Quattro® Pro for Windows

User's Guide

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C O N T E N T S

T A B L E S

F I G U R E S

INTRODUCTION

This book is one in a set of four Quattro Pro for Windows manuals:

- *Getting Started* tells you how to install Quattro Pro and includes a hands-on tutorial that introduces you to the basic features. It also contains a chapter written for users of DOS spreadsheet products.
- *Building Spreadsheet Applications* includes information on using built-in @functions in formulas, on writing macros to automate your work, and on creating your own dialog boxes and menus to build interfaces to spreadsheet applications.
- *Quick Reference Guide* gives visual reminders to Quattro Pro terminology, and lists properties, menu commands, @functions and macro commands.
- This book, the *User's Guide*, is your major source of information about the program as you learn to use it. It goes into detail about each area of Quattro Pro.

Before you begin this book, follow the instructions on installing Quattro Pro in *Getting Started*.

What's in this manual

This book contains these chapters and appendixes:

- **Chapter 1, "Essentials,"** describes the things you need to know about Quattro Pro no matter how much experience you have with spreadsheet products.
- **Chapter 2, "Entering data,"** explains how to enter labels, numbers, formulas, and dates.

- **Chapter 3, "Editing,"** explains the kinds of changes you can make in a spreadsheet page—from moving data to performing a global search and replace operation.
- **Chapter 4, "Block and page properties,"** describes the *properties* (or characteristics) of blocks and pages, such as alignment, numeric format, and fonts. Most of these properties affect the appearance of your data.
- **Chapter 5, "Files,"** explains how to load and save Quattro Pro files.
- **Chapter 6, "Windows,"** describes how to work with Quattro Pro windows on the screen.
- **Chapter 7, "Printing,"** explains how to print data and graphs, and how to set margins, orientation, and page length.
- **Chapter 8, "Building graphs,"** describes how to create the many types of graphs available in Quattro Pro.
- **Chapter 9, "Graph properties,"** explains how to change the properties of graphs and their elements.
- **Chapter 10, "Enhancing graphs,"** shows you how to add elements such as text boxes, arrows, and rectangles to your graphs. It also explains how to create slide shows.
- **Chapter 11, "Advanced editing,"** describes powerful features such as grouping pages, pasting specialized data, defining styles, and reformatting text entries.
- **Chapter 12, "Linking notebooks,"** explains how to reference data between cells in different notebook files.
- **Chapter 13, "Databases,"** shows how to set up a database within Quattro Pro and search and sort through it.
- **Chapter 14, "Data analysis,"** covers advanced math features such as regression analysis, matrix arithmetic, and sensitivity tables. It also describes the powerful Optimizer and Solve For features for performing goal-seeking calculations, and linear and nonlinear programming.
- **Chapter 15, "Importing and exporting data,"** describes how to translate files to and from other program formats. It also covers importing and parsing text files, and combining and extracting notebook files.
- **Chapter 16, "Global properties,"** describes the properties of the Quattro Pro application itself. It also covers notebook properties.

- **Appendix A, "Keys and indicators,"** lists mode and status indicators, and explains what the arrow, function, and other special keys do.
- **Appendix B, "Optimizing performance,"** gives tips on ways to make Quattro Pro operate as quickly as possible.
- **Glossary** defines words used in this manual.

Typefaces and icons in this book

The different typefaces in this manual are used as follows:

`Monospace`	This typeface represents text as it appears on the screen, and anything you must type.
Italics	Italics are used for emphasis and to introduce new terms.
Keycap	This typeface indicates a key on your keyboard. It often indicates a key you should press—for example, "Press *Enter* to complete an entry."

When commands appear in full (the name of the command preceded by the "path" used to get to it), the individual commands in the path are separated by vertical bars (|). For example, "Block | Insert | Rows" refers to the command you choose by opening the Block menu, then the Insert submenu, and choosing Rows.

Note Notes give additional information on the subject at hand, such as exceptions to a general rule, or more technical detail for advanced users.

Caution! Cautions alert you to the potential loss of information.

This lightbulb icon points out helpful tips, suggestions, and shortcuts.

How to contact Borland

North American customers can register by phone 24 hours a day: 1-800-845-0147.

Borland offers a variety of services to answer your questions. Be sure to send in the registration card; registered owners are entitled to technical support and receive information on upgrades and supplementary products.

Resources in your package

This product contains many resources to help you:

- The manuals provide information on every aspect of the program. Use them as your main information source.
- While using the program, you can press *F1* for help at any time.
- Two function key templates (one for each keyboard style) provide a quick guide to the uses of the function keys in Quattro Pro.

Borland resources

Borland Technical Support publishes technical information sheets on a variety of topics and is available to answer your questions.

1-800-822-4269 TechFax

TechFax is a 24-hour automated service that sends free technical information to your fax machine. You can use your Touch-Tone phone to request up to three documents per call.

408-439-9096 (modem) File Download BBS 2400 Baud

The Borland File Download BBS has sample files, applications, and technical information you can download with your modem. No special setup is required.

Subscribers to the CompuServe, GEnie, or BIX information services can receive technical support by modem. Use the commands in the following table to contact Borland while accessing an information service.

Online information services

Service	Command
CompuServe	GO BORLAND
BIX	JOIN BORLAND
GEnie	BORLAND

Address electronic messages to Sysop or All. Don't include your serial number; messages are in public view unless sent by a

service's private mail system. Include as much information on the question as possible; the support staff will reply to the message within one working day.

408-461-9122 (voice)
Technical Support
6 a.m. to 5 p.m. PST

Borland Technical Support is available weekdays from 6:00 a.m. to 5:00 p.m. Pacific Standard Time to answer technical questions about Borland products. Call from a telephone near your computer, and have the program running. Keep the following information handy:

- Product name, serial number, and version number.
- The brand and model of any hardware in your system.
- Operating system and version number. (Use the DOS command `VER` to find the version number.)
- Contents of your AUTOEXEC.BAT and CONFIG.SYS files (located in the root directory (\) of your computer's boot disk).
- Contents of your WIN.INI and SYSTEM.INI files in the directory where you installed Windows.
- Your network name and software version number, if you're running Quattro Pro on a network.
- A daytime phone number where you can be contacted.
- If the call concerns a problem, the steps to reproduce the problem.

408-461-9000 (voice)
Customer Service
7 a.m. to 5 p.m. PST

Borland Customer Service is available weekdays from 7:00 a.m. to 5:00 p.m. Pacific Standard Time to answer nontechnical questions about Borland products, including pricing information, upgrades, and order status.

C H A P T E R

1

Essentials

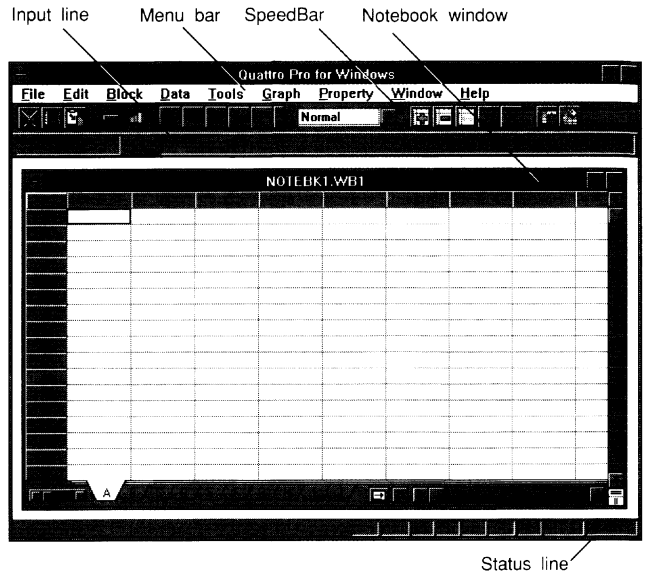
This chapter explains things you need to know to use Quattro Pro, no matter what level of experience you have with spreadsheet products. It explains

- the areas of the Quattro Pro screen
- what *notebooks* are and how best to use them
- using Object Inspector™ menus to change the properties (the characteristics) of Quattro Pro objects
- how to move around and select in the notebook
- how to undo mistakes
- how to get onscreen help

Screen areas

If you need help starting Quattro Pro, refer to Chapter 1 in *Getting Started*. When you first start, the Quattro Pro window looks like the following figure:

Figure 1.1
Components of the Quattro Pro window



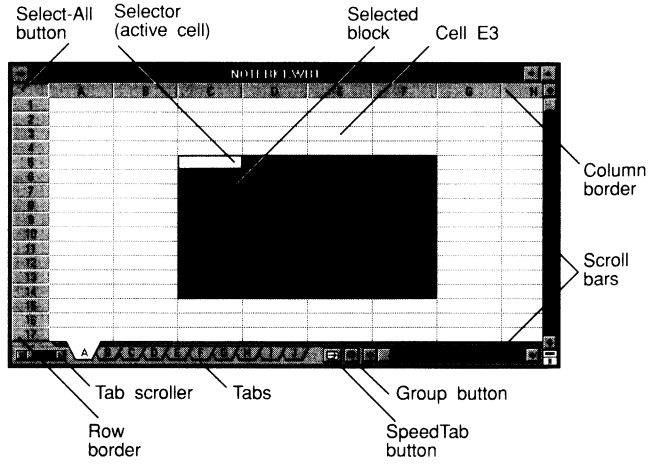
- The **menu bar** offers the main level of commands. It uses pull-down menus as in standard Windows applications.
- The **SpeedBar**™ contains buttons for choosing often-used commands, as described on page 10.
- The **input line** is where you enter and edit cell entries.
- The **status line** displays information about the current state of the program (for example, the READY indicator means Quattro Pro is ready for you to do something). For complete information on the contents of the status line, see Appendix A.
- The **notebook window** is where your data appears.

The notebook window

A *notebook* is a collection of 256 spreadsheet pages and the Graphs page, which is the last page. Each spreadsheet page is a grid made up of columns and rows. The Graphs page contains icons, each representing a graph, slide show, or dialog box you've created.

Each notebook is saved as its own file. The default file name for the first notebook is NOTEBK1.WB1. See page 12 for more information on notebooks and the best ways to use them.

Figure 1.2
Elements of a notebook window

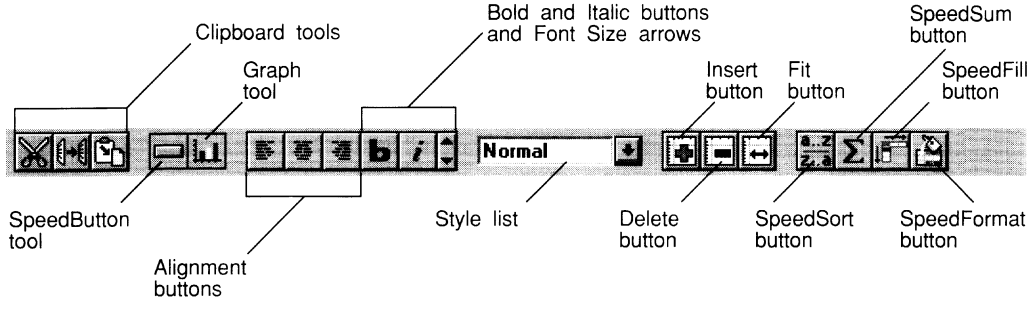


- A **cell** is a box that can hold data. The row and column containing a cell determine its *address*. For example, cell E3 is at the intersection of column E and row 3 (as shown in the previous figure).
- The **selector** is the black outline that indicates the *active cell* (the one that is currently selected). In the previous figure, the selector is on cell C5.
- A **block** is a rectangular group of one or more cells. A block is identified by *block coordinates*, which are the cell addresses of the upper-left and bottom-right corners separated by two periods (C5..F14, for example).
- The **Select-All button** selects all cells on the active page.
- **Tabs** are the page identifiers at the bottom of the window. Using the **tab scroller**, you can display tabs for pages not currently visible.
- The **Group button** activates Group mode, which is a way to change multiple pages simultaneously. See page 248 for more information.
- The **SpeedTab™ button** gives you rapid access to the Graphs page, which is the last page of the notebook. See page 14 for details.
- **Scroll bars** appear along the right and bottom edges of the window. As in most Windows applications, these scroll bars move you around the page quickly.
- The **column** and **row borders** identify columns and rows.

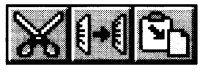
The SpeedBar

Just under the menu bar is a row of buttons and tools called the *SpeedBar*. SpeedBar *buttons* let you quickly choose commonly used commands or properties. SpeedBar *tools* create *objects*. The notebook SpeedBar looks like this:

Figure 1.3: Notebook SpeedBar



These buttons and tools are available:



- The **Cut**, **Copy**, and **Paste** buttons cut, copy, and paste data and objects to and from the Windows Clipboard. They perform the same actions as the corresponding commands in the Edit menu. For complete information on these commands, see page 50.

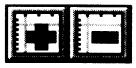
- The **SpeedButton**™ tool creates buttons you can use to run macros. SpeedButtons are floating objects that appear in a layer above spreadsheet cells. See Chapter 4 in *Building Spreadsheet Applications* for more information.

- The **Graph** tool creates floating graphs that appear above spreadsheet cells. You can double-click a floating graph to put it into a graph window for editing. For more information on using the Graph tool, see page 140.

- The **Alignment** buttons place cell entries left-aligned, right-aligned, or centered. These buttons correspond to the Alignment property (in the block Object Inspector), described in full on page 78.

- The **Style list** specifies the style for the active block. For information on the predefined styles in Quattro Pro, see page 86.

- The **Bold** and **Italic** buttons switch bold and italic font on and off in the active block. The arrow buttons decrease and increase the point size. These buttons are a quick way to change the Font property (in the block Object Inspector), as described on page 77.



- The **Insert** and **Delete** buttons let you insert or delete blocks, rows, columns, and pages. They duplicate the effects of Block | Insert and Block | Delete, which are described on page 60 and page 63, respectively.

- The **Fit** button lets you quickly tailor a column's width to its widest cell entry. It performs the same action as the Auto-Width setting of the Column Width property (in the block Object Inspector), described on page 83.

- The **SpeedSort**™ button sorts data in ascending or descending order in the active block. For complete information, see page 303.

- The **SpeedSum**™ button totals values by generating @SUM functions. You select the values to total in adjacent blank cells, then click SpeedSum. The totals appear in the blank cells. For more information, see page 40.

- The **SpeedFill**™ button fills the selected block with entries based on the entry in the upper left area of the block. For example, if you select several cells in a column beginning with Monday as the only entry, clicking the SpeedFill button enters names of the days of the week in sequence in the blank cells in the block. See page 42 for more information.

- The **SpeedFormat**™ button lets you choose a predefined format that sets properties in various standard areas of the selected block. For example, SpeedFormat can set different properties for a row of headings and a row of totals within the block. For more information, see page 87.

The SpeedBar changes depending on the active window and on what you're doing. When you're entering or editing cell contents, the SpeedButton and Graph tools are replaced by the @Functions and Macros buttons. An alternate SpeedBar appears when you're working in a graph window, using the Graphs page, using File | Print Preview, or creating dialog boxes with UI Builder™.

For information on the @Functions and Macros buttons, see Chapters 1 and 4 in *Building Spreadsheet Applications*. Before using the graph window SpeedBar or the Graphs page SpeedBar, see

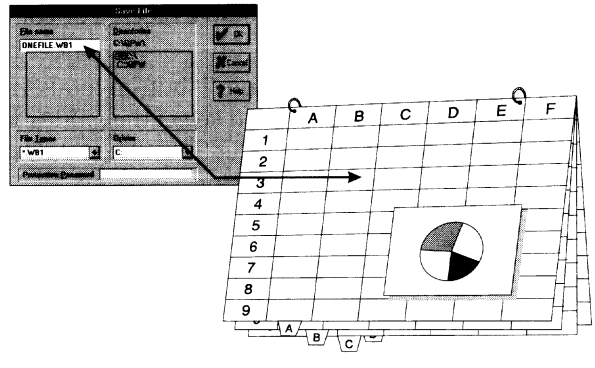
page 138. For information on buttons in the Print Preview SpeedBar, see page 129.

See Chapter 6 in *Building Spreadsheet Applications* for information on the dialog SpeedBar. That chapter also describes how to create a customized SpeedBar.

Notebooks

Notebooks are a new concept in spreadsheet products. They provide a way to organize many spreadsheets together into the same file.

Figure 1.4
A notebook as a file



There are three major ways to take advantage of notebooks:

- by breaking up a spreadsheet into small pieces on separate pages
- by gathering logically-related data into the same file
- by consolidating similarly-formatted spreadsheets into the same file

Breaking up a large spreadsheet

If you're translating a large spreadsheet from Quattro Pro for DOS or another application, you can make it easier to work with by breaking it into separate pieces for each page.

To reach an individual page, you can click the page's tab (this is easier than scrolling to different parts of a large spreadsheet).

Also, when you write a formula referring to cells on another page, the page name appears in the formula, making it easy to see what you're referencing.

Gathering related data

Instead of saving a budget, a schedule, an inventory, or other information related to the same project in different files on disk, you can make them separate pages in the same notebook. This gives you one file name to remember, not many.

By default, notebook pages are labeled A through IV, but you can give them descriptive names to remind you of their contents. For information on naming pages, see page 89.

Figure 1.5
Named pages of related data

Consolidating data

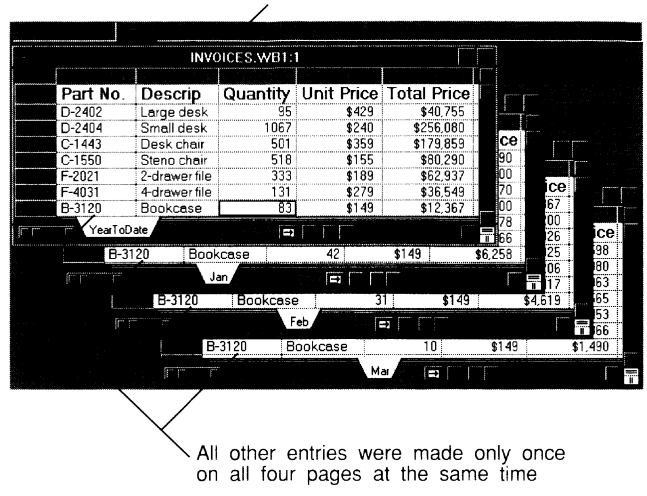
If you're working with data that conforms to a given template or layout, notebooks give you efficient ways to enter and format data. Grouping the pages together before entering standard column heading information or before making formatting changes, for example, speeds up your work. For more information on grouping pages, see page 248.

The next figure shows a notebook with pages for yearly totals and for monthly data.

Figure 1.6
Named pages of similar data

The next figure points out the common aspects of each of the pages in this sample notebook. First the pages were grouped. Then the common data and formatting was done only once, which affected all pages in the group.

Figure 1.7
A consolidation notebook

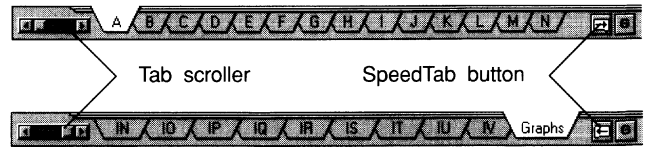


Moving around a notebook

To move to a different page in a notebook, click its tab. If its tab isn't in view, use the tab scroller to reveal additional tabs. The tab scroller works like scroll bars in most Windows applications.

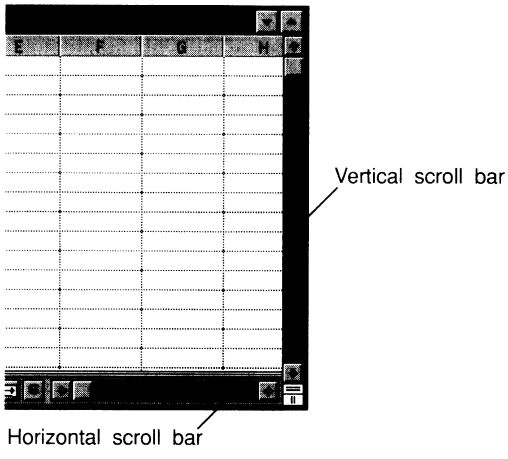
To move quickly to the last page in the notebook (the Graphs page), click the SpeedTab button. The Graphs page contains icons representing all graphs, slide shows, and dialog boxes you've created in the notebook. To switch back to the last active spreadsheet page, click the SpeedTab button again. Notice that the arrow on the SpeedTab button changes direction depending on whether the Graphs page is active or not.

Figure 1.8
Before and after clicking the SpeedTab button



After you click the tab of the page you want, you can move to different parts of the page with the scroll bars.

Figure 1.9
Scroll bars



You can also use the keyboard to move around a notebook (see Appendix A).

Selecting cells and blocks

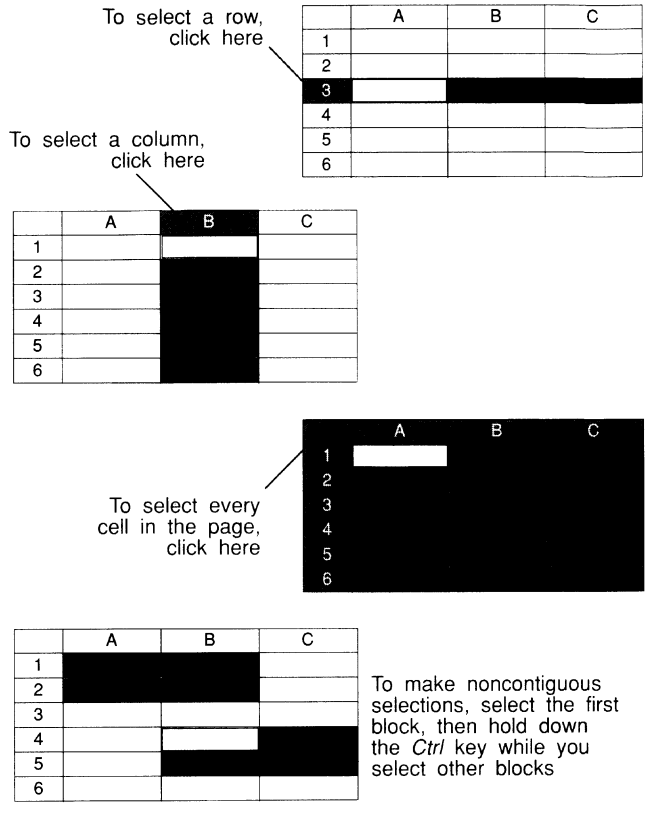
Before you can enter data or perform an action in a notebook, you need to select the cell or block(s) you want to affect.

Within the active page, to select

- A cell, click the cell.
- A block, *drag* it by clicking a cell in one corner, holding down the left mouse button, moving to the opposite corner and releasing the mouse button. Or click one corner, hold down the *Shift* key, and click the opposite corner.
- A noncontiguous block (a selection consisting of more than one disconnected block of cells), hold down the *Ctrl* key while you drag blocks.
- Every cell in a given row or column, click the corresponding row number or column letter in the border.
- All cells in the active spreadsheet page, click the Select-All box at the intersection of the row and column borders.

Figure 1.10
Selecting on the active page

When you select a block, the active cell within the selected block contains the selector, while the remainder of the selected block is highlighted.

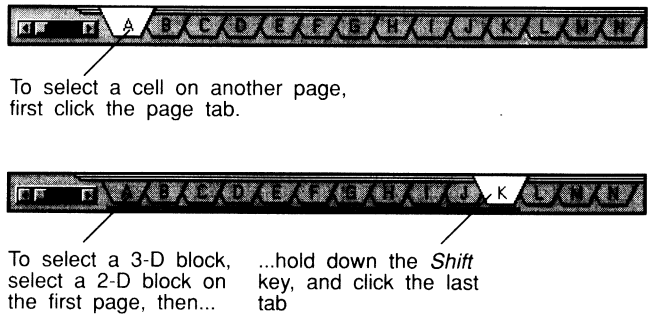


Note If you select and drag within a block of cells that are *already selected*, the mouse pointer changes to a hand, and a colored outline appears around the selected block. When you release the mouse button, the data moves to wherever you've moved the colored outline. For more information on this Drag and Drop feature, see page 50.

To select

- A cell on another page, click the page tab, then click the cell you want.
- A 3-D block (a block with the same coordinates in multiple pages), *first* select the block in the first page in the block, then hold down the *Shift* key while clicking the tab of the last page for the block. A black line appears under the tabs of the selected pages.

Figure 1.11
Selecting on other pages



You can also use the keyboard to select in a notebook (see Appendix A).

Objects and their properties

Quattro Pro provides a quick way to make changes to individual objects. You just right-click an object, and an Object Inspector menu appears.

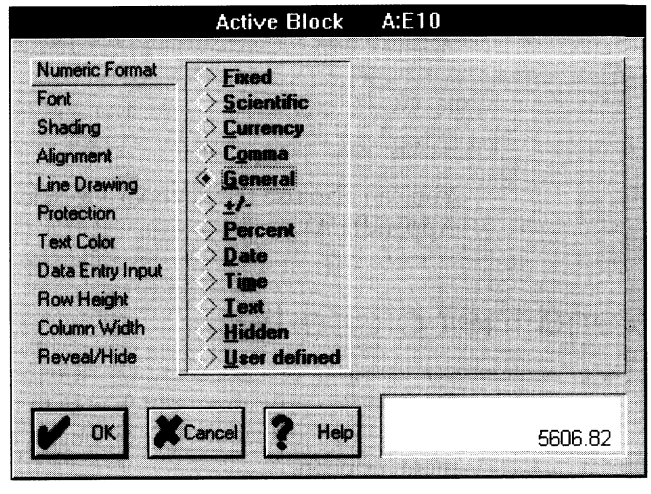
An Object Inspector is available for these objects:

- blocks (consisting of one or more cells)
- pages
- notebooks
- graphs in windows, and their elements, such as bars, axes, or text boxes
- floating objects, such as graphs, graphic images, or SpeedButtons that appear in a layer above spreadsheet cells
- dialog boxes you create and their elements, such as radio buttons or edit fields
- the Quattro Pro application itself

Each of these objects has *properties*, which are characteristics particular to that type of object. For example, blocks have a Font property that can be set to Bold, so that the text of entries in the block appear in boldface type. One property of a page is the name that appears on its tab. Each notebook has its own Palette property for controlling the colors available. Quattro Pro's system defaults, such as the default storage directory or file extension are *application* properties.

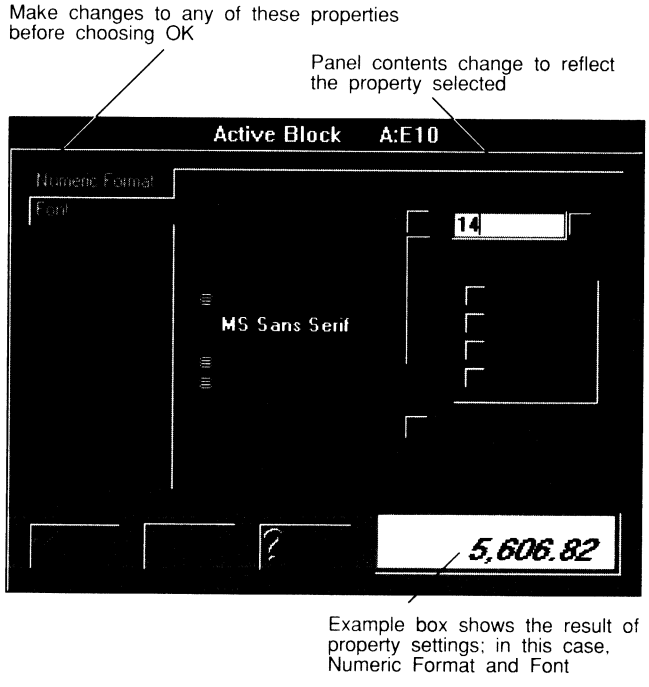
To change the properties of an object, *right-click* it. A different Object Inspector menu appears depending on the type of object you right-click.

Figure 1.12
Block Object Inspector

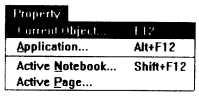


From the left side of the Object Inspector, choose the property you want to change. The options displayed on the right change to correspond to the chosen property.

Figure 1.13
A different property selected



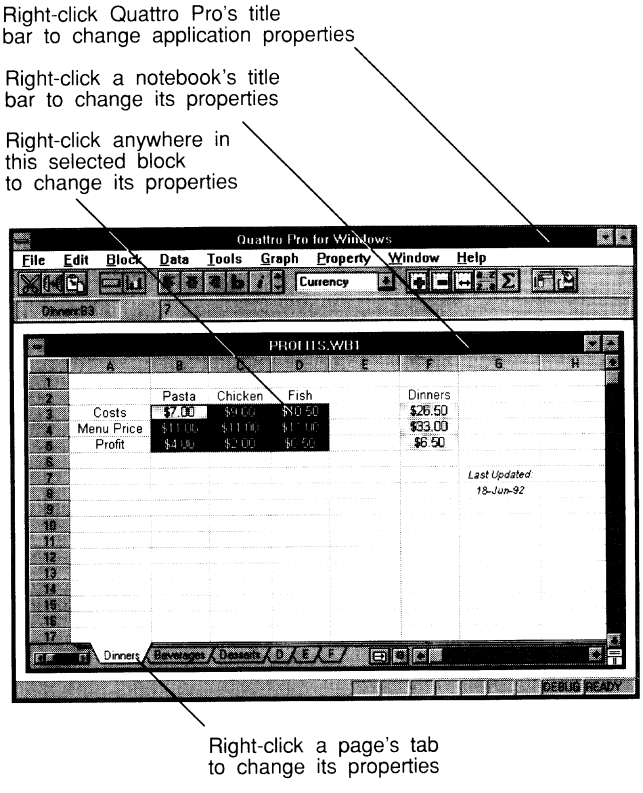
Next, choose settings for the current property. You can go on to change other properties for the current object. To help you track changes, the property name turns blue if you change its setting. If the Object Inspector has an example box, it shows the result of your choices. When you're finished, choose OK.



You can also change properties by using the Property menu. Property | Current Object displays the Object Inspector for the currently selected object; Property | Application displays the Object Inspector for the Quattro Pro application itself. Other commands, such as Property | Active Notebook or Property | Active Page, are available depending on whether a notebook, graph, or dialog window is active.

The next figure shows where to right-click to display each Object Inspector menu for the most common objects.

Figure 1.14
Where to right-click to display Object Inspector menus



Block and page properties are described in Chapter 4, and application and notebook properties are described in Chapter 16.

See Chapters 9 and 10 for information on graphs and their properties. Chapter 6 in *Building Spreadsheet Applications* describes how to create dialog boxes and set their properties.

Undoing mistakes

Quattro Pro provides an Edit | Undo command that reverses most kinds of operations after you've carried them out. For example, if you make an entry in a cell, then change your mind and want to remove it, choose Edit | Undo *immediately* after making the entry. The entry will be removed and whatever was previously entered in the cell will be returned.

You can identify your last action by the wording of the Undo command. For example, after making a cell entry, the Undo command reads "Undo Entry." After changing the Zoom Factor property (in the notebook Object Inspector), the Undo command reads "Undo Notebook Property."

If you change your mind *again* after using Undo and want to reinstate the first change, choose Edit | Redo. As with Undo, Redo specifies the type of operation available to be redone.

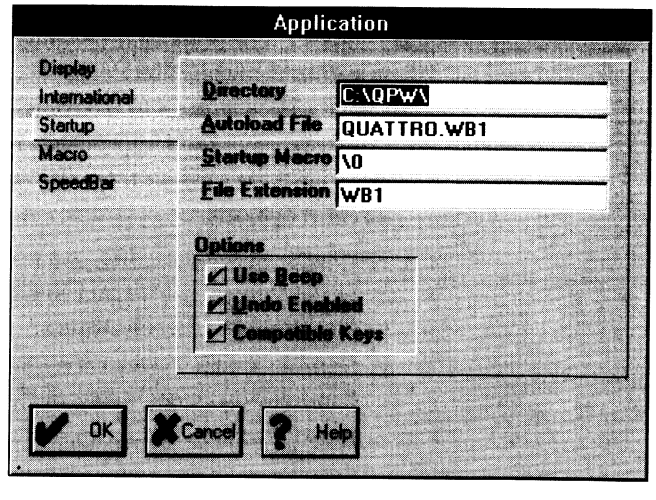
Some actions are undoable only if you enable Undo (in the application Object Inspector). You can identify these actions because the Undo command is dimmed immediately afterwards. In all situations except where program speed and available memory are absolutely crucial, it's recommended that you keep Undo enabled.

To enable Undo for the maximum variety of actions,

1. Move the mouse pointer to the Quattro Pro window title bar and click the right mouse button.
2. Choose Startup.
3. Check Undo Enabled in the Options box, and choose OK.

For a complete list of actions that are always undoable, see page 389.

Figure 1.15
Enabling Undo



Canceling an action

There are several other ways to cancel actions in Quattro Pro:

- To put away a menu, click anywhere outside the menu or press *Esc*.
- To cancel changes made in the input line, click ✕ or press *Esc*.
- To close a dialog box without accepting any changes, click Cancel or press *Esc*.
- To cancel just about *any* action, hold down the *Ctrl* key and press *Break*.

Caution! If you made so many mistakes that you want to start over, *don't save the current notebook*. Instead, immediately reload the last-saved version of the file with File | Retrieve. You'll be asked if it's OK to lose your recent changes; click Yes if you're sure you want to. Then choose the file name to reload. For complete information on File | Retrieve, see page 100.

Getting help

If you prefer to find information electronically instead of in printed manuals, use the Quattro Pro Help system. Help appears in a separate window with its own menu bar and controls. There are three ways to display the Help window:

- **Press** *F1*. For help on a particular command, press *F1* with the command highlighted.
- **Click a Help button in a dialog box**. For help about dialog box controls, click the Help button in the dialog box (or press *F1*).
- **Choose a command from the Help menu**. The Help menu offers several options:
  - **Contents** displays the same Help Contents that appears when you press *F1* from Ready mode. Icons help you distinguish different topics.
  - **Screen Areas** shows each Quattro Pro window with an explanation of each part of the screen.
  - **Keyboard** lists the functions of keys in different modes.
  - **Functions** gives a complete list of @functions and their syntax.

- **Macros** displays all macro commands and their syntax.
- **About Quattro Pro** gives system usage information about Quattro Pro.

You can move back and forth between topics and search through the entire help system for the topic you want. If you need assistance using Help, choose Help | How to Use Help from the Help menu bar, or press *F1*.

Note Quattro Pro Help uses the Help program included in Windows 3.1. To avoid conflicts between versions of the Windows Help program, Quattro Pro searches for the earlier version and replaces it with the later version during installation. For a description of new Windows Help features, open the Help window and choose Help.

Moving through the Help window

No matter how you reach the Help window, you use the same commands and buttons to find the information you need. Click underlined topics in the Help Contents to move to screens with further information. Click topics with dotted underlines to see glossary definitions, or to display a pop-up window with further choices.

You can also use these buttons:

- **Contents** displays the complete table of contents of the Help system.
- **Search** displays the Search dialog box and a list of keywords you can use to find help topics.
- **Back** displays the previous help topic, if any.
- **History** lists the Help topics you've mostly recently viewed. To return to one of those topics, double-click it in the history list.

Exiting Help

Both the File | Exit command and the Close command in the Help system menu close the Help window. You can also leave the Help window open, and continue working in Quattro Pro. You can

- resize the Help window to avoid obscuring your work
- drag its title bar to move it elsewhere on the screen
- resume your work, leaving the content of the Help window in view (choose Help | Always on Top available in Windows 3.1)

- shrink it to an icon by clicking its Minimize button

Where to go from here

From now on, you can probably accomplish most tasks in Quattro Pro just by experimenting. If you have questions, do any of the following:

- Consult online Help (press *F1*).
- Look up topics using the Index in this manual.
- Use the Table of Contents in this manual to identify whole chapters and topics to read.
- Consult the *Quick Reference Guide* for reminders.
- If you want to learn to use Quattro Pro step by step, use the tutorial in Chapter 3 of *Getting Started*.

C H A P T E R

2

Entering data

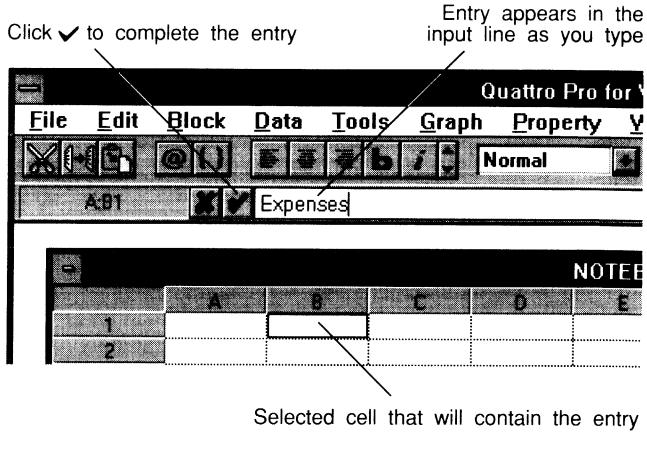
This chapter describes how to

- enter labels and values into cells
- build formulas to make calculations
- fill a block with a sequence of values

Basic data entry

When you start Quattro Pro, a blank notebook appears, ready for data entry.

Figure 2.1
Entering data



To enter data in a cell, click the cell (or use the arrow keys to move the selector to the cell) and type the entry. The characters you type appear in the input line below the SpeedBar. Use *Backspace* to erase mistakes as you type.

When you click ✓ in the input line (or press *Enter* or one of the arrow keys) Quattro Pro writes the data into the cell. If the entry is a formula, the result of the formula appears in the cell.

Quattro Pro displays an error message if it discovers a problem with an entry, such as an invalid character. After you click OK to clear the error message, you enter Edit mode, with the insertion point positioned at the problem character in the input line. Quattro Pro won't accept the entry until you correct the problem. To cancel the entry, click the × button or press *Esc*. (See page 47 for information on Edit mode.)

You can also calculate values *before* you enter them. Type the formula on the input line, but press *F9* instead of *Enter*. For example, if you type `8*9` on the input line, then press *F9*, Quattro Pro replaces the formula with the result, 72. Press *Enter* or click ✓ to write the result into the cell.

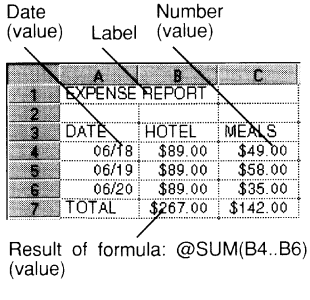
Finally, you can *drill* an entry into several pages at once using Group mode. For information, see page 248.

Types of data

There are two types of data in a spreadsheet page: labels and values.

- A *label* is a text entry such as "Total."
- A *value* is a number, a date, a formula, or a formula's result.

Quattro Pro determines whether the data is a label or a value based on the first character you type (as discussed in the following sections). It replaces the READY indicator on the status line with LABEL for text or VALUE for numbers, dates, or formulas. After you enter the data, the READY indicator reappears.



Labels

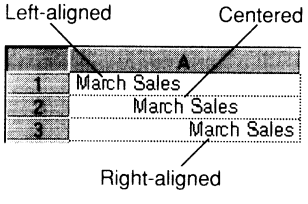
When you type a label into a cell, it can begin with any letter or punctuation mark except the following:

```
/ + - $ ( @ . #
```

If you need to start a label with any of these characters or with a digit (0–9), precede it with a label-prefix character, as described in Table 2.1.

You can force a block to accept only label entries (see page 82).

Label alignment



When you enter a label, it is positioned within the cell according to the default label alignment, which is usually left-aligned. To align a label differently from the default alignment, precede the label with a *label-prefix character*.

Label-prefix characters don't appear in the cell itself, but they do appear on the input line when you select the cell.

Table 2.1
Label-prefix characters

Label-prefix character	Alignment
' (apostrophe)	Left-aligned
^ (caret)	Centered
" (quotation mark)	Right-aligned

To begin a label with one of the label-prefix characters, precede it with another label-prefix character indicating the alignment you want. For example, to enter the label

"Lefty" Grove

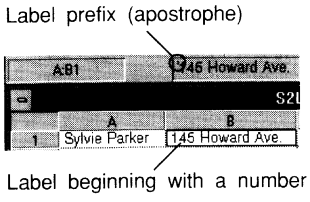
and left-align it, type the label as follows:

```
'"Lefty" Grove
```

To change alignment for several labels at once, use the Alignment buttons in the SpeedBar (see page 78).

To change the default label alignment setting for a given page to right-aligned or centered, see page 91.

Numbers in labels

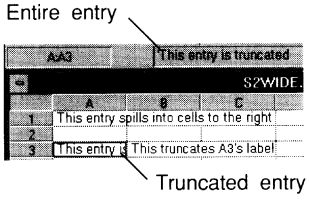


As long as a label begins with a letter or punctuation mark, you can include numbers with no special prefix. To enter a label that begins with a number, such as *145 Howard Ave.*, precede it with a label-prefix character (see Table 2.1). Otherwise, the entry is considered invalid (Quattro Pro initially identifies it as a value, but values cannot contain text).

Some numeric entries cause problems if you don't enter them as labels. For example, the phone number 555-1233 appears as `-678` in the cell because Quattro Pro interprets it as a formula; it subtracts 1233 from 555.

If there are groups of cells in which you want to enter phone numbers or zip codes, you can predefine those cells as labels with the Data Entry Input property (see page 82). You can then omit the label-prefix character when you enter phone numbers or zip codes.

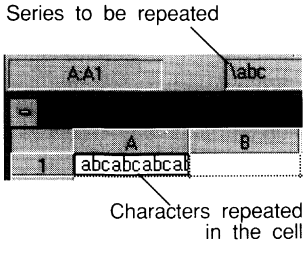
Wide labels



When a label exceeds the width of the cell, the text spills into blank cells to the right. When the label runs into a cell that contains an entry, Quattro Pro truncates the displayed appearance of the label, but still stores the entire label.

To see all of a truncated entry, select its leftmost cell (the cell that contains the entry). The entire label appears in the input line. To fully display a truncated entry in its own cell, widen the column containing it (see page 84).

Repeated characters



You can repeat one or more characters to fill a cell by preceding the character(s) with a backslash (\). For example, to fill a cell with hyphens, type a backslash and a hyphen (\–).

To repeat a series of characters in a pattern, enter the first set of characters to be repeated after the backslash, such as `\abc`.

To begin a label with a backslash without repeating the characters after it, precede the backslash with a label-prefix character.

Numbers

When you begin typing a number, VALUE appears on the status line. After you complete the entry, the indicator changes to READY. By default, numbers appear right-aligned in the cell (to change alignment, see page 78).

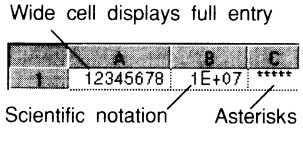
Keep these rules in mind when entering numbers:

- A number entry can contain only numerals (0 to 9), a leading negative (-) or positive (+) sign, a single decimal point, and an ending percent sign (%).
- Don't use parentheses to indicate a negative number. Use a minus sign (-) instead.
- Don't include commas when entering numbers.
- Don't include spaces in the entry.
- Don't substitute a lowercase *l* ("el") for 1 (one) or an uppercase *O* ("oh") for 0 (zero).

Note If you want to surround negative numbers with parentheses, to add commas, or to otherwise change the appearance of numbers, you can change the Numeric Format property (see page 74).

You can use scientific notation (for example, 2.35E+8) to enter a number. If the calculated number fits in the cell (and the numeric format makes it possible), it appears in full.

Length



Like a label, a number can be longer than a cell is wide. If a number is wider than a cell, however, it doesn't spill into adjacent cells as labels do. Instead, it appears either in scientific notation or as asterisks (*********) indicating that there isn't enough room for the entry. The full number appears when you widen the column (see page 82).

Dates and times

Another type of value entry is a date or a time, as long as it's entered in one of the legal date or time formats. To enter a date or time into a cell, hold down the *Ctrl* and *Shift* keys and press *D*, then enter the date or time in one of the following formats:

- DD-MMM-YY (04-Mar-92)
- DD-MMM (04-Mar)—this assumes the current year if you change to a date format that displays the year
- MMM-YY (Mar-92)—this assumes first day of the month if you change this to a date format that displays the day
- the Long International date format—the current International property setting (in the application Object Inspector), ordinarily MM/DD/YY
- the Short International date format—the shortened version of the current International property setting, ordinarily MM/DD
- HH:MM:SS AM/PM (01:42:30 PM)
- HH:MM AM/PM (01:42 PM)
- the Long International time format—the current International property setting, ordinarily HH:MM:SS
- the Short International time format—the shortened version of the current International property setting, ordinarily HH:MM

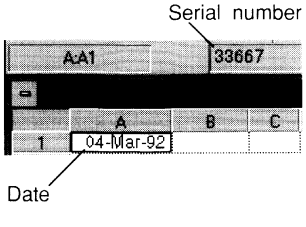
The four International date and time formats correspond to the International property settings in the application Object Inspector (see page 386). If you change those settings, you must then conform to the new settings when you enter dates or times in one of the international formats.

Once you enter a date or time, you can change to another date or time format with the Numeric Format property (see page 74).

If you forget to press *Ctrl+Shift+D* before entering the date or time, Quattro Pro interprets the date or time as a formula. Press *F2* to edit the cell, then press *Ctrl+Shift+D* followed by *Enter*.

You can force a block to accept only dates or times (see page 82).

Date calculations



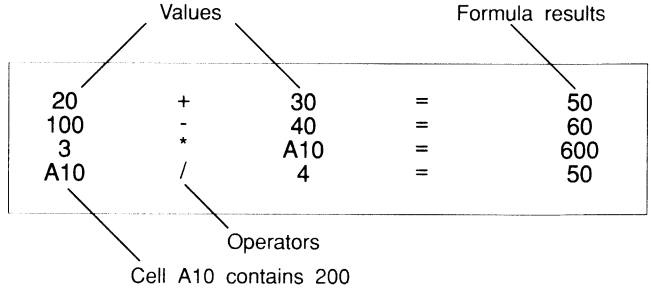
Dates and times are represented on the input line by serial numbers. For dates, the serial number is an integer. The serial number for times is a decimal fraction between 0.000 and 0.99999.

Serial numbers let you use date or time values in formulas. For example, subtracting 10/1/92 from 10/8/92 results in 7. For more information on date and time serial numbers, see Chapter 1 in *Building Spreadsheet Applications*.

Formulas

A formula combines values and operators into an algebraic expression. The result appears in the cell containing the formula.

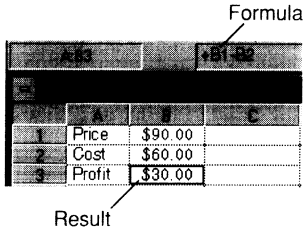
Figure 2.2
How Quattro Pro formulas work



You can use numbers, cell coordinates, or block names (see page 66) for the values in formulas. For example,

+A1 – 3

subtracts three from the value in cell A1.



The result of a formula appears in the cell. The formula appears on the input line when you select the cell and on the status line when you're editing the entry.

You can include spaces between operators and values, but Quattro Pro deletes them when you click ✓ or press *Enter* to complete the formula. A formula must begin with one of the following characters:

0 1 2 3 4 5 6 7 8 9 . + – (@ # $

Note You can also begin a formula with a comma if you've set the Punctuation option of the International property in the Application property menu to one of the four settings that specify a comma to be used as the decimal separator.

By default, Quattro Pro calculates formulas when you enter them, and recalculates them each time you change the data involved. If a notebook contains many complex formulas, you may want to postpone recalculation to save time (see page 393).

Note To begin a formula with a letter, such as for a cell address or block name (see page 66), precede it with a plus sign so the entry is considered a value, not a label.

Operators

Formulas use *operators* (such as +, –, *, and /) to act on two or more values. Often formulas contain several operators, as in

+C5 – D12 + F24 * 0.123

The result of a formula depends on the order in which the arithmetic operations are performed. Quattro Pro assigns each operator a *precedence* and performs the operations in order of precedence. Multiplication has higher precedence than addition, therefore

5 + 1 * 3 = 8, *not 18*

Operations with equal precedence are performed from left to right.

The next table lists the operators and the precedence assigned to each. Operators with the highest precedence (7) are performed first.

Table 2.2
Quattro Pro operators

Operator	Description	Precedence
^	To the power of (exponentiation)	7 (highest)
– +	Negative, positive	6
* /	Multiplication, division	5
+ –	Addition, subtraction	4
= <>	Equal, not equal	3
< >	Less than, greater than	3
<=	Less than or equal	3
>=	Greater than or equal	3
#NOT#	Logical NOT	2
#AND# #OR#	Logical AND, logical OR	1
&	String concatenation	1 (lowest)

To quickly remember the order of precedence of the common arithmetic operators, use the phrase "**M**y **D**ear **A**unt **S**ally" (multiplication, division, addition, and subtraction).

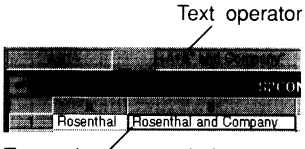
You can override operator precedence by including parentheses in formulas. Enclose in parentheses the portion of a formula you want calculated first. You can nest parentheses inside other parentheses; Quattro Pro calculates the innermost part first. For example,

4 * 2 + 3 = 11
4 * (2 + 3) = 20
(4*2) + (3 + 5) * 4 = 40
((4*2) + (3 + 5)) * 4 = 64

Types of operators

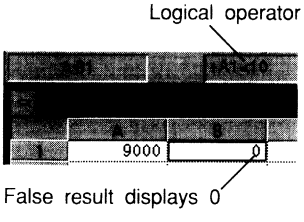
Arithmetic operators, such as the + and * used in +B3*1.3, perform addition, subtraction, multiplication, division, and exponentiation. These are the most commonly used operators:

+ - * / ^



The & (concatenation) operator is a *text* operator. You can use it to join text strings, whether each string is typed into the formula or pulled from a cell reference.

To join text strings, separate each text string or cell reference with an ampersand (&). Text strings must be surrounded with double quotation marks, and references must be to cells that contain labels. If you want a space between strings, be sure to type it within the double quotation marks.



Logical operators determine whether expressions are true or false. For example, +A1<10 determines whether the value in A1 is less than 10. If the expression is true, the cell displays 1; if false, it displays 0.

These are logical operators:

< > <= >= <> = #NOT# #AND# #OR#

For more information on types of operators, see Chapter 1 in *Building Spreadsheet Applications*.

Values in formulas

Values in a formula can be any of the following:

- Numbers (for example, 948, –84, 43.23).
- Coordinates of other cells or blocks (for example, B12, G29..G31, B:A3..D6, or [NOTEBK2]A:A1). For more information about block coordinates, see page 35.

- Block names, which are names you give a cell or block (for example, EXPENSES). See page 66 for more information.
- @Functions (for example, @SUM(B1..B24)). Quattro Pro @functions are a set of standard formulas used to simplify complex calculations (see the next section).
- Text surrounded by double quotation marks (for example, "PROFIT" or "Dear Mr.").

When you use cell addresses, Quattro Pro refers to the values in the cells. For example, the formula +B6+C1 adds the values in those two cells and displays the result.

@Functions

Quattro Pro provides many built-in functions, called *@functions* because they always begin with an @ ("at") sign. @Functions are special commands that perform particular calculations and return results. You enter them into spreadsheet cells, either alone or within formulas.

Quattro Pro has more than one hundred @functions. Some of the most commonly used @functions are mathematical operations. For example, @SUM totals the contents of the blocks you reference, and @AVG returns the average of the values.

@Functions have these parts:

- the *name* of the @function (such as @SUM, or @AVG)
- the *arguments* (the values, blocks, or text strings to be operated on)
- if there are multiple arguments, the *commas* that separate them
- the *parentheses* around the arguments

All of these parts and the order in which they are used are called the *syntax*.

Note If you change the Punctuation setting of the International property (in the application Object Inspector), other characters besides commas can be used to separate arguments (see page 385).

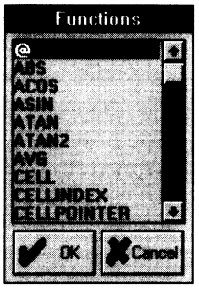
These examples show how @functions work:

- @SUM(A1..A4,B1) is equivalent to +A1+A2+A3+A4+B1.
- @AVG(A5..A8) finds the average of the values in A5 through A8.
- @ROUND(A9,2) rounds the value in A9 to two decimal places.
- @ROUND(@AVG(A5..A8),3) rounds the average of the values in A5 through A8 to three decimal places.

Quattro Pro provides the @Functions button to help you enter @functions. The @Functions button appears in the SpeedBar whenever you're entering or editing a cell entry.

To enter an @function into a cell,

1. Select the cell.
2. Type + or click in the input line to begin entering the formula.
3. Click the @Functions button or press *Alt+F3*.
4. Double-click the @function you want from the list.
5. The @function name and a left parenthesis appear in the input line. The complete syntax of the @function appears in the status line (at the bottom of the Quattro Pro window). The first argument appears in uppercase.
6. Enter the value, block reference, or text string as the first argument.
7. If the syntax of the @function you're entering requires more than one argument, type a comma. The next argument in the syntax in the status line turns to uppercase.
8. After you enter all remaining arguments, type a close parenthesis, and press *Enter*.



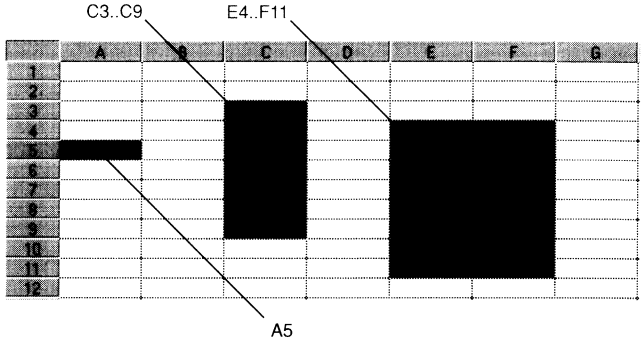
You can also enter @functions into cells by typing them; keep an eye on the status line to follow the correct syntax.

For complete information on using @functions, see Chapters 1 and 2 in *Building Spreadsheet Applications*.

Blocks

A block is any rectangular group of cells (a block can also be a single cell). The next figure shows examples.

Figure 2.3
Examples of blocks



However, you must enter two periods in block coordinates if you specified a period as the argument separator in the Punctuation setting of the International property (in the application Object Inspector); see page 385.

When specifying a block, you can enter just one dot (period) instead of two; for example, E4..F11 and E4.F11 indicate the same block.

To specify the coordinates of a block, type the address of the top left cell, followed by one or two periods and the address of the bottom right cell. For example, the block

C3..C9

refers to the middle block of cells shown in the previous figure. (You can enter the addresses of any two cells in opposite corners in any order. Quattro Pro rewrites the block coordinates to list the top left cell followed by the bottom right cell.)

To refer to a block in another page in the same notebook, type the page name and a colon before the block reference (for example, B:B4 refers to cell B4 in page B). For information on referring to a block that spans multiple pages, see page 39.

Note If you rename a page, you need to use the new name on its tab in the block reference instead of the page letter. Also, if you group pages, you can refer to them by their group name instead of by their individual page names.

To refer to a cell in a different notebook, type the file name in brackets and the page name before the block reference (for example, [SALES]C:B5 refers to cell B5 of page C in the SALES notebook file). For more information, see page 275.

You can also specify a block by entering the name you've assigned it (see page 66). Or, you can type block references using the relative addressing found in macros (see Chapter 3 in *Building Spreadsheet Applications*), but the entry switches to default block referencing when you press *Enter*.

Pointing to blocks in formulas

The easiest way to enter cell references into formulas is to *point* to them. If, at the appropriate place in a formula, you click a cell or move the selector to a cell, you enter Point mode.

For example, to enter the formula +B3*(B4-B5) into cell B6 using Point mode,

1. Select cell B6.
2. Type a plus sign (+) to begin the formula.
3. Click cell B3 or press ↑ until the selector is in B3. (The indicator changes to POINT.)
4. Type an asterisk (*) to indicate multiplication. The selector returns to B6.
5. Type an open parenthesis, (.
6. Select cell B4, and then type a minus (-).
7. Select cell B5, and then type a close parenthesis,).
8. Press *Enter*. Quattro Pro writes the formula into B6.

To enter Point mode, the insertion point must be after one of these characters:

- an arithmetic operator [+ – / * ^]
- a text operator [&]
- the last character of a logical operator [< > = #]
- an open parenthesis [(]
- a comma [,]
- a semicolon [;] (or whatever symbol you've chosen as an argument separator through the Punctuation setting of the International property (in the application Object Inspector); see page 385

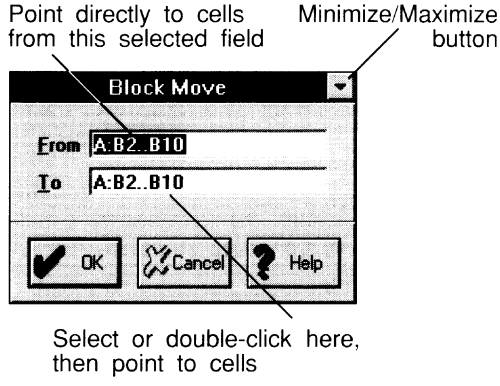
You can also enter Point mode if a cell or block reference is selected in the input line. Otherwise, if you click another cell or press an arrow key, Quattro Pro enters the formula into the cell and returns to Ready mode.

Instead of pointing only to cells, you can point to blocks by dragging them. You can also point to blocks using the keyboard (see Appendix A).

Pointing from dialog boxes

Point mode is also useful from dialog box *edit fields* that require cell references. Edit fields are dialog box controls that accept text entries. In the case of commands requiring cell references, you can make the dialog box temporarily collapsed to make pointing easier.

Figure 2.4
Pointing from a dialog box



When you first choose a command, the active cells are highlighted in the primary edit field. When you click and drag to point to a block, you enter Point mode, and the dialog box is reduced to its title bar until you release the mouse button. The coordinates of the block you point to appear in the edit field.

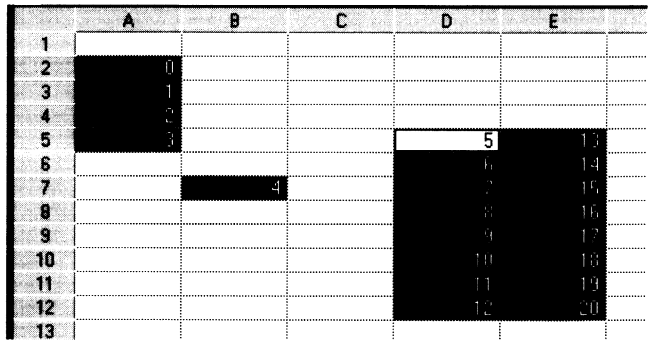
You can also enter Point mode by pressing ↑, ↓, or *F2*, or by double-clicking the contents of the edit field. In these cases, the dialog box remains collapsed until you exit Point mode or until you expand it with the Minimize/Maximize button.

You can exit Point mode by pressing *F2* (which enters the block in the edit field), or by pressing *Esc*, (which restores the previous entry in the edit field).

Noncontiguous blocks

A *noncontiguous block* is a group of separate blocks that you operate on at the same time. You can write formulas that refer to a noncontiguous block, and you can act on a noncontiguous block with commands.

Figure 2.5
A noncontiguous block



To point to a noncontiguous block, select the first subblock, hold down the *Ctrl* key, and select additional subblocks.

To type a reference to a noncontiguous block in a formula, separate each subblock with a comma. For example,

A2..A5,B7,D5..E12

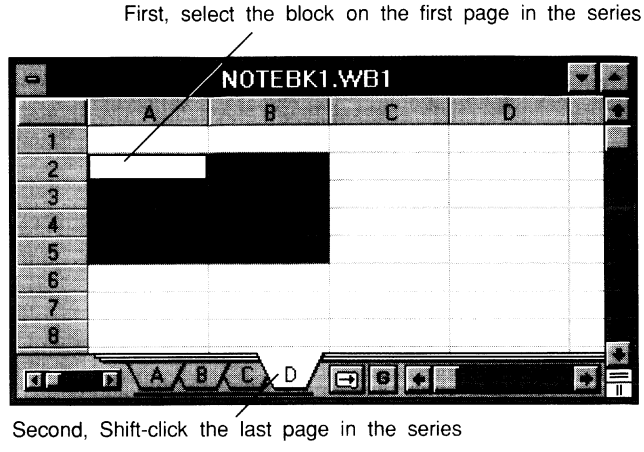
refers to the noncontiguous block in the previous figure. Most commands can work on noncontiguous blocks. For example, the data in the previous figure was created using Block | Fill.

3-D blocks

A 3-D block is a two-dimensional block selected on a series of consecutive spreadsheet pages. For example, the block A2..B5 on pages A through D is a 3-D block.

To point to a 3-D block, first select the 2-D block on the first page of the series. Then hold down the *Shift* key while you click the tab for the last page in the series. A black line appears under the tabs. Complete the formula that refers to this block, or choose the command to act on it. This block remains selected only until you select elsewhere in the notebook.

Figure 2.6
Pointing to a 3-D block



To type a reference to a 3-D block, include the page references first, followed by the block coordinates. For example,

A..D:A2..B5

refers to a block on pages A, B, C, and D.

If the same pages were grouped under the name Receipts (see page 248), the same 3-D reference would look like this:

Receipts:A2..B5

Another way to type a reference to a 3-D block is to visualize it as a cube. Type the page and block coordinates of the cube's front upper left corner, followed by two periods, then the back lower right corner. For instance, you can refer to the same block in the previous example by typing

A:A2..D:B5

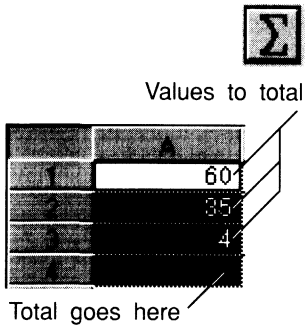
Either 3-D syntax is correct, but by default, all references you point to or type are converted to the first method. If you prefer the second method, you can switch to it with the Display property (in the application Object Inspector); see page 384.

Creating totals with SpeedSum

Quattro Pro includes SpeedSum, a way to quickly total columns and rows of numbers. The SpeedSum button on the SpeedBar uses @SUM to add the values of the specified block. You can use it to total a single row or column, multiple rows or columns, all the rows and columns in a block, or 3-D blocks.

To use SpeedSum,

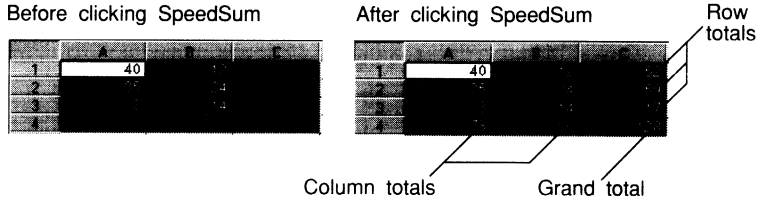
1. Select a block that includes the data to total *plus* a blank cell (or cells) beneath or to the right to contain the results.
2. Click the SpeedSum button.



The entries added depend on what you select before clicking SpeedSum:

- To total several cells in a column, select the data plus one blank cell below. For example, to total the values in the column A1..A3, select A1..A4. The total appears in cell A4.
- To total several cells across a row, select the cells plus one blank cell to the right.
- To total many columns, select the data and a blank row below.
- To total many rows, select the data and a blank column to the right.
- To total all rows and columns and create a grand total at the same time, select the block of data with a blank column to the right and a blank row below.

Figure 2.7
Totaling a block



- To total all cells on multiple pages onto a blank page, select the 3-D block of data and the same block on an extra blank page.
- To create totals outside all rows and columns on multiple pages, select a 3-D block with a blank row and column around the data.

You can also use SpeedSum without selecting the data you're totaling. This is useful for totaling large blocks of data that are time-consuming to select. Just select the blank cells where you want the *totals* placed (the blank cells must be adjacent to the data), and click SpeedSum. Quattro Pro guesses which cells you want totaled by the extent of the data above (if you selected cells in a row), to the left (if you selected cells in a column), or on previous pages (if you selected a block). After clicking SpeedSum,

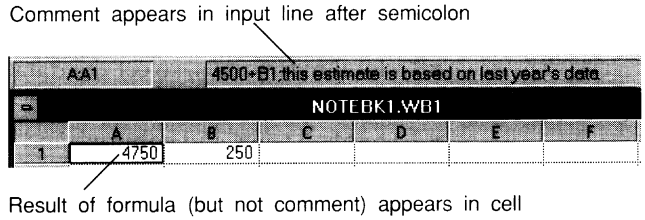
check each @SUM formula to make sure it actually chose the block you intended to sum.

Note SpeedSum adds values only. Any label entries in the selected block are treated as zero values.

Adding hidden comments

You can attach hidden explanatory comments to value entries. Just type a semicolon (;) after the entry and type your comment. The semicolon and the characters after it are stored with the cell, but they don't appear in the cell. You can see the comment on the input line when you select the cell.

Figure 2.8
A commented formula entry



Hidden comments don't appear in a printed notebook unless you check Cell Formulas in the Options dialog box of File | Print (see page 131).

To hide an *entire* entry, use the Hidden setting of the Numeric Format property (in the block Object Inspector); see page 75.

Filling a block with entries

You can quickly fill a block with a sequence of entries. You can do this either by continuing a pattern with the SpeedFill button, or by specifying a pattern explicitly with the Block | Fill command.

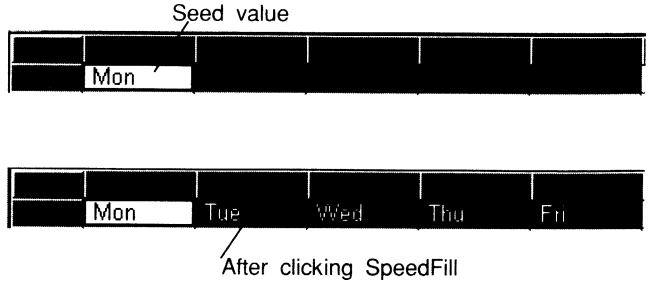
Using SpeedFill

Based on the entries in one or more cells, you can quickly fill a block with entries that continue a sequence. You can fill a block with numbers, a combination of letters and numbers, or with specific types of labels, such as days of the week or months of the year.

To use SpeedFill,

1. Select the cells to act as "seed" values for the sequence plus the blank cells to fill with entries.
2. Click the SpeedFill button.

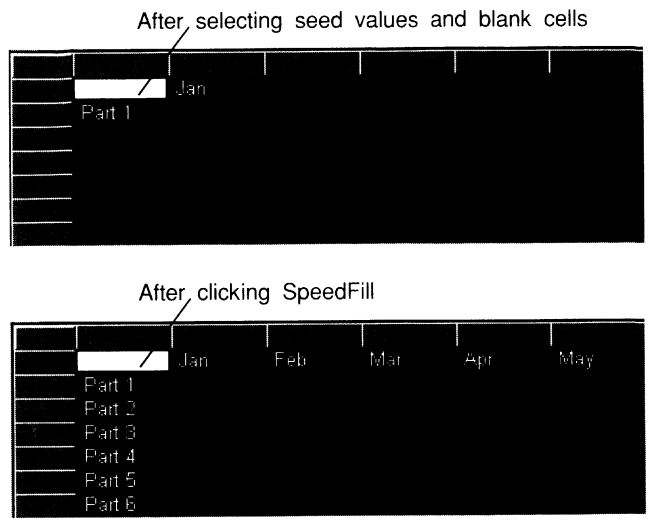
Figure 2.9
Using SpeedFill



You can extend a sequence in any direction, using the following rules:

- You can have one seed value, or many.
- The blank cells to be filled must be contiguous with the seed value(s), extending down the column or across the row to the right.
- You can fill a noncontiguous block, but each subblock must have its own seed value(s) for its own filled sequence.
- You can extend in two directions at once by selecting a block with seed values next to the upper left cell as shown next.

Figure 2.10
Using SpeedFill in two directions



The next table gives examples of the many types of entries you can use as seed values.

Table 2.3
Examples of SpeedFill sequences

Seed value(s)	Continued sequence
1st	2nd, 3rd, 4th, 5th...
Qtr 1	Qtr 2, Qtr 3, Qtr 4, Qtr 1...
1st Quarter	2nd Quarter, 3rd Quarter...
Jan	Feb, Mar...
January	February, March...
Mon	Tue, Wed, Thu...
Monday	Tuesday, Wednesday...
Week 1	Week 2, Week 3...
P1, P2, Total	P3, P4, Total, P5, P6, Total...
Jan 89, Feb 89	Mar 89, Apr 89...
100 Days	101 Days, 102 Days, 103 Days...
100 Days, 200 Days	300 Days, 400 Days, 500 Days...
1, 3, 5	7, 9, 11, 13...
1, 3, 6	8.333333, 10.83333, 13.33333...
04/05/92	04/06/92, 04/07/92...

The last example shows the seed value formatted as a date (it was entered using *Ctrl+Shift+D*).

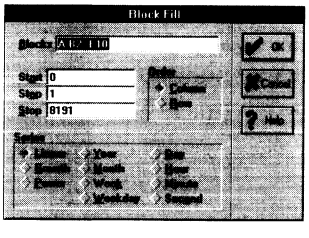
Entering a sequence of values

You can use Block | Fill to specify rules for filling the selected block. In the Block Fill dialog box, you specify the following:

- a block to fill with values
- a Start value
- a Step (interval) value
- a Stop value
- the Order for the fill (down columns or across rows)
- the Series type: if filling with numbers, the type of mathematic operation to perform on the values (addition, multiplication, or exponentiation) and if filling with dates, the type of time unit (years, months, and so on) to use

You can use numbers, dates, times, or even formulas for the Start, Step, and Stop values.

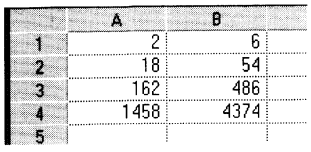
To fill a block with sequential values,



1. Select the block or blocks to fill. If you select a noncontiguous block, Quattro Pro fills it in the order selected.
2. Choose Block | Fill.
3. Enter a Start value for the first cell. You can enter a number, a formula, a date, or a time. If you enter a date or time, see the next section.
4. Enter a Step value. This is the constant value to add (or multiply or use as an exponent) with the Start value or the previous value. If you want the values to decrease, enter a negative number and a Stop value lower than the Start value. The Step value can also be a formula.
5. The default Stop value is 8191. Enter a different value if you want a higher or lower limit for the fill values.
6. Choose column or row order. The initial setting is **Column**, so the fill sequence moves down columns, starting with the leftmost column. Choose **Row** to fill across rows instead, starting with the top row.
7. Choose the type of series you'd like to govern the fill.
8. If the Start value is a number or a formula, you can choose Linear (addition), Growth (multiplication), or Power (exponentiation). **Linear** adds the Step value to the previous value (defined at first to be the Start value). **Growth** multiplies

the Step value by the previous value. **Power** uses the Step value as the exponent of the previous value.

9. Choose OK.



	A	B
1	2	6
2	18	54
3	162	486
4	1458	4374
5		

The figure at the left shows a two-column block (A1..B4) filled with a sequence of values. The Start value is 2, the Step value is 3, Growth is chosen, and the block is filled by rows.

Filling with dates or times

To fill a block with dates or times, enter the beginning date or time in the Start field. Use *Ctrl+Shift+D* as you would in a cell to enter a date or time (see page 29). The date or time format you use is repeated in subsequent cells.

For the Stop field, enter a number larger than 50000, or if you want to stop at a particular date, enter it using *Ctrl+Shift+D*.

For the Series option, the fill operation works linearly (step values are *added*), but you can add cells in units of years, months, weeks, weekdays (thereby skipping weekends), or in days, hours, minutes, or seconds.

For the Step value, enter the number of years, months, and so on to add. If you're filling with dates instead of times, only the integer part of the Start, Step and Stop values are used; the fractional part is ignored.

For example, with a start value of 6/20/92, a step value of 2, a stop value of 50000, and Series set to Day, the second cell in the series contains 6/22/92.

If the Start value is a number that isn't formatted as a date (for example, if you enter 33764 instead of 09-Jun-92), cells are filled with different date or time-related information depending on the Series setting. If you choose Month, only month names are entered. If you choose Year, 4-digit year values appear. Choosing Week, Weekday, or Day fills with days incremented by the appropriate interval, and choosing Hour, Minute, or Second displays times with the corresponding level of detail.

C H A P T E R

3

Editing

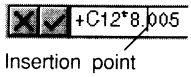
This chapter describes how to

- edit and erase entries
- copy and move data
- search for and replace entries
- insert and delete entire or partial rows, columns, and pages
- name blocks and refer to them in formulas

Editing entries

You can change the data in a cell in one of two ways:

- Select the cell and type a new entry. When you press *Enter* or click ✓ in the input line, the new entry replaces the old.
- Select the cell and edit the existing entry.



Insertion point

When you edit an entry, you can insert or delete characters without retyping the whole entry. Begin by selecting the cell you want to change. Then click anywhere in the input line or press *F2* to enter Edit mode. The EDIT indicator appears on the status line, and the contents of the active cell appear in the input line with an insertion point at the place where you clicked, or at the end if you pressed *F2*.

You can move the insertion point by clicking in the input line or by using the arrow keys. *Backspace* deletes characters to the left of

the insertion point, and *Del* deletes characters to the right. You can also drag in the input line to select characters.

If you make a selection in the input line, you can press *Del* to erase the selection, or start typing or pointing to replace the selection. See page 36 for more information on pointing. You can also use the Clipboard commands on your selection (see page 50).

All the common editing keys work as you'd expect them to work in a word processor. For details, see Appendix A.

When you first enter Edit mode, you're also in Insert mode. Any characters you type are inserted to the left of the insertion point. To write over existing characters, press *Ins* to switch to Overwrite mode. (OVR appears on the status line.) Press *Ins* again to return to Insert mode.

Quattro Pro doesn't store your changes in the cell until you click ✓ or press *Enter*. Until then, you can click the × button or press *Esc* twice to return the entry to its original state.

Erasing

There are several ways to erase data. You can

- erase the contents of a block with Edit | Clear Contents or by pressing *Del* (explained in this section)
- erase and move the contents of a block to the Clipboard with Edit | Cut (see page 50)
- remove the data and the cells containing it by deleting entire or partial rows, columns, or pages with Block | Delete (see page 63)

To erase block contents, select the block, then choose Edit | Clear Contents or press *Del*. The block's properties (alignment, numeric format, font, and so on) remain unchanged.

To erase data *and* remove property settings, select the block, then choose Edit | Clear. For more information on block properties or the Normal style, see Chapter 4.

If you accidentally erase data, use Edit | Undo to bring it back (see page 20).

Copying and moving

There are three ways to copy and move blocks in Quattro Pro:

- Using the Drag and Drop feature, you can drag a block of cells anywhere on the page. When you release the mouse button, the block "drops" into place.
- You can use Edit | Copy and Paste to *copy* blocks, and you can use Edit | Cut and Paste to *move* blocks. These are *Clipboard commands* that make use of the Windows Clipboard to transfer information.
- You can use Block | Copy or Move, commands that are familiar to users of DOS spreadsheets.

You can also move entire pages (see page 56).

Choosing a method

Drag and Drop is the quickest and easiest method, but the other methods have additional capabilities.

The advantages of the Clipboard commands are:

- You can copy or move text within the input line or to other text objects.
- You can paste the same block to many different destinations without reselecting the source.
- You can copy data to and from other Windows applications (see page 254).

The advantages of the Block menu commands are:

- You can specify blocks to be copied or moved by name (see page 66 for information on naming blocks).
- If you're already familiar with these commands, or if you have macros that use them, they are more convenient.
- Block menu commands work a bit faster than the Clipboard commands.
- The Block | Copy command provides a unique, time-saving feature called Model Copy. Use it to copy blocks that contain absolute references to cells within the copied block (see page 55).

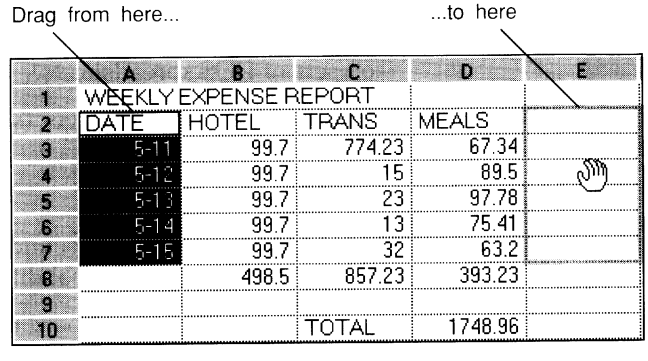
Using Drag and Drop

If you want a quick and simple way to move or copy a block of cells, use Drag and Drop.

To move a block,

1. Select the block.
2. Click anywhere in the block and hold down the mouse button. The mouse pointer changes to a hand, and a colored outline appears.

Figure 3.1
Drag and Drop



3. Drag the block to where you want to move it, using the colored outline as a guide. Be careful; data under the colored outline will be overwritten.
4. Release the mouse button to "drop" the block into place.

To copy a block, follow the steps above, except hold down the *Ctrl* key after selecting the block in step 1.

Drag and Drop doesn't work with a single cell, you can't use it on noncontiguous blocks, and you can't make multiple copies. Depending on which one of these things you want to do, use the Clipboard commands or Block | Copy and Move.

Using Clipboard commands

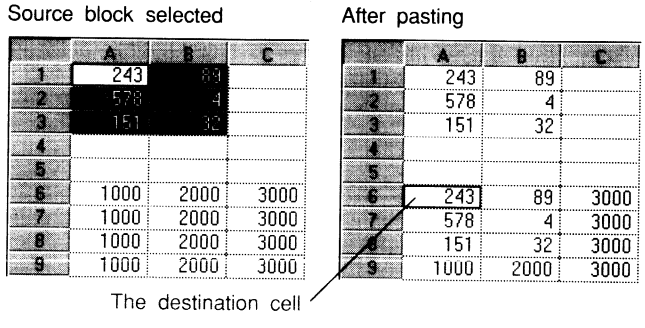
Edit | Copy and Edit | Cut each place copies of the current selection (the *source*) in the Clipboard in preparation for being pasted elsewhere (the *destination*). While Copy leaves the source intact, Cut erases it.

The Clipboard commands in Quattro Pro work as in other Windows applications. In Quattro Pro, they are also available as SpeedBar buttons:

1. Select the source you want to copy or move.
2. Click the Cut (to move data) or Copy button (to copy data).
3. Select the destination. The destination can be a cell on this or another page, a cell in another notebook, the input line, a text box in a graph window, or even other Windows applications. If you choose a cell, the entire source is pasted, using that cell for the upper left position of the pasted copy.

   Caution: If the destination already contains data, you'll overwrite it when you click the Paste button. Also, be careful that you allow enough space for the complete source to be pasted.

Figure 3.2
Choosing the paste destination

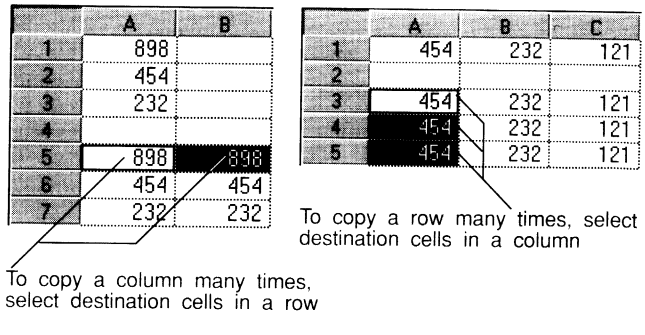


4. Click the Paste button to paste the data into the destination.

Pasting multiple copies

If the copied source is a single cell, column, or row, you can make multiple copies of it by selecting a block of cells as the destination.

Figure 3.3
Pasting multiple copies

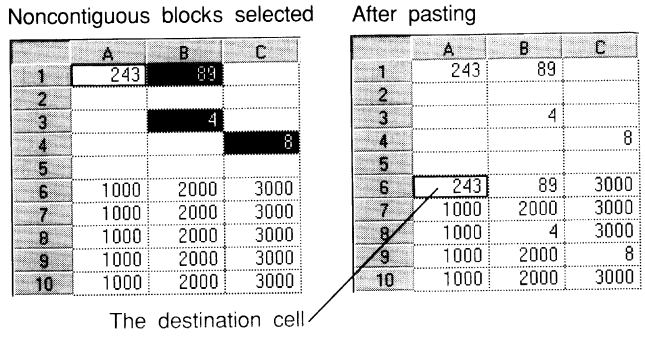


Note You can also make multiple copies of data you've *cut*. The first time you click the Paste button (or choose Edit | Paste), the source is simply moved. Clicking or choosing Paste the second time copies the source throughout the destination area.

Copying a noncontiguous block

If the source is a noncontiguous block, imagine the noncontiguous block contained by one large block. Choose the new position for the upper-left corner of that large block for the destination.

Figure 3.4
Copying a noncontiguous block

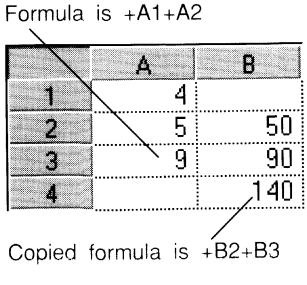


Copying formulas

When you copy data (whether you use Drag and Drop, Clipboard commands, or Block | Copy), Quattro Pro adjusts formulas to correspond to their new positions. This is helpful in most situations, but there are times when you want to *avoid* adjusting references.

Relative addresses

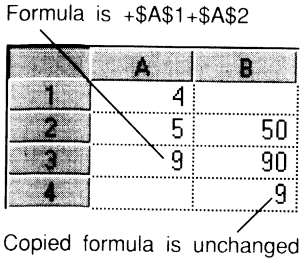
Unless you specify otherwise, cell references in a formula are *relative*. Quattro Pro finds each cell reference by its position in relation to the cell containing the formula, *not* by its address.



For example, if you enter +A1+A2 in cell A3, Quattro Pro interprets it as "Add the values in the two cells directly above this one." When you copy this formula to cell B4, Quattro Pro adjusts the formula to add the values in cells B2 and B3 (the two cells directly above).

Absolute addresses

To prevent a cell reference from adjusting when you copy a formula, make the reference *absolute* by entering dollar signs ($) before the column and row coordinates. An absolute cell reference always refers to the original cell address, regardless of where you copy the formula. You can also make a page reference absolute if you're copying from one page to another.

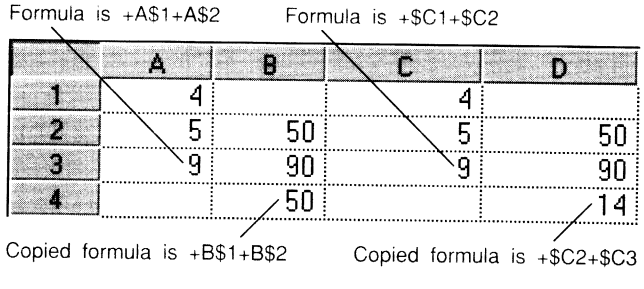


For example, if you enter +$A$1+$A$2 in cell A3, Quattro Pro reads this as: "Add the values in the cells A1 and A2." When you copy this formula to cell B4, Quattro Pro still refers to cells A1 and A2.

You can specify all or part of a cell address as absolute. Just insert a dollar sign ($) before the coordinate you want to remain fixed. For example,

- $A$1 makes both coordinates of address A1 absolute.
- $A1 locks the address into column A, but lets the row coordinate adjust.
- A$1 locks the address into row 1, but lets the column coordinate adjust.
- $A:A$1 locks the address into page A and row 1, but lets the column coordinate adjust.

Figure 3.5
Copying a formula with mixed references



When copying between pages, you can make page references absolute also. Include a dollar sign before the page name. If you omit the page reference in a formula, it will adjust to refer to the current page, wherever it is copied.

The Abs key (*F4*) simplifies inserting dollar signs in an address. Press *F4* when a cell address is highlighted in the input line.

The next table shows the effects of pressing *F4*.

Table 3.1
Using the Abs key (F4)

Number of times pressed	Cell reference	Block name
starting reference	B6	SALES
1	$A:$B$6	$SALES
2	$A:B$6	SALES
3	$A:$B6	$SALES
4	$A:B6	SALES
5	$B$6	$SALES
6	B$6	SALES
7	$B6	$SALES

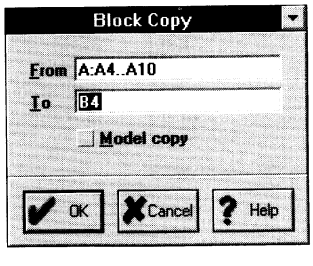
To specify a named block as absolute, precede its name with a dollar sign. To specify a block as partially absolute, use its coordinates, not its name.

Using Block | Copy and Block | Move

Use Block | Copy or Block | Move to copy or move a cell or a block. With Block | Copy, you can also copy a noncontiguous block. To copy or move data or objects other than cell blocks, use the Clipboard commands (see page 50).

Copying

To copy a block of cells,



1. Choose Block | Copy.
2. The current selection appears in the From box, which contains the coordinates of the *source* block (what you want to copy). If this entry is correct, skip to step 4.
3. To change the From entry, double-click it in the dialog box, then point to the cells you want to copy. Or, instead of pointing, you can type new coordinates, or press *F3* to choose from a list of block names (see page 66 for information on naming blocks). The source block can be the following types of references:
   - Cell or block references; either named or not (such as `B4` or `C5..D10` or `INCOME`)
   - A noncontiguous block (such as `B4,C5..D10`)
   - Blocks in other pages in the same notebook (such as `C:B4..B6`)

- Blocks in other notebook files (such as `[C:\BUDGETS\SALES]B:D10..D15`)

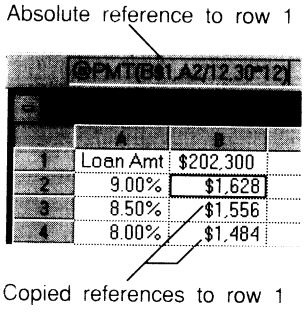
When you're finished pointing, click the Maximize button in the title bar of the reduced dialog box (for full information on pointing from dialog boxes, see page 38).

4. Select or double-click the To entry. Then to make a single copy, point to (or type the address of) the upper left cell of the *destination* block (where you want to place the copy). See page 51 for information on defining the destination block.

   Caution: If the destination already contains data, you'll overwrite it when you choose OK.

5. Choose OK.

Using the Model Copy option

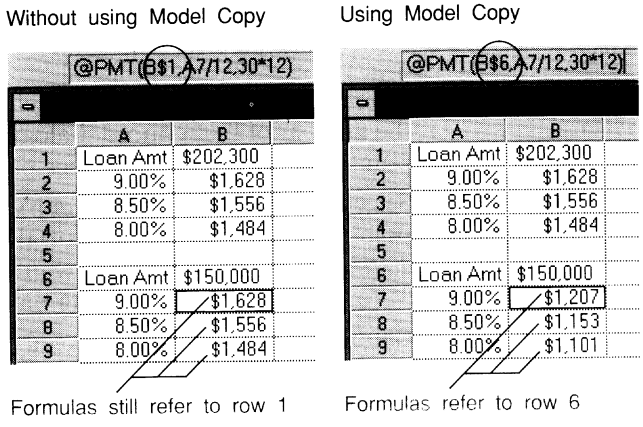


As explained on page 52, relative and absolute addresses let you control how formulas adjust when you copy them. The Model Copy option allows another variation on relative and absolute addresses that's useful when you're copying a block that contains absolute references to cells within the copied block.

The example at the left shows a small model that contains a formula to figure the monthly payment for a 30-year loan at different interest rates. The reference to the loan amount had to be absolute so that when the formula was copied it continued to refer to cell B1.

You might want to calculate monthly payments for a different loan amount. To do so, you'd copy the block, change the loan amount entry, and expect to see the new monthly payment values. But as shown next, the absolute reference still refers to row 1. One solution is to edit each formula individually to refer to B6 instead of B1. Instead, if you check Model Copy in the Block | Copy dialog box, even absolute references adjust to the new location of the referenced cell.

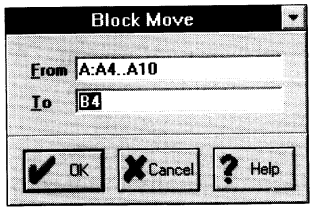
Figure 3.6
With and without Model Copy



Although the absolute reference adjusts in this first case, it remains absolute for future copies. For instance, in the previous example, should you want to make more copies of the formula for interest rates below 8% for a $150,000 loan, the reference to cell B6 is still absolute.

Moving

Block | Move moves the contents of a block from one location to another. It overwrites existing data in the new location. To move a block,



1. Choose Block | Move.
2. Enter the source block in the same way as for Block | Copy, except that you can't move a noncontiguous block (see page 54).
3. Specify the upper left cell of the destination block.

   Caution: If the destination already contains data, you'll overwrite it when you choose OK.
4. Choose OK.

The data is pasted along with its block properties.

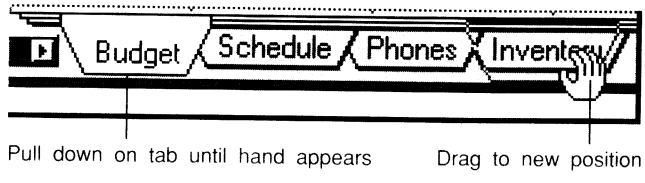
Caution! Before moving cells that contain formulas or that are referenced by formulas, see page 270.

Moving pages

You can move pages within a notebook to reorder them. With the mouse, you can directly manipulate the pages, similar to the Drag and Drop feature used on cells:

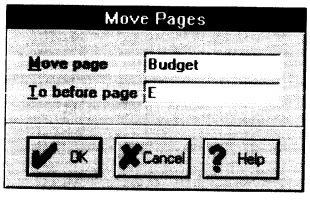
1. Click the tab of the page you want to move and drag down toward the bottom of the screen until the mouse pointer changes to a hand.
2. Drag right or left along the row of other tabs, moving the highlighted tab that appears. Release the mouse button when the highlighted tab is just before the tab where you want to place the moved page.

Figure 3.7
Moving a page



The moved page is dropped into place.

If you move a page into or out of grouped pages while Group mode is on (the blue line appears under the tabs), the page moves alone, and the group expands or shrinks accordingly. For more information on Group mode, see page 248.



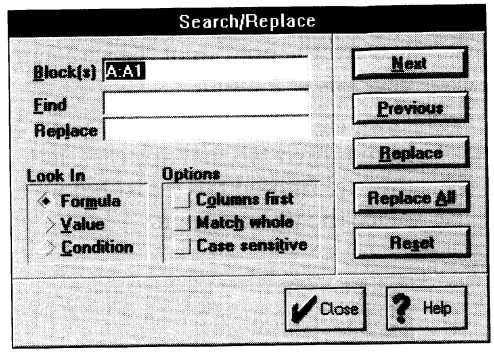
If you drag a page that is part of a selected 3-D block (the black line appears under the tabs), all pages in the 3-D block move together. For more information on selecting 3-D blocks, see page 39.

You can also move pages with Block | Move Pages. From the dialog box, enter the page name (or group of names) to be moved and the page name before which you want the page placed. Then choose OK.

Searching and replacing data

Edit | Search lets you find or alter multiple cell entries with a single command. It searches for the specified value or string and finds each match, which you can choose to replace with a new value.

Figure 3.8
Search and Replace dialog box



The Search dialog box offers these options:

- **Block(s)** is the block or blocks to search. To search the entire page, this edit field should be blank.
- **Find** is the group of characters to be found in labels, values, or formulas. These characters are called the *find string*.
- **Replace** is the group of characters to substitute for the characters found. This is called the *replacement string*.
- The first two **Look In** options determine how Quattro Pro treats formulas during its search. The last option lets you set conditional searches through all types of entries.
  - **Formula** looks at the formulas as they appear in the input line.
  - **Value** looks at the results of the formulas, as they appear in the cells.
  - **Condition** treats the find string as a conditional expression. For example, a find string of B13>500 with Condition chosen looks for the first value that is greater than 500, starting with cell B13. To search starting from the active cell (which is usually the upper left cell), substitute a question mark for the cell address; for example, ? > 500.

Note If you're using a conditional expression, you can only *find* values; they aren't *replaced* when found.

- **Columns First** sets the search path. By default, this option is unchecked for searching across rows starting with row 1. When checked, searching occurs down columns starting with column 1.
- **Match Whole** determines whether the find string must be all or part of a cell entry. The default, this option is unchecked for

searching for partial as well as whole entries. For example, if the find string is *cat*, then *catamaran* and *scatter* are found as well as *cat*.

- **Case Sensitive** controls whether entries must exactly match the find string. By default, this option is unchecked for searching for strings regardless of capitalization. For example, if the find string is *HARPER*, then *Harper*, *harper*, and *HaRpEr* are found as well as *HARPER*.
- The **Next** button begins or resumes a forward search without replacing found entries.
- The **Previous** button begins or resumes a backward search without replacing found entries.
- The **Replace** button lets you decide on an individual basis whether to replace each string found.
- The **Replace All** button replaces all found strings without stopping.
- The **Reset** button removes any entries in the dialog box and reinstates the defaults.

To find or replace entries,

1. Select the block or blocks you want to search.
2. Choose Edit | Search and Replace.
3. Choose Find and enter the find string.
4. Choose Replaced With and enter the replacement string.
5. Specify any Look In, Direction, Match, or Case settings you want.
6. To begin the search, choose Next or Previous.
7. If a string is found, choose Next, Previous, Replace, Replace All, Reset, or Close.

You can also use Data | Query to search a database. See Chapter 13.

Note If you're searching for a label with Match Whole checked, you must either include the label prefix or set Look In to Value.

Inserting space

You can insert blank columns, rows, or pages anywhere in the notebook. You can also insert partial rows, columns, or pages. Wherever you insert, existing data is pushed down, to the right, or to the back of the notebook to make room.

You can also insert from another file to a new page (see page 371).

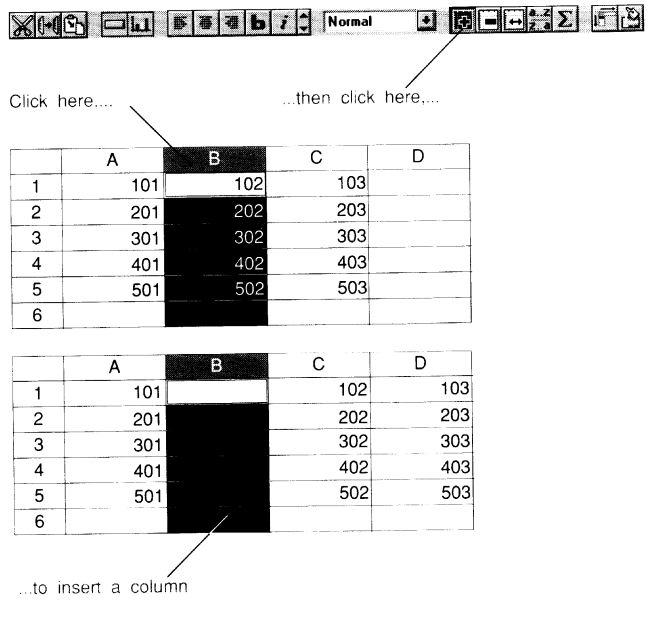
Note If inserting space pushes a named block or cell reference beyond the limit of a page (beyond column IV or row 8192), or beyond page IV, the reference becomes ERR.

Entire rows or columns

To insert an entire row, click the row border just below where you want the row inserted and click the Insert button in the SpeedBar. To insert an entire column, click the column border just to the right of where you want the column inserted and click the Insert button.

To insert multiple rows or columns, select as many row or column borders as you want to insert.

Figure 3.9
Inserting a column



You can also insert a row or column by choosing Block | Insert | Rows or Columns. As with the Insert and Delete buttons, select the row below or the column to the right of where you want to insert before choosing the command.

If you insert a column or row within the boundaries of a named block or a block referenced by a formula, Quattro Pro expands block references to include the new column or row.

Entire pages

To insert a blank page:

1. Click the tab of the page you want to follow the new page.
2. Click the Insert button.
3. Choose Pages and choose OK.

To insert more than one page, select the corresponding number of pages in step 1. (To select multiple pages, click the first page tab, then hold down *Shift* while you click the last page tab you want. A black line appears under the tabs.) For example, to insert two pages before page B, select pages B and C before following steps 2 and 3; the data in page B moves to page D.

You can also insert pages before the active page by choosing Block | Insert | Pages. In the dialog box:

1. Enter a block in the Block edit field. To insert only one page, enter the page to insert before, and any cell on the page, such as B:B12.

   To insert multiple pages, enter a 3-D block starting with the page to insert before, and spanning the same number of pages you want to insert. For example, to insert three pages before page B, enter B:A3..D:A3 (it doesn't matter which cell you reference).
2. Choose Entire, and choose OK.

Partial rows, columns, or pages

Instead of inserting an entire row, column, or page, you can insert partial ones (a block). Data in adjacent cells shifts down or to the right to accommodate the inserted cells, as shown in the next figure.

Figure 3.10
Inserting a block

	A	B	C	D	E	F
1	101	102	103	104		
2	201	202	203	204		
3	301	302	303	304		
4	401	402	403	404		
5						
6						

Inserting partial rows

	A	B	C	D	E	F
1	101	102	103	104		
2	201			204		
3	301			304		
4	401	202	203	404		
5		302	303			
6		402	403			

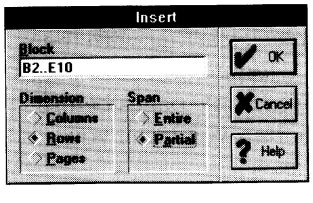
Inserting partial columns

	A	B	C	D	E	F
1	101	102	103	104		
2	201			202	203	204
3	301			302	303	304
4	401	402	403	404		
5						
6						

When you insert a partial page, data shifts to the next page.

To insert a block,

1. Select a block in the same location where you want to insert space; make sure the upper left corner of the block you select contains the first cell entry you want shifted right, down, or back. Also, the block you select should be the same size as the amount of space you want to insert.
2. Click the Insert button.
3. Choose Partial.
4. Choose Rows if you want the selected entries to shift down out of the way. Choose Columns if you want them to shift to the right. Choose Pages if you want them to shift to the next page.
5. Choose OK.



You can also insert a block by choosing Block | Insert | Rows, Columns, or Pages. A dialog box appears. In the Block edit field, enter the coordinates of the block to be shifted down (for rows), to the right (for columns), or to the next page (for pages). Then choose Partial and choose OK.

Deleting space

You can delete entire or partial columns, rows, or pages anywhere in the notebook. Deleting space is different from erasing (or blanking) data with Edit | Clear, Clear Contents, or the *Del* key; deleting with the Delete button in the SpeedBar or Block | Delete makes remaining rows, columns, or pages move to take up the deleted space.

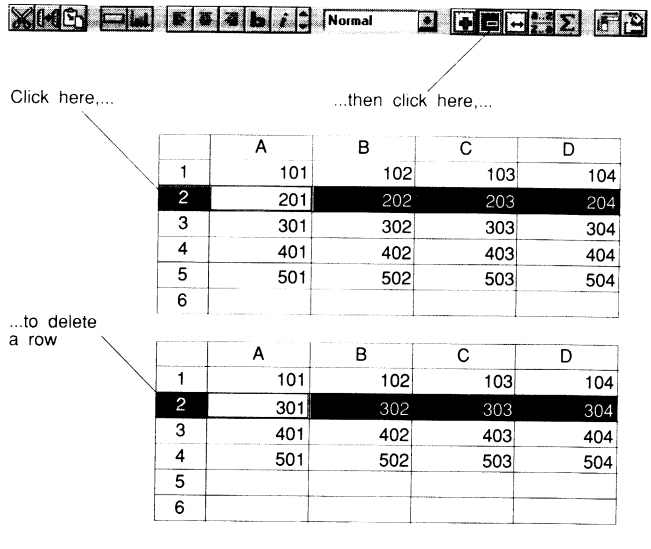
Caution! If you delete space that is within the boundaries of a named block or a block referenced by a formula, Quattro Pro adjusts all references to the block. However, if one of the deleted cells is a *coordinate* cell that defines a block, the block becomes invalid and any formulas or names referencing the block show ERR. Any formulas that reference a cell within a deleted column, row, or page also appear as ERR. See page 272 for details.

Entire rows or columns

To delete an entire row, click the row border and click the Delete button. To delete an entire column, click the column border and click the Delete button.

To delete multiple rows or columns, select as many row or column borders as you want to delete.

Figure 3.11
Deleting a row



	A	B	C	D
1	101	102	103	104
2	201	202	203	204
3	301	302	303	304
4	401	402	403	404
5	501	502	503	504
6				

	A	B	C	D
1	101	102	103	104
2	301	302	303	304
3	401	402	403	404
4	501	502	503	504
5				
6				

You can also delete a selected row or column by choosing Block | Delete | Rows or Columns.

Entire pages

To delete a page:

1. Click the tab of the page to be deleted.
2. Click the Delete button.
3. Choose Pages and choose OK.

You can also delete a page by clicking its Select-All box (to select all cells) and clicking the Delete button, or by clicking its tab and choosing Block | Delete | Pages.

To delete more than one page, select the corresponding number of pages in step 1. (To select multiple pages, click the first page tab, then hold down *Shift* while you click the last page tab you want. A black line appears under the tabs.) For example, to delete pages B and C, select them before following steps 2 and 3. The data in page D moves to page B.

Partial rows, columns, or pages

Instead of entire rows, columns, or pages, you can delete partial ones (a block). Data in surrounding cells shift to take up the deleted space, as shown in the next figure.

Figure 3.12
Deleting a block

	A	B	C	D
1	101	102	103	104
2	201	202	203	204
3	301	302	303	304
4	401	402	403	404
5	501	502	503	504
6				

Deleting partial rows

	A	B	C	D
1	101	102	103	104
2	201		203	204
3	301		303	304
4	401	402	403	404
5	501	502	503	504
6				

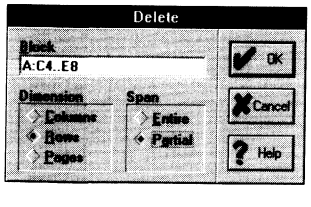
Deleting partial columns

	A	B	C	D
1	101	102	103	104
2	201		203	204
3	301		303	304
4	401	402	403	404
5	501	502	503	504
6				

When you delete a partial page, data moves forward from the next page.

To delete a block,

1. Select the block you want deleted.
2. Click the Delete button.
3. Choose Partial.
4. Then choose Rows to shift entries up into the selected block, choose Column to shift entries left, or choose Pages to shift from the next page.
5. Choose OK.



You can also delete a selected block by choosing Block | Delete | Rows, Columns, or Pages. A dialog box appears; choose Partial and choose OK.

Using named blocks

Instead of referring to a single cell or a block by its coordinates, such as B10 or C15..F21, you can use a name you assign. This has several advantages:

- Names are easier to remember than coordinates.
- If you move the contents of a named block, Quattro Pro still associates the name with the same data, regardless of the new block coordinates.
- It makes the formula easier to understand. For example, +PRICE – COST is more intuitive than B15 – D8.
- It increases accuracy. If you mistype a block name, Quattro Pro alerts you to the error. If you mistype block coordinates, you operate on the wrong block.
- When you link to another notebook, you won't need to open the other notebook to find the block coordinates.

Consider the following formula, which calculates a monthly mortgage payment:

@PMT(B3,B4/B6,B5*B6)

Here is the same formula using named blocks:

@PMT(PRICE,INTEREST/MONTHS,TERM*MONTHS)

Naming blocks

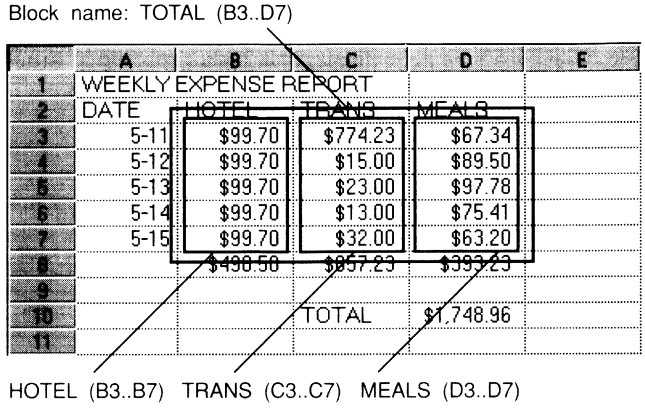
Keep the following guidelines in mind when naming blocks:

- Block names can be up to 15 characters long.
- Use any keyboard characters (*A* to *Z*, 0 to 9, punctuation marks, and some special characters such as %, or ~). Accented characters such as á and ñ are also allowed if they're available on your keyboard.
- Avoid using operator characters (+, –, *, /, ^, =, <, >, #, or &), open and close parentheses, $, and spaces.
- Uppercase and lowercase letters are equivalent; in other words, *INCOME* is the same as *income*. Block names always appear in uppercase letters in formulas.
- Don't use numbers alone (such as 327) or valid cell addresses (such as G1) as block names.

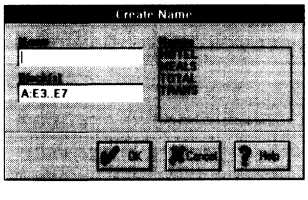
- Block names can define overlapping areas. For example, the following group of block names is acceptable:

HOTEL	B3..B7
TRANS	C3..C7
MEALS	D3..D7
TOTAL	B3..D7

Figure 3.13
Overlapping named blocks



To assign a name to a block of cells,



1. Select the block you want to name.
2. Choose Block | Names | Create.
3. Type a name for the block in the Name box. Enter a name not included on the list of existing names at the left, and choose OK.

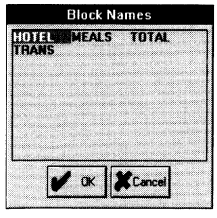
To change the block assigned to a name, choose Block | Names | Create and choose the name from the list. Then enter new coordinates in the Block(s) edit field.

To change the name of a block, delete the existing name first (see page 266), then assign the new name to the block.

Caution! If you use Block | Move to alter the contents of the upper left or lower right cells of a named block, the name becomes invalid. Formulas referencing the named block display ERR to indicate the formulas no longer reference the data they used to. Deleting any of the two coordinates of a block makes any reference to that block display ERR, also. See page 272 for details.

Block names in formulas

To reference a named block, you can type the block's name or choose it from a choice list.

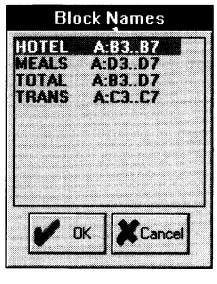


To display a choice list while writing or editing a formula, press *F3*. To enter a name onto the input line, choose the name from the list and choose OK.

To display the list while entering or editing a formula, the insertion point must be to the right of an operator or open parenthesis, or a block reference must be selected in the input line. For example, in the formula

+C7*@SUM(B6..D19)

you can display a list of block names whenever you can enter Point mode, as described on page 37.



To expand the list of names so that their coordinates show, press the Expand key (+). Press the Contract key (-) to remove the coordinates. Press *F3* again to expand the names list to full screen length or to shrink it back down.

The Choices key, *F3*, has different purposes in other situations. In Value or Edit mode, *Alt+F3* displays a list of @functions and *Shift+F3* displays a menu of macro categories. These two key combinations are equivalent to clicking the @Functions button and the Macros button in the Edit mode SpeedBar (see Chapters 1 and 3 in *Building Spreadsheet Applications*).

Note

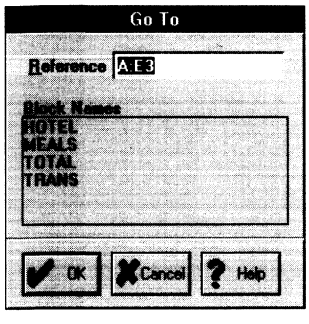
If you edit a formula that already contains a reference to a named block, it appears in the input line as block coordinates. After you press *Enter* or click ✓ to finish editing, the block coordinates switch back to the block name reference in the formula.

For information on an automated way to name blocks (Block | Names | Labels), deleting block names (Block | Names | Delete and Reset), and viewing a table of block names (Block | Names | Make Table), see page 265.

Using the GoTo command

Edit | GoTo is useful for quickly moving to named blocks (to identify or modify them), for moving quickly to distant parts of the notebook, or for selecting a noncontiguous block in disparate parts of a notebook. The selector moves to whatever location you choose with the command.

To move the selector to any location quickly,



1. Choose Edit | GoTo.
2. Choose the target block name from the list, or type the target cell address in the text box. If the cell is on another page, add the page prefix preceded by a colon. For example, to move to cell Z36 on page D, type `D:Z36`. If the cell is in another notebook, add the notebook prefix. For example, to move to the corresponding cell in the Budget notebook, type `[Budget]D:Z36`.
3. Choose OK.

The indicated block is selected.

C H A P T E R

4

Block and page properties

This chapter explains the properties you can set for blocks of cells and for pages. It also describes SpeedBar buttons that accomplish similar tasks.

Block properties control numeric format of values, font, shading, alignment of entries, line drawing, block protection, text color, the kind of data you can type into a cell, row height, column width, and whether columns or rows are hidden.

The Style list and the SpeedFormat button in the SpeedBar provide quick ways to apply combinations of block properties.

Page properties control the page name, overall page protection, line color, colors in cells that meet various conditions, default label alignment, whether zeros are displayed, default column width, row and column borders, and grid lines.

Note Although it's tempting to preset block properties in large areas of the notebook, doing so consumes memory. It's more efficient to set properties only in the cells or pages you're currently using. You can also change the Normal style to change default block properties (see page 259).

Using Object Inspector menus

You can display the Object Inspector menu for a page or a block of cells by right-clicking or by choosing commands in the Property menu.

To change block properties,

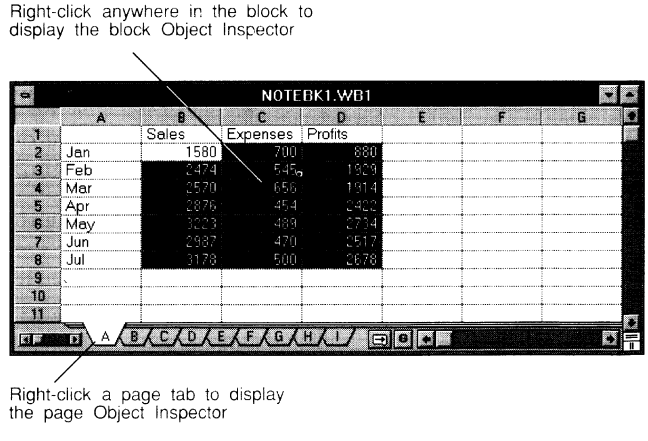
1. Select the block you want to affect.
2. With the mouse pointer anywhere in the selected block, click the right mouse button, or choose Property | Current Object.

To change page properties, do one of the following:

- Right-click the page tab.
- Select the page tab with the left mouse button, then choose Property | Active Page.

The next figure shows where to right-click to display the Object Inspector.

Figure 4.1
Where to right-click to display the block or page Object Inspector



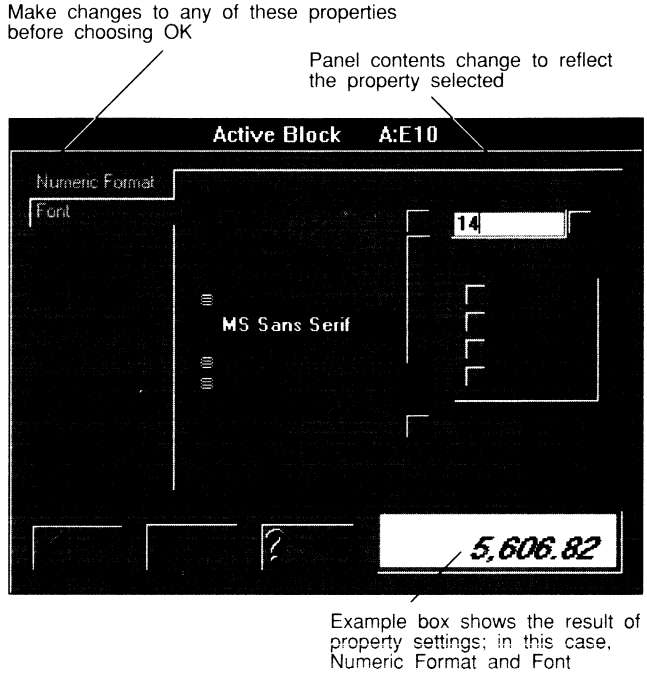
Block properties

Most block properties affect the appearance of cell entries or of rows or columns.

The block Object Inspector lets you make changes to many properties at the same time. It provides an example of what your

changes will look like before you choose OK, as shown in the next figure.

Figure 4.2
Block Object Inspector features



The coordinates of the selected block appear in the title bar of the block Object Inspector. This helps you confirm which block you're affecting.

As you choose different properties, the right side of the Object Inspector changes to display options that apply to the active property. When you change a property setting, the property name turns blue until you choose OK.

If you move a cell, its properties move with the data and are removed from the original cell. If you copy a cell, the copy takes on the properties of the original cell. If you paste a copied or cut block with Edit | Paste Special, you can control whether the cell's properties are pasted (see page 252).

Numeric format

When you enter a number in an unformatted cell, Quattro Pro displays it according to the numeric format setting determined by the Normal style. By default, this setting is General, which displays numbers exactly as you enter them (unless the column width is too narrow). A number of other formats are available, including formats that add commas, dollar signs, or other characters to your original number.

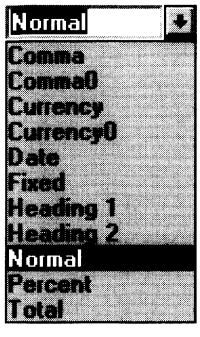
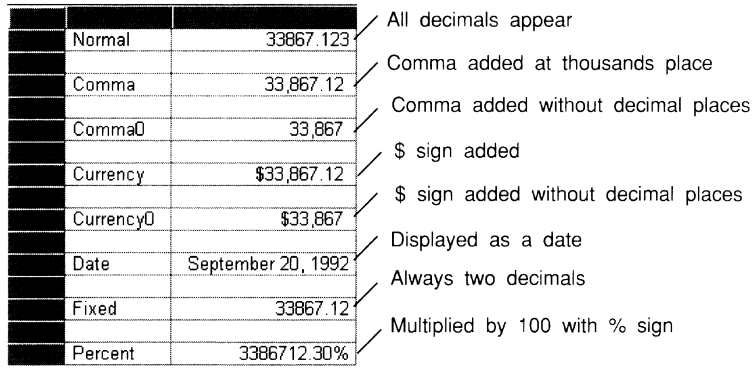


Figure 4.3
Predefined styles that set numeric formats

All numeric formats leave the cell values intact; they only affect the way values are displayed.

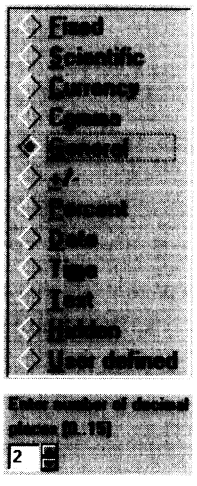
To quickly change to one of the more common numeric formats, choose from the styles listed in the SpeedBar's Style list.

Only some of the styles in the list affect the numeric format; the others set other properties. The next figure shows the effects of the numeric format styles. For information on the remaining styles, see page 86.



Note The predefined styles in the Style list differ slightly from the corresponding numeric format options in that they are preset to display a certain number of decimal places. With the numeric format options, you can choose any number of decimal places to be displayed.

To choose one of the other numeric formats available,



1. Right-click the cells you want to format. Numeric Format is already selected.
2. Choose one of the numeric formats listed. Table 4.1 describes each of these options.
3. If the format you choose allows a variable number of decimal places, an edit field appears. If you want to display other than the default number of decimal places (2), enter a number from 0 to 15 in the edit field.
4. If you choose Date, you must choose a specific date format.
5. If you choose Time, you must choose a specific time format.
6. If you choose User Defined, you can choose from a list of formats you create yourself. For instructions on creating numeric formats, see page 260.
7. Choose OK.

If the format you choose displays a number too wide for its column, a string of asterisks (`*********`) appears. You can display the entire number by widening the column (see page 84).

The next table describes the numeric format choices.

Table 4.1: Examples of numeric formats

Format	Description	Examples
Fixed	Displays no more than the specified number of decimal places.	46.1 or 0.56 or -34.123
Scientific	Uses scientific notation. Allows only one digit in the integer portion of the number.	2.35E+2 or 4.76E+9
Currency	Displays numbers as currency, using currency symbols specified with the Currency setting of the International property (in the application Object Inspector); see page 384.	$3,467.00 or 35 or ($56.24)
Comma	Separates thousands with commas, and shows negative numbers in parentheses.	15,120.25 or (2,456)
General	Displays numbers as entered, unless they're too long to fit the active cell. Then, they're rounded (if fractional) or translated into scientific notation.	456.9452 or -365 or 0.41 or 1.955E+6
+/-	Transforms values into a horizontal bar graph. Each integer translates into a symbol: - for each negative integer, . for zero, + for each positive integer.	---- . +++
Percent	Displays numbers as percentages.	13.40% or -56.44%

Table 4.1: Examples of numeric formats (continued)

Format	Description	Examples
Date	Displays numbers as dates in the format you choose:	
	DD-MMM-YY	09-Apr-92
	DD-MMM	09-Apr
	MMM-YY	Apr-92
	Long International (see page 386)	04/09/92
	Short International (see page 386)	04/09
Time	Displays numbers as times in the format you choose:	
	HH:MM:SS AM/PM	11:31:28 PM
	HH:MM AM/PM	05:15 AM
	Long International (see page 387)	06:56:10
	Short International (see page 387)	06:56
Text	Displays formulas instead of their results. Displays numbers entered in the block in General format. This is also known as the Show Formulas format.	+B6*C3 or @SUM(B1..B10)
Hidden	Suppresses display of both value and label entries. Entries still appear on the input line when the cell is selected.	
User Defined	Lets you choose from a list of formats you create (see page 260).	

If you've hidden cell contents with the Hidden numeric format, you may want to use the Protection property (in the page Object Inspector) to prevent the cells' entries from being accidentally overwritten (see page 90).

Formatting date serial numbers

Quattro Pro stores each date you enter (either with *Ctrl+Shift+D* or a date @function) as a five-digit serial number. Quattro Pro uses this date number for calculations. If you enter the date with *Ctrl+Shift+D*, the cell is switched to the date format in which you enter it. If you enter the date using @DATE, @DATEVALUE, or @NOW (described in *Building Spreadsheet Applications*), you must reformat the cells with the Date numeric format. Otherwise, Quattro Pro displays the results as a date serial number. For example, 33857 would appear instead of 10-Sep-92.

Precision of numbers

Numeric formatting doesn't affect the way Quattro Pro stores values, only the way it displays them. For example, some formats limit the number of decimal places that appear. This doesn't affect the precision of Quattro Pro calculations, which are accurate to 16 significant digits. The stored number is displayed on the input line when you select a cell.

A significant digit is any digit that is not a leading zero. Decimals, commas, dollar signs, and percent signs don't count as part of the total. For example, the number 1.23 has three significant digits.

The number .000123 also has three significant digits because the leading zeros don't count.

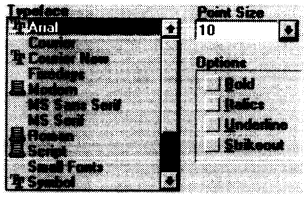
Quattro Pro rounds the appearance of numbers to the specified decimal place in the case of Fixed, Scientific, Currency, Comma, and Percent formats. The +/- format truncates decimal numbers to whole integers. The General format rounds off fractional numbers as necessary to fit in the cell.

To round the number actually stored in a cell, use @ROUND (see Chapter 2 in *Building Spreadsheet Applications*).

Choosing a font

You can quickly switch the selected block to bold or italic, or change its font size with controls on the SpeedBar.

Click **b** to choose bold or click ***i*** for italic. To toggle bold or italic off, click the button again. Click the up or down arrows to increase or decrease the font size.



With the Font property, you can choose from a variety of fonts, sizes, and options.

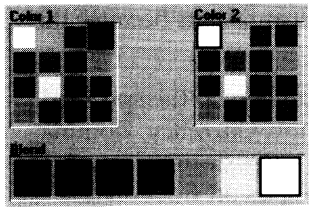
To assign a font to a block, right-click the block and choose Font. Choose the Font, Font Size, and Options you want to use.

If a font has a **TT** (TrueType) or **a** (ATM) symbol beside it, text in that font will appear in print just as it does onscreen. Fonts with a printer symbol will print on your printer, but may not appear in the correct font onscreen. Fonts without a symbol appear accurately onscreen, but may not appear in the correct font when printed.

If you enlarge or reduce the font size, the row height changes to display the tallest letters in the row (unless you've set the row height explicitly; see page 82).

Shading

The Shading property controls the color of cells. The shading color is a mixture of two colors: Color 1 and Color 2. You use the seven Blend squares to control how much of each color to include in the mix.



To shade a block,

1. Right-click the block and choose Shading.
2. Choose the two colors to be mixed by clicking color squares in Color 1 and Color 2.
3. Choose the Blend square that provides the mix you want.

With most color choices, you need to deselect the block to see the new shading. This is because selected cells are shown in reverse color.

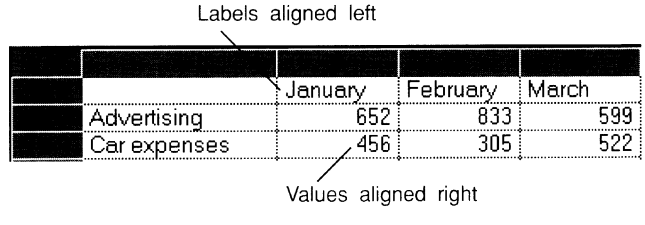
To change the colors available, use the Palette property (in the notebook Object Inspector); see page 396.

Note If shading doesn't appear on your printout, you may need to choose a darker color. Light colors print as white on some printers.

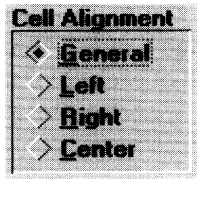
Aligning cell entries

When you enter data into a cell, Quattro Pro aligns it according to the default alignment setting, which is called General. This setting right-aligns values and left-aligns labels, as shown in the next figure.

Figure 4.4
General alignment



To quickly change alignment, select the block you want to affect, then click the left, center, or right alignment button in the SpeedBar.



Instead, you can right-click the block and choose Alignment. Then choose General, Left, Right, or Center.

You can also align an individual label by preceding it with a label-prefix character (see page 27).

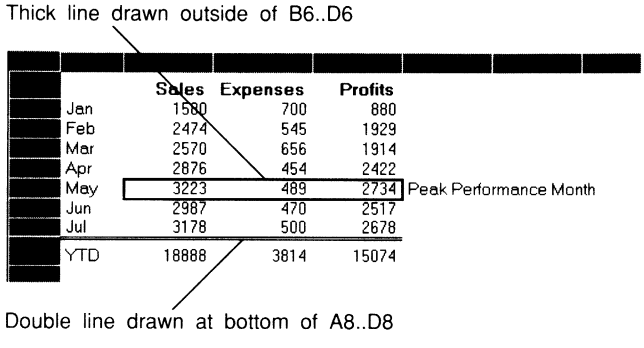
Finally, you can set the alignment of all labels later entered in the page with the Label Alignment property (in the page Object

Inspector); see page 91. This setting determines the affect (on labels only) of the General alignment setting described here. The Label Alignment property setting is overridden by any individual alignment you've set with techniques described previously in this section.

Line drawing

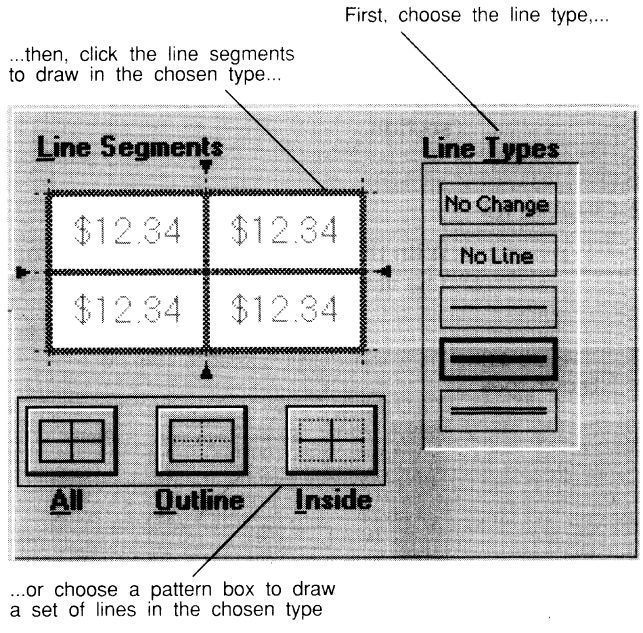
With the Line Drawing property, you can draw lines around cells. The next figure shows an example of line drawing.

Figure 4.5
Drawn lines



To draw lines in a block, right-click the block, then choose Line Drawing. As shown in the figure below, first choose a line type on the right, then click in the sample block to indicate where you want to place that type of line. You can also apply the chosen line type in a preset pattern by clicking one of the three pattern boxes.

Figure 4.6
Specifying line placement



The lines you draw in the sample box indicate where lines will be drawn in the selected block. For example, clicking the outer edges of the sample box draws lines only on the outside of the selected block; clicking the inner lines in the sample box draws lines between every row or column in the selected block.

You can combine line drawing options in the same block. For example, you can draw a double-lined border around a block, and single vertical lines between the columns in the block.

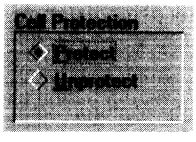
To remove lines, choose the No Line type, then click the lines you want to remove in the sample block.

If you change your mind as you're specifying lines, click the No Change line type and click the line you recently changed. It returns the line to the line type in effect when you last chose OK. To cancel *all* changes, choose Cancel.

To change the screen color of lines, change the Line Color property (in the page Object Inspector); see page 90.

Protecting cells

The Protection property (in the page Object Inspector; see page 90) lets you enable or disable overall page protection. You can then remove protection from individual blocks of cells with the Protection property (in the block Object Inspector). That way, you can enter data in those cells, leaving the remainder of the page protected.



To remove or restore protection in a block of cells in a page that has already been protected with the Protection property (in the page Object Inspector), right-click the block of cells, choose Protection, and choose Protect or Unprotect.

When a cell is protected, you can't edit, replace, or delete its contents. Nor can you delete a column or row that contains a protected cell.

Note When you disable protection with the Protection property (in the page Object Inspector), no cells are protected, even those you protected individually with the Protection property (in the block Object Inspector).

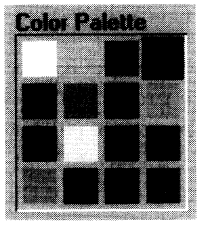
With page protection enabled, you can move the selector around the entire page, but you can make changes only to unprotected cells. To restrict the selector to unprotected cells only, use Data | Restrict Input (see page 304).

Changing text color

The Text Color property controls the color of cell entries. This property controls the color of the characters that make up the data, not the color of the cell shading.

To change the color of cell entries in a block, right-click the cells, then choose Text Color. Choose the color you want. If you already changed the cell's shading, make sure the Text Color setting will contrast enough to be visible.

Note If the text doesn't appear on your printout, you may need to choose a darker color. Light colors print as white on some printers.

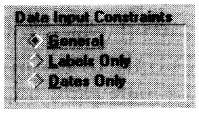


To change the colors available, use the Palette property (in the notebook Object Inspector); see page 396. If you create a new color for the palette that is *dithered* (a color that looks like a checkerboard pattern) and later choose it for the Text Color property, your text will appear in a substitute, nondithered color. You *can* use dithered colors for other elements besides text and drawn lines.

With most color choices, you need to deselect the block to see the new shading. This is because selected cells are shown in reverse color.

Limiting data input types

You can force a block of cells to accept only labels or only dates and times. This feature is especially helpful if you're setting up a notebook for others to use. For example, presetting cells for label-only entry makes it easier to enter phone numbers and social security numbers because they contain hyphens that are otherwise interpreted as minus signs.



To choose the type of data that can be typed into a cell, right-click the block and choose Data Entry Input. Then choose General, Labels Only, or Dates Only. (Dates Only restricts entries to dates or times.)

If someone types a date, time, or number in a label-only cell, it's converted to a label. If someone tries to type a label or number into a date-only cell, an error message appears.

To return to unlimited data entry, right-click the limited block and choose General for the Data Entry Input setting.

For the list of acceptable date and time formats, see page 29.

Resizing columns and rows

There are several ways to change the width of columns and the height of rows. You can

- Use the Fit button in the SpeedBar to tailor column width to the longest entry in the column.
- Drag the row or column border with the mouse.
- Specify an exact numerical setting with the block Column Width and Row Height properties.

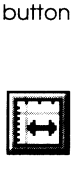
You can also hide rows or columns from being displayed, yet retain the data for other cells to reference for calculation in the notebook.

Finally, you can set a global width for all columns in the active page with the Default Width property (in the page Object Inspector); see page 93.

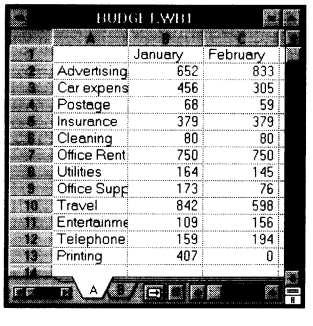
Setting automatic sizes

You can adjust column width to one character wider than the longest entry in a given column. To do this, click the column border and click the Fit button in the SpeedBar. You can also select multiple columns at the same time (they must be contiguous columns) and click Fit to adjust them simultaneously.

Figure 4.7
Using the Fit button

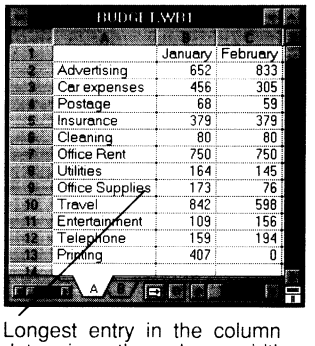


Before using Fit



	A	B	C
1		January	February
2	Advertising	652	833
3	Car expens	456	305
4	Postage	68	59
5	Insurance	379	379
6	Cleaning	80	80
7	Office Rent	750	750
8	Utilities	164	145
9	Office Supp	173	76
10	Travel	842	598
11	Entertainme	109	156
12	Telephone	159	194
13	Printing	407	0
14			

After using Fit



	A	B	C
1		January	February
2	Advertising	652	833
3	Car expenses	456	305
4	Postage	68	59
5	Insurance	379	379
6	Cleaning	80	80
7	Office Rent	750	750
8	Utilities	164	145
9	Office Supplies	173	76
10	Travel	842	598
11	Entertainment	109	156
12	Telephone	159	194
13	Printing	407	0
14			

Longest entry in the column determines the column width

To adjust a column based on a group of cells, select them and click Fit. To adjust based on the longest entry in a cell or in any cell in the same column below it, select that cell and click Fit.

To further tailor a column's width, you can specify the amount of space to add to the longest entry, using the Column Width property (see page 84).

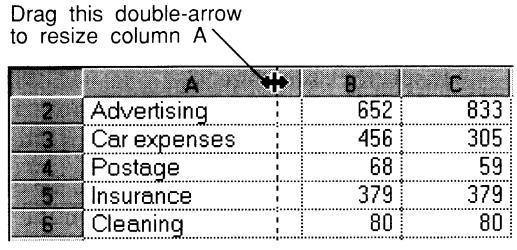
Resizing with the mouse

Another easy way to change column or row size is to drag its border. You can use this method to resize single or multiple rows or columns.

To resize a single row or a single column, move the cursor over the right edge of the column border to be resized, or over the bottom edge of the row border to be resized. The cursor turns into

a double-arrow. Then drag the double-arrow until the row or column has reached the size you want.

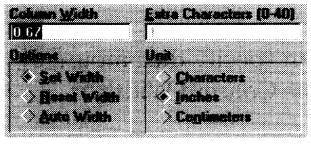
Figure 4.8
Dragging a column border



You can also resize several rows or several columns in the same page to a uniform size. Select contiguous rows or columns (by dragging in their borders), or select noncontiguous rows or columns (by clicking their borders while holding down the *Ctrl* key). Decide on a row or column within the selection that you want to govern the uniform size. Then drag the double-arrow at the right of the governing column (or if you're resizing rows, drag the double-arrow at the bottom of the governing row). All the rows or columns are resized to the same dimension even if they started out with different sizes.

Setting exact sizes

With the Column Width and Row Height properties, you can adjust single or multiple columns, or single or multiple rows to an exact size. You can also resize rows or columns back to their default size. In the case of columns, you can set an automatic width based on the longest entry plus the amount of space you choose.



To adjust column widths or row heights, select any cell in each column or row you want to resize, or select their borders. You can also select noncontiguous columns or rows.

Next, right-click the selected block, choose Column Width, and choose Set Width. Then click Characters, Inches, or Centimeters, and enter the number you want in the Column Width edit field. To return column width to the default, choose Reset Width instead.

Note The setting of the Default Width property (in the page Object Inspector) determines the default column width. Columns whose widths you've explicitly adjusted (with the Fit button, the mouse

or the Column Width property) are *not* controlled by the Default Width property.

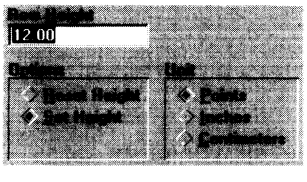
You can use the Auto-Width option to resize contiguous columns based on the longest entry instead. The longest entry is chosen based on your initial column or block selection:

- If entire columns are selected, the width is based on the longest entry in each column.
- If a multi-row block (or just part of a column) is selected, the width in each column is based on the longest entry in each column of the block.
- If a single-row block (or just one cell) is selected, the width is based on the longest entry *in that row and all cells below it.*

The Auto-Width option works like the Fit button in the SpeedBar, but it goes one step further: you can specify the amount of extra column width space to be added beyond the longest entry.

To use the Auto-Width option, select in the notebook as described above, then right-click the block. Choose Column Width and Auto-Width. Then choose Characters, Inches, or Centimeters and enter the number of extra characters to add to the longest entry.

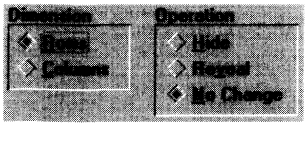
If a column you're adjusting contains a long entry that spills over into blank cells to the right, and you *don't* want the column adjusted to that cell entry's length, specify a multi-row block that stops short of the cell.



To resize rows, right-click them and choose Row Height. Click Points, Inches, or Centimeters, and enter the number you want in the Row Height edit field. To return the row height to the default (as determined by the largest font used in the row), choose Reset Height instead.

Hiding rows and columns

Occasionally, you may want to temporarily remove rows or columns of data from view and from printouts, but still use the data in calculations. With the Reveal/Hide property, you can hide rows or columns from view without losing the data they contain. You can later redisplay the rows or columns with the same property.



To hide rows or columns from view, select the borders of the row(s) or column(s) you want to hide. Right-click the block and choose Reveal/Hide. Choose Rows or Columns and choose Hide.

Columns to the right of the hidden columns move left to fill in the empty space; rows below the hidden rows move up. However, the identifying row numbers and column letters in the borders don't change. In other words, if you hide column B, the columns onscreen are labeled A, C, D, and so on.

If you use Tools | Extract to save part of a notebook that includes hidden rows or columns (see page 377), Quattro Pro saves the hidden rows or columns in the new file, although they will still be hidden from view when you load the file.

To return one or more hidden rows or columns to the screen, right-click a block containing cells on both sides of the hidden area and choose Reveal/Hide. Then choose Rows or Columns and choose Reveal.

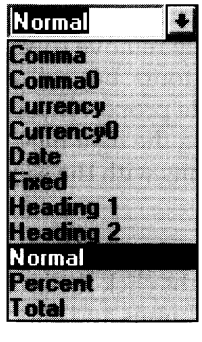
You can also reveal a single hidden row or column with the mouse. To reveal a hidden column, place the mouse pointer slightly to the right of the hidden column's border, then drag. For a hidden row, drag from just below the hidden row's border. The hidden row or column is revealed and sized as you drag.

Using styles

Quattro Pro contains several predefined styles, each of which is a specific property setting (or settings) identified by a name. Applying the style is faster than using the block Object Inspector.

You apply styles to a selected block with the Style list in the SpeedBar. If you've previously set properties with the block Object Inspector, the style doesn't disturb those settings.

The Quattro Pro styles are described in the following list:



- **Comma** uses the Comma numeric format with two decimals.
- **Comma0** uses the Comma numeric format with no decimals.
- **Currency** uses the Currency numeric format with two decimals.
- **Currency0** uses the Currency numeric format with no decimals.
- **Date** uses a User Defined numeric format that displays the month name spelled out followed by the day and year.
- **Fixed** uses the Fixed numeric format with two decimals.
- **Heading 1** uses Arial (or Helvetica) 18 Bold font.
- **Heading 2** uses Arial (or Helvetica) 12 Bold font.

- **Normal** uses the General numeric format, Arial (or Helvetica) 10 font, white shading, General alignment, no line drawing, protection on, and black text color.
- **Percent** uses the Percent numeric format with two decimals.
- **Total** uses a double line above text for line drawing.

You can create your own styles to add to the Style list, or revise existing ones using Edit | Define Style (see page 259).

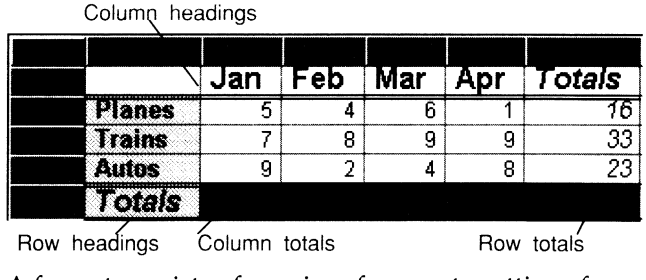
Using SpeedFormat

Instead of setting properties in individual cells, you can choose a predefined set of properties for different parts of an entire block. This set of properties is called a format, which you apply with the SpeedFormat button in the SpeedBar.

The different parts of the block that a format can affect are:

- column headings (cells in the top row)
- column totals (cells in the bottom row)
- row headings (cells in the left column)
- row totals (cells in the right column)
- the body (remaining cells in the block)

Figure 4.9
Parts of a formatted block



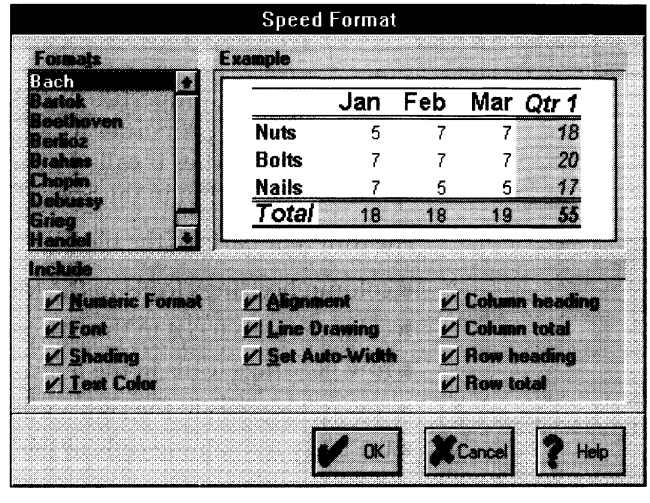
A format consists of a series of property settings for each of the five parts of a block. You can apply a format to the body and selectively to any of the other four parts.

You can also control which properties of a format to apply. Only the checked properties are applied in the body and in the checked parts of the block.

To apply a format,

1. Select the block to be formatted and click the SpeedFormat button.
2. Choose a format from the SpeedFormat dialog box.

Figure 4.10
SpeedFormat dialog box



3. Uncheck any properties you don't want applied in the block.
4. Uncheck any parts (column headings, row headings, column totals, or row totals) you don't want included as part of the format.
5. Choose OK.

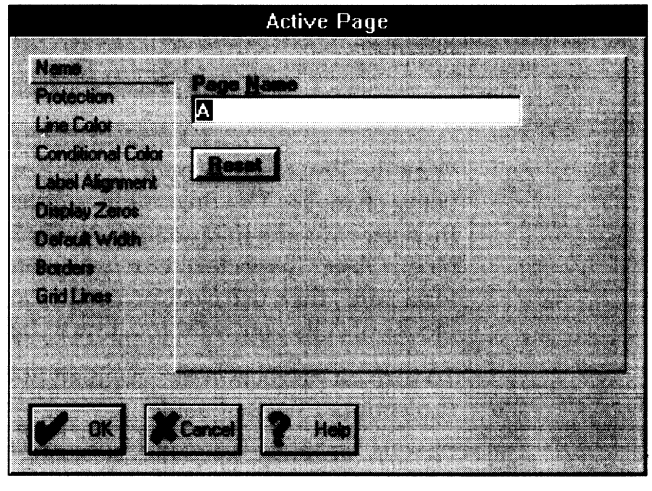
The format is applied to the body and to any of the other four parts you checked.

Using SpeedFormat works similarly to applying styles in that currently existing properties in the block are undisturbed. For example, if you use SpeedFormat to shade cells and later want to remove that shading, you need to right-click that block and select the default setting for the Shading property. Simply reusing SpeedFormat and unchecking Shading doesn't change the block's shading.

Page properties

Page properties are listed in the left side of the Object Inspector, shown next.

Figure 4.11
Page Object Inspector



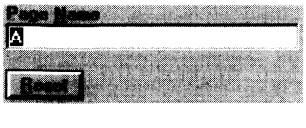
Naming a page

Pages are initially named with letters of the alphabet, in sequence from A to Z, continuing from AA to AZ, up to IV. You can give pages descriptive names up to 15 characters long for easier identification. These names are then used in formula references.

To assign a name to a page, right-click its tab. Name is already selected. You can use letters and numbers in the name, as well as the following special characters

~ ' ! % _ | \ ' ?

You can't use spaces or any other special characters. Also, you can't use a name you've previously assigned to a group in the same notebook.



After you choose OK, the new name appears on the tab. Formulas that refer to the renamed page adjust to use the new name. When you point to cells in this page from other pages to build formula references, the new page name appears in the input line.

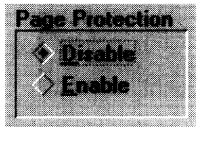
Figure 4.12
Named pages

If, after assigning a page name, you want to rename it to its original letter name, choose Reset.

Note The Graphs page (the last page in the notebook) cannot be renamed.

Enabling protection

With the Protection property, you can prevent cell entries from being changed. The Protection property (in the page Object Inspector) works in tandem with the Protection property (in the block Object Inspector). Use *page* protection to set up protection for a page, then use *block* protection to unprotect the specific blocks of cells you want to allow to be changed.



To turn on protection in a page, right-click its tab and choose Protection. Choose Enable.

To turn off protection, choose Disable. When page protection is disabled, Quattro Pro ignores the status of blocks explicitly protected or unprotected with the Protection property (in the block Object Inspector).

For more information on protection, see page 81.

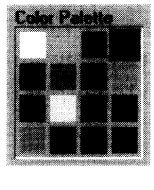
To prevent unauthorized access to an entire notebook, assign a password to the file (see page 103).

Setting line drawing color

You can draw lines around cells or blocks with the Line Drawing property (see page 79). By default, the lines are black.

To change the color of lines in a page, right-click its tab and choose Line Color. Then choose the color you prefer.

Note If lines don't appear on your printout, you may need to choose a darker color. Light colors print as white on some printers.

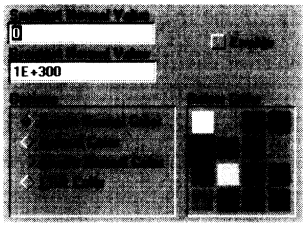


To change the colors available, use the Palette property (in the notebook Object Inspector); see page 396. If you create a new color for the palette that is *dithered* (a color that looks like a checkerboard pattern) and later choose it for the Line Color property, your lines will appear in a substitute, nondithered color. You *can*

use dithered colors for other elements besides drawn lines and text.

Coloring conditional cells

With the Conditional Color property, you can change the color of specific types of data: values above or below a specified range, and ERR values. For example, you can use it to display all negative values in red or all values greater than 1000 in green. Choose from these options in the Conditional Color property:



- **Smallest Normal Value** and **Greatest Normal Value** let you enter a range of values you consider normal. Cells with values within this range will appear in the Normal Color. The default settings are 0 (smallest) and 1E+300 (largest). You can specify different colors for values above and below this range by clicking the option you want and clicking a color square in the Color Palette.
- **Below Normal Color** sets the color of cells whose values are below the Smallest Normal Value.
- **Normal Color** sets the color of cells whose values fall within the range set by Smallest Normal Value and Greatest Normal Value.
- **Above Normal Color** sets the color of cells whose values are above the Greatest Normal Value.
- **ERR Color** specifies the color to use for ERR and NA values generated by formula errors.
- **Enable** indicates whether to use the colors set with this menu.

To turn off conditional colors, uncheck Enable.

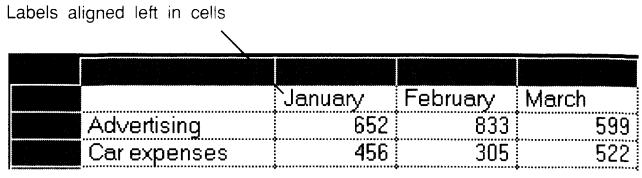
To change the colors available, use the Palette property (in the notebook Object Inspector); see page 396.

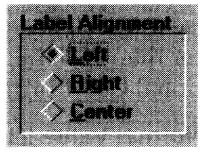
Note If colored entries don't appear on your printout, you may need to choose a darker color. Light colors print as white on some printers.

Setting label alignment

The Label Alignment property determines the alignment of labels subsequently entered into the active page. Initially, the setting is Left, as shown in the next figure.

Figure 4.13
Default label alignment





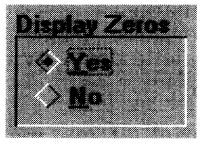
Label entries already existing in the page don't adjust. To change the alignment of existing data, use the Alignment buttons in the SpeedBar or the Alignment property (in the block Object Inspector). All *new* labels will be aligned according to the new default (unless you precede them with a different label-prefix character). Values (including string values that result from some @functions) are not affected by label alignment settings.

To change the default alignment of labels in a page, right-click its tab and choose Label Alignment. Then choose Left, Center, or Right.

The setting you make here determines the effect of the General setting of the Alignment property (in the block Object Inspector); see page 78.

Suppressing zeros

With the Display Zeros property, you can suppress the display of any value that equals *exactly* zero, whether it was entered directly or calculated with a formula.



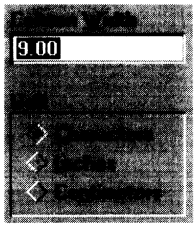
To suppress zeros from displaying on a page, right-click the page tab and choose Display Zeros. Then choose No. Zero suppression doesn't remove the zero values from the page. They remain in memory and reappear if you set Display Zeros to Yes.

A value must equal exactly zero to be suppressed. For example, a value such as .004 that appears as 0 if decimal precision is 2 or less, will still appear even if Display Zeros is set to No, because it is not actually 0.

Caution! When zero suppression is on, it's easy to accidentally write over cells containing formulas that evaluate as zero. Make sure Undo is enabled (see page 389), or consider protecting the page (see page 90).

Setting default column width

By default, columns are wide enough to display approximately nine characters in the font used by the Normal style. You can adjust the width of all columns in the active page by changing the Default Width property setting.



To change the default width of columns for a page, right-click its tab and choose Default Width. Choose Characters, Inches, or Centimeters and enter the number of units in the Column Width edit field.

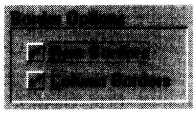
The Default Width setting doesn't affect columns that were explicitly adjusted using the Fit button, the Column Width property (in the block Object Inspector), or the mouse. Before those columns can be affected by a change in the default width, you must select them and check the Reset Width option of the Column Width property.

The next figure shows a page with the default column width set to 5 characters.

Figure 4.14
Default column width changed

	A	B	C	D	E	F
1	Emp	Sick	Vaca			
2	No.	Days	Hrs			
3	1893	5	132			
4	1563	4	178			
5	3011	6	0			
6	2732	2	28			

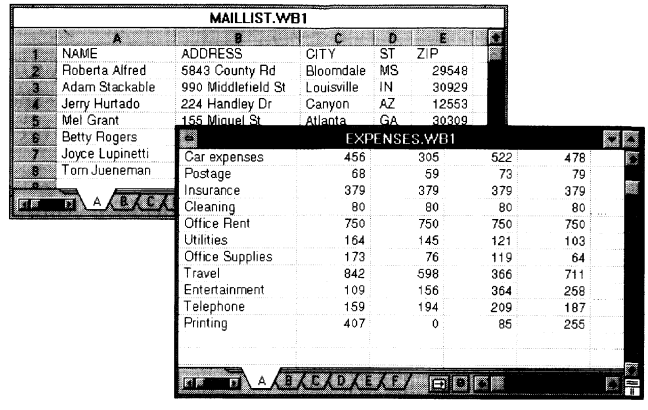
Removing borders



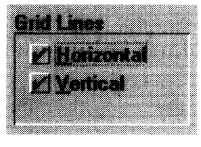
If you don't need the row and column borders (for example, if your page is set up as a form for data input), you can remove them from the screen with the Borders property.

To remove borders from a page, right-click its tab and choose Borders. Then uncheck Row Borders and/or Column Borders.

Figure 4.15
With and without borders



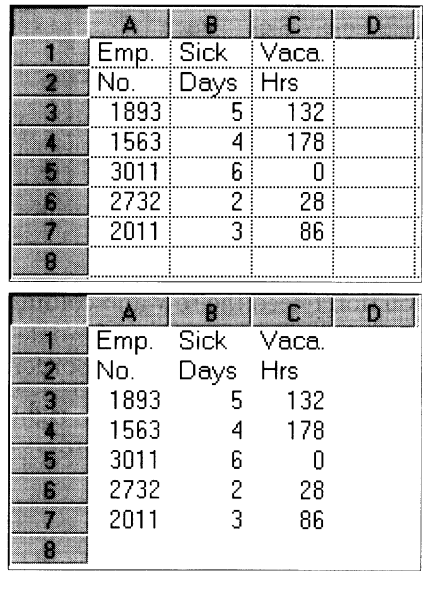
Hiding grid lines



The spreadsheet grid appears by default. It separates rows and columns; each rectangle in the grid is a cell.

To remove grid lines from a given page, right-click its tab and choose Grid Lines. Then uncheck Horizontal and/or Vertical.

Figure 4.16
With and without grid lines



	A	B	C	D
1	Emp.	Sick	Vaca.	
2	No.	Days	Hrs	
3	1893	5	132	
4	1563	4	178	
5	3011	6	0	
6	2732	2	28	
7	2011	3	86	
8				

	A	B	C	D
1	Emp.	Sick	Vaca.	
2	No.	Days	Hrs	
3	1893	5	132	
4	1563	4	178	
5	3011	6	0	
6	2732	2	28	
7	2011	3	86	
8				

C H A P T E R

5

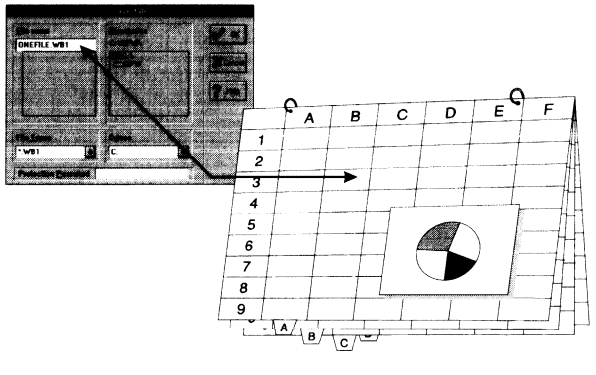
Files

This chapter describes how to

- load, save, and close notebook files
- load and save workspace files

Each Quattro Pro notebook is saved in its own file, along with any graphs, slide shows, or dialog boxes you've created.

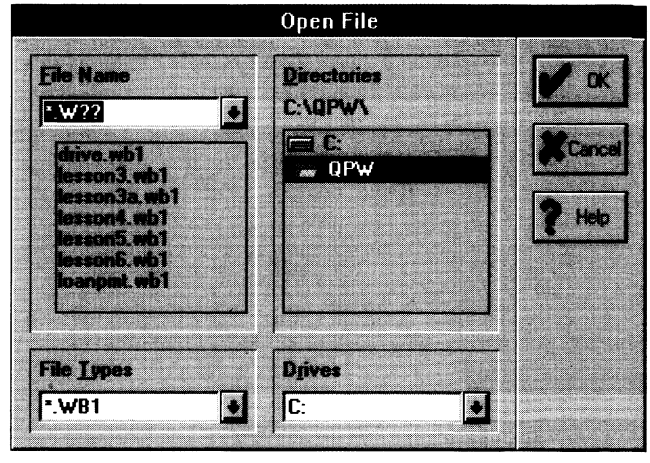
Figure 5.1
A notebook as a file



Using file handling options

Most commands that save or load files use a dialog box like the one shown in the following figure.

Figure 5.2
A File menu dialog box



When you open any file-handling dialog box for the first time in any Quattro Pro session, it displays files in the *startup directory*. The startup directory (by default, C:\QPW\) is initially the directory from which you start Quattro Pro, but you can change it with the Startup property (in the application Object Inspector); see page 388.

If you save or load a file in a directory other than the startup directory, this last-used directory becomes the *default directory*. Then, the next time you choose a command to save or load a file, the default directory initially displays in the dialog box. The last-used directory is always the default directory displayed until you restart Quattro Pro, when the startup directory again displays.

If the file name you want is already displayed, double-click it. To display file names in other drives or directories, use these controls:

- **Directories** displays the startup directory below the directory or drive containing it and above its subdirectories. To change to a different directory, double-click it.
- **Drives** lets you switch to another drive. Click the arrow at the right of the box and click the drive name you want to switch to.
- **File Types** controls the file names that are listed in the File name list box above it. Initially, the dialog box is set to display all files with any extension beginning with .W, but you can choose another popular file type by clicking the arrow and choosing a type from the list.

- **File Name** is where you choose the file to be saved or loaded, either by typing it in the edit field or clicking it from the list below. You can also quickly choose files with the down arrow button next to the File Name edit field; it displays a list of the files you've used most recently with the current command.

An asterisk is replaced by any number of characters in its position. A question mark is replaced by any single character in its position.

You can use the DOS wildcard characters (* and ?) in any part of the File Name edit field to limit the files displayed. For instance, *.PRN lists all files with the extension .PRN, and BUDGET9?.WB1 lists all notebooks that begin with BUDGET9 and have one character before the .WB1 extension.

Loading files

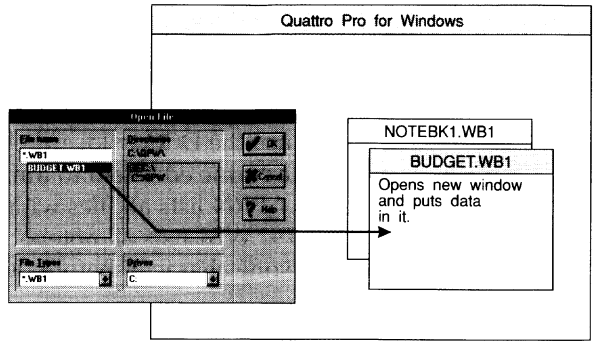
Saving a notebook writes it to a file. You can redisplay it by loading the file into a window. You can also load files created with other spreadsheet programs; Quattro Pro translates them automatically.

These File menu commands open a window or load a file into a window:

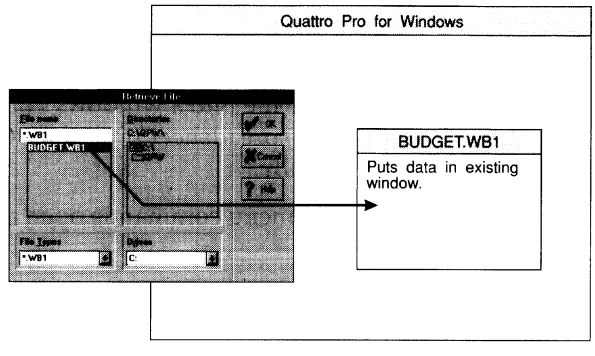
- **New** creates a new, blank notebook window, overlaying existing windows.
- **Open** creates a new window and loads the file you specify into it, overlaying existing windows.
- **Retrieve** loads a file into the active window, replacing any data currently in the window.

Figure 5.3
Loading a file

Opening



Retrieving



Creating a new file

To create a new notebook window without putting away the active notebook, use File | New. Quattro Pro opens a blank window, overlaying existing windows. It names the window NOTEBK#.WB1, where # is the number of windows you've opened since starting Quattro Pro. You can change the name when you save the file.

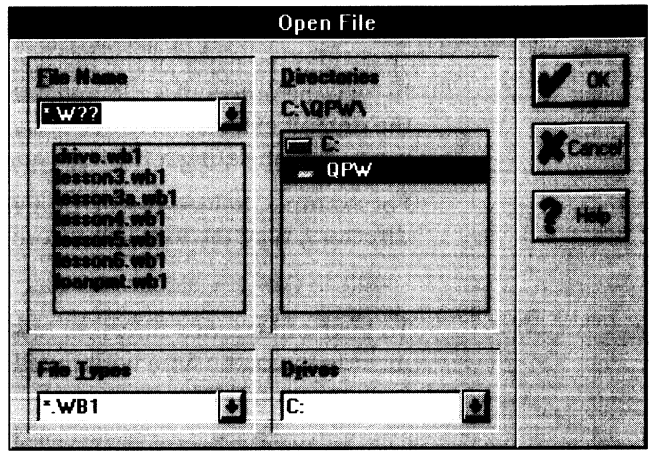
You can have multiple windows open at a time, with different notebooks in each. Each new window overlays other open windows. You can reselect an open window by clicking any visible part of it, or by selecting it from the list at the bottom of the Window menu.

Opening a file

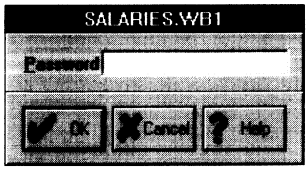
To work with another existing notebook without putting away the active notebook window, use File | Open:

1. Choose File | Open.

Figure 5.4
The Open File dialog box



2. Choose the file name you want, using the techniques described on page 96. To open a file created with a different program, include the file-name extension when you open it (see page 355).



3. If the file has a password, a dialog box appears with space for entering it. Type the password and choose OK. If the password is incorrect, Quattro Pro displays an error message and cancels the Open command. (You can set up a password as explained on page 103.)

Automatically opening a file

When you start Quattro Pro, a blank notebook appears. However, if you've specified an autoload file, this file is opened automatically. This feature lets you immediately display the notebook you use most often.

An *autoload file* is a notebook specified with the Autoload File option of the Startup property (in the application Object Inspector); see page 388. By default, this file is QUATTRO.WB1. Any notebook with that name in the startup directory is opened

automatically if no other is specified. You can change this default to any file you like.

Opening from the command line

You can start Windows and Quattro Pro and open a notebook, all at the same time.

To load a specific notebook, type `WIN C:\QPW\QPW` (depending on the directory in which you installed Quattro Pro), followed by a space and the name of the file you want to open. There is no need to type the notebook's file-name extension unless it differs from the default extension (which is .WB1 by default—see page 389), or if you're translating a file from another program (see page 355).

For example, to load the BUDGET.WB1 file from the current directory, type the following from the DOS prompt:

```
WIN C:\QPW\QPW BUDGET
```

To load a file from a directory other than the current directory, include the path name with the file name. For example, from the DOS prompt, type:

```
WIN C:\QPW\QPW C:\COMPANY\BUDGET
```

If Quattro Pro can't find the directory or the file you specify, it opens a new notebook by that name.

You can also load a file with Quattro Pro using Program Manager's Run command. For example, in the Run dialog box, type:

```
C:\QPW\QPW BUDGET
```

Note You need to include the file extension only if it is a file to be translated from another program.

Retrieving a file into a window

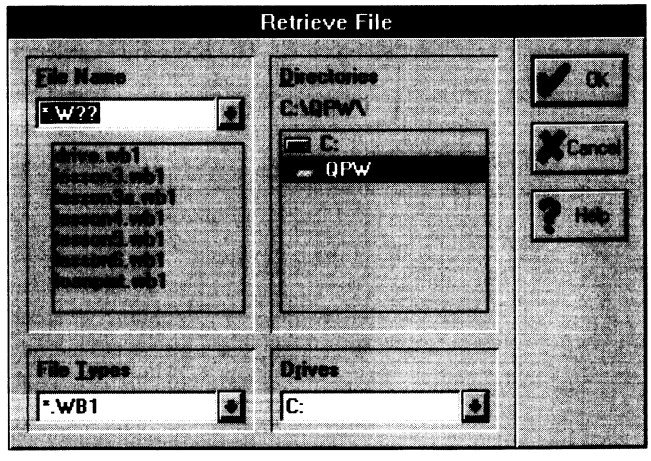
To load a notebook into the active window, use File | Retrieve. This removes any data from the active window, then fills it with the specified notebook.

To retrieve a notebook into the active window,

1. Choose File | Retrieve.

   If the active window contains unsaved data, a dialog box appears asking if you want to lose your changes. Choose No to go back and save changes, or Yes to continue.

Figure 5.5
The Retrieve File dialog box



2. Choose the file name you want, using the techniques described on page 96.
3. If the file has a password, a dialog box appears with space for entering it. Type the password and choose OK. (You can set up a password as explained on page 103.)

When a notebook is retrieved, it replaces existing data in the window. Also, the window takes on the size and position it had when you last saved the notebook. For example, if the window was in the left half of the desktop when you last saved the notebook, the window in which you retrieve the notebook moves to the left half of the desktop.

To retrieve a file created with a different program, include the file-name extension when you retrieve it (see page 355).

Saving files

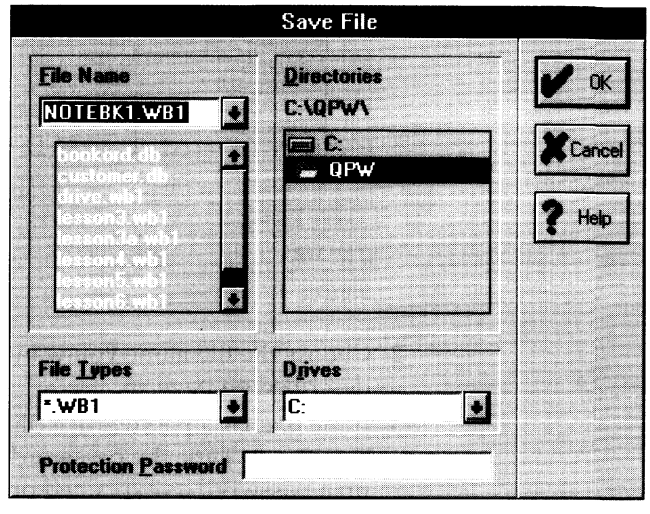
There are three commands that save notebooks to disk:

- **Save** saves the notebook to the name under which you last saved it. If the notebook has never been saved, choosing Save opens the same dialog box used by Save As.
- **Save As** saves the notebook under a new name you specify.
- **Save All** saves all open notebooks.

If you're using Save with a notebook for the first time, or if you use Save As, the Save File dialog box appears:

1. Choose File | Save As.

Figure 5.6
The Save File dialog box



2. Enter the file name you want, using the techniques described on page 96.
3. If the file name you enter already exists, Quattro Pro warns you and gives you these options:
   - **Replace** overwrites the existing file.
   - **Backup** copies the file that exists on disk, giving it a .BAK file-name extension, and creates a new file with the original's name. To load the backup file later, include the .BAK extension with that name. This .BAK file contains your data as you previously saved it.

Quattro Pro saves the notebook, storing the data along with all its properties. Quattro Pro also saves any graphs, slide shows, and dialog boxes you've created.

After you name a notebook, you can store changes to it with File | Save. Quattro Pro assumes you want to save the file under the same name.

File | Save All saves all open notebooks. For each file, you have the same Replace, Backup, or Cancel options as with the Save As command.

To save a notebook for use with another program, such as Paradox, dBASE, Reflex, or 1-2-3, include the program's data file extension when you save the notebook (see page 355).

Assigning a file name

Like all legal DOS file names, Quattro Pro file names can be up to eight characters long and can consist of both letters and numbers. You can enter file names using either uppercase or lowercase letters. You can't use spaces in a file name. You can, however, use the underscore character (_) to simulate spaces; for example, 92_SALES.

Caution! If you assign a name longer than eight characters, Quattro Pro shortens it to the first eight characters.

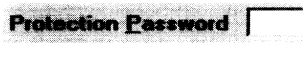
Unless you're saving a file for use with another program, it's best if you don't include an extension with the file name. Quattro Pro then adds the default extension, initially .WB1. (To change the default extension, see page 389.)

Assigning a password to a file

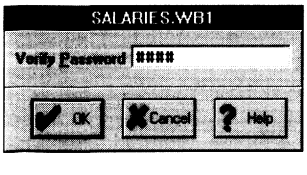
You can protect a notebook from unauthorized loading by giving it a password. That password must then be supplied whenever anyone tries to load the file.

To assign a password to a notebook,

1. Choose File | Save As.
2. For Protection Password, enter the password you want to give the file. You can use up to 15 characters. The characters you type show onscreen as pound signs (#####) so they are hidden from view.



3. Enter the file name you want, using the techniques described on page 96.
4. After you choose OK, a dialog box appears for you to verify the password.
5. Type the password again, and choose OK. If the password differs at all from the first one you typed, Quattro Pro displays an error message and cancels the Save command.



Passwords are case-sensitive. For example, if your second password entry has a lowercase letter where the first entry had a capital, Quattro Pro considers these different passwords.

Caution! If you forget a file's password, you won't be able to load the file. For this reason, record your passwords when you create them and store the record in a secure place.

Saving notebook templates

After you've worked with Quattro Pro for a while, you may find that you repeatedly use certain settings, formats, or structures in your notebooks. For example, you might use particular property settings or macros over and over. In these cases, you can reduce the time required to set up standard notebooks by creating notebook *templates*.

A notebook template is like a structural skeleton you can use as a basis for other notebooks. If you've already set up one notebook with the formatting properties and customized structure you prefer, save it first. Then erase any nonstandard data you've entered (with Edit | Clear Contents) and save the file under a different name (with File | Save As). When you load the template, much of your initial work will be done for you. Just add new data and save the file under another name.

If you want to use the template most of the time, you can load the template every time you start Quattro Pro with the Autoload File option of the Startup property (in the application Object Inspector); see page 388.

Closing files

When you close a file, you remove the notebook, all its associated graph and dialog windows, and all its views (created with Windows | New View) from the desktop. To close files,

1. Choose File | Close (for one file) or File | Close All (for all open files).
2. If a notebook has unsaved changes, a dialog box appears asking if you want to save your changes. To save the file, choose Yes; choosing No closes the file without saving it.
3. Quattro Pro closes the window, revealing any windows underneath.

To close all open windows and exit Quattro Pro at the same time, choose File | Exit.

To close a particular window (without closing related views), choose Close from the window's Control menu.

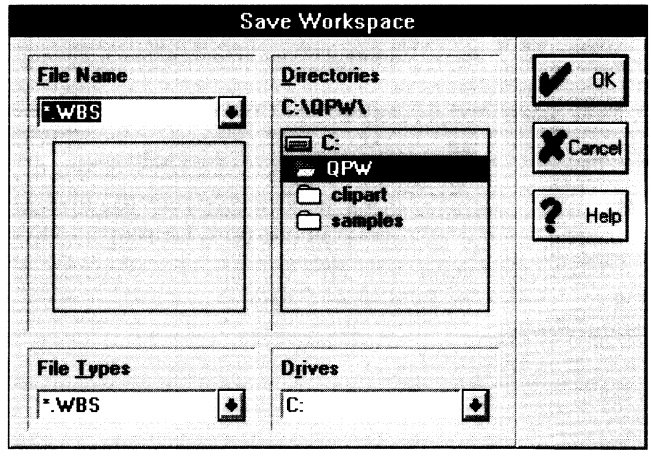
Using workspaces

The arrangement of windows onscreen is called a *workspace*. The workspace consists of the image of the position and size of all notebook windows and the names of the files contained in each window. The positions of graph and dialog windows are not saved as part of a workspace.

To save a workspace,

1. Choose File | Workspace | Save.
2. Enter the file name you want, using the techniques described on page 96. Don't include a file-name extension; Quattro Pro includes the .WBS extension for workspace files.

Figure 5.7
The Save Workspace dialog box

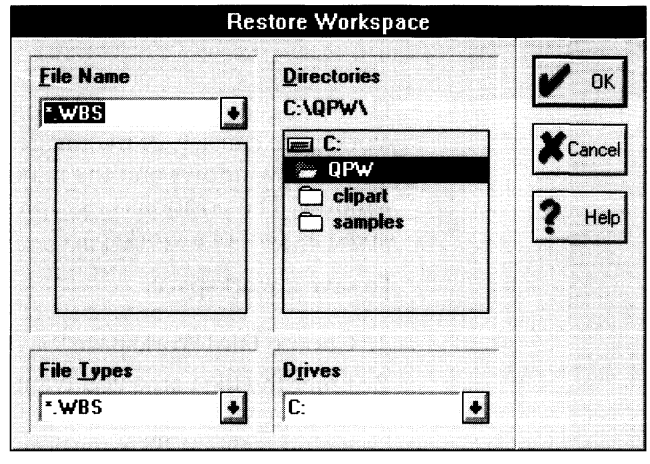


Caution! Saving a workspace doesn't save the contents of the files within it; use File | Save or Save All for this. In addition, if you use File | Save As, you must use File | Workspace Save afterward so that Quattro Pro can load the correct file the next time you retrieve the workspace.

To retrieve a workspace,

1. Choose File | Workspace | Restore.
2. Choose the file you want from the list, or type in a name and choose OK.

Figure 5.8
The Restore Workspace dialog box



Quattro Pro overlays any existing windows with the windows stored in the workspace file, then retrieves the appropriate file for each.

Quattro Pro always retrieves the latest saved version of files when you retrieve a workspace. If you close the windows that make up a workspace and later save a file included in the workspace, Quattro Pro retrieves the updated version of the file the next time you choose File | Workspace | Restore.

C H A P T E R

6

Windows

This chapter describes how to manipulate Quattro Pro's windows. You can use commands in the Windows menu to

- select windows
- duplicate windows
- resize windows
- arrange icons on the desktop
- hide or show windows
- split windows into two panes
- lock titles in place as you scroll a spreadsheet page

Selecting a window

If you have more than one window open, you can select the one you want to work in with commands on the Windows menu. When a window is selected, it is referred to as the *active* window. The window with the highlighted title bar is active.

There are three ways to select an open window:

- Click any part of the window.
- Choose the window from the list at the bottom of the Window menu. A checkmark appears next to the name of the active window.

- Press *Ctrl+F6* to move into the next window (in the sequence in which they were created). If that window is beneath other windows, it moves to the top.

Duplicating a window

The Window | New View command displays a duplicate copy of the active notebook in a new window. This is useful when you want to look at different pages in the notebook at the same time, or if you want to see distant parts of one page at the same time. You can create as many duplicate views of a notebook as you want.

You can also see two parts of a notebook at the same time by splitting a window into two panes, as described on page 110. Unlike duplicate views, however, you can have only two panes.

To duplicate a window, select it and choose Window | New View. The duplicate window appears in front of other open windows, with cell A1 selected on the first page. Now you can resize the windows so you can see parts of both of them (see the next section for instructions). Then scroll them or select different pages as desired.

Most changes you make to either view (whether changes to data or to most properties) are shown in all views. Only changes to remove grid lines or borders (using the page Object Inspector), setting up locked titles, creating panes, or changing the zoom factor (using the notebook Object Inspector) aren't shown in all views.

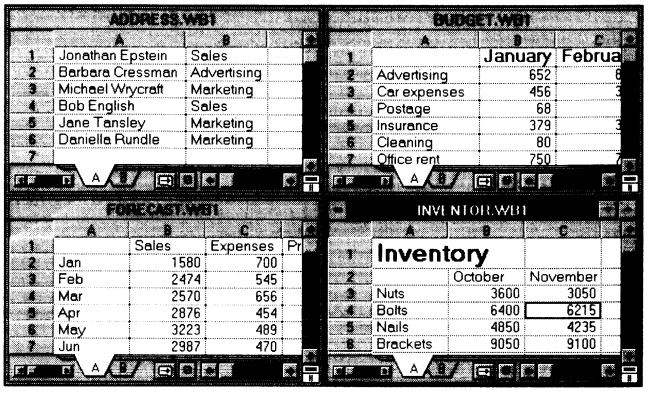
Resizing windows

You can use standard Windows techniques to resize Quattro Pro windows. For instructions on dragging corners or borders of windows with the mouse, choosing commands in the Control menu, or using the Maximize, Minimize, and Restore buttons, see the Windows documentation.

Tiling windows

The Window | Tile command displays all open windows without overlapping them. When possible, the windows are all given equal room on the screen.

Figure 6.1
Tiled windows

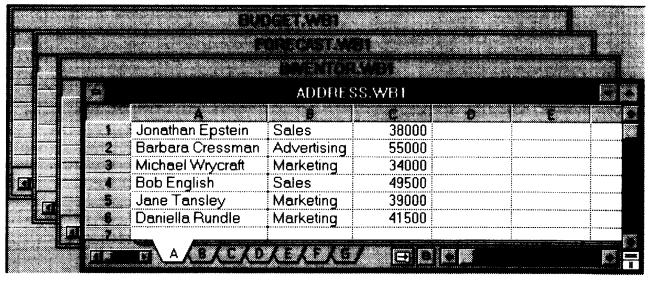


Cascading windows

The Window | Cascade command rearranges all open windows in overlapping layers. The top line of each window is revealed so you can see the name of the notebook, graph, or dialog box it contains.

The next figure shows several cascaded windows.

Figure 6.2
Cascaded windows



Arranging icons

After minimizing several windows and moving their icons around in the workspace, you can quickly place the icons in neat rows with the Arrange Icons command.

After you choose Window | Arrange Icons, the icons are lined up along the bottom of the screen.

Hiding and showing windows

You can hide open windows from view. This is handy when you're working with linked notebooks but you don't want the screen cluttered with too many windows. It also affords you confidentiality when you need it.

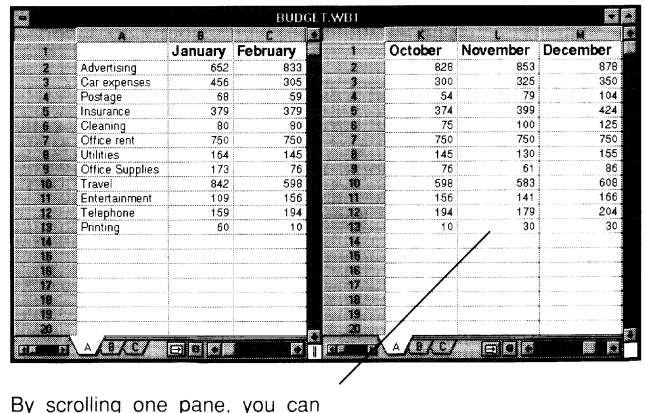
To hide a window, select it and choose Window | Hide.

To show a hidden window, choose Window | Show. Then choose the name of the window you want shown, and choose OK.

Splitting a window into panes

To view different parts of the same notebook, you can duplicate the window (as described on page 108), or you can split the window into two *panes*. The panes can be horizontally or vertically split.

Figure 6.3
Vertical panes



By scrolling one pane, you can see two parts of the same file

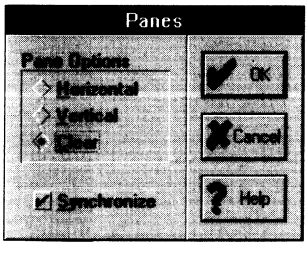
To divide the window into panes,

1. Move the mouse pointer to the lower-right corner of the window over the pane splitter.
2. The pointer changes to a black double-arrow. Depending on where you position the mouse pointer, the double-arrow points horizontally or vertically.
3. For horizontal panes, display the *vertical* double-arrow and drag up. Release the mouse button when the dotted line reaches the separation point you'd like. For vertical panes, follow the same procedure, but use the double-arrow that points *horizontally* and drag left.

The *active pane* is the one containing the selector. To select the other pane, click anywhere in the other pane, or press the Pane key, *F6*. After you unsynchronize the panes (as described in the next section), you can scroll the panes independently to display different parts of the notebook.

To resize panes,

1. Move the mouse pointer to the pane splitter at the lower right of the left or top pane until the double-arrow appears.
2. Drag to the new position where you'd like the first pane to end.



You can also split the window into panes using Window | Panes. The window is split at the position of the selector.

1. Select the row or column where you want the window to be split.
2. Choose Window | Panes.
3. Choose Horizontal to split the window horizontally at the active row. Choose Vertical to split the window vertically at the active column.

Note You can point across panes while entering formulas or using dialog boxes.

Some display changes you make in one pane don't affect the other pane:

- Grid lines, Borders, and Default Column Width properties (in the page Object Inspector)

- Row Height, Column Width, and Reveal/Hide properties (in the block Object Inspector)
- creating locked titles with Window | Locked Titles

For example, if you change column widths in one pane, the previous widths remain in the other. When you return the window display to one pane, Quattro Pro retains column width changes *only if they were made in the top or left pane.*

Unsynchronizing the panes

By default, panes are *synchronized;* when you scroll one pane, the other scrolls at the same time. Horizontal panes are synchronized horizontally (columns scroll together) and vertical panes are synchronized vertically (rows scroll together).

You can change this so each pane scrolls independently of the other. This lets you view one part of the notebook in one pane, while you scroll to another part in the other.

To synchronize or unsynchronize panes, choose Window | Panes (either before or after splitting the window). Then uncheck Synchronized to be able to scroll the panes independently, or check it to restore synchronization.

Closing the second pane

To remove the second pane, choose Window | Panes, then choose Clear.

You can also remove the second pane with the mouse:

1. Move the mouse pointer to the pane splitter between the first and second pane so a black double-arrow appears.
2. Drag the double-arrow back to the top or bottom edge of the window (for horizontal panes) or to the left or right edge (for vertical panes).

The pane on the bottom or right disappears, and the top or left pane takes up the entire notebook window. Any column width changes, locked titles, or columns that were hidden or revealed in the top or left pane remain in effect.

Locking rows and columns

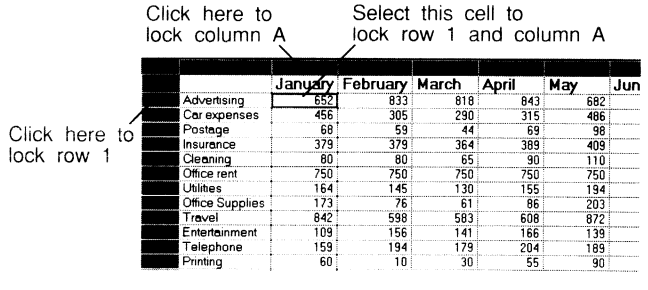
The Window | Locked Titles command locks specific rows and/or columns of a spreadsheet page onscreen as *titles*. When you scroll the spreadsheet, the titles remain fixed onscreen while the rows below (or columns to the right) scroll as usual.

Locking titles has no effect when printing. To repeat column or row titles on each page of a printed notebook, use the Top and Left heading options in the Options dialog box of File | Print (see page 126).

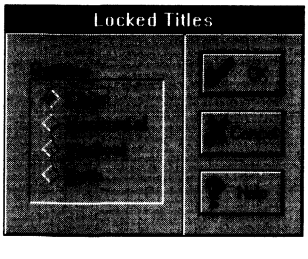
To lock titles onscreen,

1. Scroll the spreadsheet so the column(s) or row(s) you want as titles are visible at the upper left of the window. You can't adjust the position of the titles after they're locked.
2. To lock rows, select the row below the last row to be locked. To lock columns, select the column to the right of the last column to be locked. To lock rows and columns at the same time, select the top left cell of the part you want to remain scrollable.

Figure 6.4
Locking titles



	January	February	March	April	May	Jun
Advertising	652	833	818	843	682	
Car expenses	456	305	290	315	486	
Postage	68	59	44	69	98	
Insurance	379	379	364	389	409	
Cleaning	80	80	65	90	110	
Office rent	750	750	750	750	750	
Utilities	164	145	130	155	194	
Office Supplies	173	76	61	86	203	
Travel	842	598	583	608	872	
Entertainment	109	156	141	166	139	
Telephone	159	194	179	204	189	
Printing	60	10	30	55	90	



3. Choose Window | Locked Titles.
4. Choose Horizontal to lock all the rows above the selector, Vertical to lock all the columns to the left of the selector, or Both to lock both the rows above and the columns to the left.

Any previous Window | Locked Titles setting is cleared, and Quattro Pro locks the specified columns or rows in place as titles.

To unlock titles without specifying new ones, choose Window | Locked Titles and choose the Clear option.

The next figure shows column A and row 1 locked as titles. The data has been scrolled to reveal the bottom part of the page (note the skipped row numbers and column letters).

Figure 6.5
Locked titles

	A	J	K	L	M
1		September	October	November	December
7	Office rent	750	750	750	750
8	Utilities	164	145	130	155
9	Office Supplies	173	76	61	86
10	Travel	842	598	583	608
11	Entertainment	109	156	141	166
12	Telephone	159	194	179	204
13	Printing	60	10	30	30

Before you can edit data within a locked title, you must choose Edit | GoTo and specify a cell within the locked title area. This creates an adjacent duplicate copy of the locked areas. Any changes you make to the duplicate cells are reflected in the locked titles. The next figure shows the example in Figure 6.4 with cell A4 selected. Postage was revised to Mailing, which is reflected in the locked title duplicate and its original.

Figure 6.6
Revising locked titles

	A	A	B	C	D	E
1			January	February	March	April
1			January	February	March	April
2	Advertising	Advertising	652	833	818	843
3	Car expenses	Car expenses	456	305	290	315
4	Mailing	Mailing	68	59	44	69
5	Insurance	Insurance	379	379	364	389
6	Cleaning	Cleaning	80	80	65	90
7	Office rent	Office rent	750	750	750	750
8	Utilities	Utilities	164	145	130	155
9	Office Supplies	Office Supplies	173	76	61	86
10	Travel	Travel	842	598	583	608
11	Entertainment	Entertainment	109	156	141	166
12	Telephone	Telephone	159	194	179	204

To remove a duplicate column, scroll the window horizontally until it disappears. To remove a duplicate row, scroll vertically.

Note As with hidden and widened columns, locked titles affect the active pane only. If the window is divided into two panes, locked titles are retained after you close the second pane *only* if you create them in the top or left pane.

C H A P T E R

7

Printing

Quattro Pro offers many desktop publishing features that let you print notebook data and graphs in an elegant format that's easy to read and understand. Best of all, you don't need a top-of-the-line laser printer to use many of these features; most dot-matrix printers can support special effects such as shading, lines, and boxes. Any printer that prints graphics and is supported by Windows can be used.

This chapter explains how to

- specify the printer to print to
- print parts of a notebook
- set and adjust margins on the printed page
- set print direction and size
- insert page breaks into a document
- add headers and footers to a document
- use columns and rows in a notebook as titles on a document
- preview your printing
- store common print settings under a name for easy retrieval
- print graphs

Setting up the printer

Before printing from Quattro Pro, use the Windows Control Panel to specify the printers available; the Control Panel also enables printing from all Windows applications. If you have multiple printers attached to your system you can use File | Printer Setup to specify the printer to use, as follows:

1. Choose File | Printer Setup.
2. Select the printer to use from the Printer and Port list box.
3. If desired, use Setup to configure the printer (this is discussed next).
4. Choose OK.

Print defaults

By choosing the Setup command from the File | Printer Setup dialog box, you can specify default print settings such as:

- paper type (wide, letter, envelope)
- paper source on the printer (manual, bin 1, bin 2)
- print orientation (landscape, portrait)
- output size using a percentage (50%, 200%, and so on)
- pen colors in a plotter
- number of copies
- fonts available in the printer (cartridge fonts, soft fonts, internal fonts)
- output resolution (300 dpi, 150 dpi)
- color or black-and-white printing
- the amount of memory in the printer

Since many of these settings are printer-specific, they won't all be available for your printer. Consult your Windows documentation and printer manual for more information on these and additional settings.

Note Changes made to print defaults affect printing in *all* Windows applications. You can use File | Page Setup or the Options dialog box of File | Print to set many of these options (output size, paper type, number of copies) for only Quattro Pro.

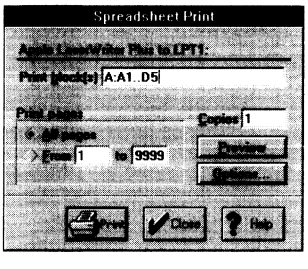
Printing notebooks

When a notebook window is active, you can use File | Print to print out parts of the notebook. You can print a simple list or a sophisticated multiple-page report, embellished with headers, footers, and page numbers.

File | Page Setup and the Options command of File | Print govern how output is arranged and produced on the printed page. You can enhance the document's appearance by using block properties (see Chapter 4) in the notebook to add lines, new typefaces, and shading.

Basic notebook printing

To print a notebook, follow these steps:



1. Use File | Page Setup to adjust print settings.
2. Select the block(s) to print.
3. Choose File | Print. The selected blocks appear in Print Blocks.
4. To print part of a document (for example, to print pages three through seven of a twenty-page document), click From and enter the starting page in the edit field next to it. Click the edit field to the right of To and enter the ending page. The default is All Pages.
5. Specify the number of copies to print in the Copies edit field.
6. If desired, use Options to add headings, gridlines, or row and column borders to the document. See page 126 for details.
7. Choose Print to print the data. (If you'd like to print the data later, choose Close to save the current print settings.)
8. Quattro Pro displays a message showing Quattro Pro's progress while sending information to the Print Manager. If you want to stop the print job, choose Cancel or use the Windows Print Manager to delete the print job after Quattro Pro sends it. If your printer has a large memory buffer, printing may continue for a few moments after cancellation.

Print settings are saved with the notebook so subsequent printing is easier. In most cases, you can just choose Print from the File | Print dialog box. You can also store print settings under a name for easy retrieval; see page 128 for details.

The print block

There are several ways to specify which parts of the notebook print:

- When choosing File | Print for the first time in a notebook, don't select a block; Quattro Pro sets the print block to all the data in the active page.
- Select the block(s) to print and choose File | Print. If a cell's contents spill over into adjacent cells onscreen, include the spill-over cells in the selection; otherwise only part of the entry will print. The Print Blocks option of the dialog box reflects the selection.
- Choose Print Blocks from the File | Print dialog box, and then point to or enter the block(s) to print.

Centering the print block

By default, the first column of each contiguous block within the print block prints flush against the left margin. You can check Center Block in the File | Page Setup dialog box to center each block between the left and right margins of the printed page.

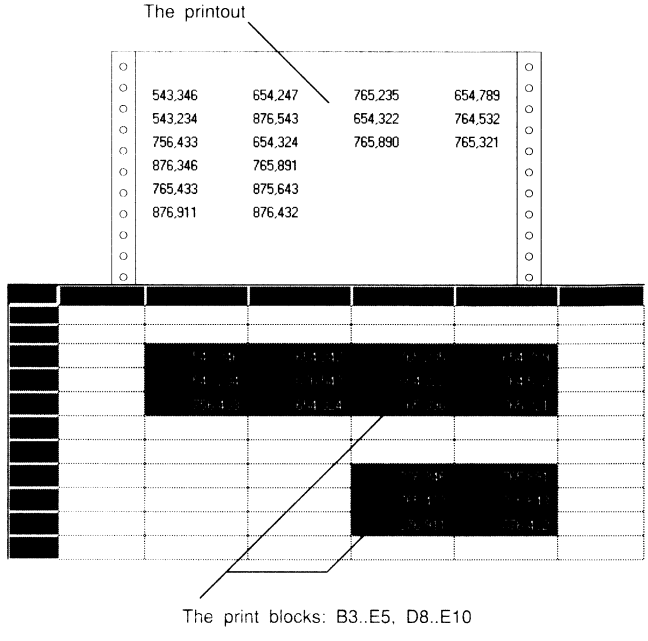
Note Extraneous blank columns on the right side of a print block will affect centering by printing the visible data in the block closer to the left margin. Don't include these blank columns in the print block if you want the data in the block to appear centered.

Noncontiguous blocks

Each subblock that makes up a noncontiguous block prints as though it was selected individually. You can use Print Between Blocks (in the Options dialog box of File | Print, as shown on page 126) to specify how much space to leave between each subblock's printout. To start each subblock on a new printed page, click the Page Advance radio button. Clicking the Lines radio button separates them by the number of lines specified in its edit field. Each line is a sixth of an inch.

The following figure shows how a noncontiguous block prints when Lines is chosen and set to 0.

Figure 7.1
Printing a noncontiguous block



Printing 3-D blocks

If a block consists of more than one notebook page, Quattro Pro prints it as though each page was selected individually. You can use Print Between 3D Pages (in the Options dialog box of File | Print, as shown on page 126) to specify how much space to leave between each notebook page's printout. To start each notebook page on a new printed page, click the Page Advance radio button. Clicking the Lines button separates them by the number of lines specified in its edit field. Each line is a sixth of an inch.

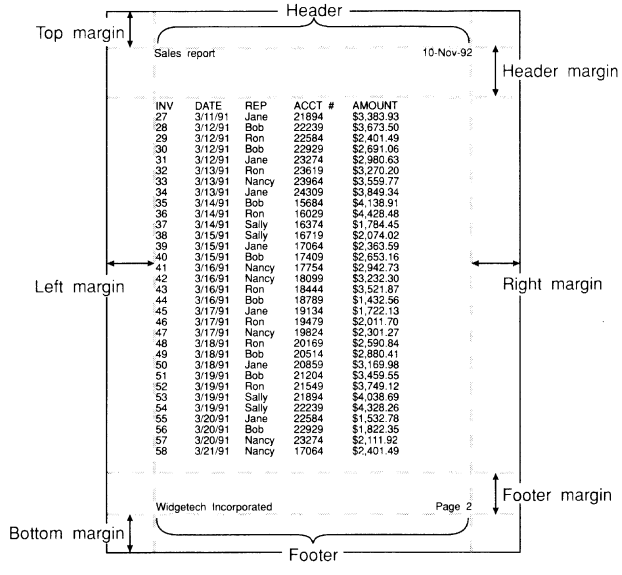
Printing floating objects

Any floating objects (graphs, macro buttons) in the print block are printed with the notebook data. Only the selected portion prints; if the floating object covers a page break, the image splits, printing on multiple pages.

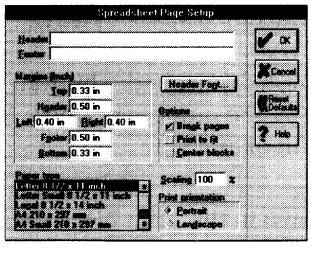
Setting margins and paper type

You can change margins to best present your data—to center a small block of data on the page, for example. The following figure shows each margin on a printed page.

Figure 7.2
Margins on a printed page



Use File | Page Setup to set margins and paper type. You can also set margins by dragging margin lines in a print preview. See page 130 for more details.



The following list describes all the margin settings available. The defaults discussed in this section are given in inches; your Page Setup dialog box may display centimeters instead. (See page 121 for information on using inches or centimeters to specify margins.)

- **Top** specifies how much room to leave between the top of each printed page and the header. The default is a third of an inch.
- **Header** (in Margins) specifies how much room to leave between the top margin and the first row of data. The header prints in the top of this space. The default is half an inch.
- **Left** specifies how much room to leave between the left edge of the paper and the first column of data. The default is four-tenths of an inch.
- **Right** specifies how much room to leave between the right edge of the paper and the last column of data (if it fills the page horizontally). The default is four-tenths of an inch.
- **Footer** (in Margins) specifies how much room to leave between the bottom margin and the last row of data (if it fills the page

See page 124 for information on headers and footers.

vertically). The footer prints in the bottom of this space. The default is half an inch.

- **Bottom** specifies how much room to leave between the bottom of each page and the footer. The default is a third of an inch.
- **Paper Type** specifies the type of paper loaded into your printer.

Basic margin setup

To change the margin settings,

1. Choose File | Page Setup.
2. Choose the margin you want to adjust: Left, Top, Bottom, Right, Header, or Footer.
3. For Left, Right, Top, and Bottom, enter the distance from the edge of the page. Use inches if **in** is displayed next to the default margin settings; use centimeters if **cm** is displayed. (See the next section for more information on using inches or centimeters.) Use decimals to indicate partial inches or centimeters, such as 0.5 for half. For Header, specify the distance between the top margin and the first row of data; for Footer, the distance between the last row of data and the bottom margin.
4. Choose OK to save the new margin settings.

Using centimeters or inches to specify margins

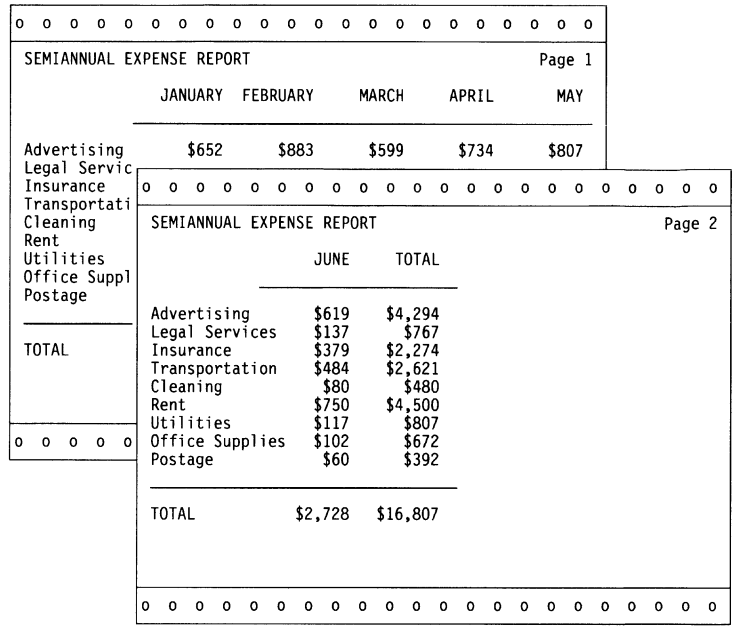
Quattro Pro uses the measurement system specified in the Windows Control Panel to determine whether to use inches or centimeters for margin measurements. You can override the default for a particular margin by placing the suffix `in` (for inches) or `cm` (for centimeters) after its value. The default suffix is displayed next to each default margin setting. For example, to set the left margin to three centimeters when the default measurement system is inches, choose Left Margin and enter `3 cm`. Quattro Pro then converts the entry into the default measurement system.

Changing print orientation

Normally, Quattro Pro prints data vertically on the page. The direction data prints is called the *orientation*. Using Print Orientation (in File | Page Setup), you can specify the direction to print data:

- **Portrait** prints the data vertically, on individual pages.
- **Landscape** prints the data horizontally, on individual pages. The next figure shows an example of landscape printing.

Figure 7.3
A document printed in Landscape mode



When switching orientation, margins switch as well; for example, the top margin stays with the top of the notebook data printed, along with the header and top heading (if any).

Changing print size

Scaling (in File | Page Setup) lets you specify a percentage (1 to 1000) to increase or decrease the size of notebook data on the printed page. The margins (except for header and footer margins) don't change.

Print To Fit (in File | Page Setup) shrinks the print block, headers, footers, and headings so that they fit on as few pages as possible. The margins (except for header and footer margins) don't change. Print To Fit only *reduces* text to fit on fewer pages—it doesn't enlarge text to fill the page. Print To Fit ignores (and doesn't change) the current setting of Scaling (under File | Page Setup), if any.

Inserting page breaks

There are two kinds of page breaks that occur in printing with Quattro Pro: *soft page breaks* and *hard page breaks*.

Quattro Pro breaks the notebook data up and prints it on separate pages to avoid running text off the bottom or right of the page. These breaks, called soft page breaks, free you from having to insert hard page breaks to print.

Hard page breaks are those you enter yourself by

- Typing the characters |:: into a cell in the first column of a print block.
- Selecting a cell in the first column of a print block and choosing Block | Insert Break. This also inserts a new row into the notebook.

Wherever hard page breaks are placed, the paper advances accordingly. In the case of a noncontiguous block, you can enter the hard page break into the first column of any block included in the print block. For example, the print block in Figure 7.1 on page 119 could have hard page breaks in B3 through B5 or D8 through D10.

Caution! Don't add any data into a row containing a hard page break. The data won't print.

Disabling page breaks

Unchecking Break Pages (in File | Page Setup) makes Quattro Pro print the data as though one large page is being printed; successive pages are treated like pieces of the same page. This also

- disables headers and footers
- disables top, bottom, header, and footer margins

Note Unchecking Break Pages doesn't disable hard page breaks.

Printing large notebooks

Quattro Pro won't print unless at least one cell fits on the printed page.

If the data in the print block won't fit on one printed page, Quattro Pro fits as many columns as possible across the first page, and prints all rows in those columns using as many pages as necessary. Then Quattro Pro returns to the first row of data and picks up at the column where it left off, until all data in the block has printed. You can combine the pages to create one large notebook.

Quattro Pro won't split a column. If the full column won't fit, it prints on the next page. Use File | Print Preview (see page 129) to see where your pages will break.

Entering headers and footers

Headers and footers are lines of text that print at the top and bottom of each page. Figure 7.2 on page 120 shows an example of a header and a footer.

You can also print specific rows or columns on each printed page as headings; see page 126 for details.

Quattro Pro separates headers and footers from the notebook data by the amount of space specified in the Header and Footer margin controls, minus the height of the header or footer text. Unless you specify otherwise, headers and footers are left-aligned.

Note Unchecking Break Pages (in File | Page Setup) disables the header and footer, along with their margins.

Basic header/footer setup

To enter a header or footer,

1. Choose Header or Footer from the File | Page Setup dialog box.
2. Enter the text you want to appear as the header and/or footer. Use *Backspace* or other editing keys to correct mistakes as you type.
3. If you want, choose Header Font and specify the header and/or footer's typeface. Header Font affects both the header and the footer.
4. Choose OK to save the new header and/or footer.

To change a header or footer, choose Header or Footer again and edit or retype the entry.

Formatting header and footer text

The following table lists special characters you can use in headers and footers to insert dates, times, file names, calculations based on the page number, and multiple lines of text.

Table 7.1
Special characters in headers and footers

Code	Description
|	(vertical bar) Determines the position of the text: left-aligned, right-aligned, or centered.
#d	Enters the current date in the short format specified in the Date Format option of the International property (in the application Object Inspector).
#D	Enters the current date in the long format specified in the Date Format option of the International property (in the application Object Inspector).
#ds	Enters the current date in Short Date format.
#Ds	Enters the current date in Long Date format.
#t	Enters the current time in the short format specified in the Time Format option of the International property (in the application Object Inspector).
#T	Enters the current time in the long time format specified in the Time Format option of the International property (in the application Object Inspector).
#ts	Enters the current time in Short Time format.
#Ts	Enters the current time in Long Time format.
#p	Enters the current page number.
#p+*n*	Enters the current page number plus the number *n*.
#P	Enters the number of pages in the document.
#P+*n*	Enters the number of pages plus the number *n*.
#f	Enters the name of the notebook that is printing, with no path (BUDGET.WB1).
#F	Enters the name of the notebook that is printing, including the path (C:\DATA\BUDGET.WB1).
#n	Prints the remainder of the header or footer on a second line.
#	(number sign) Enters the current page number. Use for compatibility with Quattro Pro for DOS.
@	Enters the current date (per your computer's calendar). Use for compatibility with Quattro Pro for DOS.

The vertical bar character (|) works like a tab; one preceding vertical bar (|) centers the text; two preceding vertical bars (| |) right-align the text. To enter this character on most keyboards, hold down *Shift* and press the backslash key (\ ). On some keyboards, the vertical bar appears broken in the middle.

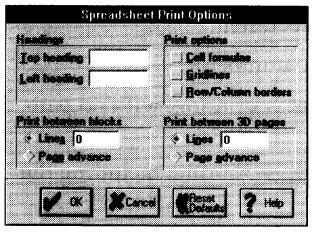
You can also use | characters to align *parts* of the header or footer. Up to two vertical bar characters can appear in a header or footer line. The following table shows examples:

Table 7.2
Aligning headers and footers

Entry	Results
`Budget Report`	Budget Report
`|Budget Report`	Budget Report
`||Budget Report`	Budget Report
`Budget Report||Page #p`	Budget Report Page 3
`#Ds|Budget Report|Page #p`	16-Mar-92 Budget Report Page 3
`Budget Report#n||Page #p`	Budget Report Page 3

Adding headings

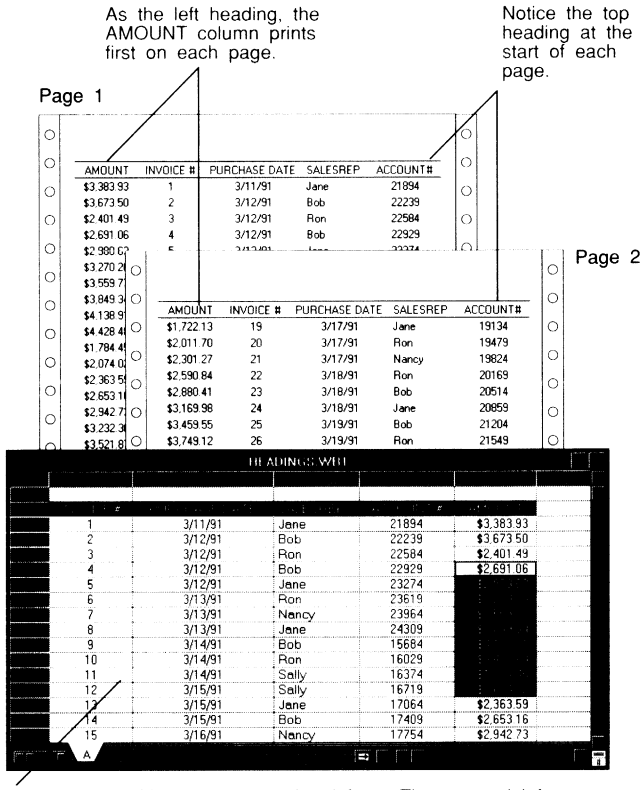
In addition to headers and footers, you can specify column or row headings to print on each page. Row headings print down the left edge of the page and are called *left headings*; column headings print at the top of each page, below any specified headers, and are called *top headings*. To print top or left headings on each page,



1. Choose Options from the File | Print dialog box.
2. Choose Left Heading (for a column of headings) or Top Heading (for a row of headings).
3. To specify a left heading, select the address of any cell in the column to use; the entire column is used as the heading regardless of which cell you select. To specify a top heading, select the address of any cell in the row to use; the entire row is used regardless of which cell you select. Selecting a block makes all columns (for a left heading) or all rows (for a top heading) in the block print as headings.
4. Choose OK to save the new heading.

The next figure shows a document containing a left and top heading, along with the notebook the document was taken from.

Figure 7.4
Headings in action



The notebook this report was printed from. The top and left heading are selected. The print block is A3..D40. Lines around the top heading are in the notebook.

Note Don't include top or left headings in the print block, or they'll print twice. For example, if you've specified A2..G2 as a top heading, and you want to print all data through row 30, specify A3..G30 as the print block.

Making the printout more like the notebook

You can check Gridlines in the Options dialog box to print the gridlines that normally appear on the notebook page. If Gridlines is unchecked, only lines added using block properties (see Chapter 4) will print.

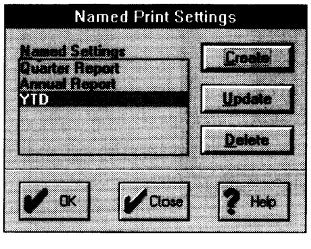
You can check Row/Column Borders to print the row and column borders that display on a notebook page.

Clearing print settings

Both the Options dialog box of File | Print and the File | Page Setup dialog box have a Reset Defaults button that you can use to reset the dialog box to its default settings. Reset Defaults doesn't clear named print settings (discussed next).

Named print settings

Many notebooks contain more than one report. Changing the current print settings manually each time a different report is printed can be tedious. You can store the current print settings under a name using File | Named Settings. All options in the File | Print and File | Page Setup dialog boxes save under the name specified. You can have multiple names in a notebook, and they are saved with the notebook. To store the current print settings under a name,



1. Specify the print settings as you would normally.
2. Choose File | Named Settings.
3. Choose Create, and enter the name for the new setting.
4. The new named setting appears in the list.
5. Choose Close to save the new name.

Now whenever you want to print using the settings stored under the name, choose File | Named Settings, select the name containing the settings to use, and choose OK. This replaces the current print settings with those stored under the name. If you change any of the current settings, you must update the settings stored under the name. To store the current print settings under an existing name,

1. Choose File | Named Settings.
2. Select the name to update from the list.
3. Choose Update to replace the settings stored under the name with the current print settings.
4. Choose Close to save the change.

To remove a name,

1. Choose File | Named Settings.

2. Choose the name to delete from the list.
3. Choose Delete to remove the name from the list.
4. Choose Close to save the change.

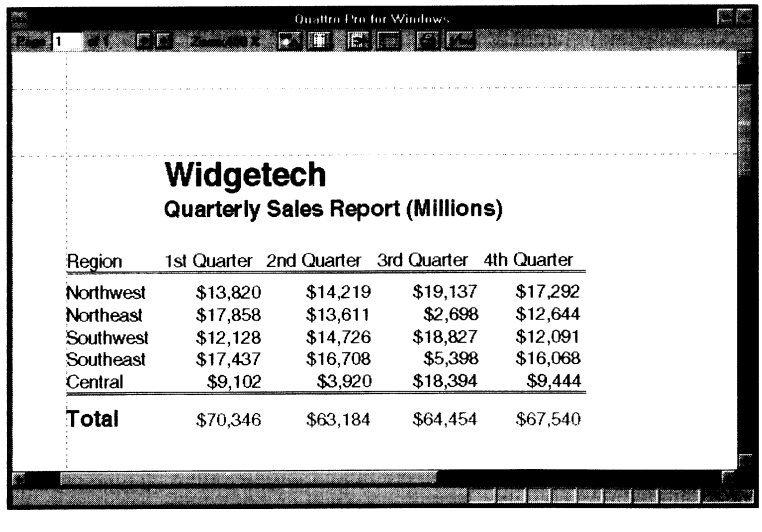
Since named settings are saved with the notebook, use File | Save to save your file after changing them.

Previewing onscreen

You can use File | Print Preview (or the Preview button in the File | Print dialog box) to see an onscreen preview of how the document will appear.

The following figure shows a preview of notebook data. The current zoom level displays to the right of Zoom (in the figure it's 400%). When previewing, left-clicking the page zooms in a level, increasing detail; right-clicking zooms out a level, decreasing detail. You can use scroll bars to adjust the section of the page viewed.

Figure 7.5
A previewed notebook



Preview commands

The SpeedBar provides a variety of tools for controlling a document while previewing:

- Since the preview shows only one printed page at a time, you can use the **Previous** and **Next** buttons to move to the preceding or following page. To change the preview to a specific page, enter the page number in the Page edit field and press *Enter*.

- The **Color** button lets you toggle the previewed document between color and black-and-white palettes. Use this to see how it will appear on black-and-white printers.

- The **Margin** button overlays dashed lines on the previewed page that denote margins; you can drag these lines with the mouse to adjust margins. The new margin displays on the status line while dragging. Clicking the Margin button repeatedly toggles the lines on and off. The default is off.

- The **Setup** button is like choosing File | Page Setup, but returns to the preview after any changes have been made, displaying the new settings.

- The **Options** button is like choosing Options from the File | Print dialog box, but returns to the preview after any changes have been made, displaying the new settings.

- The **Print** button prints the data as it appears in the preview.

- The **Close** button ends the preview.

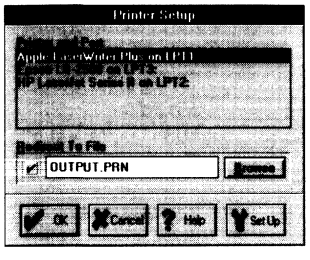
The following table lists keys you can use while previewing:

Table 7.3
Special keys in Print Preview

Key	Effect
Esc	Exits the preview.
F1	Displays online help.
PgUp	Displays the previous page.
PgDn	Displays the next page.
+	Zooms in a level, increasing detail.
–	Zooms out a level, decreasing detail.
↑	Scrolls the zoomed display up.
↓	Scrolls the zoomed display down.
→	Scrolls the zoomed display right.
←	Scrolls the zoomed display left.
Home	Displays the top left of a zoomed page.
End	Displays the bottom right of a zoomed page.

Printing to a binary file

If you want to print from a machine that doesn't have Quattro Pro installed, or if you take your printing to a service bureau with high quality printers, you can store the document in a file using Redirect Output To File (in the File | Printer Setup dialog box). This file, called a *binary file*, contains instructions in the printer's native language for creating the document. For example, if your printer is a PostScript printer, Quattro Pro creates a PostScript file. If your printer is an HP LaserJet, Quattro Pro creates a PCL (Printer Control Language) file. To create a binary file,



1. Choose File | Printer Setup and select the printer that the document will eventually be sent to.
2. Check the check box below Redirect Output To File.
3. Enter the file name in the edit field. If you don't specify a file extension, the extension .PRN is used. To store the file in a directory other than the default, or on a floppy disk, include the complete DOS path.
4. Choose OK.

Printing in Quattro Pro now sends the output to the binary file (overwriting the old file each time), not the printer. Choose File | Printer Setup again and uncheck the check box to revert to normal printing.

To print a binary file from DOS, use the DOS COPY command with the /B parameter:

```
COPY filename.PRN /B LPT1
```

This sends a binary file (/B) to the LPT1 printer port. If your printer is connected to a different port (such as COM1 or PRN), specify it instead of LPT1.

Printing cell contents

You'll usually print data as it appears onscreen. You can, however, print each cell's contents instead by checking Cell Formulas (in the Options dialog box of File | Print).

Cell Formulas lists the contents of each cell, one per line, just as they appear on the input line when you select a cell. This includes each cell's address and contents as entered, as well as any com-

ments you've added to the regular cell contents (see page 42). The information is printed in the font specified under Header Font (in the File | Page Setup dialog box).

When you print using Cell Formulas, the following print features are disabled:

- Center Blocks
- Gridlines
- Left and Top Heading
- Row/Column borders

The following figure shows two documents. The first is printed normally, the second using Cell Formulas. The print block is A1..B6.

Figure 7.6
Two document formats

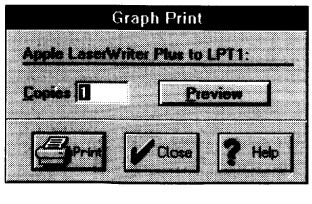
Budget for June	
Food	$108
Rent	$355
Car pmt	$292
Fun	$200
TOTAL	$955

```
A:A1:   'Budget for June
A:A2:   'Food
A:B2:   108
A:A3:   'Rent
A:B3:   355
A:A4:   'Car pmt
A:B4:   292
A:A5:   'Fun
A:B5:   200
A:A6:   'TOTAL
A:B6:   @SUM(B2..B5)
```

Printing graphs

Printing a graph is the same as printing notebook data, except

- You can set the graph's aspect ratio before printing. (See page 180 for details.)
- When you choose File | Print, a simplified dialog box appears when a graph window is active or an icon in the Graphs page is selected; certain controls in File | Page Setup are dimmed to indicate they're unavailable.
- You can print multiple graphs from the Graphs page using their icons. You can also print a slide show using its icon. (Printing multiple graphs is discussed next.)
- Graph print settings can't be stored under a name like notebook print settings. (The current graph print settings are saved with the notebook.)



Printing multiple graphs

You can print multiple graphs one after the other using the Graphs page:

1. Go to the Graphs page.
2. Select each graph's icon (by holding down the *Shift* key while clicking each of them). You can also select a slide show icon to print all the graphs in it.
3. Use File | Page Setup to adjust print settings, if you want to make changes.
4. Choose File | Print and then Print to print the graphs in the order in which they were selected.

C H A P T E R

8

Building graphs

Using graphs to analyze your data is faster and easier than examining the data cell-by-cell. A graph presents a set of data as a picture. It may uncover a trouble spot, display a trend, or illustrate a correlation between categories of data in your spreadsheet. For example, the bar graph in the next figure shows that, although the median price of a house rose steadily from 1982 to 1991, the average monthly payment actually dropped between 1982 and 1988.

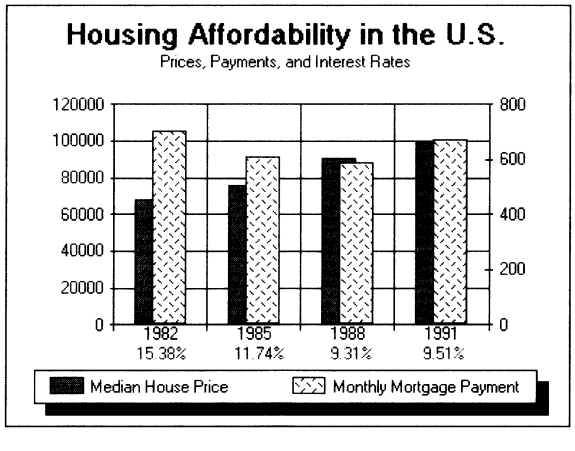


Figure 8.1
A bar graph showing housing cost trends

This chapter explains how to build a complete graph from data on a spreadsheet page. You will learn how to

- build a floating graph on a spreadsheet page

- create a graph in a window
- choose a graph type
- add x-axis and legend labels
- add a title, subtitle, and axis titles
- copy, delete, and rename graphs
- place an existing graph on a spreadsheet page

One graph type, the *text graph*, is not built from data. You use text graphs to present only text or drawings, for example, to create an introductory screen for a slide show, or to place an imported bitmap image on a spreadsheet page. To create text graphs, or to add graphic design elements to any type of graph, see Chapter 10.

Chapter 10 also explains how to import and export graphics files, create slide shows, and add buttons and button macros to graphs. For instructions on printing graphs, see Chapter 7.

Basic concepts and skills

A single graph can appear in three places in Quattro Pro: as a floating graph on a spreadsheet page, in a separate graph window, and as an icon on the Graphs page.

- Create a *floating graph* directly on a spreadsheet page when you want to view or print your graph on the same page as your data. (See page 140 for instructions.) To enhance the floating graph, double-click it to display the graph in a graph window.
- Create a graph in a *graph window* when you want the graph to appear in a slide show or on a printed page, but *not* on a spreadsheet. (Page 141 gives the procedure.) The graph window SpeedBar has tools you use to add text annotations, create drawings, or import graphic elements such as pictures and logos. You can also customize all parts of the graph using Object Inspector menus.
- Each time you create a graph, an icon appears on the *Graphs page* to represent the new graph. The Graphs page is always the last page of the notebook. Here you can see every graph you've created, rename graphs, print a series of graphs, or create an onscreen slide show with special effects. See page 139 for a full description of the Graphs page and its uses.

The graphs you create always exist on the Graphs page and in a graph window; floating graph display is optional. To go to the Graphs page, click the SpeedTab button at the bottom of the

notebook window. For information about displaying a graph in a graph window, see page 169.

The Graph menu

The Graph menu, which is available in the notebook window, in the graph window, and on the Graphs page, lists most of the commands used with graphs.

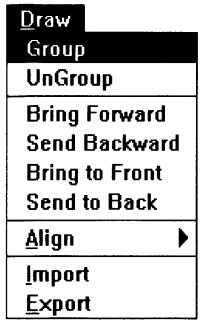
- **Type** changes the graph type (line, pie, 3-D ribbon, and so on).
- **Series** redefines the blocks of data plotted in the graph.
- **Titles** adds a title, a subtitle, and axis titles to the graph.
- **New** creates a graph from the selected data. If no data is selected, Quattro Pro creates a text graph.
- **Edit** brings a graph into the graph window, ready for editing (see Chapter 9).
- **Insert** places an existing graph as a floating graph on a spreadsheet page.
- **Delete** erases a graph from the active notebook.
- **Copy** copies a graph, or selected attributes of a graph, to a new or existing graph within the same notebook. You can copy the graph style (which includes all the graph properties), the graph data, the annotation objects, or any combination of the three.
- **View** gives you a full-screen view of a graph. Graph buttons and graph button macros become active, so you can test them (see Chapter 10). You can also select a group of graphs, either on a spreadsheet page or the Graphs page, then choose Graph | View to preview a slide show.
- **Slide Show** starts a selected slide show from any window. Chapter 10 describes how to create and run slide shows.

You must select a graph before you can use the Graph | Type, Graph | Series, or Graph | Titles command (see page 169 for information about selecting graphs). All other commands (except Graph | New and Graph | Slide Show) let you select from a list of all graphs in the active notebook.

The graph window

All graph editing and annotation takes place within a graph window. There are four ways to display a graph in a graph window:

- Create the graph in a window (see page 141). You can then edit the graph immediately after you create it.
- Double-click a floating graph.
- Choose Graph | Edit and select the graph name from the list that appears.
- Double-click a graph icon on the Graphs page.



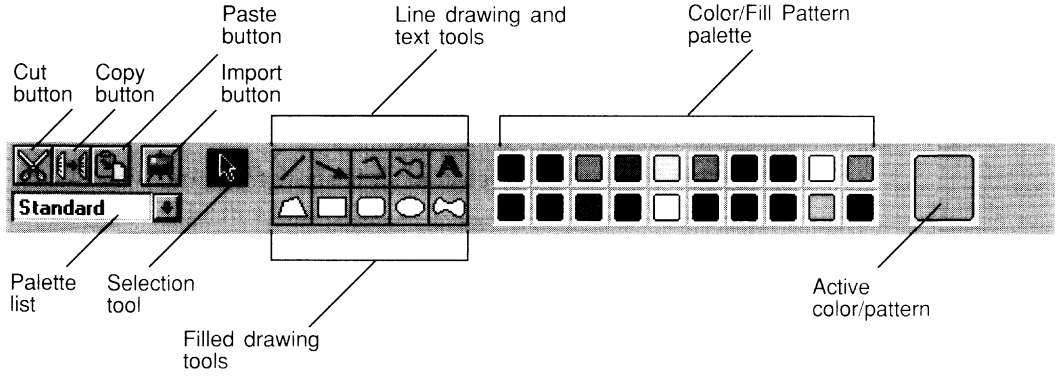
A graph window has the same menus as the notebook window, with one addition, the Draw menu. This menu lists the commands needed to arrange graphics, such as Group, Ungroup, Bring Forward, Send Backward, and Align. Descriptions of these commands begin on page 227.

You can import graphics created in other applications with Draw | Import. You can also convert a graph you create in Quattro Pro into a graphic file usable by other applications with Draw | Export. See page 233 for information about importing and exporting graphics.

You can maximize the graph window to zoom in on the graph and make drawing easier.

The graph window SpeedBar includes a set of quick-access tools and buttons:

Figure 8.2: The graph window SpeedBar



- Cut, Copy, and Paste buttons transfer objects to and from the Windows Clipboard.
- The Import button provides quick access to the Import Graphics File dialog box (see page 233).

- The palette list box displays the name of the current palette and lets you choose or create a new one (see page 236).
- The Selection tool switches to selection mode after you finish using a drawing tool.
- Drawing tools create shapes and text boxes (see page 224).
- The palette includes 20 color/pattern choices a larger box showing the current selections for fill color, background color, fill style, and border color. You can modify these choices, select a different palette, or create you own palettes. (Palette information begins on page 236.)

The Graphs page

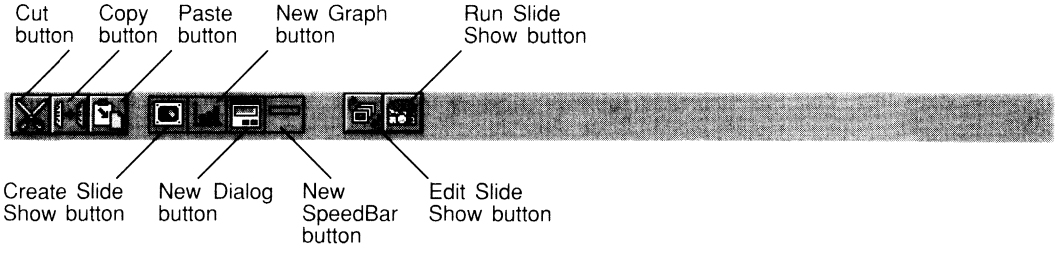
The Graphs page displays an icon for every graph and slide show in the notebook. It also displays icons for any custom dialog boxes you build.

On the Graphs page you can

- cut and copy graph icons (to cut or copy graphs)
- double-click a graph icon to edit a graph (or double-click any icon to edit its object)
- rename a graph (see page 169)
- print slide shows (see page 133)
- print a group of graphs (see page 133)
- use tools on the SpeedBar to create graphs, slideshows, dialog boxes, and SpeedBars

The Graphs page SpeedBar has its own set of buttons:

Figure 8.3: The Graphs page SpeedBar



- The Create Slide Show button creates new slide shows (see Chapter 10).

- The New Graph button creates a graph in a window (equivalent to Graph | New—see page 142).
- The New Dialog button builds a new dialog box (equivalent to Tools | UI Builder—see Chapter 6 in *Building Spreadsheet Applications*).
- The New SpeedBar button creates a new custom SpeedBar (equivalent to Dialog | New SpeedBar—see Chapter 6 in *Building Spreadsheet Applications*).
- The Edit Slide Show button displays the selected slide show on the Light Table, where you can change the sequence of slides and edit transition effects and timing parameters for individual slides.
- The Run Slide Show button runs the selected slide show (equivalent to Graph | Slide Show).

The Graphs page is always the last page of the notebook. To quickly display it, click the SpeedTab button at the bottom of the notebook window. (When you've finished you can click it again to return to the page you left.)

Creating graphs

There are two basic methods for creating a graph: use the Graph tool on the notebook window SpeedBar to create a floating graph directly on the spreadsheet, or use Graph | New to create a graph in its own window.

Creating a floating graph

To create a floating graph,

1. Select the block of data you want to plot. If surrounding cells contain explanatory labels you want to use as axis or legend labels, include them in the block.
2. Click the Graph tool in the SpeedBar, then drag over the area of the spreadsheet page where you want to place the graph. When you release the mouse button, the graph appears.

   (If you click the spreadsheet page, instead of dragging the mouse over the area where you want the graph to appear, Quattro Pro creates a floating graph of the default size.)

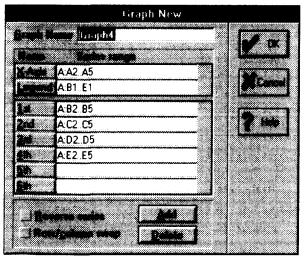
The floating graph is a bar graph, because that is the default graph type. The graph is also given a default name (Graph 1, for example). It's a good idea, however, to change the name to something unique and descriptive so the graph will be easier to find on the Graphs page and in dialog box lists.

- To change the graph name, see page 169.
- To change the graph type, use Graph | Type. Instructions for choosing a graph type (including illustrations of all the graph types) begin on page 146.
- To add, delete, or rearrange the data series in the graph you've just built, use Graph | Series (see page 161).
- To add a main title, subtitle, and axis titles to the graph, use Graph | Title (see page 168).
- To change the format or characteristics of any part of the graph, double-click the floating graph to display it in a graph window, then right-click the part of the graph you want to change to display its Object Inspector. Chapter 9 describes how to use Object Inspector menus to customize your graph.
- To change the properties of the floating graph object (including the color or style of the graph border) see page 218.
- To enhance the graph with drawings and text annotations, use the tools in the graph window SpeedBar (see Chapter 10).

Creating a graph in a window

Use Graph | New to create a graph directly in a window when you don't want the graph to appear on a spreadsheet. Graph | New is available from a spreadsheet page, from the Graphs page, and when a graph window is active.

The Graph | New dialog box has these features:



- The **Graph Name edit field** lets you enter a name for the graph. A descriptive name makes it easier to choose a particular graph on the Graphs page and in the dialog boxes of other Graph menu commands (such as Graph | Edit).
- **Series buttons** (X-axis, Legend, 1st, 2nd, and so on) activate Point mode, which lets you define a series by pointing to a block of data.
- **Series edit fields**, to the right of the buttons, display the block coordinates of the series. Double-clicking an edit field also activates Point mode.

- **Add and Delete buttons** let you add a series after the selected series, or delete the selected series.
- **Reverse series** and **Row/column swap** change the way series are plotted without changing the data block assigned to the series. For a complete description of these features, see page 161.

To create a graph in a window,

1. Choose Graph | New. (If the Graphs page is active, click the Create Graphs button on the SpeedBar, instead.) The Graph New dialog box appears.
2. Enter a name for the graph in the Graph Name edit field. If you don't type a new name, Quattro Pro assigns the default name shown in the edit field.
3. Assign data blocks to as many series as you want. You can select a single cell, a contiguous block, or a noncontiguous block.
   - Click a series button, point to the block on the spreadsheet that you want to assign to the series, then press *Enter*. Or type the block coordinates in the series edit field.
   - To create a legend, click the Legend button, point to a block of labels on the spreadsheet, then press *Enter*.
   - To add labels to the x-axis, click the X-Axis button, then point to a block of labels and press *Enter*.
4. Choose OK. A graph window opens and displays a bar graph (the default graph type).

Once you create the graph, you can

- Use Graph | Type to change the graph type (see page 146).
- Use Graph | Title to add a graph title, subtitle, and axis titles to the graph (see page 168).
- Use Graph | Series to change the way series are plotted (see page 161).
- Change the properties of any part of the graph. Just right-click any graph element to display its Object Inspector. Chapter 9 describes how to use Object Inspector menus to customize your graph.

- Use the tools in the graph window SpeedBar to enhance the graph with drawings and text annotations (see Chapter 10).
- Use Graph | Insert to display the graph as a floating graph on a spreadsheet page (see page 173).

Creating a fast graph

You can also let Quattro Pro define the series for you. This procedure is similar to the Fast Graph command in Quattro Pro for DOS. To create a fast graph,

1. Select the cells containing the data, including any explanatory labels, then choose Graph | New.
2. Enter a name for the graph.
3. Check the series assignments to be sure the data will be plotted the way you want (see the following section). To change a series assignment in the Graph | New dialog box, use the procedure described for the Graph | Series command on page 162.
4. Choose OK. A graph window opens and displays the data in a bar graph.

How series are plotted

The dimensions and contents of the data block you select for a floating graph or fast graph determine how Quattro Pro plots the data.

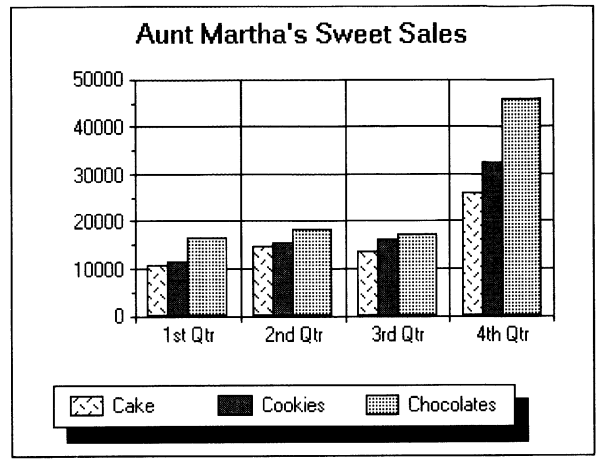
When a block contains more rows than columns, or when the number of rows and columns is equal,

- Quattro Pro plots each column as a single series.
- If the first column (the first series) contains labels, the labels are placed along the x-axis. This column of labels is called the *x-axis series*.
- If the first row contains labels, these labels are used in the graph legend. This row is called the *legend series*.

The next figure shows a block of data (A1..D5) containing more rows than columns, and the graph that is plotted from this data.

Figure 8.4
Plotting columns as series

	A	B	C	D
1		Cake	Cookies	Chocolates
2	1st Qtr	10854	11589	16589
3	2nd Qtr	14653	15428	18526
4	3rd Qtr	13525	16253	17462
5	4th Qtr	25895	32658	45789



Note Pie graphs, column graphs, and 3-D area graphs plot negative numbers as positive values.

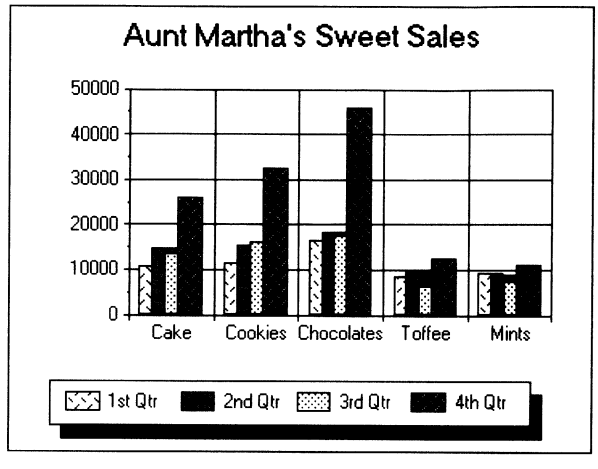
When a block contains more columns than rows,

- Quattro Pro plots each row as a single series.
- If the first row (the first series) contains labels, it automatically becomes the x-axis series.
- If the first column contains labels, these labels become the legend series.

The next figure shows a block of data with more columns than rows (A1..F5) and the resulting graph.

Figure 8.5
Plotting rows as series

	A	B	C	D	E	F
1		Cake	Cookies	Chocolates	Toffee	Mints
2	1st Qtr	10854	11589	16589	8547	9257
3	2nd Qtr	14653	15428	18526	9542	8792
4	3rd Qtr	13525	16253	17462	6325	7584
5	4th Qtr	25895	32658	45789	12547	11265



Caution! Blank columns and rows in the block of data can create a series of blank spots in the graph. Delete them (or select the data as a noncontiguous block) before you create the graph.

If the data you selected is a noncontiguous block, Quattro Pro uses the dimensions of the first sub-block you select to determine whether to plot rows or columns. See page 38 for a description of noncontiguous blocks and how to select them.

When you select a 3-D block (a block composed of data from the same coordinates on two or more consecutive spreadsheet pages), Quattro Pro starts with the row or column from the first page, then appends the corresponding row or column from each additional page to form the series. For example, if you select the block A:B3..C:D11, the first series is A:B3..C:B11 (the first column in the block on each page), the second series is A:C3..C:C11 (the second column in the block on each page), and the third series is A:D3..C:D11 (the third column in the block on each page). For more information about 3-D blocks, see page 39.

Choosing a graph type

Quattro Pro builds many different graph types automatically. (Illustrations and descriptions of these graph types begin on page 150.) Certain graphs are best suited for plotting certain types of data:

- **Bar graphs** compare values of different items in specific categories or at discrete points in time—to contrast quarterly commissions for each sales representative either by quarter or by representative, for example.
- **Line graphs** show the progression of values over time—to track sales, for example.
- **Stacked bar and area graphs** show the relationship of each value to the total—how total sales are divided between regions, for example. Because area graphs use lines to track values, they best show patterns created over time.
- **Pie and column graphs** compare individual values to other values and to the whole—how yearly expenses break down into categories, for instance.
- **XY graphs** plot values in one series against those in another—to show the relationship between salary and length of employment, for example.
- **High-low graphs** illustrate the difference between corresponding values in two or more series. Though most often used in tracking daily stock prices, high-low graphs can be used whenever you want to compare the difference between pairs of values.
- **Surface graphs** plot rows and columns as intersecting lines on a surface that is suspended in a 3-D frame. Surface graphs are useful for plotting functions such as f(x) and f(x,y), and parametric curves (x(t), yt(t)).

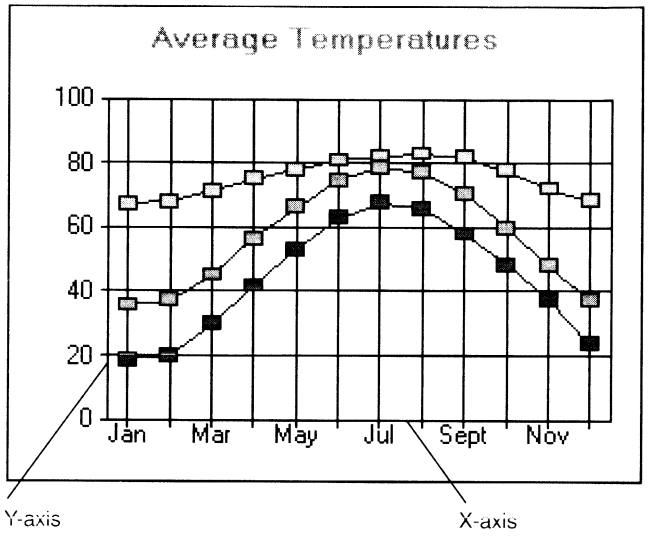
Quattro Pro graph categories

Each of the basic graphs described in the previous section can be drawn in various ways. Quattro Pro divides these variations, or graph types, into five categories: 2-D, 3-D, rotated, combination, and text.

2-D graphs

2-D graphs (except pie and column graphs) position data relative to two scales: the x-axis and the y-axis (see the following figure). X-axis divisions typically represent categories or time periods; labels along this axis are provided by the x-axis series. Y-axis scale divisions and labels are determined by the data plotted in the graph.

Figure 8.6
2-D graph axes



XY graphs (often called scatter diagrams) plot values against two numeric scales. The x-axis scale is determined by the values in the x-axis series. (Unlike most other graph types, where the x-axis series contains labels, the x-axis series in an XY graph contains data.) The y-axis scale is determined by the values in all the other series. Page 165 shows an example of an XY graph.

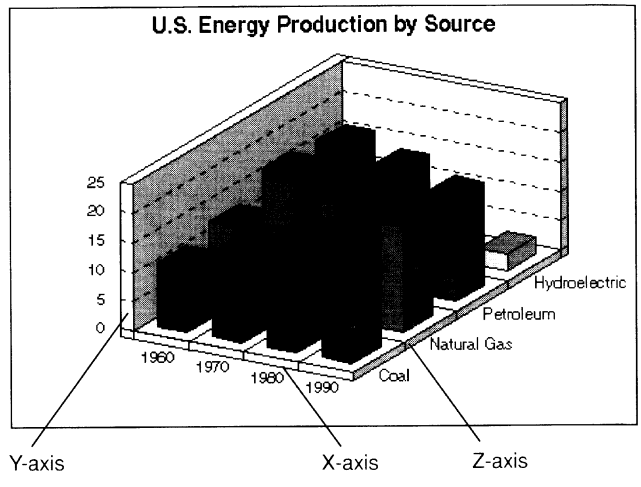
2-D pie and column graphs don't have axes at all. Pie graphs illustrate the values of a single series as slices in a circular whole. Column graphs also illustrate only a single series, and show values as sections of a column.

3-D graphs

3-D graphs (except pie and column graphs) plot multiple series against a background of two walls and a base. You can thicken the walls, or hide the base and walls, through the 3-D Options property in the graph setup and background Object Inspector (see page 201). The first series is plotted at the back of the graph, from

left to right. Successive series are drawn, in order, in front of the first. Legend labels appear along the z-axis in most 3-D graphs (see the next figure).

Figure 8.7
3-D graph axes



You can adjust the viewpoint and the amount of perspective applied to these graphs with the 3-D View property in the graph setup and background Object Inspector. 3-D View also lets you control the height and depth of the graph. See page 202 for more information.

3-D pie and column graphs are drawn in perspective, and like their 2-D counterparts, they represent a single series. There are no axes or walls in these graphs, and 3-D view options are not available.

Rotated graphs

Rotated graphs are plotted with the axes reversed: The x-axis is the vertical axis, and the y-axis is the horizontal axis. Rotated graphs can be 2-D or 3-D.

Combination graphs

Combination graphs mix bars, lines, and areas in the same graph, to highlight a series or to provide a contrast between different series in the graph. Quattro Pro builds three combination graphs automatically: line-bar, area-bar, and high-low bar. Line-bar graphs and area-bar graphs plot the first series as a line or area, and plot all other series as bars. High-low bar graphs plot corresponding data points in the first and second series as I-beams, then plot all other series as bars.

You can create your own custom combination graphs by *overriding* (changing) the graph type for any series you inspect in 2-D bar, rotated bar, 2-D line, rotated line, and variance graphs. (See page 183 for information about overriding the graph type of a series.)

Multiple graphs

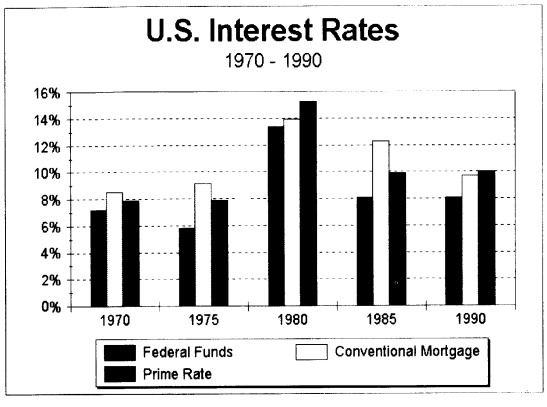
Multiple graphs (found under *Comb* in the Graph | Type dialog box) plot each series as a separate graph. Quattro Pro has multiple bar, 2-D column, multiple 3-D column, multiple 2-D pie, and multiple 3-D pie graphs. You can graph as many series as you like—each part of the graph is scaled down automatically to fit the entire graph on the screen or page.

Although it looks like several different graphs, a multiple graph is a single graph. The x-axis and y-axis on a multiple bar graph is identical on each small sub-graph, for example. The legend label for a series becomes the "title" of the sub-graph that represents the series. When you change a property (the label font, for example) on one part of a multiple graph, all the other parts change accordingly.

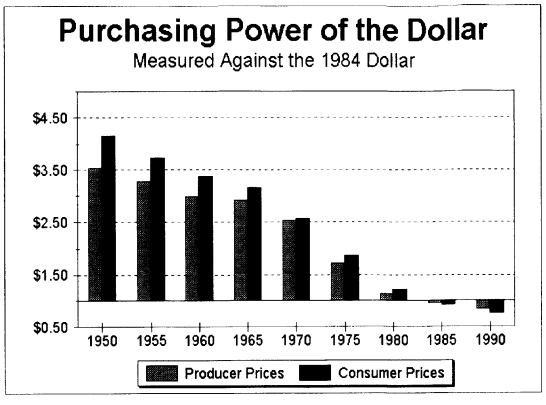
To create a multiple line graph or multiple area graph, right-click a bar in a multiple bar graph, then override the bar series with a line or area type (see page 183).

Bar graph types

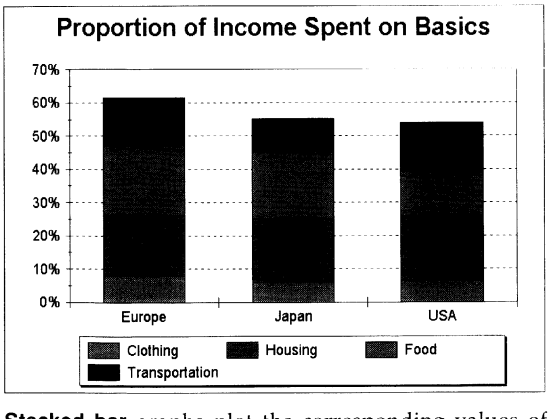
This section describes all the bar graphs Quattro Pro builds automatically. You can customize bar graph features such as bar width, bar margins, and bar colors, using the bar series Object Inspector. See page 187 for more information.



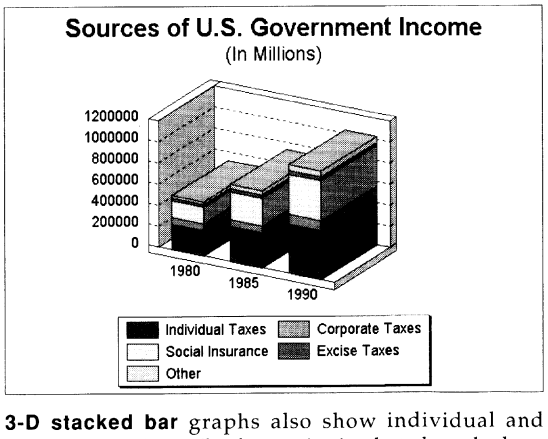
Bar graphs represent each value in a series as a bar. Values are plotted against the y-axis scale; the taller the bar, the greater the value. When you plot more than one series, the bars appear side by side, providing a good comparison of corresponding values in different series. This is the default graph type in Quattro Pro.



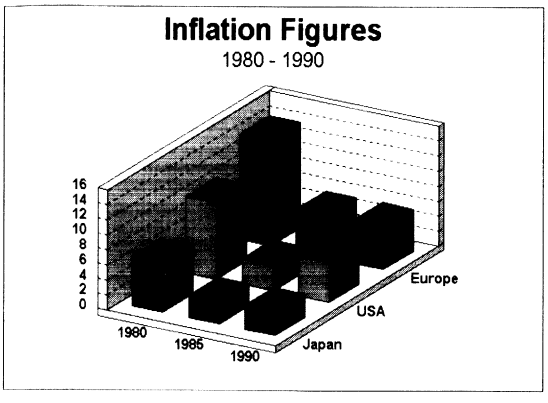
Variance graphs show how the values in each series deviate from the zero line, which is an arbitrary baseline you choose through the y-axis Object Inspector (see page 212).



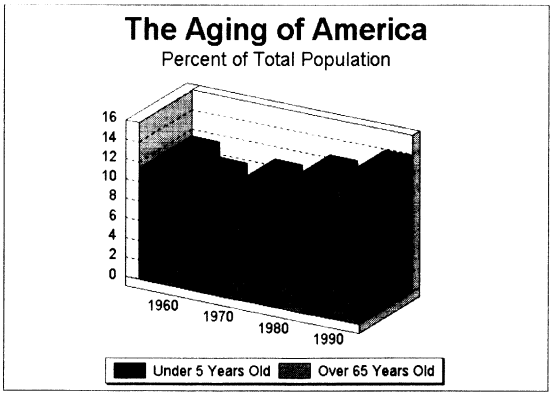
Stacked bar graphs plot the corresponding values of different series in vertical stacks, showing both the total reached by the combined values, and the way each value contributes to that total. The first series is plotted on the bottom; additional series are stacked on top, in order.



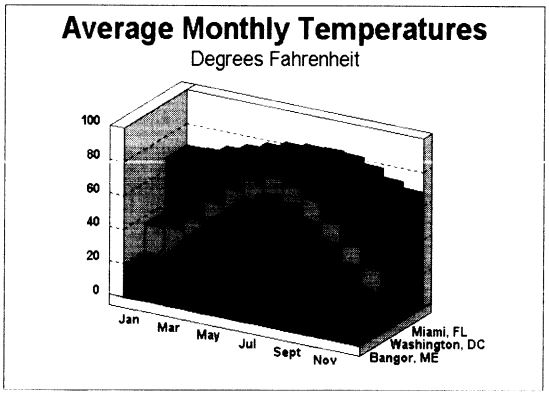
3-D stacked bar graphs also show individual and cumulative values. The first series is plotted on the base of a three-dimensional grid; additional series are stacked on top.



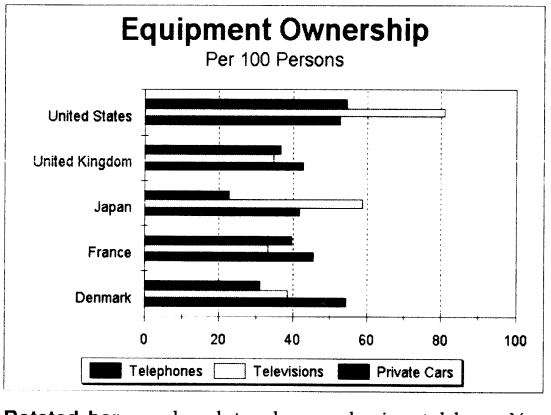
3-D bar graphs plot series values as columns with square tops and bases on a three-dimensional grid. The first series is plotted at the back of the graph, from left to right. Bars that represent additional series are plotted, in order, in front of the first.



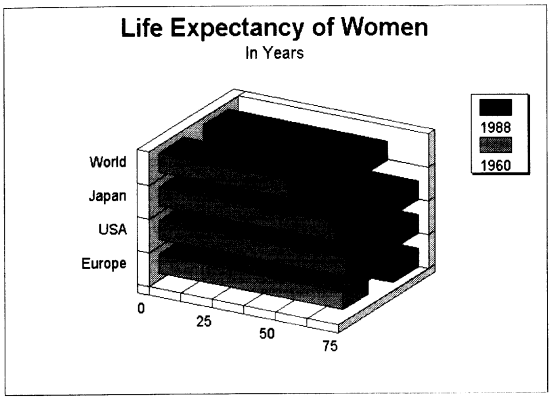
2.5-D bar graphs are similar to 3-D bar graphs, except the bars of all series are drawn next to each other (rather than behind each other) on the three-dimensional grid. Each bar projects all the way to the back of the grid.



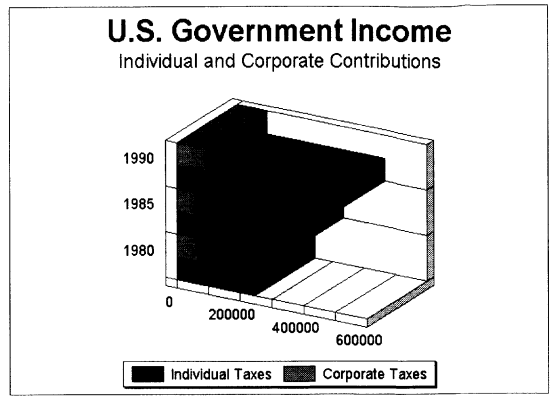
3-D Step graphs look similar to 3-D bar graphs, but adjacent bars touch, to emphasize the progression of values in the series. In this way, the 3-D step graph serves the same purpose as a 3-D unstacked area graph (see page 154), but the steps give greater emphasis to individual values.



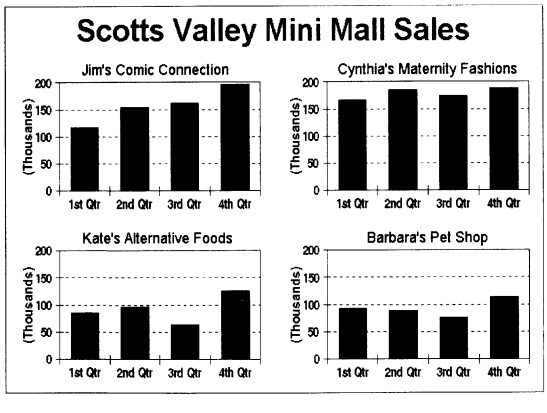
Rotated bar graphs plot values as horizontal bars. You might use this graph type instead of a standard bar graph when you want to emphasize that values "move forward," rather than increase. This is also a good bar graph choice if you have long x-axis labels.



Rotated 3-D bar graphs display series values as horizontal columns on a three-dimensional grid. The first series is plotted at the back of the graph, and additional series are drawn in front of the first. Unlike standard 3-D bar graphs, which display legend text along the z-axis, a rotated 3-D bar graph has a legend box.



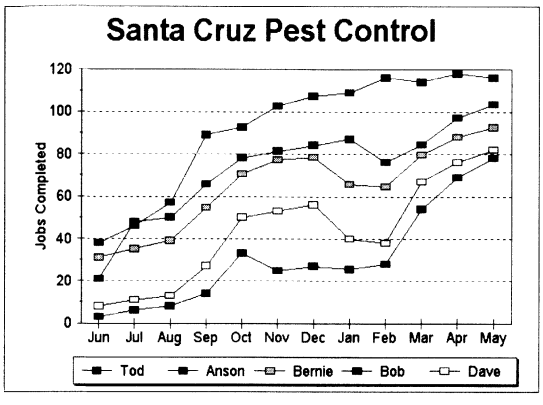
Rotated 2.5-D bar graphs plot the values in each series as horizontal plates that project from the front to the back of a three-dimensional grid. The first value in the first series is plotted on the base of the graph, and corresponding values of additional series are layered on top, in order.



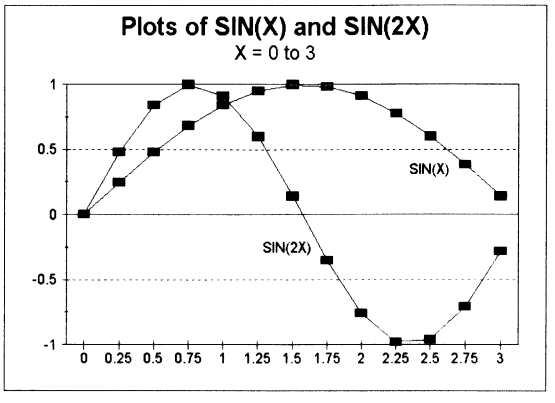
Multiple bar graphs plot each series in its own small bar graph to provide side-by-side comparisons of different sets of data. Even though each series looks like a separate graph, a multiple bar graph is really one graph. Each unit displays the same y-axis scale, x-axis divisions, and so forth. Any changes to one graph unit are reflected in all the others. You can plot as many series as you like, but the plot for each series gets smaller as you add new series.

Line graph types

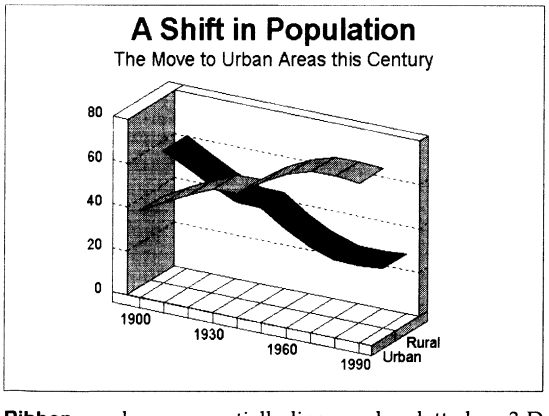
Line graphs plot series values as points, then connect the points in each series with a line. You customize line graphs using the line series Object Inspector (see page 189).



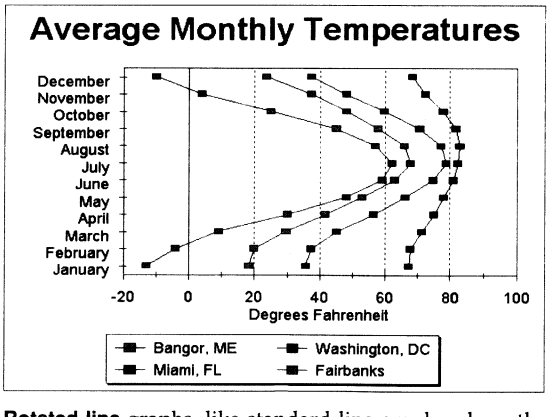
Line graphs show how values change over time. By default, Quattro Pro creates line graphs that have square markers connected by lines, but you can change line graph properties to plot data with lines or markers only (see page 190).



XY graphs (often called scatter diagrams) plot all series against the x-axis series, to display a correlation between series as a function of the x-axis data. Page 165 describes how to create an XY graph.



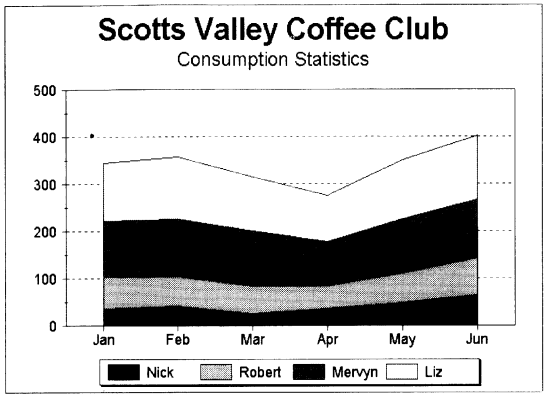
Ribbon graphs are essentially line graphs plotted on 3-D grids, with each line flattened into a segmented ribbon. Ribbon graphs are good for showing trends over time, but individual points are less visible than on standard line graphs.



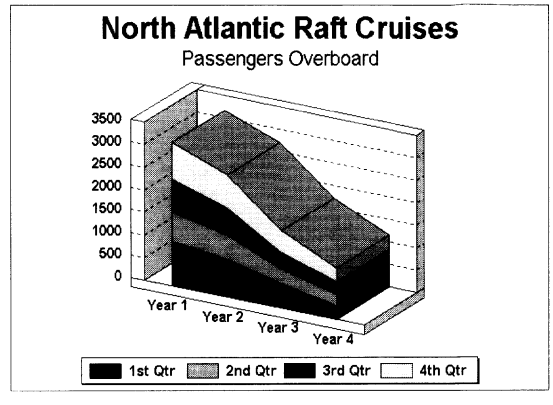
Rotated line graphs, like standard line graphs, show the pattern of values over time, but the x-axis and y-axis positions are reversed. The rotation leaves more room for long x-axis labels.

Area graph types

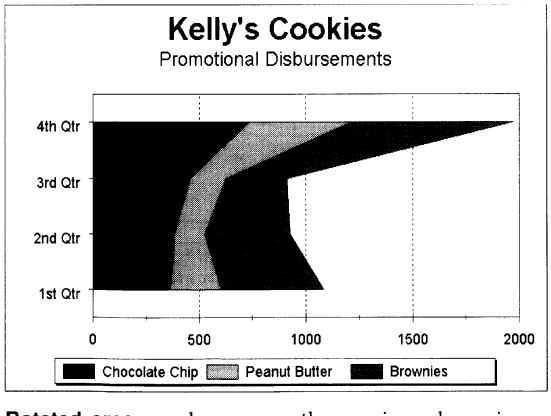
Area graphs (except 3-D unstacked area graphs) plot cumulative rather than individual values. The first series is plotted without modification. The second series is plotted using the top of the first series as the baseline. The third series is graphed on top of the second, and so forth. You customize area graphs using the area series Object Inspector (see page 191).



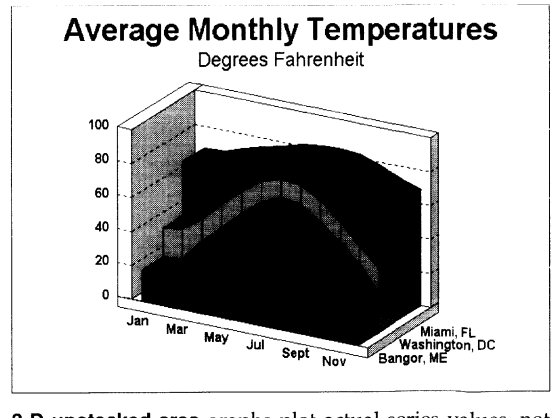
Area graphs best show how each series affects the whole over time. Although only the first line plotted is an accurate pattern (a dip in a further series might appear as a rise if values beneath it are high), the size of the area corresponding to each series represents its contribution to the whole.



3-D area graphs are like 2-D area graphs except negative numbers are plotted as positive values. Series appear as three-dimensional areas stacked inside a frame of two walls and a base.



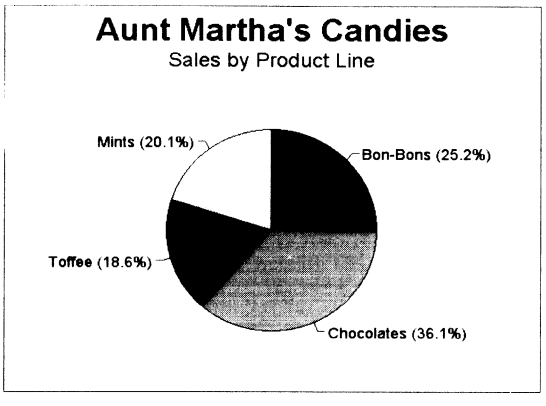
Rotated area graphs reverse the x-axis and y-axis, so areas are stacked side-by-side. The width of an area indicates how much the series contributes to the whole.



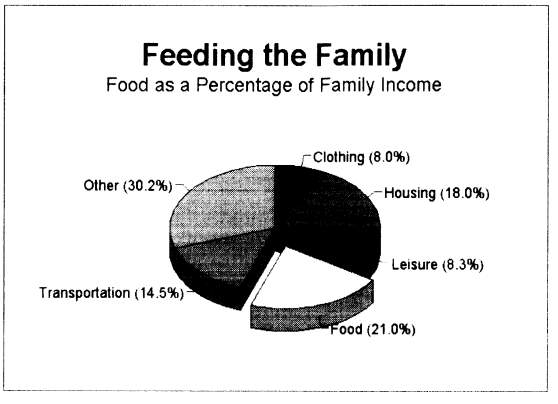
3-D unstacked area graphs plot actual series values, not cumulative values. The first series is plotted at the back of the graph; additional series are drawn in front of it. Like line graphs, 3-D unstacked area graphs are useful for showing changes over time.

Pie and column graph types

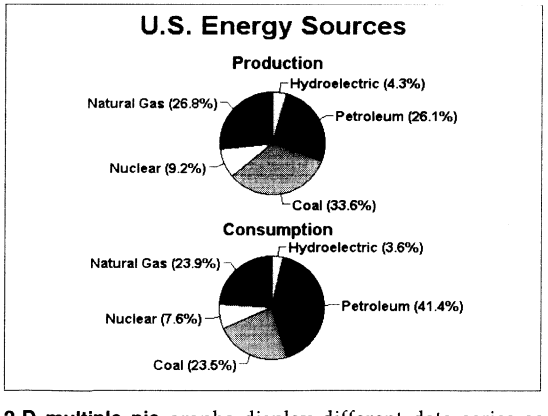
Pie and column graphs plot a single series. Each value is plotted as a percentage of the whole. To change pie or column graph properties, right-click the graph to display its Object Inspector (see page 192).



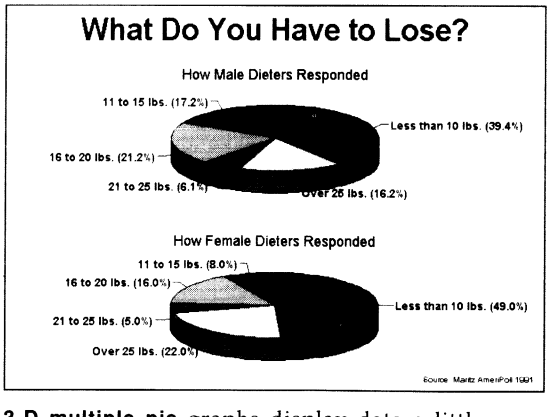
Pie graphs plot each value in a series as a "slice" of the "pie."



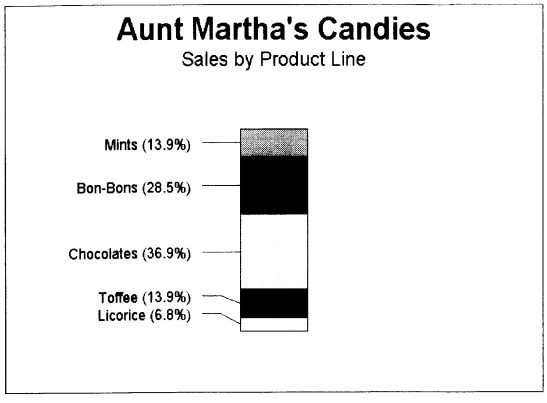
3-D pie graphs have a thicker look for a more dramatic appearance, but otherwise are exactly like 2-D pie graphs.



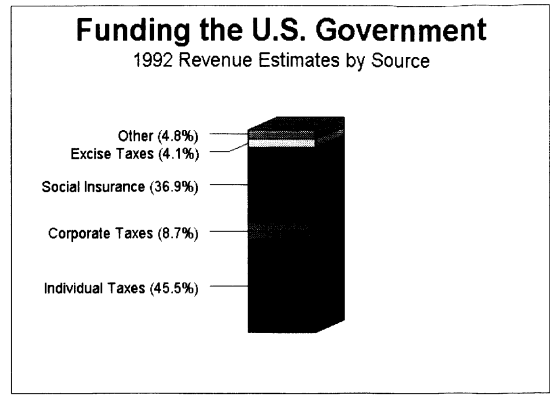
2-D multiple pie graphs display different data series as side-by-side pie graphs. Use this graph type to provide a comparison of how individual values in the series affect the whole, and how these proportions change from series to series.



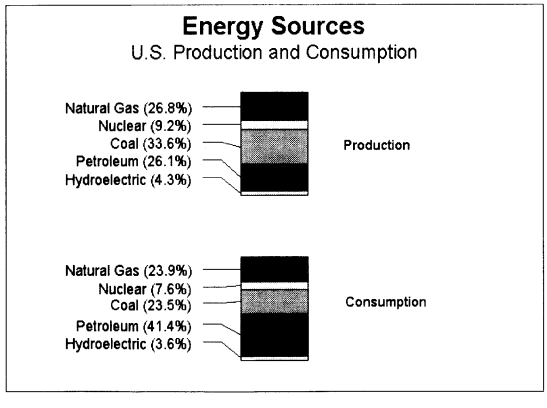
3-D multiple pie graphs display data a little more dramatically than the 2-D version, but you use them in the same way, to provide comparisons of how each value in a series affects the whole and to show how these proportions change from series to series.



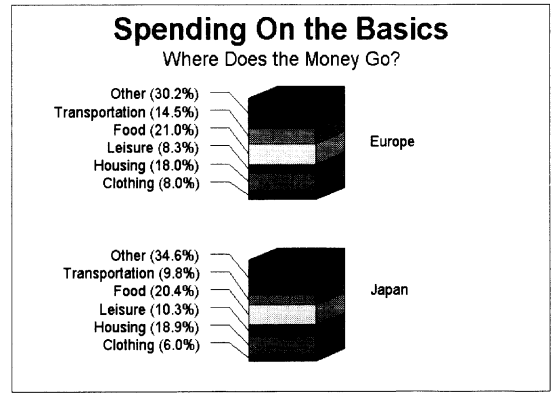
Column graphs represent values as sections of a vertical rectangle. The first value in the series is plotted on the bottom; additional series are stacked on top, in order.



3-D column graphs plot series values as sections of a column. Like the 2-D version, 3-D column graphs plot series values from the bottom up.



2-D multiple column graphs display each series as an individual column graph. Like multiple pie graphs, multiple column graphs provide a comparison of how individual values in the series affect the whole, and how these proportions change from series to series. In addition, the column arrangement leaves more room for labels.

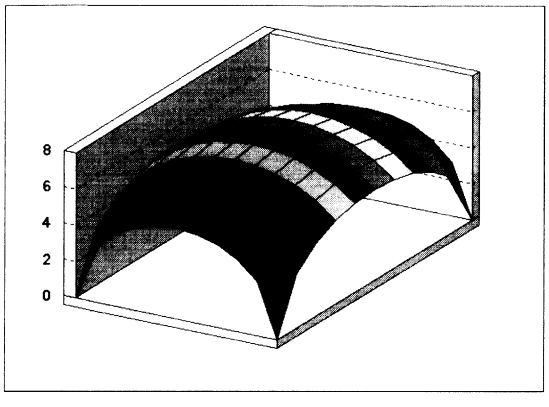


3-D multiple column graphs plot each series as individual 3-D column graphs. They have the same purpose as 2-D multiple column graphs.

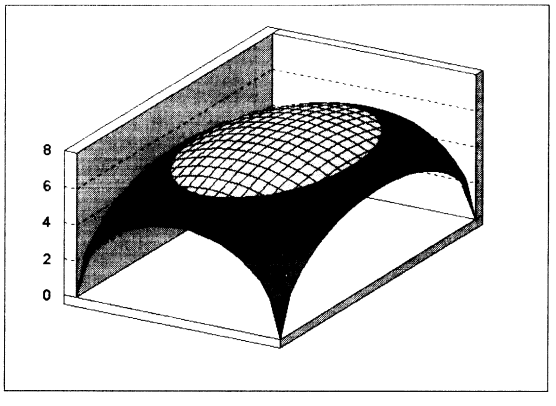
Surface graph types

Surface graphs plot rows and columns as lines that form a "mesh" on a 3-D frame. When you graph a square array of spreadsheet cells, values in columns correspond to mesh lines from left to right. Rows of data correspond to mesh lines from front to back. Each data point is represented by an intersection of two mesh lines.

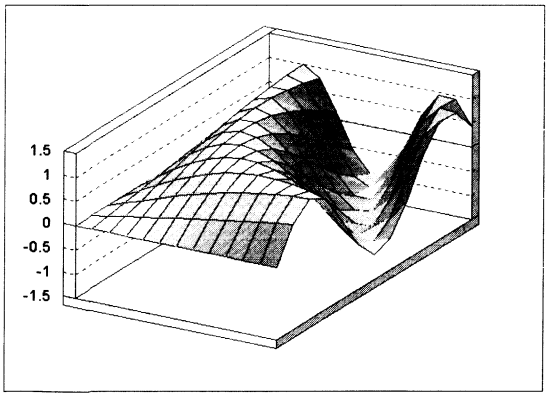
The way the surface of the mesh is shaded depends on the type of surface graph (surface, contour, or shaded surface) you choose. Surfaces can be customized using the area series Object Inspector (see page 191).



Surface graphs shade the area between each series with a different color.



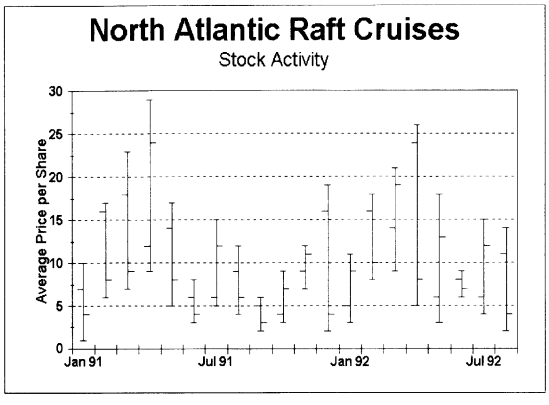
Contour graphs have shading that follows the grid lines, making it easy to compare points on the surface with values on the y-axis scale.



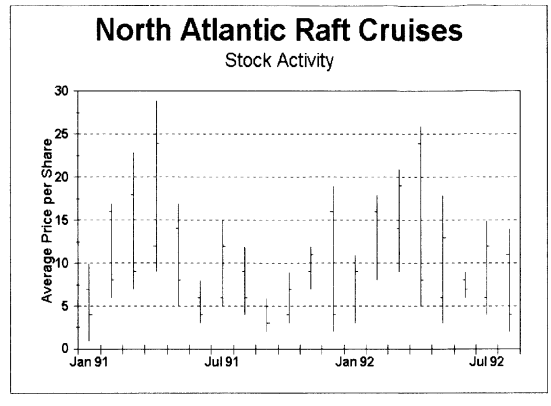
Shaded surface graphs shade a single-colored surface as though a light is shining down from directly above the graph. Flat areas, where values are the same from series to series, or from one point to another in the same series, are lightest. Places where there are great differences between adjacent values have the darkest shading.

High-low (open-close) graph types

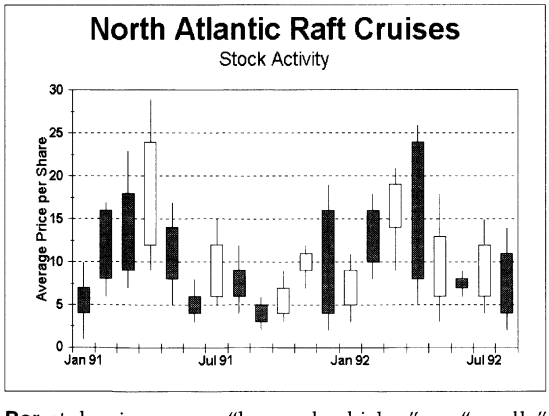
Quattro Pro offers four different styles of high-low graph: I-beam, Line, Bar, and Marker. To create these graphs, choose the 2-D High-Low graph type, or the High-Low Bar type on the next page, then select the style you want from the bar series Object Inspector (see page 195). Page 167 explains how to arrange data in a high-low (open-close) graph.



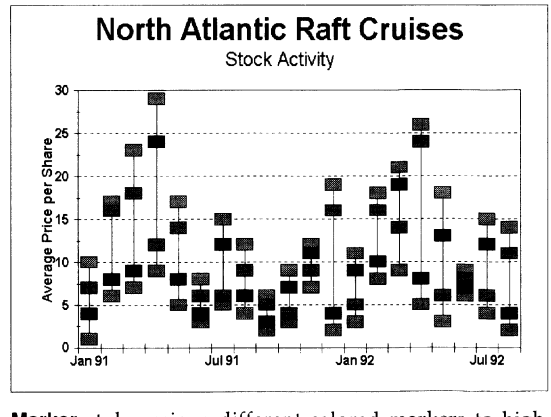
I-Beam is the default style. High and low values determine each end of the I-beam. Open and close are represented by left and right tick marks, respectively.



Line style connects corresponding high and low values with a line, and shows open and close values as left and right tick marks.



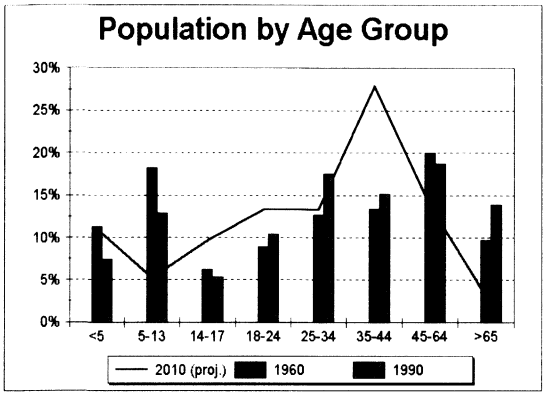
Bar style give you a "bar and whisker" or "candle" graph. A line connects high and low values. A bar spans the open and close values. When the close value is higher than the open, the bar is white. When the open value is higher than the close, the bar is blue.



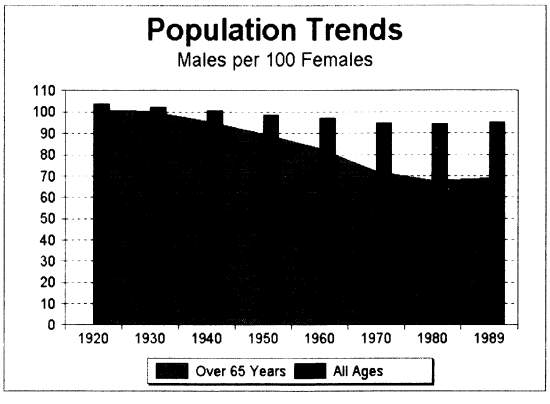
Marker style assigns different-colored markers to high, low, open, and close values, and connects each set of corresponding values with a line.

Combination graph types

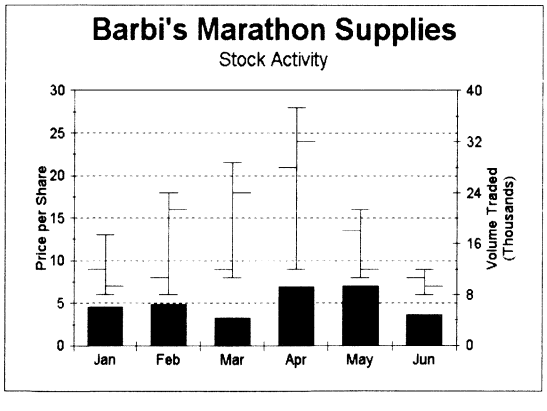
Combination graphs mix two different 2-D graph types in the same graph. Quattro Pro also lets you create your own custom combination graphs (see page 186).



Line-Bar graphs plot the first series as a line and all other series as bars.



Area-Bar graphs plot the first series as an area, and all other series as bars.

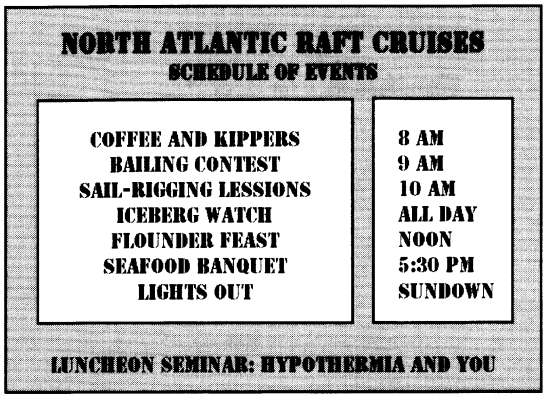


High-Low Bar graphs are high-low (open-close) volume graphs, with special formatting. High and low values (the first two series) are plotted as I-beams. Open and close values (the third and fourth series) are shown as tick marks to the left and right of each I-beam. Volume values (the fifth series) are represented by bars plotted against a secondary y-axis, as are all additional series. You can change the high-low I-beam to any style shown on page 158. Page 167 describes how data is arranged in high-low graphs.

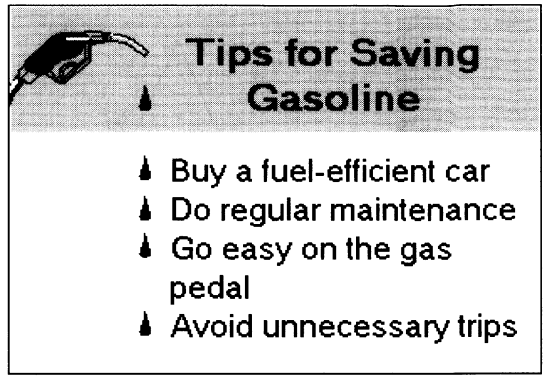
The scale of the secondary y-axis is automatically adjusted to plot volume bars on the lower one-fourth of the graph, which separates them from the high-low I-beams. Additional series are also plotted as bars on the secondary y-axis.

The text graph type

Text graphs aren't based on spreadsheet data; they're blank graphs that serve as the foundation for text and pictures you add using the tools in the graph window SpeedBar. See page 221 for a description of how to create text graphs.

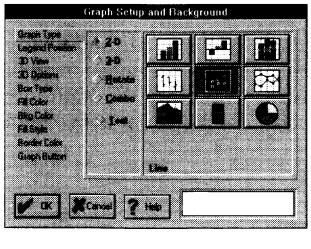


Boxed text can create interesting effects on a solid-colored background. To create text, see page 230. To change the properties of text and text boxes, see page 232.



You can also use imported graphics to enhance a text graph. See page 233 for instructions.

Changing the graph type



When you create a graph, Quattro Pro automatically builds a 2-D bar graph. To change the graph type:

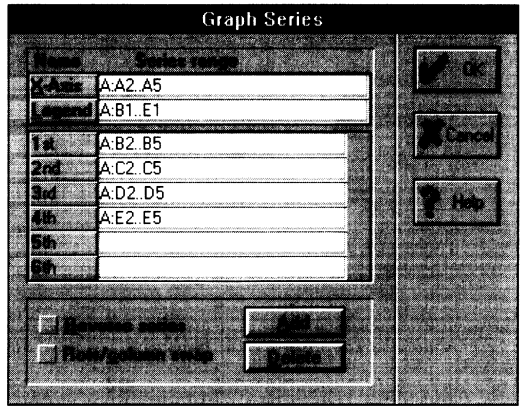
1. Choose Graph | Type. The Graph | Type dialog box has two parts, as shown in the figure. On the left is a list of graph categories; on the right is a gallery of icons that match the selected category.
2. Click a graph category from the list, then click an icon to choose a graph type from that category. The name of the graph type you select appears below the graph icons.
3. Choose OK. Quattro Pro rebuilds your graph using the new graph type.

In the graph window, you can also change the graph type from the graph setup and background Object Inspector (see page 197).

Rearranging data series

The Graph | Series command lets you change how data is plotted in the graph. To use this command, select the graph, then choose Graph | Series. The dialog box in the next figure appears.

Figure 8.8
The Graph | Series dialog box

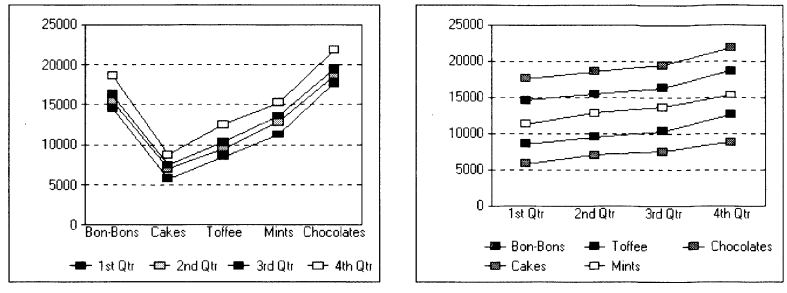


- **Series buttons** (X-axis, Legend, 1st, 2nd, and so on) appear on the left side of the dialog box. These buttons activate Point mode, which lets you define a series by pointing to a block on a spreadsheet page.
- **Edit fields**, to the right of the buttons, display the block coordinates of the series. You can define a series by typing block coordinates or by pointing to the block. A series block can be a single cell, a contiguous block, or a noncontiguous block. Double-clicking an edit field also activates Point mode.
- **Add and Delete buttons** let you add a series after the selected series, or delete the selected series.
- **Reverse series** plots the last series *first*, then moves backward through the series order. This is useful in 3-D bar and unstacked area graphs, for example, when a series with high values is plotted at the front of the graph, obscuring other series.
- **Row/column swap** plots columns as series when Quattro Pro assigns series by rows, and plots rows as series when Quattro Pro would plot columns. Row/column swap also puts x-axis series labels in the legend, and places legend series labels along the x-axis.

The next figure illustrates how you can use row/column swap to get the correct arrangement for a line graph.

Figure 8.9
A block of data graphed automatically by Quattro Pro (left), and graphed using row/column swap (right)

	A	B	C	D	E	F
1		Bon-Bons	Cakes	Toffee	Mints	Chocolates
2	1st Qtr	14589	5786	8547	11257	17589
3	2nd Qtr	15428	6978	9542	12792	18526
4	3rd Qtr	16253	7468	10325	13584	19462
5	4th Qtr	18658	8763	12547	15265	21789



Assigning series by pointing

The procedure for activating Point mode in the Graph | Series and Graph | New dialog boxes is slightly different than in other Quattro Pro dialog boxes. To select series blocks by pointing,

1. Click the series button or double-click the edit field for the series. The graph moves behind the spreadsheet, and the dialog box title bar appears above the SpeedBar. The current series block is selected in the spreadsheet.
2. Drag the mouse to select the block. To select a noncontiguous block, hold down the *Ctrl* key as you select the parts of the block. You can plot rows, columns, and noncontiguous blocks in a single series.
3. To return to the dialog box, click the maximize arrow in the dialog box title bar (which appears over the SpeedBar), or press *Enter*.
4. Change as many series as you want, then choose OK.

Adding a series

To add a new, blank series *after* the series selected in the dialog box, choose Add. If no series is selected (or if the x-axis series or legend series is selected), the series you add becomes the last one in the graph. Once you create the series, assign a block by

pointing, or by typing block coordinates into the Series Range edit field.

Adding a new first series

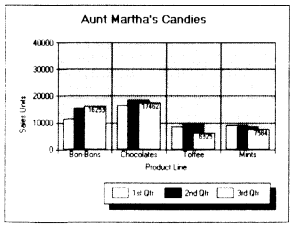
You must do a little rearranging to add a new first series:

1. Select the current first series.
2. Choose Add. A new, blank series is added after the first series.
3. Enter the block coordinates currently assigned to the first series into the edit field for this new second series. (The first and second series should now have the same data block coordinates.)
4. Choose a new data block for the first series.

Adding series through the Clipboard

In the graph window, you can also add one or more series directly to the graph by cutting and pasting data through the Clipboard.

1. On the spreadsheet page, select the block you want to assign to the series.
2. Click the Copy button on the SpeedBar.
3. Use Graph | Edit to display the graph in a graph window (or use any method described on page 169).
4. Select the place to insert the series:
   - To insert the new series after an existing series, select the bar, line, or area that represents the series.
   - To add the block as the first series in the graph, select the graph pane (the area shaded gray in the figure on the left).
   - To add the block as the x-axis series, select the x-axis. (This method is especially useful for adding a numeric x-axis series to an XY graph.)
5. Choose Paste.



The new series are always plotted to match the existing row/column arrangement of the graph. For example, if you copy a row of four cells to the Clipboard, then paste it into a bar graph where columns are plotted as series, you will see four new bars plotted at the first x-axis division, because you've just added four new series, of one value each, to the graph.

Graphing data from more than one notebook

You can use data from one or more notebooks to define series in your graph. To assign data from a different notebook, either assign blocks by pointing, or type the block coordinates in the form described on page 275. All data assigned to an individual series must come from the same notebook.

This is one method for managing windows as you point to blocks in different notebooks:

1. Open all the notebooks that contain data you need for the graph.
2. Close all notebooks you don't need for the graph. (This makes it easier to see the data you *do* need.)
3. Select the notebook where you want to place the graph.
4. Choose Graph | New.
5. Click a series button, then point to a block of data and press *Enter* to define the series. To switch notebooks, choose a notebook from the Window menu, or use *Ctrl+F6* to cycle through the notebooks.
6. Choose OK when you've finished assigning blocks to series.

Each time you open a notebook, Quattro Pro checks whether all notebooks that provide data for its graphs are open. If they are not, a dialog box with three options (Open Supporting, Update References, and None) appears. See page 283 for an explanation of these options.

Deleting a series

To delete a series from a graph, choose Graph | Series, click the series edit field, and choose Delete. In a graph window (but not on a floating graph) you can also select a bar, area, or line directly on the graph, then click the Cut button on the SpeedBar to delete the series.

Adjusting the legend and x-axis series

The legend provides labels that tell the viewer what each series represents. The placement of the legend labels depends on the graph type:

- 2-D graphs (except pie and column graphs), and some 3-D graphs have legend boxes that appear automatically.
- In most 3-D graphs, legend labels appear along the z-axis.
- In multiple graphs, legend labels appear as "titles" of the sub-graphs that represent each series.

When you add, delete, or rearrange data series, the legend series does not change automatically. If you insert a new series into the middle of a graph, for example, you must insert a legend entry for that series into the appropriate position in the legend series. To do this, just delete the old legend series and define a new one (see page 162).

You can also enter legend labels for individual series through the series Object Inspector. See page 185.

You don't have to change the x-axis series when you add or delete a series. If you see new x-axis divisions without labels after you add a series, it means the new series has a greater number of data points than the other series have. To fix this, select the new series, and assign a block that has the correct number of values.

Graphs with special series arrangements

Most Quattro Pro graph types are interchangeable—you can select a different graph type or rearrange the order of series in the graph, and the graph rebuilds correctly. The XY and high-low graph types, however, have specific requirements for the way series are arranged in the graph.

XY graphs

XY graphs plot data against two scaling axes. The x-axis scale is determined by the x-axis series, which in XY graphs contains data, not text labels. The y-axis scale is calculated from the data in all the other series you plot.

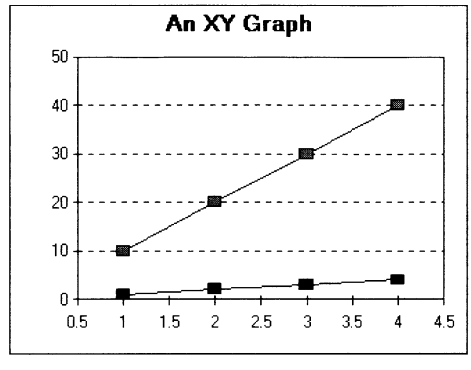
Each series value is plotted as a pair of coordinates. The first coordinate is an x-axis series value. The second coordinate is the corresponding value in the series you're plotting. For example, the next figure shows a block of data and an XY graph plotted from this data. The first column was defined as the x-axis series; the other two columns were defined as the first and second series. The values in the first series, therefore, were graphed as (1,1),

(2,2), (3,3), and (4,4). The second series was plotted as (1,10), (2,20), (3,30), and (4,40).

The first coordinate determines where the data point is placed relative to the x-axis. The second coordinate gives the data point's position in relation to the y-axis.

Figure 8.10
XY data and the finished graph

	A	B	C
1	1	1	10
2	2	2	20
3	3	3	30
4	4	4	40



To create an XY graph:

1. On the spreadsheet page, select all series *except* the x-axis series (Quattro Pro will automatically designate an x-axis series only if the series contains labels). You can also select legend labels if you want.
2. Choose Graph | New.
3. To select the x-axis series, click the x-axis series button, point to a block of data on the spreadsheet, then press *Enter*.
4. Choose OK.

XY graphs are useful for illustrating statistical trends. Page 309 describes how to plot a frequency distribution using an XY graph. Page 316 explains how to use an XY graph to plot a regression analysis.

High-low (open-close) graphs

The usual purpose of high-low (open-close) graphs is to track daily stock prices. You need at least two series to create the graph, since high-low graphs build a set of I-beams from corresponding pairs of values in the first two series. The top of each I-beam shows the *high* value (the highest price the stock reached that day), and the bottom of the I-beam shows the *low* value (the lowest price of the day).

The way Quattro Pro plots additional series depends on how many series you assign to the graph.

- When you plot only three series, the third series is *close* data (the price of the stock at the end of the business day). This data is shown as a tick mark to the right of the I-beam.
- When you plot four series, the third series is *open* data (the price of the stock at the beginning of the day), and the fourth series is close data. Each open value is plotted as a tick mark to the left of the I-beam, and each close value is shown as a tick mark to the right of the I-beam.
- When you plot more than four series, the additional series are plotted as lines (as though they are part of a line graph). If you're using a fifth series to display volume data, see the next section.

Once you create the graph, you can choose one of four high-low bar styles, including the "candle" or "bar-and-whisker" style. See page 195 for more information.

Adding a volume series

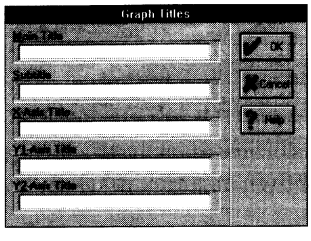
A common use for the fifth series is to display the *volume* data (the number of shares of stock that changed hands that day). High-low values are usually much smaller than volume data, so the high-low data does not show up well in the graph. High-Low Bar graphs (found under Combo in the Graph | Type dialog box), plot the volume data as bars on a secondary y-axis, to optimize the primary y-axis scale for the high-low (open-close) data.

To ensure that the volume bars don't cross the high-low I-beams, High-Low Bar graphs automatically set the high and increment values for the secondary y-axis scale to four times the automatic setting. This plots volume data on the lower one-fourth of the graph. (The increment adjustment makes the scale less cluttered.) You can fine-tune the y-axis scale values using the procedure on

page 210, but you can't change the axis assignments. To plot volume data as a line or area, override the graph type for the volume series (see page 186).

To plot volume data on the primary axis, use the 2-D High-Low graph type. This graph type plots volume data as a line (you can change the line to bars or an area), and does not assign data to a secondary y-axis.

Adding titles to the graph



The Graph | Title command creates a graph title and subtitle for any graph type except a text graph. This command can also place titles on the graph axes. To add titles to a graph,

1. Select the graph (see page 169).
2. Choose Graph | Title.
3. Enter text in the appropriate edit fields, and choose OK.

If your y-axis scale labels are greater than 1000, you can use the Show Units option to simplify the scale and add an appropriate title—for example, "(thousands)"—between the y-axis title and the axis itself. Show Units appears in the y-axis Object Inspector. See page 212 for more information.

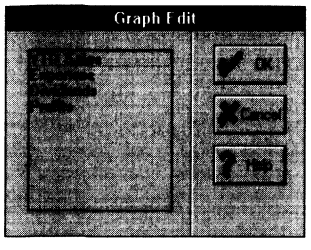
You can change the font, color, or other properties of the graph title, subtitle, and the title/subtitle text box through their Object Inspector menus (see page 196). You can edit the main title and subtitle text directly on the graph, or change the title or subtitle in the edit field of either the Graph | Title dialog box or the title's Object Inspector.

You must edit axis title text in the Graph | Title dialog box, or in the axis title Object Inspector. This inspector also lets you change the font, color, and other properties of axis titles (see page 214).

Saving and editing graphs

When you save a notebook, Quattro Pro automatically saves every graph you've created in that notebook. To see these graphs, click the SpeedTab button at the bottom of the notebook window to display the Graphs page.

Before you can use Graph menu commands to change the graph type, add graph titles, rearrange the data series, and view the selected graph full-screen, you must select the graph. On a spreadsheet page, select a floating graph by clicking it. On the Graphs page, which is the last page in the notebook, select a graph by clicking its icon.



A graph must be displayed in a graph window before you can change its properties or enhance it with drawings and text. To display a graph in a graph window,

- Double-click a floating graph on the spreadsheet page.
- Double-click a graph icon on the Graphs page.
- Choose Graph | Edit anywhere in the notebook, select the graph name from the list that appears, and choose OK.
- Create a new graph in a window. (You can then edit it immediately.)

Renaming graphs

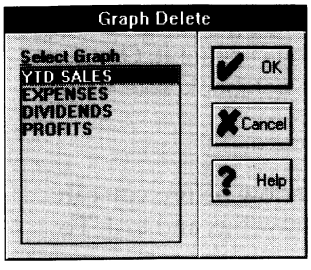
To distinguish graphs from each other on the Graphs page and in dialog box lists, graphs have unique names. Floating graphs are automatically given default names of Graph 1, Graph 2, and so on, according to the order in which they are created in the notebook. When you create a new graph in a window, you can accept the default name or enter a new one.

You can rename a graph only from the Graphs page, which is the last page in the notebook.

To change the graph name,

1. Click the SpeedTab button to display the Graphs page.
2. Right-click the icon of the graph you want to rename.
3. Type the new name in the dialog box that appears, and choose OK.

Deleting graphs

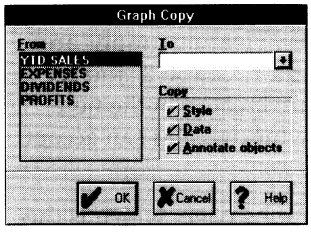


To delete a graph, choose Graph | Delete, select the graph name from the list that appears, and choose OK. If you have the Graphs page selected, you can choose an icon, then click the Cut button on the SpeedBar or press *Del* to delete the graph.

Floating graphs appear both on a spreadsheet page and in a graph window. If you select a floating graph, then click the Cut button on the SpeedBar, the graph is erased from the spreadsheet, but it is *not* deleted from the notebook. You must use Graph | Delete, or cut the graph icon in the Graphs page to delete the graph from the notebook.

Copying graphs within a notebook

The Graph | Copy command lets you copy the style, the data, annotation objects, or all of these attributes from one graph to another within the same notebook. You choose two graphs, one to copy *from* (the source graph) and one to copy *to* (the destination graph). The destination graph can be an existing graph or a new graph.



- **Style** copies all properties that affect the appearance of the graph, such as text fonts, line styles, and fill colors. Style also copies the graph type and series overrides.
- **Data** builds the destination graph from the same data as the source graph. When you choose this option, Quattro Pro copies a reference to the data used in the source graph. (Data is not physically copied to a different location in the notebook.) Any changes you subsequently make to the data affect the source graph and all copies. The Data option also copies x-axis and legend series, legend label overrides, label series, and graph title, subtitle, and axis title text (but not the style of this text).
- **Annotate Objects** copies all text and drawings you created for the source graph using the drawing tools in the graph window SpeedBar. Annotate Objects also includes any graphics you imported for the source graph.

Caution! To preserve annotation objects already existing in the destination graph, uncheck Annotate Objects. Annotate Objects erases all annotation items in the destination graph, even when there are none to copy from the source graph.

The options you choose can produce quite different results:

- If you check Style, Data, and Annotate, Quattro Pro builds an exact copy of the original graph. (You can copy the source graph through the Clipboard to get the same results.)
- If you check Style and Annotate, but not Data, Quattro Pro builds a graph that has the same graph type and properties as the source graph, but uses the data of the destination graph. (The source graph serves as a style template for the destination graph).
- If you copy to a new graph, Quattro Pro automatically creates this graph using data from the source graph (whether or not you checked the Data option in the dialog box). If you don't copy Style to a new graph, you create a 2-D bar graph.

To copy a graph,

1. Choose Graph | Copy.
2. Select a graph from the From list. This graph is the source of the style, data, and annotation objects you choose to copy.
3. Select a graph from the To list, or type in the name of a new graph.
4. Check Style, Data, Annotate, or any combination of the three to select the items to copy. To omit an item from the copy procedure, uncheck it. When you're done, choose OK.

Copying graphs between notebooks

There are two ways to copy graphs between notebooks: Use the Window Clipboard, or use the Drag and Drop feature.

Both methods give the destination notebook a record of where the original data is located. (The data is not physically copied.) Each time you open the destination notebook, Quattro Pro checks whether the source notebook is open. If it isn't, a dialog box offers three options, Open Supporting, Update References, and None. See page 283 for explanations of these options.

If the destination notebook already has a graph with the same name, the newly made copy is given a default name (Graph 6, for example).

Using the Clipboard

To copy a graph through the Windows Clipboard,

1. Select the graph.
   - In the graph window, hold down *Ctrl* and click the graph background. To include annotations, first select the graph, then hold down *Shift* and click each annotation object (or drag to select a group of annotation objects).
   - On a spreadsheet page or the Graphs page, click the floating graph or graph icon. (All annotation objects are selected automatically.)
2. Click the Copy button on the SpeedBar.
3. Open the destination notebook (or use the Window menu to choose the notebook, if it is already open).
4. Select the page where you want to paste the graph.
   - To place the copy as a floating graph on a spreadsheet page, select the page.
   - If you want the graph to appear only in a window and on the Graphs page, click the SpeedTab button to display the Graphs page. (You cannot paste a graph directly into a graph window.)
5. Click the Paste button.

Note If you paste a graph onto a spreadsheet page, then change your mind and click the Cut button or press *Del*, you have *not* erased the graph from the notebook. (The graph still exists in a graph window and on the Graphs page.) You must use Graph | Delete, or select the icon on the Graphs page and click the Cut button, to delete the graph entirely.

Using Drag and Drop

To copy a graph using Drag and Drop,

1. Open the source notebook and click the SpeedTab button at the bottom of the window to display the Graphs page.
2. Open the destination notebook and click the SpeedTab button to display *its* Graphs page.
3. Adjust the positions of these pages until both the icon of the graph you want to copy and the Graphs page of the

destination notebook are visible. (Window | Tile works well when you don't have many notebooks open.)

4. Drag the icon to the Graphs page of the destination notebook, then release the mouse to "drop" the graph onto this page. A new graph icon appears.

Inserting an existing graph on a page

To place any graph in the notebook as a floating graph on a spreadsheet page,

1. Select the page where you want the graph to appear.
2. Choose Graph | Insert.
3. Select a graph from the list that appears.
4. Choose OK. The mouse pointer changes to a miniature graph.
5. Click the upper left corner of the area where you want the graph to appear, or drag the mouse to set the boundaries and position of the floating graph.
6. Release the mouse button.

You can insert the same graph in more than one place in the notebook. Any time you make changes to a graph, all floating graphs associated with that graph reflect the changes.

To replace a floating graph with a different graph, see page 218.

Moving or resizing a floating graph

To change the size or position of a floating graph, first click the graph to select it. Square handles appear at eight positions on the border of the graph.

- To resize only height, drag a top or bottom handle; to resize only width, drag a side handle.
- To change the height and width at the same time, drag a corner handle diagonally.
- To move the floating graph, drag any area of the graph *except* its handles.

Floating graphs can be layered with other floating graphs, floating OLE objects, or other types of floating objects. To arrange these layers, see page 258.

C H A P T E R

9

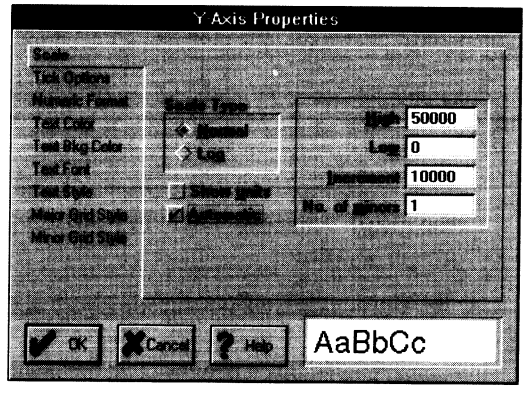
Graph properties

Chapter 8 describes how to build a basic graph. This chapter explains how to customize your graph using *Object Inspector* menus. In the graph window, when you right-click any part of a graph, an Object Inspector displays a menu of all the properties associated with that object.

For example, the y-axis Object Inspector, shown in the next figure, appears when you right-click the y-axis or choose Property | Y-Axis while a graph window is active.

Figure 9.1
The y-axis Object Inspector

The Scale property is selected.

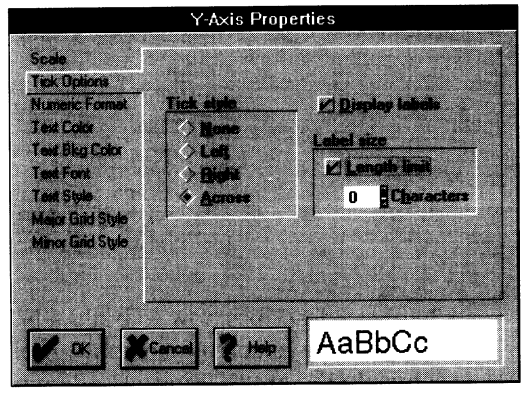


This figure illustrates the standard format for an Object Inspector. On the left is a list of the properties available for the selected

object. When you choose a property from the list, its options appear on the right.

In the previous figure, the Scale property was selected. The next figure shows how the same Object Inspector looks when the Tick Options property is selected.

Figure 9.2
The y-axis Object Inspector showing tick options



This chapter describes how to use Object Inspector menus to customize your graph. Each section explains how to set options for one property at a time; however, the best way to use an Object Inspector is to change settings for as many properties as you want, then choose OK to apply all the changes simultaneously. To help you keep track of changes, Quattro Pro highlights the property name in blue whenever you alter an option setting.

Displaying graph Object Inspector menus

You can display Object Inspectors for graph components only in the graph window. There are three ways to bring a graph into the graph window:

- Double-click a floating graph on a spreadsheet page.
- Double-click the graph icon on the Graphs page.
- Choose Graph | Edit anywhere in the notebook, select the graph name from the list that appears, and choose OK.
- Create a new graph in a window (see page 141). You can then inspect its properties immediately.

To display an Object Inspector, right-click the part of the graph you want to change, or select the graph element, then choose Property | Current Object. You can use other commands in the Property menu to quickly display the graph window, graph setup (and background), graph pane, graph legend, and x-axis and y-axis Object Inspector menus.

The following figures show where Object Inspector menus are available for different graph categories.

Figure 9.3: Right-click these areas to display Object Inspector menus for 2-D graphs with axes

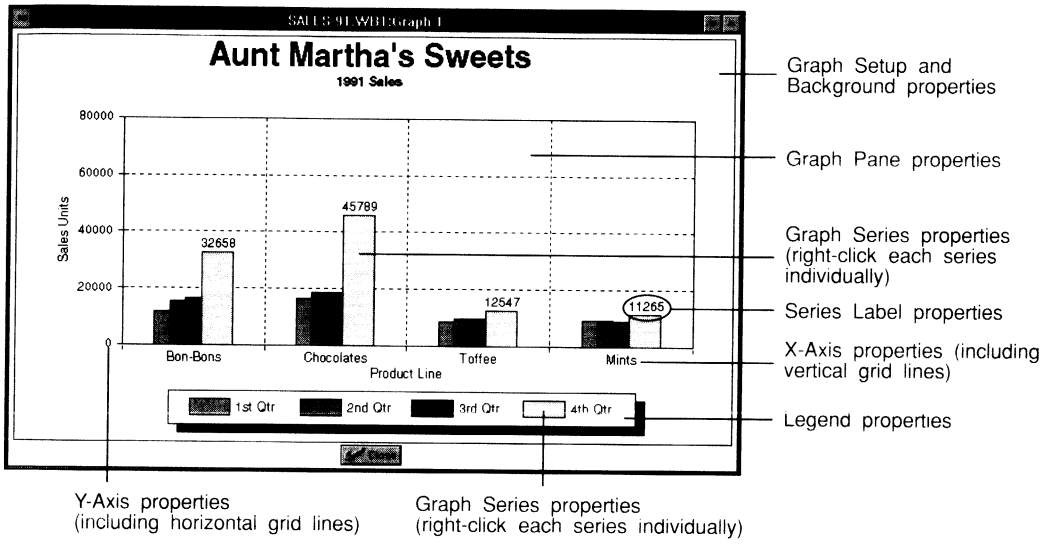


Figure 9.4: Right-click these areas to display Object Inspector menus for 3-D graphs with axes

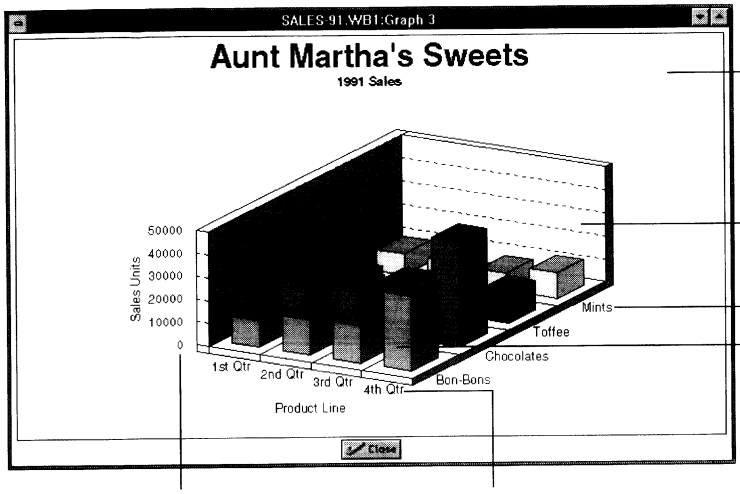


Figure 9.5: Right-click these areas to display Object Inspector menus for 2-D and 3-D pie graphs

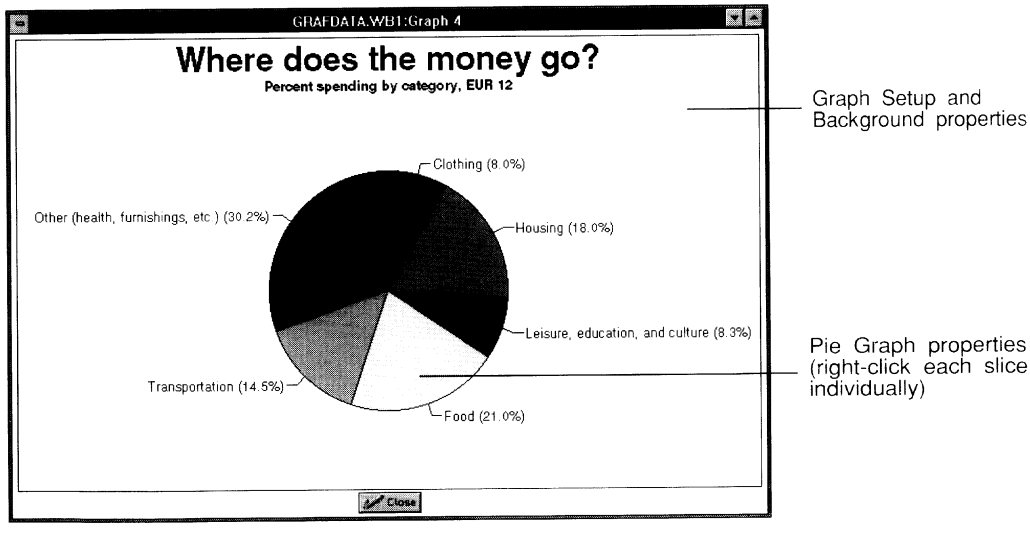


Figure 9.6: Right-click these areas to display Object Inspector menus for 2-D and 3-D column graphs

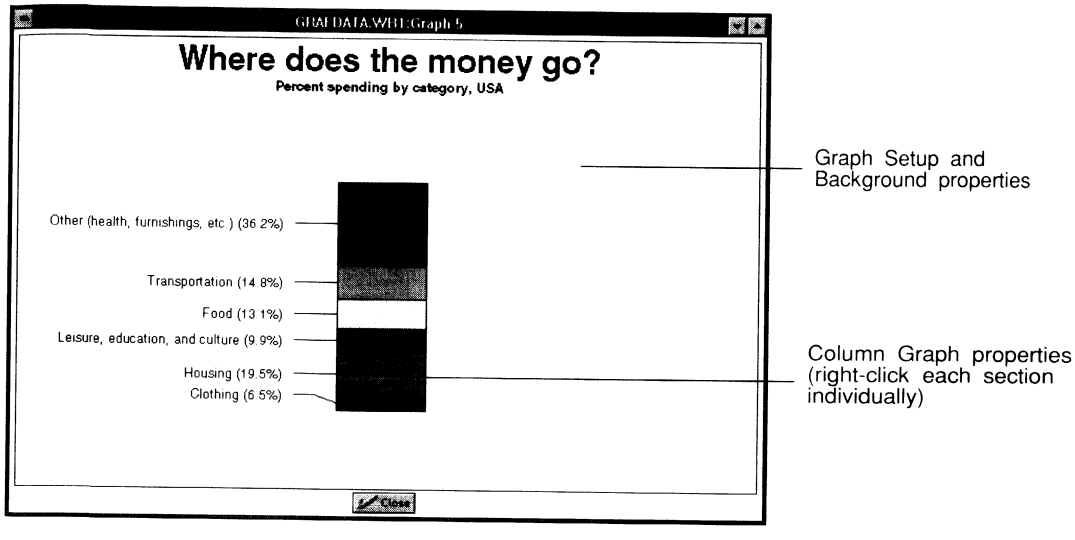
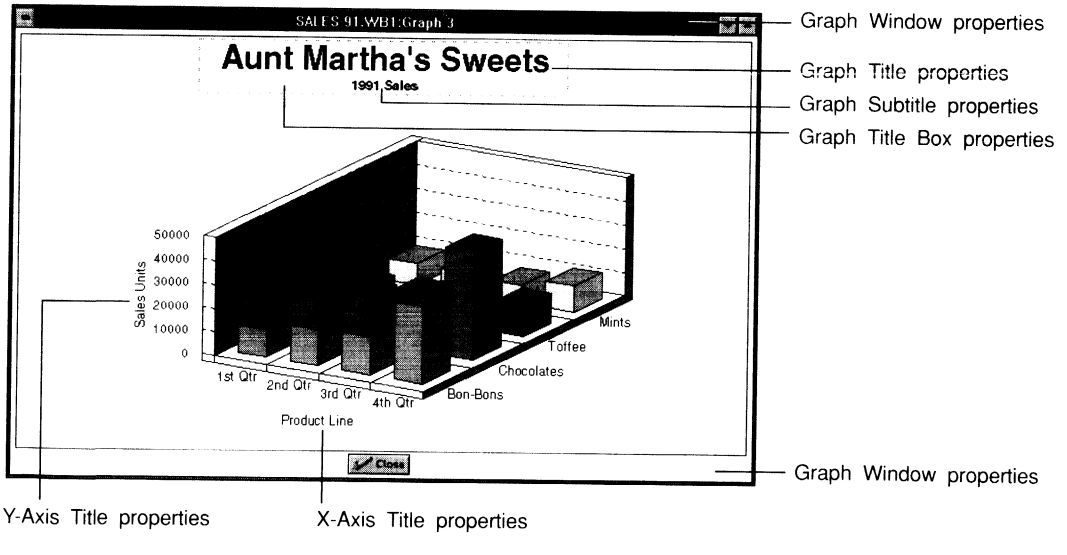


Figure 9.7: Right-click these areas to display Object Inspector menus that are common to all graph types



Instructions for changing pie and column graphs begin on page 192. The rest of this chapter describes 2-D and 3-D graph Object Inspector menus.

Changing graph window properties

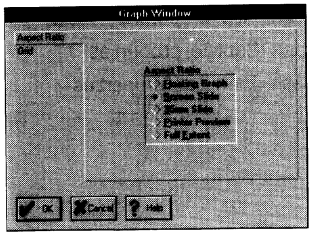
Every graph has its own window; you set properties for each graph window individually. To display the graph window Object Inspector, right-click the title bar (or the window area outside the graph border, if the graph window is maximized). You can also choose Property | Graph Window to display the Object Inspector for the active graph window

Graph windows have two properties, Aspect Ratio and Grid Options.

Setting the aspect ratio

A graph can be displayed in different ways; for example, it can appear in a small or maximized graph window, full screen in a slide show, or as a floating graph on a spreadsheet page. As a single graph moves from one display to another, its overall shape sometimes shifts. You can control such fluctuations by setting a graph's *aspect ratio*.

The aspect ratio is the proportion of width to height. There are five choices:

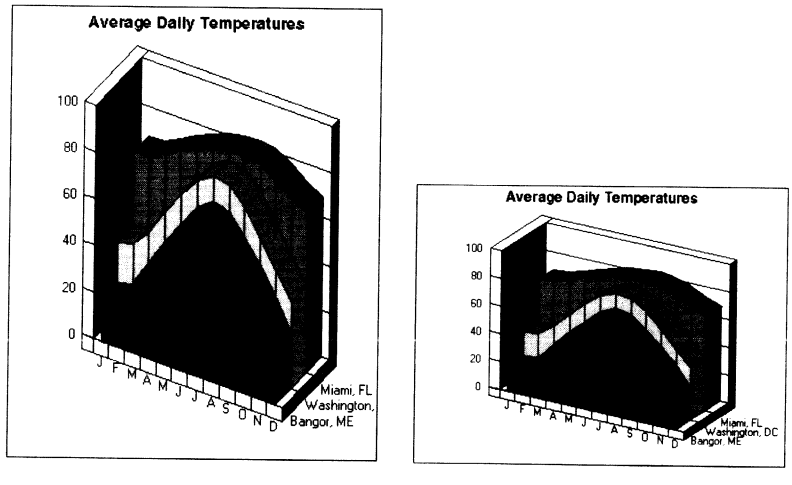


- **Floating graph** retains the proportions of the floating graph, even when you print the graph or bring it into a graph window.
- **Screen slide** gives the correct proportions to a graph that will be part of an onscreen slide show.
- **35mm screen slide** gives the correct proportions to a graph that will be sent to a slide service for processing into 35mm slides. You typically prepare a slide for processing by exporting it to a file. The file type depends on your slide service. Page 236 describes how to export graph files.
- **Printer Preview** shows the graph as it will look when printed with the current page setup.
- **Full extent** adjusts the proportions of the graph to fill the window and fit the area designated for the floating graph. Text stays the same size in every view, which makes it easy to edit the words and see the text style clearly. However, graphs and drawings are shown at actual size only when displayed full-screen, and are scaled down in smaller views. For this reason, graphs with the Full Extent aspect ratio often look different on a spreadsheet page than they do in a graph window.

Only Full Extent allows the *graph's* proportions to change when you display the graph in different ways. All other aspect ratios adjust the size of the graph *background* to fit different displays (the height-to-width ratio of the graph itself remains fixed).

It can save you a lot of work if you choose the aspect ratio for your final output *before* you begin to change properties or draw objects. A 35mm slide has different proportions than an 8.5 x 11-inch sheet of paper, for example. A graph and its labels may look right when the aspect ratio is set to 35mm screen slide, but everything may need to be resized when the aspect ratio is changed to printer preview.

Figure 9.8
A graph with aspect ratio set to Printer Preview (left), and Screen Slide (right)



The default aspect ratio is Screen Slide. To change the aspect ratio,

1. Choose Property | Graph Window or right-click the title bar of a graph window to display the graph window Object Inspector. (If the graph window is maximized, right-click the window area to the right or left of the Close button instead.)
2. Aspect Ratio is automatically selected when the Object Inspector appears. Choose the Aspect Ratio option that best fits your needs, then choose OK. The display in the active graph window changes to match the new aspect ratio setting.

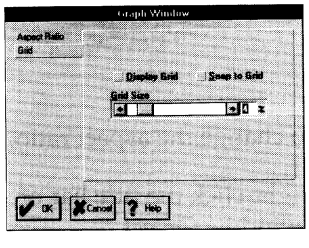
Using a grid

A grid is a series of vertical and horizontal dotted lines spaced at regular intervals. When you draw objects, the grid can help you size and place objects correctly. Grid lines are a design aid only; they don't print or appear in slide shows.

The grid has three options:

- **Display Grid** turns grid line display on and off.
- **Snap to Grid** toggles the grid's automatic alignment feature on and off. When Snap to Grid is checked, objects automatically align with the nearest grid point when you create or move them. You can align several objects by placing them close to the same grid line; Snap to Grid forces the objects to align with the grid and with each other.
- **Grid Size** sets the distance between grid lines, measured as a percentage of the graph window area. The default grid size, 4, means the distance between each grid line is 4% of the window edge it intersects, with 25 increments in each direction (a 25 x 25 grid). The grid has the fewest guidelines when the grid size is set to 25 (a 4 x 4 grid), and the densest guidelines when the grid size is set to 1 (a 100 x 100 grid).

To change grid options,



1. Choose Property | Graph Window, or right-click the graph window title bar to display the Object Inspector. (If the graph window is maximized, right-click the window area to the right or left of the Close button instead.)
2. Choose Grid.
3. Check Display Grid to turn grid display on (uncheck it to turn it off).
4. Check Snap to Grid to activate this feature (uncheck it to turn it off). Snap to Grid works even when grid display is off.
5. Adjust the slider until the grid size percentage is the one you want.

Customizing series options

Series Options for 2-D and 3-D graphs appear in the line series Object Inspector, the bar series Object Inspector, and the area series Object Inspector. There are five options:

- **Data Series** changes the data assigned to the series.
- **Label Series** places labels over bars in most bar graph types and over data points in line graphs.
- **Legend** overrides the legend series label you defined in the Graph | New or Graph | Series dialog box, or provides a legend label when no legend series is defined.
- **Override Type** changes the graph type of just the selected series, creating a custom combination graph.
- **Y-Axis** plots the series against a secondary y-axis.

To display the Object Inspector for a particular series, right-click the bar, line, or area that plots the series. Series Options is the first property, so you see these settings as soon as the Object Inspector appears.

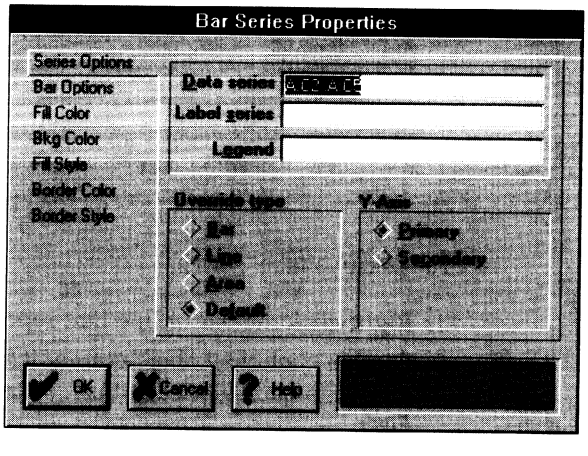


Figure 9.9
The Bar Series Object Inspector, showing Series Options

Changing the data series

The Data Series edit field displays the block coordinates currently assigned to the series. To assign different data to the series,

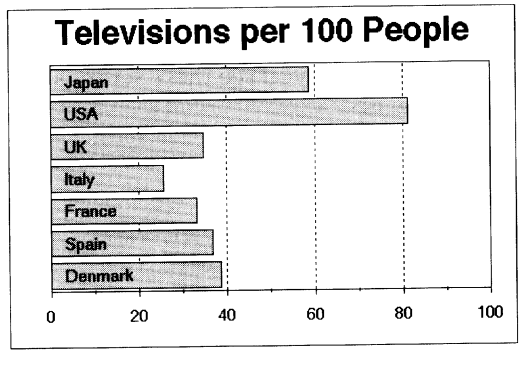
1. Double-click the Data Series edit field. The graph moves behind the spreadsheet, and the dialog box title bar appears over the SpeedBar.
2. Point to the block of the spreadsheet that contains the data and press *Enter*.
3. Choose OK. (You can also type the block coordinates directly into the edit field, then choose OK.)

Be sure to enter a block that has exactly the same number of cells as the other series in the graph.

Defining the label series

A label series places labels on the bars, markers, or data points that represent each value in a series. For example, the next figure shows how a label series positions labels over bars in a bar graph.

Figure 9.10
Labels on a bar series



To specify a label series,

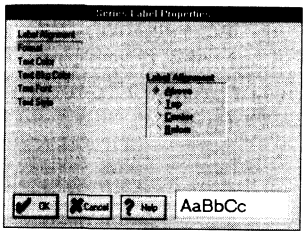
1. Right-click the bar or line that represents the series.
2. Double-click the Label Series edit field, then point to the block on the spreadsheet page that contains the labels and press *Enter*.
3. Choose OK. (You can also type the block coordinates directly into the edit field, then choose OK.)

The label series can contain text or data. For example, if you assign the same block to the data series and the label series of a bar graph, Quattro Pro places a label that shows the actual data value over each bar in the series.

Labels on bars look best when the bars are wide. To increase the bar width, see page 188.

To delete labels, delete the label series.

Changing label properties



To change the properties of labels in a label series, right-click one of the labels. The label series Object Inspector appears. There are six properties, which apply to every label series in the graph:

- **Label Alignment** sets the position of the labels relative to the data points. The graph type determines which alignment options are available.

  On line and ribbon graphs, you can *center* the labels over the data points, or place each label to the *left*, *above*, to the *right*, or *below* the corresponding data point.

  On 2-D and 3-D bar graphs (except stacked bar graphs), you have four choices: *Above* places the labels above the top margin of each bar. *Top* places labels on each bar, near the top margin. *Middle* puts labels over the center of each bar, and *Bottom* places labels just above the x-axis.

- **Format** specifies how labels are displayed (as text, or in a numeric format such as date or currency, for example). See page 75 for a description of numeric format options.

- **Text Color**, **Text Bkg (background) Color**, **Text Font**, and **Text Style** change the appearance of the labels. These properties, which are common to all text elements in Quattro Pro, are described on page 232.

Entering legend labels

The Legend option in the series Object Inspector lets you override the legend label for an individual data series, or enter a label when no legend series exists. Just click the Legend edit field, type the label text, then choose OK.

You can change the font, style, and color of legend text using the legend Object Inspector (see page 215).

Creating a combination graph

Override Type creates a combination graph by changing the graph type of the series you select. For example, this option changed the hydroelectric energy production series from bars to a line in Figure 9.11.

To override the graph type for a series, right-click the series, then choose bar, line, or area to specify how you want the series to be plotted. You can override a series on 2-D bar, line, variance, and high-low graphs, and on rotated bar and line graphs. (High-low graphs restrict the override to the fifth series or greater.) To return the series to the original graph type, choose Default.

Plotting data on the secondary y-axis

When a series has much higher values than the other series in a graph, the y-axis scale range may be so large that the plots of the lowest values are barely visible above the x-axis. If you plot the series that is very different on the secondary y-axis (the y-axis on the *right* side of the graph), the primary y-axis adjusts to accommodate the other series.

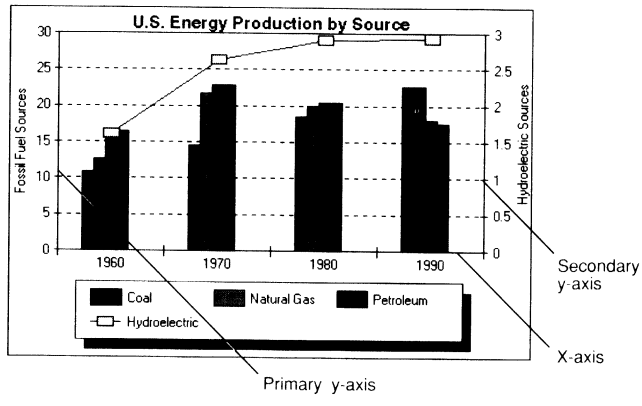
You may also want to use a secondary y-axis when the data in one series is based on a different kind of scale. For example, in a high-low (open-close) volume graph, you can plot share prices on the primary y-axis, and volume data (the number of shares traded), on the secondary y-axis.

The Y-Axis series option lets you plot any series in 2-D bar, line, variance, and high-low graphs on a secondary y-axis. (High-low graphs restrict this feature to the fifth series or greater.)

To plot a series against the secondary y-axis, right-click it to display the series Object Inspector. Series options appear automatically. Click the Secondary setting under Y-Axis and choose OK. In the next figure, the Hydroelectric series was plotted against the secondary y-axis.

Figure 9.11
A bar-line graph created by overriding a series

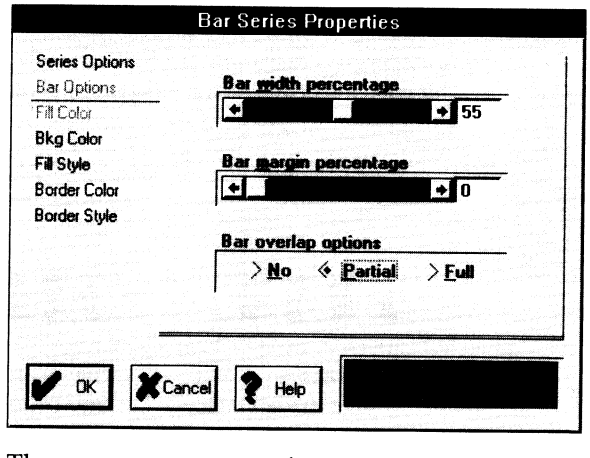
The line series is plotted against the secondary y-axis.



Customizing bar graphs

The bar series Object Inspector lists all the properties available for customizing each series in a bar graph. Right-click a bar in the series you want to change to display its inspector.

Figure 9.12
The Bar Series Object Inspector



There are seven properties:

- **Series options**, explained in the previous section, control the way the selected series is plotted. You can change the data that is plotted, add series labels, override legend labels, change the graph type of just the selected series, and plot the selected series against the secondary y-axis.

- **Bar options** adjust the width, spacing, and overlap of all bars in the graph.
- **Fill color** selects the interior color of the bars.
- **Background (Bkg) color** provides the second color for bars that have a pattern or wash fill style. (You won't see the background color if the bars don't have one of these fill styles.)
- **Fill style** makes the area transparent (select *None*), a solid color, a pattern, a wash, or a bitmap graphic.
- **Border color** selects the color of the frame around the bar.
- **Border style** chooses the line thickness of the border.

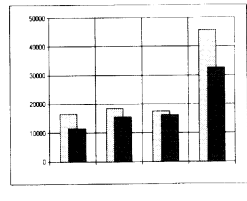
To change the fill color, background color, fill style, border color, and border style properties, see page 216.

Changing bar options

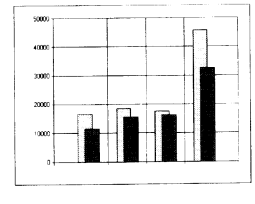
There are three bar options, Bar Width Percentage, Bar Margin Percentage, and Bar Overlap Options.

Bar Width Percentage controls the thickness of the bars. In bar graphs, space on the x-axis is divided evenly between the bars (reserving some of the axis area for spaces between the bars). The initial bar width depends on how many values you plot. To make the bars thinner, move the Bar Width Percentage slider to the left; to make the bars thicker, move it to the right.

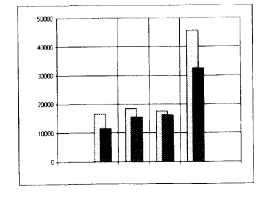
Bar Margin Percentage controls the amount of extra space between the bars and the right and left sides of the graph. A bar margin can give your graph a more polished look.



Bar Margin Percentage=0 (default)



Bar Margin Percentage=50

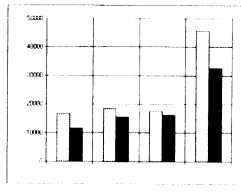


Bar Margin Percentage=100

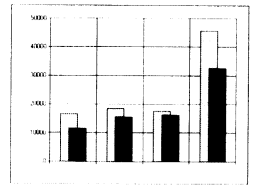
Figure 9.13
Examples of a graph at different Bar Margin Percentage settings

There are three *Bar Overlap Options*, None, Partial, and Full.

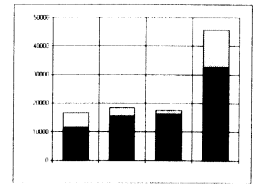
Figure 9.14
Examples of Bar Overlap Options



None (bars are placed side-by-side)



Partial (bars overlap by 50% of their width)



Full (series are placed on top of each other)

Bar options apply to each series in the graph. To change them, right-click any series to display the bar series Object Inspector and choose Bar Options. Adjust the settings, then choose OK.

For most 3-D bar graphs, there is another way to change bar width. Right-click the graph background, then select 3-D view in the graph setup and background Object Inspector. When Depth is set to 100, the bars are square. Increase the depth to make the bars narrower and deeper; decrease it to make the bars shallower and wider.

Customizing line graphs

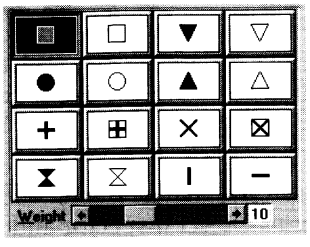
You can customize each line in a line graph with the line series Object Inspector. Right-click a line to display this menu. There are seven properties:

- **Series options**, explained on page 183, control the way the selected series is plotted. You can change the data that is plotted, add series labels, override legend labels, change the graph type of just the selected series, and plot the selected series against the secondary y-axis.
- **Marker style** changes the way each data point appears.
- **Fill color** selects the interior color of the markers.
- **Background (Bkg) color** provides the second color for markers that have a pattern or wash fill style.
- **Fill style** sets the interior style of solid markers to None (transparent), a solid color, a pattern, a wash, or a bitmap graphic.

Fill color, background color, fill style, border color, and border style properties are described on pages 216 through 218.

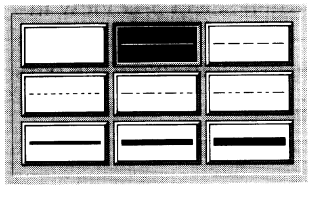
- **Line color** lets you choose the color of the line that connects the points in the series.
- **Line style** lets you change the thickness of the line that connects the points. You can also choose from several dashed line styles.

To change the marker style,



1. Right-click a line to display the properties for that series.
2. Choose Marker Style.
3. Click an icon to choose a marker style.
4. Markers initially have a weight of 10. To enlarge the marker, increase the weight. To make the marker smaller, decrease the weight. To draw lines without markers, set the marker weight to zero. When you're done, choose OK.

To change the line style,



1. Right-click a line to display the properties for that series.
2. Choose Line Style.
3. Click an icon to choose a line style. If you click the icon in the upper left corner, the points in this series are plotted without a connecting line.
4. Choose OK.

Note If a line still appears after you choose "no line" as a line style, check the marker weight. Quattro Pro will not let you eliminate a line when the marker weight is zero, and vice-versa.

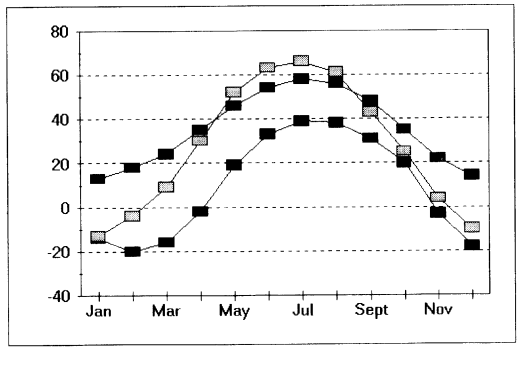
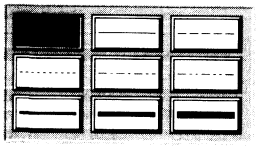
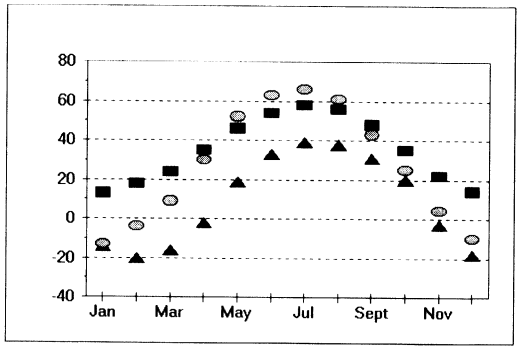


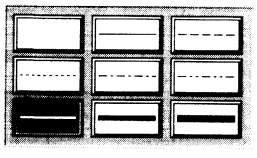
Figure 9.15
Marker Style and Line Style properties affect the appearance of a line graph

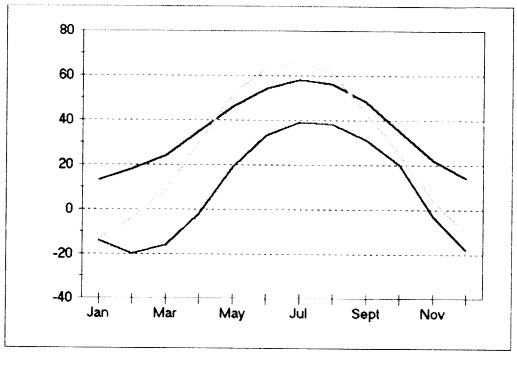
The default line graph style gives each series a different marker Fill Color. Every series has the same marker style; a black line connects the markers in an individual series.





To plot data points only, choose the upper left selection on the Line Style palette. Repeat for each series. To provide additional contrast, choose a different marker style for each series.





To plot lines only, change the Line Color to match the marker's Fill Color, and choose a thicker Line Style to make the series stand out. Choose Marker Style and set the weight option to zero to eliminate the markers. Repeat for each series.

Customizing area and surface graphs

The area series Object Inspector lists all the properties available for customizing each series in an area, surface, shaded surface, or contour graph. To display the inspector, right-click the area that represents the series you want to change.

- **Series options**, explained on page 183, control the way the selected series is plotted. By changing series option settings, you can change the data that is plotted or override legend labels. (You cannot add a label series, change the graph type of a selected series, or plot a series on a secondary y-axis in area and surface graphs.)
- **Fill color** selects the interior color of the area.
- **Background (Bkg) color** provides the second color for areas that have a pattern or wash fill style.
- **Fill style** can be none (transparent), a solid color, a pattern, a wash, or a bitmap graphic.

- **Border color** is the color of the lines that surround the selected area.
- **Border style** chooses the thickness of the lines that surround an area.

Fill color, background color, fill style, border color, and border style properties are described on pages 216 through 218.

Customizing pie and column graphs

Pie and column graphs plot a single series, and usually express each value in the series as a percentage of the whole. Negative values are plotted as though they are positive.

In a pie graph, each value is a "slice" of the pie. You can *explode* a slice (pull it away from the rest of the pie) to emphasize it.

Column graphs represent each value as a section of the column. Column graph properties are identical to pie graph properties, except that you can't explode sections.

To display the Object Inspector, right-click a pie slice or column section.

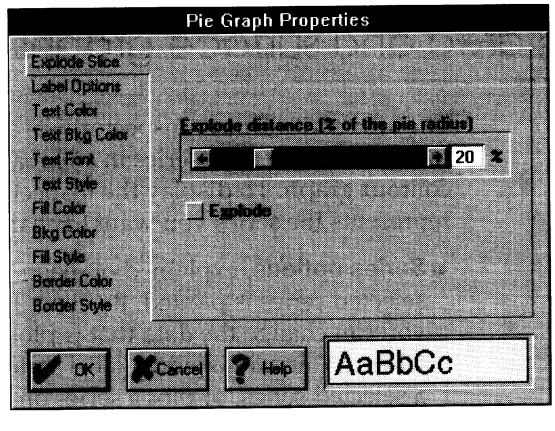


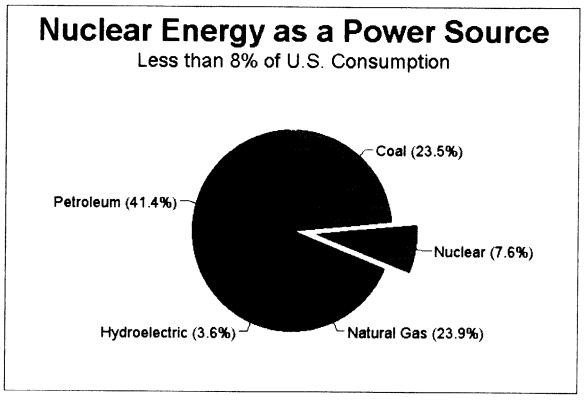
Figure 9.16
The pie graph Object Inspector

Exploding a pie slice

To explode a pie slice,

1. Right-click the slice to display the Object Inspector.
2. Choose Explode Slice.
3. Move the Explode Distance slider to set a distance that is a percentage of the pie radius (the default, 20%, was used in the next figure).
4. Check Explode to enable the explode feature, then choose OK.

Figure 9.17
A pie graph with an exploded slice

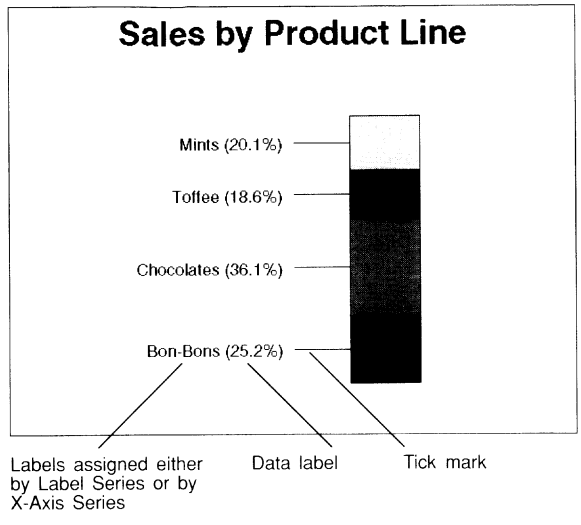


Changing pie or column graph labels

By default, the label for each slice of a pie or section of a column shows what percentage the segment contributes to the whole. A tick mark connects the label and the pie slice or column section.

When you define an x-axis series for a pie or column graph, its labels appear next to the percentages. The previous figure shows how these labels appear on a pie graph, the next figure illustrates labels and tick marks on a column graph.

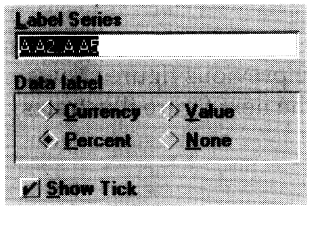
Figure 9.18
Label options on a column graph



If you didn't define an x-axis series, you can use the Label Series option to provide text labels. To define a label series:

1. Right-click a slice or section.
2. Choose Label Options.
3. Double-click the Label Series edit field, then point to the block on the spreadsheet page that contains the labels and press *Enter* (or type the block coordinates directly in the edit field).
4. Choose OK.

To change the format and appearance of these labels:



1. Right-click the slice or section to display the Object Inspector.
2. Choose Label Options.
3. Choose a Pie Label option:
   - **Currency** shows the values from the spreadsheet page in dollars.
   - **Percent** shows the data as a percentage of the value of the whole series. This is the standard way of labeling pie graphs.
   - **Value** shows the actual data that appears in the spreadsheet page.
   - **None** means no value appears next to the slice. Be sure to turn "Show Tick off" if you select this option.

4. To turn tick marks off, uncheck Show Tick. (Check it to turn them on again.) Choose OK.
5. Use Text Font, Text Color, Text Bkg (background) Color, and Text Style properties to customize label text. (See page 232 for descriptions of these properties.)

Changing the appearance of a slice or section

To customize the appearance of a pie slice or column section, right-click the slice or section, then change the fill color, background color, fill style, border color, and/or border style. These properties are described on pages 216 through 218.

Note In Quattro Pro for DOS, you can use a second series to change the style characteristics of pie graphs. Although graphs created in Quattro Pro for Windows don't work this way, a second series will continue to control DOS pie graph properties when you bring the graph into Quattro Pro for Windows.

Customizing high-low graphs

Chapter 8 described how to create a high-low (open-close) graph. Quattro Pro offers four different high-low styles: I-beam, Line, Bar, and Marker.

- **I-Beam** is the default style. High and low values determine each end of the I-beam. Open and close are represented by left and right tick marks, respectively.

These four styles are illustrated on page 158.

- **Line** style connects corresponding high and low values with a line, and shows open and close values as left and right tick marks.
- **Bar** style give you a "bar and whisker" (or "candle") graph. A line connects high and low values. A bar spans the open and close values. When the close value is higher than the open, the bar is white. When the open value is higher than the close, the bar is blue. (Retain this light/dark relationship if you change fill colors.)
- **Marker** style assigns different-colored markers to high, low, open, and close values, and connects each set of corresponding values with a line.

To change the style of a high-low graph,

1. Right-click any high-low marker (this property is global, so you don't have to select a specific series). The bar series Object Inspector appears.
2. Choose Hi Lo Bar Style.
3. Select a bar style, then choose OK.

With Marker style high-low graphs, you can use the line series Object Inspector to give each marker a different look. Change the graph type to line, right-click a series, then change the marker style, weight, and appearance. Repeat this procedure for the other series. When you're finished, change the graph type back to High-Low.

Graph title and subtitle properties

The graph title and subtitle are enclosed in a single text box. When you create a title, you don't see the text box because its fill style and box type are set to None by default. Click either the title or the subtitle to display the handles that mark the boundary of the title/subtitle text box.

Each element (the title, the subtitle, and the text box) has its own Object Inspector. To determine which inspector you'll see, move (don't drag) the mouse pointer over the title and subtitle area. If you right-click when the pointer is an arrow, you'll display text box properties. When the pointer is an I-beam, a right-click displays title or subtitle properties, depending on which line the pointer is over.

You change the appearance of the graph title with the Text Font, Text Color, Text Bkg (background) Color, and Text Style properties (see page 232). The graph subtitle has Subtitle Font, Subtitle Color, Subtitle Bkg Color, and Subtitle Style properties, which have the same effect as the text properties.

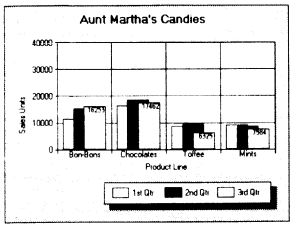
The graph title box has these properties:

- **Box type** determines the look of the box around the title and subtitle. The default box type has no border, but you can change the box type to one of 11 other styles, including several 3-D styles.
- **Fill color** sets the color of the background in the title box. If the fill style is a pattern, the fill color is the color of the pattern, and

the background color (**Bkg color**) is the color behind the pattern. When the fill style is a wash, the fill color is distributed over the background color.

- **Fill style** makes the text box transparent (the default), or gives it a solid color, a pattern, a wash, or an imported bitmap.
- **Border color** is the color of box that encloses the title and subtitle.

Graph setup and background properties



The graph background, shaded gray in the figure on the left, is the area behind the title, the legend, the graph itself, and any drawing elements you add. To display the graph setup and background Object Inspector, right-click any part of the background not covered by a graph element or drawn object, or choose Property | Graph Object.

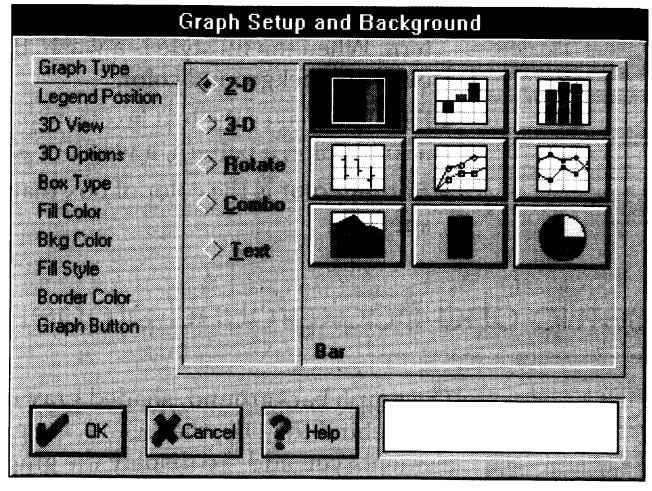
You use the graph setup and background Object Inspector to

- change the graph type
- adjust the legend position and turn legend display off and on
- change the way a 3-D graph is drawn by adjusting the rotation, elevation, perspective, depth, and height of the graph
- turn 3-D graph wall and base display off and on
- change the style of the box that surrounds the graph background area
- add colors, patterns, washes, or bitmaps to the graph background
- make the entire background a graph button for use in a slide show (see page 246)

The next figure shows the graph setup and background Object Inspector.

Figure 9.19
The graph setup and background menu, with the Graph Type property selected

3-D View and 3-D Options (described on page 201), are dimmed when you right-click a 2-D graph.



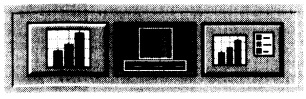
Changing the graph type

The Graph Type options available in the graph setup and background Object Inspector are identical to the choices you get when you select Graph | Type from the menu bar. To select one of the graph types,

1. Right-click the graph background to display the graph setup and background Object Inspector. The graph type property is selected automatically (see the previous figure).
2. Select a general category of graph: either 2-D, 3-D, Rotate (rotated), Combo (combination), or Text. Graph types are described in Chapter 8.
3. Choose a graph type, then choose OK.

Changing the legend position

The Legend Position property controls legend display. The left option hides the legend. The middle option creates a horizontal legend and places it below the graph. The right option creates a vertical legend and places it to the right of the graph. To change the legend position:



1. Right-click the graph background to display the Object Inspector.
2. Choose Legend Position.
3. Choose a legend position (the three options are shown at left), then choose OK.

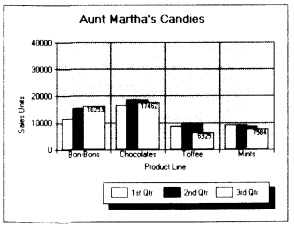
Once you display a legend, you can drag it to any position. For information about how to change legend properties, see page 215.

Changing graph background fill and border properties

The graph background can be a solid color or a two-color pattern or wash. You can even fill the background with an imported bitmap graphic. The graph background is enclosed by a box that has color and style properties of its own. Pages 216 through 218 describe these properties and how to change them.

Note The graph background has Box Type and Border Color properties that control the style and color of the frame around the graph. Floating graph objects also have a Box Type and Border Color (see page 218). On a spreadsheet page, the floating graph property settings override the graph background settings. When the floating graph is displayed anywhere else—in a slide show, or when the graph is printed separately from the spreadsheet, for example—the graph background property settings take precedence.

Graph pane properties



The graph pane, shaded gray in the figure on the left, is the area bordered by the x- and y-axes in a 2-D graph. Grid lines, and the bars, lines, or areas that represent series are drawn on top of this area. (Horizontal grid lines are a property of the y-axis; vertical grid lines belong to the x-axis.)

To change graph pane properties, right-click the graph pane, or choose Property | Graph Pane. There are six properties:

- **Border options** let you display or hide each edge of the graph pane.
- **Fill color** selects the interior color of the graph pane area.

- **Background (Bkg) color** provides the second color for areas that have a pattern or wash fill style.
- **Fill style** makes the graph pane transparent, a solid color, a pattern, a wash, or a bitmap graphic.
- **Border color** is the color of the graph pane edges.
- **Border style** chooses the thickness of the graph pane edges.

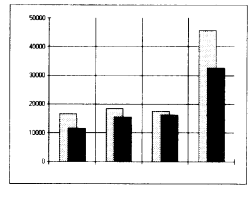
Fill color, background color, fill style, border color,and border style properties are described on pages 216 through 218.

Hiding graph pane borders

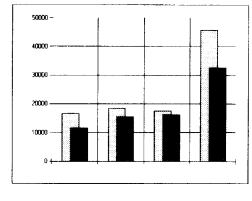
The Border Options property lets you control the display of each graph pane border. Options for this property—Left Border, Top Border, Right Border, and Bottom Border—appear automatically when you open the Object Inspector. To hide a side of the graph pane, uncheck the border option. To reveal it, check the option.

When a hidden side coincides with an axis, the vertical or horizontal line that represents the axis is hidden, but all other features, such as tick marks and labels, are displayed.

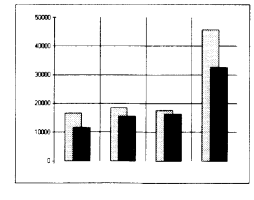
Figure 9.20
Hiding different graph pane borders



Right and top borders hidden



Left, top, and right borders hidden



Top, right, and bottom borders hidden

When you turn off the left and bottom border displays to hide axis lines, you'll see a "plus sign" at the junction of the x- and y-axes, where tick marks cross. To eliminate these marks, right-click the x-axis, choose Tick Options, set Tick Style to None, and choose OK. Then do the same for the y-axis.

Special properties of 3-D graphs

The graph setup and background Object Inspector has two properties that are active only when you right-click the background of a 3-D graph:

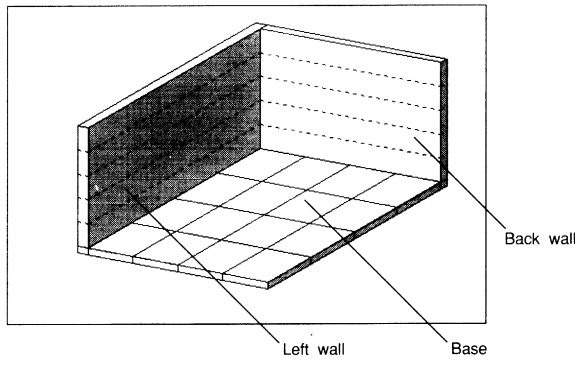
- **3-D Options** let you choose whether to display or hide each wall and the base of 3-D graphs. You can also make each wall thick or thin.
- **3-D View** lets you view a graph from different vantage points by adjusting the way the graph is drawn. See page 202 for a description of 3-D View options.

Changing 3-D options

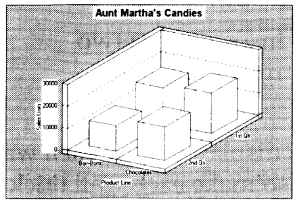
In a 3-D graph, the graph pane is replaced by two walls and a base. Each wall is a separate object. You can hide or reveal the walls and base of a 3-D graph by changing 3-D options. There are four options that toggle off and on:

- **Show left wall** hides or reveals the left wall, shown in the next figure.
- **Show back wall** hides or reveals the back wall of the graph.
- **Show base** hides the area under the series display.
- **Thick walls** gives the graph 3-D walls, as in the next figure. When thick walls are turned off, the walls look thin, as in the sample graph shown in Figure 9.22.

Figure 9.21
Walls and base on a 3-D graph



To change 3-D Options,



1. Right-click the background of a 3-D graph (the area shaded gray in the figure on the left) to display the graph setup and background Object Inspector.
2. Choose 3-D Options. A check mark next to an option indicates that display is on. To turn the option off, uncheck it.
3. Choose OK.

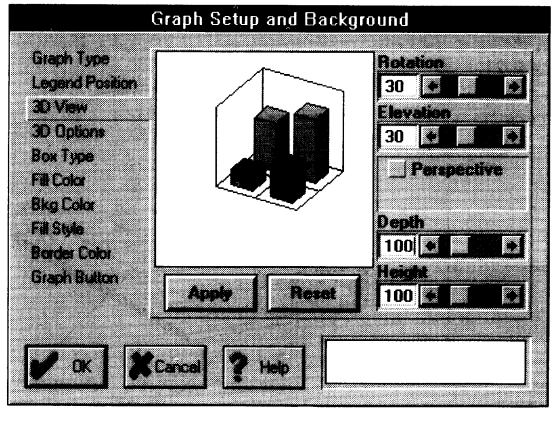
When the wall or base is displayed, you can right-click it to change the same fill and background properties you find in the graph pane Object Inspector (see pages 216 through 218). When a wall or base display is off, you don't see the wall or the grid lines and you cannot display an Object Inspector.

To hide the wall, but display the grid lines, leave the wall display on (checked). Right-click the wall, choose Fill Style, then choose None. Choose OK.

Adjusting 3-D View

You can view a 3-D graph from a different vantage point by changing 3-D View options. There are five options: Rotation, Elevation, Perspective, Depth, and Height. By adjusting these options, you can create interesting effects or reveal objects in a graph that were previously hidden.

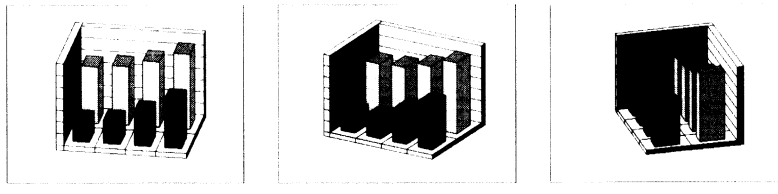
Figure 9.22
3-D view options



Rotation

Use the rotation option to pivot the graph on its base, as shown in the next figure. You can adjust the rotation to any angle between zero and 90 degrees. The standard (default) setting is 30 degrees.

Figure 9.23
Changing 3-D rotation

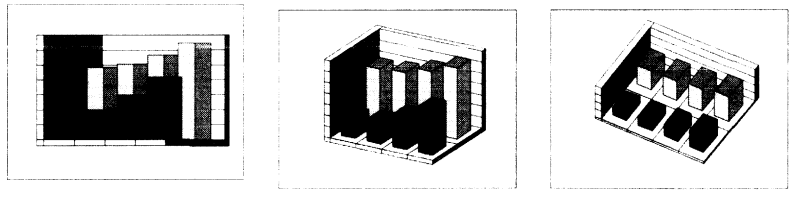


Rotation=10 Rotation=30 (default) Rotation=75

Elevation

To view a graph from different heights, adjust the elevation. When elevation is set to zero, you are at the same level as the base of the graph. As you increase the angle toward 90 degrees, your view shifts to see more of the top of the graph. At 90 degrees, you are looking directly at the top of the graph. Standard elevation for 3-D graphs in Quattro Pro is 30 degrees.

Figure 9.24
Changing 3-D elevation

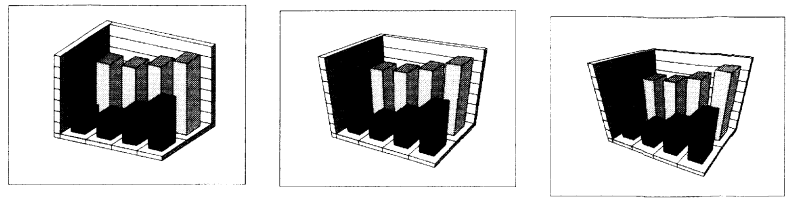


Elevation=0 Elevation=30 (default) Elevation=70

Perspective

When a graph is drawn in perspective, objects in the distance appear smaller than objects that are close. Graphs are drawn without perspective by default. To turn this feature on, check Perspective. A slider for adjusting the amount of perspective appears. To turn perspective off, uncheck it.

Figure 9.25
Changing 3-D perspective



No perspective (default)

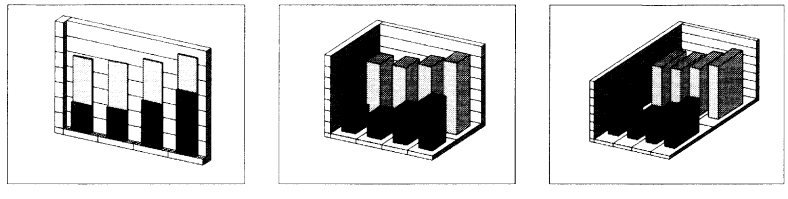
Perspective=50

Perspective=100 (maximum)

Depth

A 3-D graph has height, width, and depth. When depth is set to 166, the top and base of a 3-D bar are square. To increase the depth, move the slider to the right. To make the graph appear flatter, or more two-dimensional, move the slider to the left.

Figure 9.26
Changing 3-D depth



Depth=8

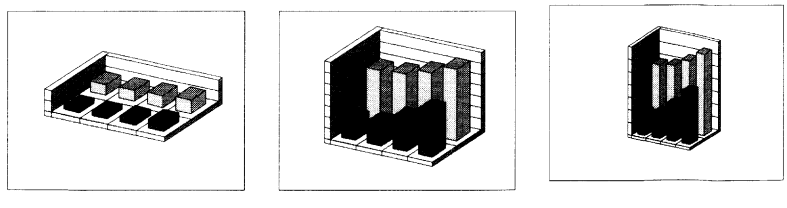
Depth=166 (default)

Depth=500 (maximum)

Height

When Quattro Pro draws a graph with the standard 3-D View settings, the height of the graph is proportional to the width. This height is given the value 100. To increase the proportion of height to width, move the slider to the right. To decrease the height to width ratio, move the slider to the left.

Figure 9.27
Changing 3-D height



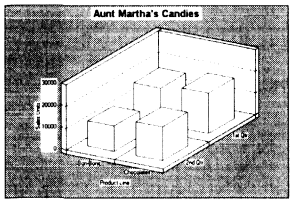
Height=25

Height=100 (default)

Height=300

Changing 3-D view

To change 3-D View,



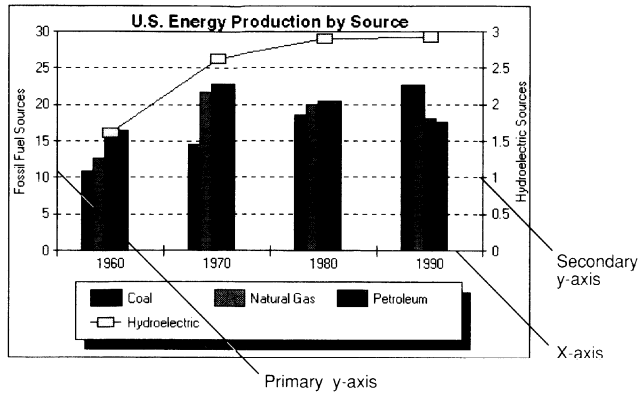
1. Right-click the background of a 3-D graph (the area shaded gray in the figure on the left) to display the graph setup and background Object Inspector.
2. Click 3-D View. The 3-D View options appear.
3. Adjust an option by moving the slider. The sample graph reflects changes as you make them. If you move the sliders too far and want to return to the default settings for all 3-D View options, click Reset.
4. When you are satisfied with your changes, choose Apply. Move the Object Inspector to one side to see how the changes look when applied to your graph.
5. Make additional adjustments to 3-D View, if necessary, then choose OK.

Axis properties

All graphs except pie, column, and text graphs have two references for plotting data, the x-axis and the y-axis. The *x-axis* is the horizontal line that forms the bottom border of the graph pane. This axis usually has fixed points of reference that are often associated with time, as illustrated in the next figure.

The *y-axis* is the vertical line on the left side of the graph. It contains a *scale*, or range of numbers against which a series is plotted. When you create a graph, Quattro Pro automatically scales the y-axis to include the highest and lowest values in all the series.

Figure 9.28
X- and y-axes



There are a few exceptions to this format:

- Rotated graphs have a vertical x-axis and a horizontal y-axis. Quattro Pro reverses the axes of rotated graphs automatically.
- In XY graphs (scatter diagrams), the x-axis series is data, not labels. Quattro Pro gives the x-axis a scale to match the data. When you right-click the x-axis of an XY graph, Quattro Pro displays an Object Inspector that lists the same properties as the y-axis Object Inspector. See page 209 for a description of these properties.
- If the graph is a 2-D bar, line, or area graph, you can assign any series to a secondary y-axis, which then appears on the right side of the graph (see page 183). Quattro Pro scales this axis to accommodate the highest and lowest values in the series, as the previous figure shows.

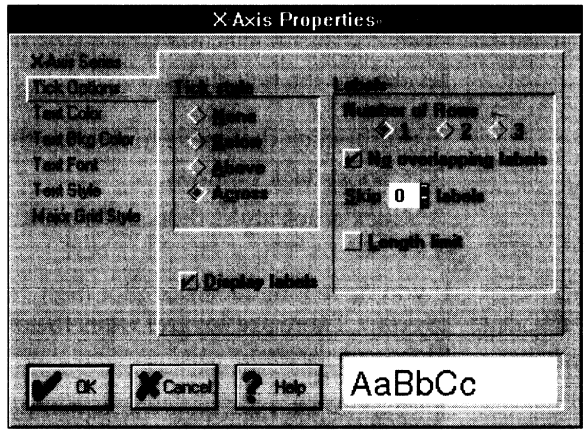
X-axis properties

When you right-click the x-axis of most bar, line, and area graphs, Quattro Pro displays the x-axis Object Inspector shown in the next figure. Through this menu, you can

- Select the x-axis series range. This is the block of labels placed beneath each division of the x-axis.
- Turn x-axis label display off or on.
- Choose a method for dealing with overlapping labels.
- Change the font, size, color, or other characteristics of label text.
- Choose a line style and color for major grid lines.

The next figure shows the x-axis Object Inspector with the Tick Options property selected. Notice that there are properties for x-axis labels, but not for the x-axis title. See page 214 for instructions on creating and modifying an x-axis title.

Figure 9.29
The x-axis Object Inspector



Selecting the axis label series

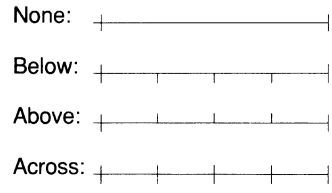
If you didn't select an x-axis series when you created the graph (see page 143), you can add a label to each x-axis division through the X-Axis Series property.

1. Enter axis labels in a spreadsheet page, if a suitable block of labels doesn't already exist.
2. Right-click the x-axis, or choose Property | X-Axis. The X-Axis Series property is already selected in the Object Inspector.
3. Double-click the Select Range edit field, then point to the block of axis labels on the spreadsheet page. If your labels are not in a continuous row or column, hold down the *Ctrl* key as you select each cell or sub-block.
4. Press *Enter* to return to the Object Inspector (or type the coordinates directly in the edit field), then choose OK.

Choosing a tick style

Tick marks are the short vertical lines that separate the major divisions of the x-axis. The Tick Style option controls the display and placement of tick marks and axis labels.

There are four tick styles:



To change the tick style,

1. Right-click the x-axis to display the Object Inspector.
2. Choose Tick Options.
3. Click a tick style, then choose OK.

Controlling label display

If you have long labels or plot many series, x-axis labels might overlap. There are several ways to correct this without changing the x-axis series:

1. Right-click the x-axis to display the Object Inspector.
2. Choose Tick Options, then use one of these options to adjust label display:
   - **Display Labels** toggles label display off and on. To turn label display off, uncheck this option; to turn them on, check it again.
   - **Number of rows** places the labels in a single row, or in two or three staggered rows.
   - **No Overlapping Labels** eliminates some of the labels when label text would otherwise overlap. The default setting is on (checked). Uncheck this option to activate Skip __ Labels.
   - **Skip __ Labels** lets you choose the number of labels to eliminate, to prevent overlap. For example, if you skip two labels, the first label in the x-axis series is displayed, the second and third labels are skipped, the fourth label is displayed, the fifth and sixth labels are skipped, and so on. To specify the number of labels to skip, uncheck No Overlapping Labels, then type a number in the edit field or click the up and down arrows.
   - **Length Limit** lets you specify the maximum number of characters displayed in a label. Any additional characters will not appear in the label. To set a length limit, check this option, then enter the number of characters in the edit field

that appears (or use the arrows to the right of the edit field to adjust the limit).

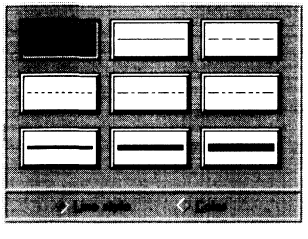
3. Choose OK.

Customizing axis labels

You can change the appearance of axis label text by selecting a new text color, text background color, text font, or text style. See page 232 for more information.

Choosing major grid style options

Major grid lines separate the divisions of the x-axis. (They partially or fully cover tick marks.) You control the style and color of these grid lines with the Major Grid Style property. To change this property,



1. Right-click the x-axis.
2. Choose Major Grid Style. Line style options appear automatically.
3. Choose a line style. (The choice in the upper left corner turns grid lines off.)
4. Click Color.
5. Select a line color from the palette, or use the color scales to create your own (see page 217). Then choose OK.

Y-axis properties

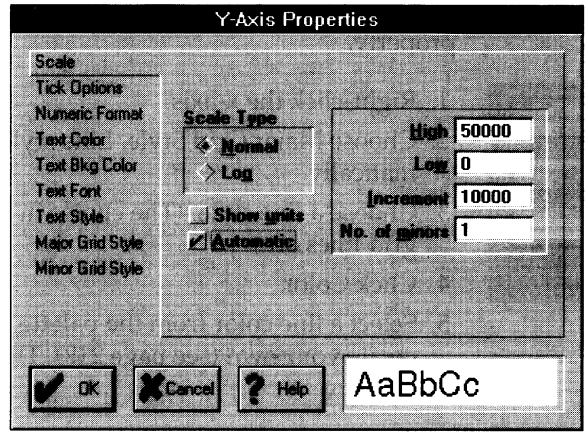
When you right-click the y-axis of a standard graph, the y-axis Object Inspector appears. There are nine properties:

- **Scale** options control the range of values plotted on the y-axis and determine the placement of major and minor divisions and scale labels.
- **Tick Options** control the appearance of tick marks and labels. Y-axis tick and label options work the same way as x-axis ticks and labels. (See page 207.)
- **Numeric Format** specifies how the numbers on the y-axis scale are expressed (as percentages, as currency, or in scientific notation, for example).

To change Text Color, Text Bkg Color, Text Font, and Text Style properties, see page 232.

- **Text Color** selects the principal color of the y-axis label text.
- **Text Background (Bkg) Color** provides the second color for pattern and wash Text Styles. The text background color is also the drop shadow color.
- **Text Font** determines the font and font size of the label text, and whether the text appears **bold**, *italic*, underlined, or with ~~strikeout~~.
- **Text Style** includes options to fill label text with a solid color, a two-color wash, or an imported bitmap. It also lets you add a drop shadow.

Figure 9.30
The y-axis Object Inspector



Changing the scale

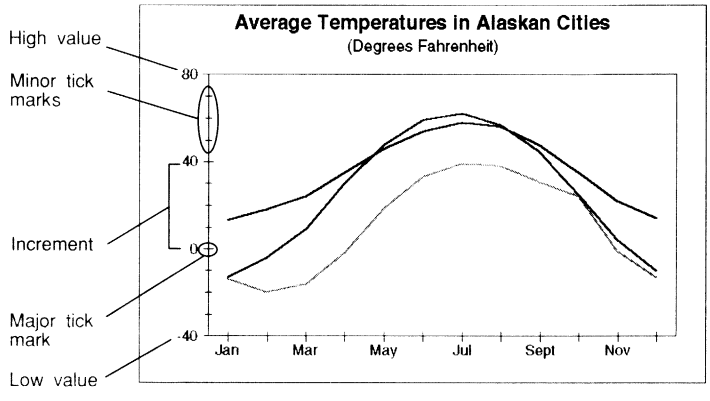
Quattro Pro automatically adjusts the y-axis scale to fit the range of values plotted against it. You can change the High, Low, Increment, and No. (number) of Minors values to fine-tune the graph or to zoom in on a specific area.

- **High** sets the highest value displayed on the scale. (If you set this lower than a value in a data series, the plot for the value will appear to run off the top of the graph.)
- **Low** sets the lowest value displayed on the scale. (If you set this higher than a value in a data series, the plot for the value will appear to run off the bottom of the graph.)
- **Increment** determines the numeric "distance" between major y-axis divisions. Y-axis labels, major tick marks, and major grid lines are placed at these divisions.

- **No. of Minors** specifies the number of evenly-spaced minor tick marks and/or minor grid lines *between* the major y-axis divisions.

The next figure illustrates these scale options.

Figure 9.31
Parts of the y-axis scale



To adjust the scale,

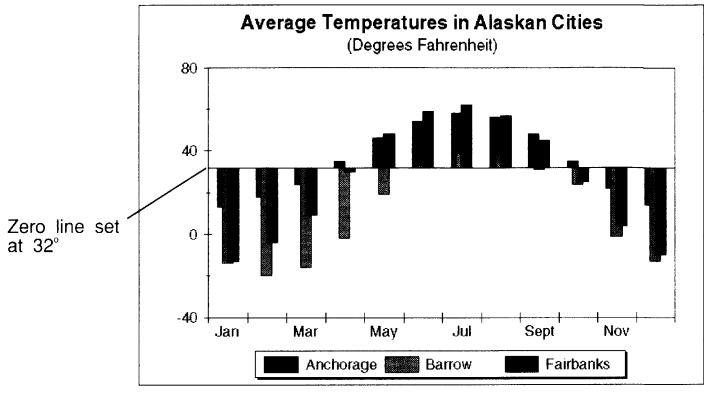
1. Right-click the y-axis, or choose Property | Y-Axis. Scale options appear automatically.
2. Select the number in the High edit field, then type the highest number you want to appear on the axis. The new setting overwrites the old. Notice that Automatic is no longer selected.
3. Select the number in the Low edit field, then type the lowest number you want to appear on the axis.
4. Select the number in the Increment edit field, then enter the scale distance between major tick marks. Enter a zero if you want Quattro Pro to calculate an increment using the new High and Low settings.
5. Select the entry in the No. of Minors field, then type over it to enter the number of minor tick marks to place between major tick marks.
6. Choose OK to apply your changes.

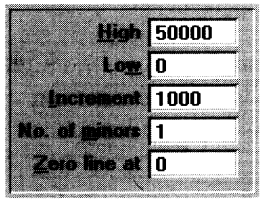
To set a descending axis scale, reverse the high and low values. To reset the scale back to its default setting, check Automatic, then choose OK.

Setting a zero line

Zero Line appears as a Scale option when you right-click the y-axis of a variance graph. The zero line provides the frame of reference for the "variance" that gives this graph type its name. Values less than the zero line setting project below the line; higher values extend above the line. The zero line in the following figure, for example, is set to show how temperatures vary from the freezing point on the Fahrenheit scale.

Figure 9.32
The zero line on a variance graph





To change the zero line value, right-click the y-axis of the variance graph, or choose Property | Y-Axis. The zero line option appears under No. of Minors. Set the zero line to a value no greater than the High scale setting, and no less than the Low scale setting, then choose OK.

Using show units

If the numbers on the y-axis scale are 1000 or greater, you can simplify the labels with the Show Units option. Show Units displays only the first characters of the label, and automatically adds the appropriate units title in parentheses along the y-axis; for example, "(thousands)" or "(millions)."

To use this option, right-click the y-axis. The scale property is automatically selected. Check Show Units. (To turn this feature off again, uncheck it.) Choose OK.

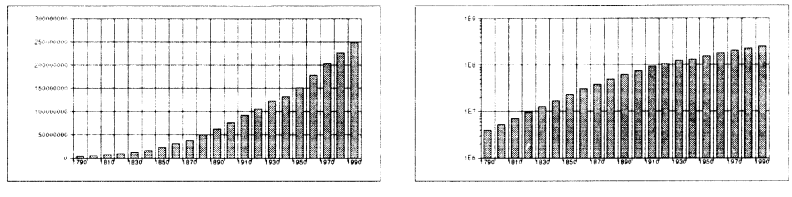
To change the font, color, or other properties of the Show Units title, right-click it to display the axis title Object Inspector (see page 214).

Logarithmically scaling an axis

In a logarithmically scaled axis, each major division of the axis represents 10 times the value of the previous major division. This type of scale is useful when you're plotting series with wide ranges in magnitude.

The following figure shows two graphs that plot U.S. Population from 1790 to 1990. The first graph uses the y-axis scale Quattro Pro set up automatically. In the second, the y-axis is logarithmically scaled. A logarithmic scale plots a steady increase or decrease as a straight line. Although it appears in the first graph that the population has been increasing in a steady geometric progression, a logarithmic plot reveals that the rate of growth is actually decreasing.

Figure 9.33
Graphing data on a standard scale (left) and a logarithmic scale (right)



To use a logarithmic scale, right-click the y-axis or choose Property | Y-Axis. Scale options appear automatically in the Object Inspector. Under Scale Type, choose Log, then choose OK.

Selecting a numeric format

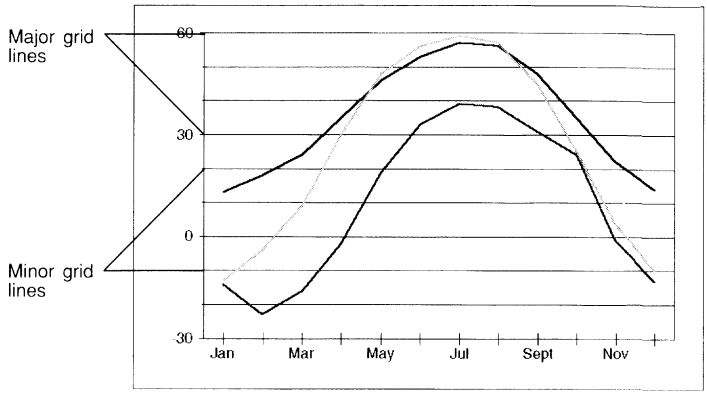
To change the format of the values on the y-axis scale, right-click the y-axis and choose the Numeric Format property. Select a format option, then choose OK. See page 75 for a description of Numeric Format options.

Choosing major and minor grid styles

Major grid lines extend from each major tick point across the graph to the opposite side (see the following figure). Minor grid lines extend from each minor tick on the axis to the opposite side of the graph.

Figure 9.34
Major and minor grid lines

Grid lines appear behind the data series and help the viewer estimate series values.

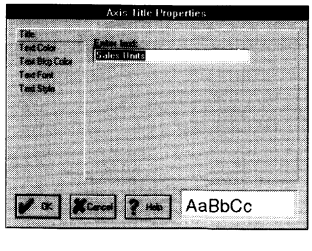


The Major Grid Style and Minor Grid Style properties select new line styles and line colors for major and minor grid lines. To change a grid line style,

1. Right-click the axis to display the axis Object Inspector.
2. Choose Major Grid Style or Minor Grid Style. Line style options appear automatically.
3. Select a line style. (The blank selection in the upper left corner turns the grid off.)
4. Click the Color option and select a color from the palette, or use the scales to create a new color (see page 217 for additional information).
5. Choose OK.

If major grid lines are too close together, choose the Scale property and increase the increment; if the lines are too far apart, decrease the increment. To change the number of grid lines between labels, increase or decrease the No. of Minors (see page 211).

Axis title properties



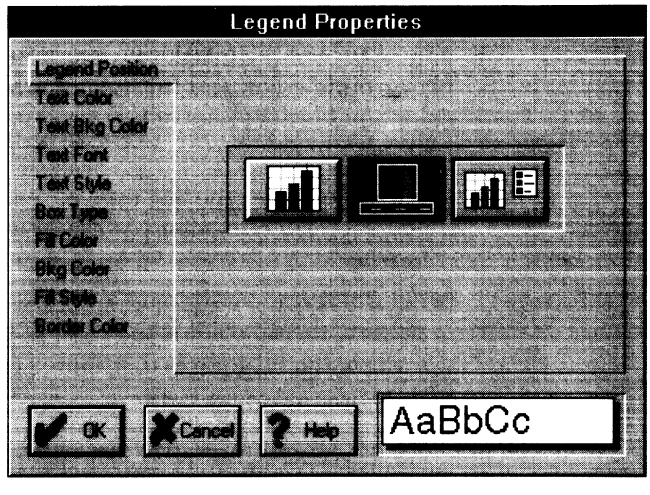
You create titles for the x-axis, the y-axis, and the secondary y-axis using Graph | Title (see page 168). To change the properties of an axis title, right-click it. The Title property displays an edit field for changing the wording of the title. Enter any changes, then choose OK.

Text Color, Text Bkg (background) Color, Text Font, and Text Style properties control the appearance of the title text. To change these properties, see page 232.

Legend properties

A legend box appears as soon as you define a legend series in all 2-D graphs (except pie and column graphs), and in some 3-D graphs. To change legend properties, right-click the legend box, or choose Property | Legend. (Avoid the series markers—a right-click on a series marker displays series properties.) The legend Object Inspector appears.

Figure 9.35
The legend Object Inspector



- **Legend Position** controls the legend display (see page 198).
- **Text Color**, **Text Bkg (background) Color**, **Text Font**, and **Text Style** change the appearance of the legend labels. These properties are described on page 232.
- **Box Type** and **Border Color** change the style and color of the frame that surrounds the legend box. To change these properties, see page 216.
- **Fill Color**, **Bkg (background) Color**, and **Fill Style** control the appearance of the legend box background. To change these properties, see page 216.

Legend labels in 3-D and multiple graphs

Many 3-D graphs display legend labels along the z-axis. In multiple graphs, the legend label for each series appears as a "title" over the sub-graph that plots the series. Right-click a label to display Text Color, Text Bkg Color, Text Font and Text Style properties. To change these properties, see page 232.

Fill and border properties

Fill and border properties are the Fill Color, Background Color, Fill Style, Border Color, Box Type and Border Style. You find fill and border properties in the Object Inspector menus for every solid object that appears in or on a graph.

A solid object has two areas, an interior and a border. The appearance of the interior is determined by the way fill color, background color, and fill style properties are set. The border color and border style (or box type) control the appearance of the perimeter of the object.

- **Fill Style** makes the box transparent (None), or fills it with a solid color, a two-color pattern or wash, or an imported bitmap graphic.
- **Fill Color** is the interior color of the object. If the fill style is a pattern, the fill color is the color of the pattern. If the fill style is a wash, the fill color is distributed over the background color.
- **Background (Bkg) Color** provides the second color when the fill style is a pattern or a wash. The background color is the color behind the pattern. In a wash, the fill color is distributed over the background color.
- **Border color** is the color of the frame or box around the object.
- **Border style** sets the style or thickness of the frame around the object.
- **Box type** determines the look of the box around the object. (An object has either a Border Style or Box Type.) The 12 choices range from "no frame" to several 3-D styles.

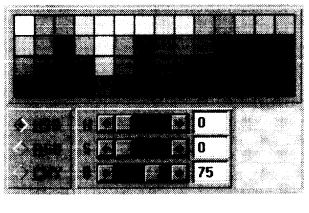
Selecting fill, background, and border colors

You use the same method to adjust all color properties in Quattro Pro. To select a fill color, background color, or border color for an object,

1. Right-click the object to display the Object Inspector.
2. Select Fill Color to choose the fill color, Bkg Color to select the background color, or Border Color to choose a border color. The Object Inspector displays a color palette, color scales, sliding scales for adjusting the color, and a sample box.
3. Select a new color from the palette. The selected color appears in the sample box. You can use this color "as is," or adjust it with the color scales. (See the following section for instructions.)
4. Choose OK.

Creating custom colors

Quattro Pro provides three different models for creating new colors: HSB, RGB, and CMY. Only one model displays at a time, but all three update when you change a color setting. The model to use is purely a matter of preference.



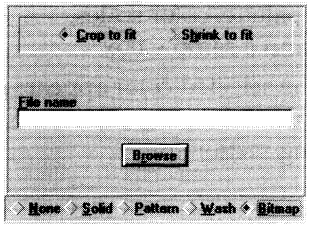
- **HSB** stands for Hue, Saturation, and Brightness. *Hue* is the basic color: red, yellow, orange, or green, for example. *Saturation* refers to the amount of white that is mixed with the hue. *Brightness* is the amount of light energy present. When brightness is zero, no light is present, and the result is black for every hue and saturation value. By adjusting the saturation and brightness scales in the HSB model, you can easily control the amount of gray in a color.
- The **RGB** model is named for its primary colors, Red, Green, and Blue. Using this model, you mix different amounts of red, green, and blue to form all other colors.
- **CMY** stands for Cyan, Magenta, and Yellow. You mix different amounts of these colors to form all other colors. Commercial printing houses often use this model to mix colors.

Once you open the Object Inspector and choose the property you want to change (fill color, background color, or border color), use this procedure to adjust the color:

1. Select the color closest to the one you want.

2. Choose a color model.
3. Use the sliders on the color scales to adjust the color. The sample color reflects the changes as you make them. When you're satisfied with the color, choose OK.

Filling an object with a bitmap



To fill an object with an imported bitmapped graphic:

1. Right-click the object to display the Object Inspector.
2. Choose Fill Style.
3. Choose Bitmap.
4. Type the path and name of a bitmap file in the File Name edit field, or choose Browse to search for and select a bitmap file. You can select a file with any of these formats: .BMP, .TIF, .PCX and .GIF.
5. Choose Crop to Fit to crop the drawing (cut out all pieces that don't fit) or Shrink to Fit to shrink or enlarge the drawing to fit it within the object. (See page 234 for more information about these options.)
6. Choose OK.

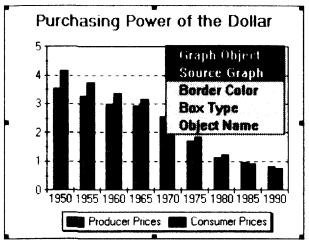
Making an object transparent

To make a background transparent (for example, when you want a text box to disappear so the text appears to float on the graph background),

1. Right-click the object to display the Object Inspector.
2. Select Fill Style and click None
3. Select Box Type or Border Style (the object will have only one of these properties), click the upper left (blank) selection, and choose OK.

Floating graph properties

Previous sections of this chapter explain how to display a floating graph in a graph window and change graph properties. You can also right-click a floating graph on a spreadsheet page to reveal an Object Inspector. There are four properties:



- **Source Graph** chooses the graph that appears on the spreadsheet page. You use this property to replace the existing floating graph with a new one that is the same size and in the same position.
- **Border Color** is the color of the frame that surrounds the floating graph. You can select a color from the palette, or create a different color using the color scales (see page 217).
- **Box Type** controls the thickness of the frame that surrounds the floating graph on the spreadsheet page. There are four choices: None, Thin (this is the default setting), Medium, and Thick. To add a black drop shadow to the floating graph, check Drop Shadow.
- **Object Name** is the name you use to reference the floating graph when you create a macro.

Each time you choose a property, a dialog box appears. Make your changes, then choose OK.

You won't see the floating graph Box Type and Border Color when you display the graph in a graph window, because the border display in a window is controlled by the Box Type and Border Color properties in the graph setup and background Object Inspector (see page 199).

C H A P T E R

10

Enhancing graphs

This chapter describes how to enhance your graphs with drawings, text boxes, and graph buttons. It also explains how to create text graphs—graphs that contain text boxes and drawings but no data—and how to assemble text and data-based graphs into slide shows. For instructions on how to build a graph from spreadsheet data, see Chapter 8. To change the properties of graph elements, see Chapter 9.

Quattro Pro has a set of integrated drawing tools for adding shapes, colors, imported art, and text. These tools appear in the SpeedBar whenever a graph window is active. Once you draw an object, you can select, move, reshape, and resize it. You can also right-click it to display its Object Inspector. The Object Inspector lets you change the object's color, line or border thickness, fill pattern, and so forth.

The drawing tools let you create simple annotations—text boxes with arrows to point out important areas of your graphs, for example—or more complex graphics, such as corporate logos, or even works of art.

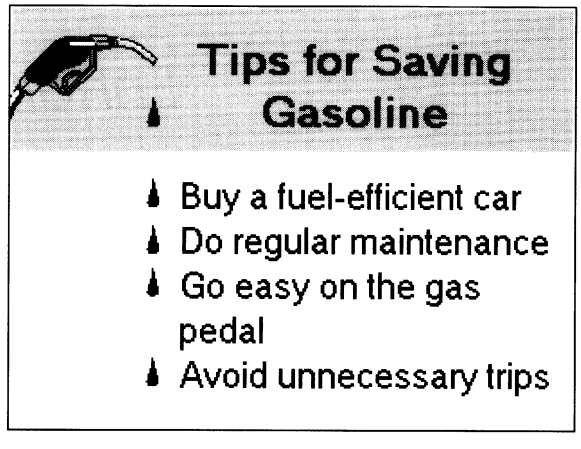
Creating text graphs

Although you can use Quattro Pro drawing tools with any type of graph, they are especially useful when working with text graphs.

Text graphs don't plot data; instead they give you a clean slate on which to draw graphics and add text boxes.

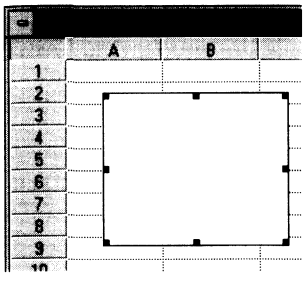
A text graph can serve as a title screen to a slide show, as an area to display a bulleted list of text, as a vehicle for original art, or as a temporary scratchpad where you create a drawing before cutting and pasting it to a different graph. You can also import a graphic image from another application and insert it as a floating text graph on the notebook page. The following figure is a text graph that might be used in a slide show.

Figure 10.1
A text graph has no data, just pictures and text



Creating a text graph is easy, because Quattro Pro automatically sets the default graph type to Text when no data is selected. Like other types of graphs, text graphs can exist as floating graphs on the spreadsheet page, or they can appear solely in a window. No matter which kind of text graph you create, you must add text and drawings in a graph window, where all the tools are located.

Creating a floating text graph



To create a floating text graph,

1. Select an empty cell on a spreadsheet page.
2. Click the Graph tool in the SpeedBar. The mouse pointer changes to a small graph.
3. Drag the mouse over the area of the spreadsheet where you want the floating graph to appear. As you drag, a dotted rectangle indicates the current border of the area.
4. When the border is in the correct position, release the mouse button. A blank graph appears (a textless text graph), as illustrated at left.

Once you create the empty floating graph, double-click it to bring it into a graph window.

Creating a text graph in a window

You create a graph in a window using the Graph | New command, which is available from a spreadsheet page, from the Graphs page, and when a graph window is active.

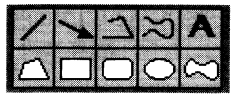
To create a text graph in a window,

1. Choose Graph | New. (If you're creating the graph from a spreadsheet page, select an empty cell, then choose Graph | New.) The Graph New dialog box appears.
2. Enter a name for the graph in the Graph Name edit field. If you don't type a new name, Quattro Pro assigns the default name shown in the dialog box.
3. Choose OK. A blank text graph appears in a graph window.

When the Graphs page is active, press the Create Graph button on the SpeedBar, enter a graph name, and choose OK to create a text graph.

Creating lines and shapes

You can draw lines and shapes in any graph with the tools in the graph SpeedBar. Here are a few rules and tips you should know before you begin:



- Pick the correct aspect ratio for a graph *before* you start to draw; otherwise you may have to resize, reposition, or even redraw elements to fit the final format. See page 180 for more information.
- To draw a shape, choose a tool on the SpeedBar. This tool stays selected until you choose a different tool. (Once you create an object, you can right-click it immediately to change its properties, but the tool will still be selected when you close the Object Inspector.)
- To select fill color and background colors, fill pattern (if any), and border color and style of an object *before* you draw it, choose a color from the palette, then choose the Drawing tool. See page 236 for more information about color palettes.
- To change the color and pattern of an object *after* you create it, right-click the object to display its Object Inspector. The tool will still be selected when you close the Object Inspector.
- You can also use the palette to change an object's attributes after you create it. Choose the Selection tool in the SpeedBar, select the object, then choose a color from the palette.
- To change the palette displayed in the SpeedBar, select a new palette from the list box under the Cut, Copy, and Paste buttons. You can also create and save your own custom palettes (see page 238).
- Use the Draw palette (available from the palette list box) to add color to lines, polylines, freehand lines, and arrows, either before or after you draw them. Choices from this palette also give you objects that appear borderless because the fill color and border color are the same.

Drawing lines and arrows

Use the Line tool to draw straight lines anywhere on a graph. Use the Arrow tool to draw a straight line with an arrow at the end. To draw a line or arrow, click the Line tool or the Arrow tool and

drag from where you want the line to start to where you want it to end.

If you're using the Arrow tool, the arrowhead appears at the end of the line where you release the mouse button.

To customize a line or arrow, right-click it and change its properties.

Drawing polylines and polygons

The Polyline tool draws lines that have more than one segment. The Polygon tool creates closed shapes with as many sides as you want.

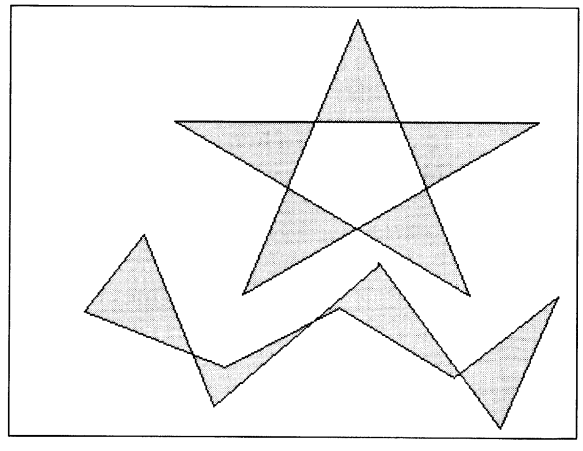
To draw a polyline or polygon,

1. Click the Polyline tool or the Polygon tool.
2. Place the pointer on the part of the graph where you want the line or segment to begin.
3. Drag to the point where you want the first segment or side to end and the second segment or side to begin, then release the mouse button.
4. Create additional segments or sides by dragging the mouse and releasing the mouse button at the end of each segment.
5. When you are ready to create the last side, double-click or right-click. Quattro Pro completes the shape for you. You can also close the polygon by clicking very close to the starting point.

To customize the polyline or polygon, right-click it and change its properties.

Figure 10.2
Shapes created with the Polygon tool

You can create special shapes like these by crossing lines as you draw.



Drawing freehand shapes

The Freehand Polyline tool draws a line anywhere you drag the mouse. The Freehand Polygon tool creates a closed shape; you drag the mouse to draw the shape's border.

To draw a freehand polyline or polygon,

1. Click the Freehand Polyline tool or the Freehand Polygon tool.
2. Position the mouse pointer where you want the polyline or the border of the polygon to begin.
3. Hold down the mouse button and drag to draw the line or border.
4. Release the mouse button to complete the polyline or polygon.

To customize the freehand line or freehand polygon, right-click it and change its properties.

Drawing rectangles and ellipses

The Rectangle tool draws squares and rectangles. The Rounded Rectangle tool creates squares and rectangles with rounded edges. The Ellipse tool draws circles and ovals. To use any of these tools,

1. Click the tool you want to use.
2. Drag the mouse to create a figure of the shape and size you want, then release the mouse to complete the figure.

To customize the figure, right-click it and change its properties.

Modifying lines and shapes

You don't have to select an object to change its properties (just right-click it to display its Object Inspector). Before you can modify, move, or resize an object, however, you must select it.

- To select a single object, click the Selection tool, then click the object.
- To select grouped objects, click the Selection tool, then click any object in the group. (For information about grouped objects, see the next section.)
- To select every object in an area, click the selection tool, place the mouse pointer just outside one corner of the area, then drag diagonally until the selection box encloses all the objects.
- To select several objects individually, click the Selection tool, then hold down *Shift* while you click each object. To deselect an object, click it again while you still hold down *Shift*.

When an object is selected it appears with dark "handles" at its corners and sides.

Grouping and ungrouping

You group two or more objects when you want them to be treated as a single object in subsequent operations. For example, you might group all the objects in a complex drawing to ensure that no objects are left behind or shift position when you move them.

To group objects, select them and choose Draw | Group. To nest groups within other groups, select any combination of groups and individual objects, then choose Draw | Group. Once you group objects, you can move and resize them with the mouse.

To change the properties of every object in a group in one operation, right-click an object in the group (*not* an area between objects) to display the group Object Inspector, then adjust property settings and choose OK. To change the fill color, background color, fill style, border color and border style of all solid objects in the group simultaneously, click the group, then click a color on the SpeedBar palette.

To break a group into its original components, select it and choose Draw | Ungroup. If the group had other groups nested within it, these groups remain intact. You must use Draw | Ungroup again to ungroup them.

Arranging object layers

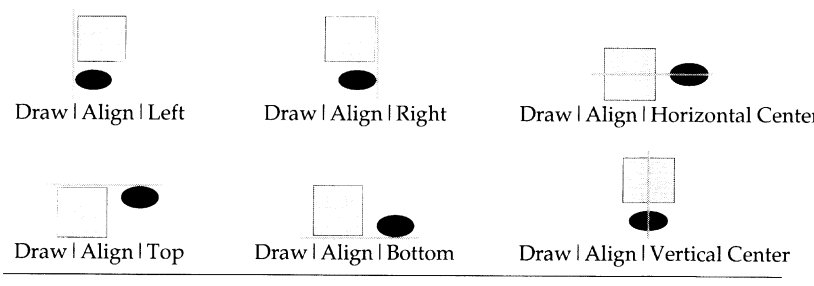
The objects you create can overlap on invisible layers. To change the order of these layers, select the object (or group of objects), then choose one of these commands from the Draw Menu:

- **Bring Forward** moves the selected objects forward one layer.
- **Send Backward** moves the selected objects backward one layer.
- **Bring to Front** places the selected objects on top of all other objects in the stack.
- **Send to Back** places the selected objects behind all other objects in the stack.

Aligning objects

You can line up the center or edges of two or more objects using Draw | Align. This command has six options, which are illustrated in the following figure.

Figure 10.3
Draw | Align options



You can choose more than one of these commands in sequence. For example, to align the right sides *and* tops of a group of objects, choose Draw | Align | Right, then choose Draw | Align | Top.

When you select an object group (a set of objects that have been grouped using the Draw | Group command) as one of the objects to be aligned, Quattro Pro aligns the group as if it were a single object.

You can also use Snap to Grid to align objects (see page 182).

Moving and resizing objects

Once an object or object group is selected, you can resize or move it.

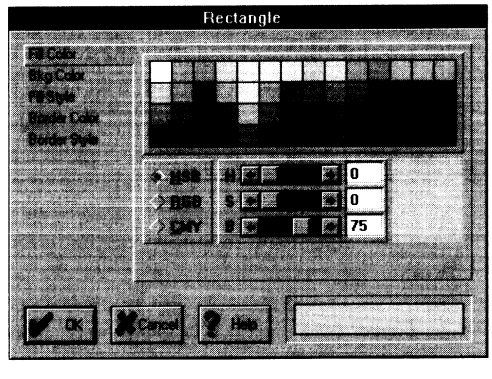
- To resize only height, drag a top or bottom handle; to resize only width, drag a side handle.
- To change its height and width at the same time, drag a corner handle diagonally.
- To move it, drag any area of the object *except* its handles.

Changing object properties

The easiest and most efficient way to customize the appearance of any object is to right-click it to display its Object Inspector. (You don't have to select the object first.) Make changes to as many properties as you want, then choose OK to apply the changes all at once.

Drawn objects have many of the same properties as graph objects. For example, the rectangle Object Inspector in the next figure lists properties that are also found in the graph pane and bar series Object Inspectors. See page 216 for descriptions of these properties.

Figure 10.4
Rectangle Object Inspector



When objects are grouped, you can right-click any object in the group (*not* the area between the objects) to display the group Object Inspector. This inspector lets you make changes that are applied to the entire group.

Creating text boxes

The Text tool on the graph window SpeedBar lets you place boxed text anywhere on a graph. To set text and text box properties before you create a text box, *right-click* the Text tool on the SpeedBar to display its Object Inspector. Choose a text font and size, set the alignment (or change any of the other properties described on pages 232 through 233), then choose OK.

To create a text box,

1. Click the Text tool.
2. Drag out a text box to the size you want. When you release the mouse, a blinking insertion point signals that Quattro Pro is ready for you to enter text. (If you click the graph instead of dragging the mouse, a default-size text box appears.)
3. Enter text. As you type, Quattro Pro wraps the text to fit the width of the text box, and the depth of the box increases automatically.
4. When you finish entering text, click the Selection tool, click another tool from the SpeedBar, or click outside the text box to deselect it.

Use standard keyboard procedures to edit the text in text boxes. Cut and Copy apply to the text when text is highlighted. When text is not highlighted, but the text box has handles around it, you cut or copy the text *and* the text box. To delete a text box, cut it, or move the cursor to the end of a line and press *Delete*.

Entering text from the Clipboard

You can use the Clipboard to paste text into a new or existing text box:

1. Copy text to the Clipboard (from a word processing program, for example).
2. Create a new text box with the Text tool, or click the Selection tool, then click at the point in an existing text box where you want to insert the text.
3. Click the Paste button on the SpeedBar.

Placing text blocks on the spreadsheet

To place word-wrapped text on a spreadsheet page,

1. Create a floating text graph (see page 223).
2. Double-click the graph to display it in a graph window.
3. Change the graph's aspect ratio to Floating Graph (see page 181).
4. Create a text box that is exactly the same size as the graph and enter text.
5. Close the graph window to see the changes in the floating graph.

To enhance the look of the text, change its properties (see page 232).

Adding bullets to text

You can add special bullet characters to text boxes by entering a bullet code within backslash characters (\). The bullet code appears when you're editing the text; the bullet itself appears when you're not. For example, if you enter `\blt1\Sales Report` in a text box, this line appears as ■**Sales Report** when you show the graph.

The following figure shows the available bullets and the codes that create them.

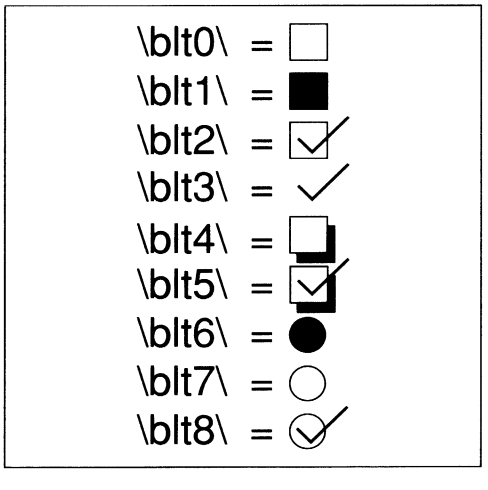


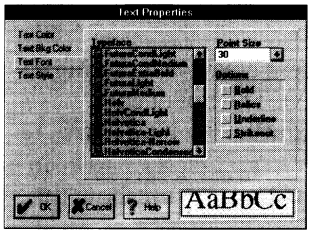
Figure 10.5
Bullet styles and their codes

Changing text properties

Text objects have two different Object Inspectors, one for the text box and one for the text itself. To display the text Object Inspector, right-click the text. To display the text box Object Inspector, right-click any part of the background area that is not covered by text.

An easy way to determine which Object Inspector you'll see is to move (not drag) the mouse pointer over the text box. If you right-click when the pointer is an arrow, you'll display text box properties. When the pointer is an I-beam, a right-click displays text properties.

Text properties



The text Object Inspector lists four properties:

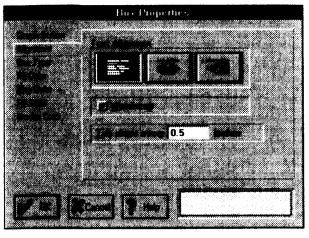
- **Text color** lets you choose a color for the text. When you select a pattern fill style, the text color is the color of the pattern. If you choose a wash fill style, the text color is distributed over the text background color. See page 217 for information about choosing and creating colors.
- **Text Background (Bkg) Color** provides the second color for pattern and wash text styles. The text background color is also the drop shadow color.
- **Text font** determines the font and font size, and whether the text appears **bold**, *italic*, underlined, or with ~~strikeout~~.
- **Text style** includes options to fill text with a solid color, a two-color wash, or an imported bitmap. It also lets you add a drop shadow.

Text box properties

The text box Object Inspector lists seven properties:

- **Graph button** lets you turn a text box into a "live" button in a slide show. When clicked, a graph button can run a macro or show a different graph. See page 244 for more information about graph buttons.
- **Alignment** makes the text left-justified, centered, or right-justified. It can also turn wordwrap off and on and set tab stops at regular intervals. When wordwrap is on, text goes to the next line when it reaches the right margin, and the box expands

vertically, if necessary, to fit all the text you type. When wordwrap is off, the box expands horizontally as you type; you must press *Enter* to start a new line.



- **Box type** determines the look of the box around the text. There are 12 choices, ranging from "no frame" to several 3-D styles.
- **Fill color** sets the color of the background in the text box. If the fill style is a pattern, the fill color is the color of the pattern, and the background color (**Bkg color**) is the color behind the pattern. When the fill style is a wash, the fill color is distributed over the background color.
- **Fill style** makes the text box transparent (None), or fills it with a solid color, a pattern, a wash, or an imported bitmap.
- **Border color** is the color of the frame around the text box.

Pre-setting text and box properties

To preset text and text box properties *before* you create text boxes,

1. Right-click the Text tool to display its Object Inspector, which lists all the text and text box properties described in the previous two sections.
2. Make any changes you want, then choose OK.

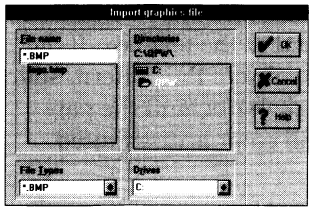
To create "unboxed" text, set Fill Style to None, and choose the blank (upper left) Box Type.

To preset just the Fill Color, Fill Style, and Border Color of a text box, click a color square on the palette before you choose the Text tool.

Note The default text box Fill Color, Fill Style, and Border Color change whenever you click a palette color, even if you previously used the text tool Object Inspector to preset these properties.

Importing graphics

You can use the Windows Clipboard to copy and paste in clip art (such as company logos or special symbols) that was copied to the Clipboard from within another Windows application. Another way to bring in clip art or drawings from other programs, especially non-Windows programs, is to import it into a graph window. To import a drawing,



1. Click the Import button on the graph window SpeedBar (or choose Draw | Import). The Import dialog box appears.
2. Locate the graphics file you want to import. Quattro Pro accepts files in any of these formats:
   - **.BMP** (Bitmap). The format used in Windows paint programs, like Paintbrush, and in the Windows Control Panel for wallpaper.
   - **.CGM** (Computer Graphics Metafile). The most common vector-based clip art format.
   - **.CLP**. A graphic format used by Quattro Pro for DOS.
   - **.EPS** (Encapsulated PostScript). The file format universally understood by PostScript printers and imagesetters. The file contains PostScript code for high-quality output plus a bitmap of the image for lower-resolution screen display. (If the .EPS file doesn't contain a bitmap image, you can't import it into Quattro Pro.)
   - **CIS .GIF** (Graphics Interchange Format). A bitmap format originating on CompuServe Information Service (CIS) and widely used on other electronic bulletin boards.
   - **.PCX**. A bitmap format supported by many programs, including Paintbrush and the DOS version of Quattro Pro.
   - **.PIC**. The graph format used in the DOS versions of 1-2-3.
   - **.TIF** (Tag Image File Format). A bitmap file format often used for scanned or gray scale images. Because TIF files can be large, they are often compressed.
3. Choose OK. The imported graphic appears in the graph window, ready to be moved or resized.

Cropping and resizing bitmapped graphics

When you import a bitmapped graphic file (.BMP, .EPS, CIS .GIF, .PCX, or .TIF format), Quattro Pro places the graphic in a rectangle. Right-click the bitmap to display the rectangle Object Inspector. If you select Fill Style, you'll see the name of the file you imported in the File Name edit field.

You can also fill any object in a graph window with a bitmapped graphic. Just right-click the object, select Fill Style, choose a bitmapped graphic file, then choose OK.

A bitmap fill style has two options, Crop to Fit and Shrink to Fit.

Shrink to Fit (the default) shrinks or enlarges the bitmap to fit within the object. To resize the object or imported bitmap, select it, then drag one of the handles. To resize only height, drag a top or bottom handle; to resize only width, drag a side handle. To change the height and width at the same time, drag a corner handle diagonally.

Crop to Fit displays only the part of the graphic that fits within the object. To crop a bitmap,

1. Right-click it to display the Object Inspector.
2. Choose Fill Style.
3. Select Crop to Fit and choose OK.
4. Select the bitmap to reveal the handles.
5. Drag one of the handles. As you decrease the size of the box, Quattro Pro eliminates parts of the bitmap. (The bitmap will not expand if you increase the size of the rectangle beyond its original dimensions.)

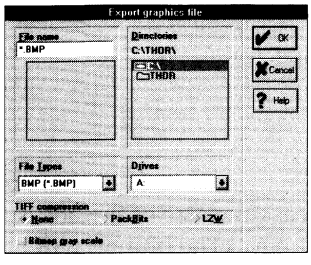
Note The upper left corner of the bitmap is a reference point that cannot be changed or eliminated. If you drag a handle on the left or top side of the bitmap, Quattro Pro crops the right or bottom side of the bitmap, respectively.

You can use the border color and border style properties in the rectangle Object Inspector to add a fancy border to an imported bitmap.

Modifying .CGM and .CLP graphics

If your imported graphic file has a .CGM or .CLP file format, you can ungroup the graphic, then modify the properties of individual sections of the graphic. To do this, select the graphic, then choose Draw | Ungroup. Handles will appear around the individual objects that comprise the graphic. Right-click any component to display and change properties such as the fill color and border style. When you're finished, select all the components and choose Draw | Group to make the graphic a single object again.

Exporting graphics



Quattro Pro also lets you export the entire contents of a graph window into other file formats. You can then use this file in other programs or send it to a 35mm slide service bureau for processing. To export a graph and any drawn objects, imported graphics, or text boxes associated with the graph,

1. Make sure the graph you want to export is the active graph window, then choose Draw | Export. The Export dialog box appears.
2. Choose a destination and file name. Be sure to use the file name extension that matches the type of file you want to create. Quattro Pro exports to .BMP, .CGM, .EPS, .GIF, .PCX, and .TIF file formats.
3. If you're exporting to a .TIF file, you can choose a compression method: PackBits or LZW. There are many types of TIF files; make sure the application to which you're exporting can accept the compression method you choose.
4. At the bottom of the dialog box is an option for Bitmap gray scale. Check this option if you want to convert the colors in the graph to levels of gray. This is useful you are going to import this file into a program that can only accept gray scale TIF files.
5. Choose OK. Quattro Pro creates the file and returns you to the graph window.

If you're exporting a graph to send to a 35mm slide bureau, be sure to set the graph's aspect ratio correctly, as explained on page 180.

Using color palettes

The graph window SpeedBar displays a palette you can use to change the fill and border properties of graph elements and drawn objects. Each palette square has these properties:

- **Fill color** selects the interior color of the object.
- **Background (Bkg) color** provides the second color for objects that have a pattern or wash fill style.

- **Fill style** makes an object transparent (None), or fills it with a solid color, a pattern, a wash, or a bitmap graphic.
- **Border color** is the color of the lines that form the boundary of the object.
- **Border style** chooses the thickness of the lines that form the boundary of the object.

The large square to the right of the palette displays the active palette selection. Objects you create with a drawing tool displays the fill color, background color, fill style, border color and border style shown in this square. To create an object with different properties, choose another palette color, then click a drawing tool and begin drawing.

To change the color of an existing object, select the object, then choose a color from the palette. For example, if you want to make a rectangle blue, select it and then choose the shade of blue that looks best. The rectangle also acquires the border color and style shown in your selection. If you want to change an object's fill color but not its border color and style, or vice-versa, right-click the object to display its Object Inspector, then make changes to the individual properties.

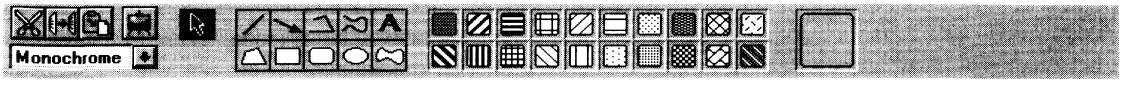
This technique applies to all graph objects, not just drawn ones. If you want to change the color of a bar series from green to purple, select any bar in the series, then choose purple on the palette; the series also acquires the border color and style shown on the palette. For complete control over fill and border colors, right-click a bar to display the bar series Object Inspector.

Choosing a color palette

Quattro Pro has several predefined color palettes gathered by theme. For example, the colors in the Summer palette are mostly bright and sunny, those of Winter are dark, the Washes palette displays different colors distributed over a white background, and so on.

There is also a Monochrome palette that offers 20 distinctive black-and-white pattern choices.

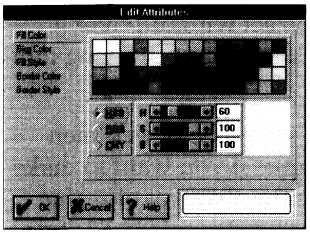
Figure 10.6: The Monochrome color palette



To select a color palette, pick it from the list box. The palette's selections appear on the SpeedBar. You can use colors from any number of palettes in the same graph.

Creating new color palettes

When you can't find the color you want in any of the existing palettes, you can define your own. Once you define new colors, you can save them in your own palettes.



To define a new color,

1. Right-click a color square on the palette to display its Object Inspector.
2. Change the Fill Color, Background Color, Fill Style, Border Color, and Border Style, or any combination of these properties (see page 216), then choose OK.

To save the modified colors in a new palette,

1. Choose <Edit> in the palette list. The Edit Palettes dialog box appears.
2. Type a new palette name in the edit field, then click New.

   The new palette is saved with Quattro Pro, not with the notebook, so you can use it anytime you're working in a graph window.

To permanently change the colors of a palette that has already been defined (including any of the ones that come with Quattro Pro),

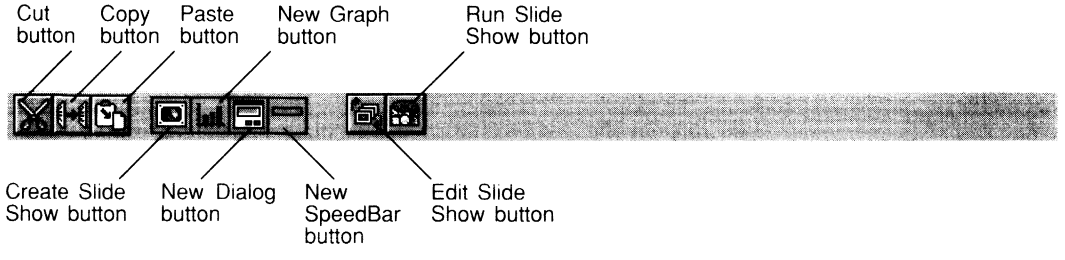
1. Define the new color(s).
2. Choose <Edit> in the palette list. The Edit Palettes dialog box appears.
3. Choose a palette name from the list, and click Replace.

To delete a palette, choose <Edit> in the palette list. Choose a palette name from the list in the Edit Palettes dialog box, and click Delete.

Creating a slide show

Quattro Pro's slide show feature lets you present your graphs in a full screen display with special transition effects. You create these slide shows on the Graphs page, which has SpeedBar tools for creating, editing, and running slide shows.

Figure 10.7: Graphs page SpeedBar tools



To create a slide show,

1. Click a blank area of the Graphs page to deselect all icons (this prevents you from accidentally adding graphs to the slide show), then click the Create Slide Show button on the Graphs page SpeedBar. A dialog box appears.
2. Type a name for the slide show into the edit field and choose OK.
3. An icon for the slide show appears on the Graphs page. Right-click this icon, and set the default visual transition effect, display time, and other properties (see page 240).
4. Hold down the *Shift* key and click icons to select graphs for the slide show, in the order in which you want them to appear, then drag one of the selected graph icons over the slide show icon (the rest will follow).
5. When the slide show icon becomes highlighted, release the mouse button. The graphs become part of the slide show, and the graph icons snap to their original positions.

   To add graphs one-by-one, drag individual icons over the slide show icon until it is highlighted, then release the mouse button. Graphs appear in the order in which you add them.

You can add the same graph to the slide show more than once, if you need to.

6. Select the slide show icon, then click the Run Slide Show button on the SpeedBar to start a test run. Write down any changes you want to make to the slide order, transition effects or display times. (See page 241 for more information about running slide shows.) If slides have graph buttons (see page 244), be sure to test them, too.
7. To edit the slide show, double-click its icon. The Light Table appears. From this dialog box you can rearrange the slide order and change the transition effect, effect speed, and display time for individual slides. (See page 242 for more information about editing slides.)
8. Repeat the last two steps until you are satisfied with your slide show.

   If any graph icons were selected when you clicked the Create Slide Show tool, the graphs were automatically added to the slide show as well, in the order in which they were selected.

Setting default effects and display times

Quattro Pro has special transition effects and timing parameters you set to make slide show presentations more interesting.

- The *Effect* you assign to a graph controls the way that graph makes its appearance on the screen. (The way the graph disappears from the screen depends on the Effect assigned to the next slide in the slide show.)
- The *Display Time* specifies how long the graph remains on screen, in seconds (up to 3600) Enter zero when you want the slide to stay on the screen until the viewer clicks the mouse or presses a key.
- When *Overlay* is checked, the second image overlays the first instead of replacing it.
- The *speed* of the transition effect is controlled by the Slow, Medium, and Fast buttons. Try each effect at the Fast speed initially, then slow it down if necessary. One or two slow effects can be dramatic; many slow effects can be tedious.

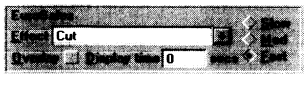
When you want to assign the same effect and display time to the majority of slides in your presentation, change the default settings to match these parameters *before* you add slides to the slideshow.

(Changes to slide show defaults affect only those slides added *after* the settings are changed.) To adjust slide show defaults, right-click the slide show icon and choose Default Effect. Make any changes you want in the Default Effect dialog box, then choose OK.

To change these settings for individual slides, edit the slide show on the Light Table (see page 242).

Slide show special effects

The Effect list in the Default Effect and Light Table dialog boxes contains all the visual transition effects available. The names of the effects describe what they do. The best way to choose a transition effect is to try them all, then select the most appropriate one. Here are some tips on using transition effects:



- A **cut** immediately replaces a graph with the next graph in the slide show. This is usually the best effect for leading into the next graph because it is unobtrusive and quick.
- Use **wipes** to simulate turning a page, because the second slide appears to be underneath the first one. Use **tilts** to give the effect of one image pushing away another.
- Avoid slower effects like the **dissolve—2x2 pixels** unless there's good reason to keep your viewers waiting (perhaps to increase suspense). Moderate dissolves and **fade out/fade in** can be restful, but fast dissolves (when run at full speed) can appear almost violent.
- Use **overlays** to build slides from other ones. This is often effective when discussing a list of bulleted items. The first slide shows only the first bulleted item. The second slide overlays the first to add the second item. Subsequent slides continue building the list until all items are onscreen.
- Take care to match the effects to the overall tone of your presentation. Showy effects like **spirals**, **sides to center**, **center to sides**, **vertical stripes**, or **diamonds** are best in small doses; they can look out of place in serious board rooms.

Running a slide show

To begin a slide show, choose Graph | Slide Show. Choose a slide show name from the list, then choose OK.

To start a slide show from the Graphs page, select a slide show icon, then either choose Graph | Slide Show or click the Run Slide Show icon in the SpeedBar.

When a slide show is running, the following actions have special meanings:

Table 10.1
Controlling a slide show

Action	Result
Left-click	Go to next slide
Right-click	Go to previous slide
Press *Backspace*	Go to previous slide
Press *Esc*	Cancel slide show
Click a graph button	Perform the actions defined in the graph button
Press first letter of graph button	Perform the actions defined in the graph button
Press any other key	Go to next slide

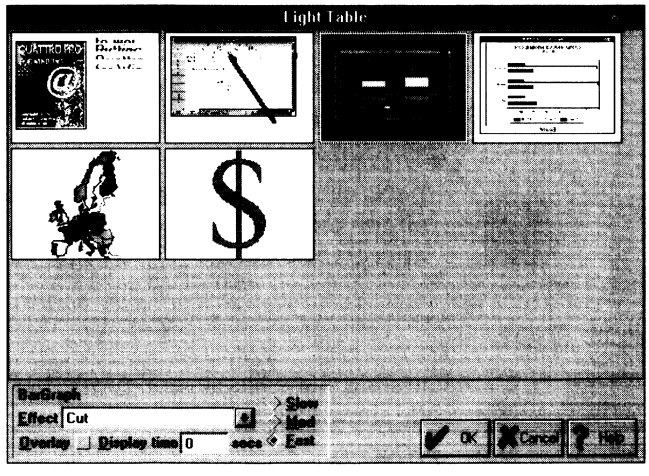
See page 244 for more on graph buttons.

Note Quattro Pro for Windows will run Quattro Pro for DOS slide shows, which are built on the spreadsheet. After you open the DOS file, highlight the range that contains slide show information, choose Graph | Slide Show, give the show a name, and choose OK to simultaneously create the slide show and run it. Sound files will be ignored. An icon appears on the Graphs page to represent the slide show. You can edit the slide show on the spreadsheet page, or use the procedure in the next section.

Editing a slide show

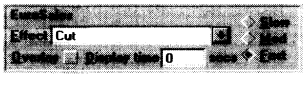
To edit a slide show, double-click its icon on the Graphs page or select it and click the Edit Slide Show button in the SpeedBar. The Light Table dialog box appears.

Figure 10.8
The Light Table dialog box



The Light Table shows all the graphs in the slide show in miniature form, in the order in which they will appear. You can change the slide order, transition effect, display time, and transition speed assigned to each slide.

- To move a slide to a new position in the slide show, drag the miniature of the graph to a new location on the Light Table. When you're rearranging slides in this way, the pointer changes to a hand. When you release the mouse button, the graph moves to the new position. The light table scrolls to reveal more slides if you drag the pointer to the top or bottom edge.
- To delete a graph from the Light Table, select it and press *Del*.



- To change the transition effect or timing parameters for an individual graph, click the graph, then make changes in the box at the lower left corner of the Light Table.

When you've finished editing the slide show, choose OK.

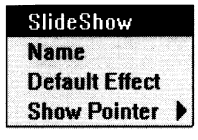
Slide show shortcuts

If you're in a hurry and don't want to bother with some of the fine points of putting together a slide show, there are several ways to accelerate the process.

- To get a fast idea of what your graphs will look like full-screen, select the graph icon and choose Graph | View. To see several graphs in sequence, select their icons and choose Graph | View. Graph buttons work when you display graphs in this way.

- To quickly assign graphs to a slide show, select their icons—in the order in which you want them shown—*before* you click the Create Slide Show button. The current default effects are applied to these graphs.
- To create a new text graph while you're working in the Graphs page, click the New Graph button in the SpeedBar or choose Graph | New. *Leave all the series blank* in the dialog box that appears and choose OK to begin editing a new text graph.

Slide show properties



The slide show has several properties of its own. Right-click the slide show icon to display them.

- **Name** lets you rename the slide show. Choose this property, enter a new name, then choose OK. The new name appears under the slide show icon.
- **Default Effect** is explained on page 240.
- **Show Pointer** hides the pointer throughout the show, which is useful when your slide show contains no graph buttons. Choose this property, then choose No to hide the pointer, or Yes to display it.

Creating graph buttons

Graph buttons are a special type of text box that can greatly enhance the usefulness of a graph. When these special text boxes are viewed in a slide show or with the Graph | View command, they take on new life; they perform an action when clicked. A graph button can

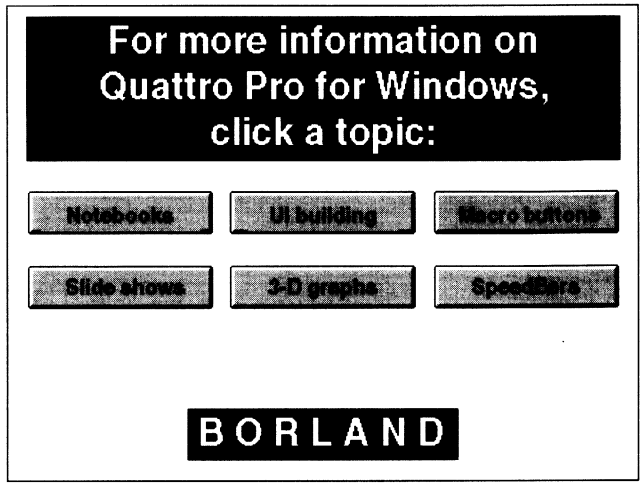
- branch to another graph, using visual transition effects if desired
- run a macro
- run a macro and then branch to another graph

Graph buttons are most useful in slide shows, where they let you construct elaborately branching presentations driven by the viewer's clicks.

This hypertext-like ability offers virtually unlimited possibilities. For example, you can set up a self-running slide show that starts

by asking what the viewer wants to learn. The startup screen might look like this:

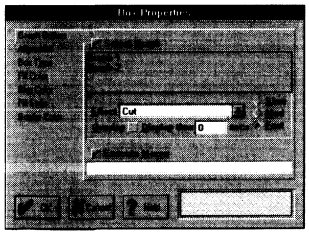
Figure 10.9
Graph buttons let presentations branch



To make a graph button:

1. Display a graph in a graph window.
2. Create a text box with the desired wording (the box can be textless if you want).
3. Right-click the background of the text box (not the text). The Text Box Properties inspector appears.

   Graph Button is already selected, so its options appear automatically.



4. Check the Execute Macro box if you want the graph button to run a macro when it's clicked. Enter a macro into the Macro edit field. You can either enter a named macro that you've already defined in the notebook, like `{MYMACRO}`, or enter macro statements up to 160 characters, like `{Slide.Goto "BUDGET"}`.
5. Check Select Graph to pick the graph you want the graph button to display after it's finished running the macro. If you don't want it to display a different graph, uncheck this box. When Select Graph is checked, you can choose a visual transition effect, speed, and duration, and check Overlay if you want to display this graph over the previous one in a slide show.
6. Choose OK.

A number of macros are dedicated to slide shows. These macros let you do such things as branch to different slide shows and go forward and backward in a presentation. See the discussion of {Slide} macros in Chapter 4 of *Building Spreadsheet Applications* for more information.

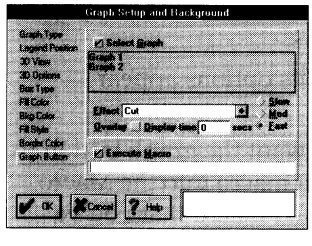
Graph buttons are active whenever the graph appears full-screen—in a slide show or when displayed with the Graph | View command. They are not "live" in a graph window or in a floating graph on a spreadsheet page.

The background graph button

Quattro Pro provides one type of graph button that is not a text box: the background graph button. Each graph can have one background button, which defines what action should be taken if a viewer clicks on any area *outside* the defined text-box graph buttons. This invisible button traps random or errant clicks, which makes it well suited for use in slide shows.

To define a background graph button,

1. Right-click the background of the graph, or choose Property | Graph Setup and Background. The graph setup and background Object Inspector appears.
2. Choose Graph Button.



3. Check the Execute Macro box if you want to run a macro whenever the background is clicked. Enter a macro into the Macro edit field. You can either enter a named macro that you've already defined in the notebook, like `{MYMACRO}`, or enter macro statements up to 160 characters, like `{Slide.Goto "BUDGET"}`.
4. Check the Select Graph box, then choose the name of the graph you want the graph button to display after it's finished running the macro. If you want a clicked background to redisplay the current graph, pick the current graph name from the list.
5. Choose OK.

C H A P T E R

11

Advanced editing

This chapter provides information on powerful editing features to use after you gain some experience with Quattro Pro. It explains how to:

- group pages together to act on them at the same time
- perform variations on a simple paste operation, including creating OLE and DDE links
- create your own styles that incorporate several Block property settings
- create your own numeric formats
- maintain block names
- reformat text entries to change line wrapping
- transpose the contents of rows and columns
- copy only the resulting values of formulas instead of the formulas themselves
- control cell references when moving formulas or referenced cells

Grouping pages

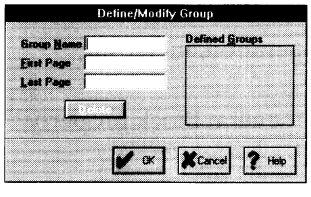
You can act on several notebook pages at the same time by grouping the pages. Then any changes you make to one page affect all pages in the group.

For example, you can enter column headings and make formatting changes on multiple pages simultaneously by first grouping the pages.

After you create a group, you turn it on and off with the Group button next to the page tabs. The group of pages is indicated by a blue line below the page tabs.

Figure 11.1
Group mode turned on

To group pages,



1. Choose Tools | Define Group.
2. Enter the first and last pages of the group in the dialog box. If you preselected a series of pages before choosing the command, they already appear in the dialog box.
3. Type a name for the group and choose OK. You can use letters and numbers in the name, as well as the following special characters

   ~ ' ! % _ | \ ' ?

   You can't use spaces or any other special characters. Also, you can't use a name you've previously assigned to a page in the same notebook.

4. To activate this group, click the Group button. A blue line appears below the tabs in the group.

From now on, changes made to blocks in the group affect all similar blocks in other pages in the group.

Also, if you point to blocks in the group from dialog boxes or in formulas while Group mode is on, the group name is used. For example, a formula would read 1stQtr:A1:A10 instead of Jan..Mar:A1:A10.

To deactivate the group, click the Group button again. The blue line disappears.

You can have multiple groups in one notebook. Changes to one page in a group affect only the other pages in the same group while you are in group mode. You cannot have overlapping groups. That is, any given page can belong only to one group.

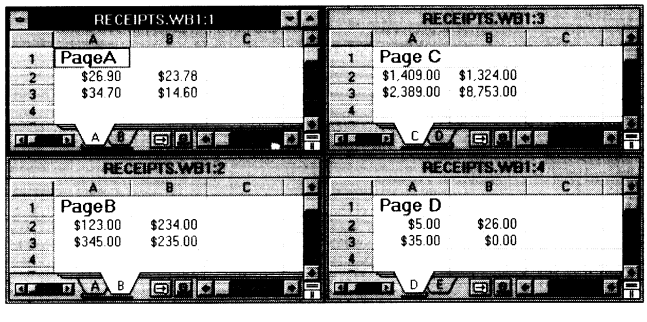
To delete a group, choose Tools | Define Group. Then choose the group name and choose Delete. Choose OK.

Using a group

Any 2-D selection that you make on a page turns into a 3-D selection when you use Group mode.

For example, the next figure shows the grouped pages A through D in separate views of the same notebook. Styles were applied to all pages at once by selecting A1 on any page and choosing Heading 2 from the Style list. Then A2..B3 was selected on any page and Currency was chosen from the Style list.

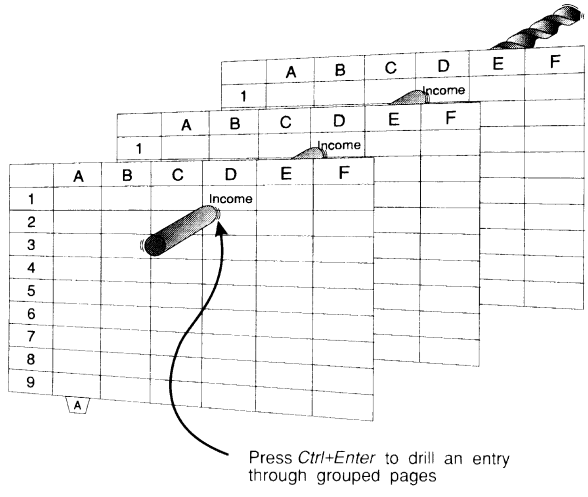
Figure 11.2
Styled grouped pages



Entering data into a group

You can "drill" an entry into the same cell in all grouped pages by combining grouping with the *Ctrl* and *Enter* keys.

Figure 11.3
Drilling an entry



To drill the label "Income" into cell D1 on pages A through C, select D1 on page A, group pages A through C, and type the label. Instead of pressing *Enter* to complete the entry, hold down the *Ctrl* key while you press *Enter*.

You can also *delete* through the pages in a group with *Ctrl+Del*. Just select a cell or block on any page in a group while Group mode is on. All entries in corresponding cells in the group are deleted.

Group mode tips

Remember that every action you take affects all pages in the group. This means that many operations require you to switch Group mode on and off.

For example, to copy data from one page in a group to the remaining pages in the group:

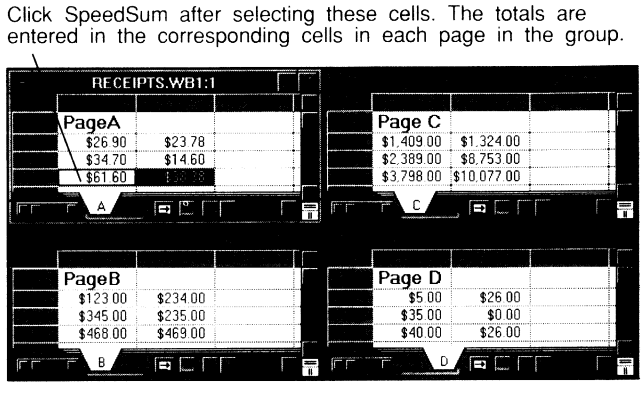
1. Click the Group button to turn off Group mode.
2. Select the source data to be copied, and click the Copy button in the SpeedBar.
3. Click the Group button to turn Group mode back on.
4. Select the destination cell in any page in the group, and click the Paste button in the SpeedBar.

You can also turn Group mode on and off while writing formulas that involve 2-D and 3-D references. Watch the input line as you

point to references; with Group mode on, you get 3-D references, with Group mode off, you point to 2-D references.

The SpeedSum button is ideally suited for using with groups. Just select the cells on any page in the group to create the desired totals on that page, then click SpeedSum. The appropriate formula is written into each page in the group.

Figure 11.4
SpeedSum used in a group



Other operations that are particularly useful in Group mode are:

- Most block property settings
- Most page property settings
- Column width and row height changes, either with the mouse or the Fit button
- Block | Move and Copy within similarly-formatted pages
- Inserting and deleting rows and columns

Caution! Be careful when using Edit | Cut, Clear, Clear Contents when Group mode is on. Data will be deleted from all pages in the group.

Variations on pasting

Quattro Pro uses the Windows Clipboard to copy data and paste it in various forms. By default, using Edit | Copy or Cut followed by Edit | Paste places the most complete version of the data into the pasted area whether it comes from another application or from within Quattro Pro itself.

Sometimes you may want to paste only a subset of the data. You can do this in the following ways:

- With Quattro Pro cell data in the Clipboard, you can use Edit | Paste Special to paste only a block's properties instead of its values, or vice versa.
- With data in the Clipboard from a participating DDE application, you can use Edit | Paste Link to create a live data link. This type of link causes data changes from the other application to be constantly reflected in Quattro Pro.
- With data from many other types of applications in the Clipboard, you can use Edit | Paste or Paste Format to create many kinds of data types, including embedded OLE objects, picture objects, and bitmap objects. Many of these types of data reside in Quattro Pro objects that float above the surface of the page, as floating graphs do.
- Without using the Clipboard, you can run an OLE server application from within Quattro Pro to create embedded OLE objects.

You can, of course, paste Quattro Pro data into other applications, as limited by the formats the other application can read. In addition, this section describes how to copy images of blocks of cells into bitmap format and paste them into other applications.

Using Paste Special

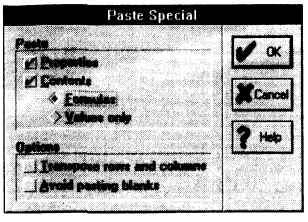
Ordinarily, when you paste a block, you paste the source block's properties, too (such as its font, alignment, and numeric format). To paste the data *without* the properties, use Edit | Paste Special.

You can also use Edit | Paste Special to transpose rows and columns or to avoid copying blank cells. Edit | Paste Special is available only when you're pasting Quattro Pro for Windows data from the Clipboard.

To control the paste operation:

1. Use Edit | Copy to copy a selection to the Clipboard.
2. Select the destination for the pasted cells.

   Caution: If the destination already contains data, you'll overwrite it when you choose OK.
3. Choose Edit | Paste Special.



4. Check the options you want:
   - **Properties** pastes the block properties from the copied selection.
   - **Contents** pastes the entries in the copied selection. If you choose Contents, the default setting is **Formulas**. If you choose **Values Only**, only the values resulting from the formulas are copied. Choosing Values Only accomplishes the same thing as using Block | Values (see page 270).
   - **Transpose rows and columns** switches the position of entries so that data in columns is placed in rows and vice versa. Be sure to allow enough room in the destination area for the changed size of the data. This option is equivalent to choosing Block | Transpose. See page 269 for an example and further explanation.
   - **Avoid Pasting Blanks** avoids erasing data in the destination selection that otherwise would be replaced by blanks pasted from the source.
5. Choose OK.

The source selection is pasted into the destination.

Creating DDE links

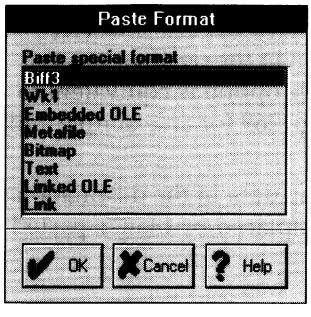
Pasting data from other Windows applications that use DDE lets you set up *live* links. Links are live when changes made to one application are automatically reflected in the other. Quattro Pro can either receive data (acting as the *client* application) or send data (acting as the *server* application).

To create a DDE link from a DDE server application to Quattro Pro, copy the data to the Clipboard in the other application. Then, in Quattro Pro, select the location for pasting the link and choose Edit | Paste Link.

To create a DDE link from Quattro Pro to a DDE client application, copy the data with the Copy button in the SpeedBar. Then follow the instructions in the documentation for the client application to paste the link.

Note You can also use Edit | Paste Link to create notebook links (see page 278) or to create OLE links (see the next section).

Choosing the data type to paste



Ordinarily, using Edit | Paste puts the most complete version of Clipboard data into Quattro Pro. But if you want to create a particular type of data, use Edit | Paste Format to choose from these types:

- **BIFF3**. Excel format data.
- **WK1**. Lotus 1-2-3 versions 2.x format data.
- **Embedded OLE**. A floating object containing data linked from another application (for more information on floating objects, see page 255).
- **Metafile**. A graphic format that creates a floating picture object in a notebook (for more information on floating objects, see page 255).
- **Bitmap**. A graphic format that creates a floating bitmap object in a notebook.
- **Text**. Text data is entered as labels into cells, and numeric data is entered as values.
- **Linked OLE**. A floating object displaying data linked from another application (for more information on floating objects, see page 255).
- **Link**. A DDE link, which is the same as the link created with Edit | Paste Link, described in the previous section.
- **WK3**. Lotus 1-2-3 version 3.x format data.
- **Paradox Table**. Paradox for Windows data.
- **DIB**. A Device Independent Bitmap format that creates a floating bitmap object.

Not all of these formats are available in all situations. Depending on the data copied to the Clipboard and the location within Quattro Pro that's selected, only a subset of the list of formats may be available.

To paste in a particular format, copy the data from the other application to the Clipboard. Then, in Quattro Pro, select the location to paste the data, and choose Edit | Paste Format. After you select the format type from the list, choose OK. Depending on

the data type, the data is entered into cells or as a floating object above the surface of the notebook page.

The **Embedded OLE** and **Linked OLE** formats create similar objects in Quattro Pro. The difference is that you create an embedded OLE object if you want to store the data for the object within a Quattro Pro file. Creating a linked OLE object leaves the data stored in the server application file. For both types of objects, you can restart the server application to further manipulate the object by double-clicking the floating object.

Creating floating objects

You can create *floating objects* containing a variety of types of data. These objects exist in a layer above the spreadsheet cells, but are part of the spreadsheet page in which they appear. They obscure entries in cells underneath them, but you can move a floating object to reveal cells underneath by selecting it and dragging it with the mouse.

Although a floating object isn't attached to particular cell borders, it prints when the block underneath it is selected, and it is saved with the notebook.

You can create floating objects by using Edit | Insert Object, by pasting Clipboard data, by using Graph | Insert, or by using tools in the SpeedBar.

Edit | Insert Object creates an embedded OLE object created by a OLE server application that you run from within Quattro Pro (see the next section).

By pasting Clipboard data, you can create these types of objects:

- Embedded OLE or linked OLE objects
- Picture objects
- Bitmap objects

See page 254 for information on creating these types of floating objects.

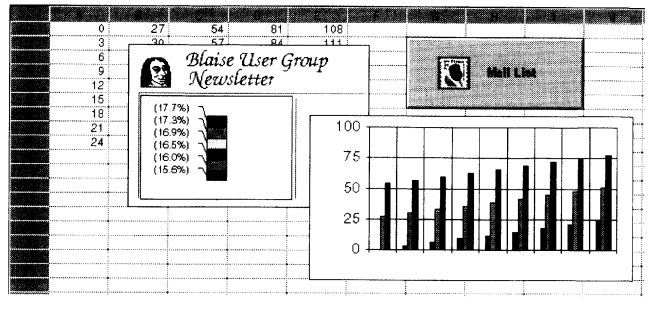
Using tools in the SpeedBar, you can create these types of objects:

- Floating graphs created with the graph tool (see page 140 for more information)
- SpeedButtons created with the SpeedButton tool (see Chapter 3 in *Building Spreadsheet Applications* for more information)

You can also create floating graphs with Graph | Insert (see page 173).

The next figure shows three types of floating objects. The cells in A1..F17 are filled with value entries. Although they're partially obscured by the picture object and the floating graph, the data is intact.

Figure 11.5
Overlapping floating objects



Note Another way to create a floating object that contains a bitmap or metafile image is to import the file into a graph window and insert the contents as a floating graph. You can import files in many popular graphics formats. See page 233 for details.

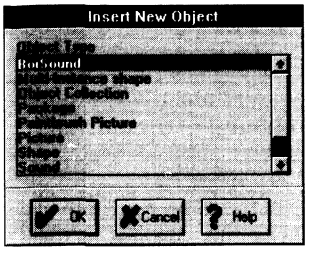
Inserting OLE objects

Quattro Pro can act as a client for OLE server applications. This means that you can use OLE server programs from within Quattro Pro to create and insert images linked into Quattro Pro notebooks. You can do this with Edit | Paste Format (explained on page 254), but an easier way is with Edit | Insert Object.

This is the quickest way to create an embedded OLE object in Quattro Pro as long as one of the available servers will produce the data you want.

To insert an object using an OLE server,

1. Select a cell in the spreadsheet page approximately where you want to place the object (you can always move it later).



2. Choose Edit | Insert Object. A list of object types you can create appears. This is the list of OLE servers available on your system.
3. Choose one of the listed OLE servers, then choose OK.

   A new window opens in which the OLE server is running. Use the commands in its title bar to create and manipulate the data you want.
4. When you're finished, there's no need to save the file or copy the data to the Clipboard; just choose File | Update or File | Exit.

An embedded OLE object appears in the spreadsheet page, and the OLE server closes. Now you can move or resize the object or change its properties as explained in the following sections.

Moving and resizing floating objects

Once a floating object is selected, you can resize it or move it. Click anywhere in an object to select it; handles appears around the border.

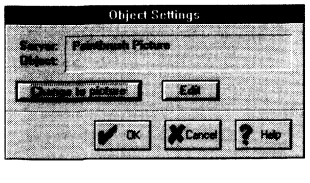
To resize only the height or width of an object, drag a side handle. To resize height and width at the same time, drag a corner handle diagonally.

To move an object, drag it from any area *except* its handles.

Changing OLE object properties

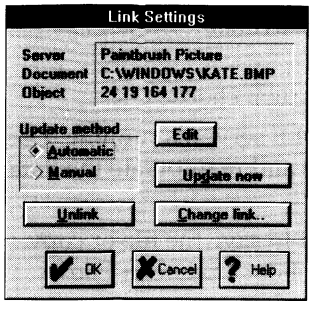
You can right-click floating objects to change their properties. The title bar of the Object Inspector identifies the object type. All objects contain the Border Color, Box Type, and Object Name properties. These properties are described on page 218.

OLE objects each have one additional property, called Object Settings (for embedded OLE objects) and Link Settings (for linked OLE objects).



To change embedded OLE object properties, right-click the object and choose Object Settings. The options are:

- **Change to picture**. Use this to convert an embedded OLE object to a picture object. Once this has been done, you will no longer be able to edit the object.
- **Edit**, **Play**, or whatever action is appropriate, as defined by the server application. You can run a video, play a sound, edit the object, and so on. When you're finished working in the server application, choose File | Update or File | Exit.



To change linked OLE object properties, right-click the object and choose Link Settings. The options are:

- **Update method**. Choose **Automatic** to make data always reflect edits in the server application. Choose **Manual** to update data only when Update Now is chosen.
- **Edit**. See the previous explanation for embedded OLE objects.
- **Update now**. Choose this when **Manual** update method is chosen to copy the latest data from the server application.
- **Unlink**. Choose this to remove the link from the server application. This converts the OLE object to a picture object, which you can no longer edit.
- **Change link**. If the file to which you're linked is moved to a different directory, choose this to relink to the file in its new location. For information on using this standard file handling dialog box, see page 96.

Layering floating objects

As you include additional floating objects on a page, you can place them in layers one above the other. To manage the placement of floating objects, use Block | Object Order.

To reorder the layering of overlapping objects, select an object (it has handles around it when selected) and choose one of these commands:

- **Bring Forward** moves the object one layer closer to the top.
- **Send Backward** moves the object one layer closer to the bottom.
- **Bring to Front** brings the object to the front or top of the layers.
- **Send to Back** sends the object to the bottom, or the layer closest to the page.

Copying Quattro Pro images

When you copy a block to the Clipboard, it is automatically stored in bitmap format in addition to the usual data format. This means you can paste this bitmap image to another application, such as Windows Paintbrush, and enhance it further.

To paste a Quattro Pro bitmap image into Paintbrush:

- Select the block you want to include in the image. The block must be contiguous.

- Click the Copy button in the SpeedBar. (Make no further changes in Quattro Pro until you paste this image.)
- Start Paintbrush (or activate it if it's already started).
- Choose Edit | Paste.

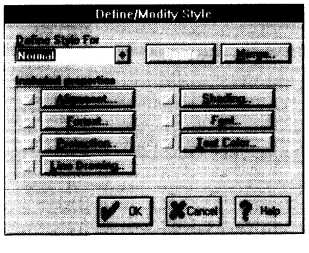
The image appears in Paintbrush just as it looks in Quattro Pro.

Defining styles

A Quattro Pro style is a combination of Block property settings gathered under a style name. You apply a style by selecting it from the Style list in the SpeedBar. The predefined styles are described on page 86.

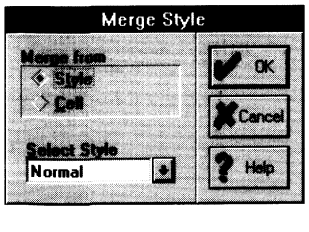
You can create entirely new styles, or you can modify Quattro Pro's predefined styles. In either case, you can copy property settings from a formatted cell or from an existing style to add to your new style.

To revise or create a style,



1. Choose Edit | Define Style.
2. To revise a style, choose it from the Define Style For list. To create a new style, type a new name in the Define Style For edit field.
3. To add or modify properties that make up the style, check the box next to the property name. Then choose the property button, modify the setting, and choose OK. To remove a property from the style definition, uncheck the box next to it.

   Note: Only *checked* properties are included in the style you're defining. The unchecked properties will have no effect in the cells to which you apply this new style. This lets you create partial styles that affect only a few properties at a time and apply them in combination with properties already existing in cells.



4. To copy property settings from a preformatted cell or another style, choose Merge. Then in the Merge Style dialog box, choose Style and choose the style name from the Select Style box to merge another style. Or, choose Cell and point to or type the cell address in the Select Cell box. Then choose OK to return to the Define/Modify Style dialog box.
5. Choose OK to complete the style definition.

To use the new style, select the cells to which you want to apply it and select the name from the Style list in the SpeedBar.

If you redefine a style that is already in use in the notebook (such as Normal, which is applied to all cells by default), all cells using that style change to reflect the new property settings. Cells in which you set individual properties with the block Object Inspector don't change. This is because style settings act as default settings that are overridden by block property settings.

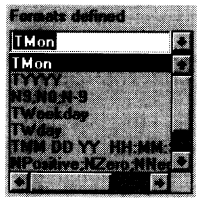
To delete a style, choose Edit | Define Style, and choose the style name in the Define Style For box. Then choose Delete and choose OK. Cells to which you had applied the deleted style revert to Normal style. You can delete any style except the Normal style.

To copy a style to another notebook, copy a cell formatted in that style, and paste it into the new notebook. The style name then appears in the Style list for that notebook.

Creating your own formats

In addition to the numeric formats built into Quattro Pro, you can create your own numeric formats to further customize the appearance of numbers, dates, and times.

To create a numeric format,



1. Right-click the block to which you first want to apply the format. Numeric Format is already selected.
2. Choose User Defined and then any format from the Formats Defined list. This format will be the basis from which you create the new format.
3. Enter a format code, using the symbols and syntax described in the next section.
4. Choose OK to complete the format and apply it to the active block at the same time.

To apply the new format to a block, right-click the block and choose Numeric Format. Then choose User Defined and choose the new format from the Formats Defined list.

Numeric format codes

Using special codes, you can create custom formats to display values. You can also create formats that display values differently depending on whether they're positive, negative, or zero. Finally, you can add text at the beginning, middle, or end of your format to be displayed with whatever value is in the formatted cell.

Formats are divided into two groups: Number formats and Date/Time formats. You create these formats using codes that represent formatted values in each character position in the formatted cell.

You can add any other characters, which will be inserted "as is" in the displayed entry within the formatted data.

The following code displays a number to three decimal places:

```
N9.000
```

For example, 53.97 would appear as `53.970`. The N code begins all Number formats. The 9 code displays as many digits as there are in the value to the left of the decimal point. The zero codes require that three digits to the right of the decimal point be displayed.

The next code displays a date and time:

```
TWeekday, H:M:S
```

For example, 1/9/92 at 2:30 a.m. would appear as `Thursday, 2:30:0`. The T code begins all Date/Time formats. The Weekday code displays the name of the day, and the H, M, and S codes display the hour, minute, and second. The colons aren't codes at all; they are simply inserted into the formatted value according to their position in the format.

The next table lists and describes special characters used as format codes. A table of example formats follows.

Table 11.1: Numeric format symbols

Symbol	Action
Number format symbols	
N or n	Begins a Number format (as opposed to a Date or Time format).
0	Always displays a digit. If the number doesn't have a digit in this position, a 0 appears. If there are more digits in the number than 0s in the format code, extra digits in the integer portion are displayed, and the fraction portion is rounded.
9	Displays a digit if the number has one. If there are more digits in the number than 9s in the format code, extra digits in the integer portion are displayed, and the fraction portion is rounded.
%	Displays the number as a percentage.
, (comma)	Inserts a thousands separator, which is a comma unless specified otherwise with the Punctuation setting of the International property (in the application Object Inspector). If not part of a Number code, the comma is inserted wherever it's positioned in the format.
. (period)	Inserts a decimal separator, which is a period unless specified otherwise with the Punctuation setting of the International property (in the application Object Inspector).
;	Sets up different formats for positive and negative values. If the format contains two parts separated by one semicolon (`part1;part2`), the first part formats positive numbers or zero and the second part formats negative numbers. If the format contains three parts, the first part formats positive numbers, the second formats zero, and the third formats negative numbers.
E- or *e-*	Displays the number in scientific notation, preceding negative exponents with a minus sign. If the format includes at least one 0 or 9 following this symbol, Quattro Pro displays the number in scientific notation and inserts E or e. If the exponent contains more digits than 9s or 0s following this symbol, the extra digits are displayed.
E+ or *e+*	Displays numbers in scientific notation, preceding negative and positive exponents with a minus or plus sign, respectively. If the format includes at least one 0 or 9 following this symbol, Quattro Pro displays the number in scientific notation and inserts E or e. If the exponent contains more digits than 9s or 0s following this symbol, the extra digits are displayed.
Date/Time format symbols	
T or t	Begins a Date/Time format (as opposed to a Number format).
d or D	Displays the day of the month as a one- or two-digit number (1–31).
dd or DD	Displays the day of the month as a two-digit number (01–31).
wday, Wday, WDAY	Displays the day of the week as a three-character abbreviation all lowercase, or with the first letter capitalized, or all uppercase.

Table 11.1: Numeric format symbols (continued)

Symbol	Action
weekday, Weekday, WEEKDAY	Displays the day of the week all lowercase, or with the first letter capitalized, or all uppercase.
m or M	Displays the month as a one- or two-digit number (1–12). If preceded by an hour code (h, H, hh, or HH), displays the minute as a one- or two-digit number (1–59).
mm or MM	Displays the month as a two-digit number (01–12). If preceded by an hour code (h, H, hh, or HH), displays the minute as a two-digit number (01–59).
Mo	Displays the month as a one- or two-digit number (1–12).
MMo	Displays the month as a two-digit number (01–12).
mon, Mon, MON	Displays the month as a three-character abbreviation all lowercase, or with the first letter capitalized, or all uppercase.
month, Month, MONTH	Displays the name of the month all lowercase, or with the first letter capitalized, or all uppercase.
yy or YY	Displays the last two digits of the year (00–99).
yyyy or YYYY	Displays all four digits of the year (0001–9999).
h or H	Displays the hour as a one- or two-digit number. If the format includes ampm or AMPM, the number will be between 1-12. If ampm or AMPM is not included, 24-hour format is used (0–23).
hh or HH	Displays the hour as a two-digit number. If the format includes ampm or AMPM, the number will be between 01–12. If ampm or AMPM is not included, 24-hour format is used (00–23).
Mi	Displays the minute as a one- or two-digit number (1–59).
MMi	Displays the minute as a two-digit number (01–59).
s or S	Displays the second as a one- or two-digit number (1–59).
ss or SS	Displays the second as a two-digit number (01–59).
AMPM	Displays the time in 12-hour format with characters for morning (AM) or afternoon (PM).
Miscellaneous format symbols	
*	If the formatted entry is shorter than the column width, fills the column by repeating the character to the right of the asterisk.
""	*Literalizes* characters enclosed in the quotation marks by displaying them wherever they're placed within the format. This is useful for including a format symbol, such as "," or "WEEKDAY" within a format.
\	Works like the quotation mark symbols described above, except it literalizes only the character after the backslash.

The next table shows examples of User Defined numeric formats.

Table 11.2
Custom format examples

Cell contents	Format code	Appears as
Number examples		
6435	N$9,999.99	$6,435.
4.3	N9,900.99	04.3
234	N9;Nnil;N(9.00)	234
0	N9;Nnil;N(9.00)	nil
–3	N9;Nnil;N(9.00)	(3.00)
556966830	N999-99-9999	556-96-6830
4155554828	N(999)999-9999	(415)555-4828
37.2	N99.00 ft.	37.20 ft.
102089	NConfidential	Confidential
.75	N9.99%	75%
.75	N9.99"%"	.75%
1234567	N0E+999	1E+6
Date and time examples		
2/10/92	TMonth D, yyyy	February 10, 1992
2/10/92	TWeekday	Monday
@TODAY	TMM/DD/YY	02/10/92
@NOW	THH:MM:SS AMPM	02:36:42 PM

Saving custom formats

Every time you create a User Defined format, it's saved in the Formats Defined list in the User Defined option of the Numeric Format property (in the block Object Inspector).

The format is also added to the list of all open notebooks. It is saved with any of these additional notebooks only if you apply the format to a cell in that notebook.

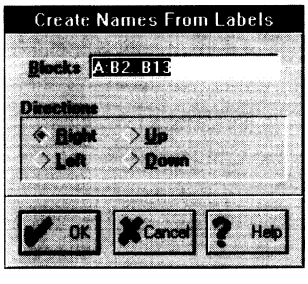
If you paste a formatted cell into another notebook, the custom format definition is copied also.

Maintaining block names

As explained on page 66, you can create names for blocks of cells and later refer to those names instead of using cell references. This saves time and promotes accuracy in formula references. This section describes the commands available for maintaining lists of block names in notebooks.

Naming blocks from labels

With Block | Names | Labels, you can name single cell blocks using the labels adjacent to them. This is useful in data entry forms, where cells usually have identifying labels beside them, and in macros, where subroutines are named.



To assign names to cells using adjacent labels, select the *labels* you want to use as names and choose Block | Names | Labels. Indicate the position of the cells you want to name in relation to the labels. For example, if the cells you're naming are below the labels, choose Down. Then choose OK.

Quattro Pro uses each label in the specified block (up to 15 characters) as a name for the adjacent cell. It ignores numeric values in the block; you can use only labels as block names.

Subsequent changes to the labels themselves don't affect the block names.

	A	B
1	Investment	5,000
2	Interest	7.1%
3	Yrs Invested	7
4	Future Value	$43,402.54

The figure at left shows a group of values used to calculate the future value of an investment made over a number of years. To assign the labels next to the values as block names, you'd specify Right as the block position, then specify block A1..A4.

Before you use Block | Names | Labels, check the labels you plan to use. If there are duplicate labels or labels that duplicate existing block names, Quattro Pro overwrites previous assignments. Use a choice list, or make a table of named blocks (described in the next section) to see a list of existing block names.

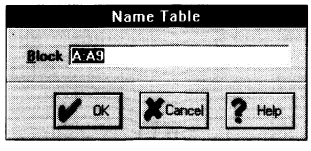
Note If there are leading or trailing spaces in a label, they're included in the block name. For example, a name that appears as "INCOME" may have been entered as "INCOME " (with a space at the end).

You can also use the Create Field Names option of Data | Query to assign names to the cells in the first row of a database (see Chapter 13).

Making a table of named blocks

In addition to using a choice list to see a list of named blocks (see page 68), you can create a table that lists the same information as a permanent part of the notebook.

To create a table of named blocks,



1. Select the top left cell of the block where you want the table.

   Caution: Make sure there is enough room for a two-column table, with one row for each block name. Quattro Pro overwrites existing data in cells it uses for the table.
2. Choose Block | Names | Make Table, and choose OK.

	A	B
1	JAN	A:E7..A:E7
2	FEB	B:E7..B:E7
3	MAR	C:E7..C:E7
4	TOTALS	D:F5..D:F9

A two-column table appears. The first column lists block names alphabetically. The second indicates the corresponding block coordinates.

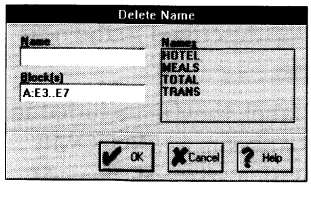
Quattro Pro doesn't update a named block table. If you add, change, or delete block names, you must re-create the table to reflect the changes. Putting a SpeedButton next to this table is a handy way of updating the table quickly (see Chapter 3 in *Building Spreadsheet Applications*).

Deleting block names

You can delete a block name without affecting the block itself. Formulas referencing the name then change to reference the block's coordinates; their results don't change.

For example, if a formula references a block named TOTAL, such as @SUM(TOTAL), and you delete TOTAL from the list of names, the formula adjusts to reference the cell coordinates: @SUM(B1..B20).

To delete a block name,



1. Choose Block | Names | Delete. You see a list of existing names in the dialog box.
2. Choose a name from the list, or type a name in the Name box, then choose OK.

To delete *all* block names in the notebook, choose Block | Names | Reset. Then choose OK to confirm that you want to delete all block names.

Although choosing Block | Names | Reset deletes all block names in the notebook from memory, the notebook itself is not affected. Formulas that reference named blocks change so they refer to block coordinates instead of names.

Reformatting text entries

Block | Reformat lets you adjust word wrapping in a series of label entries as though they were in a paragraph. You can enter text as a long label or a series of labels, then reorganize the text as a paragraph, taking up as many cells or columns as you want.

The next figure shows a paragraph entered as three long labels in cells A1 through A3. Although the text is displayed across several columns, you enter it only in column A. Because the cells to the right are empty, the text spills over into them.

Figure 11.6
Text entered as long labels

The text you see is entered in Column A only.

	A	B	C	D	E
1	Block|Reformat works like a mini word processor.				
2	It takes long labels and reformats them				
3	to fill the space you want.				
4					
5					
6					

The next figure shows the same text reformatted to fit into two columns: A and B. The text now takes up more rows (rows 1 through 6). The text is still contained only in Column A, even though it spills into B.

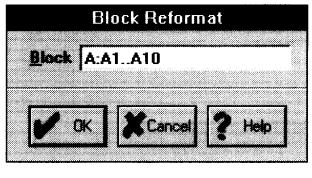
Figure 11.7
The same text reformatted within two columns

The text is still stored only in Column A.

	A	B
1	Block Reformat works	
2	like a mini word	
3	processor. It takes long	
4	labels and reformats	
5	them to fill the space	
6	you want.	
7		

To reformat text in a block of cells,

1. Enter the text in one or more cells of the same column. You can include up to 1022 characters in a single cell. There can be no blank cell between the cells containing text, and the entries must begin in the same column.
2. Select the cell containing the first cell to reformat, and choose Block | Reformat.
3. For the Block field, specify the columns or rows where you want the reformatted text to appear. If you specify cells in the active row only, the text fills up as many rows as necessary to display the text within the columns containing those cells. If you specify both columns and rows, Quattro Pro reformats the text within the block if there is enough room. Choose OK.



If an entry is longer than the column width, it's truncated or runs into the cell to the right (if empty).

If you specify the reformat block by indicating cells in the first row only, be sure there are enough blank rows underneath for the reformatted text. If the destination block contains data, the data is moved down out of the way.

Remember, even though the text may appear reformatted in several columns or rows, the data is *stored* in the leftmost cell of each row.

After you reformat a label, you can reverse the formatting with Edit | Undo, if enabled. You can also reformat the text to fill the same space as it did before (some line breaks may change).

If you reformat entries in different font sizes, the font size of the reformatted text is determined by the size of the entry in the first row. This may cause row heights to change.

Block | Reformat works only on existing text. If you reformat an empty block, it has no effect on data you enter later.

Transposing columns and rows

Whether you set up a page with entries listed in rows or columns, you can reverse the data in columns and rows with Block | Transpose.

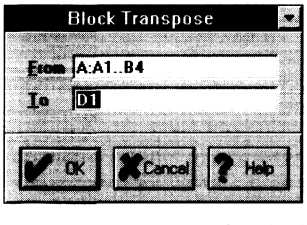
The next figure shows the same data arranged two ways: one with data running in columns and the other with the data in rows. Block | Transpose switches either block from one arrangement to the other.

Figure 11.8
The results of transposing data

	Phone	$159		Phone	Travel	Postage	Rent
	Travel	$456		$159	$456	$68	$750
	Postage	$68					
	Rent	$750					

Block | Transpose copies data to another area *and* transposes the columns and rows. Although you can transpose to the same location as the existing block, it's not wise because the transposed data will usually take a different shape than the original data and won't overwrite it completely. It's safer to specify a different part of the notebook for the destination of Block | Transpose.

Caution! Don't transpose cells containing formulas. Cell references aren't adjusted properly when you use Block | Transpose.

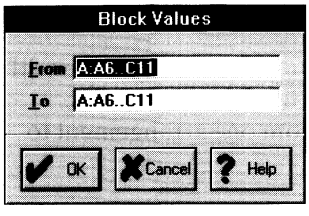


To copy and transpose data, select the block and choose Block | Transpose. For the To edit field, indicate the top left cell of the block to which you want to copy the transposed data, then choose OK. Don't specify a cell within the source block—you will disarrange the data if you do.

Caution! If there is data in the destination block, Quattro Pro overwrites it with the new data.

Converting formulas to values

Block | Values copies the *values* calculated by formulas without copying the formulas. Resulting values are usually numeric, but they can also be string values, depending on your formulas. You can copy these values to another part of the notebook or copy them over the formulas that computed them.



To copy a block of formula values, select the block and choose Block | Values. For the To field, indicate the destination block for the copy. To replace the formulas in the block with their values, specify the same block for the destination block. To copy the values of the formulas to another part of the notebook, specify the top left cell of the block you want to copy them to.

To copy formulas *and* their values to another part of the notebook, use Block | Copy or Edit | Copy and Paste. To convert a single formula to its result, select the cell containing it, press *F2*, press *F9*, then press *Enter*. The result replaces the formula. For more information on using *F9* to make calculations, see page 26.

To copy formula values into a separate file, use the Values option with Tools | Extract.

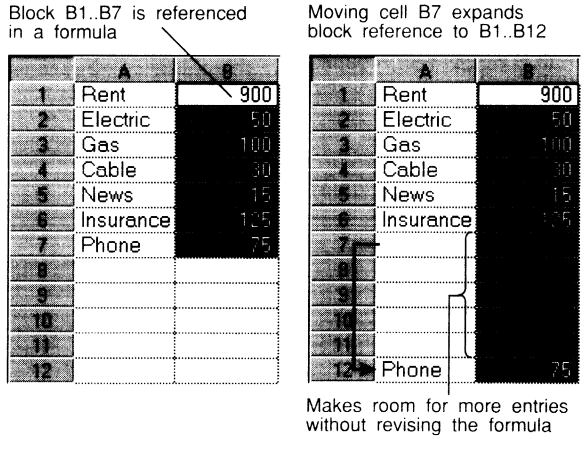
Moving formulas or referenced cells

To maintain the accuracy of your data, Quattro Pro changes formula references in a logical manner when you move cells containing formulas, or cells referenced by formulas. Here are the specifics:

- If you move a formula *without* moving the cells it references, the references remain intact, regardless of whether they're absolute or relative. Cell references adjust only when you *copy* a formula. (Absolute and relative addresses are discussed on page 53.)
- If you move a formula *and* the cells it references at the same time, the references *do* adjust. For example, if A2 contains +A1+1, and you move A2 alone to B1, the formula still reads +A1+1. But if you move A1 and A2 at the same time, the formula reads +B1+1.
- If you move a formula to *another notebook* without moving the cells it references, Quattro Pro links the two notebooks so the formula still references the cells in the original notebook. If you

- move the formula back to the first notebook, the links are removed.
- If you move a *cell* without moving formulas that refer to it, formulas update to refer to the new location, even if you specified the reference as absolute. For example, if you move the contents of cell B4 to B6 in page A, Quattro Pro revises any formula referencing B4 to reference B6. If you move A:B4 into A:B6 of a notebook named TAX, the formula's reference changes to [TAX]A:B6.
- If you move a cell from within a block without moving formulas that refer to the block, formulas still refer to the same block and no longer refer to the moved cell. However, if you move one of the block's *coordinate cells* (the upper *left* and lower *right* cells), the references to the block extend or contract to reflect the new location. For example, if you define the block BILLS as B1..B7, then move cell B7 to B12, BILLS changes to B1..B12.

Figure 11.9
Moving a coordinate cell



- If you move a coordinate (corner) cell into *another notebook*, references to the block aren't adjusted.
- If you move an entire named or referenced block, Quattro Pro updates the block name or the reference in formulas.

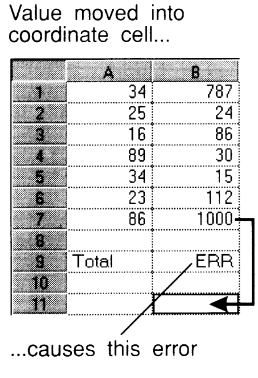
Moving into a referenced block

If you move data into a coordinate cell of a referenced block or into a single referenced cell, the formula containing the reference becomes invalid. References in formulas to the single cell or block are replaced with ERR, and cells containing those formulas display ERR. If you named the block, the block coordinates in the block names list show as ERR.

ERR values alert you to cells you've overwritten. This ensures that formulas don't display the wrong values if you accidentally move data into cells they reference.

For example, in the next figure cells A1..B7 are referenced by the formula in B9. When you move the contents of B11 to B7, the formula in B9 becomes @SUM(ERR), and ERR appears in the cell. The block names list would also show INCOME as ERR. If you move data into B1 or A7 there is no problem: Although they are corner cells, they are not the *coordinates* that define the block (A1 and B7 are the coordinates).

Figure 11.10
Moving data to a block coordinate



To reverse a move operation that causes errors, use Edit | Undo immediately after the move. Using Block | Move again to move the data back to where it was won't bring back the formulas.

To move data into a cell referenced by a formula or named block, use Block | Copy, and then erase the original data. Block | Copy won't turn cell or block references into ERR values.

C H A P T E R

12

Linking notebooks

A notebook *link* is a reference to a cell or block in another notebook. The reference is *live*, which means Quattro Pro updates the link results when the referenced data changes, as if the data were in the same notebook.

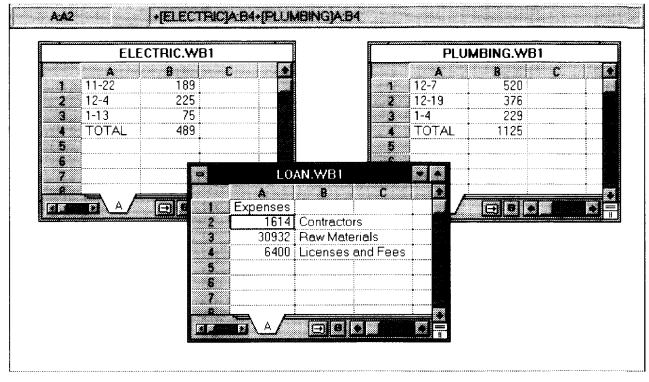
Notebook link references are identical to page and block references except that they begin with the name of the notebook to link to. Quattro Pro provides commands for keeping notebook links accurate even if one of the notebooks is closed.

This chapter describes how to

- create notebook links by typing or pointing
- link to all open notebooks at once
- update and maintain links between notebooks

The next figure shows a cell in one notebook linked to cells in two other notebooks. The top of each notebook window shows the name of the file it contains. LOAN.WB1, the notebook that contains the link, is the *primary* notebook because its values depend on two other notebooks. ELECTRIC.WB1 and PLUMBING.WB1, the notebooks referenced by the link, are the *supporting* notebooks.

Figure 12.1
Linked notebooks



Note The primary notebook must be a Quattro Pro .WB1 or .WQ1 file. The supporting notebooks can be in any spreadsheet format Quattro Pro translates (see page 355). For information about linking to Paradox, Reflex, or dBASE database files, see page 298.

Why use links?

There are several advantages to setting up notebook links instead of multipage notebooks:

- **To build models that fit into memory.** By dividing an application over several notebooks and accessing only the linked values from closed notebooks, you can build larger models.
- **To share information.** By linking pertinent information in different notebooks, you can eliminate redundancy. Since Quattro Pro updates primary formulas when you make a change, your data is always up to date. And by using one formula for several notebooks, you save disk space.
- **To divide work among several people.** If you use linked notebooks for a single application, you can divide the application's work among several people.
- **To preserve portability to non-3-D spreadsheets or databases.** Since only one page of a notebook is translated when you save it in some other formats (see page 355), you may want to link the first pages of different notebooks instead of pages within the same notebooks.

Creating links

Links are formulas with file names in them. The file name precedes the page reference and is enclosed in brackets; for example, `+[BUDGET]B:A15`.

There are four ways to create a notebook link:

- Type the link as a page reference and cell address preceded by the notebook name in brackets, such as

  `+[BUDGET.WB1]C:F6`

  This enters the value from cell F6 on page C in BUDGET.WB1 into the active cell.
- Type + to begin entering a formula and point to the block in the other open notebook.
- Select the cell or block to which you want to link and copy it to the Clipboard. Then select the location for the link and choose Edit | Paste Link. A link is created for each cell in the block.
- Use a special wildcard character (an asterisk or question mark) to create a link to the same place in all open notebooks at once. For example,

  `@SUM([*]C:F6..F10)`

  adds the values in cell F6 on page C of every open notebook. For more information on wildcard characters, see page 278.

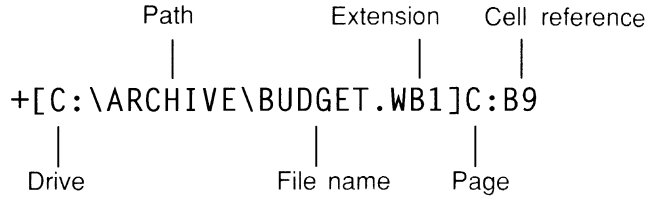
Typing links

To include a link as all or part of a formula, use the following format:

+[Drive:\Path\File name]Page:Cell reference

The plus sign is needed only if the link is the first item in a cell entry (without the plus sign, Quattro Pro would regard the reference as a label).

Figure 12.2
The parts of a link

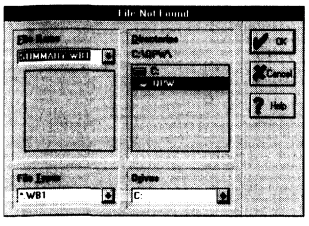


- **Drive** identifies the drive containing the file. This is necessary only if the notebook you're referencing is not on the same drive as the primary notebook.
- **Path** is the DOS path to the directory containing the file. This is necessary only if the notebook is not in the same directory as the primary notebook.
- **File name** is the name of the file.
- **Extension** is a three-letter suffix separated from the file name by a period (.). It is necessary only if the file has a different extension from the primary notebook (.WB1 or .WQ1).
- **Page** is any valid page name, page range, or group name (such as C, Sales, D..F, or YearToDate).
- **Cell reference** is any valid cell address, pair of block coordinates, or block name. However, block coordinates or a block name are valid only if the link contains an @function to operate on the block. The link in the example above (beginning with +) simply links the active cell with the referenced cell.

You can enter all parts of the link in either uppercase or lowercase. Don't include blank spaces in any part of the reference.

If you keep all linked notebooks in the same directory and use the same extension for each, you only have to enter a file name for links. This is because the default drive, path, and extension are the same as the primary notebook. Also, if you move all linked notebooks to a different directory, you won't need to edit the references.

Note Block references are acceptable for *CellReference* only if the formula contains an @function to operate on the block.



If you type a file or path name that doesn't exist, the File Not Found dialog box appears after you press *Enter*. This dialog box is equivalent to the one that appears when you choose File | Open. Select the correct location of the file to which you want to link by using standard techniques described on page 96. After you choose OK, the linked data appears in the selected cell.

Pointing to links

When entering formulas, it's easier to point to a cell or block than to type the reference.

To point to a link,

1. If the notebook you want to reference isn't open, use File | Open to access it.
2. After typing +, or at the appropriate place in the formula, activate the target notebook you want to reference. You can do this in one of these ways:
   - Click anywhere in the notebook.
   - Open the Window menu and choose the window from the numbered list at the bottom of the menu.
   - Press the Next Window key, *Ctrl+F6*, until you're in the notebook you want.
3. By default, the last-selected cell in the target notebook appears in the formula. To change the reference to another cell or block, point elsewhere in the notebook.
4. If there is more to the formula, finish typing it. Press *Enter*.

The selector returns to its original place in the primary notebook and enters the block (along with the linked file's name) in the input line.

If you're entering an @function (such as @SUM) that allows multiple block references, you can enter a comma after the first block reference (which returns you to the primary notebook), then point to the next block in any notebook. After the last one, type) (close parenthesis) to complete the @function, then press *Enter* to complete the formula. For example, your formula might look like this:

@SUM([NOTEBK1]A:A1,[NOTEBK2]A:B1)

Pasting links

The quickest way to link cells between notebooks is with Edit | Paste Link. After you copy a block to the Clipboard, using Paste Link in another notebook (or even in the same notebook) creates an individual link to each cell in the copied block.

To create these links:

1. Select the block of cells to which you want to link. The selection can even be a noncontiguous block.
2. Click the Copy button in the SpeedBar.
3. Select the upper left cell of the destination block for the links.
4. Choose Edit | Paste Link.

Each pasted cell contains a formula beginning with a plus sign followed by

- the notebook name in brackets (if different from the active notebook)
- the page name and a colon (if different from the active page)
- cell address

Linking to multiple notebooks

If you're consolidating information from several notebooks that have the same layout, you can use wildcards to link to the same place in all of them.

Choose File | Open to open the primary notebook and all its supporting notebooks (see page 283). Then close all notebooks you don't want to reference. To reference corresponding values in all open notebooks, use a wildcard character in place of the notebook names in the link. The next table lists examples using wildcard characters.

Table 12.1
Examples of wildcards in links

Link	Effect
`@SUM([*]A:A1)`	Adds the values in A1 in page A of all open notebooks (except the active one), and places the result in the active cell.
`@AVG([*]BUDGET:B3..C10)`	Finds the average of all values in block B3..C10 in the page named BUDGET of each open notebook.

Table 12.1: Examples of wildcards in links (continued)

Link	Effect
@SUM([*]TOTALS)	Sums the values of all cells in the block TOTALS in any open notebooks with a block named TOTALS. These blocks need not be the same size, or in the same relative positions.

As soon as you finish entering the link, the formula is revised to include specific file names. This means that if you open new notebooks after using a wildcard in a link, they aren't referenced in the formula.

You can use ? and * wildcards in links. As in DOS, a question mark (?) stands for any single character, and an asterisk (*) stands for any number of characters.

Table 12.2
How wildcards work in links

Link syntax	Effect
[]	Looks in the active notebook.
[*]	Links to all open notebooks.
[AB*]	Links to all open notebooks whose names begin with *AB*.
[A*B]	Links to all open notebooks whose names begin with *A* and end with *B*.
[A?B]	Links to all open notebooks with three-character names that begin with *A* and end with *B*.
[AB???]	Links to all open notebooks with five-character names that begin with *AB*.

Naming links

If you often link to a certain block, you can store the reference in a named block (either in the active notebook or in a separate one) to simplify the process. This offers several advantages:

- To reference a different file or block, you only need to edit the reference in the named block instead of editing each individual link.
- If the link statement is long, you can reference a short named block instead of typing the entire link.

- When you move a named block in a supporting notebook while the primary notebook is closed, the primary notebook is updated to reflect the change the next time you open it. With links that refer to cell addresses, the primary notebook isn't updated.

For example, suppose you often reference the sum of cells F12..F36 on page B in the file BUDGET. Instead of typing `@SUM([BUDGET]B:F12..F36)` wherever you want that sum, you can name a cell TOTAL, and enter `@SUM([BUDGET]B:F12..F36)` in it. This way, wherever you want that sum, just enter `+TOTAL` instead of typing the full link.

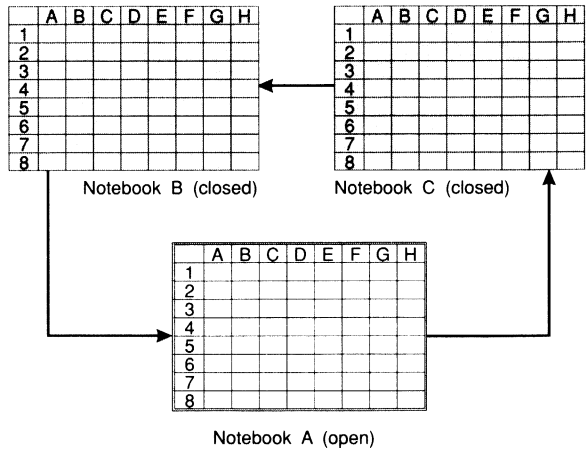
Linking to closed notebooks

A notebook doesn't have to be open for you to link to it. You can type a link to a closed notebook. When you open a primary notebook, you can also choose Update References from the dialog box that appears (see page 283). This loads only the *linked values* from supporting notebooks, leaving the supporting notebooks closed. This is useful if all your linked notebooks won't fit into memory.

Linking closed notebooks has one disadvantage: You can't update closed files. Suppose you have three notebooks that are linked: notebooks A, B, and C. Notebook A is linked to values in B. Notebook B is linked to values in C, and C is linked to values in A. These notebooks pass values in a circular fashion (see the next figure).

Let's say you're working in notebook A and the other two are closed. You change values in A that affect C. Those values in turn affect B and should be passed back to A. But because B and C are closed, their values don't get updated, and the values A gets from B are now inaccurate.

Figure 12.3
Notebooks linked in a circular fashion

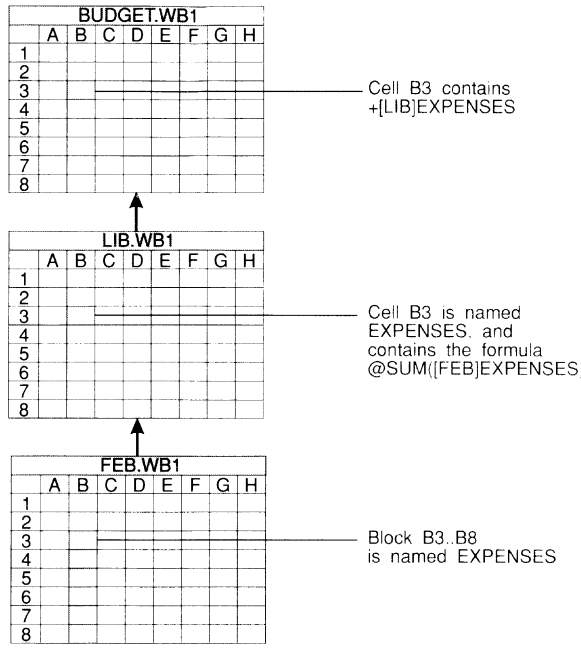


Even if you use Tools | Update Links | Refresh Links in this example, the data would still be inaccurate because B and C haven't been updated since you made the changes: They still contain inaccurate results. To be sure your results are current in a case like this, all three notebooks must be open.

If you're revising notebook A on a network and someone else is revising B or C, choose Tools | Update Links | Refresh Links after that person saves and closes B or C to update the links in notebook A.

You can avoid this circular reference problem by structuring linked notebooks hierarchically, with links that flow only one way. Then you can work on notebooks one at a time. As long as you start with the notebook at the bottom of the hierarchy and proceed upward (choosing Update References for each notebook you open), the notebook values will always be correct (see the next figure).

Figure 12.4
Notebooks linked hierarchically



Update FEB.WB1 first, then LIB.WB1, then BUDGET.WB1.

Moving and copying links

When you copy a link, cell addresses in the formula adjust like other cell addresses: relative addresses change to reference *position*, while absolute addresses stay the same (see page 52).

When you copy a link from one notebook to another, the link remains, even if you copy it into the notebook it references. However, if you *move* a link into the notebook it references, Quattro Pro removes the link, leaving only the page and block reference.

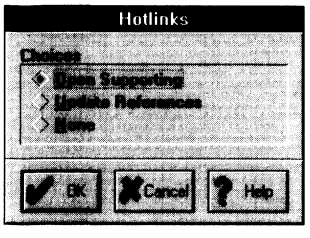
If you move a formula to another notebook without moving the cells it references, Quattro Pro creates a link to the original notebook.

When you move a block in a supporting notebook, any links to it in open primary notebooks adjust accordingly. However, links in *closed* notebooks are not updated. To avoid this problem, use block names in links when possible. Each time you open a

primary notebook, block names that have been moved are updated.

Loading supporting data

When you open a file that contains links, Quattro Pro checks whether all supporting notebooks are open. If not, a dialog box with three options appears.



- **Open Supporting** opens all supporting notebooks. If those notebooks contain links to closed notebooks, those notebooks open too, until all supporting notebooks are open.
- **Update References** accesses linked values in closed supporting notebooks *without opening them*. This takes up less memory than opening the notebooks.

  If you later decide to open the supported notebooks, choose Tools | Update Links | Open Links (see page 284).
- **None** temporarily replaces links to closed supporting notebooks with the value NA (not available). This lets you examine or edit notebooks when you don't need the linked values. It saves the time required to update values and the memory required to open supporting notebooks.

  If you later want to replace the NA placeholders with the actual link values, use Tools | Update Links | Refresh Links to update values, or Tools | Update Links | Open Links to open the supporting notebooks (see page 284). You can use these commands at any time.

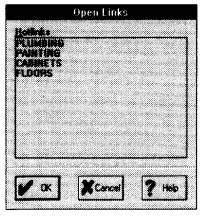
Maintaining links

To display the commands that relate to notebook linking, choose Tools | Update Links. Choose from these commands:

- **Open Links** opens one or more supporting notebooks that are linked to the active notebook.
- **Refresh Links** recalculates data in the active notebook based on data in closed supporting notebooks.
- **Change Links** lets you switch all links that reference one supporting notebook to a different notebook.
- **Delete Links** removes all links to any supporting notebook.

Supporting notebooks

If the active notebook is linked to data in closed notebooks, you can open the closed notebooks at any time.

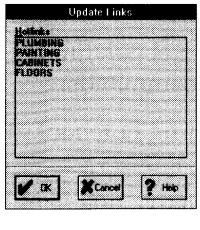


To open closed linked notebooks, choose Tools | Update Links | Open Links. Select the notebook you want to open, or select multiple notebooks by holding down the Ctrl key (as you click individual notebooks) or the Shift key (as you click the last notebook in a range to be selected). After you choose OK, Quattro Pro opens the selected notebooks. The active notebook remains active.

Tools | Update Links | Open Links opens only notebooks that are directly linked to the active notebook. If additional notebooks are linked to those directly linked, you need to activate the directly linked notebooks and choose Tools | Update Links | Open Links again. For example, suppose Notebook A refers to Notebook B, which refers to Notebook C. Activating Notebook A and choosing Tools | Update Links | Open Links lists only Notebook B. To open Notebook C, activate Notebook B and choose Tools | Update Links | Open Links.

Updating link values

If a notebook is linked to values in closed notebooks (for example, if you chose None when you opened the primary notebook), use Tools | Update Links | Refresh Links to access values in the supporting notebooks. This is similar to the Update References option offered when you access a primary notebook (see page 283), except you can use it at any time, and you can specify one notebook at a time from which to access values.



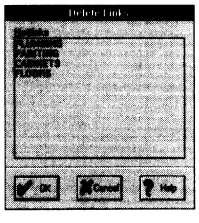
To update link values from supporting notebooks, choose Tools | Update Links | Refresh Links, and choose the notebook from which you want to update values. You can select multiple notebooks by holding down the Ctrl key (as you click individual notebooks) or the Shift key (as you click the last notebook in a range to be selected). After you choose OK, Quattro Pro reads linked values from the specified notebook into the active notebook.

Tools | Update Links | Refresh Links is useful when you're working on a network. While you're using one notebook, others can be working on supporting notebooks (which remain closed to you). If people announce over the network when they save or close a

file, you can use Tools | Update Links | Refresh Links to access updated values.

Removing links

You can delete all links to any supporting notebooks with one command.



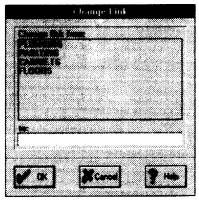
To delete links to notebooks, choose Tools | Update Links | Delete Links, and choose the supporting notebook from which you want to delete links. You can select multiple notebooks by holding down the Ctrl key (as you click individual notebooks) or the Shift key (as you click the last notebook in a range to be selected).

After you choose OK, Quattro Pro replaces each link to an unlinked notebook with an ERR value, but doesn't remove the formulas containing the ERR values. You can edit them to replace the ERR values with valid references.

Caution! Edit | Undo can't restore deleted links.

Changing notebook names in links

Tools | Update Links | Change Links unlinks the active notebook from a supporting notebook and links it to another. This is useful after you rename a notebook.



To switch links from one notebook to another, choose Tools | Update Links | Change Links and choose the file you want to unlink from the list. In the To edit field, type the name of the notebook you want to change links to. After you choose OK, all references in the active notebook to the supporting notebook you chose switch to the new supporting notebook name you typed.

Note The new supporting notebook must have the same layout as the previous one because the same relative cells are referenced. If it doesn't, formulas that reference linked cells may show errors or produce meaningless values. To avoid this, enter all links as *block names*, so the correct values are included.

C H A P T E R

13

Databases

Quattro Pro offers a variety of features to perform database operations using blocks. This chapter explains

- what a database is
- how to set up a notebook as a database
- how to search for data that meets conditions you specify
- how to extract data from the database and copy it into another part of the notebook
- how to access external databases from Quattro Pro
- how to sort data
- how to confine data entry

What is a database?

A *database* is an organized collection of entries. Each entry has a fixed set of information associated with it. Some examples of databases are

- an address book or phonebook (each business or person is one entry)
- a checkbook (each bank transaction is one entry)

The remainder of this section defines database terms and explains the structure of a database, using the phonebook as an example.

Records and fields

A *record* is an entry in a database. One example of a record is a phonebook entry. Every database is a collection of records. The types of information in these records share a common pattern, with each record breaking down into pieces of data called *fields*.

A phonebook entry (record) has three fields: name, address, and phone number. Each field has a *field name* to distinguish it from other fields. Databases use field names to identify a field's use.

Figure 13.1
A phonebook as a database

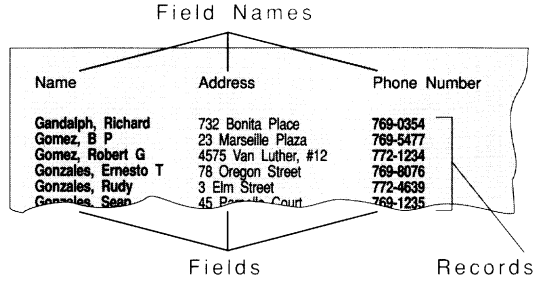


Figure 13.1 shows that defining a database is a matter of breaking the data down into the smallest units of information necessary. The record/field concept underlies every database. If you look at real-world databases, such as checkbooks or general ledgers, you can see how each breaks down into record and field definitions. The following table lists some databases and their components:

Table 13.1
Some database definitions

Database	No. of Fields	Field Names
Phonebook	3	name, address, phone number
Address book	5	name, address, city, state, postal code
Checkbook	5	check number, description, credit, debit, balance

Setting up a Quattro Pro database

Planning the structure of your database is important. When setting up a database, ask yourself these questions:

- Do I need to set up my information as a database (does my data consist of the same type of information repeated over and over)?
- What fields should each record consist of?
- What field names best describe the information?
- What's the simplest way to set up this database to serve my needs?

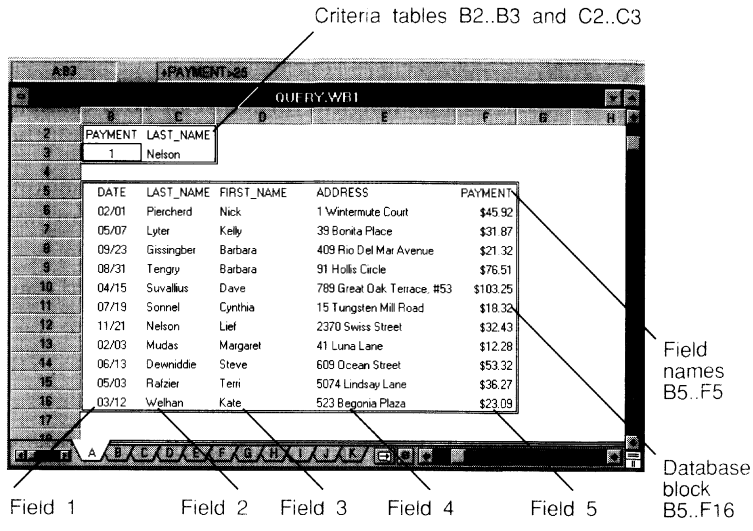
Setting up a database often involves entering hundreds of records. Good planning ensures no wasted time.

The database block

Quattro Pro stores a database in a block of cells called the *database block*. This block must be contiguous and confined to one notebook page. Use Database Block in the Data | Query dialog box to specify the database block.

Each row of the database block (except for the first row, which contains field names) is a record. A Quattro Pro database can contain up to 8,191 records. Each column of the database block represents one field (for example, the first column in the database block in Figure 13.2 is the date field, the second column is the last-name field, and so on). A Quattro Pro database can have up to 256 fields per record. The next figure shows an example of a database block.

Figure 13.2
A Quattro Pro database



Caution! Avoid the temptation to insert a blank row below the field names. Quattro Pro would consider this row a record, which can make database operations inaccurate. Use the block properties Line Drawing and Row Height to improve the database block's appearance. (See pages 79 and 82 for details on these properties.)

Setting up field names

After defining the database block (see the previous section), choose Field Names from the Data | Query dialog box to initialize the block's field names. A field name must be a label, and should be

- less than 16 characters long
- free of leading or trailing spaces
- unique

Caution! Any previously defined block names identical to the field names are deleted.

If a field name consists of more than one word, connect the words with underscores (_). This makes the name easier to read in formulas. You can select the first row of the database block and choose Down from the Block | Names | Labels dialog box instead of using Field Names; both commands produce the same result.

Searching for records

Quattro Pro lets you review database records that meet specific search conditions, or *search criteria*. This process is called *querying* or *searching* a database.

Preparing the database block

These steps aren't necessary when searching an external Paradox or dBASE table (see page 298).

To prepare a database block for searches, follow these rules:

- All cells in the first row of the database block must contain field names. Each field name must be unique.
- Initialize the field names by choosing Field Names from the Data | Query dialog box. (This step isn't mandatory, but it makes searching easier; see page 294 for more information on field names and searches.)
- The database block must include all the records to search.

The criteria table

Quattro Pro uses a technique called *query by example* to define search conditions. Query by example searches for records using an example of what they look like. The examples can be exact matches, like the last name Fernandez, or logical conditions, like a price greater than $25.

The examples are entered into a block called a *criteria table*. This block must be contiguous and confined to one notebook page (it doesn't have to be on the same page as the database block). Use Criteria Table in the Data | Query dialog box to specify a criteria table.

The following figure shows a criteria table as it appears in the notebook.

Figure 13.3
A criteria table (in the block A2..B4)

	A	B
1		
2	LAST_NAME	FIRST_NAME
3	Lyter	
4		Barbara
5		

To ensure accuracy, use Edit | Copy to copy the field names from the database block into the criteria table.

Every criteria table has at least two rows: one specifying the field(s) to search, and one indicating what to search for in those field(s). The first row of a criteria table contains field names from the database block; enter them exactly as they appear there.

Include only field names pertinent to the search in the criteria table; the criteria table doesn't have to contain every field name in the database. For example, the first row in Figure 13.3 specifies that this criteria table searches only the fields LAST_NAME and FIRST_NAME.

Additional rows in the criteria table specify the *criteria* to search by. In Figure 13.3, the rows containing Lyter (the LAST_NAME to search for) and Barbara (the FIRST_NAME to search for) are two examples of criteria.

Exact matches

You can specify two types of search criteria: *exact matches* or *conditions*. Conditions, which use logical formulas, are discussed on page 294.

Criteria tables can also use numbers or dates as exact matches; enter them exactly as you'd enter them into the database.

Figure 13.3 uses exact matches to search. To define an exact match, enter the value or label to find below the name of the field it's in. For example, entering Lyter in the LAST_NAME column of the table searches for records with Lyter in the LAST_NAME field. When searching for a label, case is ignored (using LYTER finds the same records as Lyter).

Each *column* of the criteria table specifies a different field to check, and has its own list of exact matches. For example, the first column in Figure 13.3 searches for records with a LAST_NAME of Lyter and the second column searches for records with a FIRST_NAME of Barbara. (Using Figure 13.3's criteria table on the database block in Figure 13.2 would find Kelly Lyter, Barbara Gissingber, and Barbara Tengry.)

Each *row* in the criteria table specifies a different search possibility. The criteria table in Figure 13.3 has two criteria:

- Row A3..B3 searches for records with a LAST_NAME of Lyter. Using only this row as a criteria table on the database block in Figure 13.2 (by setting Criteria Table to A2..B3) would find only Kelly Lyter.
- Row A4..B4 searches for records with a FIRST_NAME of Barbara. Using only this row as a criteria table (see the next example) on the database block in Figure 13.2 would find Barbara Tengry and Barbara Gissingber, because they both have a FIRST_NAME of Barbara.

LAST_NAME	FIRST_NAME
	Barbara

If multiple exact matches are in the same row, *all* of them must be true at once for a record to be found. For example, the following criteria table would find only records with the name Barbara Lyter (and there are no such records in Figure 13.2):

LAST_NAME	FIRST_NAME
Lyter	Barbara

Don't include blank rows in a criteria table. This finds all records.

An empty cell in the criteria table means the field in that instance can be anything. The next example searches for records containing the name Kelly Lyter or just the LAST_NAME Dewniddie (in the second instance, any first name is acceptable, as long as Dewniddie is the last name). Since the second criteria row doesn't need to find anything in FIRST_NAME, the cell below FIRST_NAME in that row is empty.

LAST_NAME	FIRST_NAME
Lyter	Kelly
Dewniddie	

Using wildcards in a criteria table

When using labels as exact matches, you can place special symbols called *wildcards* in the label to represent characters that vary. The following table shows the three wildcard types and a brief description of their use.

Table 13.2
Wildcards used in criteria tables

Wildcard	Purpose	Example
?	Takes the place of any one character in a label.	D?g finds labels with one character between the D and the g, such as Dig, Dog, or Dug (but not Dg or Digging).
*	Takes the place of any group of characters.	S * T finds labels beginning with the letter S, ending with the letter T, and having any number of letters in between, such as SAT, Set, silent, or spreadsheet.
~	Stands for all labels *except* the label you specify. It must be at the start of the label.	~Fernandez finds all labels except Fernandez.

Note You can use wildcards anywhere in a label, except for ~, which must be at the beginning of the label. You can't use wildcards in conditions (discussed next) or values. For example, the following criteria table finds Dave Suvallius and Cynthia Sonnel when used to search the database block of Figure 13.2.

LAST_NAME
S*

Using conditions as criteria

Conditions are logical formulas that define a state that a record must meet before it can be found. For example, you can specify conditions that search for payments less than $25.00 (`+PAYMENT<25`) or records dated after January 1st, 1992 (`+DATE>@DATE(92,1,1)`). See page 33 for more information on logical formulas.

Choosing Field Names from the Database | Query dialog box creates a group of block names that refer to the first record in the database. Each block name comes from the field name. Using this command on the database block in Figure 13.2 creates the block names shown in Table 13.3.

Table 13.3
Block names created by Field Names

Block name	Cell address
ADDRESS	E6
DATE	B6
FIRST_NAME	D6
LAST_NAME	C6
PAYMENT	F6

While using Field Names isn't mandatory, creating these block names makes conditions easier to enter and more readable. The remainder of this section assumes Field Names was used.

Conditions can use these block names to represent fields. For example, the first criteria table (B2..B3) in Figure 13.2 uses the condition `+PAYMENT>25` to check for payments greater than $25.00. Use the cell address of the field in the database block's first record (second row) if Field Names isn't used. For example, in Figure 13.2 you can enter the condition `+F6>25` into B3 instead of `+PAYMENT>25`, since the first record's PAYMENT field is in cell F6.

Set your criteria table's numeric format to Text to display the conditions instead of their results.

Notice that in Figure 13.2 the condition `+PAYMENT>25` doesn't appear in cell B3 because, like other cells containing formulas, only the result appears in the cell, not the formula entered. (You can see the actual condition in the input line in the figure.) In the case of conditions, the result is always 1 (true) or 0 (false). Here's the criteria table with the condition showing:

PAYMENT
+PAYMENT>25

Note If false (0) displays in the criteria table, don't worry; this doesn't mean no records will be found, only that the first record in the database doesn't meet the criteria.

For the remainder of this section, any criteria table entry beginning with a plus is a condition that is entered into the cell as a logical formula.

Quattro Pro uses the field names in the condition to determine which fields are pertinent to the search. For example, you could enter `+LAST_NAME="Sonnel"` in the previous example instead of `+PAYMENT>25` to search the field LAST_NAME.

You can combine conditions with exact matches in a criteria table. The following criteria table would find only one record (Dave Suvallius) when searching Figure 13.2's database block, because this is the only record with a last name starting with S and a payment over $100.

LAST_NAME	PAYMENT
S*	+PAYMENT>100

When you use external field names in a criteria table, they must be fully linked. See page 298 for details.

Any logical formula can be a condition. If you want to reference a fixed value in a specific cell, enter an absolute cell address in the condition. While searching, all relative addresses in a condition are adjusted one row down each time the search checks a different record. For example, the condition `+WAGE>D25` compares the WAGE field of the first record to D25, the second record to D26, the third to D27, and so on. Using `+WAGE>$D$25` checks D25 for every record searched. Field names in a condition shouldn't be absolute (`+$WAGE>25`); this might throw off the search. (See page 53 for more information on absolute addresses.)

Output blocks

You can copy the results of a search into a block (called the *output block*). Use Output Block in the Data | Query dialog box to specify the block of cells to copy search results to. This block must be contiguous and confined to one notebook page (it doesn't have to be on the same page as the database block or criteria table). Like database blocks and criteria tables, the first row of the output block must contain field names from the database block. They can be in any order. Omit fields you don't want copied.

The next example shows an output block you could use with the database block in Figure 13.2:

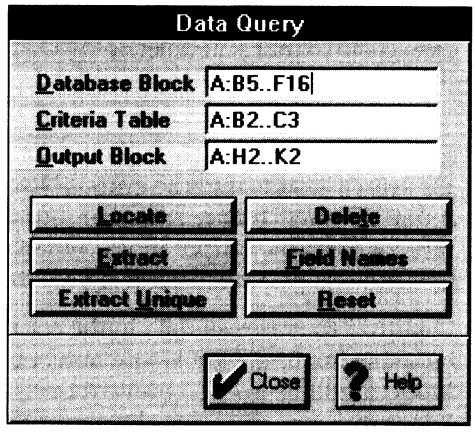
FIRST_NAME	LAST_NAME

Basic database searching

Before using Data | Query to perform database operations, follow these steps:

1. Create a database block whose first row contains field names and remaining rows contain records.
2. Choose Field Names from the Data Query dialog box to prepare the database for searches.
3. Create an output block whose first row contains the names of fields to extract. Output blocks are needed only when using Extract or Extract Unique.
4. Create a criteria table containing the conditions and exact matches to search for.
5. Select the database block and choose Data | Query.
6. Choose Criteria Table and select the criteria table in the notebook.
7. Choose Output Block and select the output block in the notebook if you want to extract records.

Figure 13.4
The Data | Query dialog box



After taking these steps, the Data | Query dialog box remains onscreen for you to perform database operations. The remainder of this section describes these operations. Unless otherwise noted, all commands in this section are in the Data | Query dialog box.

If you choose Close, no database operations occur; the database block, criteria table, and output block become defaults that are saved with the notebook. To clear these defaults, choose Reset from the dialog box, and Close.

F7
Query

Pressing *F7* repeats the last-used Locate, Extract, Extract Unique, or Delete command.

Viewing records

To view the records found by a search, choose Locate. This places Quattro Pro in FIND mode, and a highlight bar appears. You can use the mouse, ↑, or ↓ to move between records found by the search. You can press ← or → to make a field within the highlighted record active (then you can edit this cell as you would normally or enter new data). An error message appears if no records are found. Press *Esc* or *Enter* to exit FIND mode and return to the Data | Query dialog box. You can't use Locate on an external database (see page 298).

Deleting records

Choosing the Delete command removes all records found by the search. Quattro Pro asks for confirmation before deleting. Records below those deleted move up to fill in the blank space left by the deletion. You can't use Delete on an external database (see page 298 for more information).

Caution! Use Locate to check the result of a search before deleting records. This ensures that you delete only the records you want removed. If you accidentally delete records, use Edit | Undo to restore them.

Extracting records

Extract and Extract Unique (in the Data | Query dialog box) copy the search results into the output block. Extract copies all records found; Extract Unique is similar, but removes any duplicate records from the output block. When the output block is one row, Quattro Pro places all extracted records below it.

Caution! Quattro Pro erases *all* data in the cells beneath the output block before extracting. Don't store notebook data below the output block; it will be lost. To prevent this, specify an output block larger than one row; this also limits the number of records the output block accepts. For example, adding four rows to the output block shown on page 296 restricts searches to finding fewer than five records. If the search finds five or more records, an error occurs, and only the first four records are copied into the output block.

Using @functions with a database

You can use a variety of @functions with Quattro Pro databases. These functions use database blocks and criteria tables like a database search. For example, the following formula calculates the number of people with payments greater than $25 in the database of Figure 13.2:

```
@DCOUNT(B5..F16,0,B2..B3)
```

See Chapter 1 of *Building Spreadsheet Applications* for more details.

Using external databases

While you can use Quattro Pro to search for records in external Paradox or dBASE tables, the Database Desktop provides a variety of features for searching and editing external tables. For more information on the Database Desktop, see the *Database Desktop Guide* (included with the Database Desktop).

You can use the Database Desktop to view search results in or delete records from an external table; see the Database Desktop Guide for details.

Searching an external database is the same as searching Quattro Pro databases except you can't use Locate or Delete. To search an external database in Quattro Pro, choose Database Block from the Data | Query dialog box and enter a link to the database using the following syntax:

[*Database*]A1..A2

See Appendix C of Getting Started for information on configuring Quattro Pro to work with external tables.

[*Database*] is the name of the database, including the path, for example, `[C:\PARADOX\SAMPLE.DB]`. The block you specify after the file name can be any valid block with at least two rows. This block is a placeholder; it doesn't affect the search results.

When you specify a database block in a database @function, the block must have at least as many rows as the number of records in the database, plus one row for the field names. The block must also have at least as many columns as there are fields in the database. For example, [COST.DB]A1..C27 would work if the database contained three fields and fewer than 27 records.

To view all the records in an external database, open it with File | Open. This brings the database into Quattro Pro and displays it as a notebook. You can also view it using the Database Desktop; see the *Database Desktop Guide* for more details.

When using field names from external databases in a condition (discussed on page 294), use full linking to reference the block names. For example, to search an external database for records whose WAGE field is greater than 10, use the following condition:

```
+[C:\PARADOX\EMPLOY.DB]WAGE>10
```

Don't use link syntax in the first row of a criteria table or output block. For example, the previous condition in a criteria table appears as

WAGE
+[C:\PARADOX\EMPLOY.DB]WAGE>10

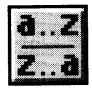
Sorting data

Sorting reorders a block (called the *sort block*) using specified columns within it. Quattro Pro uses the following rules for sorting:

- Each row in the sort block is one piece of data. When the cell in the key column moves, all data on the same row moves with it.
- Within the sort block, a column (or columns, as explained later in this section) called a *sort key* determines the order in which to place the information.
- Quattro Pro decides to move a row by checking whether the cell in the key column must move to put the data into proper order.

The quickest way to sort a block is to

1. Select the block to sort.
2. Hold the *Ctrl* and *Shift* keys and click in the column to sort by.
3. To sort the data in ascending order (lowest to highest), click the top half of the SpeedSort button (a..z) on the SpeedBar.
4. To sort the data in descending order (highest to lowest), click the bottom half of the SpeedSort button (z..a) on the SpeedBar.



See page 303 for more uses of the SpeedSort button.

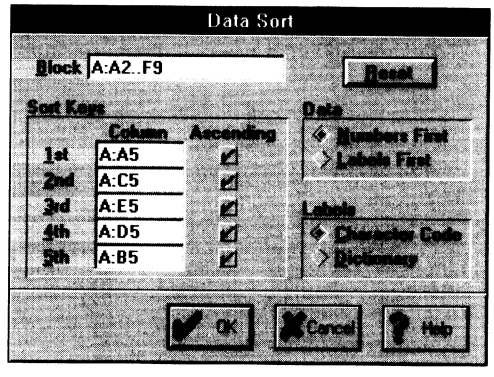
The remainder of this section discusses the more sophisticated sorting features found in Data | Sort. Commands discussed are in the Data | Sort dialog box unless otherwise noted.

Defining a sort block

To specify the data to sort, use Block in the Data | Sort dialog box. This block must be contiguous and confined to one notebook page. Anything outside this block remains in its original position. Sorts can reorder anything in the sort block.

Caution! Don't include extraneous blank rows in a sort block. They sort as data. If sorting a database block, don't include its first row (the row containing the field names).

Figure 13.5
The Data | Sort dialog box



Sort keys

Quattro Pro uses specified columns in the sort block to reorder data. These *sort keys* determine whether a row in the sort block moves. To specify a sort key, choose one of the edit fields under Column and select a cell or block in the column you want to sort by. Quattro Pro can sort by up to five sort keys. You can use the 1st through 5th edit fields (under Column in the Data | Sort dialog box) to define these key columns. Sort keys must be in the sort block, or the sort fails, and an error message appears.

Using additional sort keys

When sorting with one key, row placement can become uncertain when the items in the sort key are identical. Consider the following sort block:

A	B
Fernandez	Maria
Fernandez	John

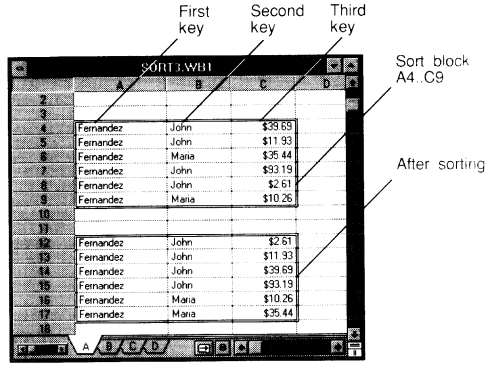
If this block is sorted in alphabetical order, using column A as the sort key, Quattro Pro might not place Maria Fernandez after John Fernandez. Since the sort never refers to column B, it can't use it to determine each row's placement.

Setting 2nd in the Data | Sort dialog box to the column B in this example ensures consistent ordering. It uses this logic: if the entries in column A of two rows are identical, check column B's entries to determine their order.

Expanding this logic defines a sort key as a column in a sort block used to compare two rows for sorting when the previous key is

identical. The next figure shows a sort block that uses three sort keys along with the result of sorting the block in ascending order.

Figure 13.6
A sort using three keys



Specifying sort order

If you're using descending order, and if your sort key contains values and labels, Quattro Pro places the values in a sorted group before the labels.

When defining a sort key, you can specify ascending or descending order. Ascending, the default, orders values in the sort key in numerical order, lowest to highest; labels are ordered alphabetically. Descending orders values high to low and labels in reverse alphabetical order. To specify descending order for a sort key, uncheck the Ascending check box. (An Ascending check box appears to the right of each sort key in the Data | Sort dialog box.)

The Labels option specifies how labels sort. Dictionary sorts labels like a dictionary; it disregards case and looks at each letter. For example, *alarm* precedes *Alice* when sorting in dictionary order. Character Code sorts using the following rules:

- Labels sort alphabetically according to the character code of their first letter. (See Appendix C for more information on character codes.)
- Labels beginning with special characters fall at the end.
- Uppercase letters precede lowercase letters.

Using Quattro Pro's Language property (found by right-clicking the application title bar and choosing International), you can use alternate character orderings. See page 387 for more details.

Using the SpeedSort button

The SpeedSort button lets you quickly set up sort keys and blocks, or re-sort data without using Data | Sort. To set up a sort block and sort keys using the SpeedSort button,

1. Select the block to sort.
2. Hold the *Ctrl* and *Shift* keys and click each column that should become a sort key. The click order determines the order of the sort keys. For example, clicking column A first makes it the first sort key, clicking column D makes it the second, and so on.

3. To sort the data in ascending order, click the top half the SpeedSort button. To sort the data in descending order, click the bottom half of the SpeedSort button. This also saves the sort settings.

After specifying sort settings this way, click the SpeedSort button whenever you want to re-sort the same block using the same keys. (Clicking the top half of the SpeedSort button re-sorts the data in ascending order; clicking the bottom half re-sorts the data in descending order.) Selecting a block and clicking SpeedSort makes that block the new sort block; sort keys defined previously are cleared.

Sorting tips

- If a sort block contains formulas referencing cells outside it, don't use relative addresses like `+A2`. These references adjust as if copied to their new position in the sort block. Make the references absolute (`+$A$2`) before sorting. References to cells within the sort block adjust properly.

Remember, you can use Edit | Undo to undo a sort operation.

- If you insert an extra column in the sort block *before* you sort the block, you can easily restore the block to its original order. After you insert the column, use Block | Fill to fill it with numbers. That way, you can specify this column as the first sort key whenever you want to restore the original order.
- Pad numbers stored as labels in the sort block with leading zeros or spaces. This ensures they sort in numerical order. For example, '5 and '100 won't sort properly unless entered as '005 and '100.

Confining data entry

Data | Restrict Input lets you restrict selector movement to unprotected cells in a specific contiguous block. This block can span multiple pages.

To use Restrict Input:

1. Unprotect the cells in the block that you want to allow changes to. (See page 81 for more information on unprotecting cells.)
2. Select the block, choose Data | Restrict Input and choose OK. INPUT appears on the status line to indicate INPUT mode is in effect.
3. Movement is restricted to the unprotected cells in the block you've selected. You can edit these cells (but you can't use menu commands). To exit INPUT mode, press *Enter* (with nothing on the input line), or *Esc*.

Restrict Input is useful for creating macros that handle form input. See "Command Equivalents" in Chapter 3 of *Building Spreadsheet Applications* for an example of a macro that uses Restrict Input to display a form for entering names and phone numbers into a database.

C H A P T E R

14

Data analysis

Quattro Pro offers a number of ways to analyze data and make predictions. Some of these analyze existing data; others create tables of new data. For example, you can build a table that predicts production rates based on an existing database, or see how many employees have salaries that fall within given ranges.

The following table lists analytical features described in this chapter. It includes the command for each feature and the page where its description starts.

Table 14.1
Matching tasks and commands

Task	Command	Page
Counting values within data intervals	Data | Frequency	306
Analyzing linear relationships between dependent and independent variables; trend analysis; predicting future values	Tools | Advanced Math | Regression	309
Multiplying two matrices to yield a third; for example, to estimate material needs across several job sites	Tools | Advanced Math | Multiply	317
Inverting matrices	Tools | Advanced Math | Invert	320
Substituting for one or two variables in a formula to create a table of formula results	Data | What-If	323
Goal seeking; adjusting one or more variables in a formula to maximize, minimize, or meet a target value	Tools | Solve For Tools | Optimizer	332 334

Table 14.1: Matching tasks and commands (continued)

Task	Command	Page
Solving linear equation sets with the same number of variables and expressions	Tools I Optimizer; Tools I Advanced Math I Invert and Multiply	334 321
Solving inequalities and equation sets that are nonlinear or have differing numbers of variables and constraints	Tools I Optimizer	334

In problems where the number of variables is equal to the number of constraints and the rows or columns of the matrix are linearly independent, Invert finds a solution. In such circumstances, the variable values are unique; there is one and only one solution.

If there are more constraints than variables, it's usually impossible to find values for the variables that satisfy all the constraints. But there are unique values that come closest to satisfying all the constraints. Regression solves for these unique values (see page 309).

If there are more variables than constraints, there are usually many possible values for the variables that satisfy the constraints. You can use Tools I Optimizer to find the best solution that maximizes or minimizes some function of the variables.

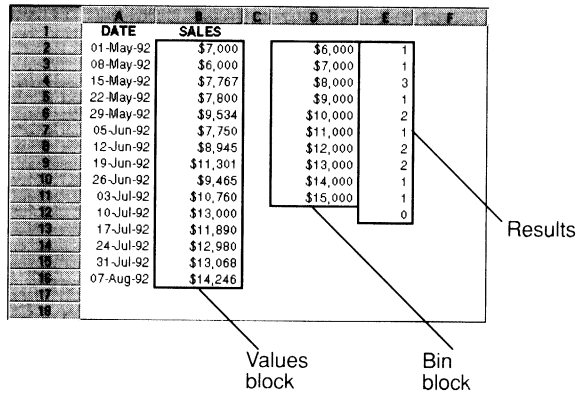
Frequency distributions

Frequency distributions show the number of values that fall within given value intervals. To create a frequency distribution table, you need

- One or more *blocks of values* to count.
- A *bin block* listing the value intervals—"bins"—for each count. Frequencies appear in the cell to the right of each bin.

The next figure shows a database with weekly sales figures. The accompanying frequency distribution (labeled Results) shows the number of weeks that sales were within each volume interval.

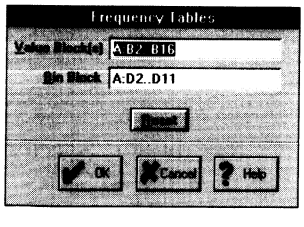
Figure 14.1
A table showing weekly sales distribution



Creating frequency distributions

To create a frequency distribution,

1. Set up a bin showing the intervals you want to analyze. The block must be a single column with a column of blank cells to the right (for the results). You can use Block | Fill to create the bin. The numbers must appear in ascending order, but the intervals can be unequal. The first number in the bin block represents any value less than or equal to that number. The remaining bin block numbers represent all values greater than the previous entry, up to and including that number.
2. Choose Data | Frequency. Make these entries in the Frequency Tables dialog box:



   - **Value Block(s)**, B2..B16 in Figure 14.1. You can specify one or more valid blocks; separate multiple blocks with commas (,). Labels are assigned a value of zero. Blank cells are not counted.
   - **Bin Block**, D2..D11 in Figure 14.1. Results appear to the right of the bin block, overwriting any data stored there.

   To delete these settings and enter new ones, choose **Reset**.
3. Choose OK to enter frequencies in the column to the right of the bin block.

The results block is one cell longer than the bin block; its last cell contains the number of values found that were greater than the final number in the bin. In the example in Figure 14.1, 1 value is equal to or less than $6,000; 2 values are greater than $9,000 but

equal to or less than $10,000; and 0 values are greater than $15,000.

Frequency results aren't updated automatically. If you change data in the values block or the bin, use Data | Frequency again to recalculate the distribution.

Other basic analyses

You can supplement the statistical information in your notebook with appropriate @functions. For example, the next figure includes these formulas at the end of the weekly sales column:

- `@SUM(B2..B16)` in B17, total sales
- `@COUNT(B2..B16)` in B18, the number of weeks
- `@AVG(B2..B16)` in B19, average sales per week

For a list of statistical @functions and more examples, see Chapter 1 of *Building Spreadsheet Applications*.

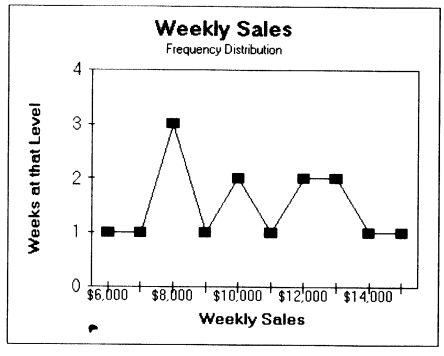
Figure 14.2
A frequency table with statistical @function calculations

	A	B	C
1	DATE	SALES	
2	01-May-92	$7,000	
3	08-May-92	$6,000	
4	15-May-92	$7,767	
5	22-May-92	$7,800	
6	29-May-92	$9,534	
7	05-Jun-92	$7,750	
8	12-Jun-92	$8,945	
9	19-Jun-92	$11,301	
10	26-Jun-92	$9,465	
11	03-Jul-92	$10,760	
12	10-Jul-92	$13,000	
13	17-Jul-92	$11,890	
14	24-Jul-92	$12,980	
15	31-Jul-92	$13,068	
16	07-Aug-92	$14,246	
17	Total	$151,506	@SUM(B2..B16)
18	Count	15	@COUNT(B2..B16)
19	Average	$10,100	@AVG(B2..B16)
20			

Graphing frequency distributions

It's easy to create an XY graph of a frequency distribution. Specify the bin block as the x-axis values and the results as the 1st Series of values (see Chapter 8 for details). The next figure shows an XY graph of the sales distribution results found in Figure 14.1.

Figure 14.3
An XY graph showing frequency distribution



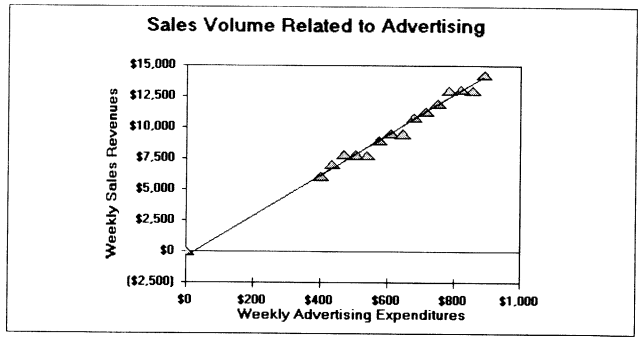
Regression analysis

Regression analysis shows the relationship between a set of independent variables and a certain dependent variable: *to what extent can a dependent variable be explained and predicted by one or more independent variables?* For example, you can estimate how the number of hours worked affects production, or how advertising expenditures affect sales.

The relationship between dependent and independent variables is a linear estimate. With one independent variable, regression analysis plots a *line of best fit* (regression line) through a scatter plot of each independent-dependent value pair.

For example, the next figure shows a scatter plot of the sample advertising-sales data shown on page 312.

Figure 14.4
A scatter plot with regression line



The solid regression line is the best expression of the relationship between advertising and sales.

Regression analysis estimates a model in which the dependent variable (y) is approximated by a linear combination of the independent variables ($x_1,\ldots,x_2$), either with or without a constant term.

Mathematically speaking, regression analysis finds values of $ß_1$, ..., $ß_k$ and C for each y so that the values of

$$C+ß_1x_1+\ldots+ß_kx_k+error$$

are as close to the values of y as possible (using the least-squares method). The values $ß_1$, ..., $ß_k$ and C are the values that minimize *SSE* (see *SSE* under *R Squared*, page 312).

ß (defined on page 313 as the *X Coefficient*) is the slope of the regression line and C, the *Constant* (defined on page 312), is the point where the regression line crosses the y-axis. In Figure 14.4, ß is 16.25 and C is 379.66. So, the equation of the regression line is

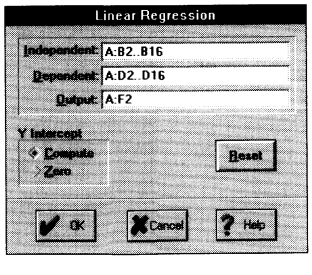
$$y = -379.66 + 16.25x$$

Because regressions assume a linear relationship, your results will be more accurate if your data closely match that linear model. To help you determine accuracy, Quattro Pro's regression output includes a standard error estimate, described on page 312.

Performing regression analyses

To perform a regression analysis,

1. Make sure the columns you want to use are the same length.
2. Choose Tools | Advanced Math | Regression to display the Regression dialog box.



- **Independent** specifies one or more columns of independent data (x), or the data you think may be affecting the dependent data.
- **Dependent** specifies the column of dependent data (y); in other words, the data you think may be affected by other variables.
- **Output** specifies the area where you want the regression results written.
- **Y Intercept** determines whether the y-intercept value is computed (Compute) or set to zero (Zero). In other words, you can force the regression line to intercept the y-axis at zero or compute the best-fit intercept. The default is Compute. See page 312 for y-intercept details.

- **Reset** returns the values in the Regression dialog box to the defaults.

3. Specify the block containing the independent data. Remember, this can be more than one column (Independent) as long as each independent variable is assigned to a different column and the same number of values is included for each variable. Independent data columns don't need to be adjacent; you can enter a list of blocks separated by commas. For example, this list defines six independent variables:

   ```
   A2..B8,D2..D8,F5..H11
   ```

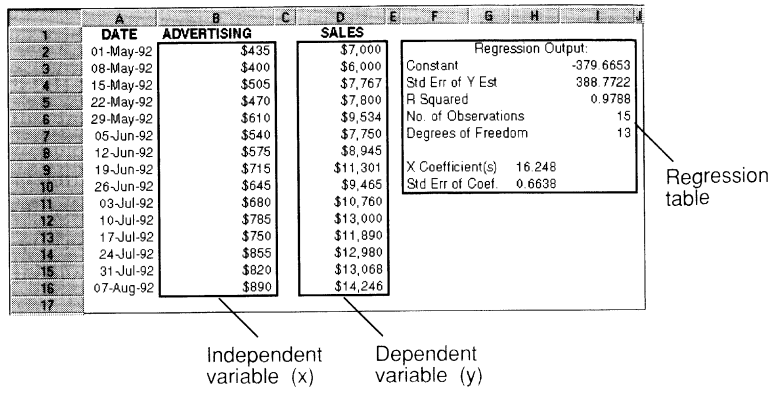
4. Specify the column that contains the dependent data (Dependent).
5. Specify the upper left cell of the block where you want to write the regression information (Output). This block, nine rows deep, will be three columns wider than the number of columns in the independent block. Make sure to leave enough blank space, or the information block overwrites underlying data.
6. To force the y-intercept value to zero, choose Zero. Compute is the Y Intercept default.
7. Choose OK.

Quattro Pro doesn't automatically update regression tables. If you alter the values in the independent and dependent blocks, you must use Tools | Advanced Math | Regression again to see the new results.

Sample regression table

The next figure shows a sample database and regression table. The database tracks the amount of money spent per week on advertising and the total sales per week. The regression analysis shows the relationship between advertising expenses and total sales. Total sales is the dependent variable; advertising money is the independent variable. The question is, how does the number of sales per week depend on advertising dollars spent per week?

Figure 14.5
A regression analysis table



The independent variable block is B2..B16; D2..D16 contains the dependent variable. The regression table displays in block F2..I10.

Regression data

The regression table contains this data (as shown in Figure 14.5):

- **Constant** is the y-axis intercept of the regression. It's zero if you specified Zero for Y Intercept. Otherwise, Quattro Pro generates it from an internal set of dummy variables.

  Note: Some data sets include a column of constant values or a set of dummy variables for estimating the constant value. If this is the case with your data, make sure Y Intercept is set to zero. Otherwise, your data will be singular (see page 321) and Quattro Pro can't compute regression data.

- **Std Err of Y Est** is the estimated standard error of the y values. It represents the deviation of the observed y values from the values of the linear combinations:

  $$C+\beta_1 x_1+\ldots+\beta_k x_k+error$$

  This standard error is computed using the square root of *SSE* divided by *Degrees of Freedom* (see the following definition). It is a measure of regression accuracy—that is, how closely your data conforms to the ideal regression line projected through it.

- **R Squared**, also known as *variance*, is a statistic that shows the strength of the relationship between the independent and dependent variables. It ranges from 0 to 1, where 1 shows a perfect relationship. For example, if each dependent value is equal to the independent value + 2, R Squared calculates as 1. *R Squared* is defined like this:

Let B be the average of the y observations, and let

SSR = sum of squares of $(C + \beta_1 x_1 + \ldots + \beta_k x_k - B)$
SSE = sum of squares of $(C + \beta_1 x_1 + \ldots + \beta_k x_k - y)$
SST = sum of squares of $(y - B)$

Then,

$$R\ Squared = 1 - \frac{SSE}{SST}$$

In the case where the y-intercept (C) is computed rather than forced to zero, then

$$SST = SSR + SSE$$

In that case, *R Squared* can also be defined as *SSR/SST*.

- **No. of Observations** is the total number of dependent (y) values, or, equivalently, the number of values for any of the independent (x) variables.
- **Degrees of Freedom** is the number of observations minus the number of independent values being computed by the regression.
  - If you have specified the y-intercept (C) to be 0, *Degrees of Freedom* equals (number of observations) – (number of independent x variables).
  - If Quattro Pro must compute the y-intercept (C) then *Degrees of Freedom* equals (number of observations) – (number of independent x variables) + 1.

  If *Degrees of Freedom* is less than 0, an error message displays.
- **X Coefficient(s)** are the coefficients $A_1, \ldots, A_k$ of the independent (x) variables in the model.
- ***Std Err of Coef.*** gives an error estimate of the coefficients (the A_n values in the $A_n x_n$ terms), assuming that
  - the model is valid
  - you can attribute the observed values' deviations from the model to a Gaussian distribution of errors

You should interpret each coefficient as the given *X Coefficient* value *plus or minus* the corresponding standard error of coefficient. There is one value of *X Coefficient*(s) and one value of *Std Err of Coef.* corresponding to each Independent (x) variable.

Sample application

You can use regression analysis results for sales projections and other value estimates. For example, you can use the weekly sales figures shown in Figure 14.5 to project future sales on the basis of advertising money. The formula for this example is

Constant + *X Coefficient* * *Advertising Money*, or
–379.665 + (16.248 * *Advertising Money*)

To do this, set up a column of proposed advertising figures, as shown in column B of the next figure (for convenience, use Block | Fill). Then create a column of projected sales figures based on the numbers in the Advertising column. Set up the Sales heading, then enter this formula in cell D23:

```
$I$3+$H$9*B23
```

Copy the formula into block D24..D37. The next figure shows the results.

Figure 14.6
Projected sales predicted with a regression table

This figure is an extension of Figure 14.5.

	A	B	C	D	E	F	G	H
21		**Proposed**		**Projected**				
22		**Advertising**		**Sales**				
23		$800		$12,619		= +$I$3+$H$9*B23		
24		$850		$13,431				
25		$900		$14,244				
26		$950		$15,056				
27		$1,000		$15,868				
28		$1,050		$16,681				
29		$1,100		$17,493				
30		$1,150		$18,306				
31		$1,200		$19,118				
32		$1,250		$19,931				
33		$1,300		$20,743				
34		$1,350		$21,555				
35		$1,400		$22,368				
36		$1,450		$23,180				
37		$1,500		$23,993				
38								

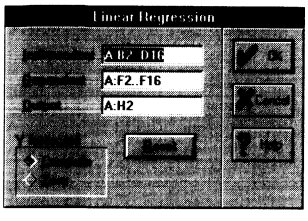
By adding other related independent variables, you can increase the accuracy of your estimates. The next figure shows the same database with two added columns—Reps/Day and Hours Open.

Figure 14.7
Two columns added to the sales database

	A	B	C	D	E	F	G
1	DATE	ADVERTISING	REPS/DAY	HRS. OPEN		SALES	
2	01-May-92	$435	5	65		$6,589	
3	08-May-92	$400	5	65		$6,000	
4	15-May-92	$505	7	65		$7,767	
5	22-May-92	$470	8	65		$7,178	
6	29-May-92	$610	7	60		$9,534	
7	05-Jun-92	$540	9	76		$8,356	
8	12-Jun-92	$575	8	70		$8,945	
9	19-Jun-92	$715	8	70		$11,301	
10	26-Jun-92	$645	8	70		$10,123	
11	03-Jul-92	$680	9	76		$10,712	
12	10-Jul-92	$785	7	70		$12,479	
13	17-Jul-92	$750	9	70		$11,890	
14	24-Jul-92	$855	10	76		$14,523	
15	31-Jul-92	$820	10	76		$14,988	
16	07-Aug-92	$890	11	76		$15,202	
17							

Dependent variable (y)

Independent variable (x1) | Independent variable (x2) | Independent variable (x3)



By creating a regression table that includes these two new factors, you can see how all three variables affect total sales. To do so, include the two new columns in the Independent block (B2..D16) and specify the Sales column (F2..F16) as the Dependent block. (Be sure Y Intercept is set to Compute.) The regression table in the next figure gives coefficient results for each independent variable.

Figure 14.8
A regression table with three independent variables

	G	H	I	J	K	L	M
1							
2			Regression Output:				
3			Constant		-2411.42433		
4			Std Err of Y Est		463.2979548		
5			R Squared		0.981389289		
6			No. of Observations		15		
7			Degrees of Freedom		11		
8							
9			X Coefficient(s)	17.715859	188.2998835	-2.6699599	
10			Std Err of Coef.	1.2418209	176.3035367	42.4953278	
11							
12							

Using the data in this table, you can expand the Projected Sales table to include projected Reps/Day and Hours Open. First, add these two columns with projected figures to columns C and D of the Projected Sales table. Then, in the first cell under Sales (F23), enter this formula: `$K$3+B23*$J$9+C23*$K$9+D23*$L$9`.

The formula is based on this format:

Constant
+ (*1st Indep. Value* * *1st X Coefficient*)
+ (*2nd Indep. Value* * *2nd X Coefficient*)
+ (*3rd Indep. Value* * *3rd X Coefficient*)

All references to the regression table must be absolute; others must be relative.

Copy this formula to other cells in the column (F24..F37). The results are calculated automatically (see the next figure).

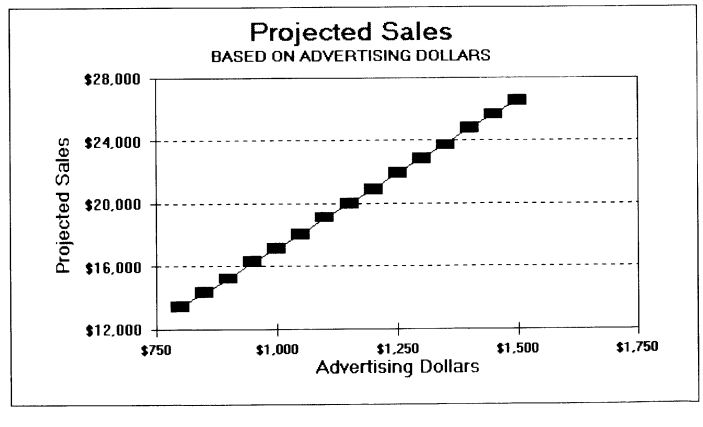
Figure 14.9
Projected sales based on three independent variables

	B	C	D	E	F	G	H	I	J	K
20										
21		Proposed			Projected					
22	Advertising	Reps/Day	Hrs. Open		Sales					
23	$800	10	70		$13,457	= +$K$3+B23*$J$9+C23*$K$9+D23*$L$9				
24	$850	10	70		$14,343					
25	$900	10	70		$15,229					
26	$950	11	70		$16,303					
27	$1,000	11	76		$17,173					
28	$1,050	11	76		$18,059					
29	$1,100	12	76		$19,133					
30	$1,150	12	76		$20,018					
31	$1,200	12	86		$20,878					
32	$1,250	13	86		$21,952					
33	$1,300	13	86		$22,837					
34	$1,350	13	86		$23,723					
35	$1,400	14	90		$24,787					
36	$1,450	14	90		$25,672					
37	$1,500	14	90		$26,558					
38										

You can see how projected sales would be affected if you increased advertising expenditures, sales representatives, and store hours. You can experiment with these results by adjusting the values in the first three columns.

A regression table is also a good way to set up an XY graph showing projected values. In the next figure, projected advertising figures were assigned to the x-axis, and projected sales figures calculated with the regression table were assigned to the first series.

Figure 14.10
An XY graph created with a regression table



Matrix operations

A *matrix* is a rectangular array of numbers. Matrixes can help you solve sets of linear formulas and equations. For example, suppose

you have these four unique equations describing variables w, x, y, and z:

$$1w+1x+2y+3z=10$$
$$3w+2x+2y+1z=20$$
$$1w+0x+3y+4z=15$$
$$1w+1x+0y+1z=6$$

You can express the coefficients of these equations (the numbers multiplying the variables w, x, y, and z) in this "4 by 4" coefficient matrix:

$$\begin{bmatrix} 1 & 1 & 2 & 3 \\ 3 & 2 & 2 & 1 \\ 1 & 0 & 3 & 4 \\ 1 & 1 & 0 & 1 \end{bmatrix}$$

For detailed information about matrixes, refer to any textbook on linear algebra.

And you can express the variables themselves in this "4 by 1" variable matrix:

$$\begin{bmatrix} w \\ x \\ y \\ z \end{bmatrix}$$

Choose Tools | Advanced Math | Invert and Multiply to solve matrix problems—sets of linear equations like the four equations above. When solving equation sets, Invert and Multiply find values for certain unknowns, or *variables*, subject to the condition that those values satisfy certain *linear constraints* on the variables. Each column in the matrix corresponds to one variable, and each row corresponds to a linear constraint:

- **Invert** performs an algebraic inversion on an existing "n by n" matrix and creates a matrix of the inversion numbers, the *invert matrix*.
- **Multiply** multiplies the values in two matrixes and displays the results in a third matrix.

Matrix multiplication

Matrix multiplication is helpful when you need to multiply the elements of one matrix by the elements of a second and sum their products. For example, matrix multiplication can combine several

types of building materials across development phases or compute job costs involving different labor categories.

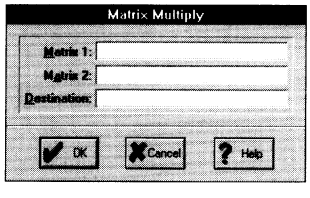
To perform matrix multiplication, you need two multiplication blocks (the coefficient matrix and the variables matrix) and a destination block (where Quattro Pro writes the results).

The number of columns in Matrix 1 (the coefficient matrix) and the number of rows in Matrix 2 (the variables matrix) must be equal. In other words, if Matrix 1 has four columns, Matrix 2 must have four rows.

The results of the matrix multiplication overwrite any data already in the output block.

The destination block can be any valid cell block; you need only specify the top left cell. The size of the destination block is determined by the sizes of the two multiplication blocks. For example, if you multiply a 5 (row) by 4 (column) matrix by a 4 by 1 matrix, the destination block will be 5 rows by 1 column.

Multiplying matrixes



To multiply two matrixes,

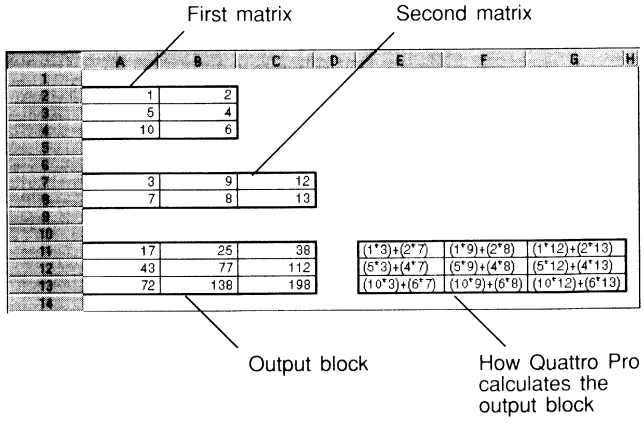
1. Choose Tools | Advanced Math | Multiply.
2. Specify Matrix 1 and Matrix 2, the matrixes to multiply.
3. Enter Destination, the top left cell of the area to hold the resulting matrix.

When you choose OK, Quattro Pro multiplies the two matrixes and displays the results in the destination block.

Matrix multiplication examples

The next figure shows three matrixes: two multiplication blocks and their output block.

Figure 14.11
A multiplied matrix



	A	B	C	D	E	F	G	H
1								
2		1	2					
3		5	4					
4		10	6					
5								
6								
7		3	9	12				
8		7	8	13				
9								
10								
11		17	25	38		(1*3)+(2*7)	(1*9)+(2*8)	(1*12)+(2*13)
12		43	77	112		(5*3)+(4*7)	(5*9)+(4*8)	(5*12)+(4*13)
13		72	138	198		(10*3)+(6*7)	(10*9)+(6*8)	(10*12)+(6*13)
14								

The block to the right of the output block shows how each output cell is calculated. For example, the top left cell of the output block is equal to

> [matrix 1, row 1, cell 1] times [matrix 2, column 1, cell 1] plus [matrix 1, row 1, cell 2] times [matrix 2, column 1, cell 2]

If the first two matrixes represent construction materials and project requirements, the output block shows total material needs for each project category.

Figure 14.12
Paint needs computed with matrix multiplication

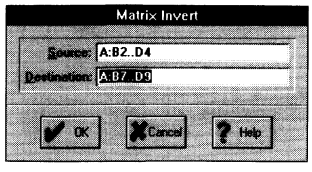
	A	B	C	D	E	F
1		Style A	Style B			
2	Enamel	1	2			
3	Semigloss	5	4			
4	Exterior flat	10	6			
5						
6		Site 1	Site 2	Site 3		
7	Style A	3	9	12		
8	Style B	7	8	13		
9						
10		Site 1	Site 2	Site 3		
11	Enamel	17	25	38		
12	Semigloss	43	77	112		
13	Exterior flat	72	138	198		
14						

The first matrix shows gallons of each type of paint needed for two house styles. The second matrix shows the number of each house style at three construction sites. The output matrix shows the amount of each type of paint needed for each site.

Matrix inversion

Matrix inversion is the first step in solving sets of linear equation. See page 321 for more about problem solving.

To invert a matrix,



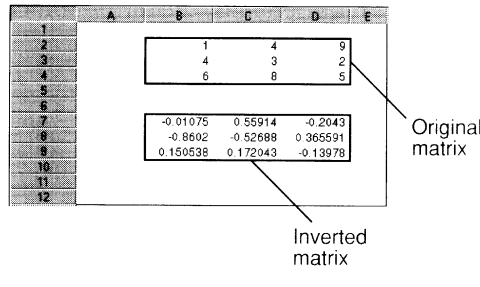
1. Choose Tools | Advanced Math | Invert.
2. Specify the Source, the matrix block to invert.
3. Specify the Destination, the upper left cell of the block to hold the inverted matrix.

When you choose OK, Quattro Pro inverts the matrix and writes the results into the destination block. Any existing data in that block is overwritten.

You can use Invert with "square" matrixes only (those with the same number of rows as columns). You can invert matrixes up to 90 rows by 90 columns.

The next figure shows two matrixes. The second is the inversion of the first.

Figure 14.13
An inverted matrix



When you multiply a matrix by its inverse, the resultant matrix is an *identity matrix*: all 1s and 0s, with only a single diagonal of 1s. For instance,

$$\begin{bmatrix} 3 & 4 \\ 5 & 6 \end{bmatrix} \text{ times } \begin{bmatrix} -3 & 2 \\ 2.5 & -1.5 \end{bmatrix} \text{ equals } \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

A matrix | Its inverse | An identity matrix

To return an inverted matrix to its original condition, use Tools | Advanced Math | Invert again.

Inversion exceptions

There are some square matrixes that can't be inverted; for example,

$$\begin{bmatrix} 1 & -2 \\ -1 & 2 \end{bmatrix} \qquad \begin{bmatrix} 1 & 2 & 2 \\ 2 & 4 & 4 \\ -1 & 2 & 3 \end{bmatrix}$$

These are called *singular matrixes*. Singular matrixes can't be inverted because the corresponding system of linear equations would have redundancies or inconsistencies in it and would not be truly square.

A *redundancy* is when one equation is a variation on another equation or is a combination of equations. For example, this system of linear equations has a redundancy because the third equation is actually the sum of the first two, so it's not unique:

$$\begin{aligned} 1x + 2y + 3z &= 10 \\ 2x + 3y + 5z &= 15 \\ 3x + 5y + 8z &= 25 \end{aligned}$$

An *inconsistency* is when two equations are essentially identical, but give conflicting results. For example, this system has an inconsistency because the second and third equations give conflicting results for the variables (to see this, divide the third equation by 10):

$$\begin{aligned} 1x + 2y + 3z &= 10 \\ 2x + 3y + 5z &= 15 \\ 20x + 30y + 50z &= 150 \end{aligned}$$

Solving equations with matrix inversion

You can use matrix arithmetic to solve sets of "square" linear equations—those with the same number of rows and columns in the coefficient matrix. For example, consider this set of linear equations:

$$\begin{aligned} 2x + 3y &= 31 \\ x + 2y &= 19 \end{aligned}$$

Follow these steps to solve them with matrix inversion and multiplication:

1. First, invert the coefficient matrix (on the left) to get the *invert matrix* (on the right):

$$\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix} \text{ inverts to } \begin{bmatrix} 2 & -3 \\ -1 & 2 \end{bmatrix}$$

A matrix Its inverse

2. Then, multiply the invert matrix (on the left) by the constant terms (on the right):

$$\begin{bmatrix} 2 & -3 \\ -1 & 2 \end{bmatrix} \text{ times } \begin{bmatrix} 31 \\ 19 \end{bmatrix}$$

The inverse Constants

to reach the solution:

$$\begin{bmatrix} 5 \\ 7 \end{bmatrix}$$

Solution

3. The solution is a matrix that gives the values for x and y that satisfy the original matrix multiplication problem:

$$\begin{bmatrix} 2 & 3 \\ 1 & 2 \end{bmatrix} \text{ times } \begin{bmatrix} 5 \\ 7 \end{bmatrix} \text{ equals } \begin{bmatrix} 31 \\ 19 \end{bmatrix}$$

Coefficients Solution Constants

So, the solution to the pair of linear equations is $x = 5$, $y = 7$.

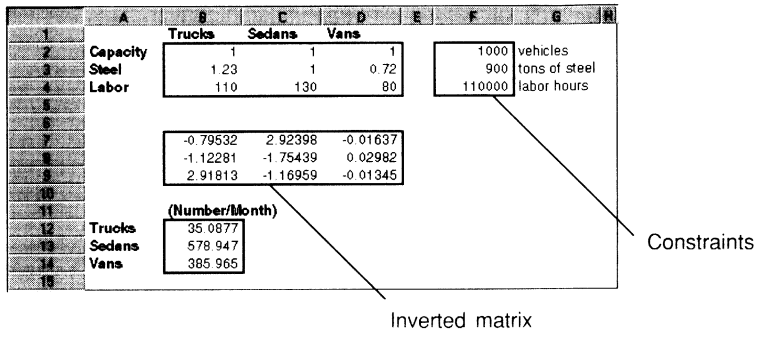
Another example

Suppose a car factory builds trucks, sedans, and vans. Each month, it obtains 900 tons of steel, has 110,000 hours of assembly labor available, and can produce a maximum of 1000 vehicles. You can express this information as a set of linear equations where each vehicle is a variable (W, X, Y) and the capacity, material, and labor factors are constraints (coefficients have been added to the steel and labor variables based on information not mentioned here):

Capacity: $W + X + Y = 1000$
Steel: $1.23W + X + 0.72Y = 900$
Labor: $110W + 130X + 80Y = 110{,}000$

The next figure illustrates the coefficient matrix, invert matrix, and solution to this problem.

Figure 14.14
Vehicle production mix calculated with matrix arithmetic



The inversion of block B2..D4 displays in block B7..D9. Multiply block B7..D9 by block F2..F4 to solve the problem. The results display in output block B12..B14; they represent a solution that satisfies the constraints in block F2..F4.

Matrix inversion and multiplication help you solve sets of equations where there are the *same number* of variables as constraints, the sum of variables times coefficients is *equal* to the constraint constant, and you don't need an *optimal* solution—the most profitable vehicle mix, for example. If your analysis needs don't match these limitations, perhaps Optimizer can help. See page 334 for details.

"What-if" tables

Matrix arithmetic can help you find a mix of unknown variable values that equal known values (constraints). But sometimes you want to do the opposite, and generate data by substituting known values for one or two formula variables.

You can use Data | What-If to create data blocks—called what-if (or sensitivity) tables—that display a range of possibilities given different circumstances. For example, you can prepare tables that answer these questions: "What if my company's business expendi-

tures increase 10%? 15%? 20%? And what if, at the same time, production increases 10%-25%?"

The next section describes one-variable what-if tables, which show the effects of altering one variable. See page 329 for a description of two-variable tables.

You can create basic tables that use data you supply, or ones that refer to data already entered in the notebook.

A basic one-variable table

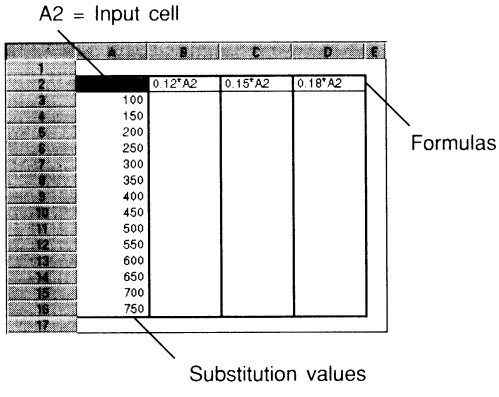
A basic one-variable what-if table substitutes values for one variable in one or more formulas. To create one, you set up a column of figures to use as substitutions, and set up formulas that reference a blank cell (the input cell). Then you use Data | What-If | One Free Variable to calculate the formulas repeatedly, inserting a different substitution value each time. The table is independent from other data in the notebook.

For example, suppose you want to set up a table that shows commissions earned for a range of sales amounts. Employees receive three different commission rates: 12%, 15%, and 18%. First, create a column of figures that reflect the sales range you want to show. Choose any empty area of the notebook. Don't use cell A2, because the top left cell of the table must be blank. (If the figures increase at regular intervals, you can use Block | Fill to enter the numbers.) In this case, enter a range from 100 to 750 with intervals of 50 (see the next figure).

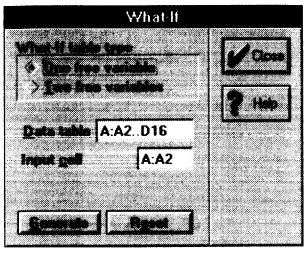
Next, enter formulas to calculate the commissions. Use one formula for each commission rate. Enter the formulas above and to the right of the substitution values—in this case in B2, C2, and D2 (see the next figure). (The format for these cells has been changed to Text to display the formulas.)

Each formula references a blank cell (A2). This is the input cell; each substitution value will be put in this cell, one at a time, to create the table. The input cell can be any cell outside the table.

Figure 14.15
Preparing data for a basic one-variable what-if table



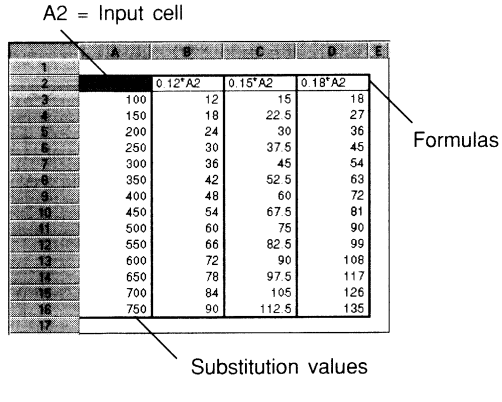
Now you're ready to build the table:



1. Choose Data | What-If to display the What-If dialog box.
2. Check One Free Variable.
3. Specify the data table block, including formulas and substitution values; in this case, `A2..D16`.
4. Specify the input cell, the blank cell referenced by the formulas; in this case, `A2`.
5. Check the dialog box settings. If you need to change them, Reset clears all settings.
6. Choose Generate.

Table values appear beneath each formula. For example, the table in the next figure shows commissions for each value in the range.

Figure 14.16
The finished commission table



To fill in the table values, Quattro Pro moves down each column, enters each row's substitution value in the input cell, recalculates the formula at the top of that column, and places the result in the cell.

If you change a formula in the first row, or any substitution value in the first column, choose Generate again to see the results. Recalculating the notebook does not recalculate the formulas. You can press *F8* to update the most recently created table.

Using a one-variable table with a database

A what-if table can be a helpful supplement to existing database information. You can create a table that uses information in a database without affecting the database itself.

Suppose you want to determine what your net income might be in 1995. Your boss promised you a yearly 10% raise, and the current inflation rate is 6.5%. You created a database projecting yearly gross income (based on a yearly 10% increase), expenses (based on a 6.5% yearly increase), and net income (subtracting expenses from gross income) as shown in the next figure.

Figure 14.17
A database projecting yearly income

	A	B	C	D	E	F
1		1991	1992	1993	1994	1995
2	Gross Income	$55,000	+A3+A3*$B$6	$66,550	$73,205	$80,526
3	Bus. Expense	$10,016	+B3+$B$9*B3	$11,360	$12,099	$12,885
4	Net Income	$44,984	+D1-D2	$55,190	$61,106	$67,640
5						
6	Salary Increase:	10.00%				
7						
8						
9	Inflation Rate:	6.50%				
10						

You want to see what happens to your projected income if the inflation rate rises or drops. Although you can experiment by entering different values in the Inflation Rate cell (B9) and recording how it changes values in the Net Income field, creating a what-if table is more efficient. It's quicker, and it shows all the possibilities at once.

To create the table shown in the next figure:

1. Below the database, enter a range of inflation rates to experiment with. Figure 14.18 shows inflation rates ranging from 5% to 9.0%.

2. Above and to the right of the list, enter `+F4`, the address of the cell that shows net income in 1995.
3. If you want to see the effects of inflation on expenses, enter `+F3` in the cell to the right of where you entered `+F4`.
4. Choose Data | What-If.
5. Check One Free Variable.
6. Specify the data table by pointing or entering a cell block. (In Figure 14.18, the table extends from B9 through D18.)
7. Specify `B9` as the input cell, the cell to hold the range of substitution values for the inflation rate.
8. Choose Generate.

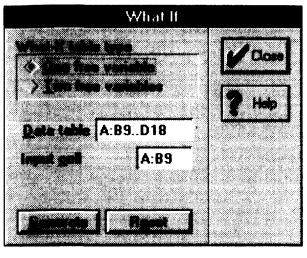


Figure 14.18
A table showing expenses and net income at different inflation rates

	A	B	C	D	E	F
1		1991	1992	1993	1994	1995
2	Gross Income	$55,000	$60,500	$66,550	$73,205	$80,526
3	Bus. Expense	$10,016	$10,016	$10,016	$10,016	+E3+$B$9*E3
4	Net Income	$44,984	$50,484	$56,534	$63,189	+F2-F3
5						
6	Salary Increase:	10.00%				
7			1995 Net Income	1995 Bus. Expenses		
8			+F4	+F3		
9		5.00%	$68,351	$12,175		
10	Inflation Rates	5.50%	$68,117	$12,408		
11		6.00%	$67,881	$12,645		
12		6.50%	$67,640	$12,885		
13		7.00%	$67,397	$13,129		
14		7.50%	$67,149	$13,376		
15		8.00%	$66,899	$13,627		
16		8.50%	$66,645	$13,881		
17		9.00%	$66,387	$14,138		
18						
19						

Input cell — Data table

Using database functions in a one-variable table

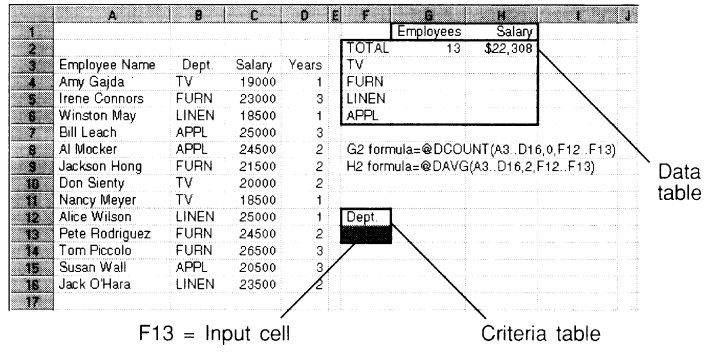
When you set up a what-if table that references a database, you can use database @functions to calculate values in the table. The database in the next figure lists employees, their departments, their salaries, and the number of years they've been with the company.

Figure 14.19
An employee database

	A	B	C	D
1				
2				
3	Employee Name	Dept.	Salary	Years
4	Amy Gajda	TV	19000	1
5	Irene Connors	FURN	23000	3
6	Winston May	LINEN	18500	1
7	Bill Leach	APPL	25000	3
8	Al Mocker	APPL	24500	2
9	Jackson Hong	FURN	21500	2
10	Don Sienty	TV	20000	2
11	Nancy Meyer	TV	18500	1
12	Alice Wilson	LINEN	25000	1
13	Pete Rodriguez	FURN	24500	2
14	Tom Piccolo	FURN	26500	3
15	Susan Wall	APPL	20500	3
16	Jack O'Hara	LINEN	23500	2

Suppose you want to see the number of employees and average salary within each department. Set up the notebook as shown in the next figure.

Figure 14.20
Preparing the notebook for a table



To create the notebook as shown,

1. To the right of the employee database, in cells F3..F6, list the departments as the first column of the data table (instead of the usual range of values).
2. Outside the data table, set up a mini-criteria table. Enter the field name `Dept.` in cell F12. The blank cell F13 is the input cell. Both cells will be referenced by formulas in the data table.
3. In cell G2, enter this formula:

   ```
   @DCOUNT(A3..D16,0,F12..F13)
   ```

   The first argument (A3..D16) refers to the entire database (you can also use a block name here). The second argument (0) specifies an offset of 0, referring to the first column of data.

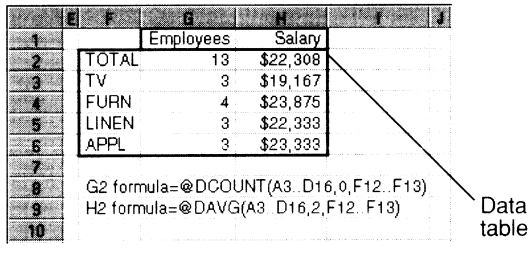
The third argument (F12..F13) refers to the table you set up in step 2. This formula counts the number of employees in the Employee Name column in relation to the department shown in the criteria table.

4. In cell H2, enter this formula:

   ```
   @DAVG(A3..D16,2,F12..F13)
   ```

   This formula averages the values in the third column of the database (Salary) in relation to the department shown in the criteria table.
5. Choose Data | What-If.
6. Check One Free Variable.
7. Specify `F2..H6` as the data table.
8. Specify `F13` as the input cell.
9. Choose Generate to produce the results shown in the next figure.

Figure 14.21
A table showing number of employees and average salary per department



For more information on database @functions, see Chapters 1 and 2 of *Building Spreadsheet Applications*.

Basic two-variable tables

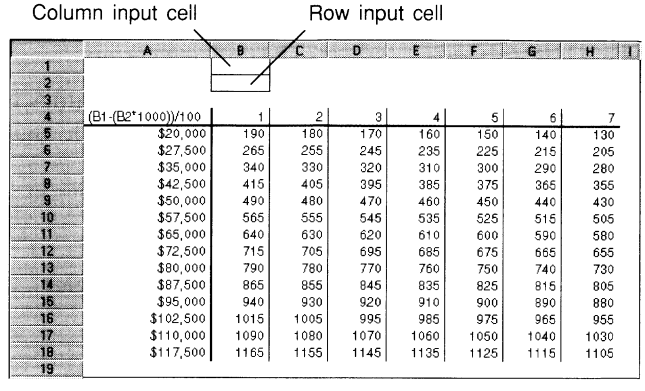
Two-variable what-if tables show values computed by varying two variables in a formula. Unlike one-variable tables, you can use only one formula. You can create a two-variable table in conjunction with a database or build basic tables completely separate from the other information in the notebook. Basic two-variable tables use only the data you supply to calculate values.

For example, suppose you own a health club and want to try a sliding-scale fee schedule. You devise a formula to calculate individual yearly fees:

*Family Income – (No. of Dependents * 1000) / 100*

Now you want to build a lookup table to make it easy to pinpoint fees. The next figure shows such a table, created with Data | What-If.

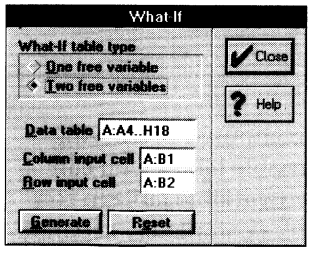
Figure 14.22
A sliding scale lookup table



	A	B	C	D	E	F	G	H
1								
2								
3								
4	(B1-(B2*1000))/100	1	2	3	4	5	6	7
5	$20,000	190	180	170	160	150	140	130
6	$27,500	265	255	245	235	225	215	205
7	$35,000	340	330	320	310	300	290	280
8	$42,500	415	405	395	385	375	365	355
9	$50,000	490	480	470	460	450	440	430
10	$57,500	565	555	545	535	525	515	505
11	$65,000	640	630	620	610	600	590	580
12	$72,500	715	705	695	685	675	665	655
13	$80,000	790	780	770	760	750	740	730
14	$87,500	865	855	845	835	825	815	805
15	$95,000	940	930	920	910	900	890	880
16	$102,500	1015	1005	995	985	975	965	955
17	$110,000	1090	1080	1070	1060	1050	1040	1030
18	$117,500	1165	1155	1145	1135	1125	1115	1105
19								

To build a table like this one,

1. Create a column of figures showing the first variable you want to include—in this case, salary range. Use Block | Fill to enter the values automatically.
2. Above and to the right of this column, create a row of values for the second variable—in this case, number of dependents.
3. In the top left cell of the table, enter the formula to calculate fees. In our example, B1 is the column input cell (salary), and B2 is the row input cell (the number of dependents). The formula is entered as `(B1-(B2*1000))/100`.
4. Choose Data | What-If to display the What-If dialog box.
5. Check Two Free Variables.
6. Specify the data table block, including both substitution ranges (that is, both the salary and dependents ranges): `A4..H18`.
7. Specify `B1` as the column input cell.
8. Specify `B2` as the row input cell.
9. Choose Generate.



You can build similar tables showing all kinds of information—for example, a mileage chart listing miles per gallon for different amounts of gas used and numbers of miles driven, or profit amounts for a range of prices and costs.

Using two-variable tables with a database

A two-variable what-if table can draw out and analyze information in a database. When you create this kind of table, you can use database @functions to calculate values. (See Chapters 1 and 2 in *Building Spreadsheet Applications* for descriptions of these functions.)

Reconsider the example of @functions in the one-variable table discussed on page 327. A what-if table was created to show the number of employees and average salary for each department. Using the same database, suppose you want to see how long people have been employed in each department.

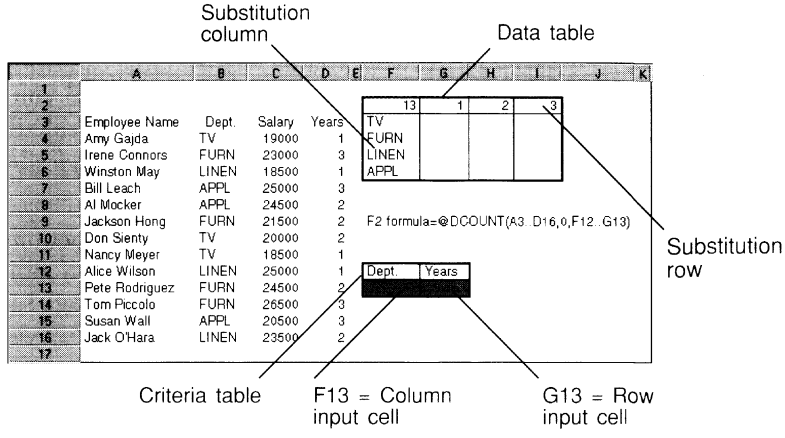
The next figure shows such a table (several columns were narrowed to show the whole table in one screen). A criteria table (F12..G13) is set up with two fields: Dept. and Years. The empty cells below the field headings are the input cells. The first column of the data table (F3..F6) lists each department. The first row (G2..I2) shows a range of years employed. The formula in cell F2 counts the number of employees for each department and employment length shown in the criteria table:

```
@DCOUNT(A3..D16,0,F12..G13)
```

Using this example,

1. Choose Data | What-If.
2. Check Two Free Variables in the What-If dialog box.
3. Specify F2..I6 as the two-variable data table, F13 as the column input cell, and G13 as the row input cell.
4. Choose Generate to produce the table.

Figure 14.23
A table showing employment lengths in each department



	A	B	C	D
3	Employee Name	Dept.	Salary	Years
4	Amy Gajda	TV	19000	1
5	Irene Connors	FURN	23000	3
6	Winston May	LINEN	18500	1
7	Bill Leach	APPL	25000	3
8	Al Mocker	APPL	24500	2
9	Jackson Hong	FURN	21500	2
10	Don Sienty	TV	20000	2
11	Nancy Meyer	TV	18500	1
12	Alice Wilson	LINEN	25000	1
13	Pete Rodriguez	FURN	24500	2
14	Tom Piccolo	FURN	26500	3
15	Susan Wall	APPL	20500	3
16	Jack O'Hara	LINEN	23500	2

	F	G	H	I
12	13	1	2	3
13	TV			
14	FURN			
15	LINEN			
16	APPL			

	F	G
12	Dept.	Years
13		

Goal seeking with Solve For

Usually, the formulas in a notebook are calculations from *existing* values. For example, this formula calculates a monthly car payment from the loan value in cell D1, the monthly interest rate in D4, and the term in months in D2:

```
@PMT(D1,D4,D2)
```

It's stored in D5 in the next figure.

Figure 14.24
Solving for a monthly loan payment

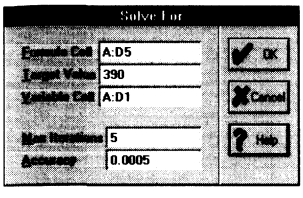
	A	B	C	D	E	F
2			**Term (months)**	48		
3			**Annual interest rate**	7.9%		
4			**Monthly interest rate**	+D3/12	=	0.66%
5			**Monthly payment**	@PMT(D1,D4,D2)	=	$423.97

Sometimes, though, you need to calculate a formula *backwards*—starting with the desired result, then solving for a variable that produces that result. For example, to arrive at a desired monthly car payment, you can repeatedly adjust one of the @PMT variables (such as the loan value in cell D1) until you reach the payment amount you want.

Tools | Solve For offers an easier and more direct way to solve this type of problem. Specify the *result* you want, then indicate which variable Quattro Pro can adjust to reach that result.

Solve For basics

When you choose Tools | Solve For, a dialog box appears with these options:



- **Formula Cell** is the cell containing the formula to calculate. The formula needs to reference the variable cell directly or indirectly.
- **Target Value** is the goal you want to meet. It can be a numeric value, a cell reference, or a formula, such as `+E9` or `@SUM(C3..C7)`. If you enter a formula, it is converted to a value; Target Value won't change if the referenced cell in the notebook changes.
- **Variable Cell** is the cell Quattro Pro can change to reach the target value.
- **Max Iterations** specifies the maximum number of calculation passes Quattro Pro can make when attempting to reach the target value.
- **Accuracy** indicates how close the formula cell value must get to the target value to solve the problem.

Solution steps

Follow these basic steps to solve for a desired result:

1. Choose Tools | Solve For to display the Solve For dialog box.
2. Specify the formula cell, target value, and variable cell.
3. Choose OK.

The results display in the formula cell and variable cell. If Undo is enabled, you can choose Edit | Undo to restore the original values.

A basic goal-seeking example

Suppose you're planning to buy a new car and want to keep the monthly payments at $390.00. The original plan was to borrow $17,400, but at 7.9% interest that amount requires a monthly payment of $423.97 (as shown in Figure 14.24).

To solve for a monthly payment of $390.00, try adjusting the loan amount:

1. Choose Tools | Solve For, and enter `D5` in the Formula Cell edit field. Cell D5 contains the formula `@PMT(D1,D4,D2)`. You want to bring this value down from $423.97 to $390.00.
2. Specify `390` as the target value, then enter `D1` in the Variable Cell edit field.
3. Choose OK.

Figure 14.25
Adjusting a payment with Solve For

	A	B	C	D	E	F
1			Car loan amount	$16,005.90		
2			Term (months)	48		
3			Annual interest rate	7.9%		
4			Monthly interest rate	+D3/12	=	0.66%
5			Monthly payment	@PMT(D1,D4,D2)	=	$390.00

The monthly payment in D5 changes to $390.00 and the loan amount in cell D1 changes to $16,005.90—almost $1400 less than before.

When you begin with realistic values in the variable cells, Solve For's search for a solution is more efficient.

Optimizer

While Solve For substitutes values in a single formula to meet a goal, sometimes you need to

- evaluate more than one formula
- solve sets of linear and nonlinear equations and inequalities
- find a minimum or maximum solution instead of an exact target
- find values that satisfy limits (constraints)

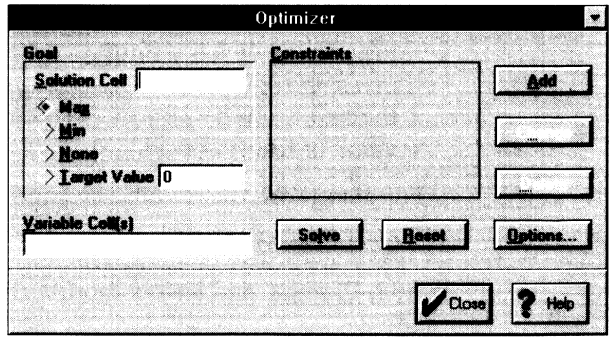
Tools | Optimizer can do everything Solve For does, and more.

Once you define a problem, you can save Optimizer settings for future use. You can print reports of interim and final problem solutions. The next sections introduce the Optimizer dialog box and its use in goal seeking and solving equation sets.

Optimizer basics

When you choose Tools | Optimizer, this dialog box appears:

Figure 14.26
Optimizer dialog box



- **Solution Cell** is the cell containing the formula you want to solve, maximize, or minimize. You don't have to reference a formula here; you can completely define the problem with constraint formulas. You must enter an arithmetical formula that returns a numeric value. The formula may be nested.
- **Max**, **Min**, and **None** indicate the type of result you're looking for—a maximum value for the formula in the solution cell, a minimum value, or neither (choose None if the problem doesn't have a solution cell). Choose **Target Value** if you want to reach an exact goal, and enter a value or a cell containing the value.
- **Variable Cell(s)** are one or more cells Quattro Pro can vary to solve the problem. These cells must contribute to the solution cell formula and/or constraints. For best results, they should already contain realistic values. These cells should not be protected, and cannot contain a date or text. If a variable cell contains a formula, it will be changed to a value.

  You can refer to the solution cell and variable cell(s) by block name or coordinates.
- **Constraints** are optional limits that help control Optimizer calculations. They have this format:

  Cell, *Operator*, *Constant*

  - *Cell*, the first term, can be one of the variable cells, or a cell that references it.

- *Operator* describes how *Cell* relates to *Constant*. It can be = (equal to), <= (less than or equal to), or >= (greater than or equal to).
- *Constant*, the second term, must be a value or a cell containing a value. It sets a limit on the first term. If *Operator* is <=, *Constant* represents the maximum value or upper bound for the first term; if =, it's an exact target; if >=, it's the minimum value or lower bound.

For details on constraints, see page 342.

The Optimizer dialog box buttons perform these actions:

- **Add**, **Change**, and **Delete** modify the highlighted Constraints entry.
- **Solve** finds a solution to the defined problem.
- **Options** displays the Options dialog box; you can save the current problem model, load a previously saved model, set a number of process and method options, and produce Optimizer reports (see page 349 for details).
- **Reset** clears the problem definition.

You'll learn more about the contents of these fields in the next sections, starting with the same basic goal-seeking problem example given for Solve For on page 332.

Goal seeking with Optimizer

Usually, the formulas in a notebook are calculations from *existing* values. For example, this formula from the Solve For example (shown in Figure 14.24 on page 332) calculates a monthly car payment from the loan value in cell D1, the monthly interest rate in D4, and the term in months in D2:

```
@PMT(D1,D4,D2)
```

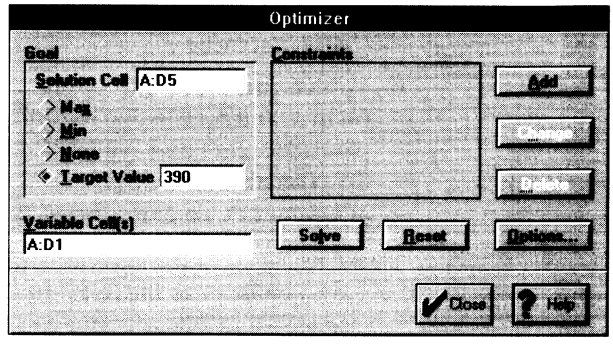
As in the earlier example, suppose you're planning to buy a new car and want to keep the monthly payments at $390.00. The original plan was to borrow $17,400, but at 7.9% interest that amount requires a monthly payment of $423.97 (as shown in Figure 14.24).

Cell D5 contains the formula `@PMT(D1,D4,D2)`.

To solve for a monthly payment of $390.00 using Optimizer:

1. Choose Tools | Optimizer, and specify `D5` as the solution cell. You want to bring this value down from $423.97 to $390.00.
2. Because you're looking for an exact value, choose Target Value and enter `390`.
3. Enter `D1` in the Variable Cell(s) edit field to vary the loan amount.

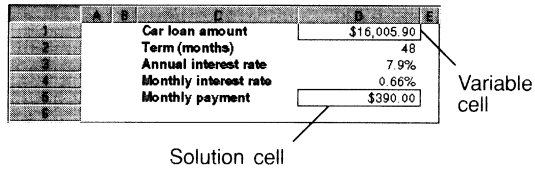
   The Optimizer dialog box looks like this:



4. Choose Solve.

The monthly payment in D5 changes to $390.00 and the loan amount in cell D1 changes to $16,005.90.

Figure 14.27
Loan payment and principal adjusted with Optimizer



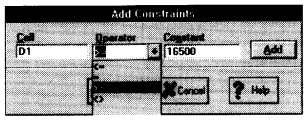
When Optimizer changes the value in the variable cells, formulas in the notebook that reference those cells adjust accordingly. If Undo is enabled, you can use Edit | Undo to restore the original values.

Goal seeking with multiple variables and constraints

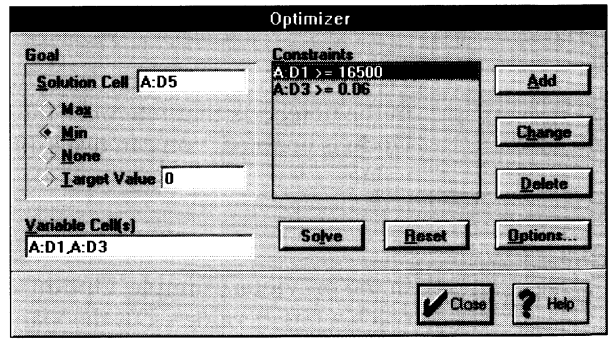
In the previous example, Optimizer changed only one cell to reach a target value—D1, the loan amount. Suppose you want to make the car payment as small as possible. You are willing to adjust several cells to reach that goal, provided you stay within a few limits.

To enter additional variables and constraints for the same example,

1. Choose Tools | Optimizer, and specify `D5` as the solution cell.
2. You want to minimize this value, so choose Min instead of Max or None.
3. You are willing to adjust the loan amount in D1 and the annual interest rate in D3 (D4 will change too, since it contains a formula that references D3). Enter `D1,D3` in the Variable Cell(s) edit field.
4. You've done some shopping and know that you'll need to finance at least $16,500 to buy the car you want with the down payment you have available. This is a constraint that affects D1. You also know that you'll pay at least 6% interest, affecting D3. To enter these constraints:



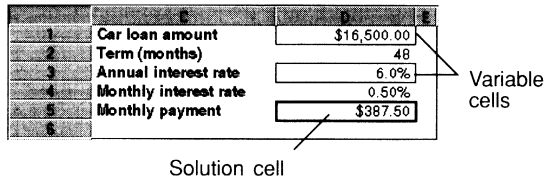
   - Choose Add (beside Constraints). Click the box beneath Cell and enter `D1` as the left term. Choose >= as the operator, since your loan amount can be equal to or greater than $16,500. Click the box beneath Constant and enter `16500` as the right term.
   - Choose Add to add the interest constraint.
   - Enter `D3` in the Cell edit field. Choose >= as the operator. Enter `.06` in the Constant edit field.
   - Choose OK to indicate that you aren't entering more values.
5. Check the constraint entries. If one is incorrect, highlight it and choose Change.
6. At this point, the dialog box looks like this:



7. Choose Solve.

As the next figure shows, D5 changes to $387.50—the monthly payment for a loan of $16,500 at 6% interest.

Figure 14.28
Optimizer solution with two constraints



Optimizer and "what-if" analysis

You can use Optimizer for "what-if" analysis. Suppose your sales manager has developed a new commission structure. If you meet your quota for the month, your commission percentage is higher and a $200.00 bonus is thrown in. You also have a monthly base salary (B1 in the next figure).

Figure 14.29
A notebook set up for Optimizer "what-if" analysis

	A	B	C	D	E
1	Base salary	$2,000		% if sales miss target	5.00%
2	Commission	@IF(B6>B5,B6*E2+200,B6*E1)		% if sales exceed target	8.00%
3	Total pay	+B1+B2			
4					
5	Sales target	$30,000			
6	Total sales				

Cell B2 calculates your commission based on your monthly sales total, and contains this formula:

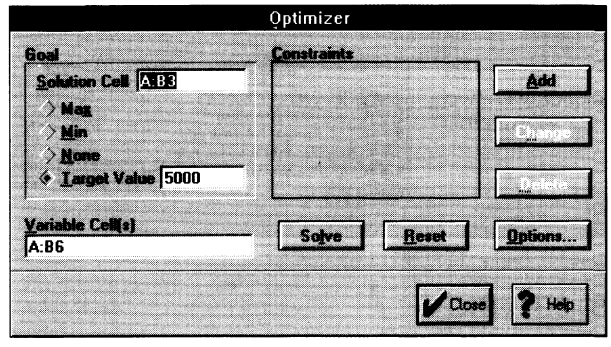
```
@IF(B6>B5,B6*E2+200,B6*E1)
```

This means if your total sales are greater than the target, multiply the total sales by 0.08 and add $200.00; otherwise, multiply the total sales by 0.05.

Suppose the current sales target is $30,000. To determine what your total sales must be to earn $5000 this month,

1. Choose Tools | Optimizer.
2. Specify `B3` as the solution cell.
3. Choose Target Value and enter `5000`.
4. Enter `B6` (total sales) in the Variable Cell(s) edit field.

The dialog box looks like this:



5. Choose Solve.

The new value in cell B6 shows that your sales must total $35,000 to bring this month's salary to $5000.00.

Figure 14.30
The Optimizer "what-if" solution

	A	B	C	D	E
1	Base salary	$2,000		% if sales miss target	5.00%
2	Commission	$3,000		% if sales exceed target	8.00%
3	Total pay	$5,000			
4					
5	Sales target	$30,000			
6	Total sales	$35,000			

As with the car payment problem, you can choose Max to maximize your salary and add a constraint, perhaps `B6<=$50,000` if you think you can't sell more than $50,000. With these changes, B3 increases to $6200.00.

This error message might display when you try to solve a problem: `No feasible solution found`. If this happens, verify that cell references are correct. Then, try adding constraints that set upper and lower bounds. For example, in the income problem a lower boundary could be `B6>=0`. For details, see page 346.

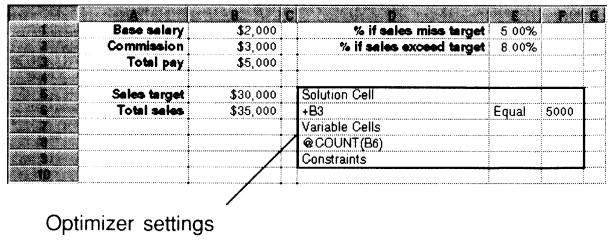
Saving and loading Optimizer settings

The most recent Optimizer settings are saved in the notebook when you choose File | Save. You can save more than one group of settings, though. To save settings before solving a different problem, choose Options from the Optimizer dialog box, then choose Save Model.

When the Save dialog box displays, enter the block to hold the settings. You just need to enter the cell in the upper left corner of

the Save block, but be sure there are blank cells to the right of and below that cell so existing data won't be overwritten. If you have a constraint, the settings take up a block at least three columns wide and six rows deep. The settings in the next figure were saved in D5.

Figure 14.31
Optimizer settings saved in a notebook



When you're ready to solve the same problem again, choose Load Model on the Optimizer Options dialog box and enter the block (or upper left corner) where the settings are saved. If some conditions have changed, edit the settings, then save the new definition in the same block.

If you're solving a problem that's similar but not identical to a saved definition, load and change the settings then save them in a different block.

It's easier to load and save models if you name the blocks they're saved in. Use meaningful names so you can identify the models easily. Then, when you're loading models, you can press *F3* for a choice list.

Solving for more than one variable

Goal-seeking problems focus on a single variable, the solution cell. Other problems need a set of solutions that meet their constraints. Optimizer can handle sets of equations and inequalities, linear and nonlinear. If one expression is more important than another—for example, profit—you can enter an appropriate solution cell and find the set of solutions that best fits the Min/Max/Target Value settings and constraints.

To solve problems with multiple variables:

1. Assign a cell to each variable.
2. Enter the variable cells and constraints in the Optimizer dialog box.

3. Choose Solve to find a solution.

The solution displays in the variable cells. If Undo is enabled, you can choose Edit | Undo to restore the original values.

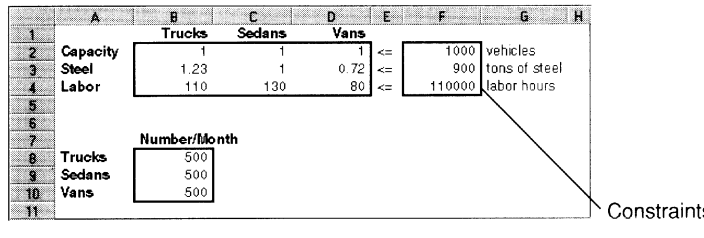
Assigning variables to cells

Variables are the parts of a mathematical expression that are free to change values—x, y, and z. In real-world terms, they are what we measure and count—cars, houses, and people, for example.

Before using Optimizer, you must designate certain data in the notebook as variable values and set aside a cell for each variable. The variables in your system can be any real numbers as long as they satisfy certain constraints (real-world limitations) and fall within certain bounds.

For example, the next figure illustrates the car factory described on page 322. Block B2..F4 contains the problem; the constraint operators are now inequalities (<= instead of =).

Figure 14.32
Car factory production notebook



The variables are trucks, sedans, and vans. The variable cells are B8..B10.

Each variable cell contains a starting value. When you begin with a realistic value in those cells, Optimizer's iterative search for a solution is more efficient. If the starting value is way out of range, Optimizer might not reach a solution within the time or maximum iterations allowed (page 349 describes maximum iterations).

Identifying constraints

Constraints are limitations placed on variables. If you're trying to optimize a manufacturing operation, for example, the amount of resources available is a constraint; you don't have endless supplies, or an infinite number of work-hours per month. Capacity is also a constraint; you can't manufacture an unlimited number of products. These limitations can be expressed as algebraic expressions and entered into Optimizer to yield solutions.

For example, the car factory in the previous figure builds trucks, sedans, and vans. If it can produce no more than 1000 vehicles per month, this is a constraint:

(# trucks) + (# sedans) + (# vans) ≤ 1000

Having only 900 tons of steel to work with per month is also a constraint:

(truck steel) + (sedan steel) + (van steel) ≤ 900 tons

And, because work-hours are limited by the number of employees and how many hours they can each work per month, the time that can be allotted to manufacturing the vehicles is another constraint:

(truck hours) + (sedan hours) + (van hours) ≤ 110,000 hours

These limits are entered in block B2..F4 in Figure 14.32.

Linear and nonlinear constraints

Optimizer can handle linear and nonlinear constraints:

- Constraints are *linear* when the algebraic statements express relationships where the variables are being *added* (or subtracted) in various combinations. For instance, if *W* is the number of trucks, *X* the number of sedans, and *Y* the number of vans, these are some additive relationships that express car factory constraints (the variable coefficients come from other information not given here):

  $W+X+Y \leq 1000$
  $1.23W+X+0.72Y \leq 900$
  $110W+130X+80Y \leq 110,000$

- Constraints are *nonlinear* when the relationships between the variables are not additive. For example, if an algebraic statement includes components like `x*y` or `5/x` or w^2, the relationship is nonlinear. Optimizer can handle nonlinear problems with the appropriate Options setting (see page 349 for details). Here are some nonlinear constraints:

  $WX+X+Y+XY/2 \leq 200$
  $3(XY)+X^2+4/Y \leq 5000$

Inequality and equality relationships

The constraints on the system can be *equality* constraints, such as

$2W+5X+3Y+Z=1000$

Or they can be *inequality constraints*, as in these formulas:

$W+X+Y+Z \leq 100$
$W+X+Y+Z \geq 50$
$W+X+Y+Z <> 50$

The constraints in the car factory example are linear inequalities.

Entering constraint formulas

Once you've identified a set of constraints:

1. Convert their left terms into formulas that include the variable cells.
2. Enter the formulas into constraint cells.

You'll reference these cells when adding constraints in the Optimizer dialog box.

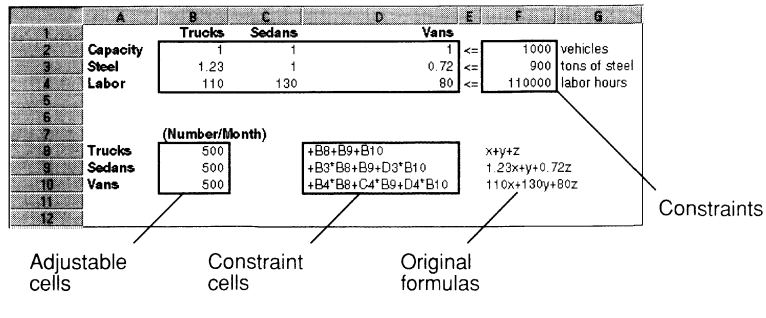
For example, consider the car factory expressions from page 322 and Figure 14.32:

Table 14.2
Car factory expressions

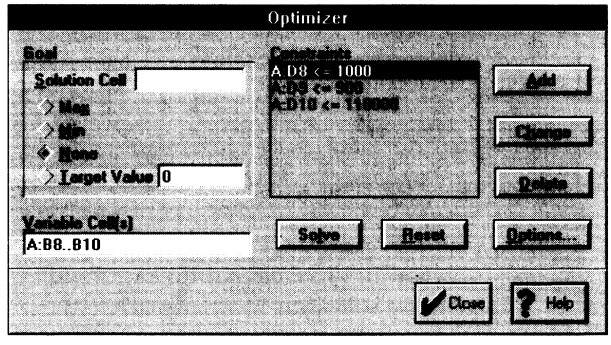
	Trucks (x)	Sedans (y)	Vans (z)		
Capacity	x +	y +	z	<=	1000 vehicles
Steel	1.23x +	y +	0.72z	<=	900 tons
Labor	110x +	130y +	80z	<=	110,000 hours

If x = variable cell B8, y=B9, and z=B10, the constraint cells for this problem contain the entries shown in the next figure. The original expressions are shown to the right of the constraint cells.

Figure 14.33
A notebook with constraint formulas entered into cells D8, D9, and D10



When all these constraints are entered, the dialog box looks like the next figure.



Note In the previous figure, the constraint constants were typed directly. You can also reference the cells containing the constants. For example, the first constraint, `D8<=1000`, can also be entered as `D8<=F2`.

Entering blocks in constraints

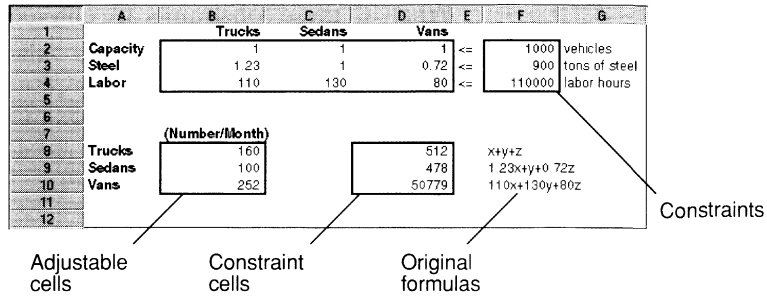
You can enter a block on either side of the constraint operator:

- If you enter a block on the left side and a single cell or constant on the right, each cell in the block is compared to the value on the right. For example, `A1..A3=950` is the same as entering `A1=950`, `A2=950`, and `A3=950`.
- If you enter a block on the left and a block of the same size on the right, each cell on the left is compared with the corresponding cell on the right. For example, `B6..B8<=D7..D9` is the same as entering `B6<=D7`, `B7<=D8`, and `B8<=D9`.
- If you enter a single cell on the left and a block on the right, the single cell is compared with the upper left cell of the block.

Finding a solution set

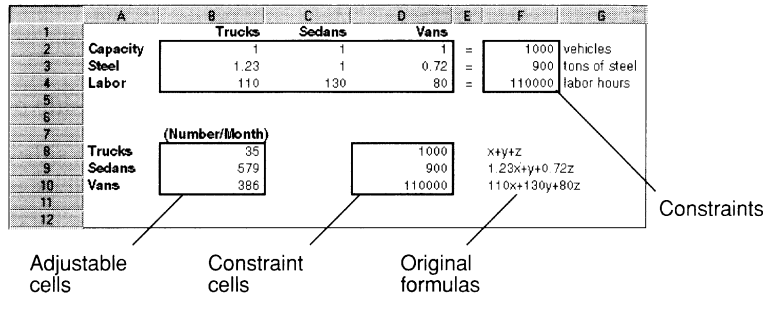
When the Optimizer dialog box is complete, choose Solve to find a solution. Solution values display in the variable cells, which are B8..B10 in the car factory example.

Figure 14.34
Multivariable Optimizer solution (inequalities)



Since all three constraint expressions are inequalities, there are many solutions that will satisfy the problem definition. If you change the constraints to equalities, there may be only one. For example, the solution in the next figure is the same one found with matrixes on page 323.

Figure 14.35
Multivariable Optimizer solution (equalities)



Adding variable bounds

Just as the variables that represent the "best" solution to your system must satisfy certain constraints, they may also be required to fall within certain upper and lower bounds. For example, perhaps variable *A* must be at least 10 but no more than 50, while variable *B* must be at least 20 but no more than 100, and variable *C* must be at least 5 but no more than 80. In this case, the lower bounds for *A*, *B*, and *C*, respectively, are 10, 20, and 5; the upper bounds for these same variables are 50, 100, and 80.

You specify bounds with constraints for expressions or individual variables. For example, the car factory example includes this basic capacity constraint (1000 is the upper bound of capacity):

```
B8+B9+B10<=1000
```

If the factory *must* produce at least 500 vehicles per month, this is another constraint (500 is the lower bound of capacity):

```
B8+B9+B10>=500
```

Bounds can also apply to single variables. In the car factory example, suppose dealer commitments require the manufacturer to produce at least 100 of each vehicle per month. With variable cells B8..B10, you can enter these constraints to express that limitation:

```
B8>=100
B9>=100
B10>=100
```

The dialog box in Figure 14.36 shows these constraints added to the others.

While it is then true that there can be no more than 800 of any one model manufactured in any given month, you don't need to enter that constraint. Optimizer can determine it from the other capacity entries.

Another use of single-variable bounds is to limit solutions to positive numbers. For example, `B8>=0` states that the factory can produce 0 cars, but not –1 car.

Goal seeking with multiple variables

In a system where there are more variables than constraints, there is usually more than one set of variable values that satisfies all the constraints. The best solution—the best set of variable values—is one that yields some optimal value when plugged into a specific constraint expression. This expression is entered into the solution cell.

As in single-variable goal seeking, you can minimize or maximize the solution cell expression, or aim for a target value. You can even set bounds. For example, if H7 is the solution cell with values between 25 and 50, you can enter those limits with these constraints:

```
H7>=25
H7<=50
```

You can choose a setting to maximize, minimize, or yield a specific value for the solution cell.

Multivariable goal-seeking example

Continuing with the car factory example, there may be three or four combinations of trucks, sedans, and vans produced in the car factory that meet the most recent monthly production constraints (at least 500, and no more than 1000) and don't exhaust the monthly resources (900 tons of steel, 110,000 human-hours, and so on). But the factory manager must also consider another factor: the total profit per month. This profit is a linear function of the number of vehicles produced each month:

(truck profit) + (sedan profit) + (van profit) = Total Profit

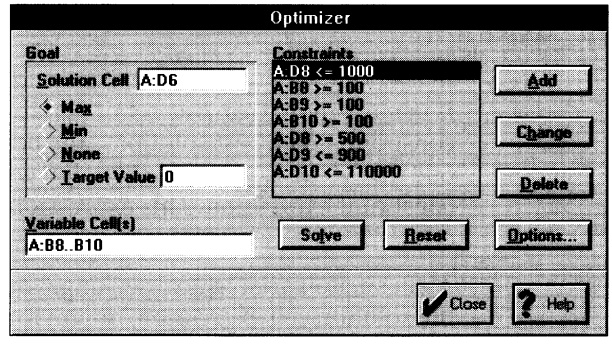
with

(profit per truck) = $825
(profit per sedan) = $625
(profit per van) = $600

With variable cells B8..B10 and solution cell D6, the formula in D6 is `825*B8+625*B9+600*B10`.

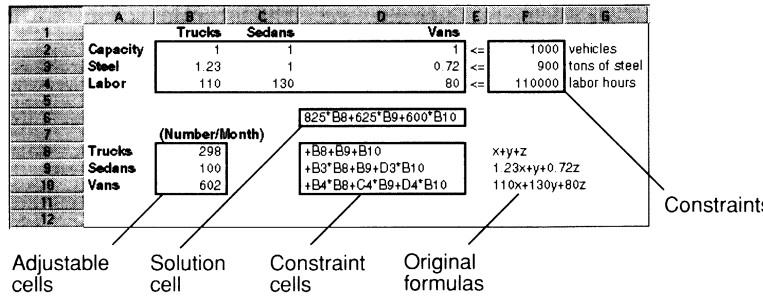
The next figure shows the Optimizer dialog box with new goal expression entries, set to maximize the solution cell.

Figure 14.36
Updated Optimizer dialog box with Solution Cell entered



When solved, the production mix changes—as shown in the next figure.

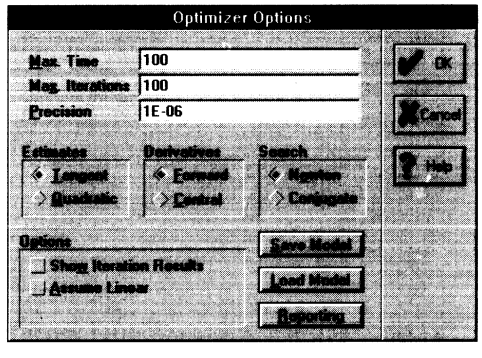
Figure 14.37
Car factory notebook with profits maximized



Optimizer options

Settings on the Optimizer Options dialog box control many of its calculation features. To display it, choose Options in the Optimizer dialog box.

Figure 14.38
Optimizer Options dialog box



- **Max. Time** specifies how long Optimizer will calculate to find a solution. The default is 100 seconds; the maximum is 1000.
- **Max. Iterations** determines how many passes Optimizer makes when calculating. The default is 100; the maximum is 1000.

  If a solution isn't found after the maximum time and iterations, try increasing these settings and Solve again.
- **Precision** specifies how close Optimizer must get to the Object Cell and Constraint Cell values you've specified. The more decimal places in the Precision setting, the longer calculation will take. The default is .000001. Precision can range from 0 to 1.

  To ensure greatest accuracy, use a Precision setting that is smaller than the significant unit in the solution. For example, if you're expecting a solution that is a small decimal, say .0005, don't use a precision of .001, which is larger than the solution.

Likewise, .0001 is equal to the solution's significant unit; use a smaller setting such as .00005 instead.

Default settings for Estimates, Derivatives, and Search are suitable for almost all problems; try resetting these options if you have trouble reaching an optimal solution.

- **Estimates** determines the approach used to obtain initial estimates of the variables in each iteration. Tangent, the default, uses linear extrapolation from a tangent vector, while Quadratic uses quadratic extrapolation. Choosing Quadratic may help in highly nonlinear problems.
- **Derivatives** specifies the type of differencing to use in estimates of partial derivatives, Forward (the default) or Central. Central requires more recalculations, but may help in a problem when the starting value of a variable cell differs greatly from the optimal solution.
- **Search** determines the gradient method used to compute the search direction. Newton is actually a quasi-Newtonian method and requires less work, but Conjugate may help when Optimizer is slow to find a solution. The default is Newton.
- **Show Iteration Results**, when checked, instructs Optimizer to pause whenever an interim solution is found. You can press *Esc* to cancel calculating. The default is unchecked.
- **Assume Linear**, when checked, indicates that your problem has only linear expressions in the solution cell or any of the constraint cells (see page 343 for a description of linear and nonlinear expressions). The default is unchecked.

  If you know your problem is linear, be sure to check this option. If you're having trouble reaching a solution, try unchecking it.
- **Load Model** and **Save Model** retrieve and save problem settings. These options are described on page 340.
- **Reporting** offers two ways to summarize the problem solution: Answer and Detail reports. The next section tells how to produce these reports, and describes their contents.

Optimizer reports

Tools | Optimizer offers two types of reports that summarize the solution process:

- **Answer Reports** describe how well the constraints are met, including variable and constraint dual values:

  Variable dual values are sometimes called reduced gradients, or reduced costs when the problem is linear. They reflect the marginal effect on the function in the solution cell of increasing the variable's value by one unit.

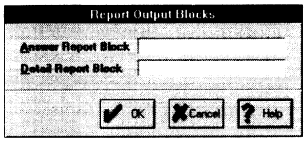
Constraint dual values represent Lagrange Multipliers, which in linear problems are called shadow prices. In many business applications they have a useful interpretation—they measure the "cost" of the constraint, or the amount by which the solution could be improved if the constraint were relaxed by one unit.

- **Detail Reports** list the variable and solution cell values at each iteration. You can see how variable cells change throughout the solution process. This is especially useful when running multiple trials with Optimizer, using different starting values or constraints. Detail reports of each trial let you see how the variables change in each trial.

Producing reports

To produce either type of report,

1. Choose Tools | Optimizer and enter an Optimizer problem into the dialog box.
2. Before solving the problem, choose Options | Reporting.



3. Enter a location block for each report you want to produce—an entire blank block or just the upper left cell. Optimizer extends the report block to the right and downward as needed. Choose an adequate area for the report; otherwise, Optimizer overwrites existing data.

   To count how many rows an Answer Report requires, add 10 to the total number of variable and constraint cells. An Answer Report needs 6 columns.

   A Detail Report requires as many rows as iterations in the solution process, plus 3 for headings. Since it's difficult to predict how many iterations are required, and the number might be large, specify an area with nothing below it. To count how many columns a detail report requires, add 2 to the number of variable cells.
4. Choose OK in the Reports dialog box and OK in the Options dialog box. Then, choose Solve in the Optimizer dialog box.

Your report(s) appear in the specified blocks.

A good place to save reports and models is below and to the right of the spreadsheet. This way, if you edit the spreadsheet by inserting or deleting columns or rows, the reports and models aren't affected.

Answer Report

The Answer Report looks like the example in the next figure. This report is for the Optimizer model shown in Figure 14.36. Its location was specified as A15.

The Answer Report lists the solution cell's address in the first column, with its starting and final values in the second and third columns. Similarly, it lists the variable cells with their starting and final values. Variable dual values are listed to the right.

Figure 14.39
Car factory Answer Report

	A	B	C	D	E	F	G
14							
15	Answer Report						
16	Solution Cell	Starting	Final				
17	A:D6	1025000	669558.82				
18							
19	Variable Cells	Starting	Final	Dual Value			
20	A:B8	500	298.03922	0			
21	A:B9	500	100	-98.529401			
22	A:B10	500	601.96078	0			
23							
24							
25	Cell	Value	Constraint	Binding?	Slack	Dual Value	
26	A:D8		<=1000	No	398.03922	282.35292	
27	A:B8	298.03921569	>=100	No	198.03922	0	
28	A:B9	100	>=100	Yes	0	0	
29	A:B10	601.96078431	>=100	No	501.96078	0	
30	A:D8		>=500	No	101.96078	282.35292	
31	A:D9		<=900	No	298.03922	441.17648	
32	A:D10		<=110000	No	109398.04	0	
33							

The last rows contain the following information about constraints:

- The first column shows the constraint cell address.
- The second column shows the constraint value.
- The third column shows the operator that qualifies the constant (<=, =, >=) and the constant as a cell address or a value, depending on what you specified.
- The fourth column, titled `Binding?`, shows whether the constraint affects the solution.
- The fifth column, titled `Slack`, lists the difference between the constant value and the value actually used in solution.

  Zero (0) in this column is paired with `Yes` under `Binding?`. Because the constraint is met exactly, there is no difference between the constant value and the value used in solution.
- The sixth column lists the variable dual values.

Detail Report

The Detail Report looks like the example in the next figure. This report is for the Optimizer model shown in Figure 14.36. Its location was specified as I1.

Figure 14.40
Car factory Detail Report

	H	I	J	K	L	M	N
1		Detail Report					
2			Variable Cells			Solution Cell	
3			A:B8	A:B9	A:B10	A:D6	
4		Starting	500	500	500	1025000	
5		Iteration 1	500	500	500.00001	1025000.003	
6		Iteration 2	159.90908	100	252.36364	345843.17272	
7		Iteration 3	400.32951	100	427.21486	649100.76633	
8		Final	298.03922	100	601.96078	669558.82353	

The first row lists the starting values of each variable cell, column by column, and the solution cell's starting value in the last column. Beneath, the rows list the results of each iteration, with the values of the variable cells and the solution cell. The last row lists the final values, which are the solution values reported in the spreadsheet.

C H A P T E R

15

Importing and exporting data

This chapter describes how to

- translate to and from different file formats
- import and format text files
- combine data from two notebooks
- extract part of a notebook to save as a file
- insert a file into a notebook

Translating files

Quattro Pro can translate many spreadsheet and database program formats. Table 15.1 shows the types of files Quattro Pro can translate, and the file extensions to use for each type. Quattro Pro looks at the extension to determine the type of translation to perform.

To save a file for use with one of these programs, include the appropriate extension when you save it. For example, to save the notebook MYFILE for use with Symphony version 1.2, use File | Save As and specify the file name MYFILE.WRK.

To load a file created by one of the programs in the next table, include the file's extension when you choose File | Open or Retrieve.

Table 15.1
Files Quattro Pro can translate

Extension	Program
.WKS	1-2-3, version 1A
.WK1	1-2-3, version 2.x
.WK3	1-2-3, version 3.x, 1-2-3 for Windows
.WKE	1-2-3, educational version
.WRK	Symphony, version 1.2
.WR1	Symphony, version 2.0
.WKQ	Quattro for DOS
.WQ1	Quattro Pro for DOS
.WKP	Surpass
.DB	Paradox
.DB2	dBASE II
.DBF	dBASE III, III+, dBASE IV
.RXD	Reflex, version 1
.R2D	Reflex, version 2
.DIF	VisiCalc
.SLK	Multiplan
.XLS	Excel

Caution! Only the contents of the current page (or if it's empty, the first nonempty page) of a notebook are saved when translating to all formats except 1-2-3 3.x (.WK3).

If you plan to open the same locally stored data file in more than one application running under Windows at the same time, make sure SHARE.EXE is running. For example, run SHARE if you plan to open a file stored on your C drive in both Excel and Quattro Pro. Without SHARE running, the first application to open a file doesn't properly prevent other applications from changing the file, which makes it easy to overwrite changes unintentionally. For complete information on SHARE, see your DOS manual.

Add SHARE to your AUTOEXEC.BAT file so it loads whenever you start your computer. Just add SHARE on a line by itself. (SHARE.EXE must be in the root directory or on your path.)

If you're loading a .WK3 file, Quattro Pro also loads any Impress file it includes. If you're loading other 1-2-3 files, Quattro Pro

loads any included Impress or Allways files. See the following sections for more details.

Note If you omit the file-name extension while loading a file, Quattro Pro looks for the file name you specify with the following extensions in this order: the File Extension setting in the Startup property (in the application Object Inspector), .WB1, .WQ1, .WK1, .WK3, .WKQ, .WKS, and .XLS. This means you *can* load a file from some spreadsheet products without specifying the extension as long as a file with the same name doesn't exist with a higher-ranking spreadsheet extension.

Quattro Pro supports the DIF file format developed by Software Arts Products Corporation, which is used by VisiCalc. Although other programs may import/export DIF files, they aren't necessarily the same file format. Consequently, they may not be compatible with Quattro Pro.

Note If you use unique Quattro Pro features like notebook linking or presentation-quality graphics, you may see a warning when you try to save the file to another file format. The warning states what feature will be lost when the file is translated. If you don't want to lose the feature, save the file as a .WB1 file.

1-2-3 version 2.2 files

When loading a 1-2-3 file, linking is converted to Quattro Pro's syntax.

Here are two examples:

Table 15.2
Linking syntax: Quattro Pro vs. 1-2-3 release 2.x

Quattro Pro syntax *[filename]celladdress*	**1-2-3 2.*x* syntax** *<<filename>>celladdress*
+[BUDGET.WK1]B4	+<<BUDGET.WK1>>B4
+[C:\SALES\AUG.WK1]D33	+<<C:\SALES\AUG.WK1>>D33

Allways files

Spreadsheets created with 1-2-3 version 2.x and designed using Allways can be loaded directly into Quattro Pro. When you load a .WK1 file that has a corresponding .ALL file, the Allways formatting is automatically added to the file.

Quattro Pro imports only .ALL files (not .AFS, .ALS, or .ENC files). To import multiple saved formats or font sets, create a

separate .WK1 file for each saved format with a corresponding .ALL file.

Quattro Pro imports the following Allways options:

- These Format options: font selection, line style (the Layout | Options | Line-weight setting is used to gauge overall line thickness), shading, boldface, underline, and font colors.

  Quattro Pro converts up to 255 different combinations of font, boldface, underline, and italic. Any additional combinations convert to the font specified as Normal style.
- Layout options: margins, titles, borders, line weight, paper type, and grid on printing.
- The Print range option.
- Worksheet options: column width and row heights.

Quattro Pro doesn't import the following:

- Inserted graphs (because Allways points only to a graph stored in a separate .PIC file in its "inserted" graphs).
- These Worksheet options: page breaks, column page breaks, and display zoom.
- Label alignment with spillover to the left (usually found in centered labels).
- The display (screen) colors.
- These Layout options: page size and borders on the bottom.
- These Print options: printer type, orientation, print settings, and port bin print options.

To save an Allways formatted file you previously imported, use File | Save to automatically save it with an Allways file. Use File | Save As and use the .WK1 extension with any file and choose Allways, Impress or None (no format file).

Impress files

Quattro Pro can import 1-2-3 files created with either the WYSIWYG or Impress add-in. When you retrieve a .WK1, .WKS, or .WK3 file that has a corresponding .FMT or .FM3 file, the WYSIWYG/Impress formatting is automatically applied to the file.

When retrieving a .WK1 or .WKS file, if there are corresponding .ALL and .FMT files in the current directory, you can choose to open either one. The .ENC and .CNF files created by WYSIWYG/Impress are not imported.

Quattro Pro retrieves and applies some graph formats as well as text formats. Not all graph formats are retained, however.

Quattro Pro imports the following WYSIWYG/Impress formats:

- These Format commands: assigned fonts, lines (except shadow), shading, boldface, underline (except double or wide), italics.
- Quattro Pro converts up to 255 different combinations of font, boldface, underline, and italic. Any additional combinations convert to the font used in Normal style in Quattro Pro.
- Inserted graphs.
- Blank graphs (usually containing annotations).
- Named styles, but the descriptions are not preserved.
- These Print settings: range, configuration/orientation, layout/compression (which converts to Print-To-Fit), layout margins, layout titles, and grid on printing.
- Label Alignment (except left-side spillover)
- The following Worksheet settings: row height, page breaks.
- Colors (global negative, lines, text color).
- Grid display.

Quattro Pro does not import the following formats:

- Column page breaks.
- Label alignment with left-side spillover.
- Formatting embedded in text.
- These Display options: colors, mode, font directory, rows, and options.
- These Format options: line shadow and colors (except global negative, line, double or wide underline, and text color).
- These Print Layout settings: page size and borders on bottom.
- These Print settings: frame and settings.
- The Print Configuration settings (printer type, port bin, and so on).

To save an Impress formatted file you previously imported, use File | Save to automatically save it with an Impress file. You can use File | Save As and use the .WK1 extension with any file and choose Allways, Impress or None (no format file).

1-2-3 version 3.*x* files

To import a 1-2-3 version 3.*x* file into Quattro Pro, just specify the .WK3 extension when you open or retrieve it.

If the .WK3 file contains no features unique to version 3 of 1-2-3, Quattro Pro opens it and converts it as if it were a 1-2-3 version 2.*x* file. If, however, there are version 3-specific features in the 1-2-3 file you're opening, any of the following might happen:

- Any @function not in Quattro Pro converts to the value of the original cell (string or numeric).
- Any .WK3 graph feature not supported in Quattro Pro is lost.
- Due to the way Quattro Pro stores numbers, any extremely large number (larger than 10^{308}) converts to ERR, and any number smaller than 10^{-308} converts to 0.
- Numeric format of Automatic, Negative Color, Label and Parenthesis convert to the Quattro Pro format General.
- Numeric formatting of blank cells will not be identical to the original once converted.

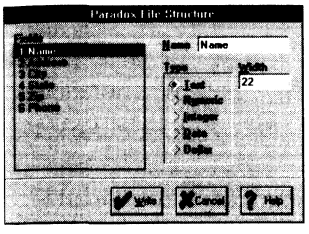
To export a Quattro Pro file to 1-2-3 version 3 format, just save it with the .WK3 file extension.

Database files

dBASE II, dBASE III, and dBASE IV use the same file-name extension (.DBF) but different file formats. To save Quattro Pro files to dBASE II format, use the .DB2 extension, then change the extension to .DBF (in DOS) before opening the file in dBASE II. In like manner, use the .DB4 extension to save Quattro Pro files to dBASE IV format, then change the extension to .DBF before opening the file in dBASE IV. To load dBASE II files in Quattro Pro, however, use the .DB2 or .DBF extension.

When you load any database file into Quattro Pro, it converts database field names to spreadsheet labels that serve as column headings and assigns block names to the cells beneath each name.

When you save a Quattro Pro notebook in Paradox, Reflex, or dBASE format, a dialog box appears with options for ordering the spreadsheet data into a database file structure:



- The Fields box lists database field names based on the data in the first row of the first spreadsheet page. If the first row contains data that is invalid as a database field name—for example, containing numbers, spaces, symbol characters, or duplicate labels—Quattro Pro uses the spreadsheet column letters to represent the field names. To change a field name, choose the default name in the Fields box and type a new name in the Name edit field.

  To mark a field to be deleted, highlight it on the list and press *Del*. An asterisk appears next to the field name. To restore it, press *Del* again.
- Use the Type settings to change the type of data contained in the column. The default setting is based on the spreadsheet data. If the Type is Numeric, you can specify a number of decimal points for the field.
- Use the Width edit field to specify the number of characters in the structure for that field name.
- The Write button proceeds with the translation to the database file format corresponding to the file extension you typed in the Save File dialog box.

Multiplan files

Since Multiplan doesn't save its files in .SLK format by default, you must do the following in Multiplan before translating the file into Quattro Pro:

1. Choose Transfer | Options | Symbolic.
2. Choose Transfer | Save, and save the file with the extension .SLK.

Alternatively, you could do the following to save the file in 1-2-3 format in preparation for translating to Quattro Pro:

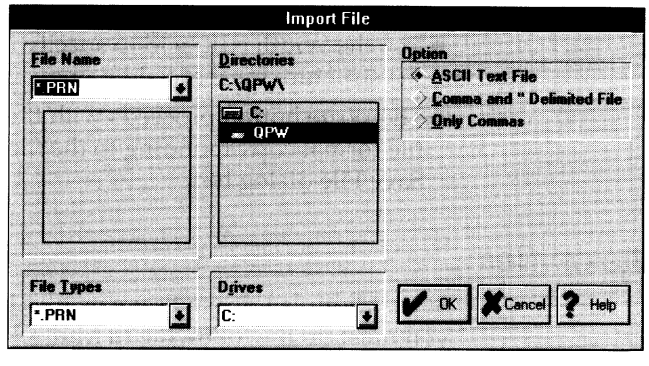
1. Choose Transfer | Options | Other.
2. Choose Transfer | Save, and save it with the extension .WK1 or .WKS, depending on the extension used with your version of Multiplan.

Importing text files

Tools | Import copies a text file into the active page of a notebook. Quattro Pro can import three types of text files with these dialog box options:

- **ASCII Text File** imports a plain, unformatted text file. Quattro Pro converts the data into a single column of labels. Each line in the file becomes a label in a single cell.
- **Comma & "" Delimited File** imports a file that uses commas and quotes to separate text in rows. The delimiters are used to set up columns in the spreadsheet page.
- **Only Commas** imports a file delimited only with commas.

Figure 15.1
The Import File dialog box



Note Don't use File | Import to load Paradox, dBASE, Reflex, 1-2-3, Symphony, Surpass, VisiCalc, or Multiplan files. Instead, use File | Open or Retrieve and specify the appropriate file extension (see page 355).

To import a text file,

1. Select the upper left corner of the block where you want to place the imported data.
2. Choose Tools | Import.
3. Choose the appropriate option: ASCII Text File, Comma & "" Delimited File, or Only Commas.
4. Choose the file name you want, using the techniques described on page 96.

The data from the text file is copied into the active page starting with the active cell.

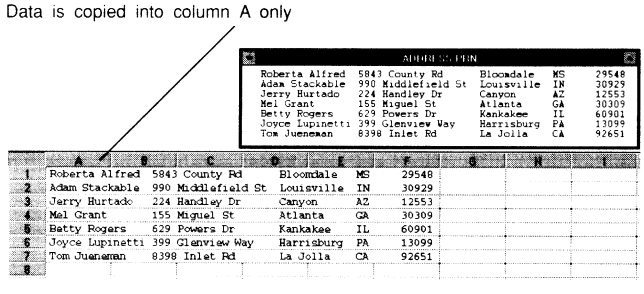
Plain text files

Text files contain straight, unformatted text. Before you import a text file, remove any special formatting characters such as bold, underlining, or centering.

Caution! Make sure no lines in the file are longer than 1022 characters, the maximum size of a cell. Characters beyond the 1022-character limit won't be imported.

Quattro Pro enters each line from the text file as a label in the first column of the indicated block (using columns to the right for spillover display). You can then break the long labels into a more usable format with Data | Parse (see page 364). Blank lines in the imported file become empty cells.

Figure 15.2
An imported text file



Caution! Many word-processing programs produce files that contain special characters you may not be able to see. These characters may produce unwanted results. If your word processor has an option for creating plain text files, use it to create files you intend to import.

Files with commas and quotes

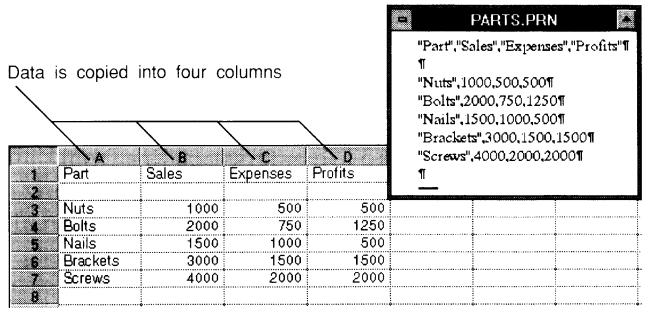
A comma-and-quote delimited file has the following characteristics:

- Data is entered in lines, much like the rows of a spreadsheet page.
- Types of data are separated (or delimited) on each line with commas.

■ Text strings are surrounded by quotation marks.

When Quattro Pro imports a comma-and-quote delimited file, it stores each delimited group of data in a separate cell. Data groups that are strictly numbers become value entries, data groups surrounded by quotes are stored as labels, and other entries are ignored.

Figure 15.3
An imported delimited text file



Files with commas only

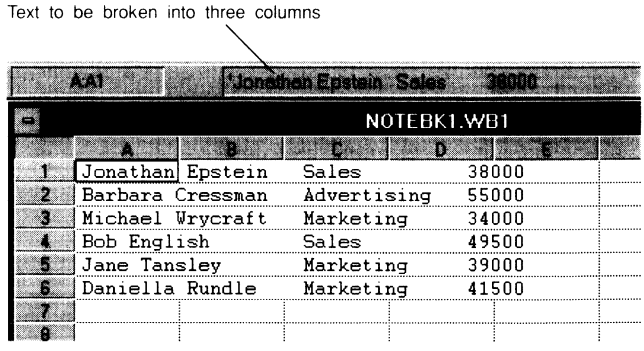
Importing a file with the Commas Only option is similar to importing a comma-and-quote delimited file. Instead of requiring quotes around labels, Quattro Pro determines whether to enter the data as a label or a value depending on its first character.

Breaking down long labels

After importing a text file, you may need to *parse* the data into individual cells. Imported text files often require parsing because each line of text translates into a single label.

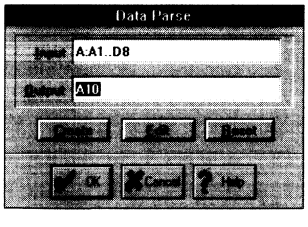
The next figure shows an imported text file. The text in each row is only in column A, as shown on the input line. The columns to the right display the spillover text from column A.

Figure 15.4
An imported text file to parse



To turn this data into a useful database of values and labels, you must break down each row into individual *fields*. In this example, the first column could be the names, the second the departments, and the third the incomes. Data | Parse lets you break down labels quickly and easily (see Chapter 13 for more information on setting up a database).

The basic procedure for parsing a file is as follows:



1. Select the first label to be parsed (the top left cell in the block of labels).
2. Choose Data | Parse.
3. Use the Create and Edit buttons to set up one or more format lines to indicate how you want to divide the labels.
4. Use the Input edit field to specify the column of labels you want to parse, including all format lines.
5. Use Output to specify the destination for the parsed labels, and choose OK.
6. If necessary, resize columns to display the data fully.

The next sections explain these steps in detail.

Format lines

You should place a *format line* in a new inserted row above the data to be parsed. It uses the following symbols to indicate how the text below it will be translated into separate fields:

Table 15.3
Special symbols in format lines

Symbol	Purpose
|	Begins a format line (shown in the input line only).
V	Begins a value.
L	Begins a label.
T	Begins a time value translated into a serial number.
D	Begins a date value translated into a serial number.
>	Continues an entry.
*	Indicates blank spaces that can be filled in by longer entries underneath the first.
S	Indicates to skip the character in this position, thereby deleting it from the parsed data (this symbol can be entered only by editing the format line).

Quattro Pro bases the format line on the first row of data. You can edit the line to parse the labels differently, and you can insert additional format lines to parse specific areas differently.

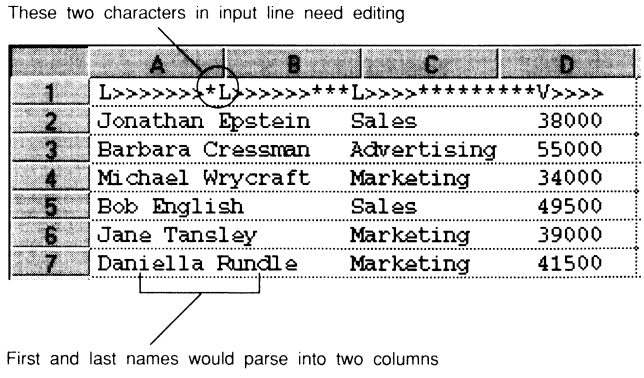
Creating format lines

To create a format line, select the first cell containing a label to be parsed, choose Data | Parse, and choose Create. A format line appears, moving the existing rows down.

Use the Font property (in the block Object Inspector) to put the format line and the text to be formatted into a monospace font, such as Courier. This helps you make sure that the text in each column starts at the same position.

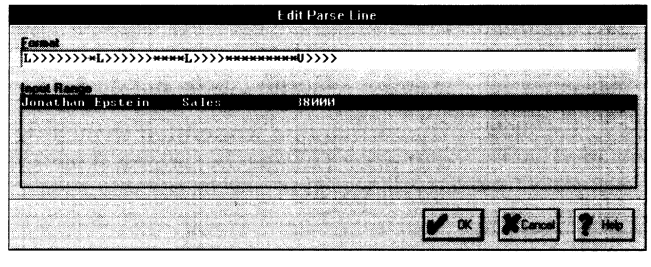
The format line shown in the next figure would break the first label into four cells: first name, last name, department, and salary. In this case, the format line must be edited to avoid splitting the first and last names into two fields.

Figure 15.5
An initial format line



Editing format lines

Figure 15.6
Editing a format line

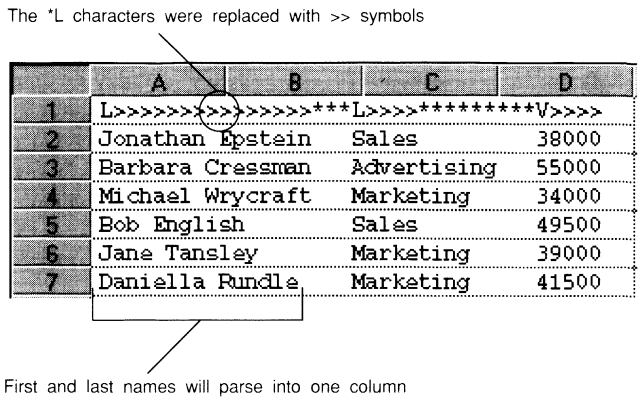


To edit a format line, select the cell containing the format line and choose Edit from the Data | Parse dialog box. Quattro Pro opens a dialog box for editing format lines.

Edit the format line in the edit field by clicking where you want to make a change and using standard editing techniques (as described on page 47). The first line of the data is displayed so you can revise the format line to match the data properly. Choose OK to finish editing.

The next figure shows the format line after editing. The *L above the last name was replaced by >> to combine the first and last names into one field.

Figure 15.7
An edited format line

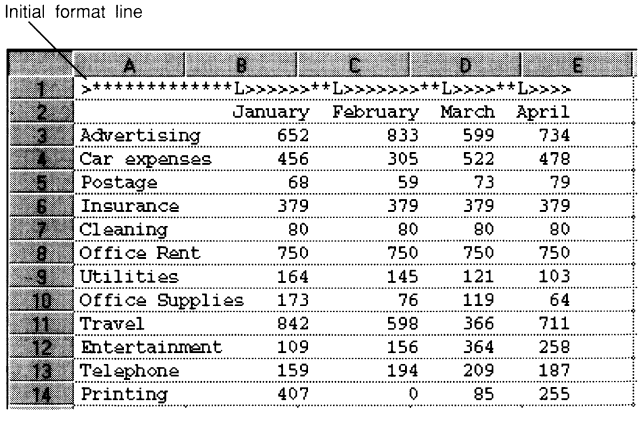


Using multiple format lines

In some cases, you must use more than one format line. For example, in the next figure the initial format line handles the monthly column labels, but doesn't format the data as values.

Note The format line was edited to include an initial > character. This will place January in column B instead of column A when the data is parsed.

Figure 15.8
The initial format line for a notebook



To create an additional format line,

1. Select the top left cell of the data to be formatted with the new format line, and choose Create from the Data | Parse dialog box.

2. A format line appears above the data, interpreting the row headings as labels and the numbers as values.

Figure 15.9
A notebook with two format lines

Second format line for parsing values and labels

	A	B	C	D	E
1	>************L>>>>>>>**L>>>>>>>**L>>>>**L>>>>				
2		January	February	March	April
3	L>>>>>>>>>>*******V>>*******V>>****V>>****V>>				
4	Advertising	652	833	599	734
5	Car expenses	456	305	522	478
6	Postage	68	59	73	79
7	Insurance	379	379	379	379
8	Cleaning	80	80	80	80
9	Office Rent	750	750	750	750
10	Utilities	164	145	121	103
11	Office Supplies	173	76	119	64
12	Travel	842	598	366	711
13	Entertainment	109	156	364	258
14	Telephone	159	194	209	187
15	Printing	407	0	85	255

You can insert as many format lines as necessary. Each format line affects the text below it down to the next format line or to the end of the input block.

Input and output blocks

Before you can parse data, you must indicate which block of data to parse and where to copy the parsed data. The input block is the column that contains the text you want to parse and the format line(s) used to parse it. (Remember that labels reside in a single column, even though they may spill over several.)

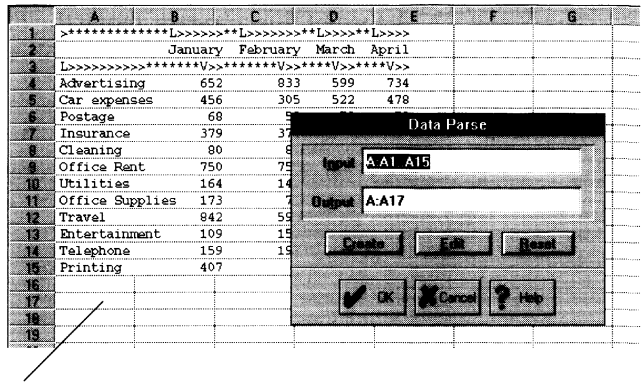
To specify the input block, click in the Input edit field of the Data | Parse dialog box, and select or type the block to parse. Make sure you include all format lines.

The output block is the destination block for the parsed data. To specify the output block, click in the Output edit field and select or type the top left cell where you want the data to begin.

Quattro Pro uses whatever space the parsed data needs, overwriting cells if necessary. To be safe, first specify an output block in another part of the page or notebook where there is no data to be overwritten. Then, after you obtain the results you want, replace the original data with Block | Move or with the Clipboard commands (see Chapter 3).

The next figure shows where the input and output blocks would be specified to parse the data into a block beginning on row 17.

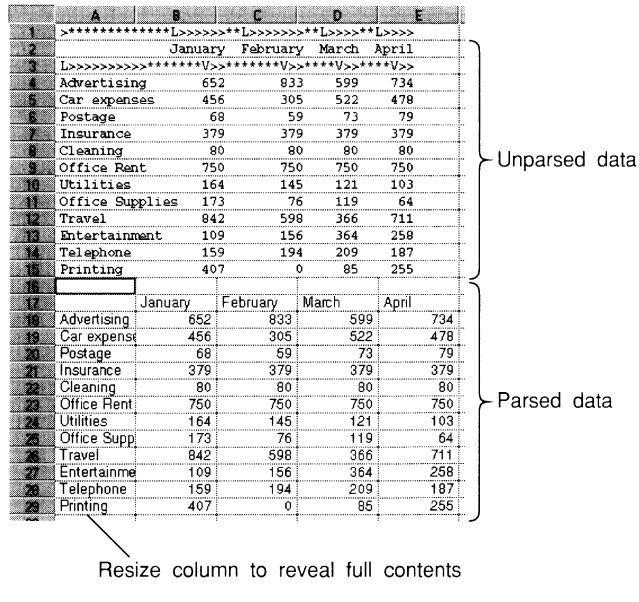
Figure 15.10
Input and output blocks specified



Performing the parse

After importing the data, creating and editing format lines, and specifying input and output blocks, choose OK from the Data | Parse dialog box to perform the parse.

Figure 15.11
Result of the parse



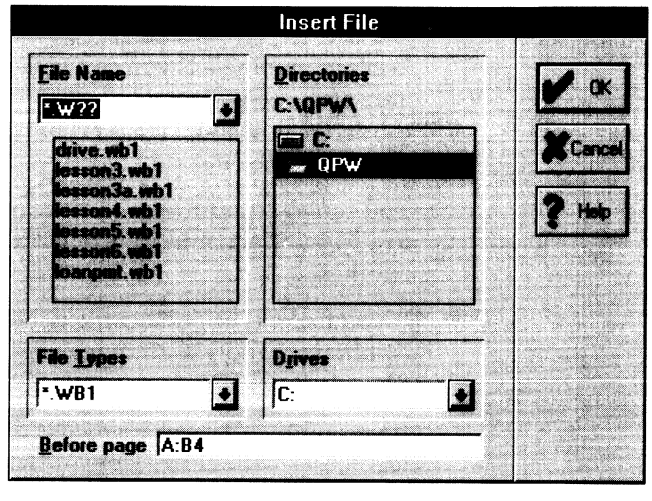
The data is placed in separate columns. To see the full content of a column with long labels (such as column A), resize the column.

Inserting a file into a notebook

You can copy an entire file into a notebook, pushing existing pages back to make room. Only pages containing data are inserted. To insert a file,

1. Make sure the file you want to insert is closed.
2. Select any cell on the page before which you want to insert the file.
3. Choose Block | Insert | File.

Figure 15.12
Insert File dialog box



4. Choose the file name you want, using the techniques described on page 96. If you want to insert a file translated from another program, include its file-name extension (see page 355).
5. Choose OK.
6. If the file has a password, a dialog box appears with space for entering it. Type the password and choose OK.

Every page in the inserted file that contained data is placed on a new page in the active notebook. If only one page is inserted, the page is given the name of the inserted file. If multiple pages are inserted, the new pages are named in the default letter sequence.

If the file is inserted within the boundaries of a named block or a block referenced by a formula, Quattro Pro expands block references to include the new pages.

Note If inserting a file would expand a named block or cell reference beyond the limit of a notebook (beyond page IV), the reference becomes ERR.

If there is any data on page IV, an error message appears, preventing you from inserting the file.

Combining files

Tools | Combine lets you copy all or part of a notebook into any area of the active notebook. Unlike File | Retrieve, it doesn't erase the active notebook; it affects only the portion of the pages covered by the inserted block.

You can also perform arithmetic operations with Tools | Combine to add, subtract, multiply, or divide cells from one notebook to another.

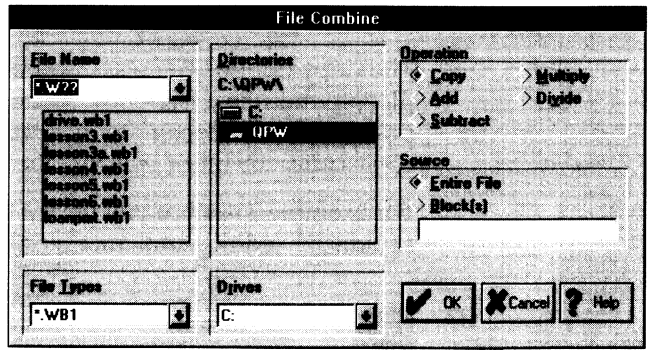
Note If you make changes to a file to be combined, save it first before combining. Tools | Combine reads data from the stored notebook file, whether it's open or not.

If you prefer, you can copy cells directly from one open notebook to another with Block | Copy or with the Clipboard commands (see Chapter 3). You can also perform arithmetic operations between cells with notebook links (see Chapter 12).

To combine files,

1. If you intend to combine only *part* of a file with the active one, make sure you know the exact block name or coordinates from the source file.
2. Select the receiving notebook. Then select the cell where you want the upper left cell of the source file to begin being copied. Make sure you have enough space so data won't be over-written unexpectedly.
3. Choose Tools | Combine, and choose the appropriate option in the dialog box:

Figure 15.13
The File Combine dialog box



- **Copy** inserts the exact contents of the incoming file.
- **Add** adds the incoming values to the existing values.
- **Subtract** subtracts the incoming values from the existing values.
- **Multiply** multiplies the incoming values by the existing values.
- **Divide** divides the existing values by the incoming values.

4. Also in the Combine dialog box, choose Entire File to copy the entire file (including all pages) into the existing one, or choose Block(s) to copy a specified block (or blocks) from the file.

   If you choose Block(s), enter a block name or coordinates in the edit field. You can also specify a noncontiguous block by separating the subblocks with commas. (Because the block names are from another file, you can't display a list of the names.)
5. Choose the file name you want, using the techniques described on page 96.

The contents of the specified file or block appear in the active notebook. If you *copied* the data, Quattro Pro also copies any properties such as alignment and numeric format. Column widths in the receiving notebook don't automatically adjust to correspond to the copied data; you can do this explicitly with the Fit button.

Tools | Combine copies the contents of named blocks, but to avoid confusion with names in the active notebook, it converts references to named blocks into block coordinates.

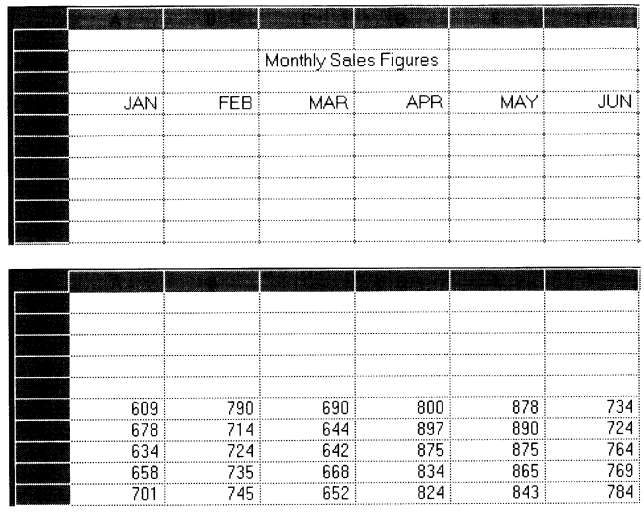
Caution! Tools | Combine overwrites any cells in the destination block, even if they are protected.

Copying

The Copy option of Tools | Combine copies data directly from a file into the active notebook. The data is inserted starting at the position of the selector. If you specify the entire file, Quattro Pro copies only the block that contains data.

For example, suppose you have a template file that contains standard headings, and another file with data.

Figure 15.14
Files with and without headings



		Monthly Sales Figures			
JAN	FEB	MAR	APR	MAY	JUN

609	790	690	800	878	734
678	714	644	897	890	724
634	724	642	875	875	764
658	735	668	834	865	769
701	745	652	824	843	784

To insert the headings into the notebook with data, select cell A1 in page A, choose Tools | Combine, and choose Copy. Choose Entire File and enter the name of the file containing the headings. The headings are added to the top of the notebook, as shown in the next figure. The data beneath the headings is not overwritten because Quattro Pro copies only the block that contains data (A2..F4).

Figure 15.15
Headings added

	A	B	C	D	E	F
1						
2			Monthly Sales Figures			
3						
4	JAN	FEB	MAR	APR	MAY	JUN
5						
6	609	790	690	800	878	734
7	678	714	644	897	890	724
8	634	724	642	875	875	764
9	658	735	668	834	865	769
10	701	745	652	824	843	784

With the Copy option of Tools | Combine, references in formulas adjust to reflect their new positions, even if they are absolute. (Absolute formulas remain absolute for the new notebook after their initial adjustment; they retain the $ signs, but the references adjust.) If a formula refers to cells outside the block being copied, the result may be inaccurate. To copy formulas' resulting *values* instead of the formulas themselves, use Block | Values on the file you're combining to copy them to another page first (see page 270). Then choose the Blocks option of Tools | Combine to copy only the page with the values.

Adding

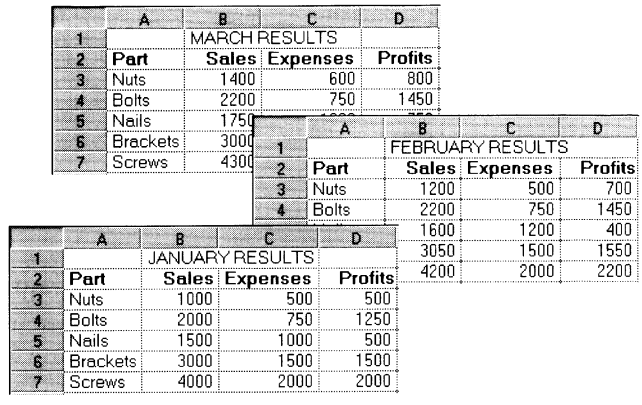
The Add option of Tools | Combine combines values in the inserted block with existing values in the notebook and calculates the sum.

The inserted block can contain formulas as well as values. However, the receiving notebook should contain *only values*—if it contains formulas, convert them to values (with Block | Values) before using the Add option. Addition won't occur in cells with formulas or labels.

Note Another way to add values between files is to create notebook links (see Chapter 12).

The Add option of Tools | Combine is useful for combining files for a cumulative total; for example, to compile year-to-date figures from monthly notebooks. The next figure shows three notebooks with monthly expense figures.

Figure 15.16
Three monthly notebooks



	A	B	C	D
1		MARCH RESULTS		
2	Part	Sales	Expenses	Profits
3	Nuts	1400	600	800
4	Bolts	2200	750	1450
5	Nails	1750		
6	Brackets	3000		
7	Screws	4300		

	A	B	C	D
1		FEBRUARY RESULTS		
2	Part	Sales	Expenses	Profits
3	Nuts	1200	500	700
4	Bolts	2200	750	1450
		1600	1200	400
		3050	1500	1550
		4200	2000	2200

	A	B	C	D
1		JANUARY RESULTS		
2	Part	Sales	Expenses	Profits
3	Nuts	1000	500	500
4	Bolts	2000	750	1250
5	Nails	1500	1000	500
6	Brackets	3000	1500	1500
7	Screws	4000	2000	2000

You can load one file, select cell A1, and combine each of the other files with the Add option of Tools | Combine. A cumulative notebook showing year-to-date expense totals is created.

Figure 15.17
Totals created with the Add option

	A	B	C	D
1		MARCH RESULTS		
2	Part	Sales	Expenses	Profits
3	Nuts	3600	1600	2000
4	Bolts	6400	2250	4150
5	Nails	4850	3200	1650
6	Brackets	9050	4500	4550
7	Screws	12500	6200	6300
8				

Before you use the Add option, select the cell where you want the added data to start (in the example, this would be A1). Data will be added to values below or to the right of the selector.

If you add an entire file, Quattro Pro adds all cells that contain values. If you specify a block to add, Quattro Pro adds the values from that block only.

When adding values, make sure the source and destination areas are set up similarly; for example, put headings in the same position. The incoming data assumes the properties of the active notebook.

Caution! Accurate selector placement is critical when adding combined values. If the selector is one cell off from proper alignment when you combine the files, the combined data may be useless. For this reason, save the active notebook before combining data. Then, if you don't get the results you want, you can retrieve the original file and try again.

When you add values with the Add option of Tools | Combine, Quattro Pro follows these rules:

- In the active notebook, cells that contain labels, formulas, ERR, or NA are not altered by the incoming data.
- Value entries in the destination block of the receiving notebook are replaced by the sum of the original and incoming values.
- When adding incoming values to those existing in the notebook, all incoming formulas convert to their end values, and labels and blank cells are ignored. Formulas resulting in ERR, NA, or strings are ignored also.

Subtracting, multiplying, or dividing

The Subtract option of Tools | Combine subtracts incoming values from values in the active notebook. The Multiply option multiplies the values together, and the Divide option divides active notebook values by the incoming values. Subtract, Multiply, and Divide have the same requirements and rules as Add.

Extracting part of a notebook

Tools | Extract saves part of a notebook to a separate file, leaving the original file intact.

If you prefer, you can open a blank notebook in a new window and copy a block of data to it with the Clipboard commands or with Block | Copy rather than extracting the block (see Chapter 3).

Tools | Extract is similar to Block | Copy, with two major differences:

- With Extract, you can choose to copy *values only*. When you choose its Values option, the actual formulas aren't copied—just the resulting values.
- Extract saves the notebook's block names and graphs along with the specified block. Some block names or graphs may not be meaningful if they refer to cells outside the extracted block. You can delete them, reassign them, or ignore them.

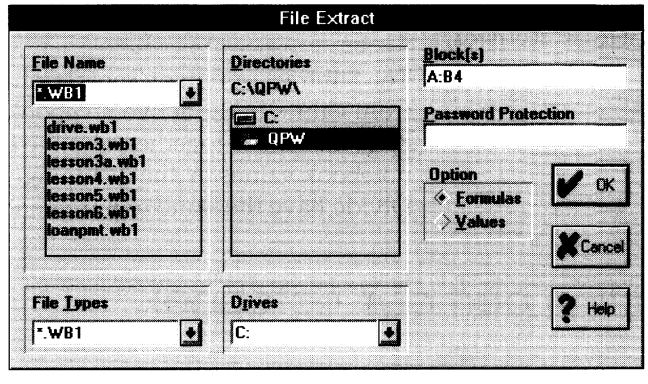
The Tools | Extract dialog box has Formulas and Values options. Formulas saves an exact copy of the block, including formulas. Values converts formulas to their end values.

When you load a file saved with the Formulas option, formulas adjust to reflect their new positions, even if they are absolute. (Absolute formulas remain absolute for the new notebook after their initial adjustment; they retain the $ signs, but the references adjust.) If a formula refers to cells outside the block being saved, its result may be inaccurate. In this case, it's best to use the Values option.

To extract part of a notebook,

1. Choose Tools | Extract.

Figure 15.18
The File Extract dialog box



   In the Block(s) edit field, enter the block name or coordinates to be saved. You can specify a noncontiguous block by separating the subblocks with commas.
2. Choose Formulas to save the block exactly as is, or choose Values to save the resulting values instead of the original formulas.
3. Enter the file name you want, using the techniques described on page 96.
4. If the file name you enter already exists, Quattro Pro warns you and gives you several options (see page 102).

The extracted data begins at cell A1, regardless of its position in the original file.

If you include the file-name extension used by a different program, the file is translated into the appropriate file format. For the extracted data to work with the program, the extracted block must be set up in a way that makes sense to the program.

For example, to extract data to a Paradox file, the block should list related data in columns (which are interpreted as fields), and should contain column headings (which are interpreted as field names). The next figure illustrates this setup.

Figure 15.19
Data set up for extracting to a database file

	A	B	C	D	E
1	NAME	ADDRESS	CITY	ST	ZIP
2	Roberta Alfred	5843 County Rd	Bloomdale	MS	29548
3	Adam Stackable	990 Middlefield St	Louisville	IN	30929
4	Jerry Hurtado	224 Handley Dr	Canyon	AZ	12553
5	Mel Grant	155 Miguel St	Atlanta	GA	30309
6	Betty Rogers	629 Powers Dr	Kankakee	IL	60901
7	Joyce Lupinetti	399 Glenview Way	Harrisburg	PA	13099
8	Tom Jueneman	8398 Inlet Rd	La Jolla	CA	92651

C H A P T E R

16

Global properties

This chapter describes how to change the properties of the Quattro Pro application or the active notebook.

Application properties (those of Quattro Pro itself) include various display, international, startup, and macro options. You can also specify your own customized SpeedBar.

Use Notebook properties to set recalculation options, reduce or enlarge notebook display, change the palette of default colors, control the display of parts of the notebook, or make a notebook a macro library.

Using Object Inspector menus

You can display the Object Inspector menu for the Quattro Pro application itself or of a notebook by right-clicking or by choosing commands in the Property menu.

To change properties of the Quattro Pro application, do one of the following:

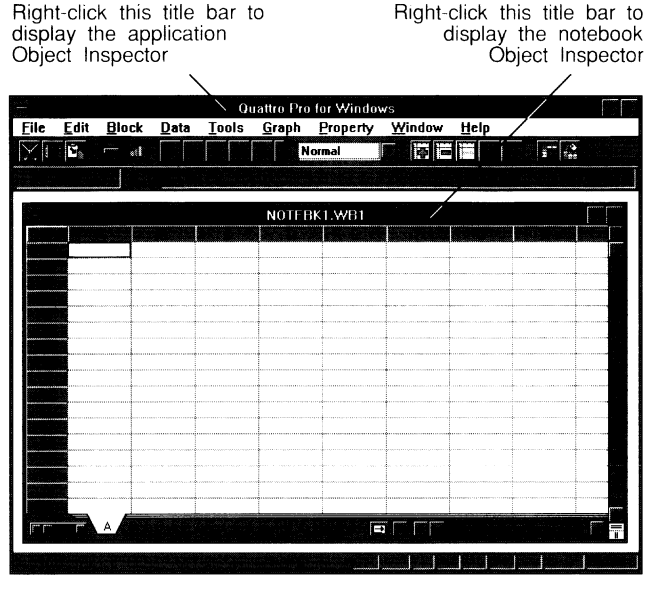
- Right-click the application title bar.
- Choose Property | Application.

To change notebook properties, first select the notebook by choosing it from the Window menu or by clicking any visible part of the window. Then do one of the following:

- Right-click the notebook title bar.
- Choose Property | Active Notebook.

The next figure shows where to right-click to display the Object Inspector.

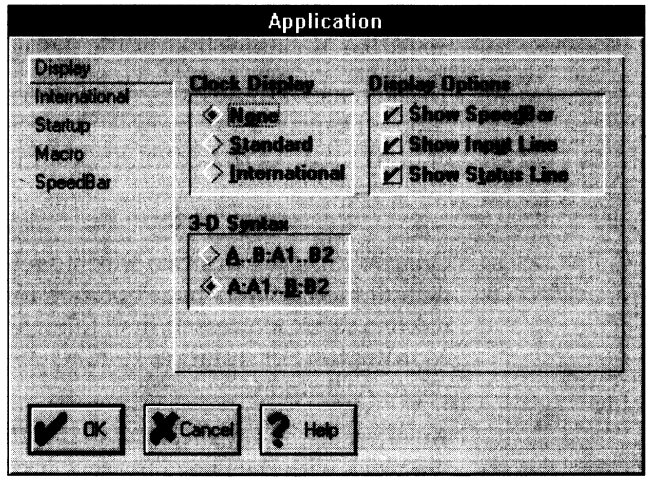
Figure 16.1
Where to right-click to display the application or notebook Object Inspector



Application properties

Application properties control the overall functioning of Quattro Pro. Any changes you make to these properties remain in effect until you change them again, even after you exit and restart Quattro Pro.

Figure 16.2
Application Object Inspector

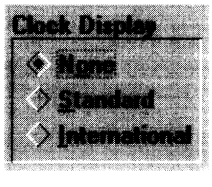


Display options

The Display property sets clock display options, hides portions of the Quattro Pro window, and switches between 3-D syntax schemes.

Setting clock display

The Clock Display option displays the date and time on the status line in your choice of formats.



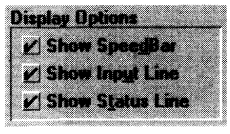
By default, **None** is selected, which doesn't display the clock. To display the date and time, right-click the Quattro Pro title bar. Display is already selected. Then choose Standard or International.

Standard displays the date and time in standard format (DD-MMM-YY and HH:MM AM/PM). **International** displays date and time in the formats specified with the International property (see page 386).

If the time or date displayed is incorrect, you must update your computer's internal clock. You can do this with the Windows Control Panel.

Hiding parts of the Quattro Pro window

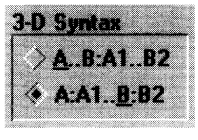
To allow more space in the Quattro Pro window, you can hide the SpeedBar, the input line, or the status line.



To hide one of these lines, right-click the Quattro Pro title bar, choose Display, then uncheck Show SpeedBar, Show Input Line, or Show Status Line. After you choose OK, the parts you chose disappear.

Switching the page range syntax

Quattro Pro provides two ways to refer to a 3-D block. The default method uses page notation for cell references. The page references are expressed first, followed by a colon and the block coordinates. For instance, `A..C:B4..D9` refers to the block B4..D9 on pages A, B, and C.



An alternate 3-D syntax is available that refers to each corner of the block with the page reference included. For instance, `A:B4..C:D9` refers to the same block in the alternate syntax.

The default syntax makes group references more concise. For example, a reference to 1stQtr:A1..A10 in the default syntax would switch to January:A1..March:A10 in the alternate syntax.

You can always type a 3-D reference in either syntax, but Quattro Pro displays the reference according to the setting in the 3-D Syntax option.

To switch to the alternate syntax, right-click the Quattro Pro title bar, choose Display, then choose the A:A1..B:B2 option. After you click to select a new cell, all existing 3-D references in formulas in open notebooks switch to the new syntax.

International options

The International property controls the appearance of currency, punctuation, dates, times, and international characters. It also lets you choose international sort orders. These options affect the appearance of values, how the date and time on the status line appear, how you enter arguments in @functions, and how certain international characters appear.

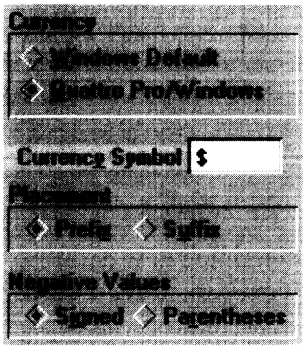
The initial defaults are standard for the United States. If you are using Quattro Pro in another country, or are doing business with another country, you can change these settings to suit your requirements.

Choosing currency or negative symbols

When you set the block Numeric Format to Currency, Quattro Pro initially displays currency values as specified in the International Currency Format in the Windows Control Panel. You can change to a different monetary symbol with the Currency option of the International property. You can position the symbol after or before the currency value.

You can also specify whether negative numbers will be indicated by preceding them with a minus sign or by enclosing them in parentheses.

To change the currency or negative symbol,

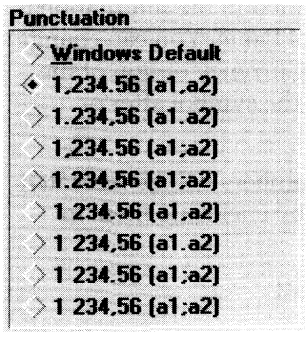


1. Right-click the Quattro Pro title bar and choose International. Then choose the Currency option.
2. Choose Quattro Pro/Windows.
3. Replace the contents of the Currency Symbol edit field with any character or character combination, including special ANSI characters. To enter an ANSI character not on your keyboard, hold down *Alt* and use the numeric keypad to type 0 and then the ANSI number for that character. For example, to enter a pound sign (£), press *Alt* and type 0163. See Appendix C in *Building Spreadsheet Applications* for a complete list of ANSI character codes.
4. Choose Prefix to display the symbol before the value (as in $100), or choose Suffix to display the symbol *after* the value (as in 500F).
5. For the Negative Values option, choose Signed to precede negative values with a minus sign, or choose Parentheses to surround them with parentheses.

Controlling punctuation

Punctuation settings specify the characters used to

- separate thousands in numbers (for display only—usually a comma in North America)
- designate a decimal separator in numbers (usually a period in North America)
- separate arguments in @function statements and macro commands (usually a comma or semicolon)



By default, Quattro Pro uses commas as thousands separators, a period as a decimal separator, and a comma as an argument separator.

You can change to another combination of settings, or to Windows Default, which uses the International Number Format settings in the Windows Control Panel.

To change the setting, right-click the Quattro Pro title bar, choose International, and choose Punctuation. Then choose one of the alternate punctuation settings listed.

These options show the punctuation marks used to mark thousands and the decimal place, followed by the punctuation mark used to separate arguments in @functions and macros (a1,a2). The last four options specify that a blank space separates thousands in numbers.

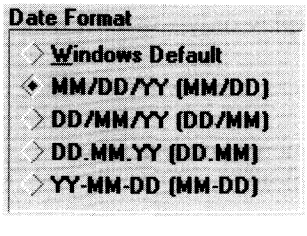
Regardless of the punctuation setting, semicolons are always accepted as argument separators.

Setting date formats

The Date Format option doesn't directly determine how dates appear. Rather, it determines the international date formats given as *options* for date appearance. To set the actual appearance of dates, use the Numeric Format property (in the block Object Inspector); see page 74.

By default, Quattro Pro displays dates in long form as MM/DD/YY (06/18/92, for example) and in short form as MM/DD (06/18, for example).

You can change to another long and short form combination, or to Windows Default, which uses the International Date Format settings in the Windows Control Panel.



To change the setting, right-click the Quattro Pro title bar and choose International. Then choose Date Format, and choose one of the alternate formats.

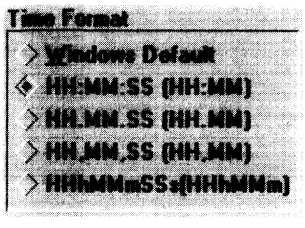
Each of these options is shown in its long and short versions. The short form is shown in parentheses. The format you choose here appears (in both long and short form) as a choice in the Numeric Format property (in the block Object Inspector). Quattro Pro uses the long version of the format as the international clock setting (see page 383).

Setting time formats

The Time Format option determines the international time formats given as *options* for time display. To set the actual appearance of times, use the Numeric Format property (in the block Object Inspector); see page 74.

By default, Quattro Pro displays times in long form as HH:MM:SS (09:32:30, for example) and in short form as HH:MM (09:32, for example).

You can change to another long and short form combination, or you can choose Windows Default, which uses the International Time Format settings in the Windows Control Panel.

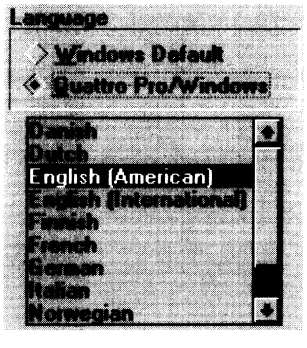


To change the setting, right-click the Quattro Pro title bar and choose International. Then choose Time Format, and choose one of the alternate formats.

Each of these options is shown in its long and short versions. The format you choose here appears (in both long and short form) as a choice in the Numeric Format property (in the block Object Inspector). Quattro Pro uses the long version of the format as the international clock setting (see page 383). All international time settings use 24-hour formats (00:00 to 23:59).

Changing sort order

If you use data written in languages other than American English, you can tailor Quattro Pro's sort order to match that language.



By default, the Language setting is Windows Default, which makes Quattro Pro use sort rules as specified by the International Language setting (or, in the case of Windows 3.0, the International Country setting) in the Windows Control Panel.

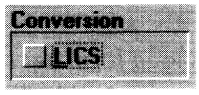
To change sort order to that of a different language:

1. Right-click the Quattro Pro title bar, and choose International.
2. Then choose Language.
3. Choose Quattro Pro\Windows and choose one of the languages from the list.

Note Quattro Pro may sort international characters in a slightly different order than products such as Paradox, dBASE, and Database Desktop do. Windows supports a richer character set than DOS products, so the results of sort operations in these products may be slightly different.

Converting LICS characters

Quattro Pro provides a way to access Lotus International Character Set (LICS) characters from 1-2-3.WK1 spreadsheets.



To convert these characters into standard ANSI characters, right-click the Quattro Pro title bar, and choose International. Then check LICS Conversion.

When you save the file, Quattro Pro writes these characters back to the LICS equivalents.

LICS characters are identical to the standard extended IBM character set except in the range 128 through 255, which is usually used for international and graphics characters. For more on LICS characters, see the 1-2-3 documentation.

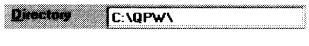
Startup options

The Startup property includes information that is used every time you start Quattro Pro.

Setting the startup directory

The startup directory is the drive and directory initially displayed when you open any command to save or load a file at the beginning of a Quattro Pro session. You should make this the directory where you keep most of your notebook files.

When you first start Quattro Pro, the drive and directory from which you started Quattro Pro indicate the startup directory.



To specify a new startup directory, right-click the Quattro Pro title bar, and choose Startup. Then in the Directory edit field enter the path, including the drive letter, of the new startup directory.

The startup directory is the one initially displayed in file-handling dialog boxes only until you save or load a file in another directory. Then, the last-used directory becomes the default directory for the duration of the Quattro Pro session.

Opening a file at startup

Each time you start Quattro Pro, it looks for a file named in the Autoload File option, and loads it if it exists. By default, the name of this file is QUATTRO.WB1.

To make another file open automatically instead, right-click the Quattro Pro title bar, and choose Startup. Then enter the new file name for the Autoload File option. If the file isn't in the default directory specified in the Directory option (just above Autoload File), include the full path name of the file.

You can also automatically open a notebook or workspace file if you start Quattro Pro with the Run command from the Windows Program Manager. (See page 100 for details.)

Running a macro when loading a file

Every time you load a notebook, Quattro Pro looks in it for a macro named in the Startup Macro option. If it exists, that macro runs immediately. By default, \0 is the startup macro.

To make another macro run automatically instead, right-click the Quattro Pro title bar and choose Startup. Then enter the new name for the Startup Macro option.

To make this macro run every time you start Quattro Pro, include it in the notebook named in the Autoload File option.

Setting the file extension

If you don't specify a file-name extension when saving or accessing files, .WB1 is used.

To specify a different default extension, right-click the Quattro Pro title bar, and choose Startup. Then enter one to three letters for the File Extension option.

Setting the computer's beep

Normally, when you make an error (for example, if you misspell an @function name when entering a formula), Quattro Pro beeps.

If you don't want to hear the beep, right-click the Quattro Pro title bar, and choose Startup. Then uncheck the Beep option of the Startup property.

Note If the Windows Control Panel Sound setting is set to suppress sounds, checking Use Beep in Quattro Pro has no effect.

Enabling the Undo command

When you want to reverse the effects of the last operation you perform, you can choose Edit | Undo. Most types of operations are reversed immediately.

Undo enabled

You can always undo the following actions whether Undo is enabled or not:

- entering data into a cell
- changing any properties except block or page Object Inspector settings
- moving and resizing floating objects (floating graphs, SpeedButtons, floating OLE objects, floating bitmaps, or floating pictures)
- changes to the Move, Align, Resize, ResizeToSame, and Create controls in graphic elements or dialog boxes you create
- changes to a graph type or graph title
- importing or exporting bitmaps into either a floating object or a graphic element

To enable Undo for all other types of undoable operations, right-click the Quattro Pro title bar, and choose Startup. Then choose Undo Enabled.

For details on using Edit | Undo, see page 20.

Changing key compatibility

By default, you can edit entries in the input line using keys described in Chapter 3 and Appendix A. These keys are compatible with Quattro Pro for DOS.

By changing the Compatible Keys setting, you enable certain keys to work in ways that take the most advantage of Windows capabilities. For example:

- The ↑ and ↓ keys move the insertion point between lines in a multiline entry (instead of completing the entry and moving the selector to the adjacent cell).
- The *Ctrl*+← and *Ctrl*+→ keys move the insertion point to the beginning of the previous or next word, respectively (instead of moving the insertion point five characters to the left or right).
- After you display the list of @functions (with the @Functions button), macros (with the Macros button), or block names (with *F3*), you can type a letter to *highlight* the first item in the list beginning with that letter (instead of having that item entered immediately in the input line). For example, in the @functions list, typing F highlights @FALSE, or typing V highlights @VALUE.

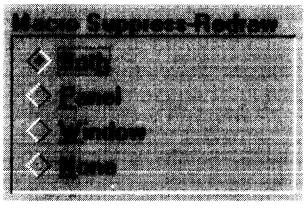
To enable keys like these to work as listed above, right-click the Quattro Pro title bar and choose Startup. Then uncheck Compatible Keys.

Macro options

With Macro property settings, you can control what the screen displays as macros are running. You can also make alternate menu systems available through the use of the slash key.

Controlling macro redrawing

The Macro Suppress-Redraw settings control which parts of the screen redraw while macros are running. The default setting, Both, suppresses redrawing of both notebook windows and panels (menus or dialog boxes), including the status line and the input line, until the macro is finished. This speeds up macros, since Quattro Pro doesn't have to stop and draw each of these items used in the macro.



To change screen redraw behavior, right-click the Quattro Pro title bar and choose Macro. In the Macro Suppress-Redraw box, choose one of the other three options:

- **Panel** suppresses redrawing of menus, dialog boxes, the status line, and the input line.
- **Window** suppresses redrawing of windows only.
- **None** redraws everything during macros.

Using alternate menu systems

Instead of using commands from the menu bar, you can run Quattro Pro for Windows using alternate menu systems. The Slash Menu setting controls which menu system displays when you press the slash key (/) from Ready mode.

To use one of the alternate menu systems, right-click the Quattro Pro title bar, choose Macro, and choose the menu system name from Slash Menu options.

After you click OK, you can press the slash key to open menus in the chosen menu system. Then choose the commands that appear.

You can also replace the menu bar with your own custom menu system. See Chapter 7 in *Building Spreadsheet Applications* for information.

Running Quattro Pro for DOS macros

To run Quattro Pro for DOS macros, simply choose Tools | Macro | Execute. By default, Quattro Pro *for Windows* dialog boxes appear as the macro is running.

If you want Quattro Pro for DOS commands and dialog boxes to appear instead, choose Quattro Pro – DOS in the Slash Menu option and make sure KeyReader is unchecked.

For more information on macros and alternate menu systems, see Chapter 3 in *Building Spreadsheet Applications*.

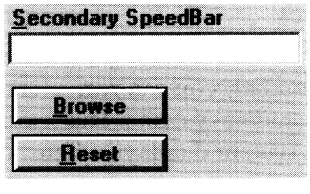
Running 1-2-3 macros

To run 1-2-3 macros, check KeyReader before choosing Tools | Macro | Execute.

Be alert when running 1-2-3 macros containing {?} statements with KeyReader checked—you may want to change those statements to {MENUCALL} statements, and create macro menus for the corresponding 1-2-3 menu choices. This ensures that the macro will still run within 1-2-3.

Using a custom SpeedBar

As explained in Chapter 6 in *Building Spreadsheet Applications*, you can create your own additional SpeedBar for use in the notebook window.



To use your own SpeedBar, right-click the Quattro Pro title bar and choose SpeedBar. Enter the SpeedBar file name into the edit field, or choose Browse to choose it from a standard file-handling dialog box. SpeedBar files have the .BAR extension.

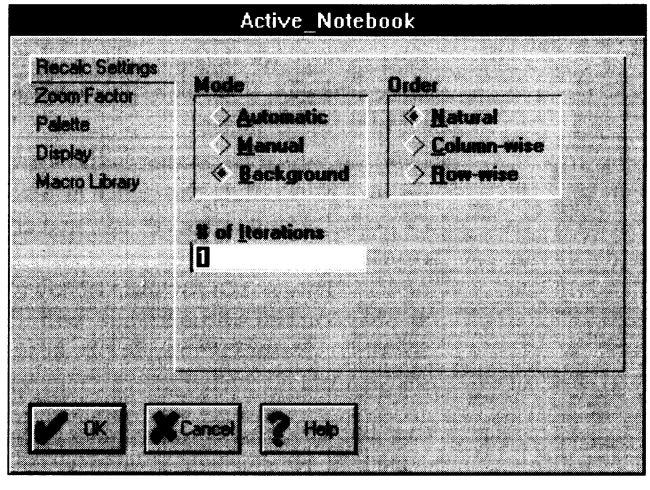
After you choose OK, the new SpeedBar is displayed in a new line below the default notebook SpeedBar. To hide the default SpeedBar, uncheck the Show SpeedBar option in the Display property (in the application Object Inspector).

To remove a custom SpeedBar, choose the SpeedBar property again and choose Reset. After you choose OK, the custom SpeedBar disappears.

Notebook properties

By right-clicking the notebook's title bar, or by choosing Property | Active Notebook, you display the notebook Object Inspector, shown next.

Figure 16.3
Notebook Object Inspector



Recalculation settings

Recalculation refers to how Quattro Pro updates formula results when you change values those formulas depend on. If you need to change the way recalculation works, right-click the notebook. Recalc Settings is already selected.

You can change

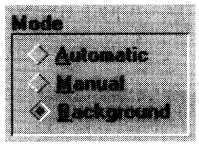
- **Mode** to specify when formulas are recalculated
- **Order** to change the sequence in which formulas are calculated (rarely changed)
- **# of Iterations** to determine how many times formulas are recalculated before calculation is considered complete (rarely changed)

Setting recalculation mode

Recalculation time is minimized by Quattro Pro's method of intelligent recalculation, which recalculates only those formulas that need to be recalculated.

Quattro Pro's default recalculation mode is Background, which recalculates formulas between keystrokes. It recalculates auto-

matically without interrupting your work. Quattro Pro always finishes recalculation before saving, extracting, or printing the notebook.



To choose one of the other two modes of recalculation, right-click the notebook title bar. Recalc Settings is already selected. Choose one of these options:

- **Automatic**, which also recalculates formulas automatically, but pauses until recalculation is finished. Use Automatic if you have complex formulas that Background calculation doesn't handle fast enough.
- **Manual**, which recalculates the formulas you enter or edit, but doesn't recalculate the entire notebook until you press *F9*. For example, if you enter `+B3-C16` in a cell, Quattro Pro displays the resulting value, but the value isn't updated if the values in B3 or C16 change. If a formula needs to be recalculated, CALC appears on the status line to remind you that the displayed results of formulas may not be accurate. Press *F9* to recalculate all formulas.

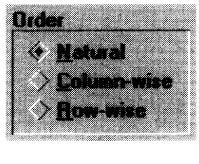
Either Background or Automatic is the recommended mode; both ensure that your data is always accurate. Manual mode is appropriate as a temporary break from recalculation while you adjust crucial cells in large notebooks that take a long time to recalculate.

In Manual mode, floating graphs don't adjust automatically; press *F9* to replot after supporting values change. To recalculate a single cell in Manual mode, select the cell, press *F2*, then press *Enter*. (This works only if the formula is not dependent on other formulas.)

In Background mode, when you want to pause your work in the notebook to finish recalculation in the background, press *F9*.

Setting recalculation order

By default, Quattro Pro recalculates data in Natural order. This means that cells are calculated in the order in which they depend on each other. Formulas without dependencies are calculated first, followed by formulas that depend on them.



To change recalculation order, right-click the notebook title bar. Recalc Settings is already selected. Choose one of these options:

- **Column-wise** starts recalculation in cell A1 of the first page and proceeds down column A, ignoring formulas in other columns. When A is finished, recalculation continues in B1, and on down

column B. This continues to the end of the page (column IV), and on to the last page in the notebook.

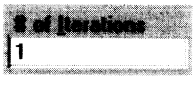
- **Row-wise** also starts recalculation in cell A1, but proceeds by rows, starting at 1 and continuing through row 8192, through to the last page.

Note If you specify Column-wise or Row-wise order of recalculation, you should set the number of iterations to at least two (see the next section). Otherwise, the notebook may be inaccurate.

Column-wise and Row-wise recalculation are provided for special purposes, such as for a series of formulas that create circular references to solve a problem or attain a goal. If you're not trying to solve problems such as these, use Natural recalculation order.

Limiting iterations

Elaborate formulas, such as those involving complicated engineering problems, require multiple evaluations to attain an acceptable degree of accuracy. These formulas are deliberately constructed to contain *circular references*, references that eventually refer back to the original formula. For such applications, you can set the number of iterations, or cycles of recalculation, to be performed when the notebook is recalculated.



To change the number of iterations, right-click the notebook title bar. Recalc Settings is already selected. Enter any number up to 255 for the # of Iterations option.

Note Before constructing elaborate formulas requiring limited iterations, refer to Chapter 14 to see if Tools | Optimizer or Solve For can find solutions to your problems.

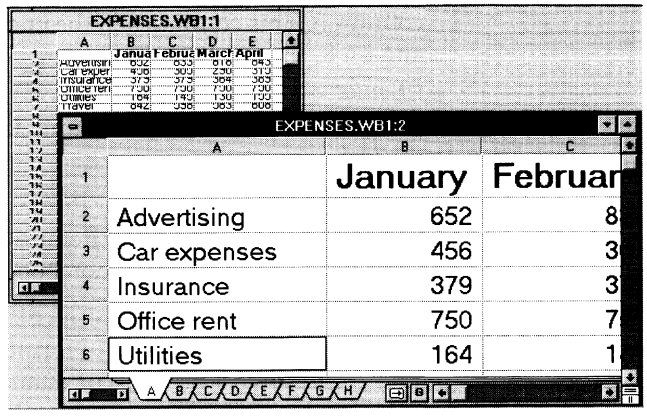
If the notebook contains no circular references and recalculation order is set to Natural, the iteration count is ignored.

Zooming in or out

You can reduce or enlarge the displayed size of all notebook cells. The Zoom Factor property lets you pull back to see a whole printed page, or focus in on the detail of a few cells.

To change the size of the notebook, right-click the notebook title bar, and choose Zoom Factor. The default setting is 100%. Percentages less than 100% show more columns and rows; percentages greater than 100% show fewer. The next figure shows two views of the same notebook at 200% and 50%.

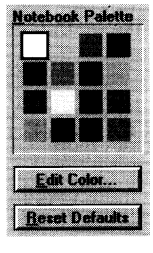
Figure 16.4
A zoomed notebook



Note The Zoom Factor setting doesn't affect printed output; use the Scaling option in the File | Print Setup to scale printed documents (see page 123).

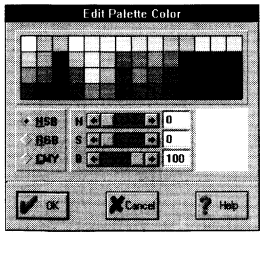
Changing the notebook color palette

Various properties use a *color palette* for changing colors. For example, you can change colors with the Text Color property (in the block Object Inspector) and the Line Color property (in the page Object Inspector). The contents of each color square on those palettes is determined by the notebook palette.



To change the notebook palette contents,

1. Right-click the notebook title bar and choose Palette.
2. Choose the color square you want to change and choose Edit Color (or just double-click the color square).
3. Click the color square in the top part of the dialog box closest to the color you want to create, or use any one of the color models to create the exact color you want. For information on color models, see page 217.
4. Choose OK to install the new color into the notebook palette. Edit any other color squares, and choose OK when you're finished.



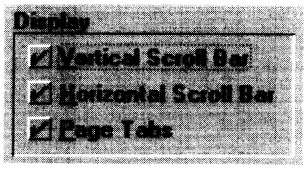
The new color palette appears when you select other color controls in Quattro Pro.

Caution! Changing any color square in the notebook palette also changes any previous uses of that color square throughout the notebook. For example, if you set the Shading property for a cell with the color square that's initially set to red (the leftmost square in the second row of the palette) and later change the corresponding color square in the notebook palette to green, the shaded cell switches to green.

To return the notebook palette to the default Quattro Pro settings, right-click the notebook title bar, and choose Palette. Then choose Reset Defaults.

Hiding parts of the notebook display

To allow more space in a notebook window, or to create a special presentation notebook, you may want to hide its scroll bars or page tabs.

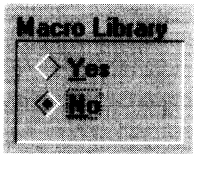


To do so, right-click the notebook title bar and choose Display. Then uncheck Vertical Scroll Bar, Horizontal Scroll Bar, or Page Tabs. After you choose OK, the scroll bars and/or page tabs disappear.

To restore them, right-click the notebook, choose Display and check the items you want displayed.

Making a notebook a macro library

A *macro library* is convenient place to store frequently used macros. When you set a notebook's Macro Library property to Yes, Quattro Pro searches it when you try to run a macro that isn't in the active notebook.



To make a notebook a macro library, right-click its title bar and choose Macro Library. Then choose Yes and choose OK.

For more information on macro libraries, see Chapter 3 in *Building Spreadsheet Applications*.

A P P E N D I X

A

Keys and indicators

This appendix describes

- the mode and status indicators that appear on the status line (the line at the bottom of the screen)
- the contents of the input line (the line at the top of the screen) for the active cell
- the function of various keys in Quattro Pro

Throughout the Quattro Pro documentation, instructions emphasize the use of a mouse. This appendix provides information about how to use an alternate method—your keyboard—to work with Quattro Pro.

For a list of key-equivalent macro commands, see *Building Spreadsheet Applications*.

Table A.1: Mode and status indicators on the status line

Indicator	Description
BKGD	Quattro Pro is calculating in the background.
CALC	One or more formulas need to be recalculated. Press *F9* to recalculate the notebook.
CAP	The *Caps Lock* key is on.
CIRC	A formula contains a circular reference (it refers to itself or to another formula that refers back to it).
COPY	You are using the Drag and Drop feature to copy a block (*Ctrl* while dragging the block with the mouse).
DATE	You are entering a date value.
DEBUG	Quattro Pro is in Debug mode. If you execute a macro in Debug mode, the Macro Debugger dialog box appears and enables you to debug your macro one step at a time.
EDIT	The notebook is in Edit mode, which lets you change the contents of the current cell. (To enter Edit mode, press *F2*.)
END	The *End* key is on. Any arrow keys you press will move to the end of an area in the notebook instead of scrolling.
EXT	You are extending a block selection with *Shift+F7*. When you're finished, choose a command that operates on a block.
FIND	Quattro Pro is searching for entries that match the conditions you specified with the Query command.
FRMT	You are editing a format line during a Parse operation.
INPUT	Input is confined to selected cells with Data | Restrict Input or its command equivalent. Press *Esc* or press *Enter* with no data in the input line to return to Ready mode.
LABEL	The entry you are making is text (a label).
MACRO	Quattro Pro is executing a macro.
MOVE	You are using the Drag and Drop feature to move a block.
NAMES	You have pressed *F3* to display a pick list of block names.
NUM	The *Num Lock* key is on.
OVR	You pressed the *Ins* key, and anything you type will overwrite existing data. (To return to Insert mode, press *Ins* again).
POINT	The notebook is in Point mode, letting you specify a cell or block with the cell selector or view a choice list of block names with *F3*.
PREVIEW	You are previewing your printed notebook.
READY	Quattro Pro is ready for the next entry or command.
REC	Macro recording is in progress.
SCR	The *Scroll Lock* key is on.
VALUE	The entry you are making is a number or formula.
WAIT	An action is in progress. You must wait before proceeding.

Table A.2: Contents of the input line

Input line contents	Description
Address	The intersection of a column and row on a particular page that identifies the active cell; for example, B:A10 (the intersection of the first column and tenth row on the second page). If the selector is inside a floating object, you'll see the object's name.
Contents	The data appears as you typed it, not necessarily as it displays in the notebook. For example, if the data appears as $1,290 onscreen, it displays as 1290 on the input line because the dollar sign and comma are *format* settings, not part of the value.
Edit mode	If you select a cell and press *F2* or click in the input line, you're in Edit mode. The input line in Edit mode shows the ✓ and ✗ boxes and the data you're editing or entering in that cell.

Table A.3: Special keys in Quattro Pro

Key	Description
Backspace	Erases the character to the left of the cursor.
Caps Lock	Enters Caps mode, in which all letters you type are displayed in uppercase letters. Press again to exit Caps mode.
Ctrl+Backspace	Clears an existing entry in a dialog box, or on the input line in Edit mode.
Ctrl+Break	Exits from a menu and returns to the notebook's Ready mode. If pressed while a macro is executing, terminates the macro.
Del	Erases the contents (but not properties) of the current cell or selected block. To delete contents and properties, use Edit | Clear.
Ctrl+Del	In Group mode, acts like *Del*, but "drills" the deletion through the group (deletes the selected cell, block, or object on all grouped pages).
/ (Slash)	Activates the active menu system, set with the Slash Key option of the Macro property in the application Object Inspector.
\ (Backslash)	Lets you enter one or more characters to repeat across an entire cell width.
Enter	In the notebook, writes the entry on the input line into the current cell and returns to Ready mode. In a menu, choice list, or dialog box, chooses the highlighted item.
Esc	Cancels whatever you are doing. For example, it can back you out of a menu, exit a dialog box, or erase any changes you made to an entry on the input line.
Num Lock	Toggles performance of the numeric keypad keys. When you first press *Num Lock*, the NUM indicator displays and you can use the keypad for entering numbers. When you press it again you can use these keys as direction keys.
Pause	Enters macro Debug mode (works like *Shift+F2*).
Scroll Lock	Toggles performance of the arrow keys. When you first press *Scroll Lock*, the SCR indicator displays and the arrow keys scroll the contents of the active window without moving the selector. When you press it again you can move the selector with the arrow keys.

Table A.3: Special keys in Quattro Pro (continued)

Key	Description
Ctrl+Shift+PgDn or *PgUp*	Selects multiple pages.
↑ or ↓	In a dialog box edit field, enters Point mode.
Tab or *Ctrl* →	In the notebook, moves right one screen. In a dialog box, *Tab* moves between controls. In a graph window, *Tab* inserts a tab space in text boxes; use *Ctrl+Tab* to select the next object.
Shift+Tab or *Ctrl* ←	In the notebook, moves left one screen. In a dialog box, moves to the previous control. In a graph window, *Shift+Tab* moves to the start of the current word in a text box; use *Ctrl+Shift+Tab* to select the previous object.
Ctrl+Shift+D	Press this key combination before entering a date.
Ctrl+Shift+S	Displays a list of styles to apply to the selected block.
Ctrl+PgUp or *PgDn*	Moves from one page to the next or previous page; in an Object Inspector or dialog box with multiple settings, changes panes (groups of property options).

Table A.4: Keys in Edit mode

Key	Function
Esc	Exits Edit mode; if Startup	Compatible Keys is checked in the application Object Inspector, also erases the contents of the input line.
Enter	Enters the data and exits Edit mode.
Ctrl+Enter	In Group mode, acts like *Enter*, but "drills" data through all grouped pages at once.
↑	Enters the data, exits Edit mode, and moves up one cell. When the insertion point follows an operator in a formula, enters Point mode. If Startup	Compatible Keys is unchecked in the application Object Inspector, moves the insertion point up a line (with data wrapped on more than one line).
↓	Enters the data, exits Edit mode, and moves down one cell. When the insertion point follows an operator in a formula, enters Point mode. If Startup	Compatible Keys is unchecked in the application Object Inspector, moves the insertion point down a line (with data wrapped on more than one line).
PgDn	Enters the data, exits Edit mode, and moves down one screenful. When the insertion point follows an operator in a formula, enters Point mode.
PgUp	Enters the data, exits Edit mode, and moves up one screenful. When the insertion point follows an operator in a formula, enters Point mode.
Ins	Toggles between Insert and Overwrite modes. (Insert mode is the default.)
Backspace	Deletes characters to the left of the insertion point.
Del	Deletes characters to the right of the insertion point.
Ctrl+Backspace	Erases the contents of the input line.
Tab or *Ctrl* →	Moves five spaces to the right (or to the next word if Startup | Compatible Keys is unchecked in the application Object Inspector).
Shift+Tab or *Ctrl* ←	Moves five spaces to the left (or to the previous word if Startup | Compatible Keys is unchecked in the application Object Inspector).

Table A.4: Keys in Edit mode (continued)

Key	Function
Ctrl+Shift →	Highlights five characters to the right of the insertion point.
Ctrl+Shift ←	Highlights five characters to the left of the insertion point.
Ctrl+Shift+D	Press this key combination before entering a date.
F2	Toggles to display an indicator on the status line that tells you what type of data you're editing—either value or label.
F3	With the insertion point positioned after an operator, displays a list of block names.
Shift+F3	Displays a list of macro commands.
Alt+F3	Displays a list of @functions.
F9	Calculates and then displays result of formulas on the input line.

Table A.5: Keys in Point mode

Key	Function
Period key + block	To point to a block, move to one corner, press the period key to "anchor" the block, move to the opposite corner, then press *Enter*.
	To extend the selection from a different corner of the highlighted block, press the period key to move clockwise around the corners of the block.
Enter	Enters the highlighted block in the formula or dialog box and exits Point mode.
Esc	If pressed while pointing to a cell block, returns you to the cell that was current before you entered Point mode.
Backspace	If pressed while pointing out a cell block, returns you to the anchor cell.
F4	Makes the cell address to the left of the cursor absolute. Press repeatedly to cycle through the absolute combinations; for example, $A:$B$4, $A:B$4. (Does not disturb the position of the selector.)
Alt+F5	Toggles Group mode.
F6	If the window is split into two panes, jumps to the other pane.
Ctrl+F6	If multiple windows are open, jumps to the next window.

Table A.6: Keys in Print Preview mode

Key	Effect
Esc	Exits the preview.
F1	Displays online help.
PgUp	Displays the previous page.
PgDn	Displays the next page.
+	Zooms in a level, increasing detail.
–	Zooms out a level, decreasing detail.

Table A.6: Keys in Print Preview mode (continued)

Key	Effect
↑	Scrolls the zoomed display up.
↓	Scrolls the zoomed display down.
→	Scrolls the zoomed display right.
←	Scrolls the zoomed display left.
Home	Displays the top left of a zoomed page.
End	Displays the bottom right of a zoomed page.

Table A.7: Keys for navigating notebook pages

Key	Description
←	Moves left one cell.
→	Moves right one cell.
↑	Moves up one cell.
↓	Moves down one cell.
PgUp	Moves up one screen.
PgDn	Moves down one screen.
Ctrl+PgDn	Moves forward one page.
Ctrl+PgUp	Moves backward one page.
Home	Moves to the upper left cell (A1) of the active page.
Ctrl+Home	Moves to the upper left cell (A1) of the first page.
End	Must be used with another direction key.
End+Home	Moves to lower right corner of the non-blank part of the notebook page.
Ctrl+End+Home	Moves to the last nonblank cell in the notebook.
End + arrow key	If in a filled cell, the selector moves in the direction of the arrow to the next non-blank cell before an empty one; if the next cell in the direction of the arrow is empty, moves to the next filled cell in that direction.
Ctrl+← or *Shift+Tab*	Moves left one screen.
Ctrl+→ or *Tab*	Moves right one screen.
F5 (Goto)	Moves to the cell you specify.

Table A.8: The Quattro Pro function keys

Key	Description
F1	Activates the Help system.
F2	Activates Edit mode, so you can change a cell entry.
Shift+F2	Activates Debug mode so you can execute a macro step by step.
Alt+F2	Displays the Tools | Macro | Execute dialog box.

Table A.8: The Quattro Pro function keys (continued)

Key	Description
F3	When you're prompted for a block, or in Edit mode with the insertion point positioned after an operator, press *F3* to display a list of block names. To expand the list of block names to show their coordinates, press the Expand key (+). Press the Contract key (-) to remove coordinates. Press *F3* again to "zoom" the names list to full screen or to shrink it back down.
Shift+F3	Displays a list of available macros, by category.
Alt+F3	In Value or Edit mode, displays a list of @functions.
Ctrl+F3	Lets you create a named block; the keyboard equivalent of Block I Names I Create.
F4	In Edit, Value, or Point mode, makes the cell address to the left of the cursor absolute. Press repeatedly to cycle through the eight absolute combinations; for example, $A:$B$4, $A:B$4. You can use *F4* when entering or editing a formula. You can also use it in Point mode without disturbing the position of the selector.
Alt+F4	Exits Quattro Pro.
Ctrl+F4	Closes a window (dialog box, graph window, notebook, or dialog window).
F5	Moves the selector to a specified cell address.
Shift+F5	Works like the SpeedTab button; displays the Graphs page, then returns to a spreadsheet page.
Alt+F5	Switches Group mode on and off.
F6	If the window is split into two panes, jumps to the other pane.
Ctrl+F6	Displays the next open window.
Shift+F6	Displays the bottom open window, as in Quattro Pro for DOS.
F7	Repeats the previous Query command.
Shift+F7	Press *Shift+F7* and use the arrow keys to select a block of text in Ext mode.
Alt+F7	Lets you find and replace strings.
F8	Repeats the last Data I What-If command.
F9	In Ready mode, recalculates the notebook. In Edit mode, calculates and then displays result of formulas on the input line. For example, if you type `8*9` on the input line, then press *F9*, Quattro Pro replaces the formula with the result, 72. To recalculate the entire notebook afterwards, press *F9* again in Ready mode.
F10	Works like / or *Alt*; moves the selector to the menu bar.
F11	Displays the current graph (equivalent to Graph I View). Press *Esc* to return to the notebook.
F12	Displays an Object Inspector for the selected object.
Shift+F12	Displays an Object Inspector for the active window.
Alt+F12	Displays the application Object Inspector.

A P P E N D I X

B

Optimizing performance

For best performance, run Quattro Pro in 386 enhanced mode. If you have 2MB of memory and a 386 or higher processor, you run Windows in 386 enhanced mode by default.

Under some conditions, however, Quattro Pro may run sluggishly. Symptoms include long startup times (longer than one minute) and delays responding to commands and loading files. Such delays are usually the result of Quattro Pro not having access to sufficient memory.

Virtual and physical memory

In 386 enhanced mode, Windows uses a "swap file" to implement "virtual memory." Virtual memory lets disk space act as accessible memory (RAM) so you can run more applications with more data. For example, if a system has 2MB of physical memory and a 10MB swapfile, Windows behaves as though the machine really has 12MB of memory.

To see how much memory (physical plus virtual) you have, choose Help | About from Program Manager. The amount of memory you have available appears near the bottom of the dialog box.

To increase the size of your swap file (thereby increasing virtual memory), consult your Windows documentation.

Virtual memory has disadvantages, however. It is significantly slower to access than physical memory is, for example. To determine the amount of *physical* memory in your system,

1. Exit Windows.
2. At the DOS prompt, type `win /s` and press *Enter* to start Windows in standard mode.
3. Choose Help | About, and check the amount of memory listed.

   Standard mode doesn't use virtual memory, so this figure is the amount of physical memory available to Windows. If this figure is less than 3MB, Quattro Pro may perform suboptimally.

There are two ways to increase the amount of physical memory available:

- Install more memory in your computer.
- Alter your CONFIG.SYS and AUTOEXEC.BAT files to make more of your computer's existing memory available to Windows. RAM disks (such as RAMDRIVE) and expanded memory (EMS) drivers (such as EMM386) do Windows relatively little good, and can often be eliminated, freeing up memory for Windows and the applications running under it.

Disk Caches

All computers running Windows should use a disk cache utility, such as SmartDrive. A disk cache buffers disk activity and greatly reduces the time required to access disk data. Windows applications run by dynamically loading code from disk, so a disk cache speeds up Windows applications and Windows itself.

See your Windows documentation for details on SmartDrive and on optimizing performance in general.

G L O S S A R Y

absolute cell reference A cell reference in a formula that always references the same cell, even if the formula is copied to a different part of the notebook. To make a cell reference absolute, use the Abs key (*F4*) to insert dollar signs in its address—for example, $A$5. See also *relative cell reference*.

active cell The cell affected by commands you choose, as pointed out by the *selector*.

active window The window affected by commands you choose. In Quattro Pro, the active window is on top and its title bar and frame are the same color as the Quattro Pro application title bar.

address The identifier for the location of a cell in a notebook. Within a spreadsheet page, a cell address is the letter of its column followed by the number of its row.

For example, D5 is the address of the cell in column D and row 5.

From one spreadsheet page to another within the same notebook, the address begins with the page letter or name. For example, B:D5 is the address of the cell in column D, row 5 of page B.

From one notebook to another, the address begins with the notebook file name in brackets. For example, [EAST]B:D5 is the address of the cell in a notebook named East in page B, column D, row 5.

ANSI The American National Standards Institute (ANSI) character set used in Windows products. ANSI characters can be translated into decimal and hexadecimal numbers. For a list of all ANSI characters, see Appendix C in *Building Spreadsheet Applications*.

argument Information required by many @functions and macro commands. For example, in @SUM(A4..A10), the block coordinates A4..A10 make up the argument; it indicates which values to add together.

arrow keys Keys on the numeric keypad or a separate set of keys (usually on the right side of the keyboard) used to move the selector or insertion point. They're usually marked with arrows: ↑, ↓, ←, →.

aspect ratio The proportion of width to height of a graph. There are several ways to control a graph's aspect ratio, depending on where you want to display or print the graph.

autoload file A file that opens automatically when you start Quattro Pro. You specify it with the Autoload File option of the Startup property (in the application Object Inspector).

axis Most graphs contain two axes: the *x-axis* usually runs horizontally along the bottom of the graph; the *y-axis* usually runs vertically on the left. (On rotated graphs, x-axis and y-axis positions are reversed.)

binary file A file that contains instructions in your printer's native language for creating a printout. By default, binary files have a .PRN extension.

bitmap image A picture in one of many graphic file formats (such as .BMP, .TIF, .PCX, or .EPS) that you can use to fill bars, backgrounds, or graphic elements.

bitmap object A floating object containing an image in bitmap format that was pasted from another application.

block Any rectangular group of cells, identified by its *coordinates*.

block name See *named block*.

border The outer edge of a *graphic element*, as opposed to its *fill*.

borders The lettered row at the top of the spreadsheet page (A to IV) and the numbered column at the left (1 to 8192) used to identify cell addresses.

buttons Rectangles that look like "push buttons" on the *SpeedBar* or in *dialog boxes*. Clicking a button takes a particular action. Most dialog boxes have at least three buttons: OK, Cancel, and Help.

You can also create *SpeedButtons*, which you can use to run a macro when clicked.

cascade To arrange the open Quattro Pro windows in cascade formation, where the bottom window in the stack is nearest to the upper left corner of the screen. The command that accomplishes this is Window | Cascade.

cell A rectangular area in the notebook used to store data. A notebook is made up of many spreadsheet pages, each containing more than two million cells ordered by rows and columns.

cell address See *address*.

cell identifier The left part of the *input line* that displays the active cell's address.

cell selector See *selector*.

check box A control in a *dialog box* that displays a ✓ mark when it's turned on. Click in the check box to turn it on or off.

client application The application receiving data from another through a *DDE* or *OLE* link. See also *server application*.

Clipboard A temporary storage area used to hold data for transfer between locations or between Windows applications.

Clipboard commands The Edit | Cut, Copy, and Paste commands. In Quattro Pro, you can choose these commands quickly by clicking the Cut, Copy, and Paste buttons in the *SpeedBar*.

controls The elements in a *dialog box* for supplying information to a command; *radio buttons*, *edit fields*, and *check boxes* are examples of controls.

coordinates The two addresses that define a block. The upper left and lower right addresses are always used. For example, the coordinates of the block stretching from column B, row 5 to column E, row 9 are B5..E9.

criteria table The block in a spreadsheet that specifies which field(s) to search and what data to search for. Quattro Pro looks for all database records that match search criteria in the specified criteria table.

database An organized collection of information. In Quattro Pro, a database is organized by rows, or *records*, of information, divided into separate columns, or *fields*.

data point A single cell value displayed in a graph.

date/time serial number A number assigned to a date or time, counting the number of days since December 30, 1899, and the portion of the day that has elapsed. The integer portion is for the date; the fractional portion is used for time.

DDE Dynamic Data Exchange. A method of exchanging data between Windows applications. You can use it to set up dynamic *links* between applications so that if the data in the DDE server application changes, it also changes in the DDE client application.

default A standard setting used when no other is specified. For example, the default file extension is .WB1. You can change a default

setting. You can also depart from the default setting for specified areas of the notebook (for example, you can change the width of an individual column).

destination block The target block for a copy or move operation. See also *source block*.

dialog box A type of window that you use to complete information needed for a command. Most dialog boxes have options and controls, which you set to give Quattro Pro information necessary to perform an operation the way you want.

dimmed The state of a menu command when it's unavailable for use. The command name appears in dimmed (gray) type on the menu.

DOS The *operating system* required to run Windows and Quattro Pro.

Drag and Drop The method of moving a selected block of cells by dragging it to a new location with the mouse. When you begin to drag the block, the mouse pointer changes to a hand and a colored outline appears. When you release the mouse button the data moves to wherever you've moved the colored outline.

You can copy a block using Drag and Drop by holding down the *Ctrl* key while dragging.

drill To enter data through several grouped pages at the same time. After creating a group and activating Group mode, you can select a cell and make an entry. Instead of pressing *Enter*, you can press *Ctrl-Enter* to drill the entry through all corresponding cells in the *group*.

drop-down list box A dialog box *control* that consists of a *text box* with a list. The list appears only when you click or press the down arrow at the right.

edit field A dialog box *control* that you can type into or point from.

ellipses (...) Following a menu command or dialog box button name, these indicate that the command or button leads to a *dialog box*.

explode To move a pie graph slice away from the center of the graph to emphasize it.

extended selection A *block* selected by holding down the *Shift* key while clicking the opposite corner cell or while pressing arrow keys.

extension A code of up to three letters attached to the end of a file name and separated from the rest of the name by a period. A file's extension often identifies the type of file it is. For example, Quattro Pro notebook files have the extension .WB1.

field A category of information in a *database*. In a Quattro Pro database, fields are set up as columns of information.

field name The name used to identify a *field*. In Quattro Pro, field names are the headings of the columns of information.

file A collection of data, stored under one name on a disk.

fill The interior of a *graphic element*, as opposed to its *border*.

find string In a Search and Replace operation, the group of characters to be found. You enter the find string in the Find *edit field*. See also *replacement string*.

floating object A rectangular object that overlaps cells. Quattro Pro has floating graphs, *SpeedButtons*, *OLE objects*, *bitmap objects*, and picture objects.

font A set of type used to print or display text. In Quattro Pro, you can assign different fonts to blocks of a spreadsheet and to different parts of a graph. You can change the fonts by choosing a different *typeface*, point size, and style (bold, italics, and so on).

format line A line used with Data | Parse to break text into separate *cells*. Symbols on the line tell Quattro Pro how to break down and interpret the data.

frequency distribution The number of times numbers within given ranges are found in a block of data.

@function One of a set of built-in commands you can enter in a formula. @Functions perform calculations and provide a resulting value.

function keys The keys labeled *F1* through *F10* or *F12* at the left or top of the keyboard, used to perform special Quattro Pro functions.

graph A visual representation of numerical information, often used to show trends and relationships in data.

graph type The plotting style of a graph, such as line, bar, pie, 3-D ribbon, or text.

graph window An area where you enhance graphs and change their *properties*. See also *Graphs page*.

graphic element Explanatory text or a drawn object added to a graph. Types of graphic elements include lines, arrows, polylines, polygons, freehand shapes, rectangles, ovals, and *text boxes*.

Graphs page The last page in a *notebook*. It contains icons representing the *graphs* and *dialog boxes* you've created. You can create and modify graphs, slide shows, and dialog boxes in the Graphs page.

grid In a *spreadsheet* page, the lines that separate rows and columns.

In a *graph window*, the dotted lines spaced at regular intervals in the background. You can use the grid to line up elements in a graph window.

grid lines Lines extending at regular intervals from axes across the graph frame. Grid lines help show the values at which lines, bars, or other graph elements are plotted.

group In a *notebook* window, a series of contiguous pages gathered together with Tools | Define Group. After you click the Group button (labeled G) at the bottom of the window, a blue line indicates that the group is active. Changes made to one page in the group affect other pages while Group mode is on.

In a *graph window*, the ability to select multiple elements in the graph window and tie them together into one group. You can then move, resize, or change properties of the group as a whole.

handles Small black squares that appear on the border of an *object* when the object is selected. You drag a handle to resize an object.

headings Entries to be repeated on the left or top of each printed page.

hint Text on the left of the status line that briefly describes the highlighted menu command.

indicator An uppercase word on the *status line* that indicates the current state, or *mode*, of the program. For example, when you're in Edit mode, the EDIT indicator appears.

input line The line below the *SpeedBar* where Quattro Pro displays information about the active cell. In Edit mode, the input line shows the data you're entering or editing, and it contains ✓ (enter) and ✕ (cancel) buttons.

insertion point A flashing vertical bar indicating where text will be inserted as you type.

key See *sort key*.

label In a spreadsheet cell, any entry that begins with a letter or a *label-prefix character*. You can type a label, or it can result from a formula.

In a graph, entries (of any type) that you assign to the graph to define plotted values.

label-prefix character A character preceding a label entry that indicates how to align the entry. A single quote (') left-aligns a label entry, a double quote (") right-aligns it, and a caret (^) centers it.

legend A key displayed beside or beneath a *graph* that specifies the colors, marker symbols, or fill for each *series* graphed.

light table The dialog box that contains representations of slides in a slide show. You use the light table to rearrange slides and apply transition effects.

link A reference to a cell in another *notebook*, or a *DDE* or *OLE* operation with another application. You can also create links from *dialog boxes* as described in *Building Spreadsheet Applications*.

list box A dialog box *control* that shows a list of choices.

locked titles Columns or rows fixed onscreen. They remain onscreen when you scroll the spreadsheet page.

macro A sequence of commands stored in a *notebook* as labels or text formulas that Quattro Pro can execute automatically. Macros can emulate the behavior of keys, mouse actions, and other commands, including commands normally unavailable to the user.

macro command One of a set of special commands that can be used within *macros*.

macro library A *notebook* used to store *macros*. When you run a macro, if it's not stored in the active notebook, Quattro Pro looks for it in the open macro library. You designate a notebook as a macro library with the Macro Library property (in the notebook Object Inspector.)

matrix A rectangular array of numbers used to solve linear formulas and equations.

maximize To enlarge the *active window* to the fullest possible size in the available *workspace*.

menu A list of items. Quattro Pro uses pull-down menus accessed through the *menu bar*.

menu bar The horizontal line just below the *title bar* of an application that contains names of *menus*.

menu tree The collection and organization of lists of commands you choose to control a program. You can create and edit menu trees to use with Quattro Pro.

minimize To reduce the *active window* to an icon.

mode A state the *spreadsheet* can be in. Actions you take have different effects depending on the current mode. For example, pressing the arrow keys in READY mode moves the *selector* between cells; doing so in EDIT mode moves the insertion point in the entry. The current mode is shown by an *indicator* on the *status line*.

named block A *block* of *cells* that has been assigned a name. You can reference such blocks by name instead of by *coordinates*.

noncontiguous blocks A series of separate *blocks* that are simultaneously selected by holding down the *Ctrl* key while selecting each block.

notebook A Quattro Pro data file that is a collection of *pages*. The file-name extension for a notebook is .WB1.

numeric format The format Quattro Pro uses to display a value entry.

object An item you can right-click and modify. Quattro Pro objects are blocks, pages, notebooks, graphs, graph elements, dialog box elements, floating objects, and the Quattro Pro application itself.

Object Inspector menus Quattro Pro's innovative way to change the characteristics of *objects*. By right-clicking an object, you display an Object Inspector menu, which contains a list of the object's properties.

OLE Object linking and embedding. A method of displaying a "snapshot" of data from another Windows application.

OLE object An object created in another Windows application that can be inserted into Quattro Pro as a *floating object*. Double-clicking an OLE object in Quattro Pro starts the application in which the object was created.

operating system The base software your computer uses to control application programs such as Quattro Pro. Quattro Pro and Windows require *DOS* (Disk Operating System) as a base in order to run.

operator A mathematical symbol used in a formula to express a relationship between two values. For example, + and / are operators in the formula +A6+10/B2.

Optimizer A Quattro Pro tool that lets you solve models for an optimal solution based on constraints.

orientation The direction that Quattro Pro prints. Landscape orientation prints horizontally and Portrait orientation prints vertically.

output block In a database query operation, an area of the *notebook* where Quattro Pro copies the *records* that match the specified search criteria. The output block must include the names of the *fields* you want copied for those records.

In a *parse* operation, an area where Quattro Pro copies the parsed data.

page One layer of a *notebook*. Each notebook has many *spreadsheet* pages and one *Graphs page*.

page break The place where one printed page ends and the other begins. You can have soft page breaks (those that Quattro Pro calculates for you) and hard page breaks (those that you create yourself with Block | Insert Break).

palette A group of color squares from which you can choose to apply a color to an object. In the graph window SpeedBar, you can choose from a list of predefined palettes in the palette list box. In the notebook window, you define colors with the notebook Object Inspector Palette property.

pane Part of a window. In Quattro Pro, you can break a notebook window into two panes and view different parts of the notebook in each.

parse To split a column of long *labels* (such as those created by importing a text file) into two or more columns of data.

paste To place something from the *Clipboard* into the active area.

play To give control of an *OLE object* to the *server application* by double-clicking the object. The activity that begins when you play an object (such as playing a sound, displaying a slide show, or editing the object) is determined by the server application.

plotter A printing device that uses colored ink jets or pens to print multicolored text and graphs.

pointer The onscreen indicator (arrow, double-arrow, graph icon, and so on) that tracks mouse movement.

pointing The method of adding a block reference to a formula or to an *edit field* in a *dialog box* by dragging with the mouse or by moving the *selector* to its location.

precedence The order in which *operators* are handled in a formula. For example, the multiplication operator (*) has a higher precedence than the addition operator (+).

primary notebook A *notebook* containing a *link* to another notebook. See also *supporting notebook*.

properties The characteristics of an *object*. For example, two of a cell's properties are Alignment and Numeric Format. To change the properties of an object, right-click it or choose the corresponding command from the Property menu.

protection A security measure that prevents the contents of an entire *spreadsheet* page from being changed. Specific *blocks* within the page can then be unprotected.

query To find specific information in a *database*. In Quattro Pro, you use Data | Query to look for and extract information in a database.

radio button A type of control in a *dialog box*. Only one radio button can be chosen in a given group of radio buttons.

recalculation The act of evaluating formulas whose references have changed.

record A set of information in a *database*. In a Quattro Pro database, records are rows of data.

regression analysis A table of figures that shows how one set of variables is affected by other sets of variables.

relative cell reference A cell reference Quattro Pro finds by its position in relation to the cell containing the formula, *not* by its address. See also *absolute cell reference*.

replacement string In a Search and Replace operation, the group of characters to replace the *find string*.

scale The range of values assigned to an *axis* and used for plotting data on a *graph*. Quattro Pro scales each numeric axis to best display the data plotted on it. You can also adjust the scale manually.

scroll bars Bars along the right and bottom edges of a *notebook* window. Use these bars with a mouse to scroll within the active spreadsheet page: drag the scroll box until the display is where you want it, click the scroll arrows, or click in the scroll bar itself.

select To activate an *object* in preparation for changing it in some way.

selector The rectangle that indicates the *active cell*.

sensitivity table A table that shows the results of varying one or two essential values. Also called a what-if table, because it shows what would happen to other figures if certain values change.

series Values plotted as a *group* on a *graph*.

server application The application sending data to another through a *DDE* or *OLE* link. See also *client application*.

shortcut A key sequence assigned to a menu command that appears to the right of the command name in the menu. See also *underlined letter*.

slide show A series of *graphs* shown full screen in any sequence you choose. You can add transition effects and control the amount of time each graph stays visible.

sort field See *sort key*.

sort key A column used to sort *records*. In Quattro Pro, you can sort records in a *database* by the entries in a given field, such as Date.

source block The original location of data to be copied or moved. See also *destination block*.

SpeedBar The row of buttons and tools you can click just below the *menu bar*. The contents of the SpeedBar change according to the current activity. You can also create your own SpeedBars, as described in *Building Spreadsheet Applications*.

SpeedButton A button you can create to run *macros*. Using the SpeedButton tool in the *SpeedBar*, you can create SpeedButtons that float in a spreadsheet page.

spillover text Part of a long label displayed in empty cells to the right of the cell containing the label.

spreadsheet A *page* of a notebook organized by rows and columns into cells.

startup directory The directory displayed the first time you choose a command to save or load a file in a Quattro Pro session. The startup directory is the directory from which you started Quattro Pro unless you specify a different directory with the Directory option of the Startup property (in the application Object Inspector).

status line The bottom line of the Quattro Pro screen showing CAP (if *Caps Lock* is on), OVR (if overwrite mode is on), and the *mode* (such as READY or EDIT). It also shows menu *hints* as commands are selected.

style A set of block property settings gathered under a name. You use a style by choosing it from the Style list in the *SpeedBar*. You can create new styles with Edit | Define Style.

supporting notebook A *notebook* that is referenced by a *link* from another notebook. See also *primary notebook*.

syntax The rules for the way *@functions* or *macros* and cell references must be entered.

tab A marker you can click to move to the associated page of the *notebook*. Initially, tabs contain the letters of pages, but you can specify full page names. Tabs are at the bottom of the notebook window.

template A notebook file you can save to serve as a basis for other notebooks. You may want to use a template to save standard property settings or column headings, for example.

text box A graphic design element that can contain word-wrapped text.

tick mark A small line on a graph *axis* indicating a value.

tile To divide the available space in the Quattro Pro *workspace* between all open windows. The command that accomplishes this is Window | Tile.

title bar The line at the top of a window that displays the name of the window. The title bar is the same color as the Quattro Pro title bar when a window is active.

titles In a *spreadsheet* page, row or column headings that you can lock into view.

In a *graph window*, lines of explanatory text. You can have two major titles above the graph and one each along the x-axis, the y-axis, and the secondary y-axis.

typeface A design of a set of type. Times Roman and Times Bold are examples of related but individual typefaces. A typeface is one attribute of a *font*. Options (bold, italic, and so on) and point size are other attributes. Each combination of typeface, style, and size makes up a different font.

UI See *user interface*.

underlined letter The character in a command or dialog box *control* that you can type to choose the command or control. In Copy in the Block menu, *C* is the underlined letter. To open a menu using its

underlined letter, hold down *Alt* and press its underlined letter. See also *shortcut*.

user interface (UI) The system of interaction through which you communicate with the computer. In Quattro Pro, some elements of the UI are *dialog boxes*, pull-down *menus*, and the *SpeedBar*. You can define your own UI using techniques described in *Building Spreadsheet Applications*.

value Any numeric entry in the *notebook*, entered either as a number, a date, or a formula that calculates a number.

what-if table See *sensitivity table*.

wildcards Placeholder characters that can stand for one or more characters. In Quattro Pro, you can use wildcards in search conditions when querying a database, when loading files, and when linking notebooks. There are two wildcards: * represents any number of characters, and ? represents a single character.

workspace A set of windows and their size, position, and arrangement. You can save the current workspace with File | Workspace | Save. Workspace files have a .WBS file-name extension.

x-axis The horizontal line at the bottom of a *graph*, used to plot values.

y-axis The vertical line, at the left of a *graph*, used to plot values.

z-axis In a 3-D *graph*, the axis that gives the illusion of depth. When using the default rotation and elevation angle settings, the z-axis extends toward the upper right of the *graph window*.

zoom factor The enlargement or reduction of the appearance of all cells in a notebook. The Zoom Factor is a notebook property. Percentage settings greater than 100% enlarge cells, and settings under 100% reduce them.

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