, also type the data into Chart directly. You can edit the series windows using the standard Macintosh editing techniques. Once the data is entered, Chart's advanced features let you format it in many creative ways, which you'll read about in the following sections.

Paste and Link From Multiplan


Multiplan → Microsoft Chart

Chapter 3 showed the simple way to transfer data from Multiplan to Chart: copy a portion of a spreadsheet to the Clipboard, run Chart, and paste the values into series windows. You normally save this chart and its data for future use. If the Multiplan spreadsheet used for the graph changes, you will need to go

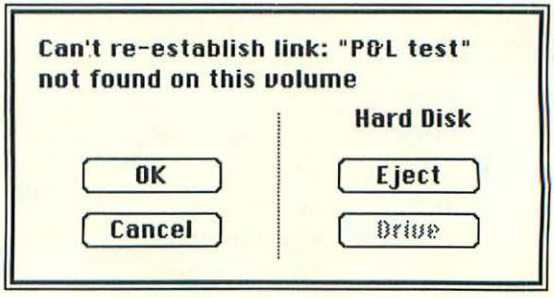
through the procedure again to get the most recent results.

If you know in advance that the spreadsheet you are using is going to be updated and that you will always want its most current data, you can use the Paste and Link command in Chart's Edit menu to tell Chart to go back to the original spreadsheet for the data each time you open that drawing. When you give the Open command on a Chart document whose data was created with Paste and Link, Chart reads the cells in the original spreadsheet to create the series windows.

Use the following steps to paste and link a spreadsheet to a chart:

1. Select the series data from your Multiplan spreadsheet and give the Copy command from the Edit menu. (If you have just created the spreadsheet, you must save it before copying the selection to the Clipboard so that Chart will know the Multiplan spreadsheet's name.)
2. Quit Multiplan and run Chart.
3. Give the Paste and Link command from Chart's Edit menu. This will create series windows just as the Paste command does.
4. Make the drawing by clicking on the Plot Series buttons in the order you want.
5. Give the Save As command in the File menu to save the drawing and series information. This will also save the information about the Multiplan spreadsheet that the series came from.

You should be sure that the Multiplan spreadsheet from which you are reading data is on the same disk as the Chart document. If it isn't, Chart will present a dialog box:



Insert the disk with the Multiplan spreadsheet and click the OK button. Chart will then read the data.

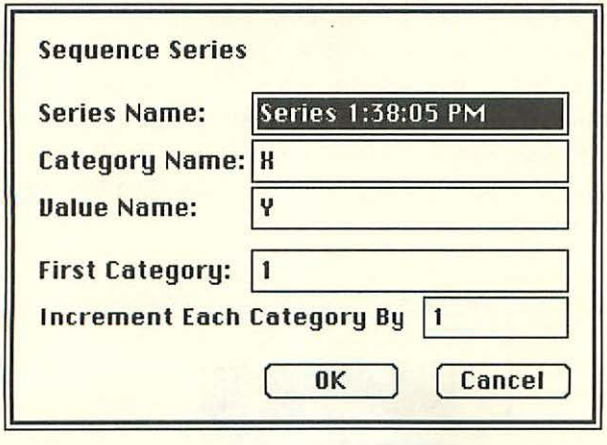
Types of Chart Data


Chart document

Before you create series windows in Chart, you can assign a series type to the data. If you are not creating text series, such as a selection with text labels in the left column, you should select the series type in Chart before pasting in the data to prevent Chart from breaking your data into separate series windows. You specify the type of data for a window with the Sequence, Date, Text, and Number commands in the Data menu.

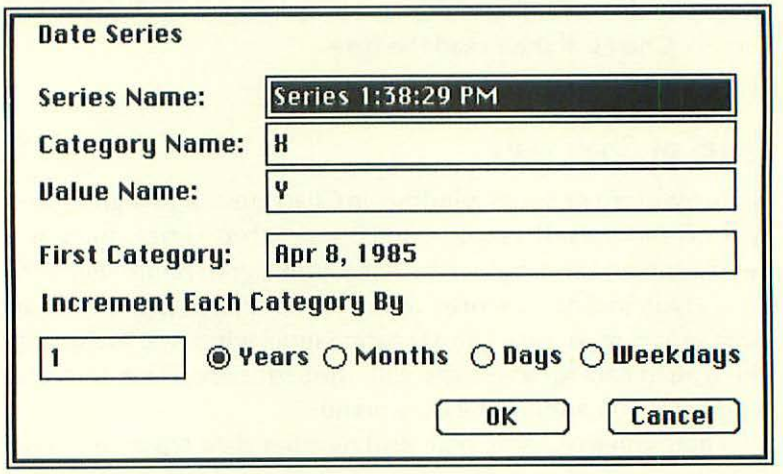
The sequence, date, text, and number data types tell Chart how to format the category column (the left column) in the series window. The four commands also let you change the labels for the series, the category column, and the value column (the right column).

Sequential data must be numeric, and each category must be incremented by a preselected amount. You can set the initial value and the increment that each category will have:



The defaults are for starting the categories at 1 and increasing by 1.

You can also specify the same settings for date series:



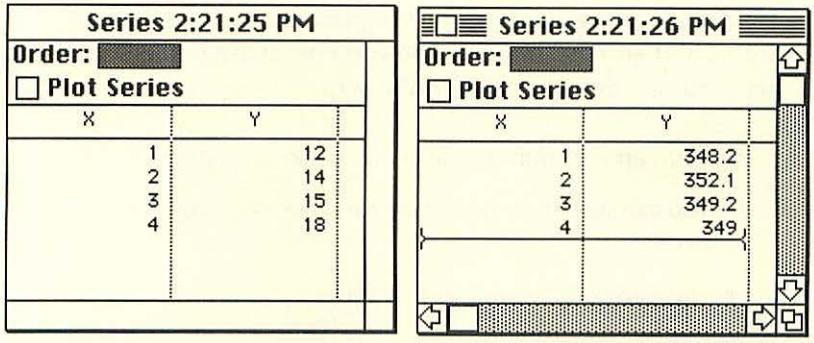
In a date series, you also specify the time increment. This is the unit of time and the amount by which the time is to be increased for each value.

If you specify a text or number series, Chart does not assume that the data is in a specific order or has incremental values. If you plot a text series first and then plot incremental series, Chart will assume that the incremental series corresponds to your text series. (You saw this in Chapter 3 when you plotted Multiplan data.)

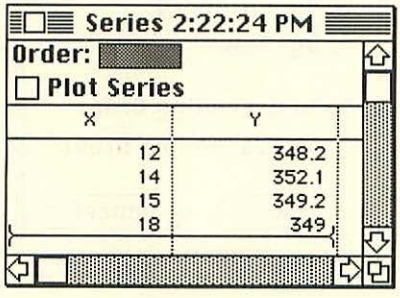
Chart's initial assumption is that the data you are entering is sequential starting with 1; if you paste other data into the New Series window, the windows that Chart forms will not be correct. For instance, assume that the following is data from a scientific experiment:

	1	2	3
1		Run 1	Run 2
2	12	348.2	342.9
3	14	352.1	342.4
4	15	349.2	344.6
5	18	349	346.8
6			

If you paste rows 2 through 5 of columns 1 and 2 into a drawing, Chart will form two windows:



Since the data in the first column is numeric, not a sequence, give the Number command in the Data menu before pasting the data. When you then paste the data into the New Series window, Chart will correctly associate the data in the first column with the data in the second:



If you specify a type of data for the series window and try to paste in a different type of data, Chart will make its best guess and change the data type. For example, if you tell Chart that the New Series window will be numeric and then paste in text, Chart will change the window type to text. This may not be what you want, so you may have to experiment before getting Chart to accept the data correctly.

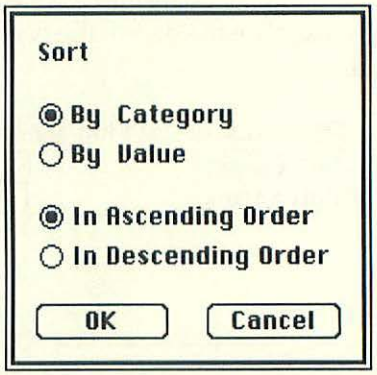
Sorting Chart Data

When you enter sequential and date data, Chart sorts the data in ascending order by category. This makes the categories in the resulting drawings appear from left to right (or top to bottom) in ascending order.

If you are using data from Multiplan or File, you can bring it into Chart and sort it there. The Sort command in the Data menu lets you sort data in a variety of ways:

- You can sort numeric and text series by categories.
- You can sort any type of category in ascending or descending order.
- You can sort the values in a series.

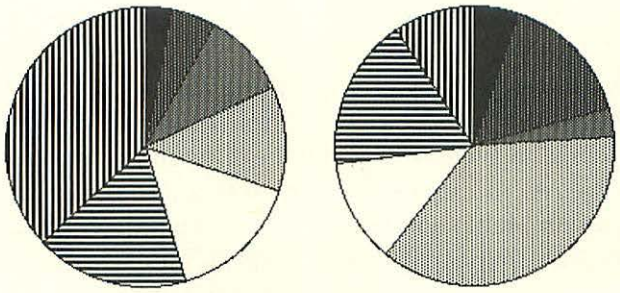
When you give the Sort command, Chart presents the following dialog box:



Choose the appropriate column to sort on and the order you want.

Sorting numeric and text categories is useful if you are preparing a graph for use in a report written in Word. Long tables of equivalent rows are often sorted so that the reader can quickly find specific information. For instance, if you are showing both a sorted File table and a graph from Chart, it is good to show the graph in sorted order as well.

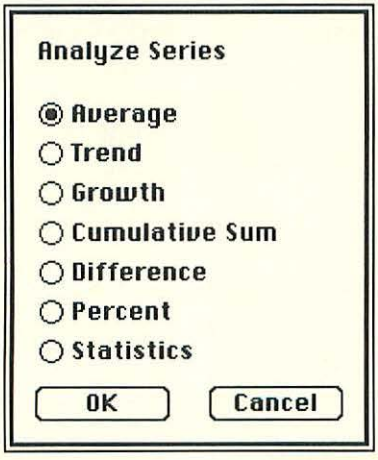
It is uncommon to sort data series by values. The resulting drawing will have steadily increasing or decreasing slope, but the category values will be jumbled. This option is only useful for numeric or text pie charts. A pie chart whose values are sorted looks better than one in no apparent order. For instance, compare the following two charts:



The sorted chart on the left presents the data in a more logical order.

Analyzing Data Series

As you saw in Chapter 3, Multiplan has many functions for making calculations on rows or columns of data. Chart has many of the same capabilities. The Analyze command in the Data menu lets you create new series windows based on the data in other windows. The types of analyses you can perform are listed in the command's dialog box:

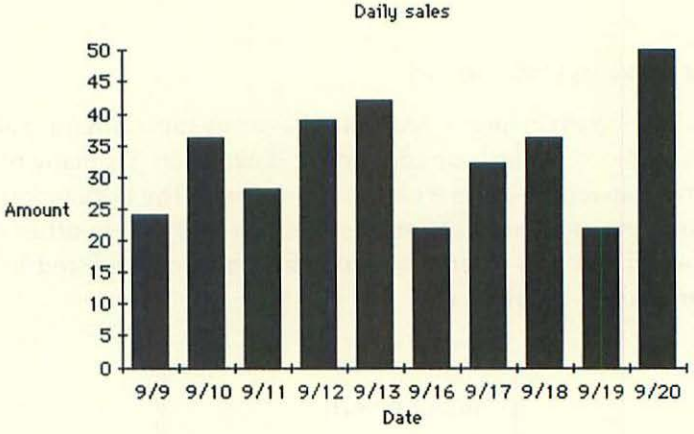


The series windows created with the Analyze command are usually used in combination charts with the original data. For example, if you have a bar chart of weekly sales, you may want to overlay it with a line graph showing the trend of sales from week

to week. You can also generate a series window of statistics to use in graph labels.

The choices you have for analyzing data are shown in Table 5-1. The most common uses for the Analyze command are to show trends, an average line, and the differences between incremental values. You should remember that just as with the computed data in Multiplan and File, the series windows created with the Analyze command are derived values, not actual data.

It is easy to find uses for such derived values. For example, assume you have a graph like this one:



It may be hard for a viewer to figure out on which day sales were above or below average in this drawing. You can simplify the viewer's task by creating a series of the average of the values:

Daily sales

Order: 1

☒ Plot Series

Date	Amount
9/10	36
9/11	28
9/12	39
9/13	42
9/16	22
9/17	32
9/18	36
9/19	22
9/20	50

Average of Daily sales

Order: 2

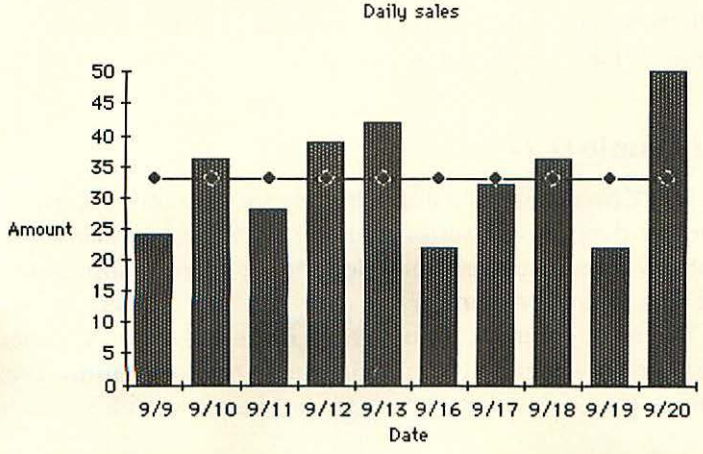
☒ Plot Series

Date	Amount
9/9	33.1
9/10	33.1
9/11	33.1
9/12	33.1
9/13	33.1
9/16	33.1
9/17	33.1
9/18	33.1
9/19	33.1

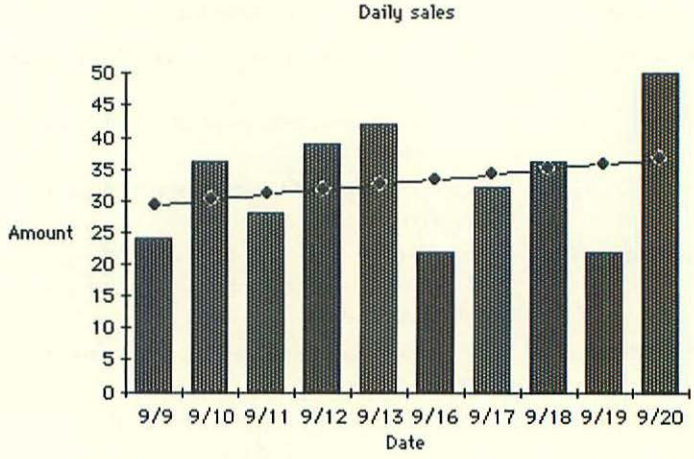
Table 5-1.
Types of Analysis in Chart

Type	Description
Average	Series of identical points that are the average of the data
Trend	Least-squares approximation of the straight-line trend of the data
Growth	Exponential growth-curve approximation of the trend of the data
Cumulative Sum	Sum of each member of the series. Each value of the new series is the previous value plus the data from the original series
Difference	Differences between each pair of values from the series
Percent	The percent of the total of the original series
Statistics	A compilation of statistics on the series, including number of values, maximum, minimum, average, median, standard deviation, and correlation coefficient

Click the Plot Series button; then click on the chart. Give the Overlay Chart Type command in the Chart menu to set the type of the overlay chart to a line chart. The result is this:



If your data is supposed to show a linear trend, use the Trend button in the Analyze command to create a trend series. Overlay that series on your original data. For example:



Types of Charts In the Gallery


Chart document

As mentioned before, the type of chart you choose can affect the relationships a viewer sees in the data. Since you may be transferring complex data from File and Multiplan, it is important to determine what type of chart you want to use based on the kind of data you have and the kind of comparisons being made.

The following discussion covers the charts that can be selected with the commands in the Gallery menu. Each type of chart has a number that is displayed in the gallery.

For Simple Data

Most of Chart's graphs are appropriate for use with simple row or column data, or for series that are parts of a whole, such as monthly sales in a given year. Depending on your application of the data, there are many graph styles to choose from.

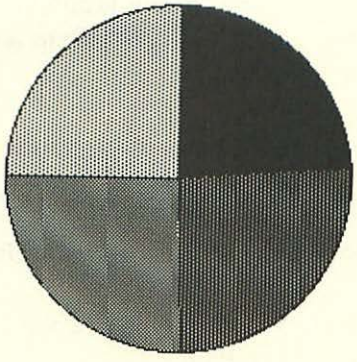
The most common simple graph is the pie chart. All types of pie charts are useful for graphing simple row or column data, as long as that data adds up to a total. The viewer of a pie chart

compares the data by comparing the pieces of the pie. Thus, pie charts are especially useful when there are a few categories of data with wide-ranging values. If the values are close together, a bar or column chart will probably show the differences better than a pie chart.

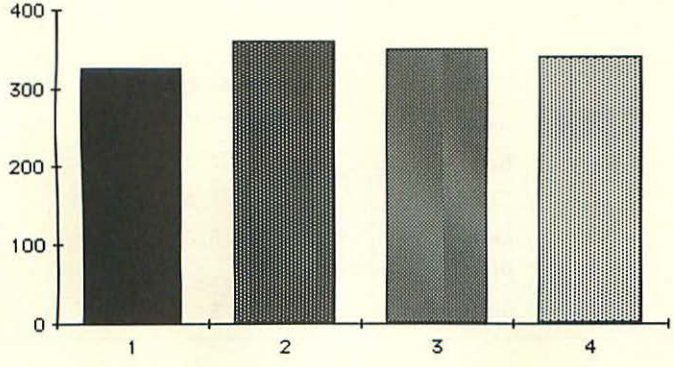
For example, assume you have the following data:

	1
1	327
2	360
3	351
4	341

A pie chart of this data would look like this:



Because the values are so close, it is hard to tell the difference between the pieces of the pie. However, a column chart of the same information would look like this:



Although the bars are almost the same height, it is easier to see which is tallest, shortest, and so on. You could make it much easier to see by using smaller intervals in the chart.

Table 5-2 lists the types of charts appropriate for simple row or column data or for series that are parts of a whole. Basically, all charts that use data that can be thought of as adding up to 100 percent will work.

For More Complex Array Data

All of the chart types (except for pie charts) are useful with two-dimensional (array) data and for graphing several unrelated series together. The specific type you use in any given situation should depend on

- The relation of the elements in each series
- Whether or not the series represents a total
- The importance of a particular series in the data.

The easiest way to decide which type of chart you want to use is simply to experiment with them.

Table 5-2.
Types of Charts Appropriate
For Simple Row or Column Data

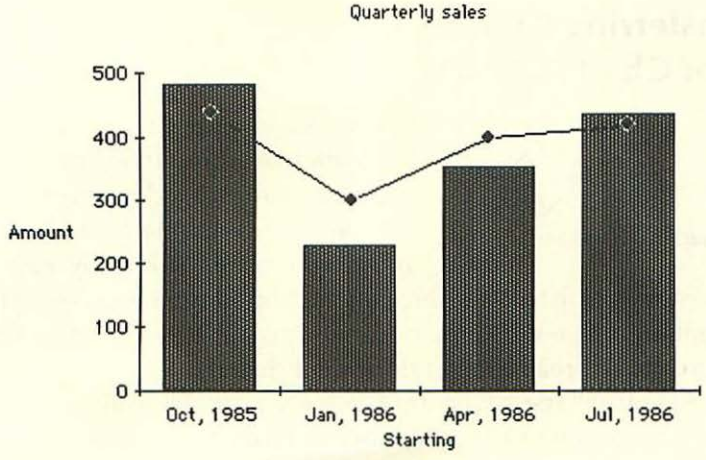
Type	Appropriate Types
Area	1, 3, 4, 5
Bar	1, 2, 4, 6, 7
Column	1, 2, 4, 6, 7, 8
Line	1, 2, 3, 4, 5, 6
Pie	All
Scatter	1, 2, 3, 4, 5

Some of the chart types assume that the series you are using are additive. For instance, someone viewing bar chart type 5 (100% stacked) will assume that the value of each complete bar is the same; if it isn't, the viewer will be quite confused. The additive charts are area type 2, bar type 5, and column type 5.

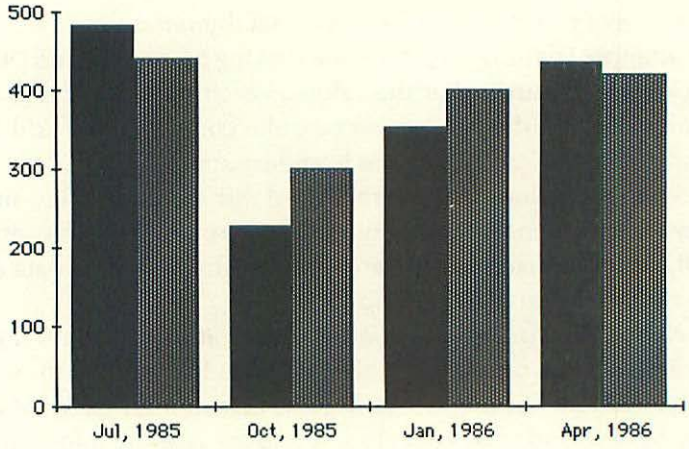
Scatter drawings are generally used with number series, since they have nonincremental columns and rows. These are especially useful in scientific research for showing points of data and are rarely used in business and finance.

As you saw earlier, Chart lets you combine chart types if you have more than one series. This can be useful not only for summary data generated by Chart, but also for summary data that you may have included in your data. If you are reading information from Multiplan, you can generate the statistics before you transfer the data to Chart.

You can use overlaid charts to emphasize the difference between series. For instance, if a column chart shows the expenditures of a company over the year, you can show the intended budget for the same period as a line graph:

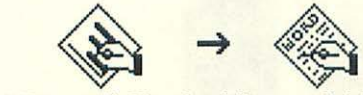


Using a different type of chart makes dissimilar data much more understandable. If you had simply used another column, the comparison would not have been as clear:



The Combination command in the Gallery menu gives you four suggestions for common combinations of charts. If you are creating your own combinations of charts, experiment with the formatting choices in the Main Chart and Overlay Chart commands in the Format command menu.

Transferring Graphs From Chart to Word



Unless you simply print out your charts, it is likely that you will want to include them in your Word documents with the data they were derived from. As you might guess, it is fairly easy to transfer a graph to Word through the Clipboard. Simply select the graph and give the Copy command to put it in the Clipboard. Word cannot read a Chart document directly.

As you will see in Chapter 6, you will probably want to transfer Chart's drawings to MacPaint or MacDraw before you put them into your reports. Since some of Chart's commands for placing text labels and legends can be awkward to use, it is easier to add your text in MacPaint.

Chart's ability to take data from File and Multiplan makes it

easy for you to create graphs. You will find that they are a useful aid in presentations and reports. You can include tables of figures in Word documents and can also include drawings of that data just as easily. You can graph data quickly as you work with it, seeing for yourself the trends and tendencies of the numbers you're working with. Chart provides a wide variety of graphs and allows you to experiment easily with the different types and formats.

6

Using MacPaint and MacDraw With the Microsoft Applications

Because the end result of integrating Word, Multiplan, File, and Chart is often a report or memo, you will want your work to look as good as possible. Although the Microsoft applications create high-quality output, you can use MacPaint and MacDraw to add embellishments, such as labels and highlights, with very little effort.


MacPaint


MacDraw

Introduction to MacDraw's Features

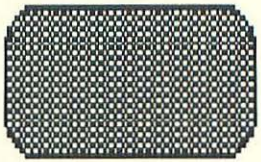
Since MacPaint comes with the Macintosh, you are probably familiar with its use and basic features. MacDraw, on the other hand, was not released until more than a year after the Macintosh, and fewer people have used it. This section is a quick introduction to the features of MacDraw that make it useful with the Microsoft applications.

Many of the drawing concepts of MacPaint are used in MacDraw, so a MacPaint user can probably start using MacDraw fairly quickly. The most significant difference is that MacDraw is *object-oriented.* MacDraw treats each pixel, which is the smallest part of a picture, as an object that can be manipulated. While this is

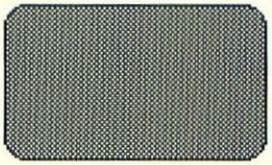
similar to the selection concept in MacPaint, it differs in that MacDraw always remembers the boundaries of each object without your having to specify them.

Objects can be enlarged or shrunk in MacDraw without the jagged edges that appear when you enlarge selections in MacPaint. For instance, assume you are working with a shaded rounded rectangle:

In MacPaint, when you enlarge the shape a little, the pattern inside the rectangle enlarges unevenly:



In MacDraw, the pattern remains constant, and only the object gets bigger:



When you type text into MacDraw, the program remembers that it is text and does not turn it into pixels as MacPaint does. You can type in some text, add a picture to another part, and then come back to the text and change the font and size. This feature is especially useful for adding or changing labels on Chart graphs and File or Multiplan tables that you are going to use in Word.

MacDraw can read large images from the Clipboard. If you copy an image from Chart with the Copy Chart command, it may be larger than the MacPaint window. Although you can get around this (as shown later in the chapter), you don't need to

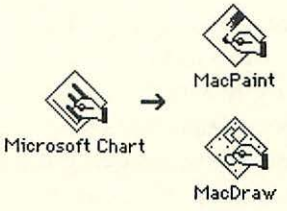
worry about it in MacDraw, since you can paste in a picture as large as MacDraw's page. MacDraw can also scale pictures to be larger than a full screen, so that you can scale a chart that is almost a full page and paste it into Word.

When you paste a Chart graph into MacDraw, each element in the graph is stored as an object. You can move labels one at a time and easily change the pattern of each section of the graph. All text is movable, and the axes can easily be modified.

If you are using MacPaint to prepare images that you will use in Word documents, you should definitely consider buying MacDraw. The tools that you can access in MacDraw make editing and revising drawings much simpler than in MacPaint.

In general, you will find that you will use both MacDraw and MacPaint to touch up and add to the output of Microsoft applications. MacDraw gives you many features that MacPaint doesn't; some of the following suggestions, however, will only work with MacPaint.

Pasting Chart Output Into MacPaint and MacDraw

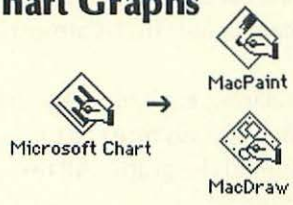


If your Chart graph uses the standard-sized Chart window, you can copy it into the Clipboard and paste it directly into MacPaint. If the window is larger, pasting the graph into MacPaint may cut off its edges. Pasting into MacDraw always works just fine, however.

A Chart graph becomes larger when you include a legend and text labels. As you will see in this chapter, it is usually just as convenient to add these with MacPaint and leave the Chart drawing at its original size. Chart limits the size of your drawing, not including text and legends, to 2 1/2 inches by 4 1/2 inches (6.3 cm by 11.4 cm). This will always fit into the MacPaint window.

In case you want to save a larger area instead of using the Clipboard, press COMMAND-SHIFT-3 to save the screen image as a MacPaint document and edit that. You can easily remove the unwanted screen borders with MacPaint by selecting them and giving the Clear command in the Edit menu.

Editing and Augmenting Chart Graphs

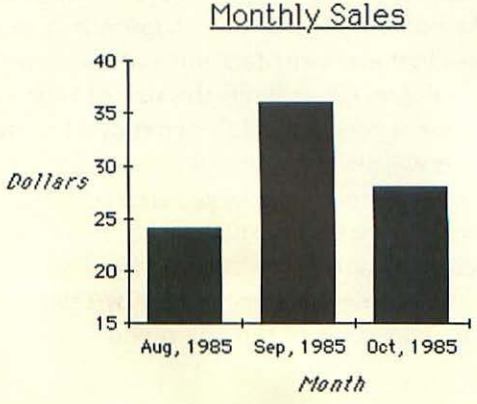


Once you are running MacPaint or MacDraw, all of its features are available for changing or adding to the graphs you create with Chart. Of course, you can do almost anything to the graph with MacPaint; the limits are mostly your imagination and patience. The following are suggestions about the most common uses for MacPaint and MacDraw with Chart images.

Adding Text

MacPaint and MacDraw give you much more freedom than Chart in adding text to graphs. On the simplest level, Chart restricts you to the Geneva, New York, and Chicago fonts, while MacPaint and MacDraw let you use any available Macintosh fonts. MacPaint and MacWrite also provide more sizes of fonts. The fonts you use for graphing may be stored in the System file or attached to MacPaint or MacDraw with a utility like the Font Librarian.

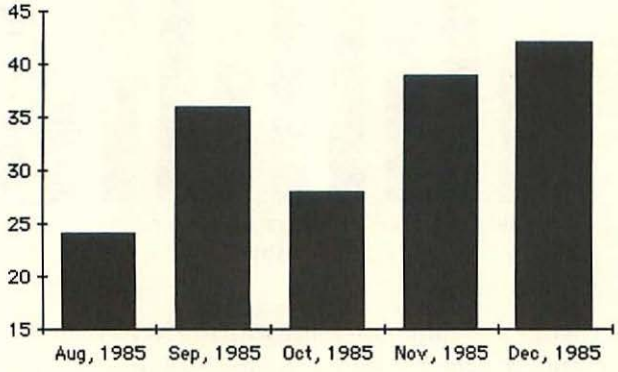
In MacPaint, you can move text around your graph by selecting it with either the marquee or the lasso and dragging it. In MacDraw, you select the entire text object by selecting anywhere on it and dragging it around. If you want the text to be turned sideways, you can rotate it after typing it in. Remember to use the various text styles (such as bold or underlined) to differentiate the different types of text on the screen.



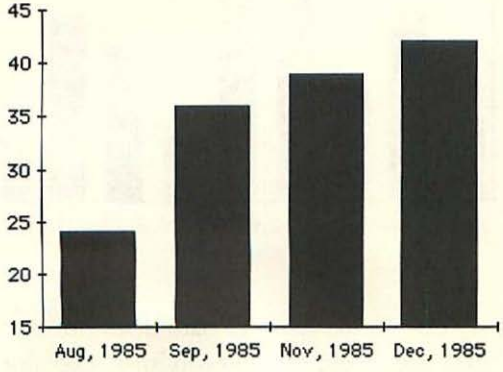
Cleaning Up Drawings

It is often useful to touch up rough edges in a Chart graph using MacPaint's FatBits mode. Jagged lines or rough edges can easily be touched up pixel by pixel. You may even want to add some small anomalies to make the chart look slightly less "sharp."

If you realize after producing a drawing that you included extraneous information, you can use MacPaint or MacDraw to remove it from the drawing. For instance, assume you want to remove the third bar from the following drawing:



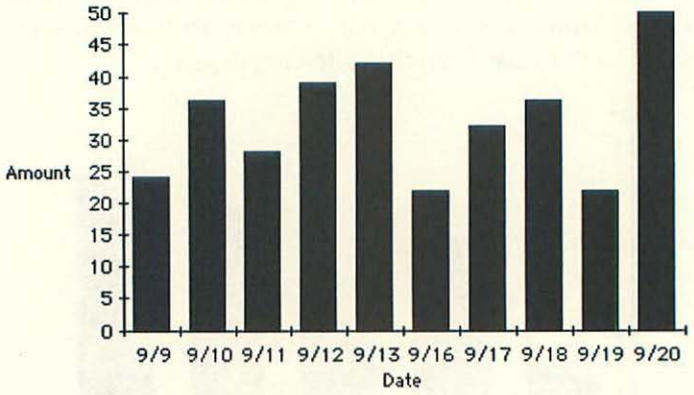
Use the marquee to select the fourth and fifth bars, hold down the SHIFT key to constrain the movement of the selected area, and drag the selection to the right.



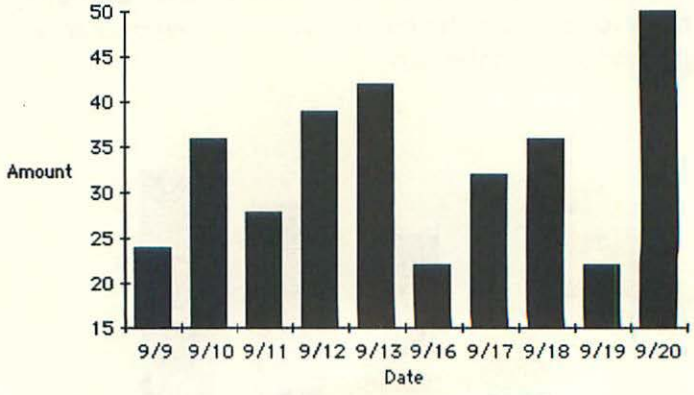
The same procedure can be performed in MacDraw by eliminating the bar object with the Clear command, grouping together

all of the elements to the right of the bar, and moving them left.

A more important MacPaint application is to highlight the differences between the heights of the columns or bars in column and bar charts. This is done by changing the scale of the columns or bars. Chart normally draws the values of a series with 0 as the minimum value.

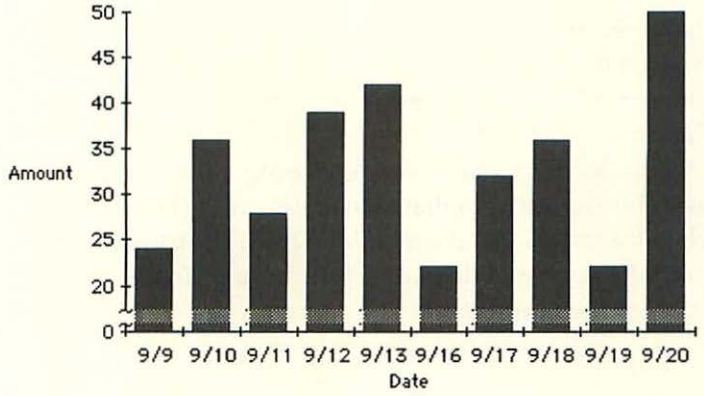


You can change the minimum value with the Axis command in the Format menu, but the results can be misleading.

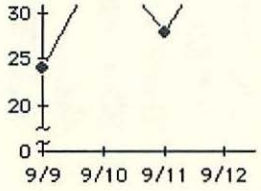


The viewer may not notice that the data does not start at 0.

To make this clearer, copy the graph into MacPaint and add a jagged edge to the bottom of the axis and bars:



On a line chart, you only need to indicate the break at the axis:



This is the standard of indicating a nonzero minimum value.

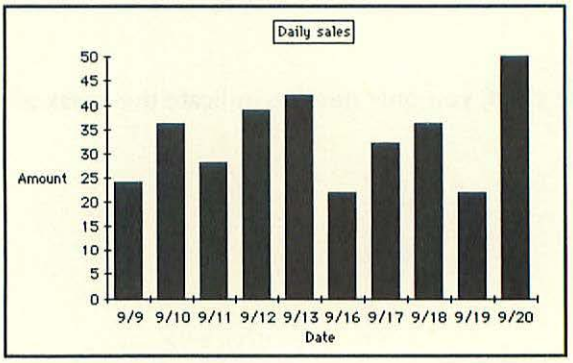
Using Chart to create a legend may give unsatisfactory results. The Add Legend command creates legends that show only the name of each series and its associated pattern. Instead of making a legend in Chart, you can usually create a more informative legend in MacPaint. You can copy the patterns from the chart and add the legend text you want. You can also place the text for the legend beneath or to the left of the pattern.

Borders

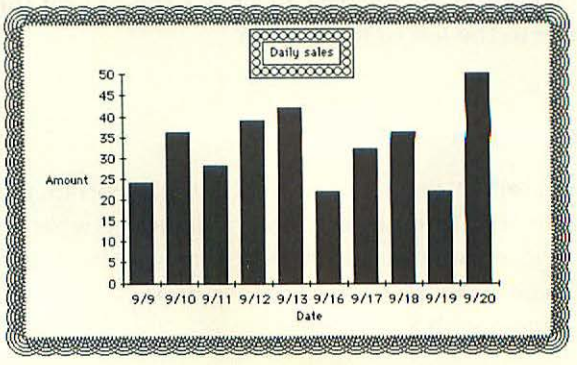
In any long report, you need to emphasize important material to make it stand out from the rest. You often do this when you write by using more forceful words and phrases or by using italic or boldface type. To emphasize a drawing (or parts of a drawing) you can surround it with a border.

The easiest way of adding a border in MacPaint or MacDraw is with the rectangle tool. Simply start at one corner and drag to the opposite one. Once the border is drawn, you may need to move the image to center it properly. For a softer effect, use a rectangle with rounded corners.

A thin border is useful for separating a picture from text; a heavier border adds emphasis. To draw a heavy border, select the thicker line styles in MacPaint or MacDraw. The usual practice is to surround the chart title with a thin border and use the heavy border for the entire chart:

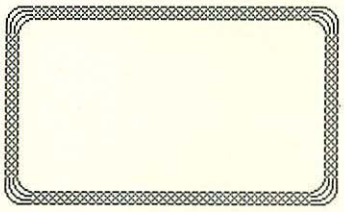


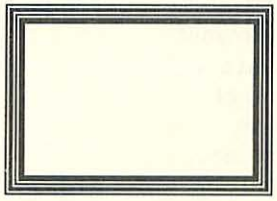
There may be times when you do not want your work to look plain or conservative, and it doesn't have to. MacPaint and MacDraw give you plenty of ways of adding interesting borders to any element in your chart. For instance, compare the following chart with the previous one:



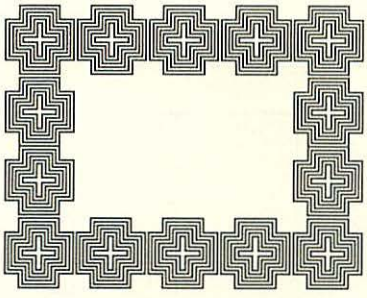
Many Macintosh clip-art packages, such as Mac the Knife from Miles Computing or ClickArt from T/Maker, include detailed decorative borders.

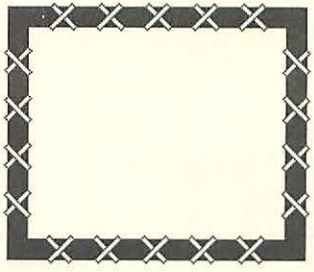
Borders can give a variety of impressions, so you should choose your borders carefully, considering the context of the report and the data's relative importance. For example, compare these light decorative borders





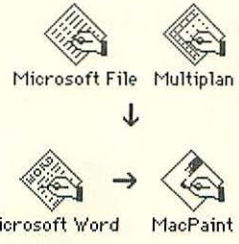
to these heavier designs:





In many cases, the fact that you are including a graph is enough to draw the reader's attention. However, if you are preparing many graphs for a report or many overhead transparencies for a presentation, consider using borders to emphasize the charts.

Enhancing Tables With MacPaint



Word's advanced formatting features are very handy for tables from File and Multiplan. However, a report with many tables can easily seem dull and hard to read even if the tables are for-

matted well. To highlight important data, you can transfer the File and Multiplan tables into MacPaint. (This is not easy in MacDraw, since text is handled in one large chunk.)

For example, you might have a table like this in your Word document:

1985 Sales by Region

	Q 1	Q 2	Q 3	Q 4	Total
Pacific	12593	16200	15467	16850	61110
Southwest	8300	16825	13690	15303	54118
Mountain	7231	14293	13994	12089	47607
Central	10173	14872	10842	14220	50107
South	4219	9024	10429	7757	31429
Northeast	9311	11554	8333	10632	39830
Total	51827	82768	72755	76851	284201

You can add vertical and horizontal lines and move the heading up a half line to create a more readable table:

1985 Sales by Region

	Q 1	Q 2	Q 3	Q 4	Total
Pacific	12593	16200	15467	16850	61110
Southwest	8300	16825	13690	15303	54118
Mountain	7231	14293	13994	12089	47607
Central	10173	14872	10842	14220	50107
South	4219	9024	10429	7757	31429
Northeast	9311	11554	8333	10632	39830
Total	51827	82768	72755	76851	284201

Later in this chapter you'll see other ways you can enhance your tables.

Adding lines to a table is simple, once you get around the Clipboard's inability to transfer a formatted table from any of the Microsoft applications to MacPaint. You need to turn your Word-formatted table into a MacPaint document, modify it in MacPaint, copy the MacPaint-enhanced table to the Clipboard, and transfer it back to Word as a MacPaint image.

To enhance a formatted table, follow these steps:

1. Create the table from File or Multiplan data and save it to the Clipboard.

2. Quit File or Multiplan, run Word, and paste the data into a document.

3. Format the data as you please using Word's tabs. The table must be narrow enough to fit in the MacPaint window, which is 5.7 inches wide by 3.2 inches high (14.5 cm by 8.1 cm).

4. Create a MacPaint document of the current screen by pressing COMMAND-SHIFT-3. Be sure that the I-beam pointer and the insertion point are not in the table when you do this.

5. Quit Word and run MacPaint. Open the MacPaint document called Screen 0. This is an exact copy of the Word screen when you pressed COMMAND-SHIFT-3.

6. Position the MacPaint window over the table, select the table with the rectangular marquee, and give the Copy command in the Edit menu.

7. Click the close box of the window to close the Screen 0 document. Select New from the Edit menu; then give the Paste command to put the table into this unnamed document.

8. Add lines to the table with the line or box tools (this is detailed in the following discussion).

9. When you are finished, select the entire table with the lasso. Give the Copy command to put the new table in the Clipboard. Quit MacPaint (you can save the MacPaint document of the new table if you wish) and run Word.

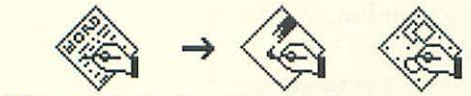
10. Paste the new table into your Word document.

The line and box tools allow you to add lines to your tables easily. To draw horizontal or vertical lines, hold down the SHIFT key while you draw. In FatBits mode, check that the ends of the new lines are lined up. You can also do this by selecting the jagged edges of the lines with the marquee rectangle and giving the Clear command in the Edit menu.

If your table has a row of text as column headers, you may want to move that text up a few pixels and insert a thicker line between it and the other text. Select a thicker line from the line-width selections at the lower-left corner of the MacPaint screen.

Future versions of Word may allow you to paste formatted text into the Clipboard as pictures. In this case, you would simply paste a copy of the formatted table into the Clipboard, quit Word, and then run either MacPaint or MacDraw.

Other Embellishments For Word Documents



Just as there are many ways you can enhance Chart graphs, MacPaint and MacDraw can enhance text in a Word document to add emphasis or just to make it more pleasant to read.

As described earlier in this chapter, the only way to move formatted text to MacPaint or MacDraw is by saving the screen with COMMAND-SHIFT-3. If the text you are embellishing is not formatted, you can type it in while in MacPaint or MacDraw. Transferring such unformatted text through the Clipboard from Word to MacPaint or MacDraw is clumsy and often produces unusable results.

In a Multiplan or File table, there may be pieces of data that you want to emphasize. A simple rectangular box around the element in the table will do this. For example:

1985 Sales by Region

	Q 1	Q 2	Q 3	Q 4	Total
Pacific	12593	16200	15467	16850	61110
Southwest	8300	16825	13690	15303	54118
Mountain	7231	14293	13994	12089	47607
Central	10173	14872	10842	14220	50107
South	4219	9024	10429	7757	31429
Northeast	9311	11554	8333	10632	39830
Total	51827	82768	72755	76851	284201

You might want to box a column or row in the same manner. You can even emphasize an already boxed item in a box with a double-line box:

1985 Sales by Region

	Q 1	Q 2	Q 3	Q 4	Total
Pacific	12593	16200	15467	16850	61110
Southwest	8300	16825	13690	15303	54118
Mountain	7231	14293	13994	12089	47607
Central	10173	14872	10842	14220	50107
South	4219	9024	10429	7757	31429
Northeast	9311	11554	8333	10632	39830
Total	51827	82768	72755	76851	284201

As you saw before, you can produce interesting borders with MacPaint. These borders, of course, can also be put around tables,

and it is common to use borders around headings and on the title pages of reports. Figure 6-1 shows more border designs that you may want to use.

A slightly less dramatic variation is simply to use corners around a table. The process of creating corners is the same as for borders. A corner works well around small tables where a border may seem like too much:

1985 Sales by Region

	Q 1	Q 2	Q 3	Q 4	Total
Pacific	12593	16200	15467	16850	61110
Southwest	8300	16825	13690	15303	54118
Mountain	7231	14293	13994	12089	47607
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Northeast	9311	11554	8333	10632	39830
Total	51827	82768	72755	76851	284201

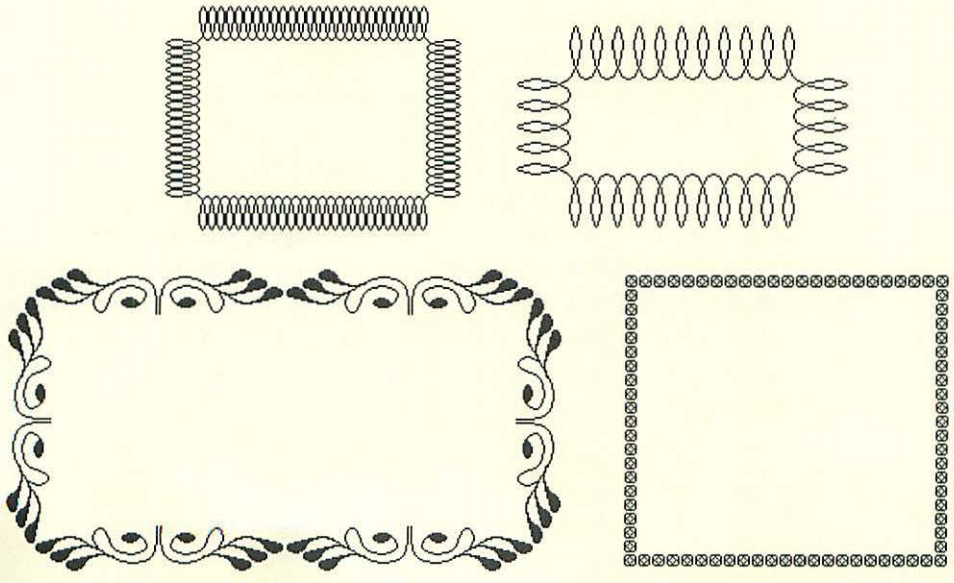


Figure 6-1.
More border designs

It is not necessary to surround text completely in order to emphasize it. You can also use *rules*, horizontal lines that set off text from other text. In Word, a rule is treated just like a text paragraph, and you can copy one rule to many places in your reports. A rule can be as simple as a single line or it can have a pattern. Since you are not affecting the text that the rule goes around, you can design a rule in MacPaint, paste it in the Clipboard, and insert it above and below a text paragraph.

For example, you can design a simple rule such as this:

Instead of boxing entire tables, placing the rule above and below the table can set it off almost as well as a border:

1985 Sales by Region

	Q 1	Q 2	Q 3	Q 4	Total
Pacific	12593	16200	15467	16850	61110
Southwest	8300	16825	13690	15303	54118
Mountain	7231	14293	13994	12089	47607
Central	10173	14872	10842	14220	50107
South	4219	9024	10429	7757	31429
Northeast	9311	11554	8333	10632	39830
Total	51827	82768	72755	76851	284201

MacPaint and MacWrite can make Chart graphs and tables from Word, File, or Multiplan look more attractive. They can also be used to enhance headings, title pages, memo distribution boxes, and text in documents you create with Word. The various tools in MacPaint and MacDraw let you easily add detail to (or subtract data from) your drawings and tables. You can also add decorative borders to text and drawings to emphasize particular elements.

Part II

Examples

The following seven chapters show many typical situations where you want to integrate the functions of Word, Multiplan, File, and Chart. The examples cover a wide range of uses of the Microsoft applications and come from many areas of business. As you read through the procedures used in these chapters, think about how these examples might apply to your work and your uses of the Microsoft applications.

7

Development Report for Fairhome Gardens

Weller Real Estate Co.
and
Fairhome Equity Associates

Introduction

Weller Real Estate Co. proposes to build a modern townhouse community on the 3200 block of DeSoto Street in North Fenton. The homes will be plush, high-quality living areas that share a common pool and garden area. These attractive units should sell well in the up-and-coming North Fenton area.

We propose to buy all of the residential and commercial property on that lot and finance the development through the Fairhome Equity Associates limited partnership. The land is currently under-utilized, and this development will add a great deal of class to the neighborhood. We have the full support of the city council and the board of adjustments in our plans.

Purchasing the land

The block to be developed currently consists of occupied and abandoned single-family dwellings, three warehouses, and two easements. The unoccupied houses and easements are currently over-valued, and can probably be bought at below the market prices.

Because of the nature of the property values in North Fenton, Weller believes that there is potentially a 25% variability in the land values for the occupied houses and the warehouses. There is probably only a 10% variability in the values for the abandoned buildings and the easements.

The following data on the buildings was obtained from the North Fenton City Assessor in October, 1985. The low and high estimates of the costs for buying the property were generated by Weller.

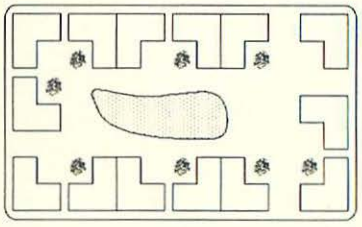
Land costs

Type	Occupied	Value	Low est.	High est.
House	Y	$136,100	$102,075	$170,125
House	N	$157,100	$141,390	$172,810
Other	N	$9,300	$8,370	$10,230
Warehouse	Y	$231,700	$173,775	$289,625
		Total:	$425,610	$642,790

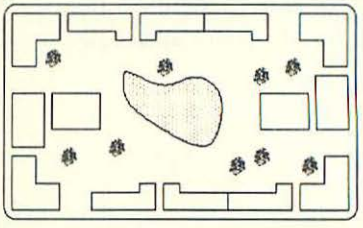
Overview of the Building Site

The following two plans indicate the architect's initial models for the layout of the properties. The costs for the two plans differ, as indicated in the next section.

Plan A



Plan B



Building Costs and Estimated Time

Depending on the building plan chosen, the costs of building Fairhome Gardens will be between $2MM and $2.5MM, and the elapsed time for the project is 14 to 16 months. Weller feels that these estimates will ensure that the project will be financially successful. The elapsed time, while longer than average for developments such as this, give the contractors enough slack time during the rainy season to still be completed on schedule.

Building costs

	Plan A costs	Months	Plan B	Months
Site prep.	$100,000	1.5	$120,000	1.5
Phase 1	$525,000	4	$810,000	5
Phase 2	$635,000	3.5	$675,000	3.5
Phase 3	$690,000	4	$825,000	5
Move-in	$75,000	1	$75,000	1
Total	$2,025,000	14	$2,505,000	16
Cost/month	$144,643		$156,563	

Real Estate Development Report


Microsoft File


Multiplan


Microsoft Word


MacDraw

Weller Real Estate Co. wants to develop a small parcel of industrial land into a multi-unit townhouse project called Fairhome Gardens. The block now has three warehouses and many occupied and abandoned single-family houses. The townhouse project would have 14 units, including a pool and gardens in the common area.

Weller's financial backers want a report on the various costs of developing the land. The considerations are the range of costs of purchasing the land and the expected cost of building the townhouses. Weller's architect has two layout plans that affect the building costs of the units; both of these plans must be included in the final report.

1. Collect the data for the current land in a File database. A portion of that database is as follows:

Development Report for Fairhome Gardens

Weller Real Estate Co.
and
Fairhome Equity Associates

Introduction

Weller Real Estate Co. proposes to build a modern townhouse community on the 3200 block of DeSoto Street in North Fenton. The homes will be plush, high-quality living areas that share a common pool and garden area. These attractive units should sell well in the up-and-coming North Fenton area.

We propose to buy all of the residential and commercial property on that lot and finance the development through the Fairhome Equity Associates limited partnership. The land is currently under-utilized, and this development will add a great deal of class to the neighborhood. We have the full support of the city council and the board of adjustments in our plans.

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Because of the nature of the property values in North Fenton, Weller believes that there is potentially a 25% variability in the land values for the occupied houses and the warehouses. There is probably only a 10% variability in the values for the abandoned buildings and the easements.

The following data on the buildings was obtained from the North Fenton City Assessor in October, 1985. The low and high estimates of the costs for buying the property were generated by Weller.

Current Land

	Parcel #	Type	Occ.	Value	Notes
1	G4302	H	N	$20,000	
2	G4595	H	Y	$38,000	Orig. owner
3	L7200	W	Y	$15,500	Frame only, barely used
4	G3722	H	N	$18,000	
5	L9774	W	Y	$80,000	Chemical storage
6	G0024	O	N	$8,300	Tiny vacant lot
7	G4304	H	N	$24,900	

16/16

The fields of the database are

- **Parcel** #—The city's identification of the parcel
- **Type**—Current use of the property (values are "H" for home, "W" for warehouse, and "O" for other)
- **Occupied**—Whether or not the building is in use (values are "Y" and "N")
- **Value**—Assessed value of the property
- **Notes**—Other information on the property

2. Design a File report so that summary information can be passed to Multiplan. If a building is in use, more costs will be associated with it than if it were unoccupied. Thus, the report must be a summary of the types of property, broken down by whether the buildings are occupied.

Since the data will be used by Multiplan, remember to use general format with no commas or dollar signs for the total of the values. The File report form looks like this:

Report

Preview ☒ Summary Report

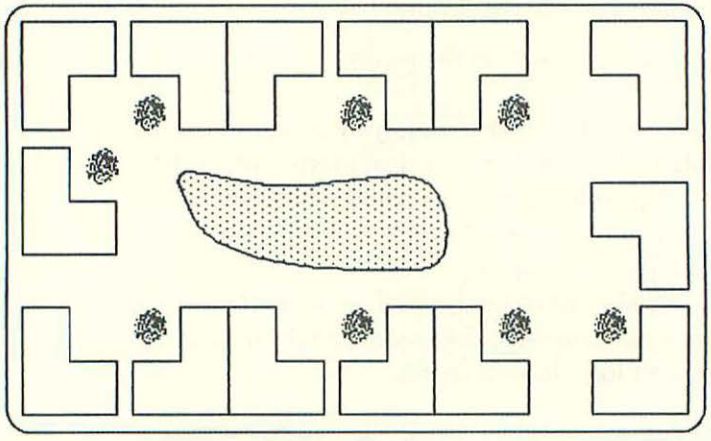
Sort	A->Z	Z->A	Not Sorte	Not Shown	
Heading	Type	Occupied	Value	Parcel #	Notes
Field	Type	Occupied	Value	Parcel #	Notes
by Occupie			Total		
by Type					
Grand					

		Land costs		
Type	Occupied	Value	Low est.	High est.
House	Y	$136,100	$102,075	$170,125
House	N	$157,100	$141,390	$172,810
Other	N	$9,300	$8,370	$10,230
Warehouse	Y	$231,700	$173,775	$289,625
		Total:	$425,610	$642,790

Overview of the Building Site

The following two plans indicate the architect's initial models for the layout of the properties. The costs for the two plans differ, as indicated in the next section.

Plan A



3. Open the Report window and then select Save Report As... from the File menu. Name the text-only file and then click the Text Output button. File saves the report on disk.

4. Quit File and run Word. Open the file you just created:

Untitled

		Land costs		
Type	Occupied	Value	Low est.	High est.
House	Y	$136,100	$102,075	$170,125
House	N	$157,100	$141,390	$172,810
Other	N	$9,300	$8,370	$10,230
Warehouse	Y	$231,700	$173,775	$289,625
		Total:	$425,610	$642,790

◇

Select the entire file; then select Copy to put it in the Clipboard. (This step is necessary because Multiplan can't read a text-only file, and File can't write a report directly into the Clipboard.)

5. Quit Word and run Multiplan. Select Paste to bring the data into a new spreadsheet.

Untitled

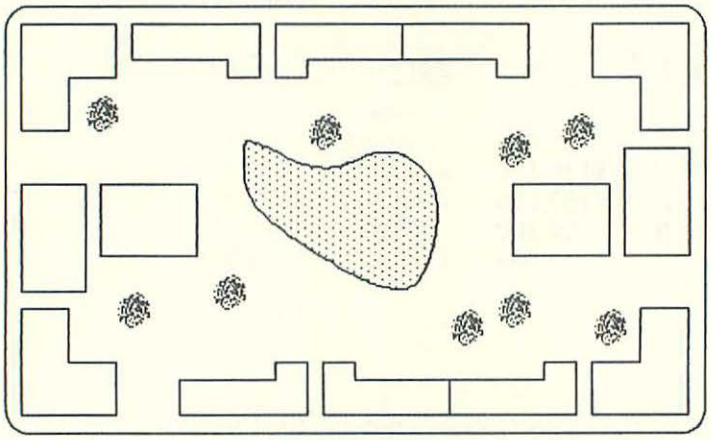
	1	2	3	
1	Type	Occupied	Value	
2	-----	----------	----------	
3	H	Y	136100	
4	H	N	157100	
5	O	N	9300	
6	W	Y	231700	

Row 2, the underlines, is not useful, so remove it by selecting it and then selecting Cut.

6. Create columns for the high and low estimated costs of the property. Weller's assumption is that the cost of the occupied property may vary 25 percent from the assessed value, while the cost of the unoccupied property will vary only 10 percent. These formulas go in columns 5 and 6. For example, the formula in cell R3C5 is "=0.75*RC([−2]".

To make the spreadsheet look better, change the text in the Type column to "House", "Other", and "Warehouse". Since the

Plan B



Building Costs and Estimated Time

Depending on the building plan chosen, the costs of building Fairhome Gardens will be between $2MM and $2.5MM, and the elapsed time for the project is 14 to 16 months. Weller feels that these estimates will ensure that the project will be financially successful. The elapsed time, while longer than average for developments such as this, give the contractors enough slack time during the rainy season to still be completed on schedule.

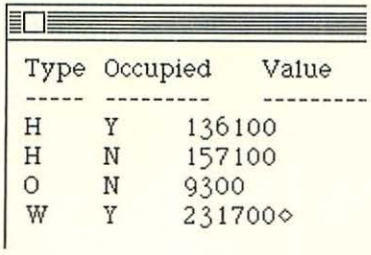
	Building costs			
	Plan A costs	Months	Plan B	Months
Site prep.	$100,000	1.5	$120,000	1.5
Phase 1	$525,000	4	$810,000	5
Phase 2	$635,000	3.5	$675,000	3.5
Phase 3	$690,000	4	$825,000	5
Move-in	$75,000	1	$75,000	1
Total	$2,025,000	14	$2,505,000	16
Cost/month	$144,643		$156,563	

goal of this spreadsheet is to determine the amount that will need to be spent, make totals for columns 5 and 6. Format all of the amounts as dollars with no decimal places but with commas. The spreadsheet should then look like this:

	1	2	3	4	5	6
1				Land costs		
2	Type	Occupied	Value		Low est.	High est.
3	House	Y	$136,100		$102,075	$170,125
4	House	N	$157,100		$141,390	$172,810
5	Other	N	$9,300		$8,370	$10,230
6	Warehouse	Y	$231,700		$173,775	$289,625
7						
8				Total:	$425,610	$642,790

7. Select the active area of the spreadsheet (rows 1-8 and columns 1-6) and select Copy to put it in the Clipboard. Save the spreadsheet; if the data on land use changes, remember to change the records in File, run the report again, and re-create the spreadsheet.

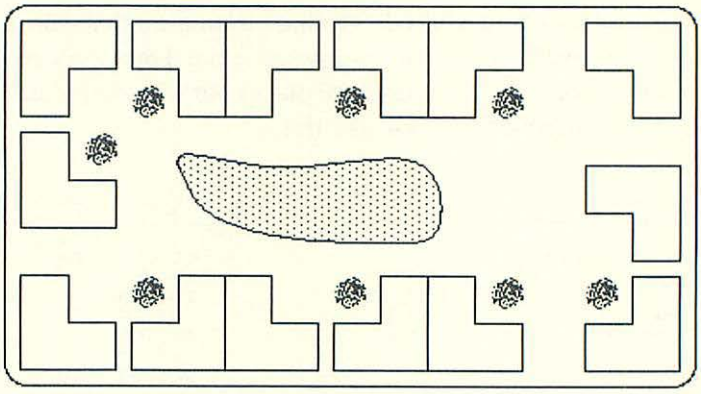
8. Quit Multiplan and run Word. Paste the spreadsheet into a new document and format the table. The result could look like this:



```
Type  Occupied    Value
----  ---------   ---------
H     Y       136100
H     N       157100
O     N       9300
W     Y       231700◇
```

You can, of course, format the information however you please. After it is written, position the beginning of the report around the table.

9. You also want to add the architect's plans that were drawn in MacDraw. Quit Word, run MacDraw, and open the document containing the first plan.



Select the entire plan with the Select All command in the Edit menu; then select Copy to put it in the Clipboard. Open the Scrapbook desk accessory and select Copy again to put the plan in the Scrapbook. Close the Scrapbook and the document, open the document containing the second plan, and copy that into the Clipboard.

10. Quit MacDraw and run Word. Move to the position in your document where you want to put the second plan (since that is what is in the Clipboard) and select Paste. Move to the position for your first plan. Open the Scrapbook, select Cut, close the Scrapbook, and select Paste. Fill in the text around the two plans.

11. Quit Word and open the Multiplan spreadsheet again. Add the data for the building costs and times of the two plans. Include totals for the columns and average cost per month for the projects.

10				Building costs	
11		Plan A costs	Months	Plan B	Months
12	Site prep.	$100,000	1.5	$120,000	1.5
13	Phase 1	$525,000	4	$810,000	5
14	Phase 2	$635,000	3.5	$675,000	3.5
15	Phase 3	$690,000	4	$825,000	5
16	Move-in	$75,000	1	$75,000	1
17					
18	Total	$2,025,000	14	$2,505,000	16
19	Cost/month:		144,643		156,563

Select the new data in the spreadsheet; then select Copy. Save the spreadsheet again, quit Multiplan, and run Word.

12. Paste in the new data and reformat the table with tabs. Fill in any other text that is necessary for the report.

8

Hewes and Benson

Book Publishers Since 1924

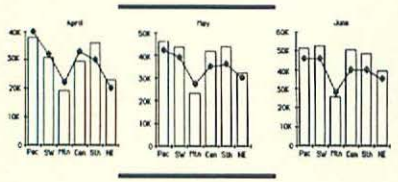
Sales figures for the

Second Quarter, 1986

Hewes and Benson had an excellent second quarter this year, with sales above predictions in every month. Our new lines are selling especially well in the chain bookstores. The cookbooks did not do as well as the "Great Gardens" series, but individual titles in the "Chef's Choice" series were strong sellers.

Our expectations for this quarter were low due to the usual soft market for games books before the summer, but we were pleasantly surprised by sales in all other categories. The sales departments everywhere except the Mountain region beat their goals and produced splendid results. The Southern region deserves special commendation.

The monthly sales by region are shown here (the expected sales are shown as a line connected with diamonds):



Regional Analysis

We became quite concerned in April, since only South exceeded the expected sale , but we were gratified with the excellent results of May and June. The leaders of the regional sales conference on May 4 reported that many regional managers felt that April was a fluke and that sales will be more consistent in the future.

The only region that performed below the expected sales was the Mountain region. This was partially due to the change in regional directors that occurred in April, and partially due to the warehousing problems that we experienced there. The latter problem has been taken care of with the repair of the new computer system that was installed in March.

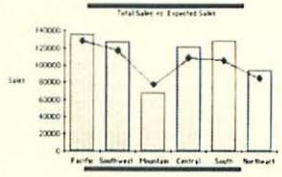
Dan Rappaport, regional manager for Northeast, noted that many of the new gardening titles were aimed at the Midwest and Pacific regions, and that very few related to New England. On reflection, this turned out to be true, and Acquisitions has told us that they will sign more Eastern gardening books for publication in the third quarter.

The final sales figures for the regions are:

	April	May	June	2nd Quarter
Pacific	38015	46150	51227	135392
Southwest	30804	43434	52728	126966
Mountain	19040	23115	25657	67812
Central	29528	41634	50544	121707
South	36062	45779	48595	128436
Northeast	22913	32307	39221	94441
Total	176362	230419	267973	674754

Summary of the Quarter

The totals, with the expected sales, were indeed impressive:

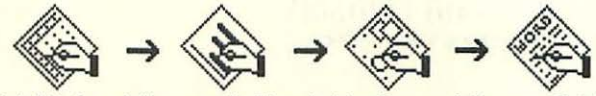


In numbers, this translates to:

	Sales	Expected
Pacific	135392	126000
Southwest	126966	117000
Mountain	67812	77000
Central	121707	108000
South	128436	106000
Northeast	94441	85000
Total	674754	621000

Congratulations are in order to the entire sales staff.

Sales Report



Hewes and Benson, a large book publisher, keeps regional sales records in a Multiplan spreadsheet. A report on the regions is prepared for upper-level management every quarter. The report includes both figures and graphs of sales results.

In addition to keeping sales figures, Hewes and Benson has recently begun to make predictions of how many books will be sold in any given month based on the previous year's sales, number of books available, the general book market, and so on. The current quarter's report must include comparisons between expected sales and actual sales.

The final report includes tables as well as charts. The charts you need are

- Three-column charts for the monthly sales and expected sales in the three months of the quarter
- A column chart for the total quarterly sales and expected sales.

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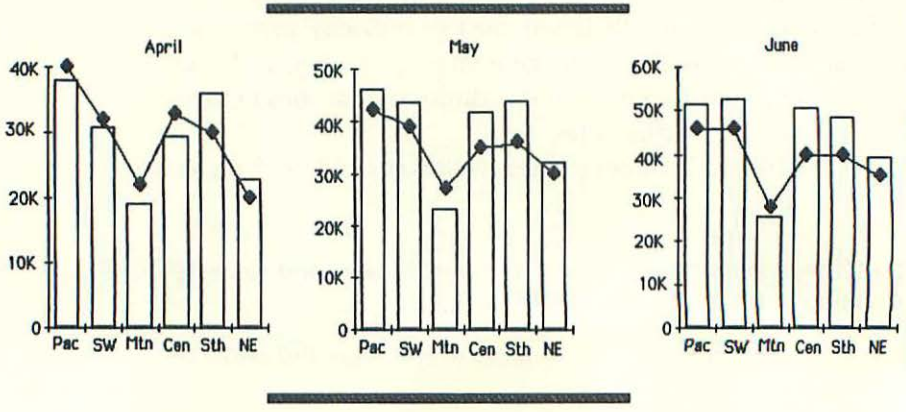
The monthly sales by region are shown here (the expected sales are shown as a line connected with diamonds):



1. Your data for the report is already in Multiplan. The spreadsheet covers the months of April, May, and June.

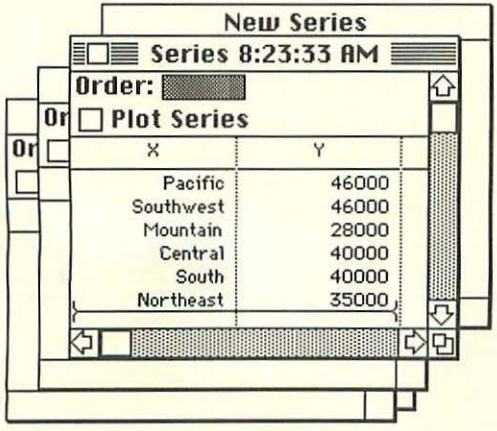
Book sales

	1	2	3	4	5	6
1	Sales					
2		April	May	June	2nd Quarter	
3	Pacific	38015	46150	51227	135392	
4	Southwest	30804	43434	52728	126966	
5	Mountain	19040	23115	25657	67812	
6	Central	29528	41634	50544	121707	
7	South	36062	43779	48595	128436	
8	Northeast	22913	32307	39221	94441	
9	Total	176362	230419	267973	674754	
10						
11	Expected					
12	Pacific	40000	42000	46000	128000	
13	Southwest	32000	39000	46000	117000	
14	Mountain	22000	27000	28000	77000	
15	Central	33000	35000	40000	108000	
16	South	30000	36000	40000	106000	
17	Northeast	20000	30000	35000	85000	
18	Total	177000	209000	235000	621000	
19						

The upper half of the spreadsheet shows actual sales; the lower half shows expected sales.

2. To draw the three monthly column charts, select rows 3 through 8 and columns 1 through 4. Copy this region into the Clipboard and then to the Scrapbook. Now select rows 12 through 17 of columns 1 through 4 and copy them into the Clipboard. Quit Multiplan and run Chart.

3. Select Text from the Data menu to tell Chart that your categories are text (the names of the regions). Select Paste, and Chart creates three series windows of expected sales.



Regional Analysis

We became quite concerned in April, since only South exceeded the expected sales, but we were gratified with the excellent results of May and June. The leaders of the regional sales conference on May 4 reported that many regional managers felt that April was a fluke and that sales will be more consistent in the future.

The only region that performed below the expected sales was the Mountain region. This was partially due to the change in regional directors that occurred in April, and partially due to the warehousing problems that we experienced there. The latter problem has been taken care of with the repair of the new computer system that was installed in March.

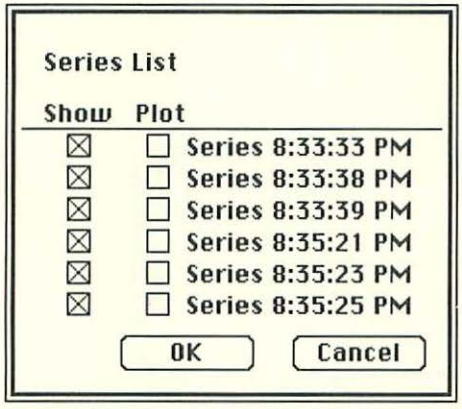
Dan Rappaport, regional manager for Northeast, noted that many of the new gardening titles were aimed at the Midwest and Pacific regions, and that very few related to New England. On reflection, this turned out to be true, and Acquisitions has told us that they will sign more Eastern gardening books for publication in the third quarter.

The final sales figures for the regions are:

	April	May	June	2nd Quarter
Pacific	38015	46150	51227	135392
Southwest	30804	43434	52728	126966
Mountain	19040	23115	25657	67812
Central	29528	41634	50544	121707
South	36062	43779	48595	128436
Northeast	22913	32307	39221	94441
Total	176362	230419	267973	674754

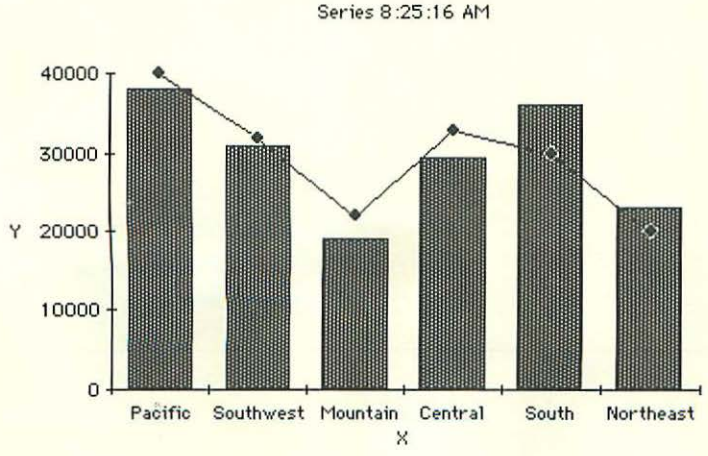
4. Open the Scrapbook and cut the data with the sales figures. Select the New Series Window and paste the data into Chart; you now have six data windows.

5. Select List from in the Data menu to get a list of the six windows:



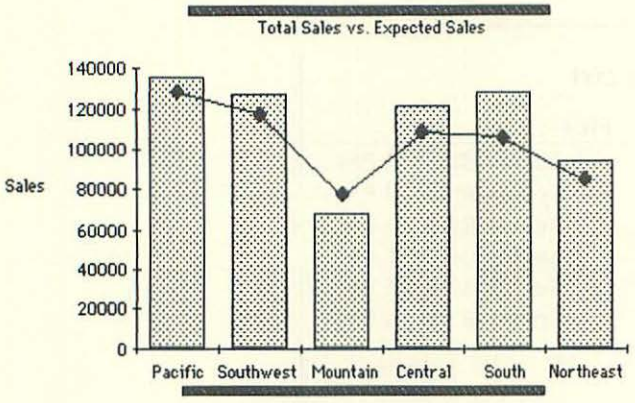
Deselect all the windows except the first and fourth (the sales and expected sales for April). Click the OK button.

6. Select Combination from the Gallery menu and choose type 1. Click the Plot Series button for the sales series (the second one you pasted into Chart) and then the Plot Series button for the expected sales series (the first one you pasted). This makes the actual sales come out as bars and the expected values as a line:



Summary of the Quarter

The totals, with the expected sales, were indeed impressive:

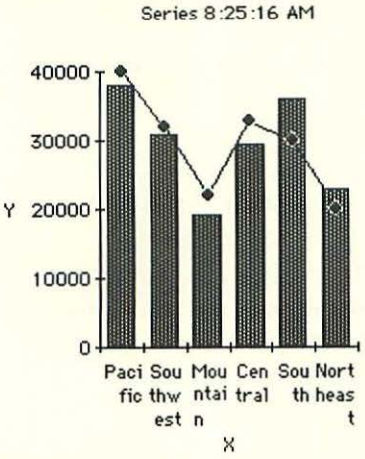


In numbers, this translates to:

	Sales	Expected
Pacific	135392	128000
Southwest	126966	117000
Mountain	67812	77000
Central	121707	108000
South	128436	106000
Northeast	94441	85000
Total	674754	621000

Congratulations are in order to the entire sales staff.

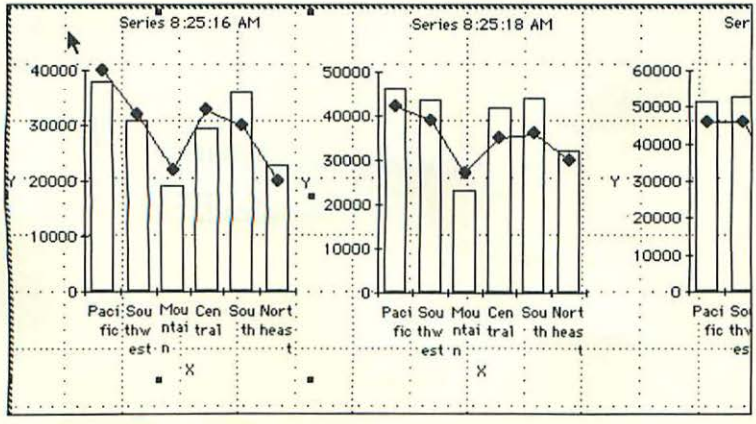
7. In your written report, you want to have the three monthly charts on the same line; therefore, they must be smaller than normal. Give the Select Chart command in the Chart menu to select the plot. Point at the square in the lower-right corner of the selection and drag it until the plot is about 2 1/2 inches wide:



8. Select Copy to put this drawing on the Clipboard. Transfer the drawing to the Scrapbook.

9. Repeat steps 5 through 8 for the data in the second and fifth windows and then for the data in the third and sixth windows. You now have three small overlaid charts in the Scrapbook.

10. Quit Chart and run MacDraw. Cut and paste the first chart from the Scrapbook into a new document; then cut and paste the other two into the document. You can easily group the charts and move them around so that they line up and fit together well:



Make new labels for the axes and titles.

11. To improve the report's appearance, add rules above and below the charts. Select Turn Grid Off from the Arrange menu. Create a rectangle four pixels high (the height between two grid dots, including the dots) by about three inches. Select Fill, selecting the pattern in the middle column of the third row:

Copy this above and below the charts, and save a copy of the rule in the Scrapbook for the other charts in the report.

12. Select everything in all three charts and the rules with the Select All command in the Edit menu and copy it to the Clipboard. You may want to save this MacDraw document for future use. Quit MacDraw and run Word. Open a new document and select Page Setup from the File menu; change the right margin to 0 inches. This is necessary so that Word does not try to squeeze the charts into the default margins; otherwise, the charts will come out distorted.

13. Select Paste to copy the three charts into the document. Enter the introductory text about the monthly sales before and after the charts. Set the right indent of the text paragraphs to 0.75 inch to make up for the changed page margin.

14. Quit Word and run Multiplan again. You now have to select the data for the table that goes with the monthly charts. Select rows 2 through 9 of columns 1 through 4; then select Copy. Paste these into the Scrapbook.

15. Select columns 1 through 5, rows 3 through 8. Copy this selection to the Clipboard and paste it in the Scrapbook. Next, select columns 1 through 5, rows 12 through 17. Copy this selection to the Clipboard and paste it in the Scrapbook.

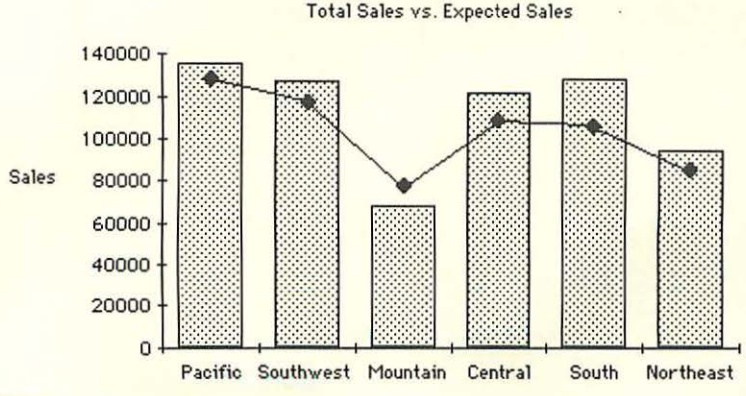
16. Quit Multiplan and run Word. Open the Scrapbook and retrieve the table from step 14. Paste this *into Word* and format the table with tabs.

	April	May	June	2nd Quarter
Pacific	38015	46150	51227	135392
Southwest	30804	43434	52728	126966
Mountain	19040	23115	25657	67812
Central	29528	41634	50544	121707
South	36062	43779	48595	128436
Northeast	22913	32307	39221	94441
Total	176362	230419	267973	674754

17. Quit Word and run Chart. Select Combination chart type 1 in the Gallery menu for the chart; then select Text from the Data menu. Open the Scrapbook and cut the first selection (the total sales) to the Clipboard; then paste this into a new series window. Close the first three windows (the monthly sales), leaving only the Total Sales window open.

18. Open the Scrapbook again and cut the total expected sales, select the New Series window, and paste this data into a new series window. Again, close the first three windows, leaving only the Expected Totals window open.

19. Plot the sales data first and then the expected sales. Select the entire chart and copy it to the Clipboard. Modify the labels and fill pattern in MacPaint or MacDraw; then copy the chart back to the Clipboard.



20. Run Word and paste this chart into your report. Copy the rule from the Scrapbook and add it above and below the pasted chart. Fill in the text around the chart.

21. Quit Word once again and open your Multiplan document. Create a new area of the spreadsheet that copies column 1, rows 3 through 9; column 5, rows 3 through 9; and column 5, rows 12 through 18. To get the numbers in the second and third columns to appear as data, you must first copy the selections to the Scrapbook and then copy them back to the Clipboard again.

	8	9	10
1			
2			
3	Pacific	135392	128000
4	Southwest	126966	117000
5	Mountain	67812	77000
6	Central	121707	108000
7	South	128436	106000
8	Northeast	94441	85000
9	Total	674754	621000
10			

Select these cells and copy them to the Clipboard. Quit Multiplan and run Word.

22. Paste the table into your document and format it with tabs.

9

BestWords

This proposal represents BestWords request for a 5-year loan of $250,000 to help us expand our business. We are Clifton's biggest word-processing firm, but with an increase in personnel and equipment, we can nearly double our expected sales in one year.

Background

Bestwords provides word-processing and typing services to the business community in the Clifton area. We are well known in the community and have been in business since 1981.

Most of our services consist of word processing using microcomputers. BestWords provides our customers with report-quality documents as well as light typesetting services. Our office has recently began training local secretaries in how to use word-processing equipment.

Income and Expenses

BestWords is a privately held firm. We have been profitable every year that we have been in business. We have always been ahead of our competition in buying the newest equipment, this has consistently paid off by bringing in new customers.

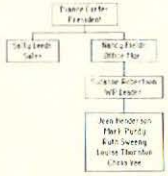
Our 1984 income and expenses were as follows:

1984

Income		Expenses	
WP services	$278,428	Salaries	$211,600
Interest	$248	New equip	$17,527
Used equip	$4,730	Rent/phone	$14,134
Training	$6,800	Adv /Promo	$20,290
		Legal	$2,100
		Office supp	$3,821
		Misc	$6,392
Total	$290,206	Total	$275,864

Company Organization

Bestwords staff consists of the president, office manager, sales representative, and the word-processing staff. Our company structure is:



The staff has grown steadily since our founding in 1981. Bestwords salaries are based on job description and length of time with the company. The salaries and beginning dates of employment are:

Nancy Fields	Office Mgr.	$27,500	8/30/81
Dianne Carter	President	$35,000	2/1/81
Sally Leeds	Sales	$31,200	11/5/84
Chris Yee	WP	$18,500	8/18/84
Louise Thornton	WP	$18,500	6/12/84
Ruth Sweeny	WP	$18,300	1/8/85
Jean Henderson	WP	$19,600	9/22/83
Mark Purdy	WP	$19,600	9/22/83
Suzanne Robertson	WP Leader	$23,400	4/20/83

Purpose of the Loan

Our staff of six word-processing employees are now working at full capacity. Bestwords has been in the enviable position of turning away work for the last eight months. We propose to add four new positions to the word-processing staff (one leader and three operators).

The increase in staff will let us accept more new business. Thus we will need to add a new sales representative to bring in new clients and to interest our current clients in new services that we offer. We also want to add a full-time training specialist to the staff to cover the new demand for word-processing training.

With the addition of new staff, Bestwords will, of course, need new word-processing equipment and a proportional increase in rent and office supplies. The total new needs are shown here:

New expenses

	1985	1986	1987
Salaries	$150,100	$172,615	$198,507
New equip	$15,000	$3,000	$2,000
Rent/phone	$4,000	$4,000	$4,000
Adv./Promo.	$20,000	$20,000	$20,000
Legal	$0	$0	$0
Office supp	$3,000	$3,000	$3,000
Misc	$4,000	$4,000	$4,000
Total	$196,100	$206,615	$231,507

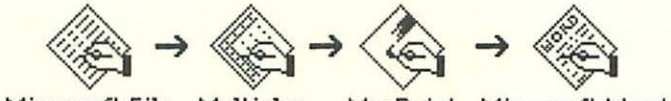
This will result in significant new income for BestWords. With our new capabilities, our three-year projections for income added by the new staff and equipment are:

New Income

	1985	1986	1987
WP services	$200,000	$225,000	$250,000
Interest	$0	$0	$0
Used equip.	$4,000	$2,000	$2,000
Training	$40,000	$45,000	$50,000
Total	$244,000	$272,000	$302,000

As you can see, we feel that the $250,000 loan can be easily paid off in the five-year timeframe, given that we will continue to make a profit each year with other expansions that are currently underway. Bestwords should be able to meet the goals of the loan in three to four years.

Loan Application



A growing word processing firm is requesting more capital from its bank. BestWords currently has nine employees; the president, Dianne Carter, wants to expand the staff to 15. BestWords is requesting a $250,000 loan for five years to cover the expansion.

The current staff consists of Carter, a sales representative, an office manager, a word processing leader, and five word processors. Carter wants to add a second leader, a second sales position, a new training specialist, and three word processors.

The proposal to the bank must include BestWords' current income and expense report, an organizational chart of employees, and a plan for the use of the new capital. Since each new word processing employee needs a computer to work on, the capitalization report must include the costs of adding salaries and buying new equipment.

1. The income and expense report is kept in Multiplan. Financial transactions are entered in the spreadsheet each week. The totals for the various categories are linked to the new spreadsheet:

BestWords

This proposal represents BestWords' request for a 5-year loan of $250,000 to help us expand our business. We are Clifton's biggest word processing firm, but with an increase in personnel and equipment, we can nearly double our expected sales in one year.

Background

Bestwords provides word processing and typing services to the business community in the Clifton area. We are well known in the community and have been in business since 1981.

Most of our services consist of word processing using microcomputers. BestWords provides our customers with report-quality documents as well as light typesetting services. Our office has recently begun training local secretaries in how to use word-processing equipment.

Income and Expenses

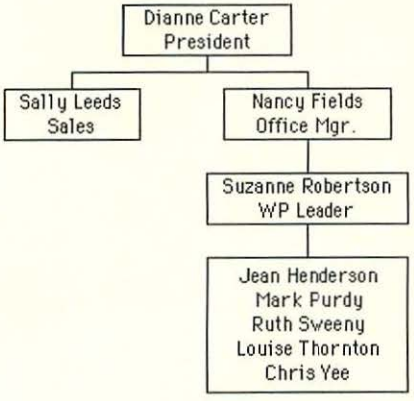
BestWords is a privately held firm. We have been profitable every year that we have been in business. We have always been ahead of our competition in buying the newest equipment; this has consistently paid off by bringing in new customers.

Our 1984 income and expenses were as follows:

	1	2	3	4
1	Income and expense report			
2	for 1985			
3				
4	Income		Expenses	
5				
6	WP services	$278,428	Salaries	$211,600
7	Interest	$248	New equip.	$17,527
8	Used equip.	$4,730	Rent/phone	$14,134
9	Training	$6,800	Adv./Promo.	$20,290
10			Legal	$2,100
11			Office supp.	$3,821
12			Misc.	$6,392
13				
14	Total	$290,206	Total	$275,864

2. Select this data and copy it to the Clipboard. Quit Multiplan and run Word. Paste the data into a new document, format it, and add an explanation for the balance above or below the table.

3. The organizational chart can be created in MacPaint or MacDraw. In MacPaint, select Grid from the Goodies menu to make it easier to align the rectangles. The chart looks like this:



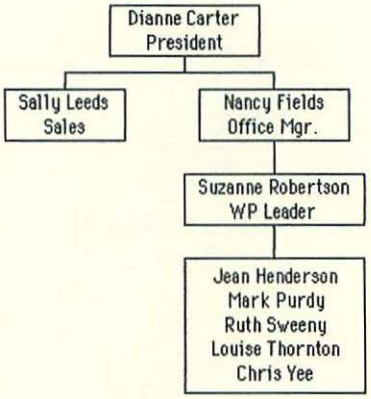
Select the chart with the lasso, copy it to the Clipboard, and quit MacPaint. Run Word and paste this chart into the report. Center the chart in the text area by selecting it and dragging on its right border.

4. Since the organizational chart does not tell much about the employees, the request should include a table of employee information. BestWords keeps this information in a File database:

1984			
Income		**Expenses**	
WP services	$278,428	Salaries	$211,600
Interest	$248	New equip.	$17,527
Used equip.	$4,730	Rent/phone	$14,134
Training	$6,800	Adv./Promo.	$20,290
		Legal	$2,100
		Office supp.	$3,821
		Misc.	$6,392
Total	$290,206	Total	$275,864

Company Organization

BestWords staff consists of the president, office manager, sales representative, and the word-processing staff. Our company structure is:



The staff has grown steadily since our founding in 1981. BestWords salaries are based on job description and length of time with the company. The salaries and beginning dates of employment are:

BestWords Staff

	Name	Position	Salary	Started
1	Jean Henderson	WP	$19,600	9/22/83
2	Mark Purdy	WP	$19,600	9/22/83
3	Dianne Carter	President	$35,000	2/1/81
4	Ruth Sweeny	WP	$18,300	1/8/85
5	Sally Leeds	Sales	$31,200	11/5/84
6	Louise Thornton	WP	$18,500	6/12/84
7	Nancy Fields	Office Mgr.	$27,500	8/30/81
8	Suzanne Robertson	WP Leader	$23,400	4/20/83
9	Chris Yee	WP	$18,500	8/18/84
New				

Sort the records on the Position field. Copy the records to the Clipboard (retaining the formatting) and paste them into the Scrapbook; they will be used in the report. Copy the same records to the Clipboard without the formatting and also paste them into the Scrapbook; this will be used in Multiplan.

5. Quit File, run Word, open the report, and cut the table with the formatted amounts into the Clipboard. Paste the table into the report and format the results.

Nancy Fields	Office Mgr.	$27,500	8/30/81
Dianne Carter	President	$35,000	2/1/81
Sally Leeds	Sales	$31,200	11/5/84
Chris Yee	WP	$18,500	8/18/84
Louise Thornton	WP	$18,500	6/12/84
Ruth Sweeny	WP	$18,300	1/8/85
Jean Henderson	WP	$19,600	9/22/83
Mark Purdy	WP	$19,600	9/22/83
Suzanne Robertson	WP Leader	$23,400	4/20/83

6. Of course, the bank is most concerned with the use of the loan; so make a spreadsheet showing how the loan would affect income and expenses. Quit Word, open the Multiplan spreadsheet, cut the unformatted records from the Scrapbook, and paste them into the spreadsheet beginning at row 22. Remove the Name and Started columns:

	1	2
20		
21	Current	
22	Office Mgr.	$27,500
23	President	$35,000
24	Sales	$31,200
25	WP	$18,500
26	WP	$18,500
27	WP	$18,300
28	WP	$19,600
29	WP	$19,600
30	WP Leader	$23,400
31		
32	Total	$211,600

Nancy Fields	Office Mgr.	$27,500	8/30/81
Dianne Carter	President	$35,000	2/1/81
Sally Leeds	Sales	$31,200	11/5/84
Chris Yee	WP	$18,500	8/18/84
Louise Thornton	WP	$18,500	6/12/84
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Purpose of the Loan

Our staff of six word processing employees are now working at full capacity. BestWords has been in the enviable position of turning away work for the last eight months. We propose to add four new positions to the word processing staff (one leader and three operators).

The increase in staff will let us accept more new business. Thus we will need to add a new sales representative to bring in new clients and to interest our current clients in new services that we offer. We also want to add a full-time training specialist to the staff to cover the new demand for word processing training.

With the addition of new staff, BestWords will, of course, need new word processing equipment and a proportional increase in rent and office supplies. The total new needs are shown here:

Add a total to row 32.

7. Copy columns 1 and 2, rows 22 through 30, to columns 3 and 4. This will be the proposed new staff. Add the new workers into column 3. Increase the pay levels for the current positions and add a total. The spreadsheet now appears as follows:

	1	2	3	4
20				
21	Current		Proposed	
22	Office Mgr	$27,500	Office Mgr	$30,000
23	President	$35,000	President	$40,000
24	Sales	$31,200	Sales	$35,000
25	WP	$18,500	Sales	$35,000
26	WP	$18,500	Training	$17,500
27	WP	$18,300	WP	$19,600
28	WP	$19,600	WP	$18,300
29	WP	$19,600	WP	$20,800
30	WP Leader	$23,400	WP	$20,800
31			WP	$18,500
32	Total	$211,600	WP	$18,500
33			WP	$18,300
34			WP	$19,600
35			WP Leader	$24,900
36			WP Leader	$24,900
37				
38			Total	$361,700

8. Start a new area of the spreadsheet for expected new expenses on row 40. The major new expense is salaries for new employees. The total of the new expenses for 1986 is the difference between the two previous totals (R38C5—R32C2). For 1987 and 1988, estimate an increase of 15 percent for current employees each year (R42C2*1.15 and R42C3*1.15). The result is as follows:

40	New expenses			
41		1985	1986	1987
42	Salaries	$150,100	$172,615	$198,507

9. Copy the Expense categories from column 3, rows 7 through 12, into column 1 beginning at row 43. The estimates are based on the costs of equipment for the new word processing employees and a doubling of the advertising and promotion budget for the new sales representative. Use row 50 for yearly totals:

New expenses

	1985	1986	1987
Salaries	$150,100	$172,615	$198,507
New equip.	$15,000	$3,000	$2,000
Rent/phone	$4,000	$4,000	$4,000
Adv./Promo.	$20,000	$20,000	$20,000
Legal	$0	$0	$0
Office supp.	$3,000	$3,000	$3,000
Misc.	$4,000	$4,000	$4,000
Total	$196,100	$206,615	$231,507

This will result in significant new income for BestWords. With our new capabilities, our three-year projections for income added by the new staff and equipment are:

New Income

	1985	1986	1987
WP services	$200,000	$225,000	$250,000
Interest	$0	$0	$0
Used equip.	$4,000	$2,000	$2,000
Training	$40,000	$45,000	$50,000
Total	$244,000	$272,000	$302,000

As you can see, we feel that the $250,000 loan can be easily paid off in the five-year timeframe, given that we will continue to make a profit each year. With other expansions that are currently underway, BestWords should be able to meet the goals of the loan in three to four years.

	1	2	3	4
40	New expenses			
41		1985	1986	1987
42	Salaries	$150,100	$172,615	$198,507
43	New equip.	$15,000	$3,000	$2,000
44	Rent/phone	$4,000	$4,000	$4,000
45	Adv./Promo.	$20,000	$20,000	$20,000
46	Legal	$0	$0	$0
47	Office supp.	$3,000	$3,000	$3,000
48	Misc.	$4,000	$4,000	$4,000
49				
50	Total	$196,100	$206,615	$231,507

10. Copy the labels in column 1, rows 6 through 9, to column 1 beginning at row 54. Enter information about the expected increase in sales due to the doubling in size of the sales staff, the full-time training position, and the increased capacity for new word processing work. Add totals for each year:

52	New Income			
53		1985	1986	1987
54	WP services	$200,000	$225,000	$250,000
55	Interest	$0	$0	$0
56	Used equip.	$4,000	$2,000	$2,000
57	Training	$40,000	$45,000	$50,000
58				
59	Total	$244,000	$272,000	$302,000

11. Select rows 40 through 59, copy them to the Clipboard, and quit Multiplan. Open your Word document and paste the tables from the Clipboard. Format the tables and add explanations for the new costs and expected income as follows.

New expenses

	1985	1986	1987
Salaries	$150,100	$172,615	$198,507
New equip.	$15,000	$3,000	$2,000
Rent/phone	$4,000	$4,000	$4,000
Adv./Promo.	$20,000	$20,000	$20,000
Legal	$0	$0	$0
Office supp.	$3,000	$3,000	$3,000
Misc.	$4,000	$4,000	$4,000
Total	$196,100	$206,615	$231,507

New Income

	1985	1986	1987
WP services	$200,000	$225,000	$250,000

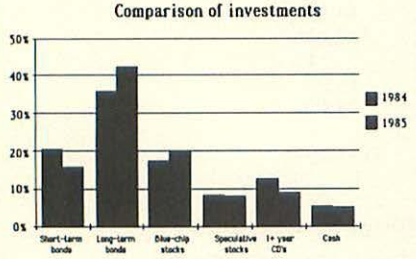


Table 1. Investment reliance for 1984 and 1985.

The pension fund for American Foods bought more long-term bonds in 1985 and liquidated some of our holdings in short-term bonds. Due to the softness in the cash and short-term CD markets, we also put more reliance on blue-chip stocks.

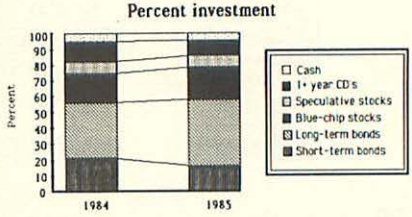
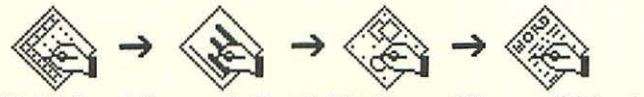


Table 2. Comparison of investment mix for 1984 and 1985.

While slightly increasing the total amount invested in bonds, American Foods' pension fund shifted the bond emphasis from short-term to long-term bonds. Blue-chip stocks also played a bigger role in the portfolio in 1985.

Business Presentation



Jim Rothstein is giving a presentation on the holdings of the American Foods pension fund to the board of directors. The board has copies of the graphs that he is discussing, but he wants to make his presentation more interesting by using overhead transparencies.

The pension fund has grown by almost ten percent over the year, and although the data is fairly simple, it is important that the board see how the mix of investments has contributed to the fund's growth. Jim uses Chart to make two transparencies:

- A simple column chart showing the percent reliance on each type of investment in each year
- A 100 percent column chart showing the mix of investments in the two years.

Since the board of directors already has copies of the data, Jim decides to make graphs more informative by adding descriptive captions. He also wants to use MacDraw to improve the appearance of the labels. His finished charts are presented throughout this chapter.

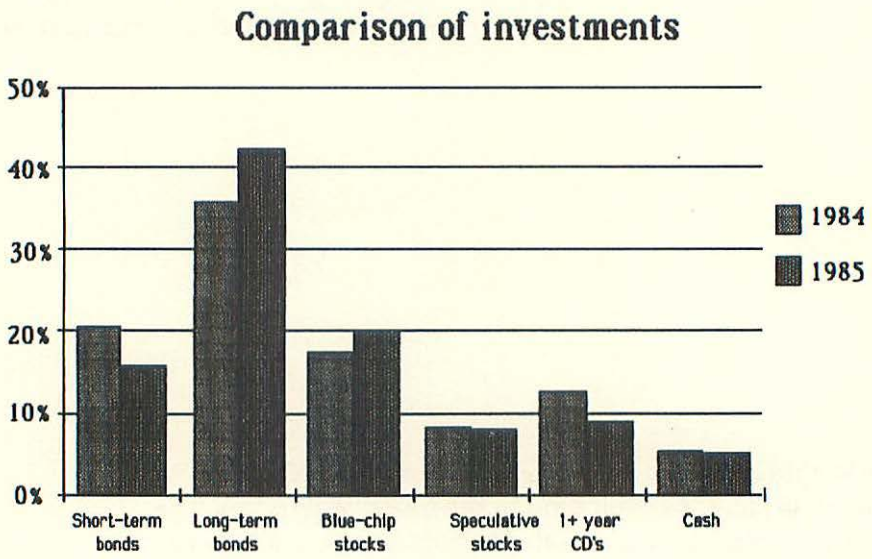


Table 1. Investment reliance for 1984 and 1985.

The pension fund for American Foods bought more long-term bonds in 1985 and liquidated some of our holdings in short-term bonds. Due to the softness in the cash and short-term CD markets, we also put more reliance on blue-chip stocks.

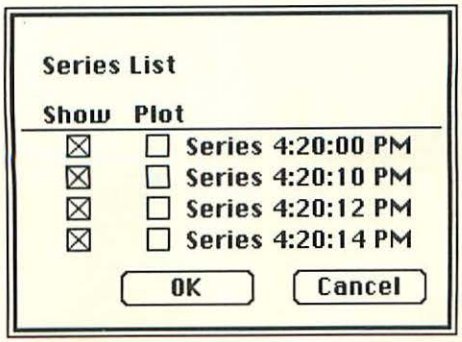
1. The data is kept in a Multiplan spreadsheet:

	1	2	3	4	5
1	American Foods pension investments				
2					
3		1984		1985	
4		Dollars (1000)	Percent	Dollars (1000)	Percent
5					
6	Short-term bonds	105820	20.7%	87727	15.6%
7	Long-term bonds	182392	35.7%	238431	42.4%
8	Blue-chip stocks	89004	17.4%	112421	20.0%
9	Speculative stocks	41753	8.2%	45700	8.1%
10	1+ year CD's	63912	12.5%	49705	8.8%
11	Cash	27358	5.4%	28391	5.0%
12					
13	Total	510239	100%	562375	100%

Since you are using Chart to graph the results, you do not need to use the headings or the totals. The percentages are necessary because the totals for the two years are different. Select columns 1 through 5 of rows 6 through 11 and copy the data to the Clipboard. (Be sure to save the cells as unformatted.)

2. Quit Multiplan and run Chart. Select Text from the Data menu to tell Chart that the first column will be your text categories. Don't worry about the column labels or the chart title; you will change these in MacDraw.

3. Paste the data from the Clipboard. Chart opens four series windows. Select List from the Data menu:



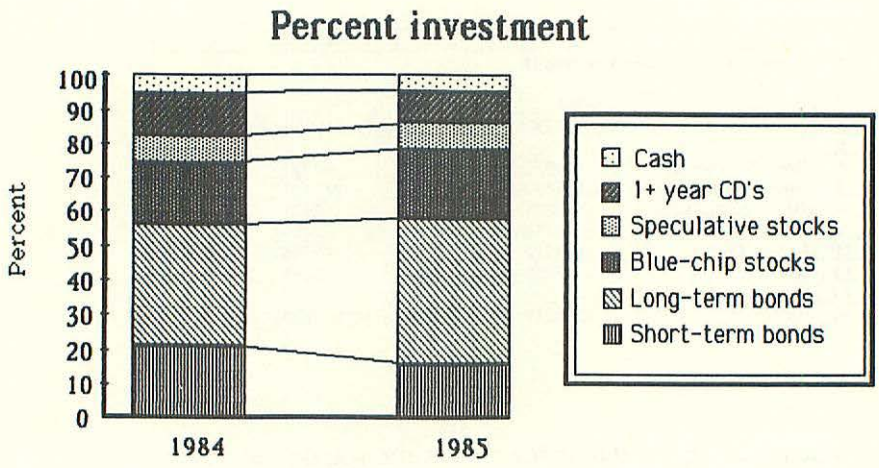
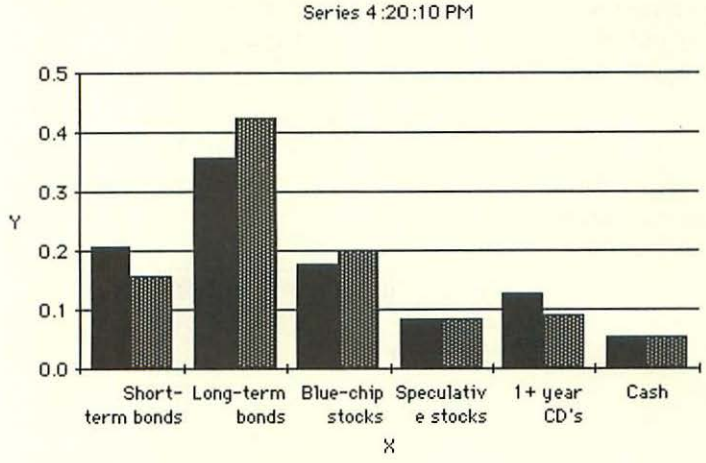


Table 2. Comparison of investment mix for 1984 and 1985.

While slightly increasing the total amount invested in bonds, American Foods' pension fund shifted the bond emphasis from short-term to long-term bonds. Blue-chip stocks also played a bigger role in the portfolio in 1985.

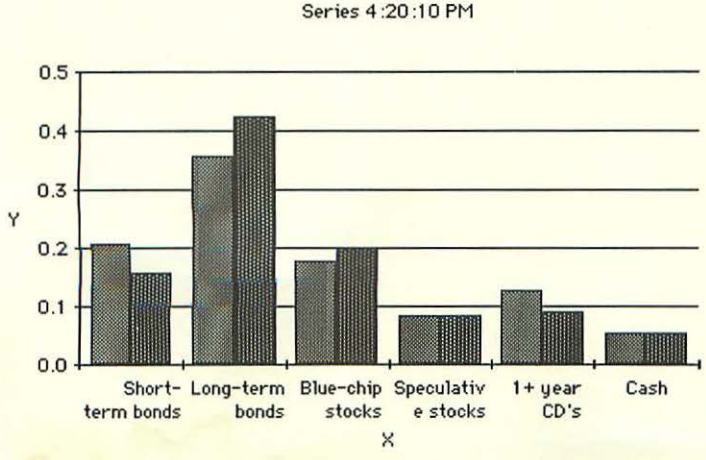
Deselect the first and third windows, since these are the dollar amounts, not the percentages.

4. The first chart is a bar chart for the two years. Select column chart type 6 in the Gallery menu. Click the Plot Series box for the 1984 data first; then plot the 1985 series:



Don't worry about the poorly formed labels; these are easy to change in MacDraw.

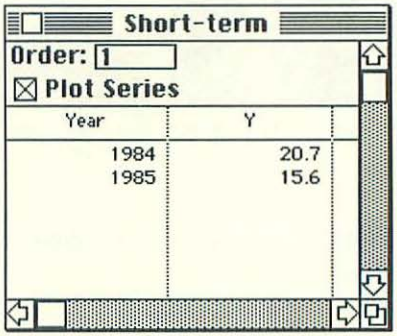
5. You want to emphasize the 1985 bars, but the current arrangement makes the black (1984) bars look more important. Select one of the 1984 bars; then select Patterns from the Format menu. Change the area pattern to 50 percent gray (the third from the left). The chart now looks like this:



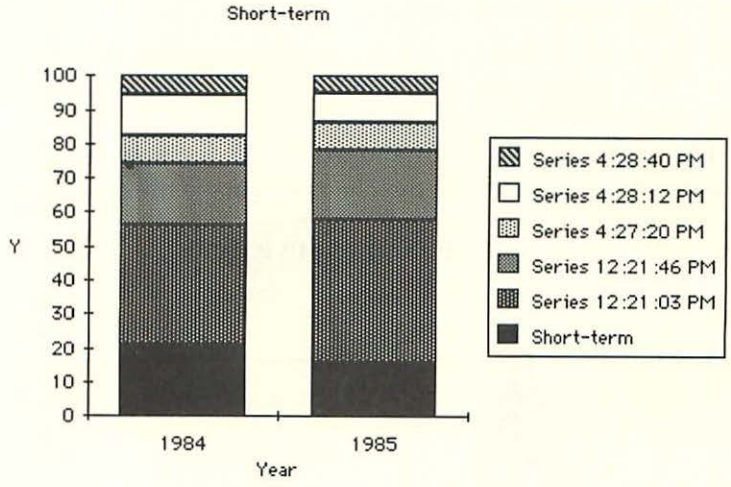
6. Select the entire chart; then select Copy. Paste this chart into the Scrapbook.

7. The second graph is much harder to make. Since Chart does not let you paste in a spreadsheet that is wider than it is tall, you cannot set up the six series windows easily. Therefore you must type the data series into Chart by hand. Before beginning, select List from the Data menu and deselect the showing or plotting of all four series.

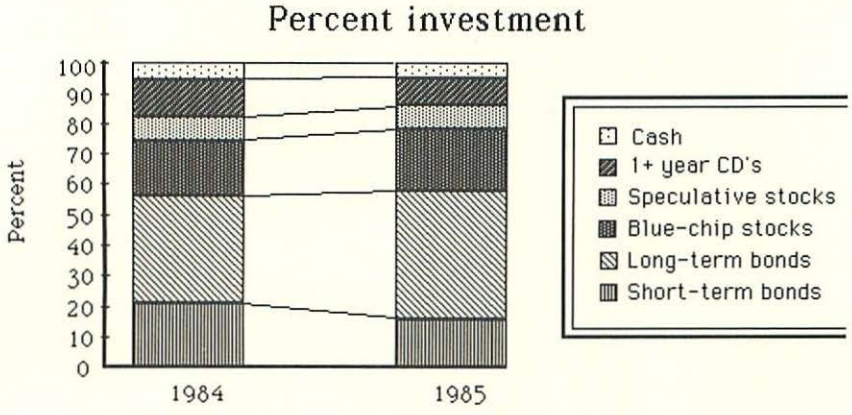
8. Start adding data to the New Series window for the short-term bonds. The category column will contain "1984" and "1985"; the values column will contain "20.7" and "15.6" (don't worry about the series name):



9. Create a new series for long-term bonds, then for blue-chip stocks, and so on. After you have created all six windows, select column chart type 5. Click the Plot Series button for the first window, then the second, and so on. Change the pattern in the top rectangle to diagonal stripes. Select Add Legend from the Chart menu (you will change the names in MacDraw).

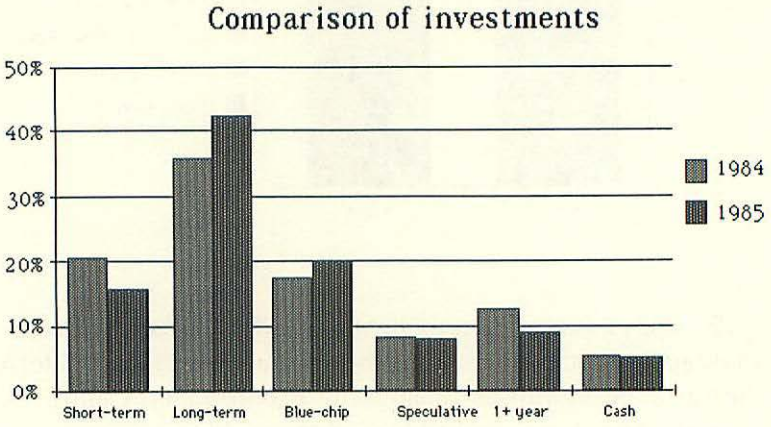


10. Copy this chart to the Clipboard and quit Chart. Run MacDraw and paste this chart into a new document. Add a new title to the top of the drawing and change the legend, patterns, and axes. Separate the columns and add lines between them:



11. Select the entire chart, copy it to the Clipboard, and paste it into the Scrapbook. Copy the first chart from the Scrapbook into the Clipboard, move to an unused part of the chart, and paste the chart into MacDraw.

12. Change the column and axis labels to show the proper names, change the title of the chart, and make the chart larger.



13. Select the chart and copy it to Clipboard. Quit MacDraw and run Word. Set the right margin to 0 inches. Paste the chart into a new document; then add the caption at the bottom. Save this document and print it on overhead transparency material.

14. Start a new document and retrieve the second chart from the Scrapbook. Add its caption, save it, and print it.

11

To: Sylvia Lloyd, Marketing Director
From: Chris Baker
Re: Television advertising for Devonshire and SnappyZaps

Our research of the television viewer datasets produced some interesting results and indicate that there are some excellent shows for us to use as advertising vehicles. We have found shows with audiences that are very close to our hoped-for audience mixes.

Determining the optimal audience mix

Introducing two products as different as Devonshire cookies and SnappyZaps at the same time will certainly require that Marketing use two very different campaigns. Our meetings last month helped us to determine exactly who we are selling to and how we want to approach the consumer for these products.

It was agreed that the target audience for Devonshire cookies was primarily adults and that children will not have much effect on the market. We threw in a few teens into the mix to cover those who have buying power. We also down-played the seniors, who have traditionally been wary of new snack products.

For SnappyZaps, we decided to go for a broad appeal concentrated on the lower age ranges. We feel that half of the potential market will be in the 13 to 35 range, with children influencing the buying decisions in another 20% of the market.

The optimal mixes that we finalized on, categorized by television rating age groups, are as follows:

Ages:	0-12	13-19	20-35	36-55	56+
Devonshire cookies	0%	15%	45%	35%	5%
SnappyZaps	20%	25%	35%	10%	10%

Television data

Five television shows approved by the Marketing Acceptance Board were compared to the optimum mix. Of these five, good matches for both Devonshire cookies and SnappyZaps were both found. Given an even larger sample of shows, we could probably find many other shows that suit our needs.

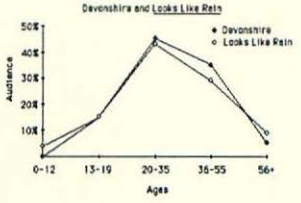
The data for the five shows were as follows:

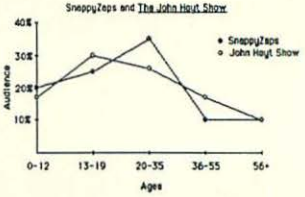
Ages:	0-12	13-19	20-35	36-55	56+
Fly Home is My Castle	5%	10%	31%	29%	25%
Here Goes Nothing	41%	29%	11%	15%	4%
Top Shots	24%	18%	24%	20%	14%
Looks Like Rain	4%	15%	43%	29%	9%
The John Hoyt Show	17%	30%	26%	17%	10%

The cost per viewer for each of the shows was about the same. We looked at shows in different hours of the television evening to be sure we sampled the widest possible range of viewers.

After correlating the differences between the shows and the optimum audiences, we found that Looks Like Rain matched Devonshire cookies quite well and that The John Hoyt Show closely matched the desired SnappyZaps audience.

The following charts show the correlation for these two shows and the products. The lines with the filled-in diamonds are the desired mixes, and the lines with the open diamonds are the shows.





It should be noted that the desired audience mix should be finalized and approved at all levels before these two shows are chosen by Marketing. As an experiment, we shifted the age ranges for desired mix of Devonshire cookies up and that of SnappyZaps down, and we found that two different shows matched better than Looks Like Rain and The John Hoyt Show. It would also be advisable for us to research many more shows for the final sample.

Market Research

Samuelson Products has recently developed two snack foods that it wants to market on television. One product, Devonshire cookies, is mostly aimed at adults; the second product, Snappy-Zaps, will have wider appeal among kids. The marketing director wants you to find the best shows to advertise the two products.

The audience data for many TV shows is available through a database that you can access with a modem. After receiving the data, you can set up "optimum viewer profiles" and compare them with the actual show audiences to find the one that best meets your criteria.

Your report for the marketing director (illustrated at the end of the chapter) should include both the television show data and charts showing the match with your optimum models. By using a spreadsheet, you can perform what-if calculations to see the effects of changing your models.

1. Use MacTerminal to access the remote database. After displaying the information on the screen, select it and copy it to the Clipboard with the Copy Table command in the Edit menu. This command turns the spaces between columns into tab characters.

2. Quit MacTerminal and run Multiplan. Paste the table into a new document:

	1	2	3	4	5	6
1		0-12	13-19	20-35	36-55	56+
2	My Home is My Castle	5%	10%	31%	29%	25%
3	Here Goes Nothing	41%	29%	11%	15%	4%
4	Top Shots	24%	18%	24%	20%	14%
5	Looks Like Rain	4%	15%	43%	29%	9%
6	The John Hoyt Show	17%	30%	26%	17%	10%

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Television data

Five television shows approved by the Marketing Acceptance Board were compared to the optimum mix. Of these five, good matches for both Devonshire cookies and SnappyZaps were both found. Given an even larger

Row 1 shows each age group; columns 2-6 give the percentage of the audiences in each age group for the five shows.

3. Determine the best possible audience for each product. For each age category, you should consider the interest in the product and the ability to buy or influence a buying decision. The result is a desired audience mix:

8	Desired mix					
9						
10	Devonshire cookies	0%	15%	45%	35%	5%
11	SnappyZaps	20%	25%	35%	10%	10%

Save rows 1 through 11 to the Clipboard and then to the Scrapbook for use in the written report.

4. The best way to determine the fit of the show's audience to your optimum audience is to find the differences for each category and select the show with the smallest cumulative differences. You must use the absolute values, or the sum of the differences will always equal 0.

For Devonshire cookies, make a second chart that contains the absolute-value difference between the audience percentage and the optimum percentage.

13	Devonshire ratings					
14						
15	My Home is My Castle	0.05	0.05	0.14	0.06	0.2
16	Here Goes Nothing	0.41	0.14	0.34	0.2	0.01
17	Top Shots	0.24	0.03	0.21	0.15	0.09
18	Looks Like Rain	0.04	0	0.02	0.06	0.04
19	The John Hoyt Show	0.17	0.15	0.19	0.18	0.05

For example, cell R15C2 contains the formula

```
=ABS(R10C2-R[-13]C)
```

Copy this formula down to rows 16 through 19. In R15C3, change the formula to

```
=ABS(R10C3-R[-13]C)
```

Copy it down, and so on.

5. Make a similar chart for SnappyZaps:

	1	2	3	4	5	6
21	SnappyZaps ratings					
22						
23	My Home is My Castle	0.15	0.15	0.04	0.19	0.15
24	Here Goes Nothing	0.21	0.04	0.24	0.05	0.06
25	Top Shots	0.04	0.07	0.11	0.1	0.04
26	Looks Like Rain	0.16	0.1	0.08	0.19	0.01
27	The John Hoyt Show	0.03	0.05	0.09	0.07	0

sample of shows, we could probably find many other shows that suit our needs.

The data for the five shows were as follows:

Ages:	0-12	13-19	20-35	36-55	56+
My Home is My Castle	5%	10%	31%	29%	25%
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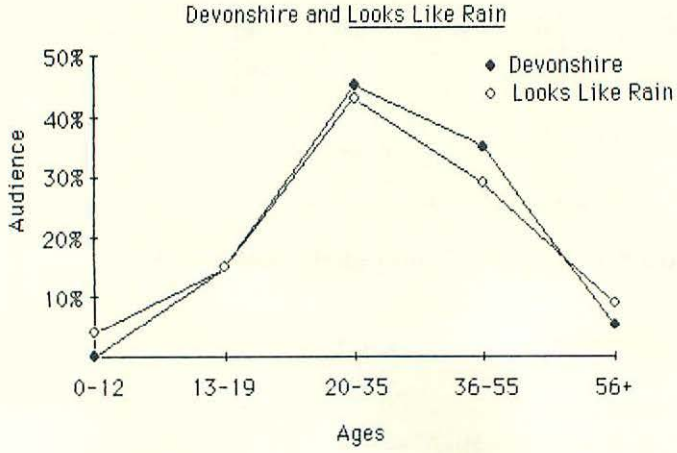
The cost per viewer for each of the shows was about the same. We looked at shows in different hours of the television evening to be sure we sampled the widest possible range of viewers.

After correlating the differences between the shows and the optimum audiences, we found that Looks Like Rain matched Devonshire cookies quite well and that The John Hoyt Show closely matched the desired SnappyZaps audience.

The following charts show the correlation for these two shows and the products. The lines with the filled-in diamonds are the desired mixes, and the lines with the open diamonds are the shows.



6. Use column 7 to create totals for the differences (use the SUM function). The totals for the two products are

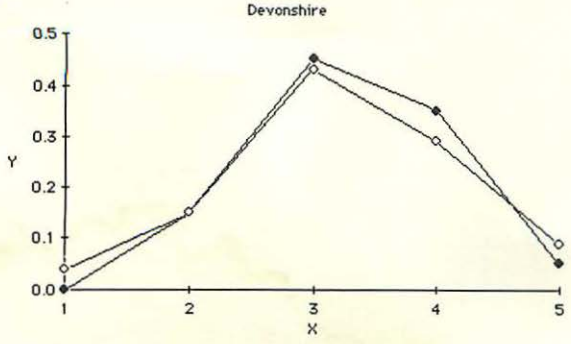
6	7
5%	
10%	
	Total
0.2	0.5
0.01	1.1
0.09	0.72
0.04	0.16
0.05	0.74
	Total
0.15	0.68
0.06	0.6
0.04	0.36
0.01	0.54
0	0.24

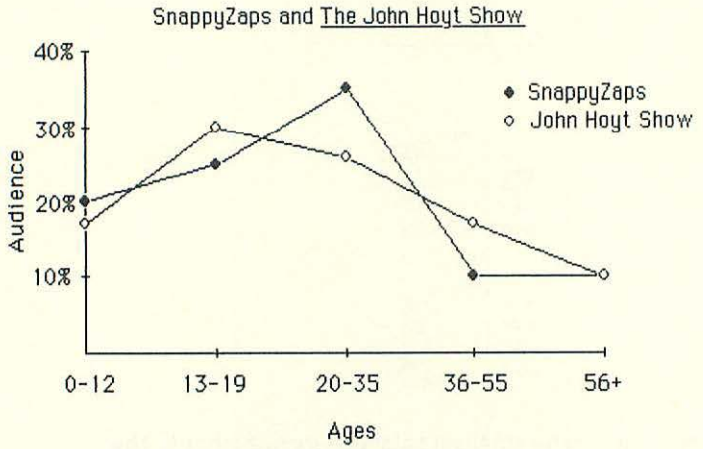
Since you are looking for the smallest total difference (that is, the closest fit between the sample and optimum audiences), you can see that *Looks Like Rain* (row 26) is the best fit for Devonshire cookies and *The John Hoyt Show* (row 27) is the best fit for SnappyZaps.

7. To create graphs in Chart, copy columns 2 through 6 of rows 5 and 6 to the Clipboard and then to the Scrapbook. Copy columns 2 through 6, rows 10 and 11, to the Clipboard. Quit Multiplan and run Chart.

8. Paste in the data for the snacks; Chart will assume that you are using sequence data, which is fine for now. Use the Sequence command to change the series name for the first series to "Devonshire" and the second series to "SnappyZaps." Cut the TV show data from the Scrapbook and paste it into Chart. Rename the series *Looks Like Rain* and *The John Hoyt Show,* respectively.

9. Select line chart type 1 in the Gallery menu. Click the Plot Series button for "Devonshire" and then for *Looks Like Rain.* The result is



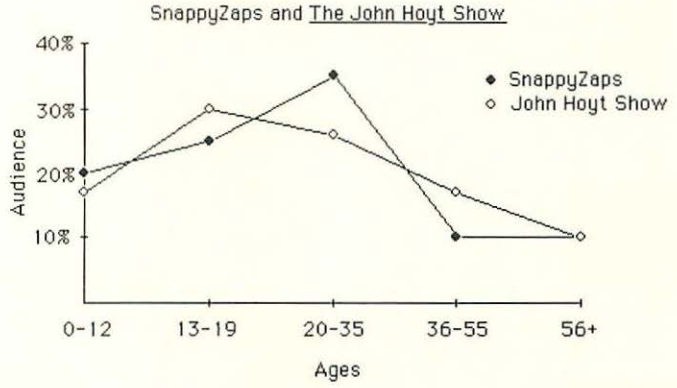


It should be noted that the desired audience mix should be finalized and approved at all levels before these two shows are chosen by Marketing. As an experiment, we shifted the age ranges for desired mix of Devonshire cookies up and that of SnappyZaps down, and we found that two different shows matched better than Looks Like Rain and The John Hoyt Show. It would also be advisable for us to research many more shows for. the final sample.

The filled-in points are for the cookie and the open points are for the show. As you can see, this was a good match. Save this graph to the Clipboard and then to the Scrapbook.

10. Deselect the two series; plot "SnappyZaps" and then *The John Hoyt Show.* Save this graph to the Clipboard, quit Chart, and run MacPaint.

11. Paste the second graph into a new document. Change the title, add better labels, and add a new legend:



Copy this to the Clipboard and save it in the Scrapbook. Copy the first chart from the Scrapbook, perform the same operations, and save it to the Clipboard.

12. Quit MacPaint and run Word with a new document. Paste in the first chart and then copy the second chart from the Scrapbook into the new document. Also copy the tables saved in step 3. Enter the text around the drawings and tables to complete the report.

13. To see the effect of changing the desired audiences, simply change the values in rows 10 and 11. For example, if you decide to change the Devonshire audience to be much older and the SnappyZaps audience to be much younger, you might use the following mixes:

10	Devonshire cookies	0%	5%	35%	45%	15%
11	SnappyZaps	35%	35%	25%	5%	0%

These results show that *My Home is My Castle* is better for Devonshire cookies and *Here Goes Nothing* is better for SnappyZaps.

12

<u>Interim memo on the transformation of EOTD to EOSL in solution</u>

Professor Ruth Williams

Many literature references include the reaction:

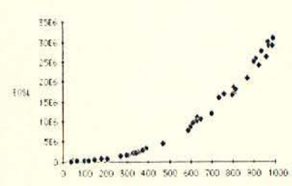
EOTD + heat ---> EOSL

According to Holland, this reaction follows the formula:

$x^{2.5}+4x$

where x is the amount of EOTD After studying 46 reactions, both from the literature and measured in the lab, I have found that most of these reactions conformed quite closely to the equation.

The data was collected from 35 literature reports and 11 experiments in our lab. The data looks like



The standard deviation of the data from the equation was 0.058, which indicates a fair degree of inaccuracy in the literature and in the experiments My group is studying the reaction further to find the edge conditions of Holland s equation

Laboratory Report

Professor Ruth Williams is researching a nonlinear chemical reaction. The reaction has been measured by many other researchers, and her graduate students have also run the reaction with differing amounts of the reactant. She wants to compare the data to the theoretical equation for a paper she is writing.

Since the literature on this reaction and Dr. Williams's laboratory data are considerable, she has kept the results in a database. She is preparing a short, informal memo with the results of the comparisons. The memo should include a chart of the data and a report of the standard deviation from the expected values.

1. The three fields in the database are the source of the data, the amount of the reactant chemical (whose acronym is EOTD), and the amount of the resulting chemical (whose acronym is EOSL). A partial selection of the data is shown on page 179.

Interim memo on the transformation of EOTD to EOSL in solution

Professor Ruth Williams

Many literature references include the reaction:

EOTD + heat --> EOSL

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$x^{2.5+4x}$

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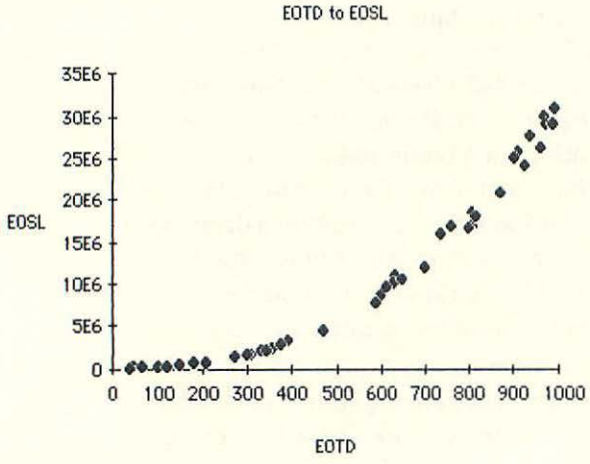


The standard deviation of the data from the equation was 0.058, which indicates a fair degree of inaccuracy in the literature and in the experiments. My group is studying the reaction further to find the edge conditions of Holland's equation.

	Source	EOTD	EOSL
1	L782	9.10E+02	2.57E+07
2	L690	3.60E+01	7.22E+03
3	L429	3.56E+02	2.35E+06
4	L899	7.35E+02	1.58E+07
5	L845	4.50E+01	1.28E+04
6	L609	8.09E+02	1.85E+07
7	L885	4.67E+02	4.47E+06
8	L981	2.07E+02	6.40E+05
9	E717	3.91E+02	3.12E+06
10	L932	9.68E+02	2.99E+07

An "L" in the Source field indicates that this is a literature reference; an "E" indicates that it was an experiment in Dr. Williams's lab.

2. Copy all of the records to the Clipboard and quit File. Run Multiplan and paste the records into a new document starting in row 2. Enter the labels in row 1.

	1	2	3
1	Source	EOTD	EOSL
2	L782	9.10E+02	2.57E+07
3	L690	3.60E+01	7.22E+03
4	L429	3.56E+02	2.35E+06
5	L899	7.35E+02	1.58E+07
6	L845	4.50E+01	1.28E+04
7	L609	8.09E+02	1.85E+07
8	L885	4.67E+02	4.47E+06
9	L981	2.07E+02	6.40E+05
10	E717	3.91E+02	3.12E+06

3. You want to compare the data in column 3 with the results from the reaction equation. In this case the equation is

$$x^{2.5}+4x$$

where x is the amount of EOTD from column 2. In column 4, enter the formula for the reaction as

```
=(RC[-2]^2.5)+(RC[-2]*4)
```

Copy this formula down for all of the data.

4. Column 5 should show the percent difference between the data and the expected results. The equation for the cells is

```
=(RC[-2]-RC[-1])/RC[-1]
```

Copy this equation down for all of the data. The new data looks like this:

	1	2	3	4	5
1	Source	EOTD	EOSL	Equation	Diff. fr. eq.
2	L782	9.10E+02	2.57E+07	2.50E+07	2.94%
3	L690	3.60E+01	7.22E+03	7.92E+03	-8.90%
4	L429	3.56E+02	2.35E+06	2.39E+06	-1.81%
5	L899	7.35E+02	1.58E+07	1.46E+07	7.57%
6	L845	4.50E+01	1.28E+04	1.38E+04	-7.32%
7	L609	8.09E+02	1.85E+07	1.86E+07	-0.55%
8	L885	4.67E+02	4.47E+06	4.71E+06	-5.16%
9	L981	2.07E+02	6.40E+05	6.17E+05	3.68%
10	E717	3.91E+02	3.12E+06	3.02E+06	3.28%

5. For the memo, you should also calculate the standard deviation of the differences. In cell R2C6, enter the formula

```
=STDEV(R1C5:R46C5)
```

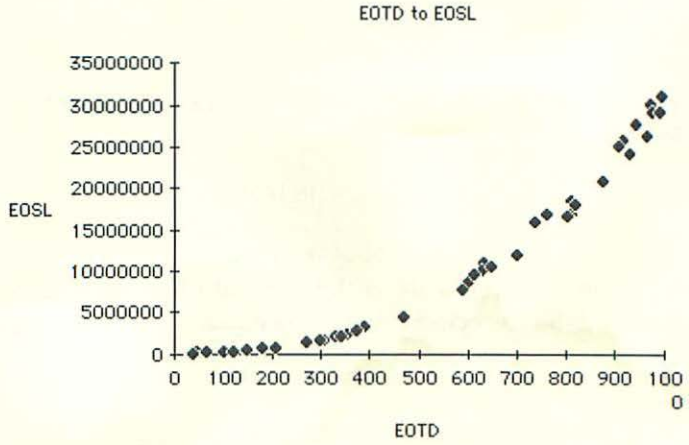
In this case, there are 46 data points. Give this cell a label in R1C6.

6
St. dev.
0.0580153

Copy it to the Scrapbook for the memo.

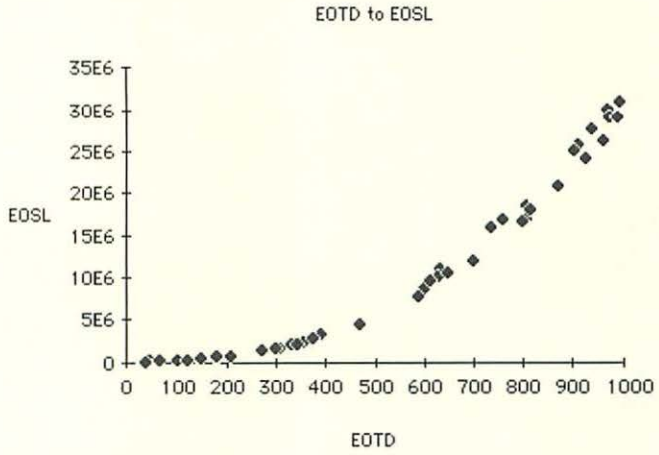
6. Copy the data in columns 2 and 3 to the Clipboard. Quit Multiplan and run Chart. Select Number from the Data menu to tell Chart that the data is numeric. Label the series "EOTD to EOSL" and the columns "EOTD" and "EOSL", respectively.

7. Paste the data from the Clipboard. Select scatter chart type 1 for the results. Click the Plot Series button:



Copy this chart to the Clipboard and quit Chart.

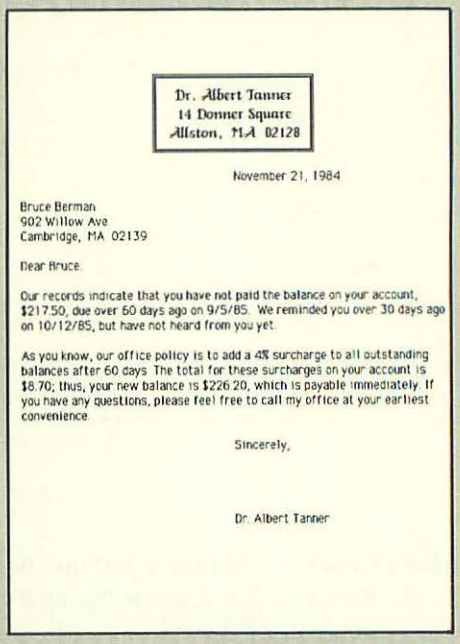
8. Run Paint and modify the axis labels:



Save this to the Clipboard and quit MacPaint.

9. Run Word and paste the chart into a new document for your memo. Paste the standard deviation calculated in Multiplan into the document and finish the report.

13



Dr. Albert Tanner
14 Donner Square
Allston, MA 02128

November 21, 1984

Bruce Berman
902 Willow Ave
Cambridge, MA 02139

Dear Bruce:

Our records indicate that you have not paid the balance on your account, $217.50, due over 60 days ago on 9/5/85. We reminded you over 30 days ago on 10/12/85, but have not heard from you yet.

As you know, our office policy is to add a 4% surcharge to all outstanding balances after 60 days. The total for these surcharges on your account is $8.70; thus, your new balance is $226.20, which is payable immediately. If you have any questions, please feel free to call my office at your earliest convenience.

Sincerely,

Dr. Albert Tanner

Letter for Delinquent Payment

Dr. Albert Tanner, a dentist in private practice, keeps an extensive patient database in File. He uses the database for sending patient billings. If a patient does not pay in 30 days, he sends a reminder notice. After 60 days, he adds a 4% surcharge to the patient's account.

Although the letters are created with a File report, Dr. Tanner wants the reminders to sound friendly, so he uses a Word merge document to create them. He includes as much personal information as possible to make the letter seem more individual. Of course, he also wants the letters to convince his clients to pay their bills. A sample letter appears on the next page.

1. Create the form letter for the delinquent notices with Word. The main document must include a DATA instruction for the datafile that you created (in this case, call it "Delinquent 60"). The field names in the main document must match the ones in the database. Since the datafile for this letter will be a subset of your main database, you will use the same field names. Figure 13-1 shows the main document.

Dr. Albert Tanner
14 Donner Square
Allston, MA 02128

November 21, 1984

Bruce Berman
902 Willow Ave.
Cambridge, MA 02139

Dear Bruce:

Our records indicate that you have not paid the balance on your account, $217.50, due over 60 days ago on 9/5/85. We reminded you over 30 days ago on 10/12/85, but have not heard from you yet.

As you know, our office policy is to add a 4% surcharge to all outstanding balances after 60 days. The total for these surcharges on your account is $8.70; thus, your new balance is $226.20, which is payable immediately. If you have any questions, please feel free to call my office at your earliest convenience.

Sincerely,

Dr. Albert Tanner

2. To make the letter look a bit more professional, add a letterhead to the top. You can create a letterhead in MacPaint or MacDraw with large fonts; many of these fonts are available from commercial manufacturers.

«data Delinquent 60»

Dr. Albert Tanner
14 Donner Square
Allston, MA 02128

«set date=?Enter today's date: »
«date»

«first name» «last name»
«address»
«city», «state» «zip»

Dear «first name»:

Our records indicate that you have not paid the balance on your account, «amount», due over 60 days ago on «orig notice». We reminded you over 30 days ago on «30-day», but have not heard from you yet.

As you know, our office policy is to add a 4% surcharge to all outstanding balances after 60 days. The total for these surcharges on your account is «surcharges»; thus, your new balance is «total due», which is payable immediately. If you have any questions, please feel free to call my office at your earliest convenience.

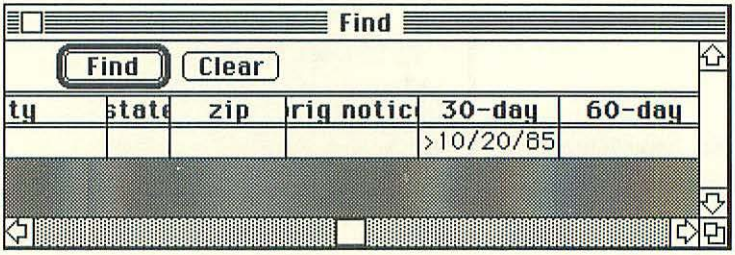
Sincerely,

Dr. Albert Tanner

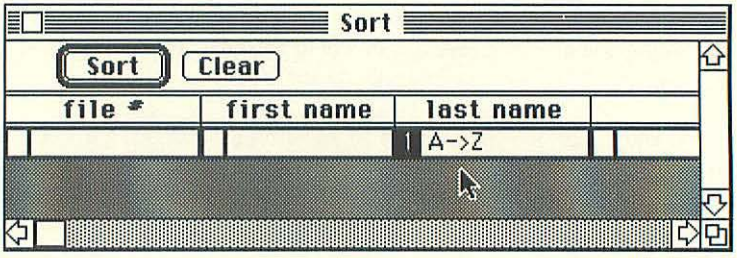
Figure 13-1.
Main document for form letter

Copy the letterhead to the Clipboard, quit MacPaint or MacDraw, run Word again, and paste the letterhead into the main document.

3. The patient database has more than two dozen fields, many that are not useful for this letter (such as denture type). Thus, you should make a subset of the database with only the fields that relate to the letter. Since this mailing is only for patients who have been sent a 30-day notice, you can simply select all records in which the field called "30-day" has a date that is more than 30 days ago:



You should also sort the selected records by last name so they are easy to match with the envelopes that you will be printing:



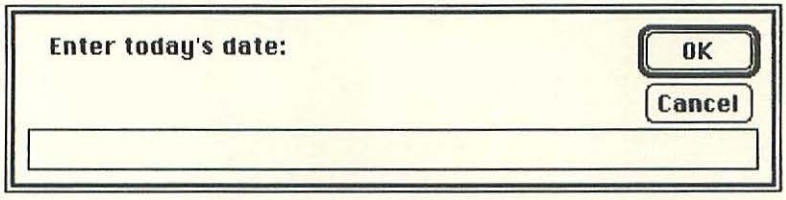
4. Create a form for these records. Since you are using this database only as input to Word, you can use the simple List Helper form. The subset database's form contains the fields shown in Table 13-1. Hide the other fields; then select Save Records from the File menu. Click the Text (Microsoft Print Merge) button in the dialog box, and name the file "Delinquent 60". Click the Save button to create the text-only file. Quit File and run Word again.

5. Open the main document and select Print Merge from the

Table 13-1.
Fields in the "Delinquent 60" Database

Field	Type	Contents
file #	Number	File identification number
first name	Text	
last name	Text	
address	Text	
city	Text	
state	Text	
zip	Text	
orig notice	Date	Date of original notice
30-day	Date	Date of 30-day notice
60-day	Date	Date of 60-day notice
amount	Number	Amount owed in dollars
surcharges	Number	Late fees (calculated from "amount")
total due	Number	Sum of "amount" and "surcharges"

File menu. The SET instruction will cause Word to prompt



Type in today's date. Word will print each of the letters.

6. You can use the same datafile to print names and addresses on the envelopes. Create a simple main document:

```
«data Delinquent 60»



                    «first name» «last name»
                    «address»
                    «city», «state»
                                    «zip»
◇
```

Select Print Merge again, but be sure to click the Cut Sheet button so that Word pauses between envelopes.

Part III

Appendixes

The following two appendixes show you how the Microsoft products relate to the rest of the Macintosh world. Appendix A shows you how to manage your Microsoft disks and set up your applications with various Macintosh configurations. Appendix B covers many of the other Macintosh applications that can use data from, or produce data for, the Microsoft applications.

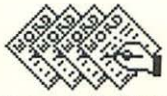
A

Hints for Using the Microsoft Applications

You can use a number of "housekeeping" procedures to make working with the Microsoft applications easier and more efficient. This appendix discusses these and suggests various ways you can use the applications if you have a nonstandard Macintosh setup.


Macintosh

Backing Up Programs


Microsoft Word

An important way of averting disaster on your Macintosh is to *back up* (make copies of) your disks regularly. Your Macintosh may *crash* (fail to work) despite your best precautions. If you make regular copies of your data and program disks, a crash will cause only limited damage.

Almost every computer professional stresses the importance of regularly copying data onto another disk, known as a *backup disk*. The disk should be stored in a safe location. Safety is, of course, relative; if your office floods or burns down when your backup disk is in the office, it obviously won't be of much help to you. However, for most situations, simply backing up your files is an adequate precaution.

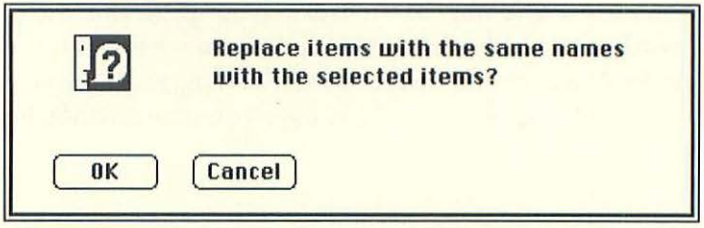
If you use a hard disk with your Macintosh, it is especially important to back up the datafiles on it. Hard disks are known to

crash more often than floppy disks, usually making all of the data disk unreadable. If you use a hard disk, remember to back up your data often.

You must decide what files you need to back up and how often you should copy them. These decisions are fairly simple: back up every file at least once, and back up every file that changes as often as you can afford the time to do so.

Backing Up Data Disks

Backing up your data is easy. In the Finder, simply copy all of your datafiles from your data disks to your backup disks. (You do not need to keep old backup copies of data once you make new copies.) For instance, if you have a data disk that contains all of your File databases, you can simply copy all the files from that disk to your backup disk by dragging the data disk's icon to the backup disk's icon. When the Finder asks,



click the OK button, since you can safely replace the old backup files with the new ones.

Backing up from a hard disk is not as easy as from a floppy disk. In the Finder, you need to select files for backing up that will fit on the destination floppy disk. This means that you cannot select more than 400K of files at a time when you copy onto a floppy disk. Some hard disks come with sophisticated backup programs; other hard-disk backup programs are available from software manufacturers.

Backing Up The Microsoft Applications

Most of the software you buy or that comes with your Macintosh is on diskette. Since diskettes wear out or become damaged, you

should always make a complete copy of each original diskette (the *master*) before you use the software. You should then store the master in a safe place and use the copy. If your working copy should later become unreadable because of wear or mishandling, you can simply copy the master again.

Some software manufacturers, including Microsoft, prevent you from completely copying your master disks. These disks contain special instructions that the Finder cannot copy. When you run one of these applications, the program looks for the special instructions on the disk; if it does not find them, it will not run. If your master copy is ever lost, destroyed, or damaged, you will not be able to run the program.

Microsoft recommends that you copy all of the files from your master disks by dragging their icons to other disks. You can then run the applications from the other disks; however, the first time you run the application after turning on your Macintosh, you must insert your master diskette in the internal drive so that the program can check that you indeed have a master disk. Since all diskettes fail at some time, this situation is hardly desirable.

You can also obtain programs that allow you to make copies of copy-protected software like the Microsoft applications. With such a program, you can make a runnable copy of your master disks. One popular disk-copying program is Copy II Mac from Central Point Software, which backs up all of the Microsoft applications as well as many other programs.

Of course, you should not use one of these programs to make copies of software that otherwise might be sold. That is illegal, in the same way that it is illegal to copy a book on a photocopier instead of buying it in a store. It is legal, however, to make archival copies of your software to protect against your original disk becoming unusable.

Managing the Clipboard And Scrapbook


Clipboard File


Scrapbook File

If you use only one system disk on your Macintosh, the Clipboard and Scrapbook files will always remain on that disk. Most people, however, use different system disks for the different programs they run. When you switch system disks, the Finder copies the

Clipboard file (but not the Scrapbook file) from system disk to system disk. You do not need to copy the Clipboard file when you switch disks.

There are many times when you want the Scrapbook file to move with you when you switch disks. For example, you may have one system disk for Chart and one for Word. If you create a few charts that you want to include in a Word document, you would save them in the Scrapbook. When you switch system disks, however, your Macintosh will access the Scrapbook on the Word system disk, not on the Chart disk.

To make a Scrapbook file from a different disk available to you, you must copy it from the first system disk to the second. To do this, simply drag the icon for the Scrapbook file from one disk to another, just as you would for any other file.

Some people like to keep many scrapbooks on one disk, although there is little use for this. Since each disk can have only one file with the name "Scrapbook File", copy the Scrapbook file and give the copy another name (such as "Old Scrapbook"). To use that file as the Scrapbook again, simply delete the current Scrapbook file and rename the one you want to use "Scrapbook File".


Diskette

Hard Disks

The Microsoft applications work fairly well with hard disks. Since the Macintosh treats hard disks as if they were large floppy disks, you can copy any of the Microsoft applications onto them and run your programs from them.

The main advantages of using a hard disk with the Microsoft applications are that hard disks hold much more data and are faster than floppy disks. Most hard disks hold 5 or 10 megabytes, which is 12 to 25 times more than a single floppy disk. Starting Microsoft File from a floppy disk takes almost 30 seconds, while starting from a hard disk takes about 15. Searching through a long Word document with the Find command takes about one-fourth the normal time on a hard disk.

When you use Microsoft applications on a hard disk, simply copy the files to the new disk. When you run your applications from this disk, you will still have to insert the master disk in the

internal floppy drive so the program can check that you have a master disk.

Integrating With the MiniFinder And the Switcher


MiniFinder


Switcher

Version 4 of the Macintosh Finder includes two features that help speed up your work, the Minifinder and the Switcher. Both of these features make moving between the Microsoft applications easier and quicker since you do not have to go through the Finder each time you leave an application.

Using the MiniFinder


MiniFinder

The MiniFinder is used instead of the Finder to move between applications. If you have a hard disk, the MiniFinder is very useful because you can specify all four Microsoft applications in its selection window. Even if you are using floppy disks, the Mini-Finder can be useful if you install it on each program disk.

When you set up the MiniFinder on a hard disk, you will probably want to include all of the Microsoft applications and MacPaint. If you are using MacDraw or other programs with the Microsoft applications, you should include them as well.

On a Macintosh with no hard disk, install the MiniFinder on each of your Microsoft program disks. When you want to switch from one application to another, simply click the Eject button in the MiniFinder and insert the new disk.

Using the Switcher


Switcher

The Switcher is different from the MiniFinder in that it allows you to run many programs at the same time. With the Switcher you do not need to exit from one program in order to run another one. For example, you can run Word and Chart at the same time; when you want to put a drawing in your Word document, you simply save it to the Clipboard, switch over to Word, and give the Paste command.

The Switcher requires at least 512K of RAM. When you start the

Switcher, you can install up to four applications to switch between. For instance, you might install Word, Multiplan, and Chart if you are writing a report that will require tables from Multiplan and drawings from Chart.

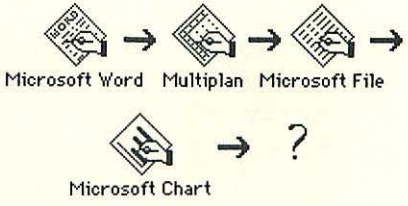
While an application is running without the Switcher, the information that the application stores on the Clipboard is in a format that only the application knows how to use. When you quit from the application, it converts whatever is on the Clipboard to a general format (such as to a MacPaint-like picture or to text with tabs between columns). However, if you are running the Switcher, you never "quit" the application; you simply switch to another one while the first one is still running. If you want to use information that the first program put on the Clipboard, the contents of the Clipboard must be converted to the general format. You can do this in two ways:

- You can press the OPTION key as you switch, which causes the Clipboard to be converted when you move between applications.
- You can set a Switcher option to always convert the Clipboard when you switch between applications. This is a bit slower than converting on demand, but you don't have to remember to convert when you need to.

Generally, you will use the Always Convert option, which is set with the Options command in the Switcher menu.

B

Integrating With Other Programs



Throughout this book you have seen how the Microsoft applications can transfer data between each other with the Clipboard and text-only files. Many other Macintosh programs can produce and use this data, and they may have capabilities not included in Word, Chart, File, or Multiplan. If you use non-Microsoft programs on your Macintosh, you should investigate the possibility of integrating them with the Microsoft applications.

This appendix discusses some of the programs that you may want to use with your Microsoft applications. Of course, new programs are produced every day, so this list will never be complete. You should use this list as a guide to some of the types of software in which you might be interested. However, keep in mind that not all software can read data from other programs. Some excellent packages, such as the Filevision database manager, cannot read data generated by other programs and cannot produce files that other programs can use. Before you buy a package, be sure that it can produce or read data from your Microsoft applications.

Integrated Software Packages

An integrated software package is a set of programs that performs many functions without requiring you to switch from program to program. Although it is easy to transfer information among Microsoft Multiplan, Word, Chart, and File, they are considered stand-alone programs, not an integrated software package. However, many integrated packages included some of the basic features of Multiplan, Word, Chart, and File.

Each program in an integrated package usually does not offer as many features as a stand-alone program. For instance, the charting portion of Jazz does not have as many features as Microsoft Chart. The tradeoff, then, is quantity of features for convenience. Integrated packages also usually cost less than the combination of Microsoft applications.

Excel

Microsoft's first integrated package, Excel, incorporates a spreadsheet, a small file manager, and a graphics package. These are the same three functions provided in Lotus 1-2-3, which was the first successful integrated package for the IBM PC.

Excel gives the user a medium amount of processing power for a low price. Excel's spreadsheet is simpler than Multiplan, and the database is less powerful than File; however, the drawing portion is nearly as complete as Chart. Excel is meant to be a cost-effective application for people who would probably never buy the entire set of Microsoft applications.

Since it is a Microsoft product, Excel can communicate with Word, Multiplan, Chart, and File quite easily. The spreadsheet portion can save files as text-only and can read data from the Clipboard. The database portion can also save and read text-only files as well as use the Clipboard for data. The drawing program can save output to the Clipboard just as Chart can.

Jazz

One of the most advanced integrated packages is Jazz from Lotus Development Corp. Like the Microsoft applications, Jazz

is based around its word processor. It also includes a spreadsheet, database system, chart maker, and telecommunications application.

With Jazz, not only can you cut and paste information from one program to another, but a HotView feature also allows you to link the data used in the various parts of the program so that when you update the original data it is also changed in any other documents that are based on it. For example, assume you are writing a document that incorporates a chart based on spreadsheet data. If you change the data in the spreadsheet, the chart in the word processing document is updated. This means you don't have to go through the procedure of making a new chart and copying it into a word processing document each time you change your spreadsheet.

Jazz can read data from all four Microsoft applications through the Clipboard. The Jazz spreadsheet can also read SYLK files from Chart or Multiplan, and the word processor can read text-only files from Word. Jazz can also transfer data from some of the Microsoft applications on the IBM PC.

Database Management Systems

Many Macintosh database products on the market have features that make them more suitable for some business uses than File. Some of them can give you more flexibility in data reporting and can relate the information in one database with the information in a different database. Just like File, most can read data from, and write data to, the Clipboard, so they can be used with Word, Multiplan, and Chart. There are more than a dozen database managers available for the Macintosh; only a few are mentioned here to give you a flavor of the types of features you can expect to find in them.

OverVUE from ProVUE Development Corp. is a relational database system that also includes a small subset of Chart. You can use OverVUE to analyze your database without having to leave the program. It also has an advanced macro capability that lets you specify a set of commands (such as sorting, searching, and reporting) to be performed in a single step. It can read File data and write data to the Clipboard for use in the Micro-

soft applications.

Odesta's Helix is a user-friendly system whose features are often only found on advanced systems. The entire program is icon-oriented, so beginning database users who are familiar only with the Macintosh interface can use it easily. It can read and save data through the Clipboard.

Programming Languages

You can overcome some of the limitations of File and Multiplan by writing programs that manipulate the data produced by the other Microsoft applications. For example, assume that you have two fields in a File database, one for the ZIP code and one for the state. You cannot cause File to change the value of the state field in a record based on the value of the ZIP code field, even though you can determine the state from the ZIP code. However, you can write a program to read a File text-only database and change the fields accordingly.

Many people assume that it is necessary to learn a programming language in order to use a computer effectively. This is not true. You should only learn a programming language if you need an unusual program; even then, you will probably find that such a program already exists. If no such program is available, you can always hire someone to write it for you.

The more you use the Microsoft applications, the more you will think of features that you wish had been built into them. Some programming languages can give you these capabilities in a limited fashion by manipulating data that is in text-only files or in the Clipboard. For example, you may want to be able to

- Change File fields based on other fields in the record
- Perform a calculation on records in a File database (such as adding 10 percent to a numeric field)
- Use scientific calculations that are not available in a Multiplan spreadsheet
- Determine the number of words in a Word document.

There are dozens of programming languages, although

many are only minor variations on others; only a dozen of them are understood by more than a few programmers. Most of these popular languages have been translated to the Macintosh. Recently, some programming languages that run only on the Macintosh have been developed.

The following list gives you a brief overview of the programming languages available. Many others will be written as the Macintosh becomes more popular.

- Pascal—Apple's first supported language on the Macintosh was Macintosh Pascal. Apple felt that it was better for beginning users to learn a structured language like Pascal than to learn BASIC. Pascal has been adopted as Apple's preferred language on all of their computers, and it is being taught in many introductory computer courses in colleges. SofTech Microsystems also produces a Pascal compiler.
- BASIC—BASIC is one of the most popular languages because it is easy to learn. Many computer professionals turn up their noses at BASIC, but it is a good way to learn some of the concepts behind programming. Microsoft's BASIC has many features of Pascal and can be used to read and write data in the Clipboard.
- FORTRAN—Many scientific laboratories use FORTRAN for all of their computations. MacFortran from Absoft is a full implementation of FORTRAN 77, the latest standard version of the language. It includes many handy features, such as the ability to create your own applications that can be run from the Finder and the ability to use the Macintosh's standard windows and menus.
- COBOL—Although COBOL is not as popular as it was 15 years ago, it is still used by many programmers. MacCOBOL from Micro Focus incorporates many of the features of mainframe COBOLs as well as using the standard Macintosh interface.
- C—The C programming language is the most popular language for Macintosh applications development. Although learning C is not as easy as learning BASIC or Pas-

cal, it is more powerful for the advanced programmer. If you are a beginning C user, the Hippo-C Level 1 from Hippopotamus Software is an excellent way to learn the language without worrying about the intricacies. There are many full-functioned C compilers available, including those from Manx, Consulair, Hippopotamus, and MegaMax.

- Modula-2—Although it is similar to Pascal, Modula-2 has many features that makes it more powerful for advanced programmers. It was designed by the same person who originally designed Pascal, and many of Pascal's inconsistencies have been successfully redesigned.
- Forth—MacForth from Creative Solutions was one of the first languages available for Macintosh development. The Forth language is best suited for creating compact programs that run quickly. Most people find it hard to learn, although its adherents claim that it is the most simple language available.
- Lisp—Most of the artificial intelligence programs that are being produced in the United States are written in Lisp. Like Forth, it is often hard for beginners to learn, although the underlying structure of the language makes it very useful for applications that handle lists. ExperLisp from Expertelligence is a good learning environment for the Lisp language.
- Neon—This new language, from Kriya Systems, is the first language that is available only on the Macintosh. Neon is different from many programming languages because it uses data as "objects" that the program moves around; this makes programming in Neon more intuitive than languages in which you have to guess how the computer will handle your data.

Other Programs

There are hundreds of programs for the Macintosh that are not listed here. You can find advertisements and reviews of many programs in magazines such as *MacWorld*, *A+*, and *Macazine*. Some of these Macintosh products work directly with the

Microsoft applications and enhance their usefulness.

Several of the Macintosh spelling programs work with documents created by Word. A spelling checker examines each word in your text file, looks up the words in its dictionary, and tells you which ones it does not recognize. It then lets you decide if you misspelled the words or if the program is just not familiar with them (for instance, acronyms and proper names). Since most of these programs are used primarily with MacWrite files, check whether a program works with Word before you buy it.

If you invest in stocks or bonds, you can get current information on your holdings with a modem and the Dow Jones News/Retrieval Service. If you use Dow Jones' telecommunications software, Straight Talk, you can also use its Spreadsheet Link package to read data from the service directly into Multiplan spreadsheets. Spreadsheet Link relieves you of having to give commands to read the latest data every time you dial into the service. The program will automatically update any of your Multiplan spreadsheets with data from the service.

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