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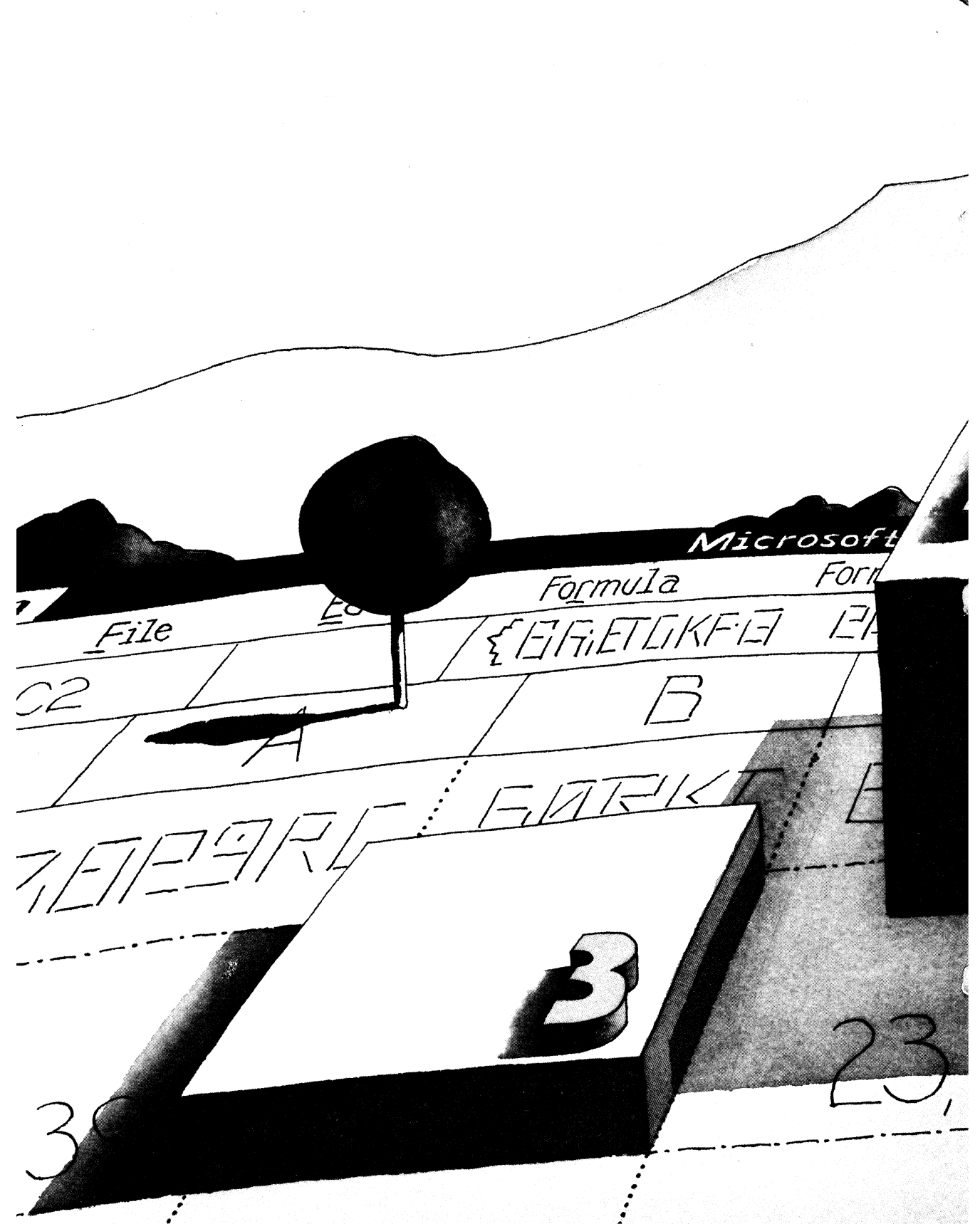
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Reference



Introduction

Microsoft® Excel provides the automated business tools you need for your projections, calculations, data analysis, decision-making, and reporting:

- **Worksheets.** With Microsoft Excel worksheets you can design powerful, effective models and systems with accuracy and precision.
- **Charts.** A complete charting package makes it easy to visualize your worksheet data instantly, perform rapid analysis, and create custom presentation graphics.
- **Databases.** You can conveniently manage a database on a worksheet, using standard database operations or a data form, a tool that simplifies most database operations.
- **Macros.** With Microsoft Excel, you can create your own macros to automate frequently performed tasks, perform specialized calculations, and design custom applications.

Microsoft Excel gives you advanced calculating ability, along with the convenience of using windows to organize tasks and documents on your screen.

About This Manual

Microsoft Excel Reference is a complete guide for using Microsoft Excel. This manual assumes that you have installed Microsoft Excel, using the procedures outlined in *Microsoft Excel Getting Started and Quick Reference*, a separate manual included in your Microsoft Excel package.

Microsoft Excel Reference is intended for Microsoft Excel users of all proficiency levels. Topics in this book are listed in alphabetical order. For example, to create a worksheet, look under W for "Worksheet."

Reference contains four kinds of topics:

- **Core topics.** The core topics are starting points in the manual, presenting the essential concepts and procedures you need to start working with Microsoft Excel. The six core topics are: **Command, menu, and dialog box**; **Windows**; **Worksheet**; **Chart**; **Database**; and **Help**. A core topic is identified by a blue bar across the top of each page of the topic.
- **Task topics.** Task topics explain concepts, examples, and procedures in Microsoft Excel.
- **Command topics.** Command topics describe the basic operation and options or settings related to each command.
- **Glossary topics.** Glossary topics provide brief definitions of essential terms in Microsoft Excel.

In addition, the Appendix provides information about the utility programs included with Microsoft Excel:

- "Clipboard" explains how you can move or copy information within Microsoft Excel or, if you are running Microsoft Excel under Microsoft Windows, version 2.0 or higher, between Microsoft Excel and other applications.
- "Control Panel" provides information on how you can use Control Panel to adjust such settings as date and time, printer assignments, and screen colors.

Where to Start

The following table lists topics you should read first. If you're new to Microsoft Excel or to Windows-based applications, you may find it helpful to start with the core topics (indicated by an asterisk) in the order they appear in the table.

To	See this topic
Learn to display menus and choose commands	* Command, menu, and dialog box
Learn to work with windows	* Windows
Learn worksheet basics	* Worksheet
Learn chart basics	* Chart
Learn database basics	* Database
Learn to use online Help	* Help
See all commands	Command, menu, and dialog box
Learn about a specific command	The corresponding command topic (alphabetized by menu name, then command name— for example, **File Open command**)
See a complete listing of features and specifications	Features and specifications
See a complete listing of default settings	Default settings
See a complete listing of required and optional hardware	Hardware and system configuration

To	See this topic
Learn about command shortcut keys, special keys, and keyboard techniques	Keyboard
Learn about mouse techniques	Mouse

Notational Conventions

The following terms and notational conventions are used throughout this manual:

- **Keynames.** The names of keys are spelled out in this manual (for example, ESCAPE, ENTER, CONTROL) and appear in small capital letters. On your keyboard, the key caps may abbreviate the names or represent them differently. For example, the ESCAPE key is often labeled Esc, and the CONTROL key is often labeled Ctrl.
- **Key combinations and sequences.** A plus sign (+) used between two keynames indicates that those keys must be pressed at the same time. For example, "Press ALT+ESCAPE" means that you should press the ALT key and hold it down while you press the ESCAPE key and release it. Then release the ALT key.

  A comma (,) between two keynames indicates that those keys must be pressed sequentially. For example, "Press ALT, SPACEBAR" means that you should press the ALT key and release it, then press the SPACEBAR and release it.
- **DIRECTION keys.** The DIRECTION keys are the four arrow keys on your computer's keypad. The name of the individual DIRECTION key refers to the direction the arrow points: the UP key, the DOWN key, the RIGHT key, or the LEFT key.
- **Italics.** *Italics* indicate words and characters you type. Titles of books also appear in italics.
- **Numbered lists and boxed-bulleted items.** A numbered list (1) indicates a procedure with two or more sequential steps. A boxed-bulleted (■) item indicates a procedure with only one step.

  Whenever possible, a single procedure is given for keyboard and mouse use. Where separate keyboard and mouse procedures are explained, each is indicated by a keyboard or mouse icon in the left margin.
- **Square bullets.** Square-bulleted lists, such as this one, provide information but not procedural steps.

Microsoft Excel and Microsoft Windows

Microsoft Excel, version 2.0, operates in a graphics environment called Microsoft Windows, created by Microsoft Corporation. An extension of the MS-DOS® operating system, Microsoft Windows gives a standard look and feel to Microsoft Excel and all other Windows applications.

The Microsoft Excel package contains all the software necessary to run Microsoft Excel. You can also run Microsoft Excel under Microsoft Windows, version 2.0 or higher.

With Microsoft Windows, you can take advantage of these additional features of the Windows environment:

- **Running multiple applications.** You can run several applications under Windows at one time and easily switch between them, creating an integrated work environment.
- **Data exchange between applications.** You can transfer data between Microsoft Excel and other standard MS-DOS applications, as well as other Windows applications.
- **Windows control of the MS-DOS environment.** From the Windows environment, you can easily access all Windows and non-Windows applications, files, directories, and disks, and control all MS-DOS-related tasks such as directory or file management and formatting disks.
- **Additional applications.** The Microsoft Windows package also includes Write (graphical word processor), Paint (bit-image editor), a graphical clock, calculator, notepad, card file program, and terminal emulator.

To run Microsoft Excel under Microsoft Windows, you need to purchase and install Microsoft Windows, version 2.0 or higher. You can install Microsoft Windows before or after installing Microsoft Excel.

Microsoft Product Support

If you have a question about Microsoft Excel and you can't find the answer in this manual, call our Product Support staff by dialing the telephone number on your registration card. When you call, please have the following handy:

- Information about the make of your computer
- Your copies of the *Microsoft Excel Reference* and *Microsoft Excel Functions and Macros* manuals

Microsoft® Excel Reference

Complete Spreadsheet with Business Graphics and Database

Version 2.0

For IBM® Personal System/2™, IBM PC AT®, and Compatibles

Microsoft Corporation

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Absolute reference

A cell can refer to the contents of another cell in one of two ways: it can make an **absolute reference** or a relative reference to another cell.

An absolute reference is like giving an address to a friend. For example, if you give the address 1540 Maple Avenue, your friend will find the correct location. In the same way, you might use the absolute reference $C$3 to tell Microsoft Excel to look in a cell at a specific location. An absolute reference does not change if the formula containing it is copied or moved; it will still refer to the same cell.

By contrast, a relative reference does not refer to one specific cell. A relative reference is like telling your friend to "go up four blocks and over two."

In the A1 reference style, absolute references have a dollar sign before the column letter and row number (for example, $B$8); relative references do not (for example, B8). In the R1C1 reference style, relative references have brackets around the row and column indicators (for example, R[8]C[2]); absolute references do not (for example, R8C2).

For more information on absolute and relative references and on reference styles, see **References**.

Alignment

Alignment refers to the way text or numbers are positioned or arranged in a document. In a worksheet, alignment has to do with the position of text or numbers within a cell — to the left, right, or center of the cell. In a chart, alignment refers to the vertical and horizontal arrangement of chart text and labels for chart objects.

This topic explains:

- Alignment in worksheets

  Aligning worksheet entries

  Justifying a paragraph of text

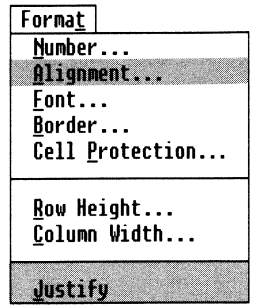
- Text alignment in charts

  Aligning chart text

Note | All worksheet alignment options also apply to macro sheets.

Alignment in Worksheets

You control the alignment of data in worksheets and macro sheets with these commands on the Format menu (Full menus shown):

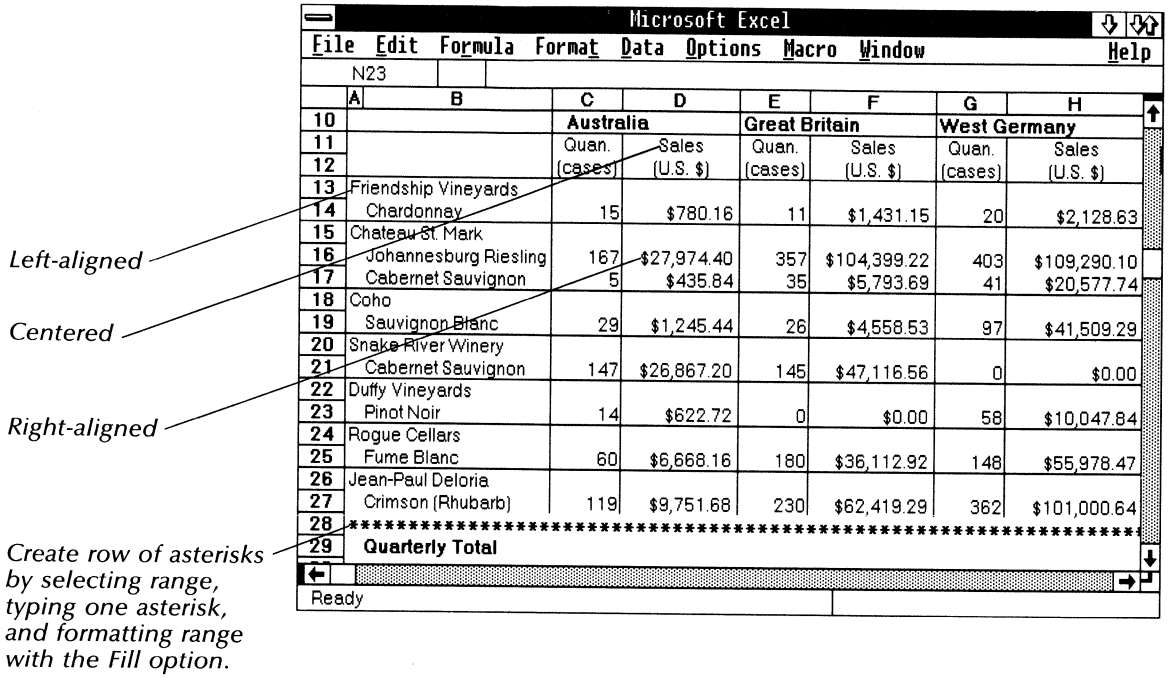


- Format Alignment controls alignment of text or numeric entries in cells and ranges.
- Format Justify aligns paragraphs of explanatory text in a worksheet to fit ranges you specify.

Aligning Worksheet Entries

The default alignment setting is the General alignment option, controlled by the Format Alignment command. With General alignment, text is automatically aligned to the left in a cell, numbers to the right, and logical and error values (for example, #DIV/0!) in the center. Other Format Alignment settings for worksheet entries include the Left, Center, Right, and Fill options. The Fill option offers a quick way to repeat characters across an entire cell or range.

The following illustration shows examples of these alignment options:



To specify alignment or use the Fill option:

1. Select the cells you want to format.
2. Choose Format Alignment.
3. Select the option you want.
4. Choose the OK button.

For more information, see **Format Alignment command**.

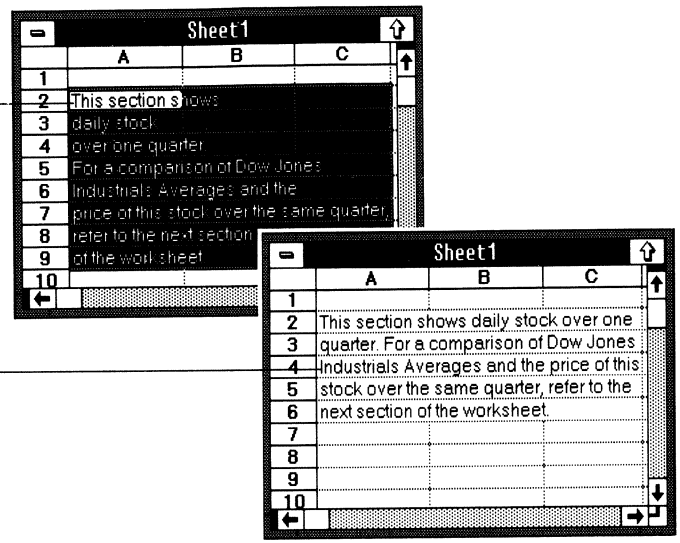
Justifying a Paragraph of Text (Full Menus)

With the Format Justify command, you can neatly align paragraphs of explanatory text or comments included on a worksheet. Microsoft Excel aligns the text in a single-column or a multicolumn range you specify. The text is aligned left, with each line measuring as close as possible to the maximum width of the column or range.

The following illustration shows how to justify a long, one-column paragraph into three columns on a worksheet:

Original, unjustified text is entered in column A. To justify the text in a three-column range, select the column containing the text and the two additional columns.

The Format Justify command evenly aligns the text within the three-column range.



The Format Justify command adjusts text only within the range you specify. If the justified text does not fit within the range, Microsoft Excel displays a message asking if you want to replace the data in the cells below the selection. Choosing the OK button replaces the data in cells with justified text; choosing the Cancel button cancels the command. If the justified text is shorter than the specified range, unused cells are left blank.

Tip Before you justify a paragraph, you may want to adjust column widths in the range affected. With the keyboard, select one cell in each column you want to adjust and use the Format Column Width command. With the mouse, drag the vertical gridline to the right of the column heading in each column you want to adjust. For more information, see **Column**.

To justify a paragraph of text:

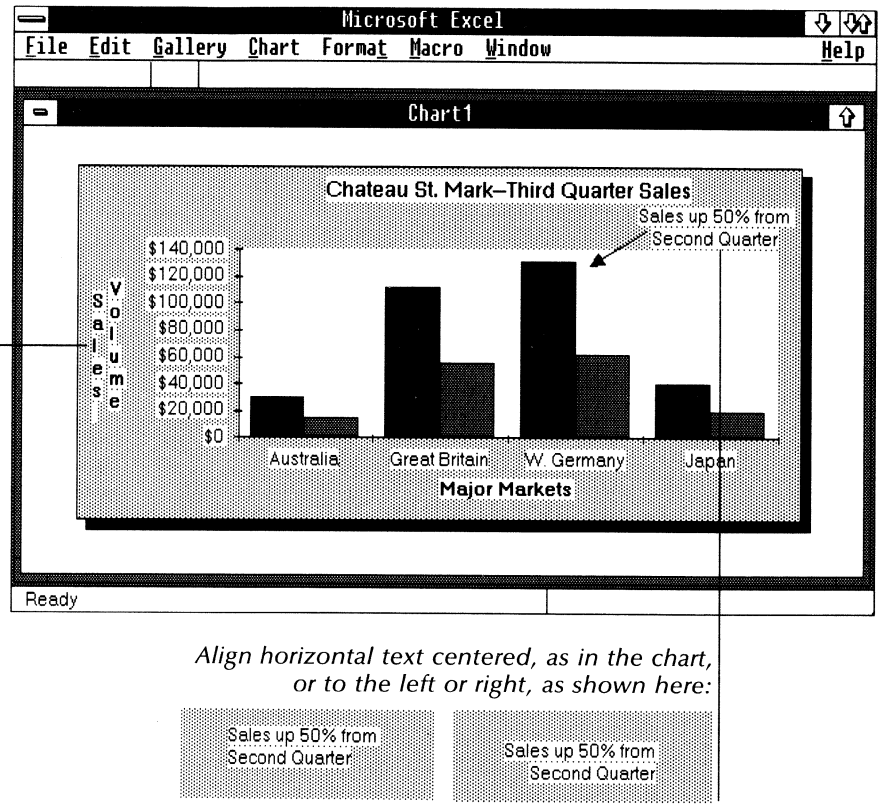
1. Select the cells containing the text you want to justify and include the entire range in which you want the justified text to appear.
2. Choose Format Justify.

Note You can use the Format Justify command only for ranges that contain text or blank cells. If you select a range that contains numeric values, Microsoft Excel displays a message indicating that nontext cells are in the range.

For more information, see **Format Justify command**.

Text Alignment in Charts

You use the Format Text command to control the alignment of unattached text and attached text labels for chart objects (such as a category axis label). You can format both vertically and horizontally oriented text, as shown in the following illustration:



You can also adjust vertical text horizontally, or horizontal text vertically.

Aligning Chart Text

1. Select the chart text you want to align.
2. Choose Format Text.
3. Select the options you want.
4. Choose the OK button.

For more information about formatting chart text, see **Chart text**.

Related Information

Reference

For information on	See
General overview of formatting worksheets and charts	Formatting a document
Formatting text fonts in worksheets and charts	Font
Using borders and shading in worksheets	Borders and shading

Sampler

Creating Calendars, Diagrams, Tables, and Forms

Tutorial

Changing How a Worksheet Looks

Feature Guide

Worksheet Formatting

Array

In Microsoft Excel, you use **arrays** to build formulas that produce multiple results or that operate on a group of arguments arranged into rows and columns. There are two types of arrays in Microsoft Excel: **array ranges** and **array constants**. An array range is a rectangular area of cells sharing one common formula (an array formula). An array constant is a specially arranged group of constants that's used as an argument in a formula.

It's not necessary to know about arrays to use Microsoft Excel. Most array operations can be performed using ordinary, single-value formulas and arguments. However, in some cases you'll find that one array formula can replace a group of ordinary formulas, saving you time and reducing the amount of memory used by your worksheet. Some Microsoft Excel worksheet functions either use array constants as arguments or produce array values as results. If you want to use these functions for calculating a group of results based on a group of arguments, you'll want to explore the topic of arrays.

This topic explains:

- Array ranges

  Entering an array formula

  Using arrays

  Editing an array range

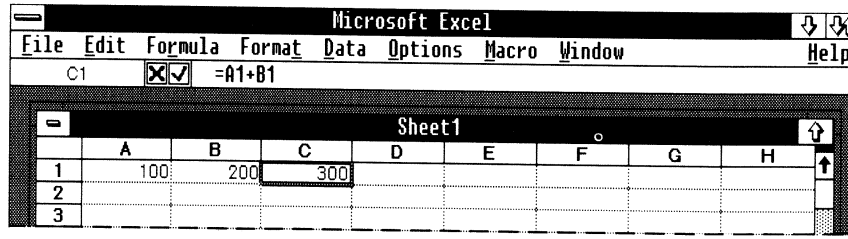
  Converting an array range to constant values

  Clearing an array range

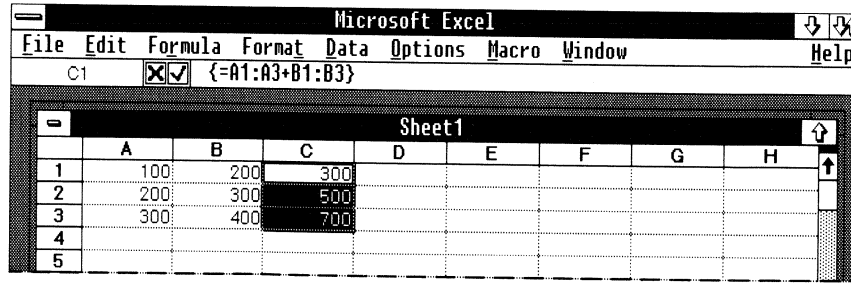
- Array constants
- Array arguments and results

Array Ranges

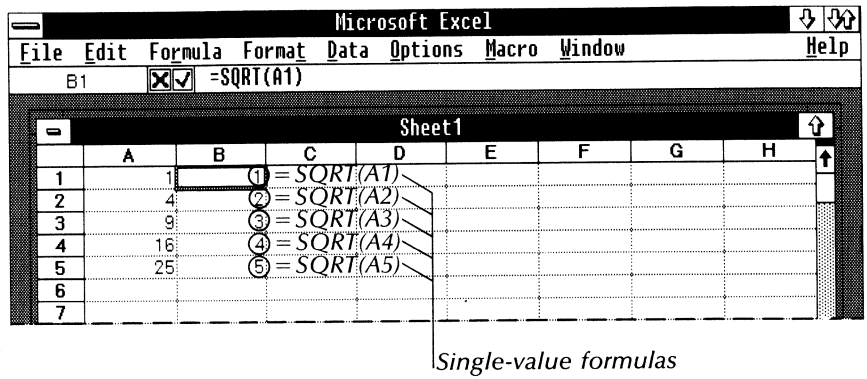
To understand how an array range and formula work, first consider how an ordinary, single-value formula works. A single-value formula produces a single result from one or more arguments or operands. For example, the formula =A1+B1 produces a single result — the sum of the values in cells A1 and B1:



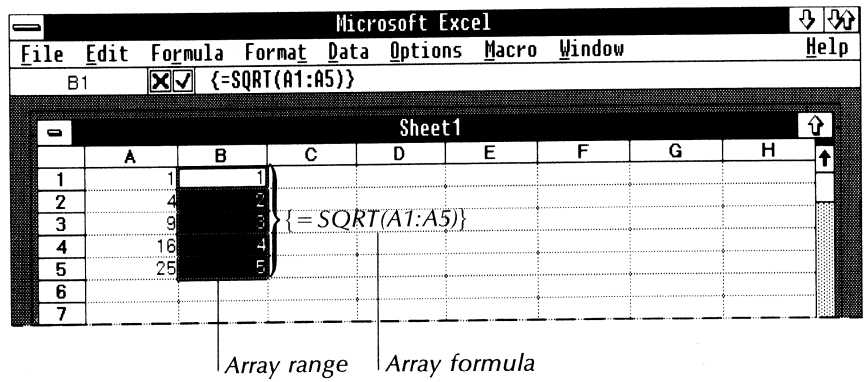
Array formulas differ from single-value formulas in that they can produce more than one result from a group of arguments or operands. For example, the array formula =A1:A3+B1:B3 produces a set of three results:



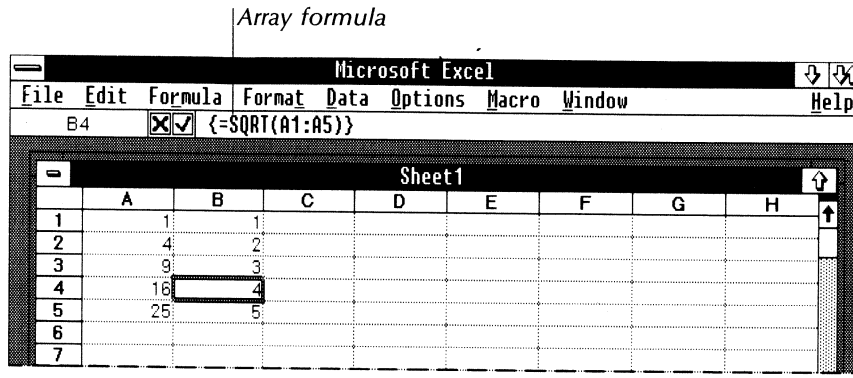
For some calculations, you'll find that you can replace a group of ordinary formulas with one array formula. For example, suppose you want to calculate the square root of each number entered in cell range A1:A5. You could enter five single-value formulas in five cells:



Or, you could enter one array formula in five cells. Unlike a single-value formula, which can occupy only a single cell, an array formula can occupy a rectangular area of cells called an array range. Because you can use just one array formula instead of several single-value formulas, using arrays saves memory.



When you select a cell in an array range, Microsoft Excel displays that array range's formula in the formula bar:



You can recognize an array formula by the braces ({}) enclosing it. Microsoft Excel automatically puts the braces around a formula when you enter it as an array; you don't type the braces yourself.

Entering an Array Formula

You enter a formula as an array by pressing CONTROL + SHIFT + ENTER. This tells Microsoft Excel that the formula contains an array as an argument and/or produces an array as a result.

When you enter a formula as an array, Microsoft Excel places braces ({}) around it to indicate that it's an array formula. When you activate the formula bar to edit the formula, the braces disappear.

Do not type the braces around a formula in an attempt to enter it as an array formula. If you do, Microsoft Excel interprets the entry as text, not as an array formula.

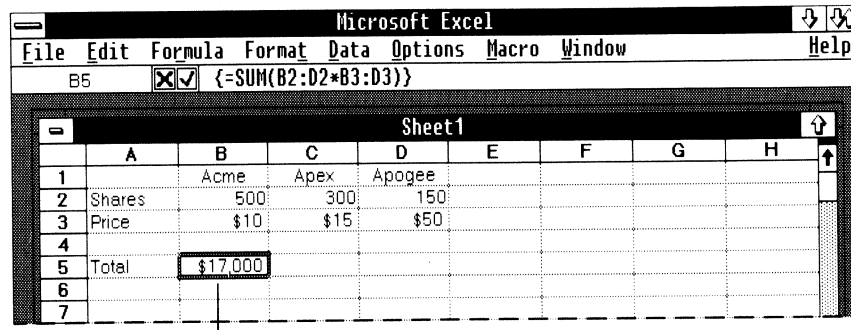
To enter an array formula:

1. Select the array range.
2. Build the formula by typing or using the mouse.
3. Press CONTROL + SHIFT + ENTER.

Note Make sure you hold both the CONTROL and SHIFT keys down while you press ENTER. If you hold only SHIFT down, Microsoft Excel enters the formula as an ordinary formula (not as an array formula) in the active cell (not in the selected range). If you hold only CONTROL down, Microsoft Excel enters the formula as an ordinary formula in all of the selected cells.

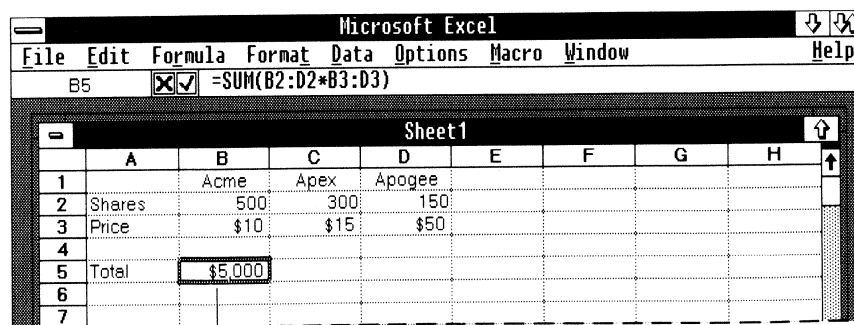
Using Arrays

In an array formula, you can give an array as an argument to a function or operator that normally operates on single values and produces a single result. For example, if you enter the formula =SUM(B2:D2*B3:D3) in a single cell by pressing CONTROL+SHIFT+ENTER, Microsoft Excel multiplies each value in cell range B2:D2 by the corresponding value in cell range B3:D3, then sums the resulting array of products:



Note The relative references used in an ordinary formula are always relative to the cell containing that formula. In contrast, relative references used in an array formula are always considered to be relative to the upper-left corner cell of the array range containing that formula.

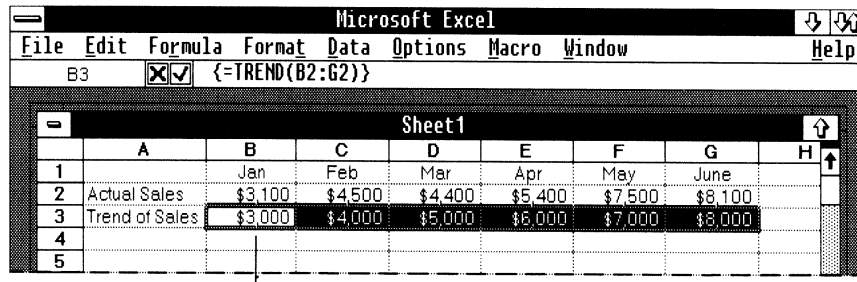
Note that if you enter the formula =SUM(B2:D2*B3:D3) as an ordinary formula by pressing ENTER, Microsoft Excel calculates a different result. In an ordinary formula, the multiplication operator operates on two single values, not on two arrays. Microsoft Excel chooses only the value from each cell range that occupies the row or column containing the formula:



If the formula is not in a common row or column with the cell range, the formula returns the #NULL! error value.

To produce multiple results using an array formula, you enter the formula in a cell range. For example, suppose you want to compute the trend of your monthly sales figures over the last six months. That trend is described by six values — one value for each month. If your monthly sales figures are entered in cell range B2:G2, you could calculate the trend by selecting cell range B3:G3, building the formula =TREND(B2:G2), and pressing CONTROL+SHIFT+ENTER. (The TREND function computes the array of values that correspond to the trend of its arguments.)

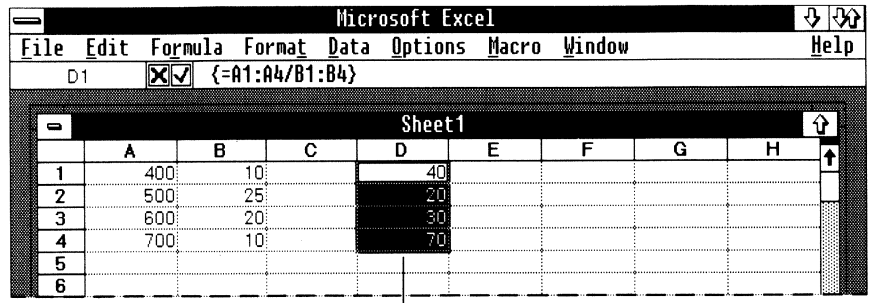
When you enter the array formula, all the cells in the selected range are filled with the formula {=TREND(B2:G2)}. And, Microsoft Excel displays the array of sales trend values in cell range B3:G3. If you fail to enter the formula as an array (for example, by pressing only the ENTER key) Microsoft Excel enters the formula as an ordinary formula without braces (for example, =TREND(B2:G2)).



Cells B3:G3 contain the trend of the corresponding values in cells B2:G2.

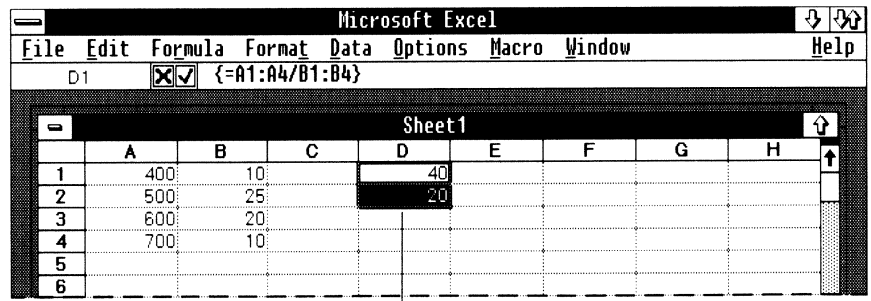
The array range in the preceding illustration (cell range B3:G3) is one row high and six columns wide. The **dimension** of that array is "1-by-6" (1 row by 6 columns).

For most array operations, you'll want to select an array range that's the same dimension as the **result array** produced by the array formula. For example, the array formula =A1:A4/B1:B4 produces a 4-by-1 result array:



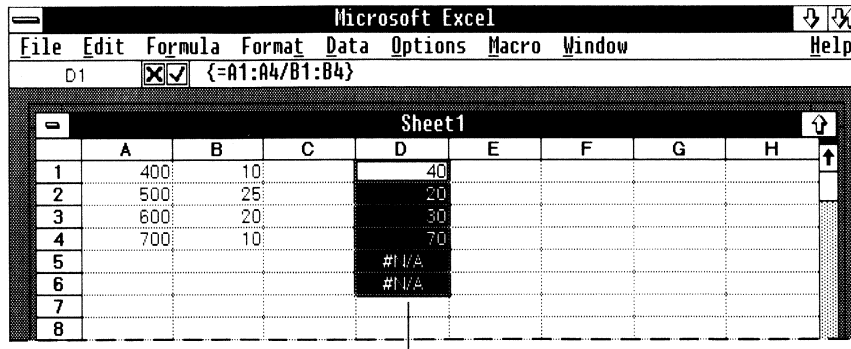
4-by-1 result array

However, if you enter =A1:A4/B1:B4 as an array formula in cell range D1:D2, Microsoft Excel displays only the first two values of the result array:



2-by-1 result array

Or, if you enter the formula in cell range D1:D6, Microsoft Excel calculates all four result array values, but displays the #N/A error value in cells D5 and D6:



Editing an Array Range

Because an array range shares one formula, you edit an array range differently than ordinary cells. You edit an array range as if it were a single cell by selecting the array range and editing the entire range at once.

When you edit an array range, you cannot perform any operation that changes only a portion of the array range. For example, you cannot:

- Change the contents of cells that form only part of an array.
- Clear or move cells that form only part of an array.
- Delete cells that form only part of an array.
- Insert cells within an array range.

If you attempt any of these operations, Microsoft Excel displays a message that tells you the operation is illegal for arrays.

To edit an array formula:

1. Select any cell in the array range.
2. Activate the formula bar.

   The array formula braces disappear when the formula bar is active.
3. Edit the formula.
4. Press CONTROL + SHIFT + ENTER to enter the new formula in the array range.

Tips

Although you cannot change portions of an array range, you can assign a unique format to selected cells in an array range. And you can copy and paste a single cell or several cells from an array to another part of the worksheet. Microsoft Excel adjusts the relative references in the copied array formula just as it does with ordinary formulas.

For all editing operations except copying or editing the array formula, you should select the entire array range before carrying out the operation. As a shortcut, you can select the current array range (the array range that contains the active cell) by pressing CONTROL+SLASH (/). This is the same as selecting the Current Array option in the Formula Select Special dialog box.

Converting an Array Range to Constant Values

Because of the restrictions that apply to editing an array range, you may want to convert array formula results into a range of constant values, then edit those values.

1. Select the array range.
2. Choose Edit Copy.
3. Choose Edit Paste Special.
4. Under Paste, select Values.
5. Choose the OK button.

Clearing an Array Range

1. Select the array range.
2. Choose Edit Clear.
3. Choose the OK button.

Array Constants

Up to now, all the examples in this section have used references to represent arrays in formulas. In the formula =A1:A3+B1:B3, for example, A1:A3 and B1:B3 represent the two arrays containing the values in cells A1, A2, and A3 and in cells B1, B2, and B3. You can also use array constants in formulas to represent an array of values.

You specify an array constant by enclosing the values within braces ({}). Separate the values in the same row with commas, and use semicolons to separate different rows. For example, to use the following array in a formula:

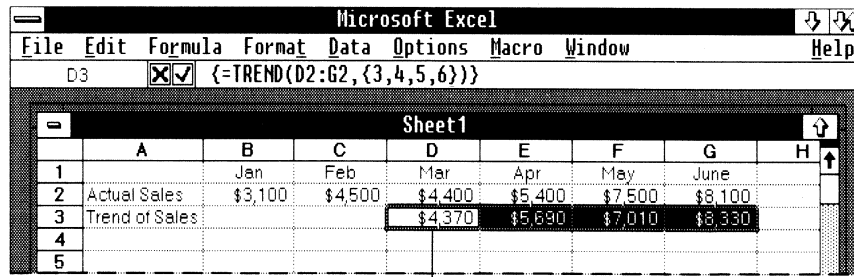
1 2 3
4 5 6

you would type:

{1,2,3;4,5,6}

The array constant {1,2,3;4,5,6} is a 2-by-3 array because it consists of 2 rows of 3 values each.

Generally, you use array constants in place of array references when you don't want to enter the array values on your worksheet. For example, in the following illustration you could compute the trend of your sales figures for March through June by entering *=TREND(D2:G2,{3,4,5,6})*. The second argument ({3,4,5,6}) tells Microsoft Excel to figure the trend for the third, fourth, fifth, and sixth months of the year:



Cells D3:G3 contain the trend for months 3–6 (Mar through June).

Array constants can contain numbers, text, logical values, or error values. These values must be entered in the correct format for a formula. Numbers can be in integer, decimal, or scientific format, but cannot contain

dollar signs, parentheses, or percent signs. Text must be enclosed in double quotation marks. You can also include different types of values in the same array constant. Here are some examples of array constants:

Type	To get this	
{*10,20,30,40*}	1-by-4 array:	10 20 30 40
{*100;200;300*}	3-by-1 array:	100 200 300
{*7,8,9;"x","y","z"*}	2-by-3 array:	7 8 9 x y z

The values in an array constant must be constants and not formulas. For example, you could not use {1+2,3+4} as an array constant. Also, you cannot enter array constants that have columns or rows of unequal length. For example, {1,2,3;4,5;6,7,8} is not a valid array constant since the middle row contains two values and the other rows contain three values.

Microsoft Excel does not allow you to list cell references or names in an array formula the same way that you list constants. For example, you could not use {A1,B1,C1} to represent the array containing the values in cells A1, B1, and C1. Instead, you would have to use the cell range reference A1:C1 or enter the values of those cells directly in the array as constants (for example, {10,20,30}).

Array Arguments and Results

When you use an array as an operand or as an argument to a function, all other operands or arguments to that function should be the same dimension as the first array. If necessary, Microsoft Excel expands constants or array constants to the dimensions required by an operation. Microsoft Excel expands only constant values, not values represented by a cell reference.

For example, in the formula =SUM({1,2,3}*4), one operand to the multiplication operator is a 1-by-3 array and the other is a single value. In evaluating this formula, Microsoft Excel automatically expands the second argument to a 1-by-3 array and evaluates the formula as =SUM({1,2,3}*{4,4,4}). The formula's result equals 24, which is the sum of 1*4, 2*4, and 3*4.

When determining how to expand arguments, Microsoft Excel considers the dimensions of all the arguments used in the operation. Each argument must have the same number of rows as the argument with the greatest number of rows and the same number of columns as the argument with the greatest number of columns.

If an argument is a single value, or a 1-by-1 array, Microsoft Excel expands the argument by repeating its single value as often as necessary to produce the desired array dimension. If an argument is a one-row or one-column array, Microsoft Excel expands the argument by repeating its one row or column of values. Otherwise, if an argument is an array with multiple rows and columns, Microsoft Excel expands it to the proper dimension by filling the array with the #N/A error value.

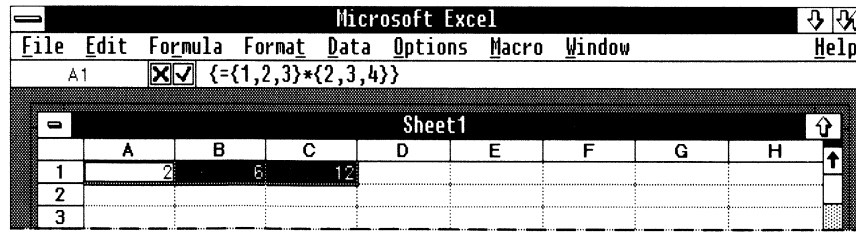
The following table shows how array arguments are expanded:

In this formula	Microsoft Excel expands the arguments to this
=1+{1,2;3,4}	{1,1;1,1}+{1,2;3,4}
={1,2,3}*{2;3}	{1,2,3;1,2,3}*{2,2,2;3,3,3}
={1,2}+{1,2,3;4,5,6}	{1,2,#N/A;1,2,#N/A}+{1,2,3;4,5,6}
={1,2;3,4;5,6}+{1,2,3;4,5,6}	{1,2,#N/A;3,4,#N/A;5,6,#N/A}+ {1,2,3;4,5,6;#N/A,#N/A,#N/A}
=MOD({5,6,7},4)	MOD({5,6,7},{4,4,4})

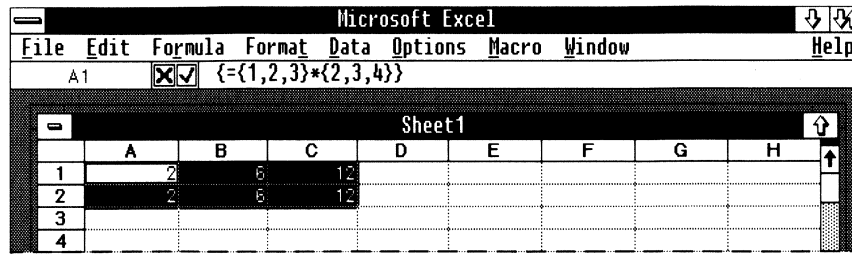
When you enter an array formula in an array range, the formula should produce an array with the same dimensions as that array range. Then, Microsoft Excel places each element of the result array in one cell of the array range.

If the result array is smaller than the array range, the result array is expanded, as described above, before its values are placed in the array range. If the result array is larger than the array range, the excess values are not shown on the worksheet.

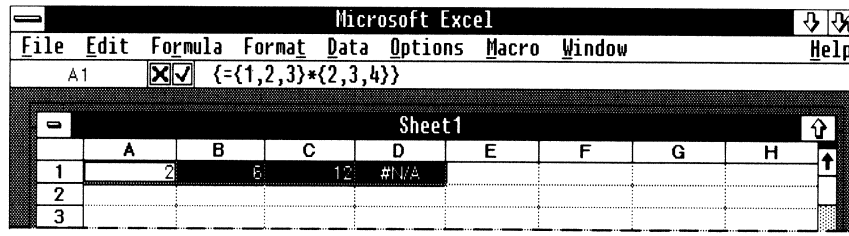
For example, if the array formula ={1,2,3}*{2,3,4} is entered into the 1-by-3 array range A1:C1, Microsoft Excel produces the 1-by-3 array {2,6,12}.



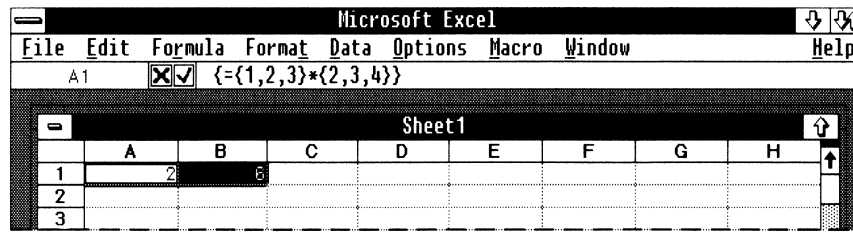
If that formula were entered into the 2-by-3 array range A1:C2, Microsoft Excel expands the result to {2,6,12;2,6,12}.



If the formula were entered into the 1-by-4 array range A1:D1, Microsoft Excel would expand the result to {2,6,12,#N/A}.



If the formula were entered into the 1-by-2 array range A1:B1, Microsoft Excel would trim the result to {2,6}.



The following table shows some examples of array calculations:

For this formula	Microsoft Excel produces this result
=\{1,2,3\}+\{4,5,6\}	\{5,7,9\}
=SQRT(\{1,4,16\})	\{1,2,4\}
=\{1,2,3\}*\{2;3\}	\{2,4,6;3,6,9\}
=\{1,2\}+\{1,2,3;4,5,6\}	\{2,4,#N/A;5,7,#N/A\}
=\{1,2;3,4;5,6\}+\{1,2,3;4,5,6\}	\{2,4,#N/A;7,9,#N/A; #N/A,#N/A,#N/A\}
=MOD(\{5,6,7\},4)	\{1,2,3\}
=IF(\{"A";"B";"E"\}=\{"C";"B";"A"\}, TRUE,FALSE)	\{FALSE;TRUE;FALSE\}

Related Information

Reference

For information on	See
Building formulas	Formula Formula bar
Overview and list of built-in worksheet functions	Function
Overview of macros	Macro
Calculation and operators	Calculation Operator

Functions and Macros

"Data Types" in Chapter 1, "Worksheet Function Basics"

Chapter 2, "Worksheet Function Directory"

Sampler

Calculating a Sales Commission

Analyzing a Loan

Generating Mailing Labels

Tracking and Forecasting Stock Prices

Auditing worksheet models

Auditing your worksheet models means checking your worksheet to make sure it's correct.

This topic explains:

- Auditing basics
- Checking names
  - Checking the definition of a name
  - Listing all defined names
  - Displaying names in the Info window
- Checking relationships between cells

Auditing Basics

Microsoft Excel provides many tools to help you audit your worksheet models:

- **Names.** You can apply names to a worksheet even after the worksheet has been created. Names make it easier to read a worksheet, and to understand the logic behind a worksheet. The "Checking Names" section of this topic discusses how to check your worksheet names. For information on using names, see **Names**, **Formula Define Name command**, **Formula Create Names command**, **Formula Apply Names command**, and **Formula Paste Name command**.
- **Information about circular references.** If you accidentally create a circular reference in your worksheet, Microsoft Excel can tell you where the circular reference is located. For more information, see **Circular reference**.
- **A visual overview of large documents.** You can use the File Print command, with the Preview check box turned on, to see a reduced version of a document. For more information, see **Printing a document** or **File Print command**. Or, you can reformat a document using a very small font. For information on fonts, see **Font**, **Formatting a document**, or **Format Font command**.
- **Specific error values.** Microsoft Excel uses seven different error values to indicate errors such as division by zero or use of unrecognized names. All error values begin with a number sign (#), so you can find all the error values on your worksheet by using the Formula Find command to search for the number sign (#). You can also find cells containing

error values with the Formula option of the Formula Select Special command (Full menus). For more information, see **Formula Select Special command**. For more information on error values, see **Error value**.

- **Cell notes.** Cell notes are very useful for documenting worksheet models. You may want to use notes to explain the sources of data, to indicate the accuracy of certain numbers, and so on. For more information, see **Notes**.
- **Methods for examining the relationships between cells.** The Info window and the Formula Select Special command are powerful auditing tools. The "Checking Relationships Between Cells" section of this topic discusses how to use these tools to study how cells depend on each other.
- **Methods for finding changes in your model.** The Formula Select Special command provides ways to find cells that don't fit the pattern of the rest of your model. By selecting the Constants and Formulas options, you can find cells that contain numbers where you expected formulas, or formulas where you expected numbers. By selecting the Row Differences and Column Differences options, you can make sure that all cells in a row or column of a range contain equivalent formulas. For more information, see **Formula Select Special command** and **Finding cells and data quickly**.

Checking Names

Using names helps prevent errors in the first place, since it's easier to type or select an incorrect cell reference (for example, C28 instead of D28) than to type an incorrect name (for example, Profits instead of Losses). Once you've defined a name, it's easy to get information about it.

Checking the Definition of a Name

1. Choose Formula Define Name.
2. Select the name in the list box.

The definition of that name is displayed in the Refers To box.

Listing All Defined Names

You can use the Formula Paste Name command to paste a list of all the names defined on a worksheet. The names are listed in a column, with definitions listed in a column to the right of the names.

1. Select the upper-left cell of the range in which to paste the names.

Important Make sure there's sufficient room for all the names and definitions to be pasted without pasting over existing information on your worksheet. On a worksheet, a two-column list of names and definitions is pasted. On a macro sheet, a four-column list is pasted.

2 Choose Formula Paste Name.

3 Choose the Paste List button.

Displaying Names in the Info Window (Full Menus)

1 Choose Window Show Info to display the Info window.

2 Choose Info Names to list names in the Info window.

The Info window lists all the named ranges that include the active cell. You can then move the active cell around the worksheet to look for specific names.

Checking Relationships Between Cells

You can list or select precedents and dependents of cells. For information on precedents and dependents, see **Info window**. Examining the precedents and dependents of a cell is useful for:

- **Finding errors.** If you find, for example, that cells B2:B200 are dependent on cells A2:A200, with the single exception of cell B129, you may have found an error.
- **Faster and easier what-if analysis.** If you'd like to see the effects of changing a value on the worksheet, knowing which cells will be affected by the change — that is, the dependent cells — will speed up checking the results.
- **Understanding someone else's model (or a model you haven't used for a while).** You may want to identify the initial values that the worksheet is based on, then find the cells directly dependent on those cells, then the cells directly dependent on those cells, and so on. This provides a quick look at the overall logic of a worksheet.

There are two ways to identify precedents and dependents:

- List them in the Info window.
- Select them with the Formula Select Special command.

Note To use the Info window or the Formula Select Special command, you must have full menus displayed.

The following list summarizes when you would want to use the Info window and when you would want to use the Formula Select Special command:

If	Use
You want to find precedent/dependent cells and then modify them in some way	Formula Select Special, because it actually selects the cells.
You want to select the precedents/dependents of all the cells in the selection, not just the active cell	Formula Select Special.
You want a graphic way to see precedents/dependents, not just a list of names	Formula Select Special, because you can use TAB and SHIFT+TAB to move around the resulting selection and see each selected cell in context.
You want to quickly identify precedents/dependents as you move the active cell around the worksheet	Info window, because you can position the Info window on the screen with your worksheet window and watch the Info window as you move the active cell.
The precedents/dependents of a cell are far apart from each other on your document	Info window, because the list of precedents/dependents is more compact. If you use Formula Select Special, the worksheet has to scroll frequently while you look at the selected cells.
You want a print-out on the relationship of all cells in a model	Info window. Such print-outs are easy to generate, and can help you find complex errors in the logic of your model.

You might also want to use the Formula Select Special command to select the precedent or dependent cells, then use the Formula Define Names command to assign a name to the selection. The Formula Define Name dialog box shows you the reference of the selection in a compact form, just like in the Info window. Once the area is named, you can easily select it with the Formula Goto command or use it in calculations.

Related Information

Reference

For information on	See
Formula Select Special	Formula Select Special command Finding cells and data quickly
Names	Names
The Info window	Info window

Sampler

Managing Accounts Receivable

Correcting for Instrument Drift

Feature Guide

Auditing and Documenting

Borders and shading

Borders and shading are useful for highlighting key information and making a worksheet easier to read. With Microsoft Excel you can easily box off or shade cells or cell ranges on a worksheet. In addition, you can draw any combination of horizontal and vertical lines to the left, right, top, or bottom of a cell. You can create double underlines and column lines for ledgers. You can also make a blank worksheet look like a report or data entry form.

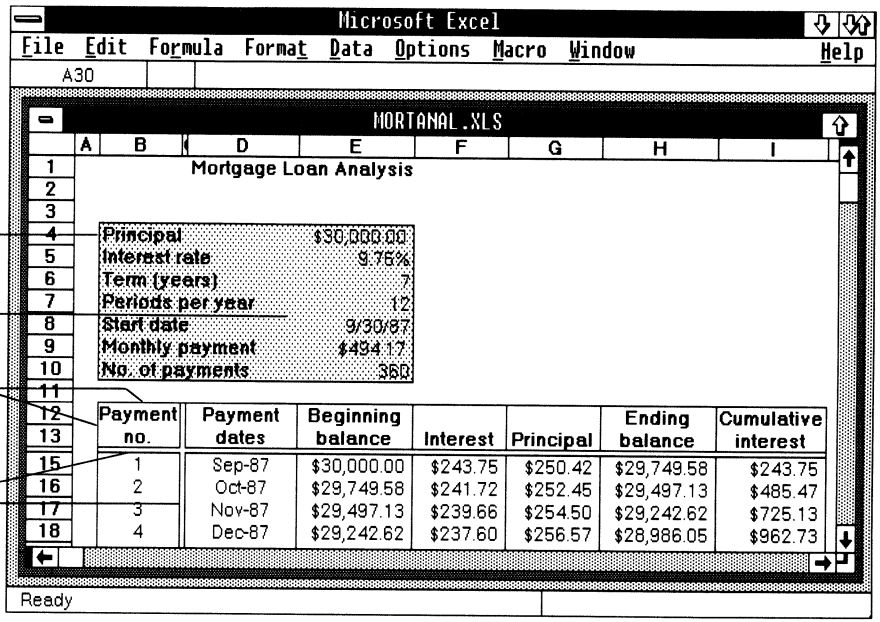
This topic explains:

- Adding borders or shading
- Deleting borders or shading

Note | All worksheet border and shading options also apply to macro sheets.

Adding Borders or Shading

The Format Border command controls border and shading formats. The following illustration shows how you can use Format Border settings to enhance a worksheet:



Outline option boxes off cell or range.

Shading option

Top, Bottom, Left, and Right options draw horizontal and vertical lines.

Use borders with narrow row heights and column widths to create double lines.

Borders and shading adjust to row height and column width changes that occur when you reformat fonts or when you make manual adjustments for appearance. Border and shading formats apply to both the onscreen display and the printed worksheet. Quality of shading depends on screen and printer resolution.

To add borders or shading:

1. Select the cell or cells you want to format.
2. Choose Format Border.
3. Turn on the check boxes for the border or shading options you want.
4. Choose the OK button.

For more information, see **Format Border command**. For information on column width and row height, see **Column** and **Row**, respectively.

Deleting Borders or Shading

1. Select the area you want to reformat.
2. Choose Format Border.
3. Turn off the check box for any border or shading option you want to delete.
4. Choose the OK button.

Suggestions for Formatting

Use Format Border options in worksheets to add fine touches such as double underlines and thin double column lines, as shown in the illustration earlier in this topic:

- For double underlines, make a narrow row height (with the keyboard, use Format Row Height; with the mouse, drag the horizontal gridline in the row heading below the row you want to reduce). Choose Format Border and turn on the Top and Bottom check boxes.
- For double column lines, make a narrow column width (with the keyboard, use Format Column Width; with the mouse, drag the vertical gridline in the column heading). Choose Format Border and turn on the Left and Right check boxes.

For instructions on how to automate this procedure as a simple macro, see **Macro**.

Hiding the gridlines on a worksheet allows formats such as borders, double underlining, and shading to stand out:

- To hide gridlines when you display a worksheet, choose Options Display and turn off the Gridlines check box.
- To hide gridlines when you print a worksheet, choose File Page Setup and turn off the Gridlines check box.

Related Information

Reference

For information on	See
Using borders with chart text	Chart text
Text alignment in worksheets and charts	Alignment
Using fonts in worksheets and charts	Font
General overview of formatting worksheets and charts (including print and display options)	Formatting a document

Sampler

Preparing a New Business Plan

Creating Calendars, Diagrams, Tables, and Forms

Tutorial

Changing How a Worksheet Looks

Feature Guide

Worksheet Formatting

Calculation

Calculation is the process of computing formulas, and then displaying the results as values in the cells containing the formulas.

This topic explains:

- Calculation in Microsoft Excel
- Changing to manual or automatic calculation
- Starting manual calculation from a worksheet window
- Starting manual calculation from a chart window
- Calculating with the Precision As Displayed option
- Other adjustments to calculation

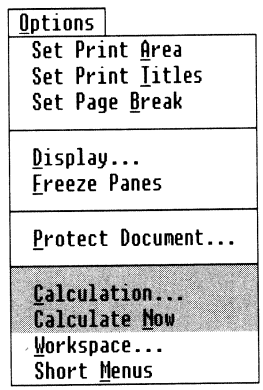
Calculation in Microsoft Excel

To speed up worksheet calculation, Microsoft Excel calculates cells selectively. When you change a value, Microsoft Excel tries to update only those cells that are directly affected by the change, thus avoiding unnecessary calculations.

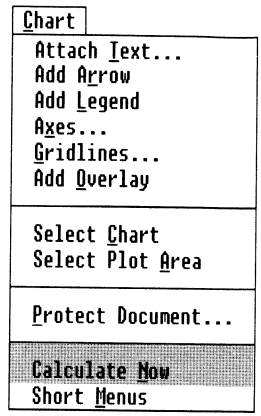
Microsoft Excel calculates on the basis of the underlying stored values in cells, not their display formats. This means that you can use a built-in or custom number format through the Format Number command to change the appearance of a cell without affecting its formula or stored value. Microsoft Excel calculates on the basis of displayed values only when you specify "Precision As Displayed." For more information, see "Calculating with the Precision As Displayed Option," later in this topic.

While Microsoft Excel calculates, you can choose commands or perform actions such as entering numbers or formulas. Microsoft Excel temporarily interrupts calculation to carry out the other commands or actions and then resumes calculation. When Microsoft Excel calculates your worksheet, it displays to the left of the formula bar the number of cells being calculated.

When you start Microsoft Excel for the first time, calculation is automatic. Immediately after you make changes in a document, Microsoft Excel calculates any formulas affected. You can set calculation so that it occurs only when you want it to. You control calculation with the following commands (Full menus shown):



- Use Options Calculation to set automatic or manual calculation for the entire workspace or to specify Precision As Displayed.
- Use Options Calculate Now to start calculating all open worksheets (when manual calculation is set) or to replace a formula in the formula bar with its calculated value. The shifted version of this command, Options Calculate Document, calculates only the active worksheet.



- Use the Chart Calculate Now command to start manual calculation while a chart window is active.

The Options Calculation command also controls other calculation-related adjustments. For more information, see "Other Adjustments to Calculation," later in this topic. For more information on each command, see the topic of the same name.

Changing to Manual or Automatic Calculation

Even though Microsoft Excel tries to calculate only formulas affected by changes, you can further speed up calculation by changing from the automatic to the manual setting when entering or editing many formulas.

Switching to manual calculation also can save time if you are working with charts because, otherwise, Microsoft Excel redraws any open charts linked to the active worksheet when you make changes on the worksheet. Note that changing to manual or automatic calculation affects the way all open worksheets are calculated.

To change to manual or automatic calculation:

1. Choose Options Calculation.
2. For manual calculation, select Manual.
   For automatic calculation, select Automatic.
3. Choose the OK button.

Note Data tables may slow down calculation. If you do not want to calculate your data tables every time you enter a new value on the worksheet, you can speed up automatic calculation by selecting Automatic Except Tables in the dialog box for the Options Calculation command.

Starting Manual Calculation from a Worksheet Window

When you change to manual calculation, you need to tell Microsoft Excel every time you want to calculate your documents. You can specify that all open worksheets or only the active worksheet be calculated. To calculate the formulas on all open worksheets and update all open chart documents, you use the Options Calculate Now command. To calculate the active worksheet and update only the open charts linked to it, you use the shifted command, Options Calculate Document. In either case, Microsoft Excel does not resume automatic calculation until you so specify. For more information, see "Changing to Manual or Automatic Calculation," earlier in this topic.

Important

If you choose the Options Calculate Now command while the formula bar is active, the command performs a different function: it replaces the formula or the selected part of the formula in the active cell with the calculated result of the formula or partial formula. You can use this option if you want to "freeze" a formula value, but note that this also erases the formula. For more information on replacing a formula with its calculated value, see **Formula**.

To calculate all open worksheets	**To calculate only the active worksheet**
▣ Choose Options Calculate Now.	[1] Hold down SHIFT as you select the Options menu. [2] Choose Options Calculate Document.

Tip

If you're running Microsoft Excel under Microsoft Windows, version 2.0 or higher, you can run other applications at the same time. If you have a large worksheet with many time-consuming calculations, you can start calculation in Microsoft Excel and then switch to another application — such as a word processor — while Microsoft Excel completes the calculation.

Starting Manual Calculation from a Chart Window

You can also start manual calculation from an active chart window without switching back to a worksheet window.

To calculate all open worksheets and update charts:

▣ Choose Chart Calculate Now.

Calculating with the Precision As Displayed Option

You can use built-in or custom formats from the Format Number command to change the appearance of a cell without affecting its formula or underlying stored value. Unless you specify otherwise, Microsoft Excel calculates formulas based on their stored values, rather than the displayed values. Microsoft Excel calculates a worksheet or macro sheet on the basis of displayed values only when you specify Precision As Displayed for that sheet.

Important | Calculating with Precision As Displayed permanently changes the stored values to the values as displayed in the cells.

To calculate the active sheet with the Precision As Displayed option:

1. Choose Options Calculation.
2. Turn on the Precision As Displayed check box.
3. Choose the OK button.

   Microsoft Excel displays a message asking for confirmation.
4. Choose the OK button.

Other Adjustments to Calculation

You can also control the following calculation-related adjustments with the Options Calculation command:

- To use iteration, turn on the Iteration check box and specify the conditions you want in the Maximum Iterations and Maximum Change boxes. This option affects all open worksheets. For more information, see **Iteration**.
- To update formulas with references to data in other applications, turn on the Update Remote References check box. If the check box is turned off, Microsoft Excel uses the last values received from the remote references to calculate the formulas. This option affects the active sheet only. For more information, see **Linking documents**.
- To adjust dates in files you plan to use in Microsoft Excel for the Macintosh, turn on the 1904 Date System check box. This option affects the active sheet only. For more information, see **Date**.

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Using built-in and custom number formats	Number
Working in the formula bar	Formula bar

Sampler

Analyzing a Loan

Chart

A **chart** is a graphic presentation of data from a worksheet. Microsoft Excel has seven types of charts to choose from: area, bar, column, line, pie, scatter, and combination. The seven chart types are available in 44 predesigned formats, each of which you can also customize.

This topic explains:

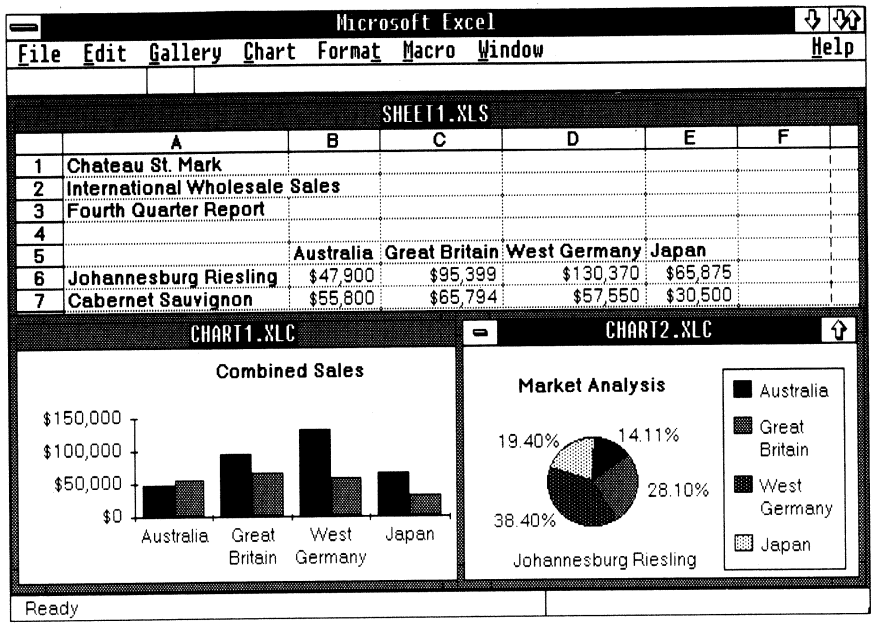
- Chart basics
  - The chart window
  - Creating a new chart
- Using the predesigned chart formats
  - Types of charts in the gallery
  - Strategies for charting
  - Changing chart type or formats with the Gallery commands
- Techniques for customizing a chart
  - Moving and selecting in the chart window
  - An overview of chart customizing features
  - Changing chart type or formats after you customize
  - Using the preferred chart format
- Saving and printing a chart
  - Saving a new chart
  - Printing a chart

Chart Basics

Microsoft Excel provides a complete charting package for powerful uses like those shown in the following illustrations.

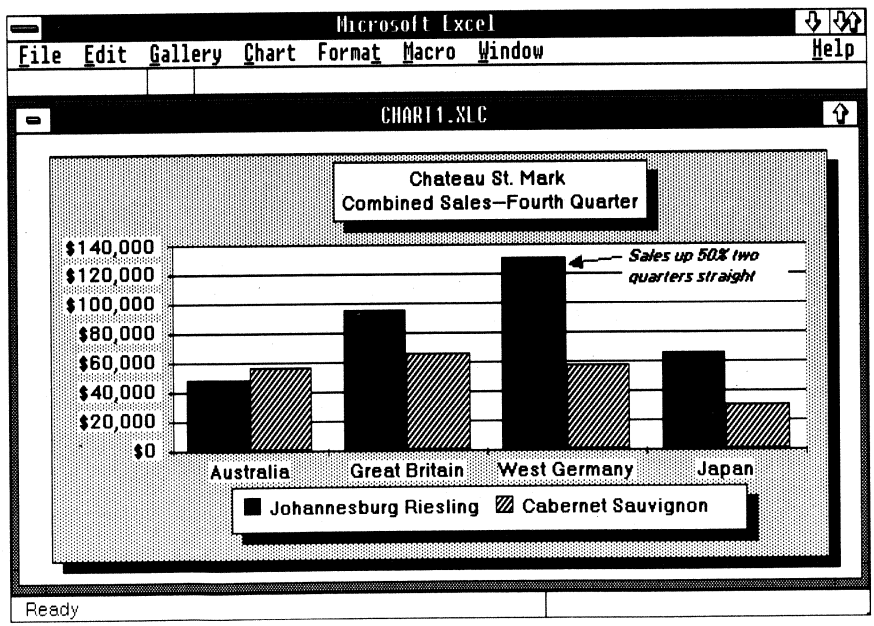
Perform rapid analysis of data, viewing charts and worksheets on the same screen:

You instantly see your worksheet data graphically displayed for analysis or overview. A worksheet and chart are dynamically linked, so you can easily explore the effects of changing a key variable or assumption.



Create presentation-quality graphics:

Predesigned formats and customizing features help you create professional-looking graphics for display or printed reports.



The Chart Window

You display and work on charts in the chart window. You can move, size, shrink, and enlarge the chart window as you would any other window. You can also open one or more chart and worksheet windows on the screen at the same time or work on your chart with the Help window open.

The following illustration shows the parts of a chart window:

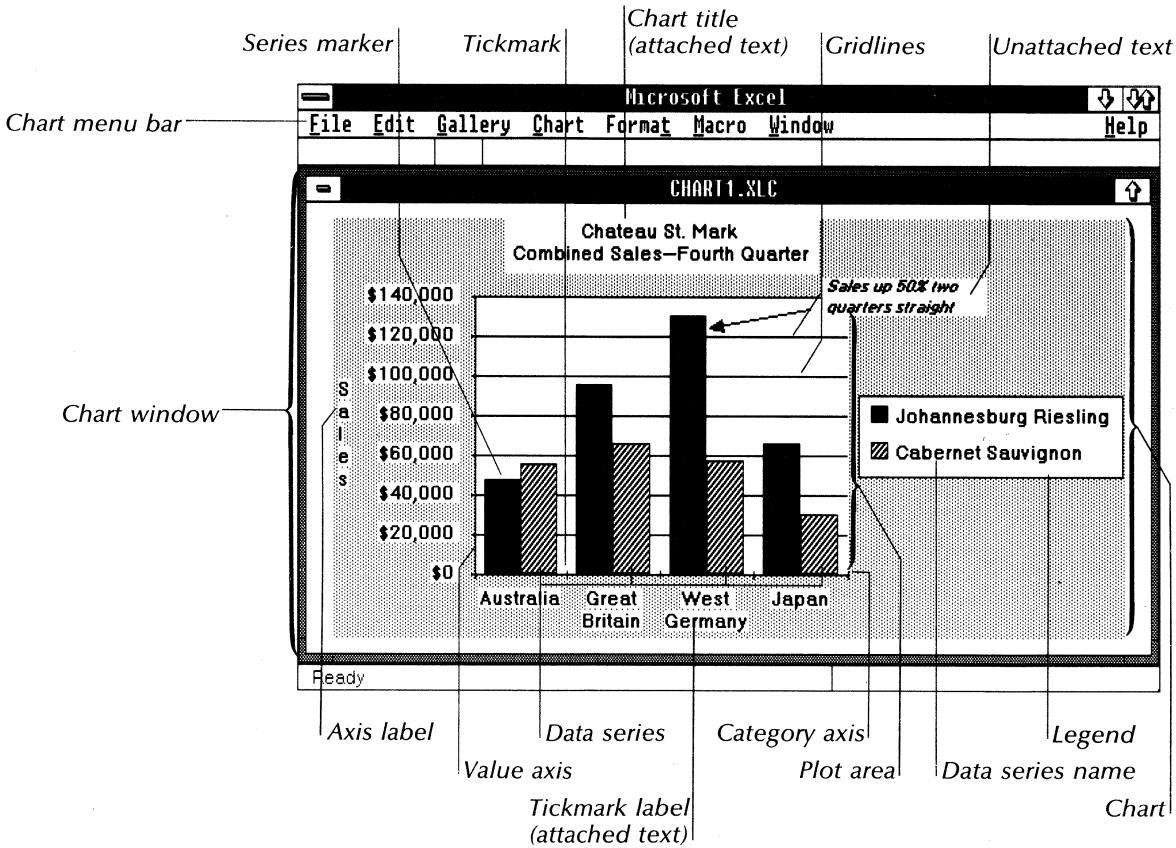


Chart — the entire area inside the chart window, including all elements of the chart, such as text, axes, or markers.

Chart menu bar — the bar that displays the names of the drop-down menus for charts when a chart window is active.

Data series — a group of related data points (numeric values within a category). A chart can have one or more data series.

Series marker — a bar (column and bar charts), dot, or tiny symbol (line and scatter charts) that plots a single data point (one value in a category) from a worksheet. Related markers in a chart make up a data series. Markers for a data series are usually distinguished by the same pattern, color, or symbol. In a chart with a single data series, markers may vary in pattern, color, or symbol.

Series formula — a formula consisting of the data Microsoft Excel uses to plot a data series in a chart. The formula includes a reference to the cell that contains the data series name, constants or references to worksheet cells used for categories and values, and the plotting order of the data.

Axis — a line that serves as a major reference for plotting data in a chart. In Microsoft Excel, the term **category axis** usually refers to the horizontal axis (x-axis), while the **value axis** refers to the vertical axis (y-axis). Bar charts reverse this layout, with the value axis as the horizontal axis and the category axis as the vertical axis. A pie chart has no axes. Area, bar, column, line, and scatter charts each have two axes. A combination chart may have up to four axes.

Tickmark — a small line that intersects an axis and marks off a category or scale. A tickmark label is attached text that identifies a tickmark.

Plot area — the area bounded by the axes, in which Microsoft Excel plots your data. It includes the axes and all markers that represent data points.

Gridlines — optional lines that extend from the tickmarks on an axis across the plot area.

Chart text — text that describes data or objects in a chart. **Attached text** is any label linked to a chart object such as an axis or a data point; such text moves with the object if it is repositioned. **Unattached text** is not linked to a chart object and can be moved anywhere in the chart.

Legend — a key that identifies the patterns, colors, or symbols associated with the markers of a data series.

Data series name — a label on a chart legend that identifies the specific pattern, color, or symbol used in the markers of a data series.

Creating a New Chart

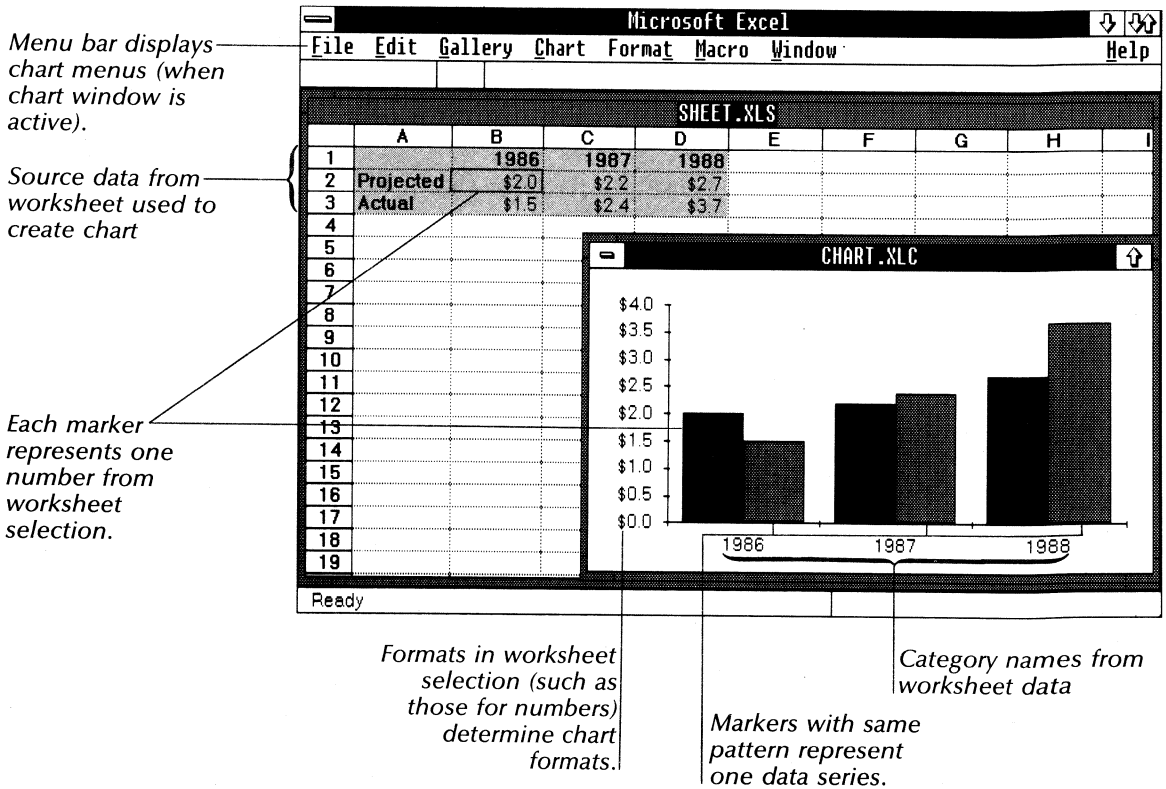
1. Select the cells on the worksheet that contain the data you want to plot.
2. Choose File New.
3. Select Chart.
4. Choose the OK button.

Microsoft Excel takes care of setting up the chart. It looks at the shape of the range you selected and also at the kinds of entries. Then it plots the data as a

column chart, the default for a new chart. Microsoft Excel gives a default name (Chart1, Chart2, Chart3, etc.) to each chart created during a session.

You can also have Microsoft Excel plot data from a multiple selection (discontinuous cells or ranges). For more information, see **Data series**.

The following illustration shows a new chart and the worksheet data used to create the chart:



When you create a new chart, Microsoft Excel uses defaults for defining data series and plotting data. For information on how Microsoft Excel defines data series, see **Data series**.

You can override Microsoft Excel defaults for plotting data by using any of the following procedures to create a chart:

- You can use a multiple selection to control plotting. For more information, see **Data series**.
- You can copy data series or formats from worksheet data and then paste them into a chart. For more information, see **Data series**.

- You can build the series formula (the formula Microsoft Excel uses to plot data) for each data series you want plotted. For more information, see **Series formula**.

Using the Predesigned Chart Formats

The Gallery menu commands let you instantly reformat a new chart with any of 44 predesigned chart formats. You can also customize a chart by starting with a predesigned format that is close to what you want, and then adding your own format changes. This section discusses the types of charts in the gallery, their best uses, effective charting strategies, and how to use the gallery formats.

Types of Charts in the Gallery

Microsoft Excel has seven basic types of charts. You can create area, bar, column, line, pie, and scatter charts; you can also create charts that are combinations of these types. For each chart type, there is a command on the Gallery menu. When you choose one of these commands, Microsoft Excel presents a gallery that shows the predesigned formats for that chart type. The following table gives a quick summary of chart types and some of the most appropriate uses of each.

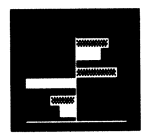
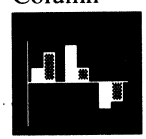
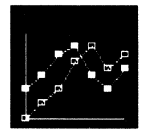
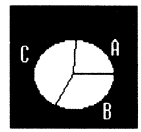
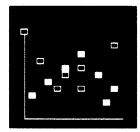
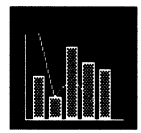
Chart type	Uses
Area 	Shows the relative importance of values over a period of time; similar to line chart, but emphasizes amount of change (magnitude of values) rather than rate of change.
Bar 	Shows individual figures at a specific time or draws comparisons among items but not to a whole; similar to column chart but vertical orientation places less emphasis on time flow.
Column 	Shows variation over a period of time or draws comparisons among items but not to a whole; horizontal orientation suggests time flow more than bar chart.

Chart type	Uses
Line 	Shows trends or changes in data over a period of time; similar to area chart, but emphasizes time flow and rate of change, rather than amount of change.
Pie 	Shows the relationship or proportions of parts to the whole (always contains just one data series); good for highlighting a significant element.
Scatter 	Shows the relationship or degree of relationship between the numeric values in different groups of data; useful for finding patterns or trends and for determining whether variables are dependent upon or affect one another.
Combination 	(Full menus only) Shows related data that is measured in different units (up to four axes can be used in a combination chart); combines simple "messages" to create a different message.

For a quick tour of the chart galleries, see **Gallery Area command**, **Gallery Bar command**, **Gallery Column command**, **Gallery Line command**, **Gallery Pie command**, **Gallery Scatter command**, and **Gallery Combination command**. Each topic also points out special features of the formats.

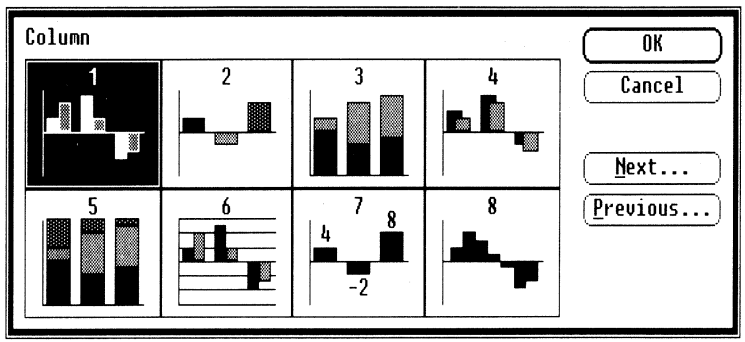
Strategies for Charting

You'll find the Gallery commands useful for these charting strategies:

- Experimenting with different chart types and formats to find the one best suited to your needs.
- Setting up a base chart with a predesigned format that you can then tailor to your needs. Because gallery settings may override your custom formats, use gallery formats before you add your own formats to the chart.
- Analyzing data quickly by viewing it in several chart formats.

Most gallery choices are actually formatting shortcuts. They automatically incorporate chart elements you could add manually, such as gridlines, overlay charts, or data point labels. For example, the column chart gallery looks like this:

Preset options such as stacked columns (formats 3 and 5), gridlines (format 6), and data point labels (format 7) are formatting shortcuts.



Changing Chart Type or Formats with the Gallery Commands

1. Activate the chart window.
2. Select the Gallery menu.

   The checkmark on the menu indicates the type of chart in the active chart window.
3. On the Gallery menu, choose the command for the chart type you want.

   A dialog box displays a gallery of different formats for that chart type.
4. Select the format you want.
5. Choose the OK button.

Note

If you change a chart with multiple data series to a pie chart, Microsoft Excel plots only the first data series. For more information, see **Gallery Pie command**.

Scatter charts have different requirements for plotting data than other types of charts. For more information on scatter charts, see **Scatter chart**.

Techniques for Customizing a Chart

You can customize a chart by:

- Reformatting any of the "chart objects" that Microsoft Excel automatically includes in a new chart — such as series markers or the axes.
- Adding and formatting other chart objects — such as a legend, chart title and subtitle, explanatory text, or arrows for emphasis.
- Controlling how data is plotted.

This section explains the basics of customizing charts. It begins with techniques for working in the chart window and then provides a complete overview of chart customizing features.

Techniques for Quick Analysis

Charting the same worksheet data different ways may reveal new relationships or hidden trends in the data. Try this:

1. Repeat the procedures under "Creating a New Chart," earlier in this topic, several times to create several column charts of the same data.
2. Activate one of the chart windows.
3. Select the Gallery menu and choose a command for another chart type (other than Gallery Column). This replots the chart as a new chart type.
4. Follow steps 2–3 here with the other column charts to see how the data looks plotted other ways.
5. Move and size the chart windows so you can view all of them on the screen. Change a value on the worksheet; all charts are instantly updated. You can also use this technique to discover which chart type works best for your purpose.

Moving and Selecting in the Chart Window



To move and select with the keyboard, use the DIRECTION keys. You can move object-by-object or between "classes" of objects. Microsoft Excel groups chart objects into the following classes:

- Chart
- Plot area
- Legend
- Axes
- Chart text
- Chart arrows
- Gridlines
- First data series
- Second data series, and so on
- Drop lines
- Hi-lo lines

Use the UP and DOWN keys to move among classes of objects, and the LEFT and RIGHT keys to move among objects within each class, as follows:



Go to first item in next class



Go to last item in previous class



Go to next item in same class



Go to previous item in same class



To move and select with the mouse in the chart window:

1. Point to the chart object.
2. Click a mouse button.

Note | To select the entire chart or the plot area with the mouse, choose the Chart Select Chart command or the Chart Select Plot Area command.

A chart object, when selected, is marked with white squares or black squares, depending on what type of object it is. These black or white selection squares tell you that the next command or action will affect the selected item.

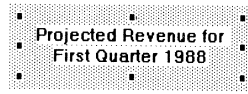


Chart objects and text marked with black selection squares can be formatted with commands, and moved or sized directly with the keyboard or mouse.

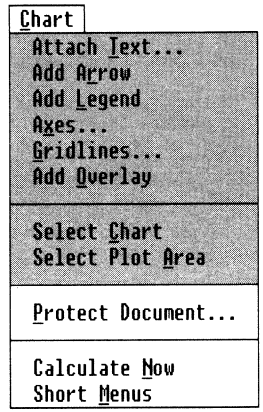


Chart objects and text marked with white selection squares cannot be moved or sized directly. Some items, such as the legend or axis labels, can be formatted or realigned with commands.

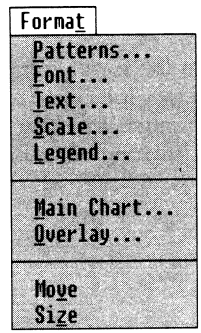
If chart text is selected, it appears in the formula bar so you can edit it. If series markers are selected, the series formula Microsoft Excel uses to plot the data series is displayed in the formula bar. You can edit this formula to control how data is plotted. For information on editing a series formula, see **Series formula**.

An Overview of Chart Customizing Features

You can use Microsoft Excel customizing features to enhance your charts for presentations and printed reports. Most of the commands for customizing a chart are on these two menus (Full menus shown):

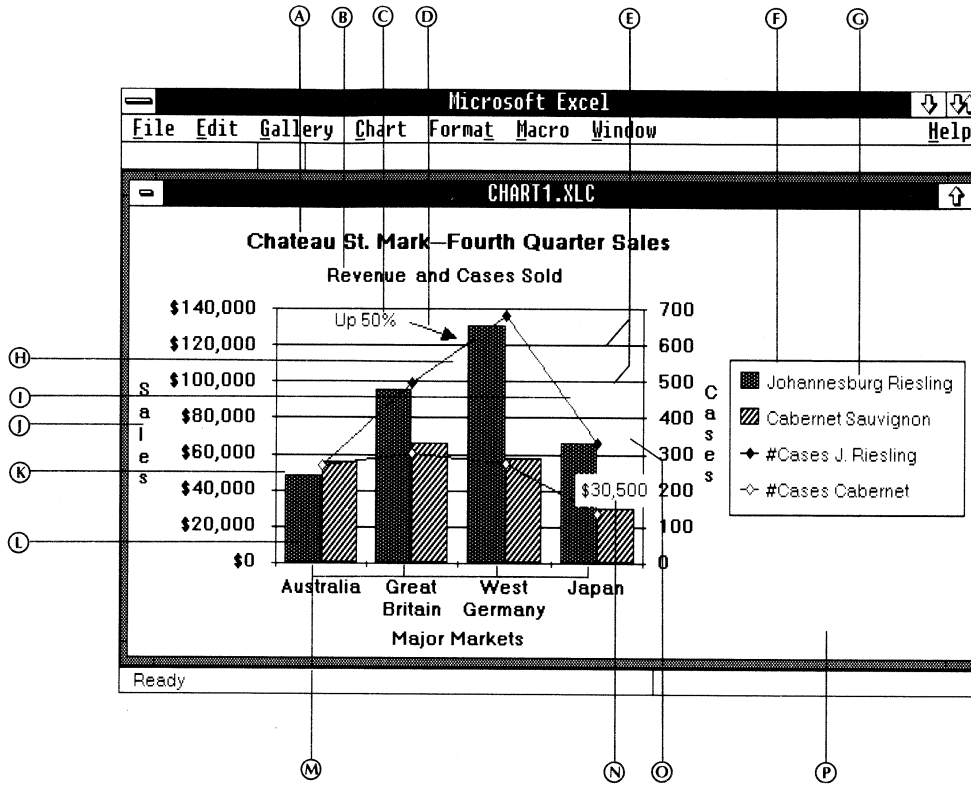


Use these Chart menu commands to add chart objects and attached text or to select the entire chart or plot area.



Use these Format menu commands to format the chart, chart objects, and chart text and to move or size chart objects and text with the keyboard.

All the information you need for customizing charts with Microsoft Excel is in this manual. Look at the following illustration for examples of the available customizing features. Then refer to the topics listed in the table for complete procedural information about the feature you want to use. For a brief description of each Chart and Format menu command, see the topic listed alphabetically under the command name.



For information on	See this topic
A Chart title	Chart text
B Chart subtitle	Chart text
C Unattached text	Chart text
D Arrow	Chart arrow
E Gridlines	Chart axis
F Legend	Chart legend
G Data series name (attached text)	Series formula
H Line chart options (drop lines, hi-lo lines)	Gallery Line command Format Main Chart command Format Overlay command
I Overlay chart (for combination chart)	Overlay chart

For information on	See this topic
J Axis title	Chart text
K Axis	Chart axis
L Data series marker	Data series
M Data series (adding; controlling how data series are plotted)	Data series
N Data point label (attached text)	Chart text
O Plot area	Chart plot area
P Chart area	Chart area

An additional topic, **Formatting a document**, contains brief summaries of chart customizing procedures. That topic is most useful if you are familiar with the more detailed information in the topics listed in the previous table.

Changing Chart Type or Formats After You Customize

Using a Gallery command on a customized chart removes many of the custom formats. If you want to change the chart type after you customize a chart, use the Format Main Chart command. Your custom formats are preserved in the new chart type, if appropriate.

1. Choose Format Main Chart.
2. Under Type, select the chart type you want.
3. Choose the OK button.

If you want to change the formats of a customized chart, the Format Main Chart command offers many of the same options as the Gallery formats (for example, stacked formats, hi-lo lines, or drop lines). Your customized changes appear with the new formats, if appropriate.

To change formats after you customize:

1. Choose Format Main Chart.

   The dialog box presents format options appropriate to the chart type. All other options appear grayed.

2. Select the format options you want.
3. Choose the OK button.

For more information, see **Format Main Chart command**.

Using the Preferred Chart Format (Full Menus)

The preferred chart format is the default chart format. Initially, the preferred format is the first option in the Gallery Column command dialog box. Every new chart you create first appears as a column chart. You can use the preferred format at any time to return a chart to its initial format.

To change a chart to the preferred format:

- Choose Gallery Preferred.

You can change the default so that Microsoft Excel creates new charts in whatever format you want — one of the predesigned Gallery formats or a custom format you've created. If you prefer a custom format, first create your chart format by modifying a Gallery chart option.

To change the Preferred Chart format:

1. Activate the chart window.
2. Make sure the chart is in the format you want for the default.
3. Choose Gallery Set Preferred.

Microsoft Excel saves all formatting details of the active chart as the preferred format. Any new chart you create will be formatted accordingly during the work session. You can also apply the format to existing charts during the work session.

For more information, see **Gallery Preferred command** and **Gallery Set Preferred command**.

Note

You can save the settings of the preferred format by saving the workspace with the File Save Workspace command (Full menus). When you restart Microsoft Excel and open the workspace file, Microsoft Excel sets the preferred format to what is was when the workspace file was saved. For more information, see **File Save Workspace command**.

Saving and Printing a Chart

You save and print each chart as a separate document.

Saving a New Chart

1. With the chart window active, choose File Save As.

   The dialog box displays a default document name in the text box.

2. In the text box, type a document name for the chart.

   Your document name automatically replaces the default name when you start typing.

   If you want to save the chart in a different directory than the one specified in the dialog box, type the full pathname preceding the document name (for example, *C:\sales*).

3. Choose the OK button.

   Unless you typed a different file extension, Microsoft Excel automatically adds the extension .XLC.

Once you've named the chart file, you can use the File Save command whenever you want to save it again. To rename the file, use the File Save As command again.

For more information, see **Saving and closing a document**, **File Save command**, and **File Save As command**.

Printing a Chart

Before you print:

- If you specified more than one printer when you ran the Setup program, or if you want to use a different printer, use the File Printer Setup command to choose a printer.
- Preview the chart. The Preview option in the File Print command shows you what the printed chart will look like. You can view at a larger scale any detail on the previewed page, and make any necessary page layout adjustments with the File Page Setup command.

To print a chart:

1. With the chart window active, choose File Print.
2. Choose the OK button.

For additional information, see **Printing a document**.

Related Information

Reference

For information on	See
Chart default settings	Default settings
Copying chart contents and formats from one chart to another	Copying data and formats
Copying a chart to another application	Edit Copy Picture command
Links between charts and worksheets	Series formula
Controlling windows	Windows
Choosing commands and dialog box options	Command, menu, and dialog box
Getting help with chart commands and procedures	Help

You can find information about Microsoft Excel basics in the other core topics: **Command, menu, and dialog box**; **Database**; **Help**; **Windows**; and **Worksheet**.

Sampler

Writing a Report with Microsoft Excel and Windows Write

Analyzing the Break-even Point

Tracking and Forecasting Stock Prices

Changing Coordinate Systems

Continued

Tutorial

What Is a Chart?

Chart Basics

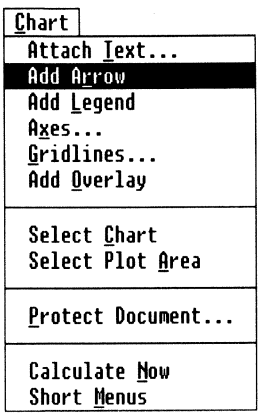
Changing How a Chart Looks

Printing a Chart

Feature Guide

Charts

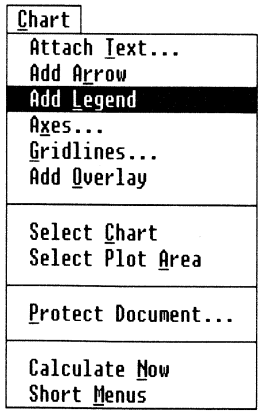
Chart Add Arrow command



Adds an arrow to the upper-left corner of the chart. You can add as many arrows as you want. You can move the arrow with the Format Move command, change its size with the Format Size command, or format the arrow with the Format Patterns command. For more information on moving or sizing an arrow, see **Chart arrow**.

When you select an arrow, the command changes to Chart Delete Arrow.

Chart Add Legend command

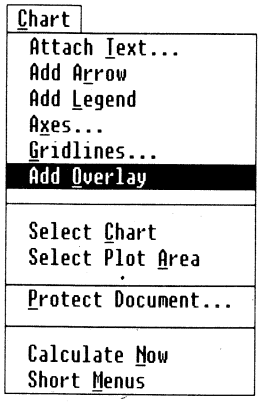


Adds a legend to the active chart. When you add a legend, the plot area becomes smaller to accommodate the legend. You can format the legend with the Format Patterns, Format Font, and Format Legend commands.

After you choose Chart Add Legend, the command changes to Chart Delete Legend; you can use this command to remove the legend. If you delete a legend and then later choose Chart Add Legend for the same chart, the new legend will have the same format as the one you deleted.

Chart Add Overlay command

(Full menus)



Creates an overlay chart and adds it to the active chart. If the active chart already has an overlay chart on it, this command changes to Chart Delete Overlay.

When you add an overlay chart, Microsoft Excel divides the data series evenly between the main chart and the overlay chart. When there is an odd number of data series, the main chart has one more than the overlay chart.

For example, if your chart has four data series, the first two are plotted in the main chart and the last two go into the overlay chart. If your chart has five data series, the first three go into the main chart and the other two go into the overlay chart.

The overlay chart is always initially plotted as a line chart. You can change the overlay chart type with the Format Overlay command.

For information on overlay charts, see **Overlay chart**. For information on charts, see **Chart**.

Chart area

The **chart area** is the entire background area of the chart. You can change the pattern or color of the chart area and format the border with several pattern, weight, and style options, including a shadow border effect.

Formatting the Chart Area

1. Select the chart by choosing Chart Select Chart.
2. Choose Format Patterns.
3. Select the options you want.
4. Choose the OK button.

For more information, see **Chart Select Chart command** and **Format Patterns command**.

Related Information

Reference

For information on	See
Chart basics	Chart
Plot area	Chart plot area
Gridlines	Chart axis

Chart arrow

You can add **arrows** to emphasize key elements or data in a chart. You can also use arrows as pointers from chart text.

This topic explains:

- Adding an arrow
- Moving or sizing an arrow
- Formatting an arrow
- Deleting an arrow

Adding an Arrow

You can add any number of arrows to one chart. Each time you add an arrow, Microsoft Excel automatically places a small black square at each end of the arrow to indicate that the arrow is selected. These selection squares also appear anytime you select the arrow to move, size, format, or delete it.

■ With the chart window active, choose Chart Add Arrow.

Moving or Sizing an Arrow



To move or size an arrow with the keyboard:

1. To move the arrow, choose Format Move.
   To size the arrow, choose Format Size.
2. Use the DIRECTION keys to position or size the arrow as you want it.
   For finer movement, press CONTROL+DIRECTION key.
3. Press ENTER.



To move or size an arrow with the mouse:

1. To move the arrow, drag the arrow shaft.
   To size the arrow, drag the black selection squares.
2. Release the mouse button when the arrow is positioned or sized as you want it.

Formatting an Arrow

1. Select the arrow.
2. Choose Format Patterns.
3. Select the formatting options you want.
4. Choose the OK button.

Deleting an Arrow

Whenever you select an arrow, the Chart Add Arrow command changes to Chart Delete Arrow on the menu.

1. Select the arrow.
2. Choose Chart Delete Arrow.

For more information, see **Chart Add Arrow command**. For information on basic techniques for working with chart objects, see **Chart**.

Related Information

Reference

For information on	See
Chart basics	Chart
Unattached text	Chart text

Sampler

Analyzing the Break-even Point

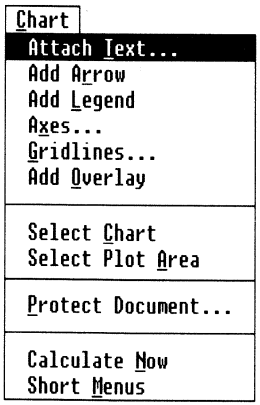
Tutorial

Changing How a Chart Looks

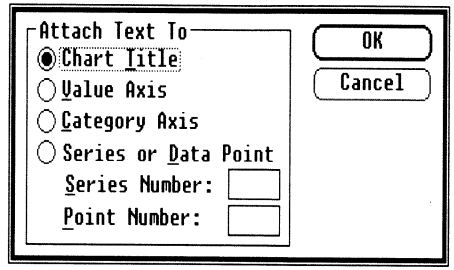
Feature Guide

Charts

Chart Attach Text command



Attaches text to certain parts of a chart, such as axes, the plot area, and data points. The text identifies the part to which it is attached. After you attach the text, you can edit it in the formula bar.



Select the option that identifies the part of the chart you want to attach text to, then choose the OK button. Microsoft Excel attaches the text, selects it, and displays it in the formula bar.

You can then edit the text in the formula bar. When the text is as you want it, press ENTER to enter the text in the chart. To format the text, use the Format Text command.

Attach Text to

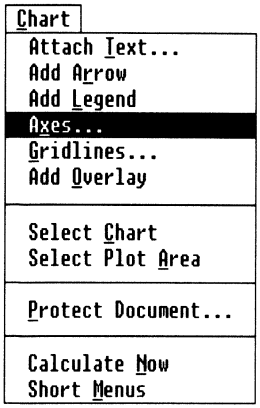
Chart Title	Centers the word "Title" above the plot area
Value Axis	Centers the letter "Y" (for y-axis) along the value axis
Category Axis	Centers the letter "X" (for x-axis) along the category axis
Series or Data Point	Attaches text to a series or a data point in a series

To attach text to a data point, type the plot order number of the series containing the data point in the Series Number box, and type the data point number in the Point Number box. Microsoft Excel uses the value for that data point as the text and puts it next to the marker for the data point.

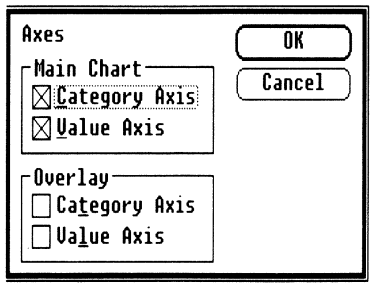
The only time you don't have to specify both the Series Number and the Point Number is when you want to attach text to an area in an area chart. If you leave the Point Number box blank, Microsoft Excel uses the series title as the text and centers it in the area for that series.

For more information on charts, see **Chart**. For more information on adding attached text to a chart, see **Chart text**.

Chart Axes command



Controls whether the axes are visible. When there is no overlay chart, the options for overlay chart axes are not shown.



Main Chart

Controls the appearance of axes on the main chart. You can turn on the main chart's category axis, value axis, both, or neither.

Overlay

Controls the appearance of axes for the overlay chart. You can turn on the overlay chart's category axis, value axis, both, or neither.

You can change the appearance of axes with the Format Patterns command. You can change other properties of the axes, such as the ranges and where axes cross each other, with the Format Scale command.

For more information on charts, see **Chart**.

Chart axis

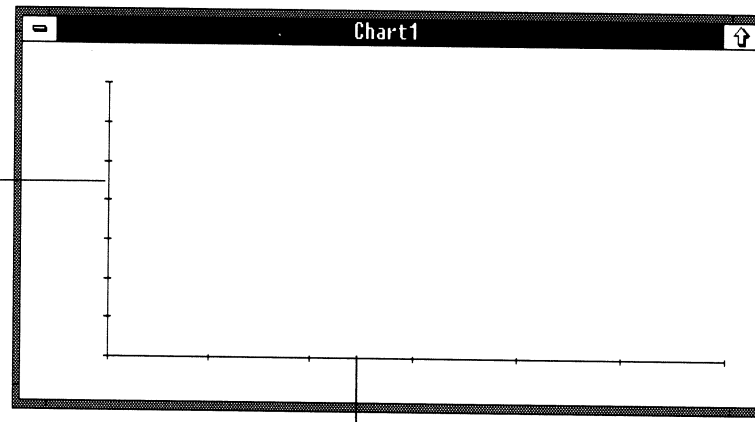
An **axis** is a line used as the defining scale or category against which chart data is plotted; an axis provides a frame of reference for measurement or comparison in a chart.

This topic explains:

- Value and category axes
- Adding gridlines to a chart
- Formatting chart axes

Value and Category Axes

You may be familiar with other terms for axes:



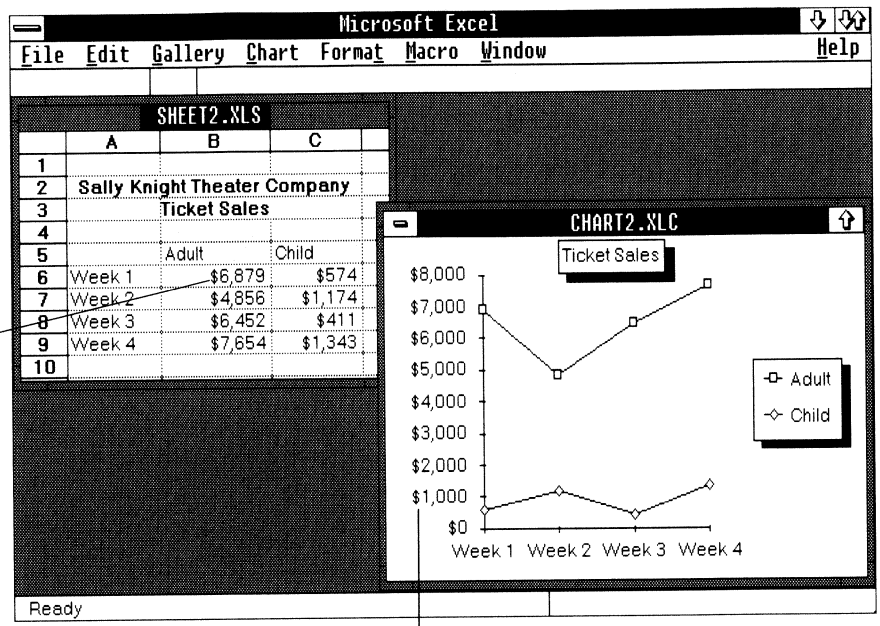
Microsoft Excel: Value axis
Equivalent terms:
Y-axis
Vertical axis
Dependent variable

Microsoft Excel: Category axis
Equivalent terms:
X-axis
Horizontal axis
Independent variable

Note Bar charts reverse this scheme: the value axis is the horizontal axis and the category axis is the vertical axis.

Area, bar, column, line, and scatter charts each have two axes. A pie chart has no axes. A combination chart may have up to four axes, since the overlay chart in a combination chart may have up to two additional axes, possibly in different scales than on the main chart.

When you first create a chart using worksheet data, Microsoft Excel creates axes with tickmark labels from the source worksheet, as shown in the following illustration:



The formats of the worksheet cells (note dollar format)...

...determine the formats of the tickmark labels.

The worksheet cells from which values and categories are taken determine the format of tickmark labels on the axes. In the previous illustration, the worksheet cells display values in dollars, so the tickmark labels on the value axis also appear in dollars.

You can change the number format of tickmark labels along the value axis by reformatting the worksheet cells with the Format Number command. For more information, see **Number**.

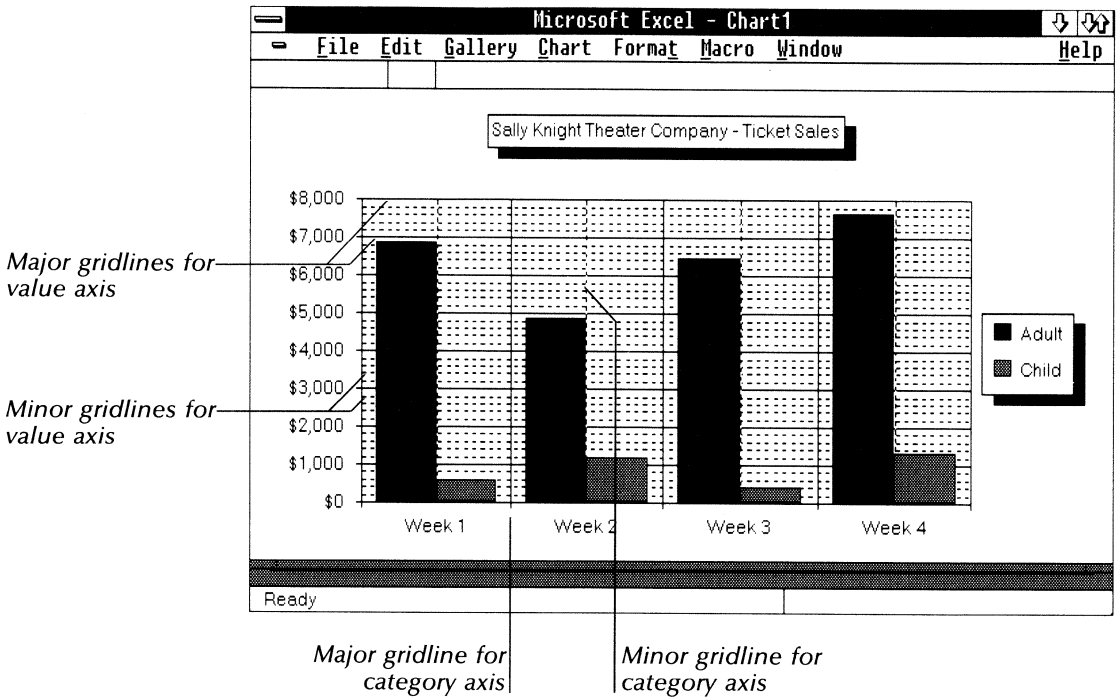
You can change the content of a tickmark label by editing the worksheet cell in the formula bar. For more information, see **Formula bar**. For information on reformatting tickmarks and tickmark labels, see "Formatting Chart Axes," later in this topic.

Note

You can also create a chart that is not linked to a worksheet by building series formulas — the formulas Microsoft Excel uses to plot charts — "from scratch." For information on building a series formula, see **Series formula**.

Adding Gridlines to a Chart

Gridlines are lines that extend from each tickmark on an axis across the plot area. They help guide the eye to the tickmark values or categories. The following illustration shows the types of gridlines you can add to a chart:



The Chart Gridlines command controls whether axes and major and minor gridlines appear in the main chart.

To add gridlines to a chart:

1. Choose Chart Gridlines.
2. Turn on the check boxes for the gridline options you want.
3. Choose the OK button.

For more information, see **Chart Gridlines command**.

Formatting Chart Axes

You can control the following characteristics of chart axes:

For	You can
Category axis	Specify where value axis crosses.
	Specify the number of categories between tickmarks and tickmark labels.
	Reverse the order of categories along the axis.
Value axis	Specify where category axis crosses.
	Specify the range of values displayed.
	Specify the interval between tick-marks.
	Make the scale logarithmic.
	Reverse the order of values along the axis.
Both axes	Format style, color, weight, tick-mark type, and tickmark label position.
	Format tickmark labels with a variety of font options for color, typeface, and style.

Note If your data extends over a wide range, you may want to format one or both axes with logarithmic scales to spread out the lower values, while keeping the higher values within the plot area of the chart.

You can quickly move directly between the dialog boxes for the Format Font, Format Patterns, and Format Scale commands by using the command buttons in each dialog box. These buttons bypass the menu commands. Dialog box options vary, depending on whether a category or value axis is selected.

To format a chart axis:

1. Select the axis you want to format.
2. To change the intersection of axes or make numeric adjustments, choose Format Scale.

   To format the physical appearance of axes, tickmarks, or tickmark labels, choose Format Patterns.

   To format text attached to axes, choose Format Font.
3. Select the options you want or make the desired adjustments.
4. If you want to make other changes or adjustments to the axis, choose the Format, Patterns, or Scale button.
5. Choose the OK button.

For more information, see **Format Font command**, **Format Patterns command**, and **Format Scale command**. For information on axis labels, see **Chart text**.

Related Information

Reference

For information on	See
Chart basics	Chart
Controlling how data series are plotted	Data series Series formula
Overlay charts and axes	Overlay chart

Sampler

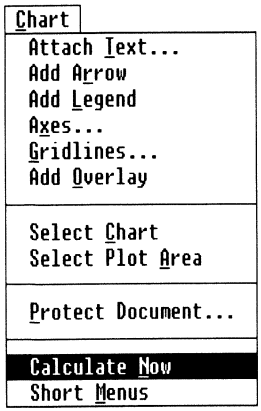
Tracking and Forecasting Stock Prices

Changing Coordinate Systems

Feature Guide

Charts Practices, "Editing Axes"

Chart Calculate Now command

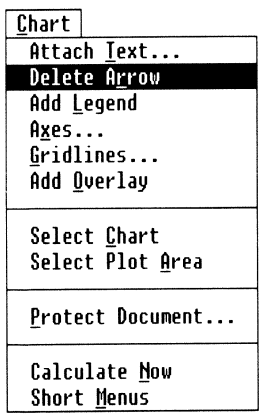


Calculates all open worksheets and redraws charts dependent on them according to the settings in the Options Calculation dialog box (worksheet menu bar). Microsoft Excel does not redraw a chart if all the worksheets it is dependent on are closed. Chart Calculate Now works the same way the Options Calculate Now command works when a worksheet is active.
Shortcut key: F9.

Use this command when you are using manual calculation and want to see the effect of changes you have made in formulas.

For information on the way documents are calculated, see **Calculation**. For information on calculation settings, see **Options Calculation command**.

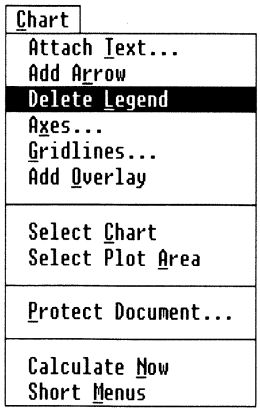
Chart Delete Arrow command



Removes the selected arrow from the chart. For information on moving, sizing, or formatting an arrow, see **Chart arrow**.

If an arrow is not selected, or there are no arrows on the active chart, the command changes to Chart Add Arrow.

Chart Delete Legend command

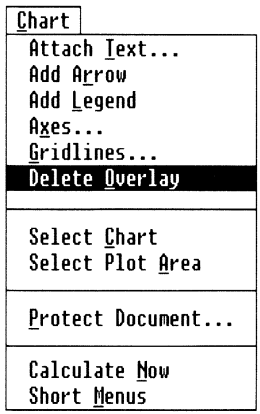


Removes the legend from a chart. When you remove the legend, the plot area expands to use the extra space. You can format the legend with the Format Legend, Format Patterns, and Format Font commands.

After you choose Chart Delete Legend, the command changes to Chart Add Legend. If you later choose the Chart Add Legend command for the same chart, the legend will have the same format as the one you deleted.

Chart Delete Overlay command

(Full menus)



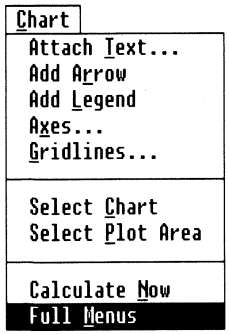
Recombines the overlay chart with the main chart to form a single, main chart. This command only appears when the active chart has an overlay chart.

When you delete an overlay chart, all of the data series on the overlay chart are added to the main chart and the command changes to Chart Add Overlay.

You can change the overlay chart type with the Format Overlay command.

For more information on charts, see **Chart**.

Chart Full Menus command

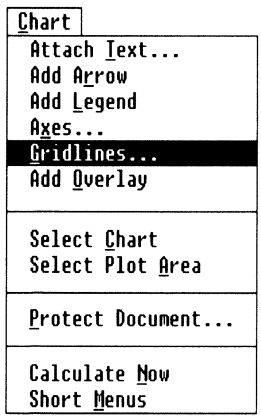


Changes all menus to show all commands instead of just the short menu commands. Chart Full Menus affects all menus for all documents, including worksheets and macro sheets.

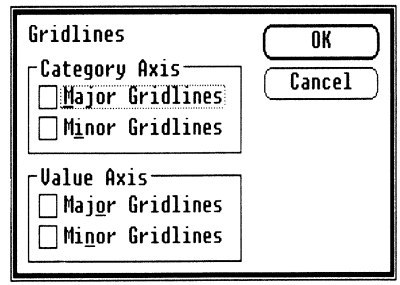
Use full menus when you want to use a command that isn't available on short menus.

Full Menus appears on the chart menu when you are using short menus. Chart Full Menus works exactly the same as the Options Full Menus command, which appears when you are using short menus and a worksheet or macro sheet is the active document.

Chart Gridlines command



Controls whether the major and minor gridlines are visible. Gridlines are attached to the main chart axes. You can change the appearance of gridlines with the Format Patterns command.



Category Axis

Controls the gridlines for the category axis. You can turn on the major gridlines, the minor gridlines, both, or neither.

Value Axis

Controls the gridlines for the value axis. You can turn on the major gridlines, the minor gridlines, both, or neither.

For more information, see **Chart**.

Chart legend

A **chart legend** identifies the different markers in a chart. A legend includes each pattern or symbol used as a marker in the chart, followed by the name of the data series (when there is more than one series) or by the category name (when the chart plots a single data series).

This topic explains:

- Adding a legend
- Moving a legend
- Formatting a legend
- Deleting a legend

Adding a Legend

▣ With the chart window active, choose Chart Add Legend.

Microsoft Excel places a legend at the right of the plot area, and resizes the plot area to accommodate the legend.

Note

For legend text, Microsoft Excel automatically uses the data series name — if any — from the series formula. For charts with only one data series, Microsoft Excel uses the category names. You can add or change legend text by editing the series formula. For more information, see **Series formula**.

Moving a Legend

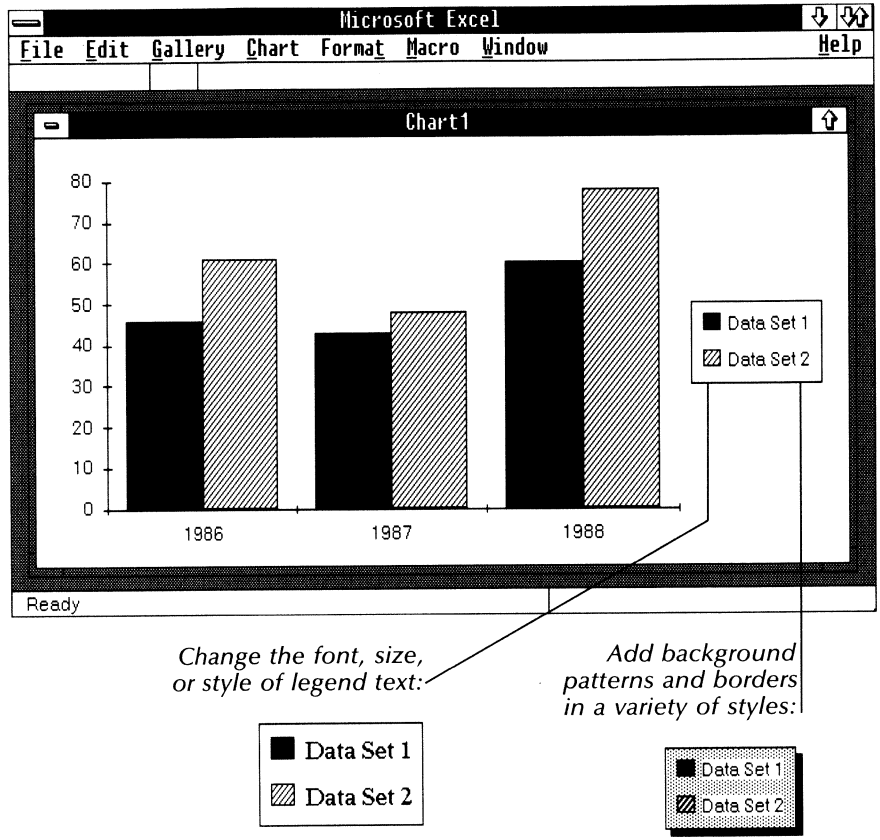
You can position a legend in four different locations on a chart: at the right (default), in the upper-right corner, or centered at the top or bottom.

1. Select the legend.
2. Choose Format Legend.
3. Select the option for the legend position you want.
4. Choose the OK button.

For more information, see **Format Legend command**.

Formatting a Legend

The following illustration shows the two basic ways you can format a chart legend:



Experiment with the different options to see which combinations work best.

To format legend background or border

1. Select the legend.
2. Choose Format Patterns.
3. Select the options you want.
4. Choose the OK button.

To format legend text

1. Select the legend.
2. Choose Format Font.
3. Select the options you want.
4. Choose the OK button.

For more information, see **Format Patterns command** and **Format Font command**.

Deleting a Legend

If a chart containing a legend is active, the Chart Add Legend command changes to Chart Delete Legend on the menu.

▣ Choose Chart Delete Legend.

Related Information

Reference

For information on	See
Chart basics, overview of formatting options	Chart
Using text in charts	Chart text
Formatting series markers	Data series

Sampler

Writing a Report with Microsoft Excel and Windows Write

Tutorial

Changing How a Chart Looks

Feature Guide

Charts

Chart plot area

The **chart plot area** is the region, bounded by and including the axes, in which Microsoft Excel plots your data. The plot area of a pie chart is the smallest rectangle enclosing the pie.

Formatting the Plot Area

You can change the background pattern or the border pattern or weight of the plot area.

1. Select the plot area by choosing Chart Select Plot Area.
2. Choose Format Patterns.
3. Select the options you want.
4. Choose the OK button.

For information about the chart background area, see **Chart area**.

Related Information

Reference

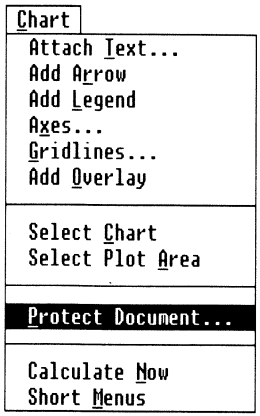
For information on	**See**
Chart basics, overview of chart formats	Chart
Axes and gridlines	Chart axis

Feature Guide

Charts

Chart Protect Document command

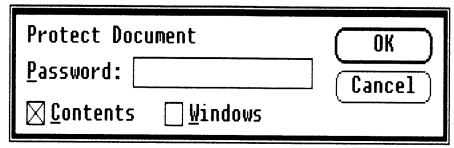
(Full menus)



Controls whether a chart's data series and formats can be altered, and whether its window can be moved, resized, or otherwise altered. When the active chart is protected, the command changes to Chart Unprotect Document.

Chart Protect Document is similar to the Options Protect Document command, which protects worksheets and macro sheets.

For more information, see **Protecting or hiding data**, **Options Protect Document command**, and **Chart Unprotect Document command**.



Password

Type a password, using any combination of letters, numbers, and symbols. A password can be up to 16 characters long. The password you type when you reverse protection of a chart must be identical to the password you typed when you protected the chart.

Important If you lose your password, you cannot reverse protection of the chart. It's a good idea to keep a list of your passwords in a safe place.

If you are protecting your chart from yourself to avoid inadvertent changes, you may want to protect your document without a password. If you choose the OK button in the Protect Document dialog box without typing a password, you won't need to type a password when you unprotect the document.

Using a password to protect a document from being changed is different from using a password to protect a document from being opened. For more information on using a password to protect a document from being opened, see **File Save As command**.

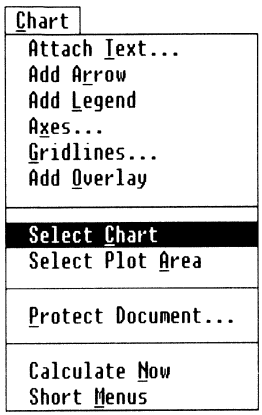
Contents

Protects all aspects of a chart except its window.

Window

Prevents the chart's window from being changed, including sizing, moving, and hiding the chart's window.

Chart Select Chart command

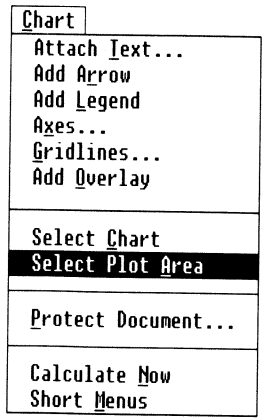


Selects the entire chart in the active window.

When the chart is selected, you can use the following commands:

Format Font	Changes the font, font size, font style, and font color used by all text in the chart
Format Patterns	Changes the border style, border color, border weight, background pattern, background color, and foreground color
Format Main Chart (and Format Overlay if there is an overlay chart)	Controls chart type and chart formats
Edit Clear	Clears the chart's formats or data series
Edit Copy	Copies the chart's formats or data series to another chart

Chart Select Plot Area command

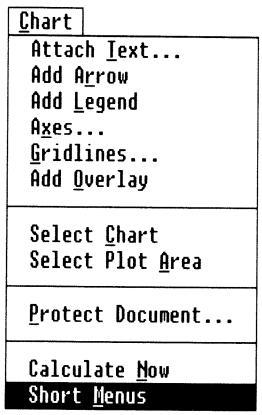


Selects the plot area of the chart in the active window.

The plot area of a chart is the area bounded by the axes. When the plot area is selected, you can use the Format Patterns command to change the border style, border color, border weight, background pattern, background color, or foreground color.

Chart Short Menus command

(Full menus)



Changes the menus to show fewer commands. Chart Short Menus affects menus for all documents, including worksheets and macro sheets.

Short menus are designed to contain the commands you use most often, so you can find them quickly and use Microsoft Excel more efficiently. Use short menus for routine work, or when you are first learning to use Microsoft Excel.

Short Menus appears on the Chart menu when you are using full menus. Chart Short Menus works exactly the same as the Options Short Menus command, which appears when you are using full menus and a worksheet or macro sheet is the active document.

Chart text

Chart text describes data or objects in a chart. You can attach text to a specific part of the chart or add unattached text. You can link any chart text to a worksheet cell, so that the text always reflects any changes on the worksheet. In addition, you can format chart text with a variety of options for fonts, borders, background patterns, and colors.

This topic explains:

- Adding text to a chart

  Types of chart text

  Adding attached text to a chart

  Adding unattached text to a chart

  Linking chart text to a worksheet

- Changing chart text

  Editing chart text

  Formatting chart text

  Moving unattached text

  Resizing the text area for unattached text

  Deleting chart text

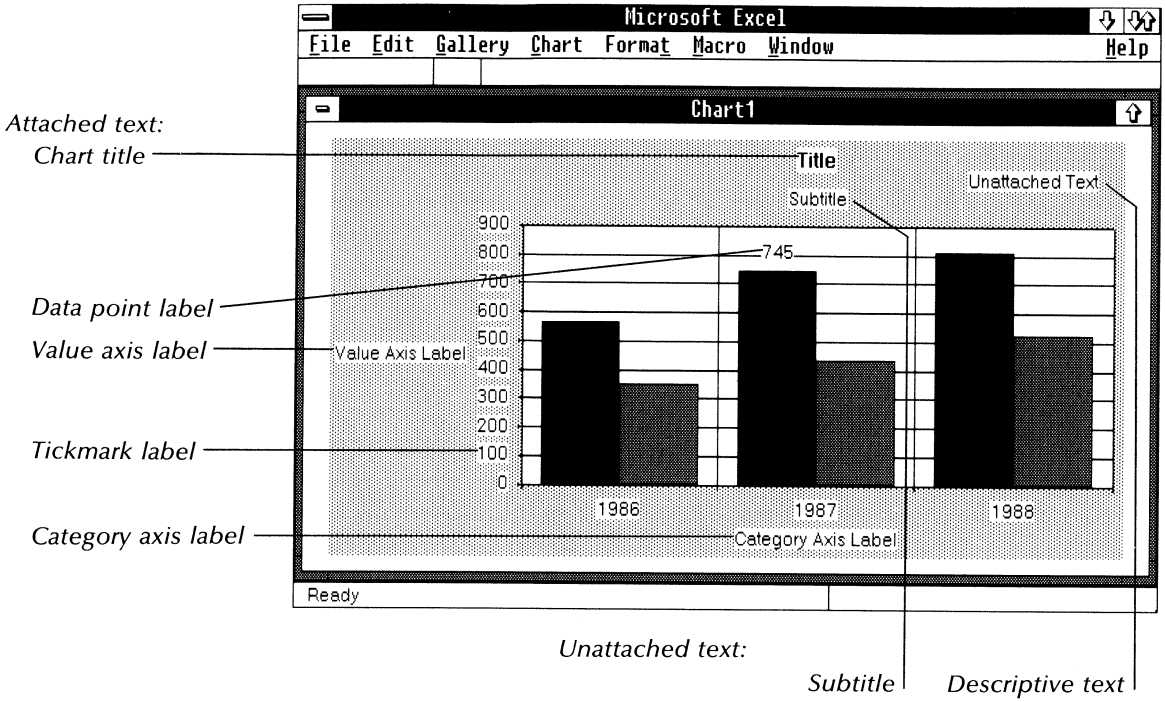
Adding Text to a Chart

Types of Chart Text

You can use two types of chart text:

- **Attached text** is linked to a specific chart object, such as an axis. This text moves with the object if you move or resize the object.
- **Unattached text** is not linked to a chart object. You can size or move this type of text anywhere in the chart.

The following chart shows examples of attached and unattached text:



Adding Attached Text to a Chart

When you create a new chart, Microsoft Excel automatically attaches tick-mark labels along the axes. You can attach text for a chart title, category axis label, value axis label, and data series or data point labels.

1. Choose Chart Attach Text.
2. Select the part of the chart you want the text attached to.

   If you select the Series or Data Point option, you then use the Series Number and Point Number boxes to identify the series or data point you want to attach text to. If you selected a series marker before choosing the Chart Attach Text command, these boxes show which data point and series you selected.
3. Choose the OK button.

   Microsoft Excel provides default text surrounded by white selection squares.
4. To change the text, edit it in the formula bar, just as you would edit text for a worksheet cell.

   To insert a line break in the text, press CONTROL+ENTER.

Note | To add or change a data series name in a chart legend, you edit the series formula, the formula Microsoft Excel uses to plot the data series. For information on editing a series formula, see **Series formula**.

For more information, see **Chart Attach Text command**.

Adding Unattached Text to a Chart

Use unattached text for subtitles, for comments on chart objects and data, or with chart arrows to emphasize elements in a chart.

1. Make sure no other text in the chart is selected.
2. Type the text you want.

   The text appears in the formula bar as you type. To insert a line break in the text, press CONTROL+ENTER.
3. Press ENTER or choose the enter box.

Microsoft Excel places the text in the chart and surrounds it with black selection squares. With these squares you can move the text and change the size of the text area (see "Changing Chart Text," later in this topic).

For information on chart arrows, see **Chart arrow**.

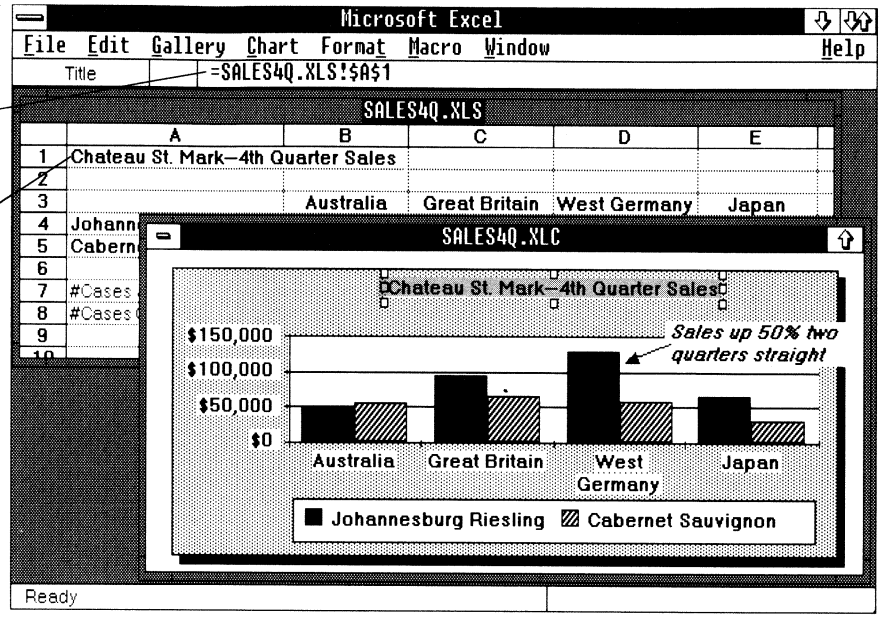
Linking Chart Text to a Worksheet

You can link any attached and unattached text in a chart to a worksheet cell. Then any change on the worksheet will be reflected in the chart text. This is an optional linking feature in addition to the automatic links between worksheet values and the data plotted in the chart.

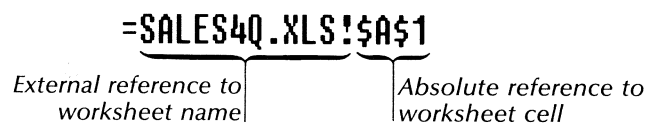
You create linked text with a formula that includes an external reference — a reference to the source worksheet. These rules apply to the formula:

- The source worksheet must be open when you create the formula.
- The external reference may be to a name or a single cell. If the external reference is to a name, the name must not refer to a range of cells or an array.
- The external reference can be an absolute reference or any type of constant — text, number, date, time, logical value, or error value.

In the following illustration, the chart text is selected so you can see the formula that creates the linked text:



The syntax of the example formula is as follows:



Note If you change the worksheet, the chart does not have to be open for the chart text to be updated. When you reopen the chart, Microsoft Excel asks if you want to update references to nonresident sheets. Choose the OK button to update the references.

To link attached text to a worksheet

1. Choose Chart Attach Text.
2. Select the part of the chart you want the text attached to.
3. Choose the OK button.
4. With the default text selected, type an equal sign.
5. Activate the worksheet window and select the cell that contains the data you want for the text.

   You can also type the cell reference in the formula bar.
6. Press ENTER or choose the enter box.

To link unattached text to a worksheet

1. Make sure no text is selected.
2. Type an equal sign.
3. Activate the worksheet window and select the cell that contains the data you want for the text.

   You can also type the cell reference in the formula bar.
4. Press ENTER or choose the enter box.

Changing Chart Text

Editing Chart Text

1. Select the text to display it in the formula bar.

   If the text is linked to a worksheet, activate the worksheet and select the cell that contains the text.
2. Edit the text in the formula bar.

   To insert a line break, press CONTROL+ENTER.
3. Press ENTER or choose the enter box.

Formatting Chart Text

You can format chart text in the following ways:

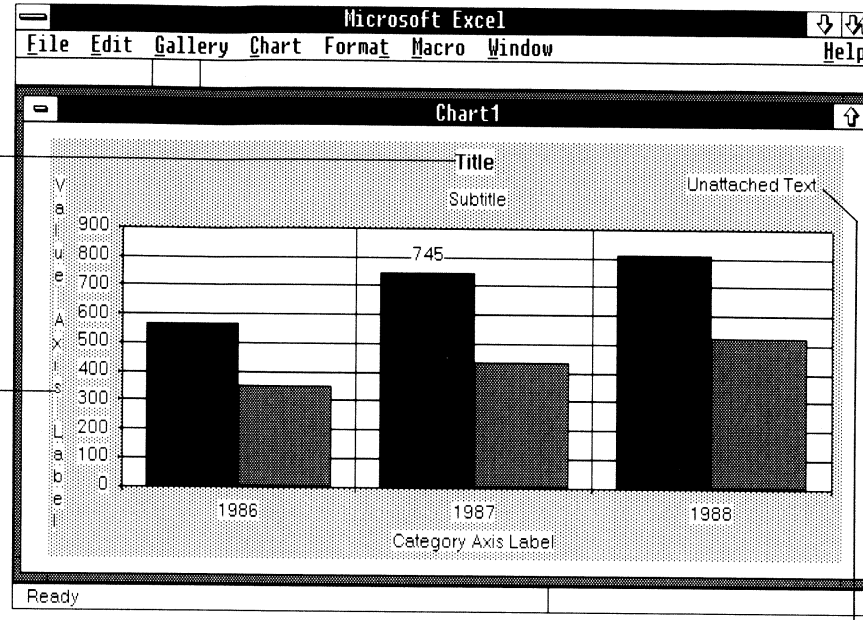
- Change font, font style (bold, italic, underline, or strikeout), and font size.
- Change the orientation and alignment of attached text.
- Add background patterns and borders in a variety of styles.

Use Format Patterns to add backgrounds and borders:

Title

Use Format Text to change orientation and alignment:

Value Axis Label



Use Format Font to change font size, style, and color:

Unattached Text

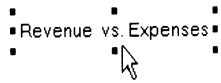
Try experimenting with different format options to see which combinations work best.

To format font, size, style, and color	To format orientation and alignment	To format background or border pattern, color, weight, or style
1 Select the text. To format all chart text, choose Chart Select Chart. 2 Choose Format Font. 3 Select the options you want. 4 Choose the OK button.	1 Select the text. 2 Choose Format Text. 3 Select the options you want. 4 Choose the OK button.	1 Select the text. 2 Choose Format Patterns. 3 Select the options you want. 4 Choose the OK button.

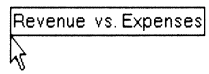
For more information, see **Chart Select Chart command**, **Format Patterns command**, and **Format Text command**.

Moving Unattached Text

You can use either the keyboard or mouse to move unattached text. For both the keyboard and mouse procedures, you'll see the following:



The selected text is surrounded with black selection squares.



Once you start the procedure for moving the text, the squares change into a positioning box that indicates text placement.



To move unattached text with the keyboard:

1 Select the text.

2 Choose Format Move.

3 Using the DIRECTION keys, move the positioning box until the text is where you want it.

For fine adjustment, press the CONTROL key along with a DIRECTION key.

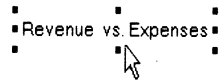
4 Press ENTER.

To move unattached text with the mouse:

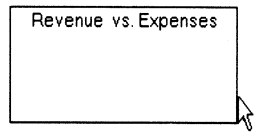
1. Select the text.
2. Drag until the text is where you want it.

Resizing the Text Area for Unattached Text

You can also resize the area containing unattached text. This determines line breaks within the text and the size of any special border you might add around the text (see "Formatting Chart Text," earlier in this topic). For both the keyboard and mouse procedures, you'll see the following:



The selected text is surrounded with black selection squares.



Once you start the procedure for resizing the text, the squares change into a positioning box that shrinks and expands.

To resize the text area with the keyboard:

1. Select the text.
2. Choose Format Size.
3. Using the DIRECTION keys, enlarge or shrink the positioning box until the text area is the size you want.

   For fine adjustment, press the CONTROL key along with a DIRECTION key.
4. Press ENTER.

To resize the text area with the mouse:

1. Select the text.
2. Point to one of the black selection squares.
3. Drag to enlarge or shrink the positioning box until the text area is the size you want.

Deleting Chart Text

1. Select the text.

   If you gave the text a border or changed its background pattern, choose Format Patterns. Change the border and area patterns back to Invisible.

2. Press BACKSPACE.

3. Press ENTER or choose the enter box.

Related Information

Reference

For information on	See
Chart basics, moving and selecting in a chart	Chart
Working with chart arrows	Chart arrow
Working with legends	Chart legend

Sampler

Writing a Report with Microsoft Excel and Windows Write

Analyzing the Break-even Point

Tutorial

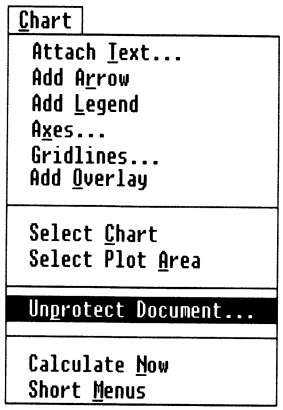
Changing How a Chart Looks

Feature Guide

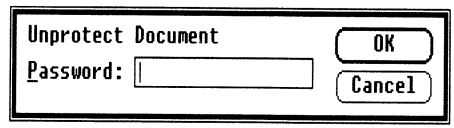
Charts

Chart Unprotect Document command

(Full menus)



Reverses the Chart Protect Document command. Chart Unprotect Document is available when a protected chart is active. When the active chart is unprotected, the command changes to Chart Protect Document.



Password

Type the password for the chart. The password must be identical to the password you typed when you protected the chart.

For more information, see **Protecting or hiding data**, **Options Protect Document command**, and **Chart Protect Document command**.

Note | If you did not use a password when you protected the document, Microsoft Excel unprotects the document without displaying the dialog box.

Circular reference

A **circular reference** occurs when a formula refers back to its own cell, either directly or indirectly. Microsoft Excel is then unable to complete the formula's calculation because it is searching for a value that is never found.

Circular references can occur in three ways:

- A formula refers directly back to its own cell.
- A formula refers to a second cell which refers back to the first cell.
- A formula refers to another cell which in turn refers to another cell, and so on, until the chain of references ends at the first cell.

When a circular reference occurs, Microsoft Excel displays a message. Then, to help you locate the circular reference, the status bar at the bottom of the screen identifies a cell involved in the circular reference.

Circular references can be accidental or intentional. If you did not intend to create a circular reference, check the logic of your formulas. You may have to redesign the logic or edit the formulas to eliminate the circular references.

If you want to build formulas that depend on each other, you can use a calculation technique called iteration to resolve the circular reference. For more information on resolving circular references, see **Iteration**.

Color

If you have a color monitor and a color display adapter, you can use color to customize your Microsoft Excel workspace. The Microsoft Excel additional color display options provide many ways to enhance worksheet and chart displays.

This topic explains:

- Basic screen colors
- Additional color display options

Basic Screen Colors

You can specify hue, brightness, and amount of color for the following screen elements:

- Screen background area
- Application workspace
- Window background
- Window text
- Menu bar
- Menu text
- Active (selected) title bar
- Inactive (unselected) title bar
- Title bar text
- Active border
- Inactive border
- Window frame
- Scroll bars

You set parameters for screen colors and shades of gray with the Preferences Screen Colors command in Control Panel. For information on Control Panel options, see "Control Panel" in the Appendix.

Additional Color Display Options

The windows on your Microsoft Excel workspace show the screen colors you specify in Control Panel. You can also enhance the display of your Microsoft Excel documents with the following color options:

- **Color gridlines and row/column headings in worksheet windows** — for easy document identification if multiple worksheets are open on the workspace. Colors are set individually for each window, so you can also use this color option to easily distinguish multiple windows into the same worksheet. For more information, see **Display options**.
- **Color in worksheet number and text formats** — for emphasizing key data or for showing relationships between figures in your worksheets and charts. For more information, see **Format Number command**.
- **Color formats for patterns, markers, and borders in charts** — for creating high-quality graphics or for color-keying data in your charts to corresponding worksheet data. For more information, see **Format Patterns command**.

Available colors for these options include red, green, blue, yellow, cyan, magenta, black, and white.

Related Information

Reference

For information on	See
General overview of formatting worksheets and charts	Formatting a document
Hardware components	Hardware and system configuration

Column

On a Microsoft Excel worksheet, a **column** is one complete vertical line of cells. Microsoft Excel has 256 columns. In A1 reference style, the columns are labeled A through IV (A, B, C, . . .Z; AA, AB, AC, . . . IV). In R1C1 reference style, the columns are labeled 1 through 256.

This topic explains:

- Changing a column width
- Changing column widths for an entire worksheet
- Inserting a column of blank cells
- Deleting a column
- Hiding a column
- Displaying a hidden column

This topic does not discuss basic procedures for selecting partial or entire columns. For information on those basic procedures, see **Keyboard**.

Note | All worksheet column concepts and procedures also apply to macro sheets.

Changing a Column Width

The standard column width in a new worksheet is eight characters wide. When displaying formulas, Microsoft Excel doubles the width of the columns. The doubled column width is also the standard column width in a new macro sheet.

If you enter data that does not fit within the display boundary of a column width, Microsoft Excel stores the data but displays number signs (###) in the cell. To fully display the data, you can change the column width for any or all columns in a worksheet.

You can make a column as wide as the worksheet window or as narrow as a fraction of one character. Or, you can hide a column altogether by setting its width to zero. When you change a column width, the stored contents of the cells do not change; only the number of characters displayed changes.

Note | Microsoft Excel sets column width based on the width of unformatted numeric characters. The number of characters actually displayed in a cell may vary, depending on the font (for example, Helv or TmsRmn), font size, and font style (for example, bold or italic).

For information on displaying formulas or values, see **Display options**. For information on using fonts, see **Font**.



To change column width using the keyboard:

1. Select a column or a cell in the column you want to change.
2. Choose Format Column Width.
3. In the Column Width box, type the column width you want.

   To return a column to its standard eight-space width, turn on the Standard Width check box.
4. Choose the OK button.



To change column width using the mouse:

1. Point to the vertical line at the right of the column heading.
2. When the pointer changes to a vertical bar with arrows to each side, drag to the right to widen the column, or to the left to narrow it.

Changing Column Widths for an Entire Worksheet

1. Select an entire row of cells or the entire worksheet.
2. Choose Format Column Width.
3. In the Column Width box, type the column width you want, or turn on the Standard Width check box.
4. Choose the OK button.

Inserting a Column of Blank Cells

1. Select the column you want to shift to the right to open space for the new column.
2. Choose Edit Insert.

For more information, see **Inserting blank cells**.

Deleting a Column

1. Select the column you want to delete.
2. Choose Edit Delete.

For more information, see **Deleting and clearing data**.

Hiding a Column

You can hide a column so that it still exists on the worksheet but is not visible when you display or print the worksheet. This procedure is useful for avoiding clutter in a worksheet if, for example, you have a column of supporting figures that are used in calculating formulas but are unnecessary to include in the printed report.



To hide a column using the keyboard:

1. Select the column or a cell in the column you want to hide.
2. Choose Format Column Width.
3. In the Column Width box, type *0* (zero).
4. Choose the OK button.



To hide a column using the mouse:

1. Point to the vertical line at the right of the column heading.
2. When the pointer changes to a vertical bar with arrows to each side, drag to the left until it overlaps the line at the left side of the column heading.

For information on hiding or protecting data for security purposes, see **Protecting or hiding data**.

Displaying a Hidden Column



To display a hidden column using the keyboard:

1. Choose Formula Goto.
2. In the Reference box, type the reference of any cell in the hidden column.
3. Choose the OK button.
   Microsoft Excel selects the cell in the hidden column.

4 Choose Format Column Width.

5 Type a number greater than zero, or turn on the Standard Width check box.

6 Choose the OK button.



To display a hidden column using the mouse:

1 Point to the column heading line where the column is hidden.

2 When the pointer changes to a vertical bar with arrows to each side, move it just to the right of the column heading line.

3 Drag to the right.

If you start dragging to the left of the column heading line, or start to the right and drag to the left, you will change the width of the visible column on the left instead of displaying the hidden column.

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Adjusting, adding, or deleting rows in a worksheet	Row
Column or row headings and titles	Display options
Moving worksheet cells and ranges	Moving data on a worksheet
Copying worksheet cells and ranges	Copying data and formats

Sampler

Creating Calendars, Diagrams, Tables, and Forms

Tutorial

Changing How a Worksheet Looks

Feature Guide

Worksheet Formatting

Command, menu, and dialog box

A **command** is a word or phrase that instructs Microsoft Excel to carry out an action. Microsoft Excel's commands are organized in drop-down **menus**, groups of related commands. After you choose a command, Microsoft Excel may display a **dialog box**, a prompt for further information needed to carry out the command.

This topic explains:

- Working with commands and menus

  Choosing a command from a menu

  Choosing a Control Menu command

  Canceling a command

  Alternate keyboard and mouse techniques

  Displaying short menus or full menus

  Choosing a shifted command

  Grayed commands

- Working in dialog boxes

  The parts of a dialog box

  Using the keyboard in a dialog box

  Using the mouse in a dialog box

  Editing in a text box

  Grayed dialog box options

Note Throughout *Microsoft Excel Reference* and in all other print and online materials in the Microsoft Excel package, a command is usually referred to by both its menu name and actual command name. For example, "File Open command" refers to the Open command on the File menu. This naming convention reflects the sequence you follow in choosing a command — first selecting the menu, then choosing the command.

Working with Commands and Menus

Microsoft Excel commands are grouped on menus whose names appear in the menu bar in the Microsoft Excel window. Depending on what kind of window is active, the menu bar displays a different set of menu names:

- Worksheet or macro sheet window — worksheet menu names displayed.
- Chart window — chart menu names displayed.
- Info window — Info menu names displayed.

For more information on menu bars in Microsoft Excel, see **Menu and menu bar**.

Note

Also included with Microsoft Excel are a number of smaller applications called utility programs: Control Panel, Spooler, Clipboard, and Macro Translation Assistant. Each of these programs appears in a separate application window (outside the Microsoft Excel application window) with its own menus. For information on the types of windows in Microsoft Excel, see **Windows**.

The following illustration shows the worksheet, chart, and Info menus.

Worksheet Menus

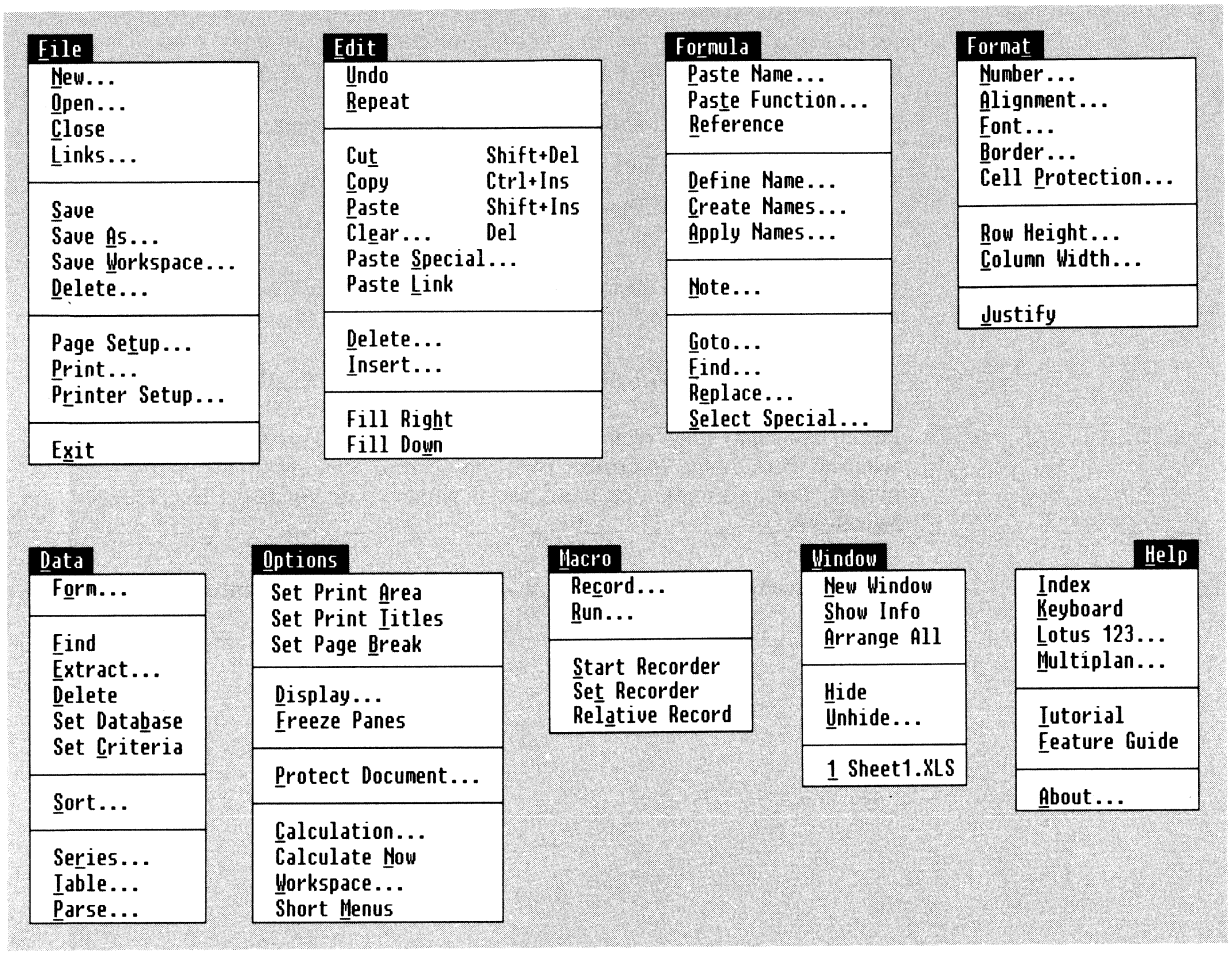
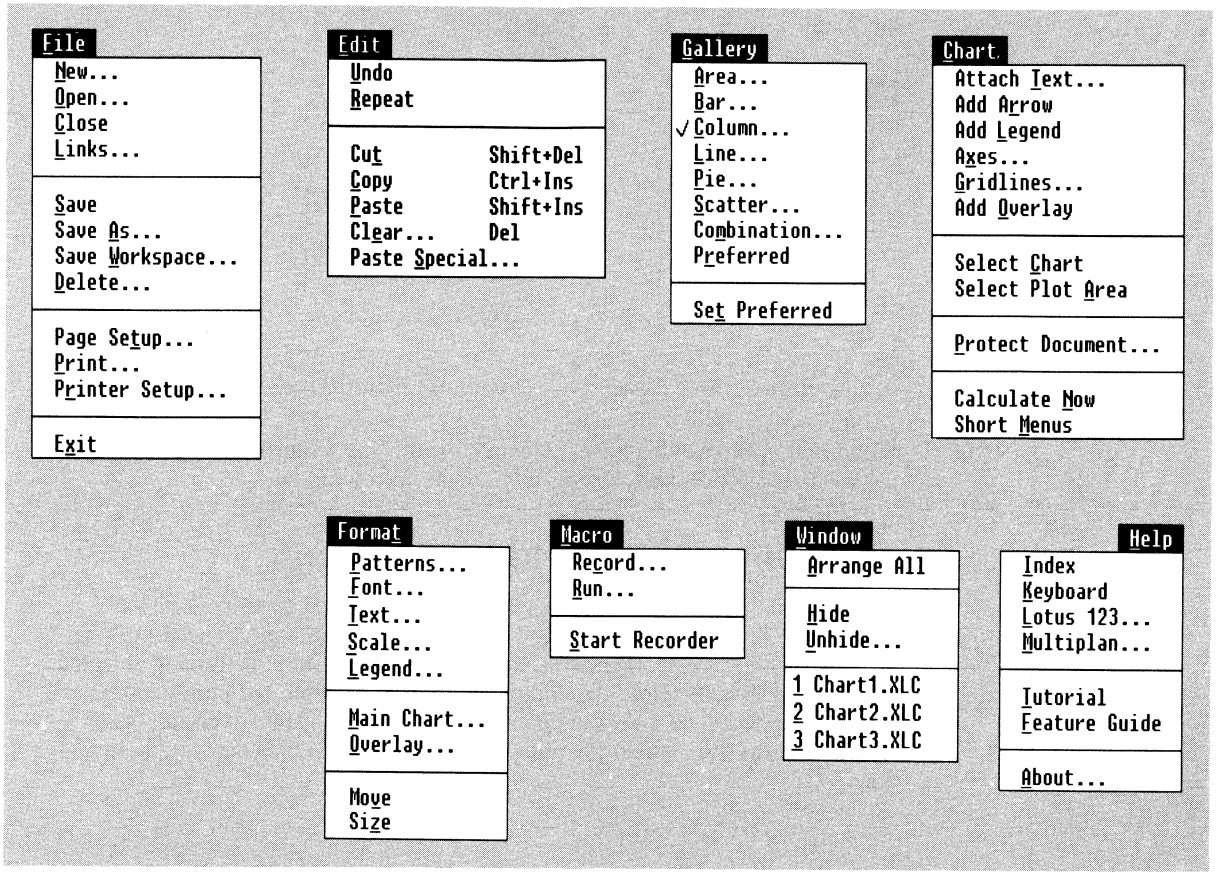
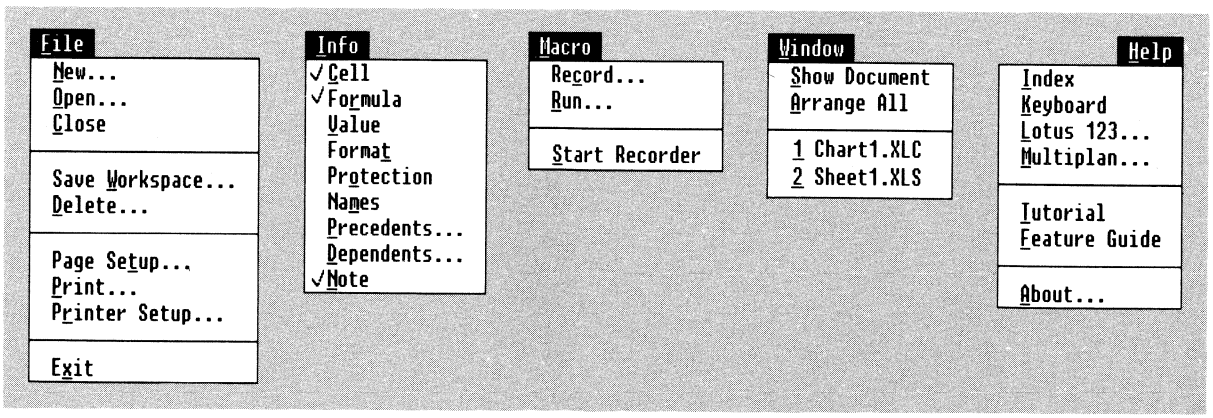


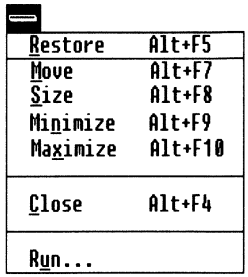
Chart Menus



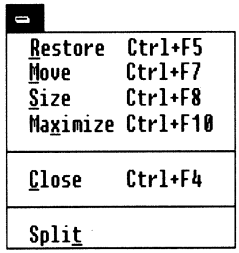
Info Menus



Two Control menus — one for the application window and one for the document window or Info window — are always available for manipulating windows on the screen. A window's Control menu is at the upper-left corner of the window.



Application Control menu

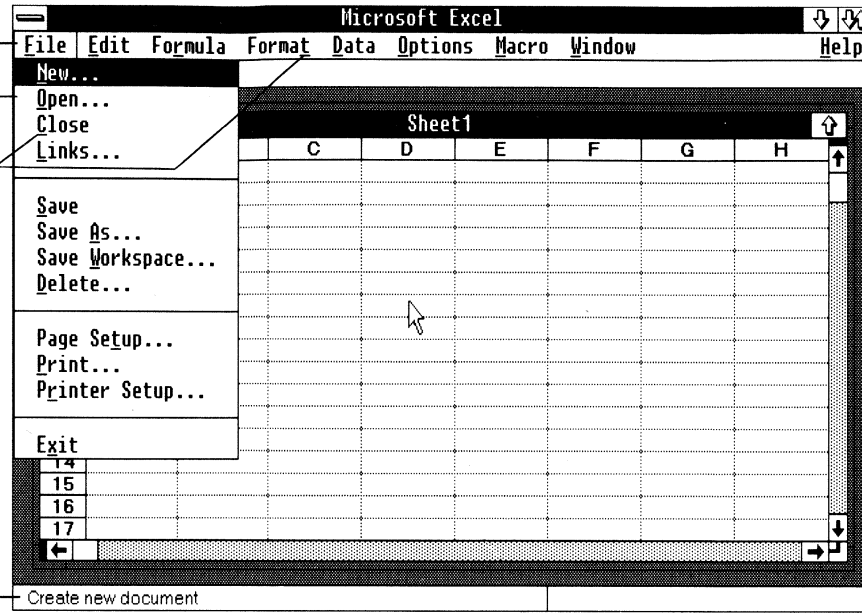


Document Control menu

Note | Some dialog boxes also have a Control menu. The Control Split command is not available for a chart, dialog box, or the Info window.

Choosing a Command from a Menu

To choose a command with either the keyboard or the mouse, you first display the drop-down menu and then choose the command. The following illustration shows a worksheet window with the File New command selected (Full menu shown). Note the underlined letters in menu and command names. These provide an easy way to choose commands with the keyboard. Also note the status bar, which provides a brief description of what the command does.



To choose a command with the keyboard:

1. Press ALT to activate the menu bar.

   The File menu name appears selected, indicating that the menu bar is now active.

2. Press the key for the underlined letter in the name of the menu you want to display.

3. Press the key for the underlined letter in the command you want to choose.

   If the command name ends in an ellipsis (. . .) on the menu, Microsoft Excel displays a dialog box prompting you for further information after you choose the command; otherwise, it carries out the command directly.

4. If the command displays a dialog box, specify the information needed.

   For information on how to use a dialog box, see "Working in Dialog Boxes," later in this topic.

5. When you finish with the dialog box, choose the appropriate command button to carry out the command.

   In most cases, pressing ENTER chooses the OK button and carries out the command. In a few cases, the command button that carries out the command may be labeled with a term such as Open or Delete. To choose the

button, press ALT and then the key for the underlined letter in the command button label. For more information, see "Working in Dialog Boxes," later in this topic.

To cancel a command, press ESCAPE to choose the Cancel button.



To choose a command with the mouse:

1. Click the menu name in the menu bar to display the menu.
2. Click the command you want to choose.

   If the command name ends in an ellipsis (...) on the menu, Microsoft Excel displays a dialog box prompting you for further information after you choose the command; otherwise, it carries out the command directly.
3. If the command displays a dialog box, specify the information needed.

   For information on how to use a dialog box, see "Working in Dialog Boxes," later in this topic.
4. When you finish with the dialog box, click the appropriate command button to carry out the command.

   In most cases, clicking the OK button carries out the command. In a few cases, the command button that carries out the command may be labeled with a term such as Open or Delete. For more information, see "Working in Dialog Boxes," later in this topic.

   To cancel a command, click the Cancel button.

For alternate ways of working with commands using either the keyboard or mouse, see "Alternate Keyboard and Mouse Techniques," later in this topic.

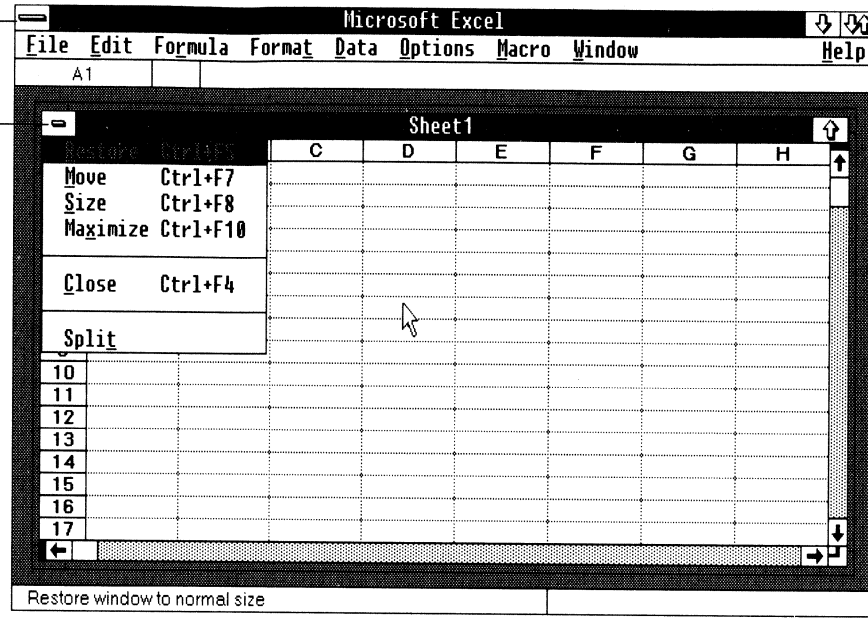
Choosing a Control Menu Command

You use commands on the Control menu to manipulate windows on the screen. (A few movable dialog boxes also have Control menus.) When the Control menu is not displayed, it appears as the Control menu icon, a box in the upper-left corner of the window.

You choose commands from the Control menu as you would from any other, but you display this menu in a slightly different way: you press ALT and then press the key shown on the Control menu icon. On application windows (for example, the Microsoft Excel window), the key on the icon is a spacebar. On document windows (for example, a worksheet or chart window), the key is a hyphen.

Control menu icon on an application window shows a spacebar.

Control menu icon on a document window shows a hyphen (-).



To display the Control menu with the keyboard:

1. Press ALT.
2. To display the Control menu on a document window, press HYPHEN.
   To display the Control menu on an application window, press SPACEBAR.

To display the Control menu with the mouse:

- Click the Control menu icon to display the Control menu you want.

Once the menu is displayed, you can choose commands as described earlier in this topic.

For information on windows techniques, see **Windows**.

Canceling a Command

To close a menu or cancel a command with the keyboard:

- Press ESCAPE.



To close a menu, or cancel a command with the mouse:

▣ If you are displaying a menu, click anywhere outside the menu bar. If you are in a dialog box, click the Cancel button.

Alternate Keyboard and Mouse Techniques

You can use the following alternate techniques to choose commands:

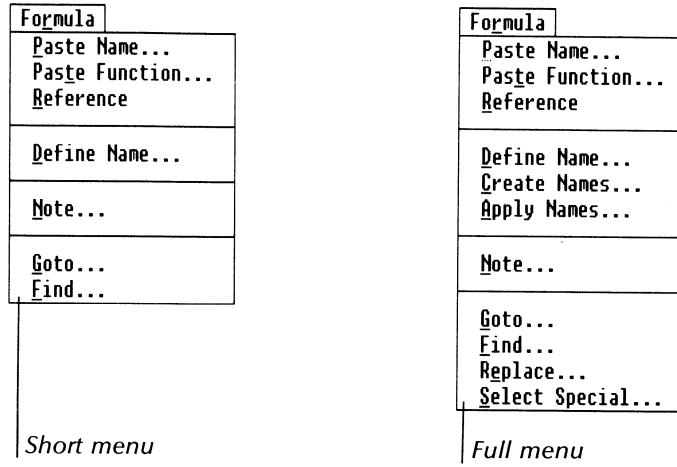
- **Alternate menu keys:** Instead of the ALT key, you can press F10 to activate the menu bar. You can also use the slash (/) key to activate the menu bar, an option you may want to try if you're used to Lotus 1-2-3. You can change this slash (/) key setting and create a custom menu key; for more information on this option, see **Options Workspace command**.
- **Alternate keys for moving in menu bars and menus:** Use the RIGHT and LEFT keys to move across the menu bar. Use the UP and DOWN keys to display and move through a menu.
- **Keyboard shortcuts:** Many of the most frequently used menu commands have equivalent keyboard shortcuts that let you choose a command directly from the keyboard, bypassing the drop-down menus. For example, to go directly to the dialog box for the Formula Paste Name command, press F3. To choose the Formula Goto command and go directly to the dialog box, press F5. For more information, see **Keyboard**.
- **Mouse shortcuts:** Mouse shortcuts are features built right into a window. For example, instead of choosing the Control Close command from the drop-down menu to close a document window, you can double-click the Control menu icon with the mouse. Instead of choosing the Control Move command to move a window, you can drag the window's title bar. For more information on using the mouse with Microsoft Excel, see **Mouse**.
- **Combining mouse and keyboard techniques:** If you're using a mouse, try mixing mouse and keyboard techniques to find the most convenient methods for you.

Displaying Short Menus or Full Menus

You can choose whether you want to display short menus or full menus:

- **Short menus** display the most common commands you use for routine worksheet, database, and chart tasks. Using short menus makes it easy to learn the basic commands so that you can become productive quickly. When you start Microsoft Excel the first time, short menus are displayed.
- **Full menus** contain all the commands on short menus plus commands for more advanced or specialized tasks.

For example, here's how the Formula menu looks displayed as a short menu and a full menu:



To switch to full menus from short menus:

- Choose Options Full Menus, or Chart Full Menus if the active document is a chart.

To switch to short menus from full menus:

- Choose Options Short Menus, or Chart Short Menus if the active document is a chart.

Note | To use a command on a full menu, you must first switch to full menus.

Choosing a Shifted Command

Microsoft Excel has a small number of shifted commands, variations of commands normally displayed on a few worksheet and chart menus. When you hold down SHIFT while selecting a menu, Microsoft Excel displays the shifted command names.

The following table lists commands that have shifted versions:

Regular Command	Shifted Command
File Close	File Close All
Edit Copy	Edit Copy Picture
Edit Fill Right	Edit Fill Left
Edit Fill Down	Edit Fill Up
Options Calculate Now	Options Calculate Document

For information on each shifted command, see the topic by that name.



To display a menu with a shifted command using the keyboard:

1. Press ALT.
2. Hold down SHIFT and press the key for the underlined letter in the menu name you want.

   Once the menu is displayed, choose the command you want.



To display a menu with a shifted command using the mouse:

- Hold down SHIFT and click the menu name you want.

  Once the menu is displayed, choose the command you want.

Grayed Commands

Some commands occasionally appear grayed or dimmed. This indicates that the command is not available at this time or that you may need to make a selection or complete an action before choosing the command.

Working in Dialog Boxes

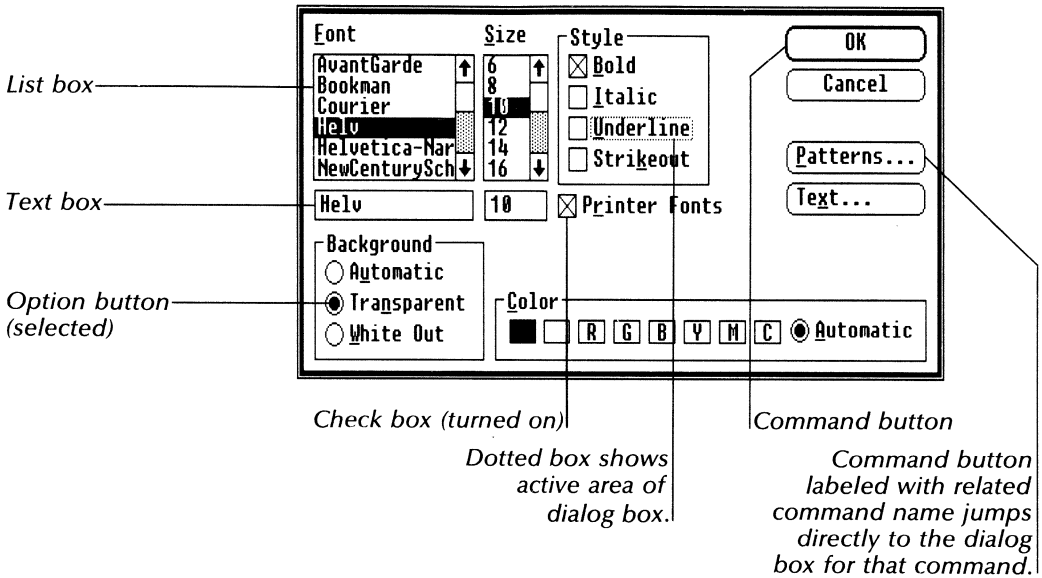
Microsoft Excel displays a dialog box when it needs additional information to carry out a command or action. A command name followed by an ellipsis (. . .) on a menu indicates that Microsoft Excel displays a dialog box after you choose that command.

The Parts of a Dialog Box

A dialog box may include areas in which you enter text or numbers and view or change settings for options related to the command. Or it may simply display additional information or a request for confirmation.

A dotted box around a dialog box item indicates the active area of the dialog box. When you move to an area in which you enter text or numbers, the dotted box changes to a flashing vertical line called the insertion point — the same type of insertion point you also see in the Microsoft Excel formula bar.

The dialog box for the Format Font (charts) command shows most of the elements found in dialog boxes:



List box — a boxed area that displays a list of choices for a command.

Text box — a rectangular box in which you can type information (text or numbers) needed to carry out the command. What you type appears to the left of the insertion point, which pushes existing text to the right as you type.

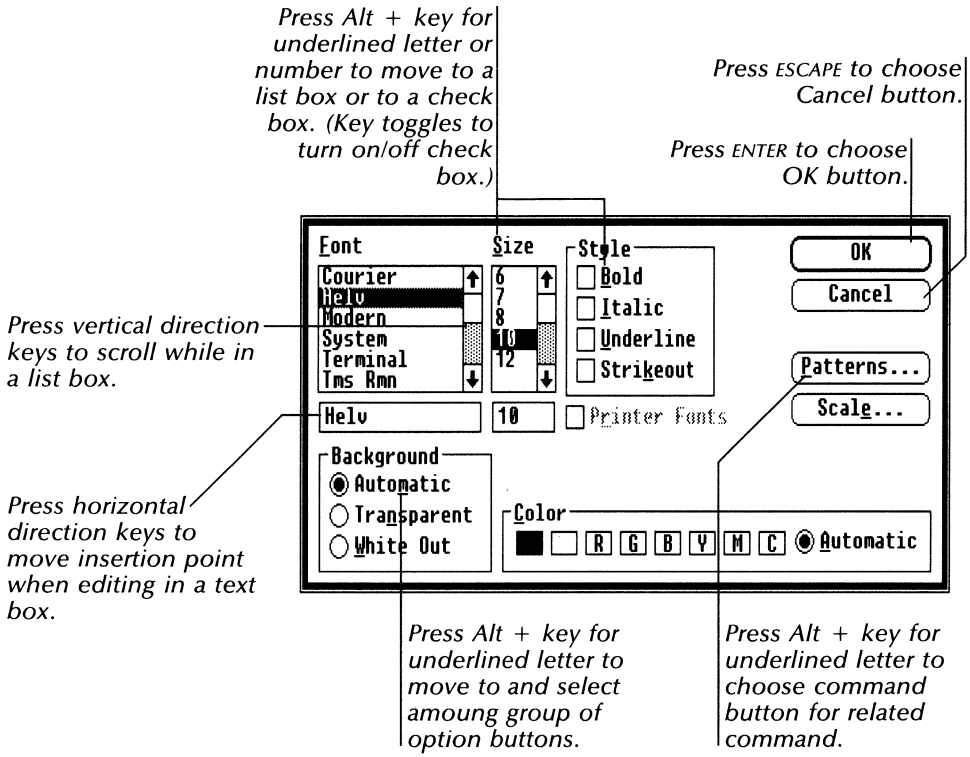
Option button — a small round button used to select an option. Option buttons are generally used to specify one of a group of related options.

Check box — a small square box used to turn on or turn off an option.

Command button — a large rectangular button, labeled to indicate what action it carries out. The OK button closes the dialog box and carries out the command. The Cancel button closes the dialog box and cancels the command. A command button may also be labeled with words such as Replace or Find Next, where appropriate.

Using the Keyboard in a Dialog Box

The following illustration shows how to use the keyboard to move and select in a dialog box:

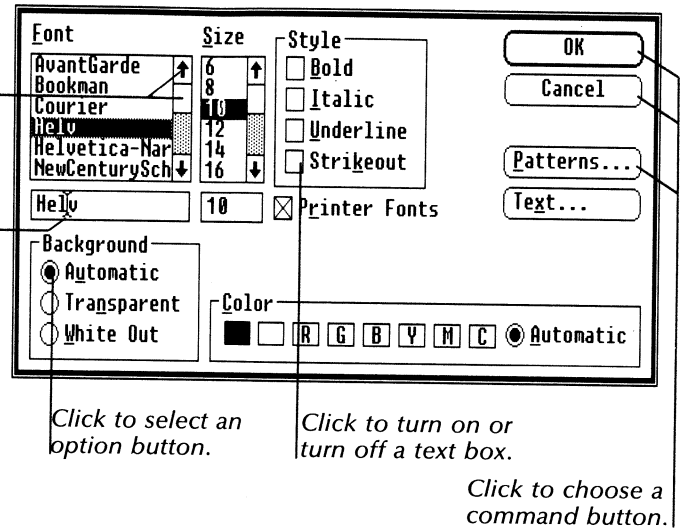


You can also move and select in a dialog box, using these keys:

- Press TAB to move to the next list box, text box, check box, command button, or group of option buttons.
- Press the DIRECTION keys to move and select within an active group of option buttons.
- Press the SPACEBAR to turn on or turn off an active checkbox or choose the active command button.
- In a list box, press the key for the first letter of an item to move directly to the item and select it.

Using the Mouse in a Dialog Box

The following illustration shows how to use the mouse to move and select in a dialog box:



Click on arrow to scroll one line at a time; drag box to scroll several lines.

Click where you want the insertion point when editing in a text box.

Click to select an option button.

Click to turn on or turn off a text box.

Click to choose a command button.

You can also move and select in a dialog box with the mouse, using the following techniques:

- Double-click a list box item or an option button to carry out the command.
- Use the LEFT or RIGHT key to scroll text that extends beyond the border of a text box.
- Click the check box label to turn it on or off, or click the option button label to select it.

Editing in a Text Box

Use the keyboard and mouse techniques given in this section for editing in a text box.



To edit in a text box with the keyboard, use the following techniques:

To	Press
Move one character left or right; scroll text that extends beyond border of text box	LEFT or RIGHT key
Extend selection one character left or right	SHIFT + LEFT or RIGHT keys
Move to beginning of text line	HOME
Extend selection to beginning of text line	SHIFT + HOME
Move to end of text line	END
Extend selection to end of text line	SHIFT + END
Clear character to left	BACKSPACE
Clear selection or character to right	DELETE
Cut selection to Clipboard	SHIFT + DELETE
Copy selection to Clipboard	CONTROL + INSERT
Paste contents of Clipboard	SHIFT + INSERT



To edit in a text box with the mouse, use the above techniques in addition to the following selection techniques:

To	Do this
Move insertion point within text box entry	Click where you want insertion point.
Select or extend selection	Drag to extend selection.

Note

The dialog box for the Formula Note command displays a vertically scrollable text box in which you can type multiple lines of text. To edit multiple lines of text in a scrollable text box, use the procedures and techniques for editing in a regular text box, plus the UP and DOWN keys to move between lines.

Grayed Dialog Box Options

Some dialog box options occasionally appear grayed or dimmed. This indicates that the option is not available at this time or that you may need to make a selection or complete an action before specifying the option.

Note

A check box may appear shaded if an option is already in effect for some but not all the cells in a selected range. If you want the option to apply to all cells in the selection, turn on the check box. If you want to cancel the option for all cells in the selection, turn off the check box.

A Quick Tour of the Commands

For a fast way to get acquainted with Microsoft Excel, take a quick tour of the commands. If Microsoft Excel is set to display short menus, choose the Options Full Menus command. Then follow these steps to tour the commands:

1. Press ALT to activate the menu bar.
2. Press the LEFT or RIGHT key to move across the menu bar, and the UP or DOWN key to move up or down in a menu.
3. As you move through a menu, look at the status bar at the bottom of the screen for a brief preview of what the command does. For more information on the status bar, see **Status bar**.

You can take a complete "guided tour" of the commands through Microsoft Excel Help. Help provides complete information on each command and dialog box. Help is displayed in its own movable, sizable window so you can view both your work and Help at the same time. For more information on working with Help, see **Help.**

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Chart basics	Chart

You can find information about Microsoft Excel basics in the other core topics: **Chart**, **Database**, **Help**, **Windows**, and **Worksheet**.

Functions and Macros

"Creating Customized Menus and Dialog Boxes" in Chapter 6, "Advanced Macros"

Tutorial

Worksheet Basics

Feature Guide

Basic Mechanics, "Using Menus and Dialog Boxes"

Constant value

A **constant value** is anything you enter into a cell, other than a formula. Formulas always begin with an equal sign (=). Constant values may be text, numbers, dates, times, logical values, or error values. Microsoft Excel never changes constant values as part of its calculations. Values that appear in a cell as the result of that cell's formula are not constant values.

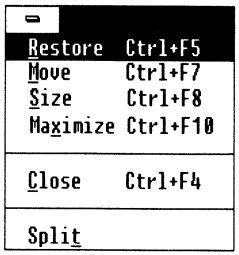
For more information, see **Values**, **Number**, **Text**, **Date**, and **Time**.

Dialog Box

Some dialog boxes have a Control menu. You can move a dialog box with a Control menu by pressing ALT, SPACEBAR, M.

With the mouse, you can drag the title bar of the dialog box.

Control Restore command



Restores the active window to its previous size and location after minimizing or maximizing the window. Control Restore does not affect changes made to a window with the Control Move or Control Size command. **Shortcut key:** **ALT + F5** (application window); **CONTROL + F5** (document window).

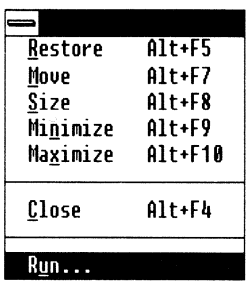
Application Window

Press ALT, SPACEBAR, R to restore the Microsoft Excel application window to its previous size and position after minimizing or maximizing it.

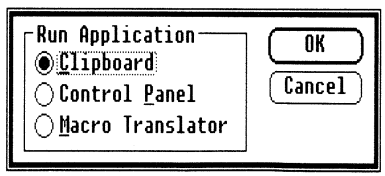
Document Window

Press ALT, HYPHEN, R to restore the active document window to its previous size and position after maximizing it. You cannot minimize a document window.

Control Run command



Allows you to run other applications such as the Clipboard, Control Panel, and Macro Translation Assistant. Press ALT, SPACEBAR, U to display the following dialog box:

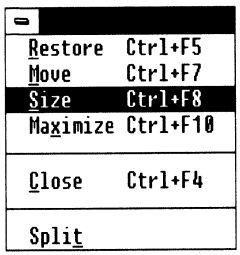


Run Application

Clipboard	Displays the contents of the Clipboard
Control Panel	Use Control Panel to add and delete printer drivers and fonts, connect or disconnect ports, and change your screen colors or mouse buttons
Macro Translator	Use the Macro Translation Assistant to convert Lotus 1-2-3 macros to Microsoft Excel macros

For information on the Clipboard and Control Panel, see the Appendix. For information on the Macro Translation Assistant, see **Lotus 1-2-3**.

Control Size command



Changes the size of the active window. To change the size of the active window, choose Control Size, then use the DIRECTION keys to resize the window. Hold down the CONTROL key to make the DIRECTION keys move the window borders more slowly. When the window is the size you want it, press ENTER.
Shortcut key: **ALT**+**F8** (application window); **CONTROL**+**F8** (document window).

With the mouse, you can resize the active window by dragging the gray window border.

If the window is maximized, this command is grayed.

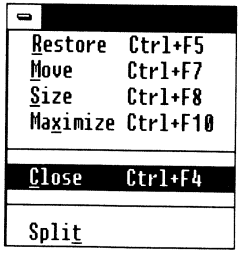
Application Window

Press ALT, SPACEBAR, S to change the size of the Microsoft Excel application window.

Document Window

Press ALT, HYPHEN, S to change the size of the active document window.

Control Close command



Closes the active application window or document window. If a dialog box is open and has a Control menu, closes the dialog box. **Shortcut key:** **ALT + F4** (application window); **CONTROL + F4** (document window).

Application Window

Press ALT, SPACEBAR, C to close the application window. Closing the application window is the same as quitting Microsoft Excel by choosing the File Exit command. For information on quitting Microsoft Excel, see **File Exit command**.

Document Window

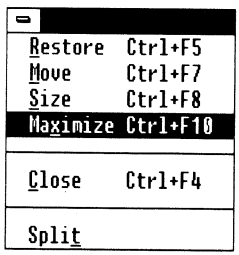
Press ALT, HYPHEN, C to close the active document window. If you have more than one window open into a document, Control Close closes only the active window.

If you want to close all of a document's windows, use the File Close command. If you want to close all open windows for all documents, use the File Close All command.

Dialog Box

Some dialog boxes have a Control menu. You can close a dialog box with a Control menu by choosing the OK button or the Cancel button, or by pressing ALT, SPACEBAR, C.

Control Maximize command



Enlarges the active window to fill the available space. Use Control Maximize to see as much as possible of Microsoft Excel, the active document, or both. If the window is already maximized, this command is grayed. **Shortcut key:** **ALT + F10** (application window); **CONTROL + F10** (document window).

To restore a maximized window to its former size, use the Control Restore command.

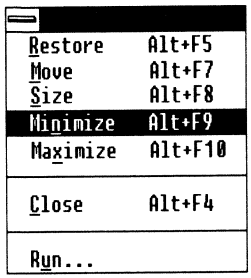
Application Window

Press ALT, SPACEBAR, X to expand Microsoft Excel to fill the entire screen.

Document Window

Press ALT, HYPHEN, X to expand the active document to fill as much of the Microsoft Excel application window as possible.

Control Minimize command

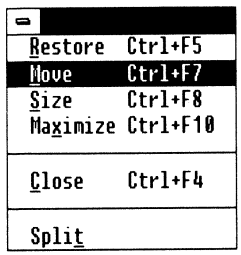


Reduces the Microsoft Excel application window to a small icon at the bottom of the screen. You may want to minimize Microsoft Excel when you are temporarily running another application. **Shortcut key: ALT + F9.**

Press ALT, SPACEBAR, N to minimize the Microsoft Excel application window. Use the Control Restore command (ALT, SPACEBAR, R) to restore the application window to its previous size and position.

You cannot minimize a document window.

Control Move command



Moves the active window. To move the active window, choose Control Move, then use the DIRECTION keys to move the window to a new location. Hold down the CONTROL key to make the DIRECTION keys move the window more slowly. When the window is where you want it, press ENTER. **Shortcut key: ALT + F7** (application window); **CONTROL + F7** (document window).

With the mouse, you can drag the active window's title bar.

If the window is maximized, this command is grayed.

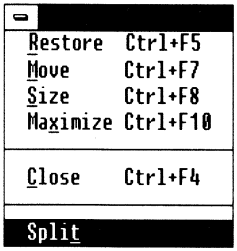
Application Window

Press ALT, SPACEBAR, M to move the Microsoft Excel application window.

Document Window

Press ALT, HYPHEN, M to move the active document window.

Control Split command



Splits the active window into panes that scroll together. Control Split appears on the document Control menu only when a worksheet or macro sheet is the active document.

When you choose Control Split, the split bars appear as gray lines that cross at the upper-left corner of the worksheet. Use the DIRECTION keys to move the bars to where you want to split the window, then press ENTER.

If you have a mouse, you can choose Control Split and then move the split panes pointer until the split bars are where you want to split the window, and click. Or you can bypass the command and drag the split bars that appear to the left of the horizontal scroll bar and above the vertical scroll bar.

When you split panes, they scroll together, in the direction of the split. If you want to freeze the top and/or left panes to prevent them from scrolling, use the Options Freeze Panes command. For more information, see **Options Freeze Panes command**.

Convergence

During iteration — a process of repeated calculation to resolve circular references — **convergence** occurs when the difference between results from one iteration to the next becomes smaller and smaller. When this happens, Microsoft Excel continues to iterate until one of the following happens:

- The maximum change between iterations is reached.
- The maximum number of iterations is completed.
- You press ESCAPE to cancel iteration.

You specify maximum change and maximum number of iterations in the Options Calculation dialog box. For more information, see **Iteration** and **Divergence**.

Copying data and formats

Microsoft Excel allows you to easily copy data, cell notes, formulas, and formats to simplify editing tasks and streamline worksheet construction. You can copy cells and ranges to a different part of the worksheet or to another worksheet without affecting the original cells. You can also copy chart data and formats into another chart.

This topic explains:

- Copying in a worksheet

  How copying affects relative and mixed references

  How copying affects named cells and ranges

  Copying to another part of the worksheet or to a different worksheet

  Copying the same cells to many areas of a worksheet

  Copying to adjacent cells

  Copying specific cell or range attributes

  Pasting only non-blank cells or transposing copied cells

  Combining the contents of the copy and paste areas

  Copying in the formula bar

- Copying a chart

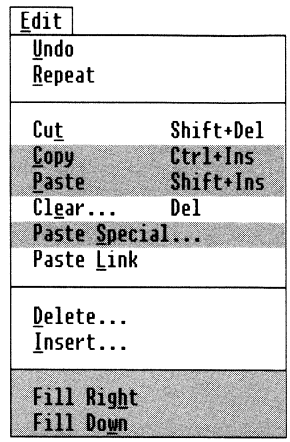
  Copying chart data and formats

This topic does not discuss copying data from a worksheet to a chart or copying data between Microsoft Excel and other applications. For information on these procedures, see **Data series** and **Exchanging data between applications**, respectively.

Note | All concepts and procedures for copying in worksheets also apply to macro sheets.

Copying in a Worksheet

The commands for copying in a worksheet are on the Edit menu (Full menu shown):



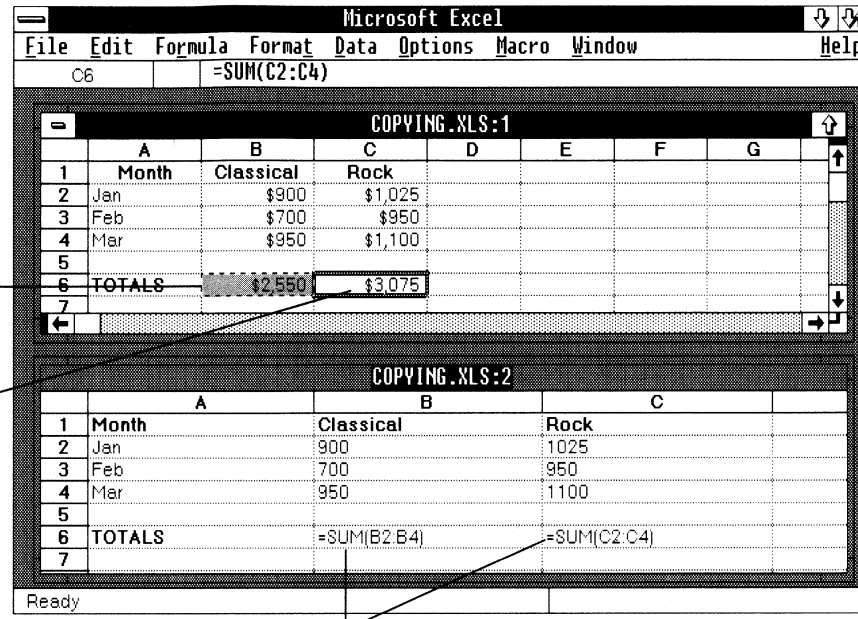
- Edit Copy defines the copy area — the cell or range you want to copy.
- Edit Paste places the cell or range you copy into the paste area — the new location you specify.
- Edit Paste Special pastes part of a cell or range — for example, formulas only or formats only.
- The Edit Fill commands copy data or formulas into adjacent cells.

For information on each command, see the topic of the same name.

How Copying Affects Relative and Mixed References

Copying data is like physically duplicating cells and pasting them into another location — either on the same worksheet or on a different worksheet. When you copy cells, Microsoft Excel automatically adjusts relative references and the relative parts of mixed references in the paste area. In both the paste area and copy area, the cells referred to have the same position relative to the cells containing the references.

In the following illustration, which uses A1 reference style, the formula in cell B6 refers to a range of three cells above it. If you copy cell B6 and paste it in cell C6, Microsoft Excel changes the references so that the formula still refers to the three cells in the same relative positions above it. When you copy relative or mixed references in the A1 reference style, the paste area references look different than those in the copy area because Microsoft Excel has adjusted them to refer to different cells that are in the same relative positions.



Cell B6, the copied cell, refers to cells B2:B4.

When the copied cell (B6) is pasted into cell C6, Microsoft Excel adjusts the references to refer to cells C2:C4.

The bottom window shows the formula view of the worksheet in the top window. Compare the formulas in the copied cell (B6) and the cell copied to (C6).

Microsoft Excel makes the same type of adjustments when you use the R1C1 reference style. For example, using R1C1 reference style in the preceding illustration, the formula in cell R6C2 (cell B6 in the illustration) would be =SUM(R[−4]C:R[−2]C). If you copy cell R6C2 to cell R6C3 (cell C6 in the illustration), Microsoft Excel does not change the references; they still refer to the "second through fourth cells up from the formula cell." The [−4] and [−2] in R[−4] and R[−2] indicate the relativity of the references. Thus, when you copy relative or mixed references in R1C1 style, the paste area references look the same as those in the copy area, even though they refer to different cells.

Important If you need to create a formula with references that will refer to the same cells after you copy them, use absolute references in the formula.

For information on absolute, relative, and mixed references, see **References**.

How Copying Affects Named Cells and Ranges

You can copy references to named cells and ranges between worksheets. Microsoft Excel keeps track of names used on worksheets and alerts you if you use duplicate names when copying between worksheets.

If a copied formula from one worksheet contains a name that is already defined on the worksheet in which you are pasting the formula, Microsoft Excel displays a message asking if you want to use the existing definition of the name. Choose Yes to use the definition on the active worksheet — the worksheet in which you are pasting the formula. Choose No to use the definition on the worksheet you are copying the formula from. If you choose No, Microsoft Excel asks you to create a different name for the definition.

For example, you might have a worksheet named 1986, with the name Inflation defined on it as 4%, and a worksheet named 1980, where the name Inflation is defined as 20%. If you copy a formula containing a reference to Inflation from the 1980 worksheet to the 1986 worksheet, Microsoft Excel asks if you want to use the existing definition of Inflation in the 1986 worksheet. If you choose Yes, the formula uses the 4% inflation rate for calculations. If you choose No, the formula uses the 20% inflation rate, but Microsoft Excel asks you to rename it because Inflation cannot be defined as 4% and 20% at the same time.

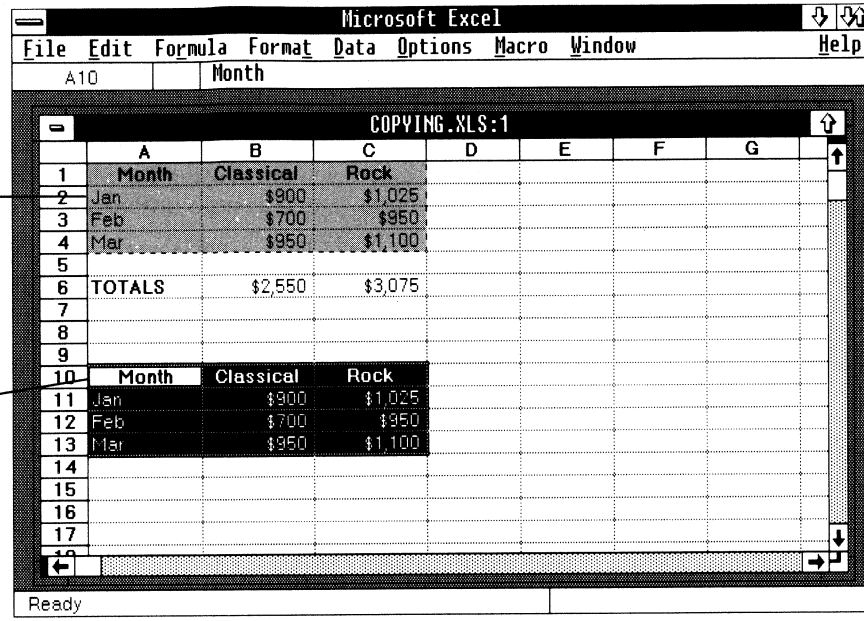
For information on using named cells and ranges, see **Names**.

Copying to Another Part of the Worksheet or to a Different Worksheet

Whether you are copying to another part of the worksheet or to a different worksheet, the procedure is basically the same. When you select cells and choose the Edit Copy command, Microsoft Excel surrounds the copy area with a dotted line, called the marquee. The easiest way to select the paste area for copied cells is to select only the upper-left cell of the range you want to copy to. If you select the entire paste area, it must be the same size and shape as your copy area.

Select a cell or range and choose Edit Copy to mark it as the copy area. The marquee (dotted line) surrounds the copy area.

Select the upper-left cell of the paste area (or a paste area the same size as the copy area); choose Edit Paste to complete the copy.



	A	B	C	D	E	F	G
1	Month	Classical	Rock				
2	Jan	$900	$1,025				
3	Feb	$700	$950				
4	Mar	$950	$1,100				
5							
6	TOTALS	$2,550	$3,075				
7							
8							
9							
10	Month	Classical	Rock				
11	Jan	$900	$1,025				
12	Feb	$700	$950				
13	Mar	$950	$1,100				
14							
15							
16							
17							

Note If the upper-left corner of the paste area is selected and the copy area exceeds the area available for pasting, Microsoft Excel displays a message and does not paste the copied range.

To copy cells:

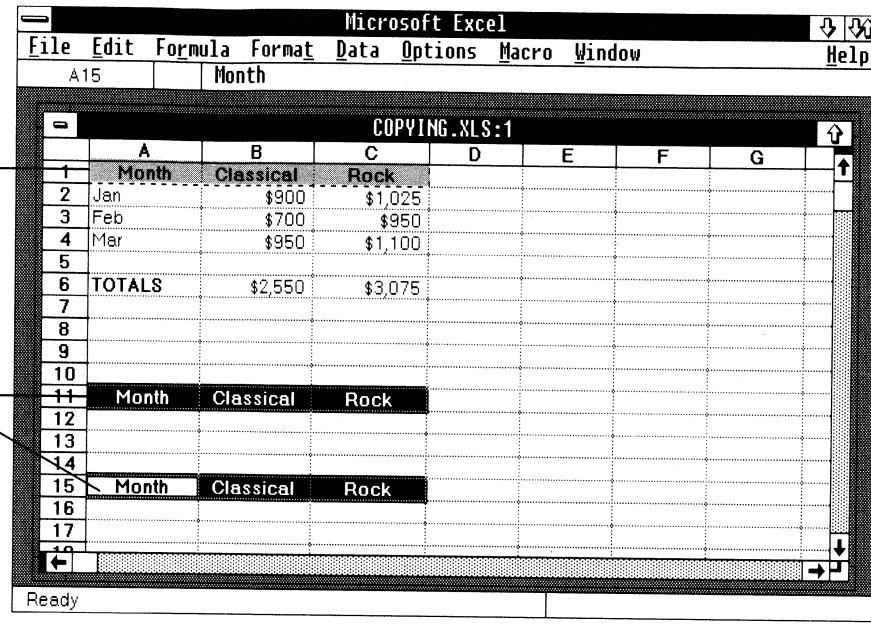
1. Select the cells you want to copy.
2. Choose Edit Copy.
   Microsoft Excel surrounds your selection with the marquee.
3. Select the paste area — the cells you want to copy to.
4. Choose Edit Paste.
   Microsoft Excel fills the paste area with the copied cells.

Copying the Same Cells to Many Areas of a Worksheet

You can copy the same cell or range to many areas of a worksheet. To do this, you make a multiple selection for the paste area.

The copy area is marked with dotted marquee.

The paste area is a multiple selection, each part of the selection the same shape as the copy area.



You can also duplicate the copy area many times within one paste area. To do this, you select a paste area made up of multiple rectangles the same shape as the copy area. In the preceding illustration, for example, selecting cells A10:C17 for the paste area would paste in the copied range eight times.

To copy the same cells to many areas of a worksheet:

1. Select the cells you want to copy.
2. Choose Edit Copy.
3. To paste the same cells in many areas of the worksheet, select multiple paste areas the same size and shape as the copy area.

   To duplicate the copy area many times within one paste area, select a paste area made up of multiple rectangles of the same size and shape as the copy area.
4. Choose Edit Paste.

Note

To make a multiple selection with the keyboard, select the first cell, press F8 to turn on the Extend key, and use DIRECTION keys to extend the selection. Then press SHIFT+F8 to keep that selection, and then move to the first cell of the next range you want to select. Repeat this sequence to add selections.

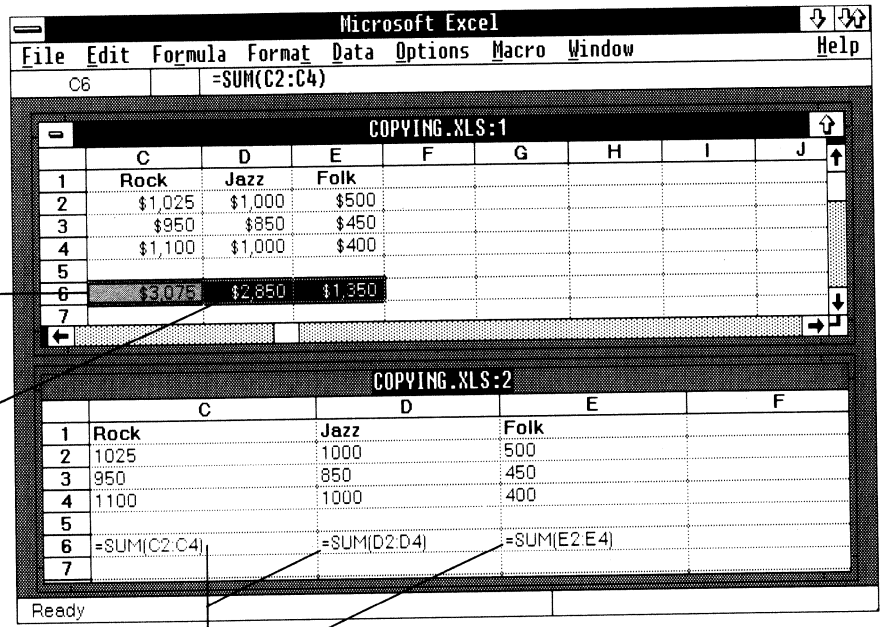
With the mouse, drag through the first selection, then hold down the CONTROL key as you drag through each additional selection.

For more information, see **Keyboard**.

Copying to Adjacent Cells

If you need to put the same formulas or data in several adjacent worksheet cells, you can enter the information once, and then copy it. The Edit Fill commands allow you to copy cells from one or more cells in a selection into the adjacent cells of the selection.

The following illustration shows how you could use the one formula for several data entry areas:



Cell C6, the copied cell, refers to cells C2:C4.

Cell C6 is copied to cells D6 and E6 with the Edit Fill Right command.

The bottom window shows the formula view of the worksheet in the top window. Compare the formulas in cells C6, D6, and E6 to see how Microsoft Excel adjusted the references.

To copy to adjacent cells:

1. Select the cells you want to copy and the cells you want to fill.
2. To copy the selection's first column into the adjacent cells to the right, choose Edit Fill Right.

   To copy the selection's first row to the adjacent cells below, choose Edit Fill Down.

   To copy the selection's last column into the adjacent cells to the left, choose Edit Fill Left (press SHIFT as you display the Edit menu).

   To copy the selection's last row into the adjacent cells above, choose Edit Fill Up (press SHIFT as you display the Edit menu).

Tip

You can enter the same formula or value into all of the selected cells by holding down the CONTROL key while you press ENTER or click the enter box in the formula bar. Microsoft Excel fills each cell in the selection with the formula or value. For more information on using the formula bar, see **Formula bar**.

Copying Specific Cell or Range Attributes (Full Menus)

Use the Edit Copy and Edit Paste Special commands when you want to limit how much of a cell or range you copy. With Edit Paste Special, you can specify that all or only one of the following be copied:

- Formulas
- Values
- Formats
- Notes

To copy specific cell or range attributes:

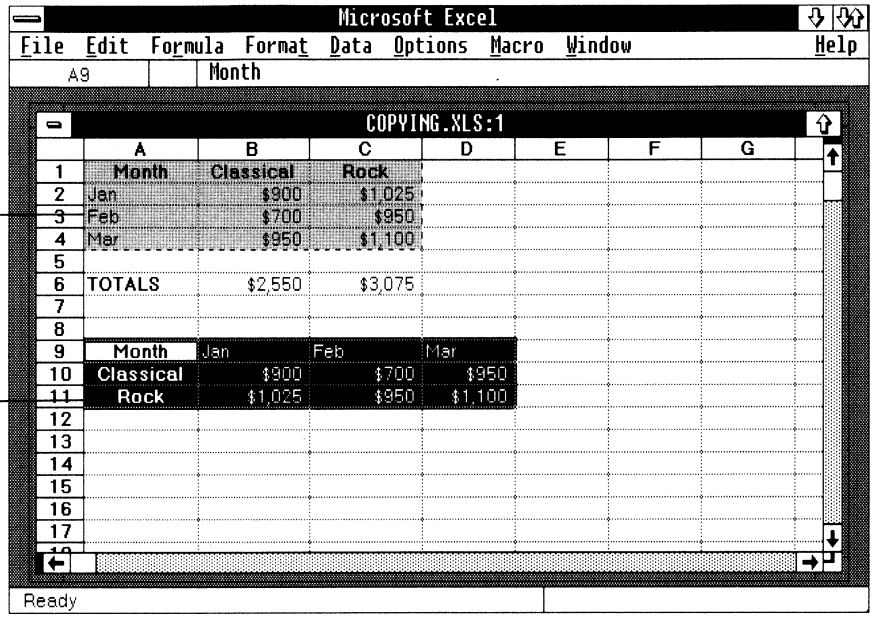
1. Select the cells you want to copy.
2. Choose Edit Copy.
3. Select the paste area.
4. Choose Edit Paste Special.
5. In the dialog box, select the options you want.
6. Choose the OK button.

For information on the Edit Paste Special options, see **Edit Paste Special command**.

Pasting Only Non-Blank Cells or Transposing Copied Cells (Full Menus)

With the Edit Paste Special command, you can specify that only non-blank cells from the copy area be included in the paste area. Cells in the paste area corresponding to blank cells in the copy area are unaffected by the paste.

With the Edit Paste Special command, you can also specify that the copied cells be transposed in the paste area. This means that if the copied data is originally arranged in columns, Microsoft Excel will paste the data in rows, as in the following illustration:



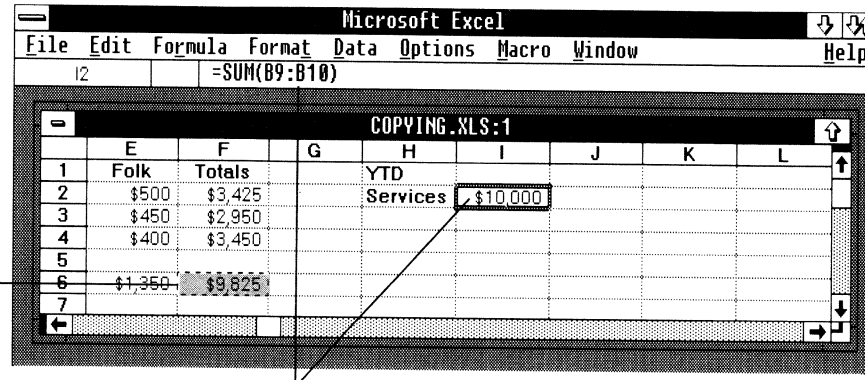
To paste only non-blank cells or to transpose the copied cells in the paste area:

1. Select the cells you want to copy.
2. Choose Edit Copy.
3. Select the paste area.
4. Choose Edit Paste Special.
5. To paste only non-blank cells from the copy area, turn on the Skip Blanks check box.

   To reverse the arrangement of the copied cells in the paste area, turn on the Transpose check box.
6. Choose the OK button.

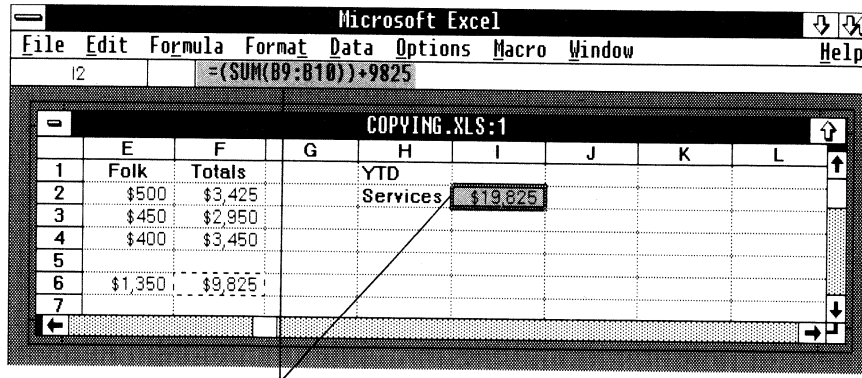
Combining the Contents of the Copy and Paste Areas
(Full Menus)

With the Edit Paste Special command, you can specify that the contents in the copy and paste areas be combined by adding, subtracting, multiplying, or dividing them when you paste. This procedure is useful for formulating cumulative data, as in the following illustration:



Cell F6 is selected as the copy area.

Cell I2 is selected as the paste area. Note its formula in the formula bar before the actual paste occurs.



Selecting the Values and Add options for Edit Paste Special adds the value of the copy area (F6) to the value of the paste area (I2). Note how the formula bar reflects this.

To combine the contents of the copy and paste areas:

1. Select the cells you want to copy.
2. Choose Edit Copy.
3. Select the paste area.
4. Choose Edit Paste Special.
5. In the Operation box, select the option you want.
6. Choose the OK button.

Note | To consolidate data from more than one worksheet, use the procedures for linking cells or ranges between worksheets. For information on linking, see **Linking documents**.

Copying in the Formula Bar

As a time-saver when you're creating long formulas or labels, use the Edit Copy and Edit Paste commands while working in the formula bar.

To copy characters in the formula bar

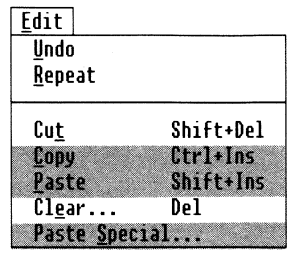
1. Select the characters you want to copy.
2. Choose Edit Copy.
3. Move the insertion point in the formula bar to where you want to paste the copied characters.
4. Choose Edit Paste.

To copy all or part of another cell entry into the formula bar

1. Select the cell, and in the formula bar, select the characters you want to copy.
2. Choose Edit Copy.
3. Press ESCAPE to deactivate the formula bar.
4. Select the cell you want to copy to.
5. Activate the formula bar and move the insertion point to where you want to paste the copied characters.
6. Choose Edit Paste.

Copying a Chart

The main commands for copying in a chart are also on the Edit menu (Full menu shown):



You use the Edit Copy, Edit Paste, and Edit Paste Special commands to copy data series or chart formats to another chart.

For information on each command, see **Edit Copy command**, **Edit Paste command**, and **Edit Paste Special command**.

Copying Chart Data and Formats

When you copy data from one chart to another, Microsoft Excel includes the data from the copied chart with the data in the chart you copy to. When you copy formats, the copied formats replace the formats in the chart you copy to.

There are two ways to copy data and formats from one chart to another:

- Use the Edit Paste command to copy all data and formats from one chart to another.
- Use the Edit Paste Special command to copy either data or formats from one chart to another.

Important When you use the Edit Paste command to copy from one chart to another, Microsoft Excel replaces the formats of the active chart with those of the copied chart.

To copy all data and formats to another chart

1. Make sure both chart documents are open.
2. Activate the chart window for the chart you want to copy.
3. Choose Chart Select Chart.
4. Choose Edit Copy.
5. Activate the chart window for the chart you want to copy to.
6. Choose Edit Paste.

To copy data and/or formats to another chart (Full menus)

1. Make sure both chart documents are open.
2. Activate the chart window for the chart you want to copy from.
3. Choose Chart Select Chart.
4. Choose Edit Copy.
5. Activate the chart window for the chart you want to copy to.
6. Choose Edit Paste Special.
7. In the dialog box, specify whether you want data and/or formats copied to the chart.

   To copy only data and no formats, select the Formulas option.
8. Choose the OK button.

Related Information

Reference

For information on	See
Moving data	Moving data on a worksheet
Editing worksheets and charts	Editing a document
Creating and editing data series in a chart	Data series Series formula

Sampler

Creating Calendars, Diagrams, Tables, and Forms

Tutorial

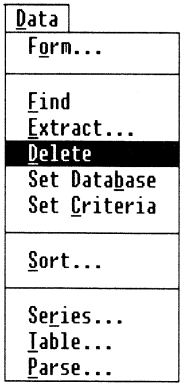
Creating a Worksheet

Feature Guide

Basic Mechanics, "Copying"

Data Delete command

(Full menus)



Deletes records from the database. Data Delete deletes all records that match the criteria defined in the criteria range.

When you delete records from the database, the other records in the database shift up to fill any gaps, but the rest of the worksheet is not affected.

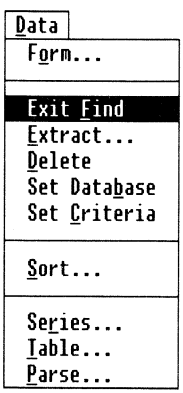
For example, if you delete ten records from a database, the records in the database shift up to fill the gaps, but the cells below the database do not shift up ten rows, as they would if you used the Edit Delete command.

Important

Data Delete cannot be reversed with the Edit Undo command. Before you choose the OK button, make sure you want to delete all of the records that match the criteria in your criteria range. You may want to use the Data Find or Data Extract command to preview the records that Data Delete will delete.

When you choose Data Delete, make sure you don't unintentionally include any blank rows in the criteria range. With a blank row in the criteria range, Microsoft Excel matches every record in the database; therefore all records in the database would be deleted.

Data Exit Find command



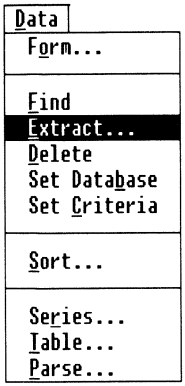
In a database, exits Data Find and returns the scroll bars to normal scrolling.

Exit Find appears on the Data menu only when you are in Data Find. You can also exit Data Find by editing the formula or value of a cell, selecting a cell outside the database range, choosing another command, or pressing the ESCAPE key.

If you choose the Data Find command again, Microsoft Excel selects the next record that matches the criteria in the criteria range, and Exit Find reappears on the Data menu. When Microsoft Excel reaches the last matching record in the database, it displays a message. For more information on finding database records, see **Data Find command** and **Database**.

Data Extract command

(Full menus)



Finds database records that match the criteria defined in the criteria range, and copies them into a separate extract range.

Note

To extract data, you need to have three things defined:

- The database range (use the Data Set Database command).
- The criteria range (use the Data Set Criteria command).
- The extract range.

The extract range can be either a range containing only field names, or a range containing field names and the cells that will contain the extracted data.

If you select an extract range that contains only the field names, Microsoft Excel copies the extracted records into the cells directly below the field names.

Important

Any values or formulas below the field names in the extract range are replaced with the extracted information. If the extract range contains only the field names, *all* cells below the field names to the bottom of the worksheet are cleared whether or not information is extracted into them. You cannot reverse Data Extract with the Edit Undo command.

If you select an extract range containing the field names and cells below the field names, Microsoft Excel copies as many extracted records as will fit into the selected range. A message appears on the screen to tell you when the extract range cannot hold all of the extracted records. If this happens, either make the extract range larger and extract again, or include only the extract field names in the extract range.

The field names you use for the extract range must be the same as the field names you used in the database. However, you don't have to use all of the database field names in the extract range. Use only the field names for the fields you want each extracted record to have.

After selecting the extract range, choose Data Extract.

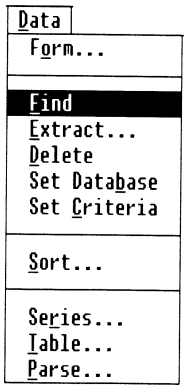


Unique Records Only

Excludes duplicates from the extracted list.

Note | If a record contains a formula, the extract range will contain only the value produced by that formula and not the formula itself.

Data Find command



Selects records in the database range that match the criteria in the criteria range.

When you choose Data Find, Microsoft Excel selects the first matching record in the database and the scroll bars become striped. When you scroll, Microsoft Excel selects only matching records in the database.

To search backward in the database, hold down SHIFT when you choose Data Find.

When you are using Data Find, the Exit Find command appears on the Data menu. You exit Data Find by choosing Data Exit Find, editing the formula or value of a cell, selecting a cell outside the database range, choosing another command, or pressing ESCAPE.

When you exit Data Find, the matching record you last found stays selected.

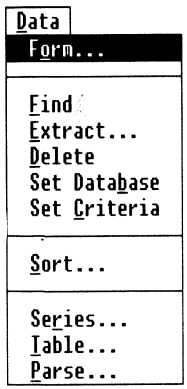
If you choose Data Find again, Microsoft Excel selects the next matching record. This means that you can find and replace matching database records by choosing Data Find to find the next matching record after each edit.

For information on finding and replacing data on the entire worksheet, rather than just in the database, see **Formula Find command**, **Formula Replace command**, and **Finding cells and data quickly**.

When Microsoft Excel reaches the last matching record in the database, it remains at that record.

For more information on finding records, see **Database.**

Data Form command



Displays a dialog box arranged as a database form. Data Form provides an alternative to the normal database commands when you want to work with a database. Data Form lets you view, change, add, and delete records in your database, and find specific records based on criteria you specify while the form is displayed.

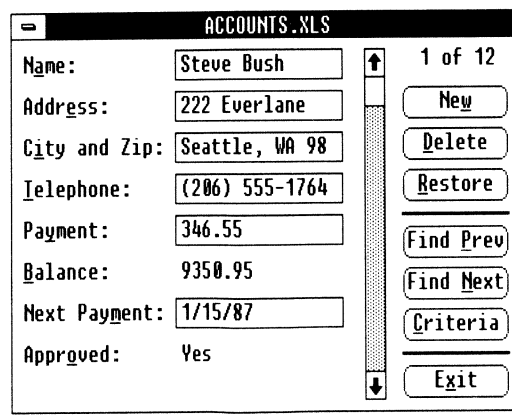
Data Form works independently of the other database commands (Data Find, Data Delete, and Data Extract). Data Form also operates independently of the criteria range, and if you use criteria within the form to find specific database records, those criteria do not affect the criteria specified in the criteria range.

Note

You can also customize the form that appears when you choose Data Form. If the name Data_Form is defined on the worksheet, and it refers to a valid custom dialog box description on a worksheet or a macro sheet, the custom form appears instead of the standard form when you choose Data Form.

If you use a custom dialog box to create a custom data form, the custom form replaces the part of the data form to the left of the scroll bar. The scroll bar and the buttons do not change. If you create a custom form, make sure you put the field names in the INIT/RESULT column of the text edit items in the custom dialog box description.

For information on custom dialog boxes, databases, and using the data form, see **Database**.



Field Names

The column of text at the left side of the form is a list of your database's field names.

Fields

The column next to the field names contains the fields that correspond to those field names. These fields collectively make up a single database record.

You can edit some fields, but not others. Fields that you can edit appear in a text box, which you edit the same as any text box. Fields that are computed or protected cannot be edited, and so do not appear in a text box. A protected field is a field in a cell that is locked while the worksheet is protected.

Note | Any changes you make to a record are saved when you move to another record.

For information on computed fields, see **Database**. For information on locking a cell, see **Format Cell Protection command**. For information on protecting a worksheet, see **Options Protect Document command** and **Protecting or hiding data**.

Scroll Bar

The scroll bar shows your position in the database.



The following list shows how to move to fields and records with the keyboard:

To	Press
Move to the next field in the record	TAB
Move to the previous field in the record	SHIFT + TAB
Move to the first field in the next record	ENTER
Move to the first field of the previous record	SHIFT + ENTER
Move to the same field in the next record	DOWN key
Move to the same field in the previous record	UP key
Move to the same field 10 records forward	PAGE DOWN

To	Press
Move to the same field 10 records back	PAGE UP
Move to the new record at the end of database	CONTROL + PAGE DOWN
Move to the first record	CONTROL + PAGE UP



The following list shows how to move to fields and records with the mouse:

To	Do this
Select a field	Click in the text box
Move to the same field in the next record	Click the down arrow
Move to the same field in the previous record	Click the up arrow
Move to the same field 10 records forward	Click the scroll bar below the scroll box
Move to the same field 10 records back	Click the scroll bar above the scroll box
Move to the new record at the end of database	Drag the scroll box to the bottom
Move to the first record	Drag the scroll box to the top

Position Indicator

Shows which record is displayed and how many records are in the database. Blank records at the end of the database are not counted. The position indicator changes to "New Record" when you scroll to the first blank record after the last non-blank record in the database.

New

Scrolls to the new record — the first blank record at the end of the database. You can add data to the fields in this record.

If there are no blank records at the end of the database, and there is room below the database, Microsoft Excel extends the database range to include a new, blank record at the bottom of the database.

When you scroll to the new record, the position indicator displays "New Record."

Delete

Deletes the data in the currently displayed database record, and moves the other records up to fill the space. Deleting a record does not change the size of the database range, nor the total number of records; it just removes the data from one of the records.

Restore

Restores the edited fields of a record to what they were before you made the changes. When you make changes to the fields in a record and then decide not to keep those changes, choose the Restore button before you scroll or make any further changes.

Find Prev

Searches the database for the previous record that matches the criteria you define with the Criteria button, and displays the fields of that record in the form. If the criteria are blank, Find Prev is the same as pressing SHIFT+ENTER; Microsoft Excel selects the previous record in the database.

Find Next

Searches the database for the next record that matches the criteria you define with the Criteria button, and displays the fields of that record in the form. If the criteria are blank, Find Next is the same as pressing ENTER; Microsoft Excel selects the next record in the database.

Criteria

Allows you to define criteria used when you choose the Find Next or Find Prev button. Criteria you define while the data form is displayed are separate from criteria defined with the Data Set Criteria command.

Form

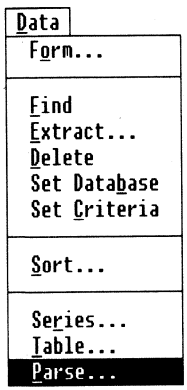
Appears in place of the Criteria button while you are setting criteria. Form returns you to the regular data form, and displays database records instead of criteria.

Exit

Puts away the form.

Data Parse command

(Full menus)



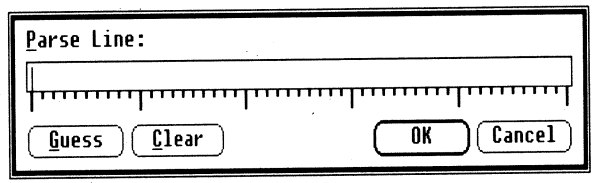
Distributes the contents of a single column to fill several columns. This is called parsing.

Data Parse is most often used after you have imported data from other applications into Microsoft Excel.

For example, if you open a database report file from another application as a worksheet in Microsoft Excel, each full record is typically placed in a single cell. Use Data Parse to place the fields of each record in separate columns.

The range you parse can be any number of rows long, but only one column wide. The parse settings you create for the first cell in the range apply to all cells in the range.

For information on parsing data, see **Values**.



Parse Line

Displays the contents of the first non-blank cell in the selected column. The only editing allowed in the parse line is adding and deleting brackets. The brackets you set in the parse line define where the contents of all cells in the selected column will be divided into multiple columns. Add brackets by typing them — the same way you add characters in the formula bar.

Guess

Makes a best guess at where the brackets should go for the data displayed in the parse line. After you choose the Guess button, you can modify the guess by adding or deleting brackets.

Clear

Removes all brackets from the parse line so you can start over.

Data series

A **data series** is a group of related data points (numeric values within a category) plotted on a chart. A chart consists of one or more data series.

This topic explains:

- How Microsoft Excel plots a chart

  How Microsoft Excel defines data series

- Working with data series

  Using a multiple selection to control plotting

  Copying data series from a worksheet

  Adding data series from another chart

  Formatting data series and data points

  Deleting a data series from a chart

Note

A chart data series is different from the type of series you create with the Data Series command. You use the Data Series command in a worksheet to enter a row or column of dates or numbers that increase by a constant amount or factor. For more information, see **Data Series command**.

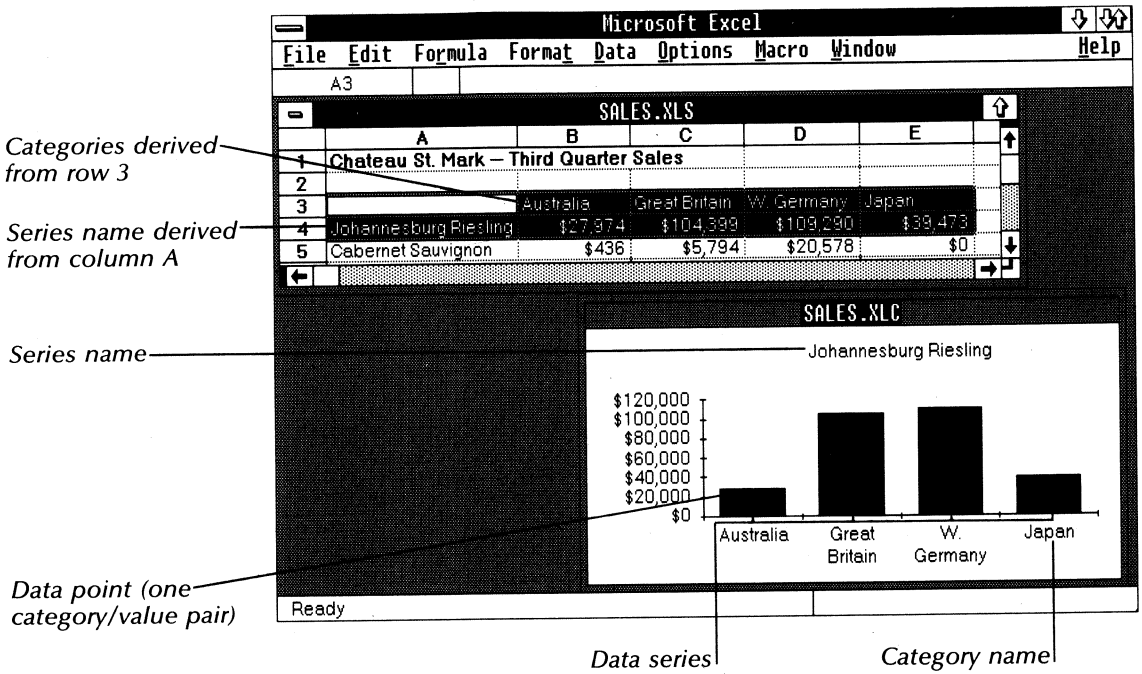
How Microsoft Excel Plots a Chart

Understanding how Microsoft Excel defines data series and plots a chart is useful for these charting tasks:

- Adding data series from a worksheet or another chart to an existing chart
- Controlling how data series are defined and plotted in a chart

When you select cells in a worksheet and create a new chart, Microsoft Excel groups the related values and plots them as data series in the chart. A data series consists of a series of values grouped by categories. A data point is one value plotted in relation to its category.

The following illustration shows how Microsoft Excel organizes and plots one data series from a worksheet selection:



Values in a data series must be numeric. Categories can be text or numeric data.

Note

Microsoft Excel plots non-numeric values in a data series as follows: Any sequence of characters or the logical value FALSE is plotted as 0. The logical value TRUE is plotted as 1.

Line and scatter charts make special adjustments when blank cells or cells with the error value #N/A are part of the selection: A blank causes a break in the plot line; #N/A causes the previous point and the next point to be joined, skipping the #N/A point. For more information on line and scatter charts, see **Gallery Line command** and **Gallery Scatter command**.

How Microsoft Excel Defines Data Series

Microsoft Excel defines a data series from a worksheet selection by first determining whether or not the selection includes categories and series names. Then it organizes the series values.

- **How Microsoft Excel chooses categories and series names from the worksheet selection:** If the upper-left cell of the worksheet selection is blank, Microsoft Excel uses the first row and the first column for the series names and categories. Whether the row or column is used for series names or categories depends on the shape of the selection, as described below and in the following illustrations.

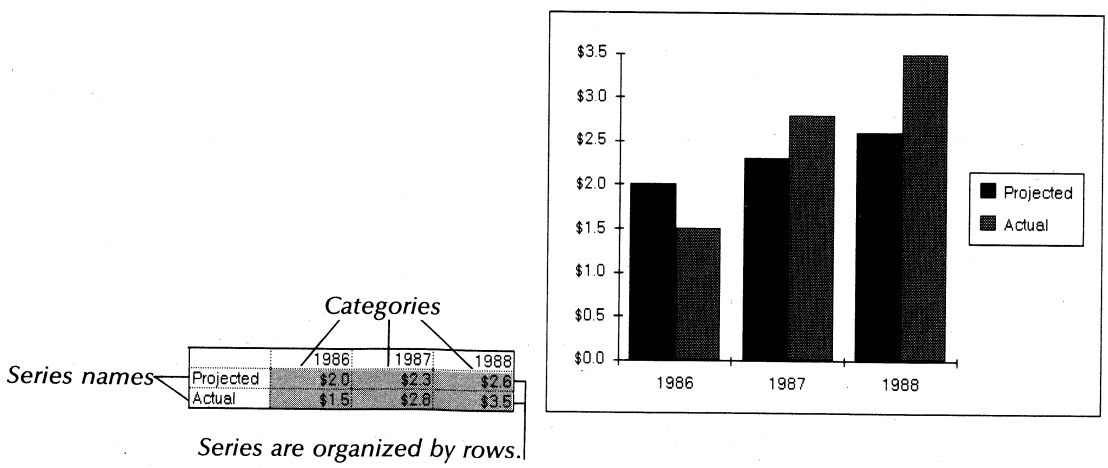
  If the upper-left cell is not blank, Microsoft Excel looks for non-numeric or date-formatted values in the first row and then in the first column. If it finds such data, Microsoft Excel uses the cell values as categories or series names, again depending on the shape of the selection. If only the first row is formatted as dates, the first row becomes the categories and the data is organized by rows. If only the first column is formatted as dates, the first column becomes the categories and the data is organized by columns.

- **How Microsoft Excel organizes series values from the worksheet selection:** Unless you specify differently, Microsoft Excel assumes you want fewer data series than data points. From the shape of the worksheet selection — excluding categories and series names — Microsoft Excel determines whether to use the selection's rows or columns for the chart's data series.

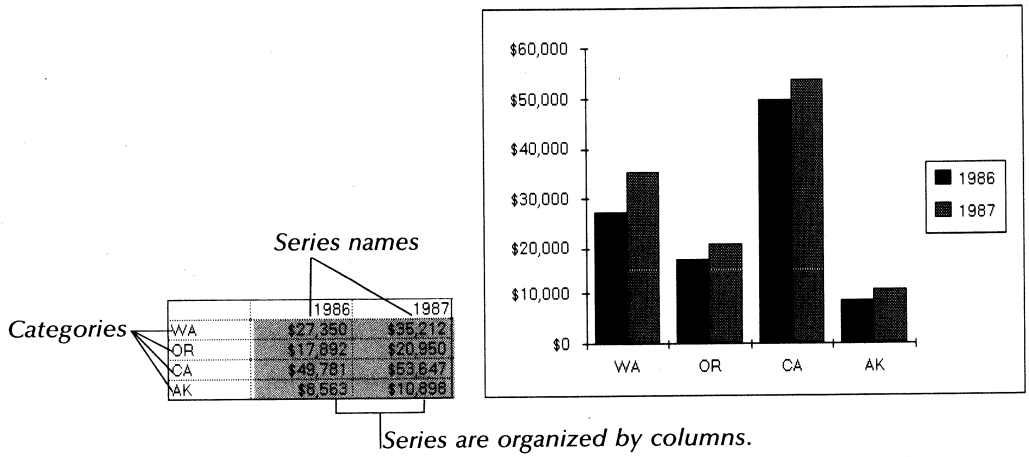
  If the selection has more rows than columns, Microsoft Excel organizes the data by columns. Otherwise, data is organized by rows.

The following illustrations show how Microsoft Excel interprets different kinds of worksheet selections for charting. Note that in the first two illustrations, the blank upper-left cell of the selection causes Microsoft Excel to plot categories and series names.

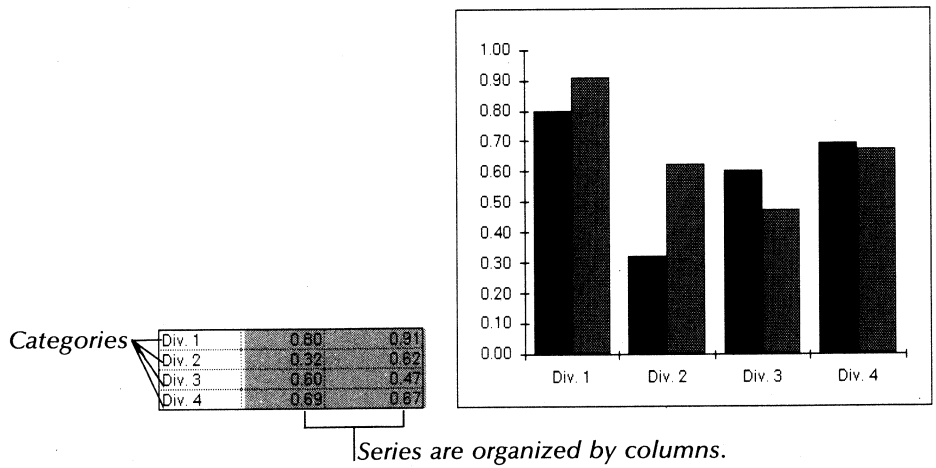
Worksheet selection, wider than tall



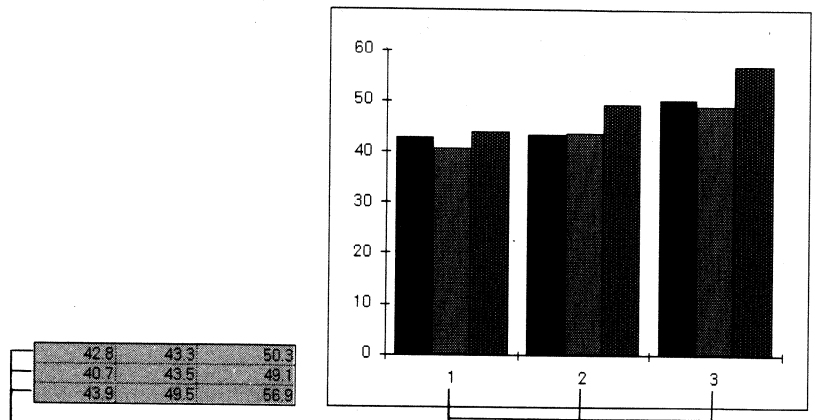
Worksheet selection, taller than wide



Worksheet selection, text categories and values only



Worksheet selection, values only



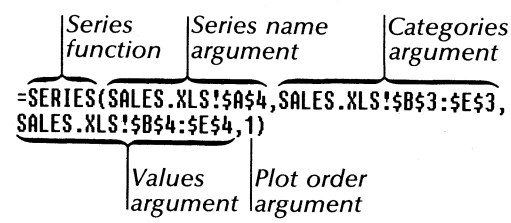
For an explanation of how Microsoft Excel plots a multiple selection, see "Using a Multiple Selection to Control Plotting," later in this topic.

Note Scatter charts have different requirements for plotting data than other types of charts with two axes (area, bar, column, and line charts). For more information, see **Scatter chart**.

A Closer Look at Data Series

If you want to view the full details of how Microsoft Excel defines data series, select any marker in a data series and look at the formula bar. There you'll see the series formula — the exact blueprint for how Microsoft Excel plots a given data series. You can create or delete data series with series formulas. You can also edit these formulas to change data series names as they appear on the chart legend. For more information, see **Series formula**.

The Parts of a Series Formula



Working with Data Series

This section explains how to control the plotting and appearance of data series in your charts.

Using a Multiple Selection to Control Plotting

In addition to plotting a single rectangular range of cells on a worksheet, you can also plot a multiple selection — a combination of discontinuous ranges. Plotting a multiple selection is useful for:

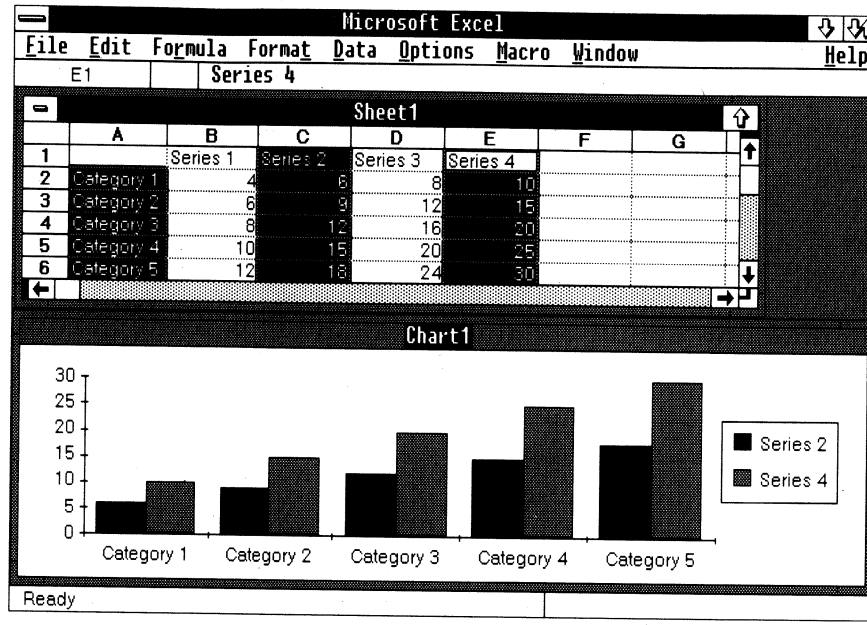
- Selectively charting rows or columns of worksheet data.
- Overriding Microsoft Excel default plotting assumptions.

When you chart a multiple selection, Microsoft Excel looks at the first range selected to see if it includes dates or non-numeric data, and whether to organize the data by columns or rows. If the first range selected includes dates or non-numeric data, this data becomes the categories in the chart. If the first range also includes values, Microsoft Excel determines whether there are series names; otherwise, the second range determines series names.

As for a regular selection, Microsoft Excel organizes values in a multiple selection into data series by determining whether there are fewer columns or rows in the first range selected. The ranges in a multiple selection — excluding series names and categories — should be rectangles of the same size or increments thereof. In other words, if the separate selections — minus categories and series names — were combined, they would form one large rectangle.

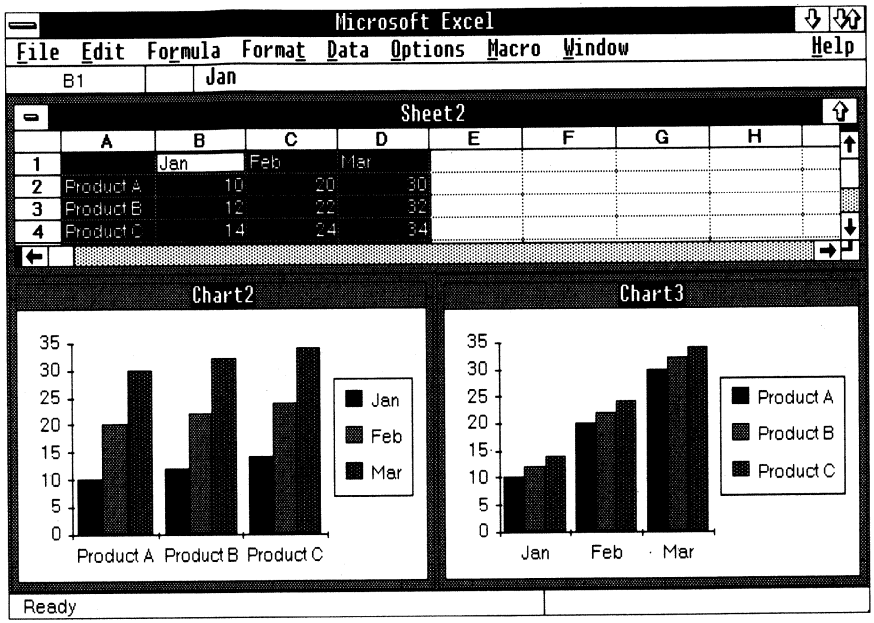
For example, selecting only the data in columns A, C, and E of the following worksheet and choosing the File New command creates Chart1, as shown here:

The multiple selection consists of three separately selected areas on the worksheet — cells A2:A6, C1:C6, and E1:E6. (Legend added separately.)



In the following illustration, making the multiple selection in Sheet2 and choosing the File New command creates Chart2. Chart3 shows how the chart would look when created with a single selection and Microsoft Excel default plotting. Notice how categories and values are organized and plotted differently in the two charts.

The multiple selection used to create Chart2 is in two steps — cells A1:A4, then cells B1:D4. A single selection, cells A1:D4, creates Chart3. (Legends added separately.)



Tip

To make a multiple selection with the keyboard, select the first cell, press F8 to turn on the Extend key, and use the DIRECTION keys to extend the selection. Then press SHIFT + F8 to keep that selection, and move to the first cell of the next range you want to select. Repeat this sequence to add selections.

With the mouse, drag through the first selection, then hold down the CONTROL key and drag through each additional selection.

To control plotting with a multiple selection:

1. Make the multiple selection.
2. Choose File New.
3. Select Chart.
4. Choose the OK button.

You can also control how a data series is plotted with the Edit Paste Special command. See the next section in this topic, "Copying Data Series from a Worksheet."

Copying Data Series from a Worksheet

You can copy data series from a worksheet and add them to an existing chart. This procedure is also useful for creating a summary chart that consolidates different data series from several worksheets.

There are two ways to copy data series from a worksheet to a chart:

- Use the Edit Copy and Edit Paste commands to "paste in" the data series, letting Microsoft Excel control how the data series are organized and plotted. In this case, Microsoft Excel plots data according to the defaults described earlier in this topic under "How Microsoft Excel Defines Data Series."
- Use the Edit Copy and Edit Paste Special commands to paste in the data series and control how the data series are organized and plotted. With options in the Edit Paste Special dialog box, you can specify whether you want to make each row or column in the worksheet selection a data series. You can also specify the source cells for data series names and categories.

Note | Before starting either procedure in this section, you may want to size the worksheet and chart windows so you can see both on your screen.

To add data series and let Microsoft Excel control plotting

1. Make sure both the worksheet and chart documents are open.
2. Select the worksheet data.
3. Choose Edit Copy.
4. Activate the chart window.
5. Choose Edit Paste.

To add data series and control data plotting (Full menus)

1. Make sure both the worksheet and chart documents are open.
2. Select the worksheet data.
3. Choose Edit Copy.
4. Activate the chart window.
5. Choose Edit Paste Special.
6. Select the options you want.
7. Choose the OK button.

For more information, see **Edit Paste command** and **Edit Paste Special command**.

Adding Data Series from Another Chart

There are two ways to add data series from another chart:

- Use the Edit Paste command to "paste in" all data series and their formats from one chart to another.
- Use the Edit Paste Special command to selectively paste in all data series, their formats, or both.

Important When you add data series from another chart with the Edit Paste command, Microsoft Excel replaces the format of the active chart with that of the copied chart.

To add all data series and formats from another chart

1. Make sure both chart documents are open.
2. Activate the chart window that contains the data series you want to add.
3. Choose Chart Select Chart.
4. Choose Edit Copy.
5. Activate the chart window containing the chart you want to modify.
6. Choose Edit Paste.

To add data series and/or formats from another chart (Full menus)

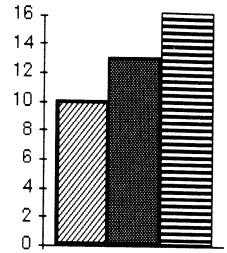
1. Make sure both chart documents are open.
2. Activate the chart window that contains the data series you want to add.
3. Choose Chart Select Chart.
4. Choose Edit Copy.
5. Activate the chart window containing the chart you want to modify.
6. Choose Edit Paste Special.
7. In the dialog box, specify whether you want data series, their formats, or both copied into the chart.

   Select the Formulas option if you want to copy only data series and no formats.
8. Choose the OK button.

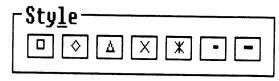
For more information, see **Edit Paste command** and **Edit Paste Special command**.

Formatting Data Series and Data Points

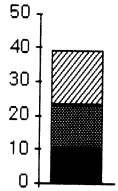
You can format data series and data points with the options shown here. These options also apply to overlay charts.



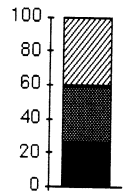
Use a variety of patterns and colors for column and bar chart series markers; modify border patterns and weights of the markers (Format Patterns).



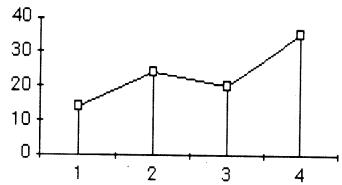
Use a variety of symbols for line and scatter chart series markers; modify colors and patterns for markers and lines (Format Patterns).



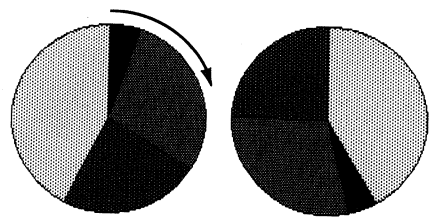
Stack or overlap bar and column chart series markers (Format Main Chart or Format Overlay).



Show each value in a category as a percentage of all values in that category (100% option — Format Main Chart or Format Overlay).



Use drop lines or hi-lo lines in line charts (Format Main Chart or Format Overlay).



Control the angle of the first slice in a pie chart (Format Main Chart or Format Overlay).

For information on each option, see **Format Main Chart command** and **Format Patterns command**.

With the Format Main Chart or Format Overlay commands, you can also use the Cluster Spacing option to specify the amount of space between bars or columns. If you are working with a chart that has only one data series, the Vary by Categories option automatically applies a different pattern to each marker in the data series.

Note

Before you make many formatting changes in a new chart, check the formats in the Gallery commands. You can find many of the formats shown here (for example, stacked or overlapped bars or columns) among the predesigned formats in the gallery. For more information, see **Gallery Area**, **Gallery Bar**, **Gallery Column**, **Gallery Line**, **Gallery Pie**, **Gallery Scatter**, and **Gallery Combination commands**.

If you've already made formatting changes, use one of the following procedures to format data series and data points. For either procedure, dialog box options vary according to the type of chart you're working on. If the chart has only one data series, you format individual data points within a data series for some options.

To format marker patterns, colors, lines, and borders

1. Select the data series.
2. Choose Format Patterns.
3. Select the options you want.
4. Choose the OK button.

To format stacking, 100%, vary by categories, drop/hi-lo lines, overlapping, cluster spacing, or pie wedge angle

1. Activate the chart window.
2. Choose Format Main Chart or Format Overlay (Full menus).
3. Select the options you want.
4. Choose the OK button.

For more information, see **Format Patterns command**, **Format Main Chart command**, and **Format Overlay command**. For information on working with overlay charts, see **Overlay chart**.

Deleting a Data Series from a Chart

You delete a data series from a chart by erasing the series formula for that data series. The series formula contains all the instructions Microsoft Excel uses to plot the data series. Deleting a data series from a chart does not delete the source data in the worksheet.

1. Select any marker of the data series you want to delete.
   The formula bar displays the series formula.
2. Press BACKSPACE.
3. Press ENTER or choose the enter box.
   Microsoft Excel deletes the data series and redraws the chart.

For more information, see **Series formula**.

Related Information

Reference

For information on	**See**
Chart basics, chart formatting options	Chart
Adding a data series or data point label	Chart text
Changing the data series name on a chart legend	Series formula
Working with overlay charts	Overlay chart

Sampler

Writing a Report with Microsoft Excel and Windows Write

Changing Coordinate Systems

Tutorial

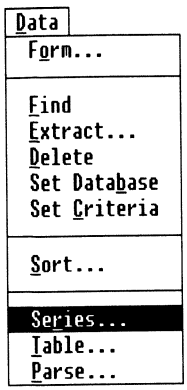
Changing How a Chart Looks

Feature Guide

Charts, "Adding Series with Paste Special"

Data Series command

(Full menus)

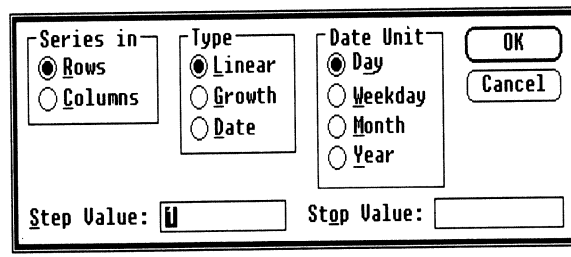


Fills the selected range of cells with a series of numbers or dates.

The command fills by rows or columns. The first cell in each row or column to be filled must have the starting value in it.

Select the range of cells you want to fill with a series, then choose Data Series.

Note The series you create with the Data Series command is different from a chart data series. For more information on chart data series, see **Data series.**



Series In

Determines which direction to fill.

Rows	Fills each row of the selected range with a series that starts with the value in the leftmost cell of the row
Columns	Fills each column of the selected range with a series that starts with the value in the top cell of the column

Type

Determines how the value for each cell is calculated from the starting value.

Linear	Adds the Step Value to each cell in turn to calculate the value of the succeeding cell
Growth	Multiplies the value of each cell in turn by the Step Value to calculate the value of the succeeding cell
Date	Calculates a series of dates according to the Date Unit and the Step Value

Date Unit

Available only if you select Date as the series type. Select the unit you want each successive value in the series of dates to increase by.

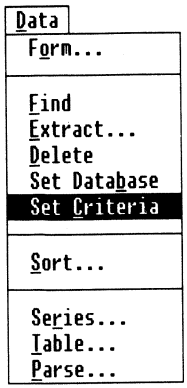
Step Value

Amount by which you want each successive cell in the series to be increased. Type a negative number to make the series decrease.

Stop Value

Value at which you want the series to end. Data Series stops filling a series when it reaches the stop value or the end of the selected range, whichever comes first.

Data Set Criteria command



Defines the criteria range — the range of cells that contains or will contain the criteria used to find, extract, or delete matching database records. Only the database records that meet the criteria in the criteria range are selected by the Data Find command, copied by the Data Extract command, or deleted by the Data Delete command.

The first row of the criteria range must contain the criteria names — one or more field names from the database; the criteria go in one or more rows beneath the first row.

To define the criteria range, select the range of cells you want to be the criteria range, then choose Data Set Criteria. Microsoft Excel defines the range as the criteria range and names the range Criteria. You can use this name as you can any named reference. Only one criteria range can be defined on a worksheet at a time.

The criteria range can be on a different worksheet than the database. To use a criteria range that is on another worksheet, use the Formula Define Name command to make the name Criteria an external reference. For information on external references, see **References**.

A criteria range can have two kinds of criteria: comparison criteria and computed criteria. Each type of criteria is compared to the database records differently, and each has a different criteria name. For more information, see **Database**.

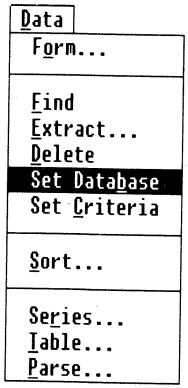
Note | If the criteria range contains a blank row, all database records will be matched.

Once you have defined a criteria range, you can change the criteria as often as you want. Each time you find, extract, or delete data, Microsoft Excel uses only the criteria currently in the criteria range.

You can include wildcards when you set criteria. A question mark (?) takes the place of a single character, and the asterisk (*) takes the place of any number of characters. For more information, see **Wildcard**.

For more information on databases and criteria, see **Database**.

Data Set Database command



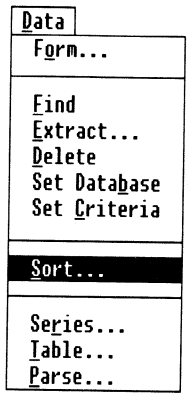
Defines the range of cells that contains or will contain the database.

A database consists of one row with field names and the rows below it containing the records.

To define a database, select the range of cells you want to be your database, then choose Data Set Database. Microsoft Excel defines the range as the database range and names the selection Database. You can use this name as you can any named reference.

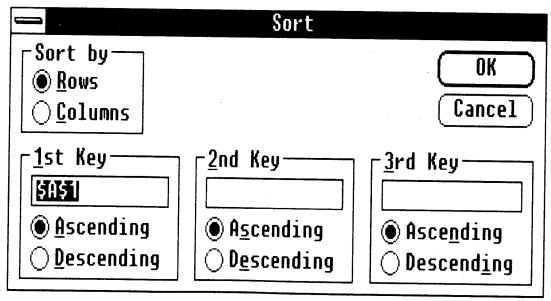
For more information, see **Database**.

Data Sort command



Sorts the rows or columns of the selection according to the contents of a key row or column within the selection.

You tell Microsoft Excel which rows or columns to sort, which row or column is the key row or column, and whether to sort in ascending or descending order. You can select several key rows or columns. If using more than one key, specify the most important key as the first key.



Sort By

Rows	Rearranges the rows in the selected range
Columns	Rearranges the columns in the selected range

Keys

Identifies which column to sort by when sorting rows, or which row to sort by when sorting columns. You can accept the proposed cell reference, type a new one, or select one on the worksheet. You can reference any cell in a row or column to identify that row or column as a key to the sort.

Duplicates in the first key row or column are sorted according to the second and third keys, if you have identified them. If you have not identified second and third keys, duplicates in the key row or column are left in the order in which they are found.

For each key, select Ascending or Descending to define the order in which you want the data sorted. In ascending order, Microsoft Excel sorts in the following order, top to bottom for rows and left to right for columns:

- Numbers: negative to positive
- Text: according to the order described below. Microsoft Excel ignores capitalization when sorting text.
- Logical values: FALSE then TRUE
- Error values
- Blanks

Text is sorted in the following order:

space		!	"	#	$	%	&	'	(	)	*	+	,	-	.	:	;	
<	=	>	?	@	[	\	]	^	_	`	{	|	}	~	¢	¥		
±	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H
I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	

The numbers shown in the text sort order shown above refer to numbers that are typed on the worksheet as text values. Numbers that are typed on the worksheet as number values are sorted before text values.

In descending order, Microsoft Excel reverses the order of everything except blank cells, which are always sorted last.

Sorting with More Than Three Keys

You can sort with more than three key rows or columns by sorting two or more times. When you sort with more than three key rows or columns, keep two rules in mind:

- The most recent sort takes precedence.
- Microsoft Excel retains the previous sort sequence in places where the current sort produces equal items.

If you want Microsoft Excel to take into account more than three key rows or columns, sort the data three keys at a time, starting with the least important group of keys and progressing to the most important group, but listing the most important key first within each group.

For example, if you have five key columns you want to use to sort the rows of a selection, do one sort with the fourth and fifth most important columns selected as the first and second keys. Then do a second sort with the three most important columns selected as the keys.

Note | If you sort a database, be careful not to include the field names as part of the selection to be sorted. The field names for a database must always remain in the top row of the database.

For more information, see **Sorting data**.

Data table

A **data table** is a range of cells that shows the results of substituting different values in one or two cells of the worksheet.

Once you have created a worksheet, you may want to perform "what-if" analysis by changing certain constant values on your worksheet to see how the value of certain cells is affected. It can be very time-consuming to manually change the numbers one by one. Data tables provide a shortcut. You set up the table, then Microsoft Excel does the calculations as one operation.

There are two types of data tables: a one-input table and a two-input table. With a one-input table you enter different values for one variable and see the effect on one or more formulas. With a two-input table you enter different values for two variables and see the effect on one formula.

This topic explains:

- Using a one-input table

  Setting up a one-input table

  Creating a one-input table

  Adding formulas to an existing table

- Using a two-input table

  Setting up a two-input table

  Creating a two-input table

- Table formulas
- Editing a table

  Clearing the values in a table

  Adding input values or formulas to a table

  Moving a table

  Deleting a table

Using a One-Input Table

If you would like to see how changes in one number affect one or more formulas, use a one-input table. For example, suppose you are considering getting a $30,000 mortgage, and want to see how your monthly payment would change depending on the interest rate of the loan.

Setting Up a One-Input Table

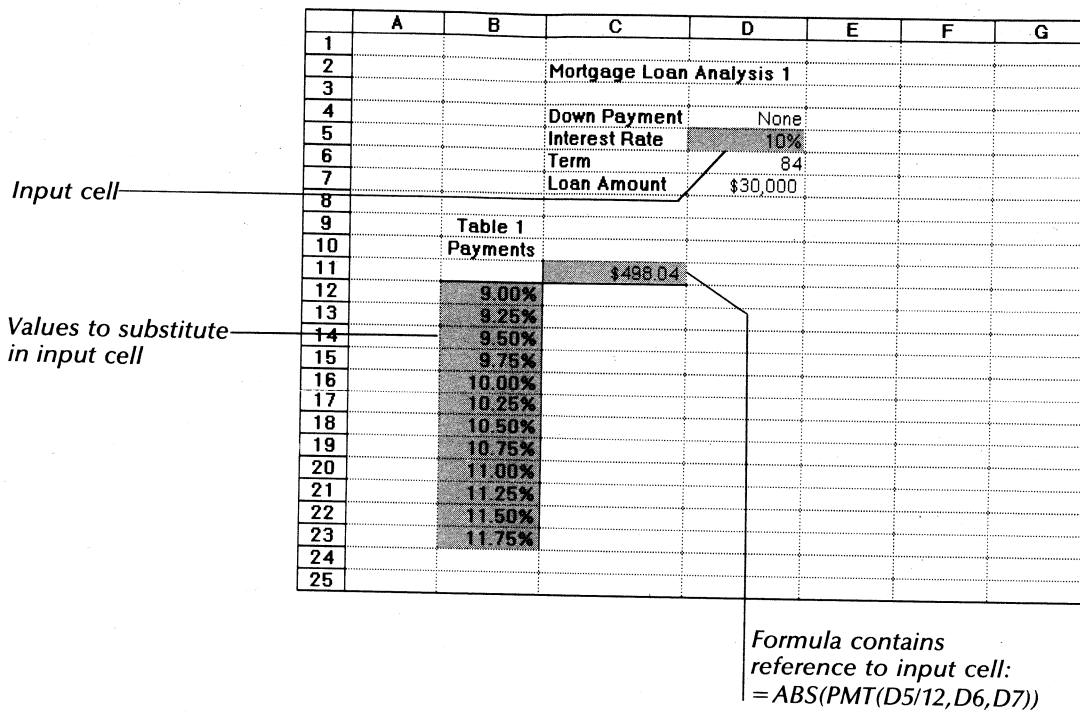
1. In a row (or column), enter the formula or formulas that will use the substituted values.

   You can have as many formulas as you want. Each formula should refer to the **input cell**, either directly or by referring to other cells that refer to the input cell. The input cell is the cell that values will be substituted into.

2. Enter the values that you want to substitute into the input cell in a column (or row).

   If the formulas are in a row, enter the values in the column to the left of the first formula, starting in the row below the formulas. If the formulas are in a column, enter the values in the row above the first formula, starting in the column to the right of the formulas. If you just have one formula, you can enter the values either way.

   You can have as many values in this column (or row) as you want.



Creating a One-Input Table
(Full Menus)

1. Select the range containing the formula(s) and the list of values to substitute.

   In the preceding example, you would select B11:C23.

2. Choose Data Table.

3. If the values to be substituted are in a row, enter the reference to the input cell in the Row Input Cell box. If the values to be substituted are in a column, enter the reference to the input cell in the Column Input Cell box.

   In the preceding example, the values to be substituted are in a column, so you would enter $D$5, the reference to the input cell, in the Column Input Cell box. You enter the reference either by typing it or by selecting the cell.

4. Choose the OK button.

   Microsoft Excel substitutes each value into the input cell and fills in the table with the results of the formula(s).

Note Microsoft Excel has to calculate all the formulas that depend upon the input cell every time it tests a new input value in the cell or every time you edit one of the formulas. Therefore, tables usually require more time to be calculated than normal worksheet formulas. You can control when tables are calculated by choosing the Options Calculation command and selecting the Automatic Except Tables option. Then, whenever you want Microsoft Excel to calculate the table, choose the Options Calculate Now command.

Values calculated by the Data Table command

	A	B	C	D	E	F	G
1							
2			Mortgage Loan Analysis 1				
3							
4			Down Payment	None			
5			Interest Rate	10%			
6			Term	84			
7			Loan Amount	$30,000			
8							
9		Table 1					
10		Payments					
11			$498.04				
12		9.00%	$482.67				
13		9.25%	$486.49				
14		9.50%	$490.32				
15		9.75%	$494.17				
16		10.00%	$498.04				
17		10.25%	$501.92				
18		10.50%	$505.82				
19		10.75%	$509.74				
20		11.00%	$513.67				
21		11.25%	$517.63				
22		11.50%	$521.59				
23		11.75%	$525.58				
24							
25							

The input cell can be empty. That won't affect the values calculated in the table, but you may get an unusual result in the cell or cells containing the formula(s). That is because Microsoft Excel is using zero as the value of the input cell.

Adding Formulas to an Existing Table (Full Menus)

In the preceding example, you could use a one-input table to see the effect of changing interest rates in more than one formula. You might, for example, have one formula that calculates the monthly payment for a seven-year loan and one formula that calculates the monthly payment for a six-year loan.

To add one or more formulas to an existing one-input table:

1. Enter the new formula or formulas in the row or column containing the existing formula(s). The new formula(s) should be adjacent to the existing formula(s).

   In the example, you would enter the formula for the six-year loan in the cell to the right of the formula for the seven-year loan.

2. Select the range containing the formulas and the list of values.

   In the example, you would select B11:D23.

3. Choose Data Table.

4. In the dialog box, enter the reference to the input cell.

   In the example, you would enter $D$5 in the Column Input Cell box.

5. Choose the OK button.

This data table shows the monthly payment for a seven-year and a six-year loan, depending on the interest rate.

	A	B	C	D	E	F	G
1							
2			**Mortgage Loan Analysis 1**				
3							
4			**Down Payment**	None			
5			**Interest Rate**	10%			
6			**Term**	84			
7			**Loan Amount**	$30,000			
8							
9		**Table 1**					
10		**Payments**					
11			$498.04	$555.78			
12		**9.00%**	$482.67	$540.77			
13		**9.25%**	$486.49	$544.50			
14		**9.50%**	$490.32	$548.24			
15		**9.75%**	$494.17	$552.00			
16		**10.00%**	$498.04	$555.78			
17		**10.25%**	$501.92	$559.56			
18		**10.50%**	$505.82	$563.37			
19		**10.75%**	$509.74	$567.19			
20		**11.00%**	$513.67	$571.02			
21		**11.25%**	$517.63	$574.87			
22		**11.50%**	$521.59	$578.73			
23		**11.75%**	$525.58	$582.61			
24							
25							

This cell contains the formula for the 6-year loan: =ABS(PMT(D5/12,72,D7))

Using a Two-Input Table

If you would like to see how changes in two numbers affect one formula, use a two-input table. For example, suppose you are considering getting a $30,000 mortgage and want to see how your monthly payment would change depending upon the interest rate and term of the loan.

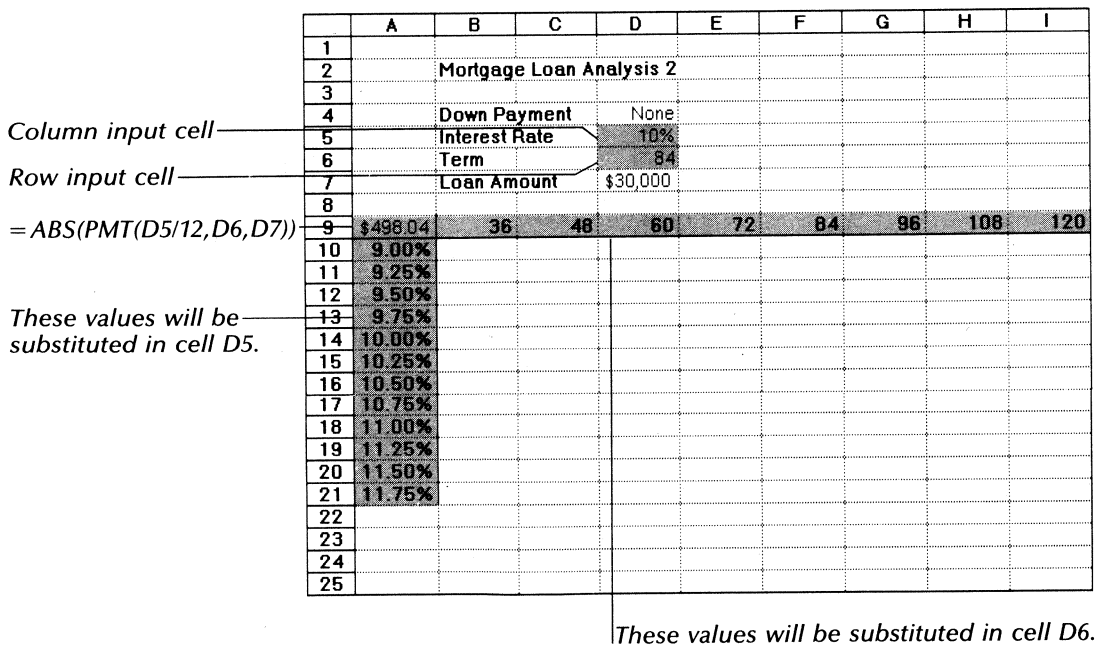
Setting Up a Two-Input Table

1. In a cell, enter the formula that will use the substituted values.

   The formula should refer to two input cells, either directly or by referring to other cells that refer to the input cells. The input cells are the cells that values will be substituted into.

2. Starting in the cell below the formula, enter the values that you want substituted into one input cell. Enter these values in the same column as the formula.

3. Starting in the cell to the right of the formula, enter the values that you want substituted into the other input cell. Enter these values in the same row as the formula.



Creating a Two-Input Table
(Full Menus)

1. Select the range of cells containing the row and column of values and the formula.

   For the preceding example, you would select A9:I21.

2. Choose Data Table.

3. For the Row Input Cell box, enter the reference to the input cell in which you want the row of values to be substituted. You can enter the reference by typing or by selecting the cell.

   For the preceding example, you would enter $D$6.

4. In the Column Input Cell box, enter the reference to the input cell in which you want the column of values to be substituted.

   For the preceding example, you would enter $D$5.

5. Choose the OK button.

After carrying out the Data Table command, your table looks like this.

	A	B	C	D	E	F	G	H	I
1									
2		**Mortgage Loan Analysis 2**							
3									
4		**Down Payment**		None					
5		**Interest Rate**		10%					
6		**Term**		84					
7		**Loan Amount**		$30,000					
8									
9	$498.04	**36**	**48**	**60**	**72**	**84**	**96**	**108**	**120**
10	**9.00%**	$953.99	$746.55	$622.75	$540.77	$482.67	$439.51	$406.29	$380.03
11	**9.25%**	$957.49	$750.12	$626.40	$544.50	$486.49	$443.41	$410.27	$384.10
12	**9.50%**	$960.99	$753.69	$630.06	$548.24	$490.32	$447.33	$414.28	$388.19
13	**9.75%**	$964.50	$757.28	$633.73	$552.00	$494.17	$451.27	$418.31	$392.31
14	**10.00%**	$968.02	$760.88	$637.41	$555.78	$498.04	$455.22	$422.36	$396.45
15	**10.25%**	$971.54	$764.48	$641.11	$559.56	$501.92	$459.20	$426.43	$400.62
16	**10.50%**	$975.07	$768.10	$644.82	$563.37	$505.82	$463.20	$430.53	$404.80
17	**10.75%**	$978.61	$771.73	$648.54	$567.19	$509.74	$467.22	$434.64	$409.02
18	**11.00%**	$982.16	$775.37	$652.27	$571.02	$513.67	$471.25	$438.78	$413.25
19	**11.25%**	$985.72	$779.01	$656.02	$574.87	$517.63	$475.31	$442.93	$417.51
20	**11.50%**	$989.28	$782.67	$659.78	$578.73	$521.59	$479.38	$447.11	$421.79
21	**11.75%**	$992.85	$786.34	$663.55	$582.61	$525.58	$483.47	$451.31	$426.09
22									
23									
24									
25									

Values calculated by the Data Table command

Tip If the values to be substituted are spaced evenly (such as 1000, 2000, 3000, or 1.5%, 1.75%, 2%), you can save time by entering them with the Data Series command. For more information, see **Data Series command**.

Table Formulas

Every resulting cell in a table contains the same formula, enclosed in braces. The formula is enclosed in braces to indicate that the cell is part of a table and that you cannot edit the formula.

Here are some examples of table formulas:

Type of table	Formula	Description
One-input table with a row input cell	{=TABLE($D$9,)}	$D$9 is the input cell. Since the reference is followed by a comma, the cell is a row input cell.
One-input table with a column input cell	{=TABLE(,$E$8)}	$E$8 is the column input cell. Since the reference is preceded by a comma, the cell is a column input cell.
Two-input table	{=TABLE($D$9,$E$8)}	$D$9 is the row input cell; $E$8 is the column input cell.

Editing a Table

You can edit the input values or formulas in the top row or left column of a table. If Calculation is set to Automatic, Microsoft Excel immediately calculates the table after you edit. You can also copy just the resulting values inside a table. When you copy the resulting values, only the values are copied, not the table formulas. Other than copying, you cannot edit cells inside the table. If you try to edit a portion of the table, Microsoft Excel displays a message.

Clearing the Values in a Table

If you've made an error in your table, such as entering the wrong reference to an input cell, you can clear just the resulting values. You must clear all the resulting values, however.

1. Select all the resulting values in the table.
2. Choose Edit Clear.

Adding Input Values or Formulas to a Table (Full Menus)

1. Insert blank cells in the top row or left column of the table using Edit Insert.
2. Enter the new values or formulas in the blank cells.
3. Select the table.
4. Choose Data Table.
5. Enter the reference(s) for the input cell(s).
6. Choose the OK button.

Microsoft Excel calculates the table with the new values or formulas.

Moving a Table

1. Select the entire table, including the input values, the formulas, and the resulting values inside the table.
2. Choose Edit Cut.
3. Select the paste area.
4. Choose Edit Paste.

Deleting a Table

1. Select the entire table, including the input values, the formulas, and the resulting values inside the table.

   If the active cell is within the table, you can select the entire table by choosing Formula Select Special (Full menus only), and then choosing the Current Array button.
2. Choose Edit Clear.

Related Information

Reference

For information on	**See**
Calculating tables	Calculation
Two-input tables	Two-input table
One-input tables	One-input table

Continued

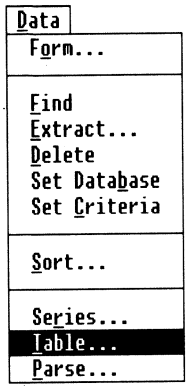
Sampler

Analyzing a Loan

Analyzing the Break-even Point

Data Table command

(Full menus)

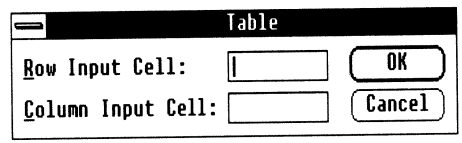


Creates a table based on the input values and formulas you define on a worksheet. You cannot create a table on a macro sheet.

For a one-input table, enter the reference of either the row input cell or the column input cell; for a two-input table, enter both.

If the Data Table dialog box hides an input cell that you want to select, you can move the dialog box with the Control Move command for the dialog box (ALT, SPACEBAR, M), or by dragging the dialog box title bar with the mouse.

Procedures for creating a table are described in **Data table**.



Row Input Cell

If your input values are in a row, put the input cell reference in this box. You can either type the cell reference or select the cell.

Column Input Cell

If your input values are in a column, put the input cell reference in this box. You can either type the cell reference or select the cell.

Database

A **database** is a collection of data organized in a logical, consistent order that allows simple and flexible retrieval and updating. In Microsoft Excel, you create a database on a worksheet. You can easily store and manipulate complex data or large bodies of data with commands and techniques for sorting the data in a variety of ways. You can query the database and select subsets of it based on criteria you define, perform statistical analysis on the data for decision-making, and print information tailored to specific data requirements.

This topic explains:

- Database basics
  - Essential terms
  - Three ways to work with a database
- Setting up a database
  - Creating a database
  - Editing a database
  - Formatting a database
  - Redefining the database range
- Using a data form
  - The parts of a data form
  - Working in a data form
  - Editing records with a data form
  - Adding a new record with a data form
  - Deleting data with a data form
  - Finding specific data with a data form
  - A prototype for a custom data form
- Setting up a criteria range
  - Creating the criteria range
  - Types of criteria
  - Criteria names
  - Matching values with comparison criteria
  - Comparing values with comparison criteria

Using computed criteria

Combining criteria

Matching every record in a database

- Using database commands

Finding records

Scrolling in Data Find

Exiting Data Find

Deleting records

Creating an extract range

Extracting records

- Using database functions

This topic does not discuss procedures for sorting a database, which involves the same steps used for sorting any worksheet range. For more information, see **Sorting data**.

Database Basics

In Microsoft Excel you create a database on a worksheet. A database is a range of a worksheet specifically designated by the name Database.

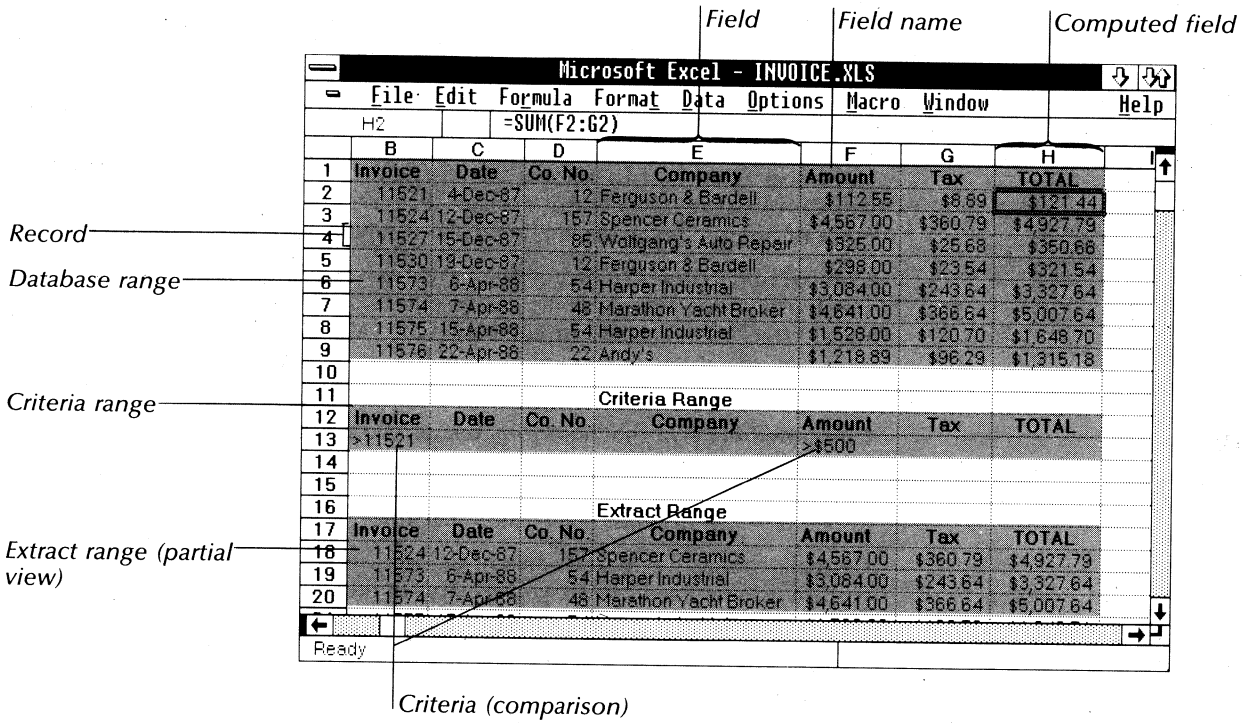
A database is useful for the following tasks:

- Searching or querying the database to obtain information about the contents.
- Extracting subsets of the data based on criteria you specify.
- Performing statistical calculations on the data for analysis and decision-making.
- Sorting data alphabetically, numerically, in ascending or descending order, by names or locations, or by other categories you specify.
- Printing out data tailored to specific purposes.

For example, you might structure a database as a list of clients, their addresses, and sales transactions. You could use the database to find all transactions during a certain period for one client or prepare a print-out summarizing those transactions.

Essential Terms

The following illustration shows the parts of a database:



Database range — a rectangular area of the worksheet defined as a database. You use the Data Set Database command to define the database range on a worksheet. Microsoft Excel assigns the name Database to this range. You can use the name Database as you would any other named reference. For example, you can use the Formula Goto command with the name Database to quickly select the database range, or you can use Formula Paste Name to paste the name Database into a formula if you use a database statistical function. In the preceding illustration, the range B1:H9 comprises the database range.

Field — an individual category of data in a database. Each column in a database is a separate field. You can enter text, numbers, dates, formulas, and functions as field entries. In the illustration, the listings under "Company" in column E comprise a field, as do the listings under "Date" and "TOTAL."

Computed field — a field whose entries are the result of formulas or functions. You create computed fields by filling the cells in the field with the desired formula. In the illustration, the "TOTAL" field is a computed field.

Field name — a name that identifies the data stored in a field. The top row of a database contains the field names. In the illustration, "Co.No." and "Company" are field names.

Record — all data pertaining to a particular item in a database; each row in a database is a separate record. Each record contains the same fields as every other record in the database. In the illustration, the data for Wolfgang's Auto Repair in row 4 is a record.

Criteria — the instructions that tell Microsoft Excel which records in a database to find, extract, or delete. You set up criteria in a range of cells on the worksheet; Microsoft Excel uses the criteria to "test" the database and find, extract, or delete the data that matches that criteria. You can specify two types of criteria: comparison criteria and computed criteria.

Comparison criteria — one of two basic types of instructions that tell Microsoft Excel which records in the database to find, extract, or delete. Microsoft Excel "tests" the database by comparing the value of a particular field against what you specify as the comparison criteria. In the illustration, ">11521" and ">$500" are comparison criteria.

Computed criteria (not shown) — one of two basic types of instructions that tell Microsoft Excel which records in a database to find, extract, or delete. Microsoft Excel "tests" the database against the result of a formula that refers to one or more fields in one or more records.

Criteria range — a separate area of the worksheet set aside to store the comparison or computed criteria you specify. In the illustration, the range B12:H13 comprises the criteria range.

Extract range — a separate area of the worksheet set aside for data retrieved and copied from the database. When you extract data, you find records (based on criteria you specify) and copy them to the extract range. In the illustration, the data in rows 18 and 19 are two of the records that meet the criteria specified in the criteria range.

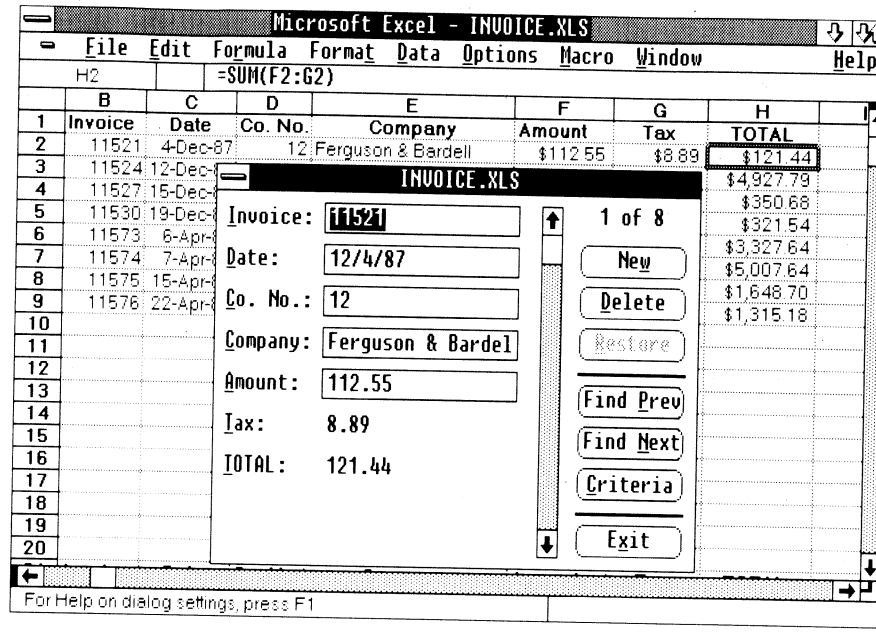
Three Ways to Work with a Database

You can work with any database you create in three ways:

- **Use a data form.** A data form is a simple way to view, change, add, delete, or find records in a database. You can use a data form without learning all the specifics of setting up criteria and extract ranges or other details of database architecture. You might prefer this method if you're just starting to use databases or if you are setting up a database for someone else to enter data.

The following illustration shows the data form for the database shown in the preceding section of this topic:

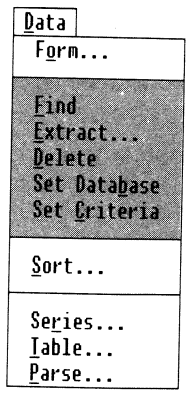
Microsoft Excel takes the field names you set up and automatically creates a data form based on them. You can also create custom data forms.



For information on using data forms, see "Using a Data Form," later in this topic.

- **Use the Data menu commands.** The Data menu commands let you work with a Microsoft Excel database using more advanced techniques for specifying criteria. In addition to the operations available in a form, you can extract all records matching the criteria to another range of the worksheet, and you can delete all records matching the criteria.

The Data menu commands shown here let you use the full power of the database. (Full menu shown.)



For information on using the Data menu commands and database functions with a database, see "Setting Up a Criteria Range" and "Using Database Commands," later in this topic.

- **Use the database functions to compute database statistics.** You can use database functions to compute specific database statistics such as the sum or average of a certain field for all the records of the database that satisfy the criteria. Here are a few examples of database functions, shown with argument placeholders:

The database functions shown here average numbers, find a maximum number, and calculate standard deviation.

```
H2   =DAVERAGE(database,field,criteria)
H2   =DMAX(database,field,criteria)
H2   =DSTDEV(database,field,criteria)
```

For a brief summary of database functions, see "Using Database Functions," later in this topic. For complete information on the database functions, see *Microsoft Excel Functions and Macros*, a separate manual included in your Microsoft Excel package.

Setting Up a Database

Logical, consistent structure is the key to the power of a database. Before you begin creating your database, think about how you'll use it. With careful planning, you can create a database that allows fast data retrieval and makes efficient use of the worksheet space.

Follow these guidelines for organizing a database:

- **Create the records from the events or items you want to track.** Think about the kind of data you want to manage with the database. For example, if you have to track sales orders, make each sales order transaction a record in the database.
- **Create the fields from the categories of data you need to keep for each event or item.** For example, in tracking sales orders, you might need to know the date, the client's name, address, phone number, the quantity and price of each item ordered, and the order total. These would all become fields in the database.
- **Use a separate field for each item you may want to retrieve separately.** For example, if you want to sort addresses by zip code, create one field for addresses and a separate field for zip codes, rather than a single field containing both addresses and zip codes.
- **Use "rapid prototyping" to test the design of your database.** If you need to create a large database with many records, you might want to create the database with only ten records and do a trial run with a few data retrieval techniques to see if the organization of the database suits your purposes. For information on data retrieval techniques, see "Using a Data Form," "Setting Up a Criteria Range," "Using the Database Commands," and "Using Database Functions," later in this topic.

Creating a Database

Once you've decided on a design for your database create the database using the procedure in this section. Follow these guidelines for entering data:

- **Database range.** It's a good idea to include several blank records at the end of the database to simplify adding records later. You should always include at least one blank row as the bottom row of your database. You can insert new records anywhere in the database above the blank row without redefining the database; Microsoft Excel automatically expands the range.
- **Database size.** A database can be as large as 256 fields and 16,383 records (an entire Microsoft Excel worksheet).
- **Number of databases on a worksheet.** Microsoft Excel looks for the name Database to determine which area of the worksheet to work with. For this reason, only one database at a time can be defined with the name Database. However, you can still set up several databases on a single worksheet, and switch between them by changing the one currently defined as the database.
- **Allowed values in field names.** Field names must be text constants. Do not use numbers, logical values, error values, blank cells, or formulas as field names. Otherwise, the database commands will not work properly.
- **Length of field names.** Field names may be a maximum of 255 characters in length. However, it's best to use brief field names and keep the contents of any field to a minimum. This allows you to use narrower column widths and view more of the database at one time.
- **Records.** Every record must have the same fields, but you don't have to enter data in each field. Be careful not to insert extra spaces at the beginning or end of each entry in a field, as extra spaces can affect the results of a search.
- **Capitalization.** Use uppercase or lowercase letters. Microsoft Excel ignores capitalization when searching or sorting.

To create a database:

1. Enter the field names in the first row of the area that will become the database range.
2. Enter the records in the rows below the field names.
3. Select all the cells in the entire database range, including the field names and extra blank rows for future expansion.
4. Choose Data Set Database to define the database range.

   Microsoft Excel names the range you defined Database.

Tip

You can set up your worksheet to perform database operations using a database or criteria range on another worksheet or macro sheet. To do this, you use the Formula Define Name command instead of the Data Set Database or Data Set Criteria command to name a database range or criteria range.

For example, to extract records from range A1:D200 on the TAX.XLS worksheet, while SUMMARY.XLS is the active worksheet, you would use the Formula Define Name command to define an external reference formula (=TAX.XLS!$A$1:$D$200) as the name Database. For information on defining names, see **Names**. For information on external reference formulas, see **Linking documents**.

Editing a Database

You can edit a database using any of the editing techniques for worksheets such as adding or deleting rows and columns, or copying data. When adding or deleting records, use the following guidelines to make sure that your database range remains valid and includes all records:

- If you add new or blank records with the Edit Insert command, make sure you insert them above the last record of the database. Otherwise, you will need to redefine the database range to include the new records.
- If you did not include a blank row at the end of the database, you must redefine the database range if you add records to the end.
- If you delete records in the middle of a database, Microsoft Excel automatically adjusts the database range.
- Deleting the last record of a database does affect the database range, so you should keep the last record of the database blank.
- Changing the order of records or fields other than the last does not affect the database range. Sorting the records or fields never affects the name.

An easy way to add and delete records is to use the Data Form command. For more information, see "Editing Records with a Data Form," later in this topic. For information on worksheet editing procedures, see **Editing a document**.

Formatting a Database

You can format the database with any of the worksheet formatting options such as alignment or column width adjustments, font choices, and built-in or custom number formats.

Here are a few reminders about formatting a database:

- Because all entries in a particular field are similar, it's usually best to use the same formats for an entire field.
- Exclude the field names when formatting a field because the same formats generally don't apply. For example, field names are often text, whereas the actual data they describe may be numbers, text in special formats, and so on.
- Many of the display formats and options you use to view normal worksheet ranges — such as opening multiple windows or splitting a window into panes — are also extremely useful for working with large databases.

For more information on worksheet formatting options, see **Formatting a document**.

Redefining the Database Range

You can enter more than one database on the same worksheet, but you can define and use only one database at a time. When you want to use another database on the same sheet, redefine the database.

1. Select the new database range, including field names.
2. Choose Data Set Database.

Using a Data Form

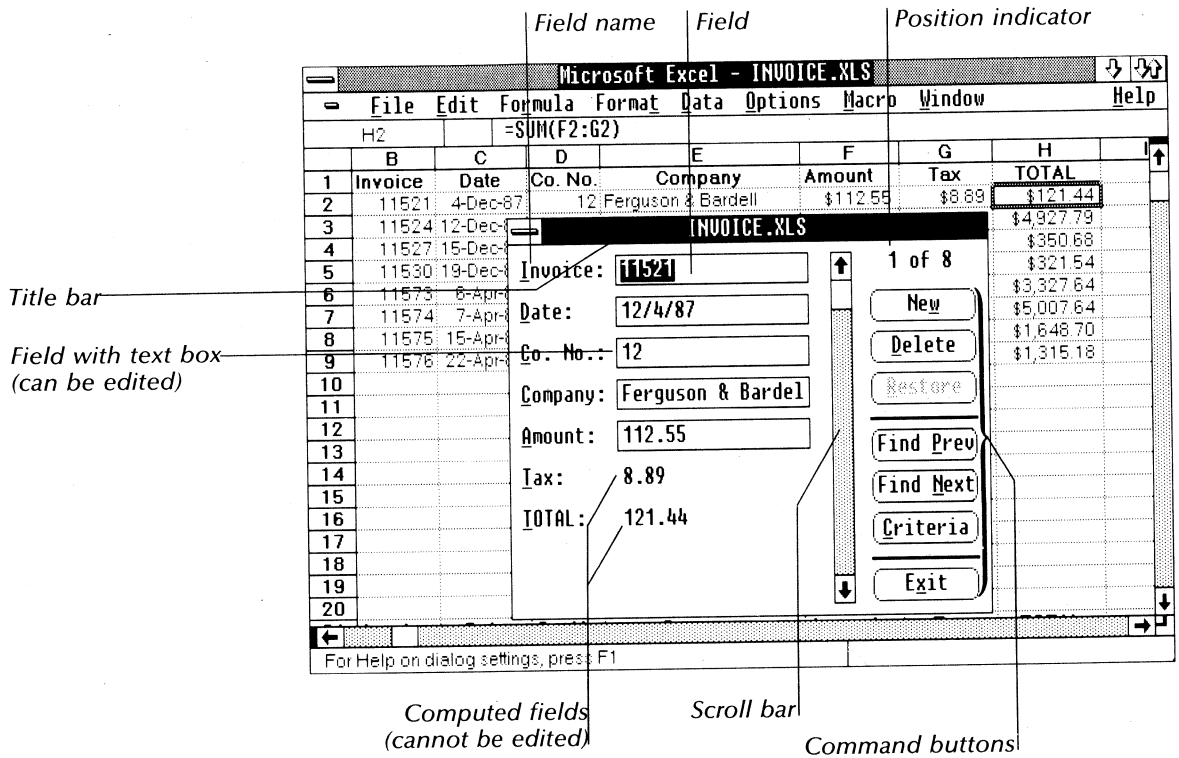
For many database tasks, a data form is an alternative to the commands on the Data menu. With a data form, you can view, change, add, and delete records in your database, or find specific records based on criteria you specify while the form is displayed. You cannot extract records with a data form.

The data form works independently from the other commands you use to manipulate a database — the Data Find, Data Extract, Data Delete, and Data Set Criteria commands. It also operates independently of any criteria range you may have set up. If you use criteria within the data form to find specific database records, those criteria will not affect any criteria in the criteria range.

The Parts of a Data Form

When you define a database and choose the Data Form command, Microsoft Excel creates a data form based on your database and displays it in the Data Form dialog box. The data form displays all fields for one record at a time and gives you access to all records in your database.

The following illustration shows how the data form looks for the database example used earlier in this topic and highlights the parts of a data form:



Field names — the column of field names from your database that Microsoft Excel creates for the data form.

Fields — the column next to the field names that contains the data for each field within the record. These fields collectively make up one database record.

Field with text box — field data you can edit with the data form. Any field that you can edit appears in a text box.

Field without text box — a field whose entries you cannot edit. You cannot edit a field that is the result of a formula or function, or a field that is locked while the worksheet is protected.

Scroll bar — a bar that allows you to scroll through the records. The scroll bar shows your approximate position in the database, with respect to the database range. For example, when the **scroll box** is halfway down the scroll bar, you are in the middle of the database.

Position indicator — the message indicating which record is displayed and how many non-blank records are in the database. Blank records at the end of the database are not counted. The position indicator changes to "New Record" when you scroll to the first blank record after the last non-blank record in the database.

Title bar — the bar at the top of the data form that shows the name of the worksheet containing the database and a Control menu icon.

Note | To see areas of your database behind the data form, choose the Control Move command or drag the title bar with the mouse.

Working in a Data Form

A data form is always displayed in the Data Form dialog box. To work in a data form, you use many of the standard keyboard or mouse techniques for working in dialog boxes.

Note | When Microsoft Excel creates field names in the data form, it includes in each field name an underlined letter so you can use the standard keyboard technique (ALT+key for underlined letter) to move easily to that field.



To work in a data form with the keyboard, use the keys given in the following table:

To	Press
Select a field	ALT+key for underlined letter in field name
Choose a command button	ALT+key for underlined letter in button
Move to same field in next record	DOWN key
Move to same field in previous record	UP key
Move to next field in record	TAB
Move to previous field in record	SHIFT+TAB
Move to first field in next record	ENTER
Move to first field in previous record	SHIFT+ENTER

To	Press
Move to same field 10 records forward	PAGE DOWN
Move to same field 10 records back	PAGE UP
Move to last record	CONTROL + PAGE DOWN
Move to first record	CONTROL + PAGE UP
Move and edit within a field	HOME, END, LEFT, RIGHT, BACKSPACE



To work in a data form with the mouse, use the techniques given in the following table:

To	Do this
Choose a command button	Click command button you want
Select and enter or edit data for a field	Click in text box of the field you want
Move to same field in next record	Click down arrow in scroll bar
Move to same field in previous record	Click up arrow in scroll bar
Move to same field 10 records forward	Click scroll bar below the scroll box
Move to same field 10 records back	Click scroll bar above the scroll box
Move to last record	Drag scroll box to bottom of scroll bar
Move to first record	Drag scroll box to top of scroll bar
Move and edit in a field	Click where you want the insertion point

For information on editing in a text box, see **Command, menu, and dialog box**.

Editing Records with a Data Form

You can use a data form to edit the fields of a record, except for protected fields and computed fields. If you can edit a field, the data is displayed in a text box. To edit in a data form, use standard procedures for editing in a text box.

To edit database records with a data form:

1. Activate the worksheet window containing the database.
2. Choose Data Form.

   Microsoft Excel displays the data form as a dialog box.
3. Edit the records you want, using the keyboard or mouse techniques discussed in the preceding section of this topic.
4. When you finish working in the data form, choose the Exit button to exit the data form.

If you make changes to the fields in a record and then decide you want to cancel those changes, you can restore the record to its original contents, as long as you do so before moving to a different record.

To cancel changes to a field in a record:

- Choose the Restore button.

For information on locking a cell and protecting a worksheet, see **Protecting or hiding data**. For information on editing in a text box, see **Command, menu, and dialog box**.

Adding a New Record with a Data Form

1. Activate the worksheet containing the database.
2. Choose Data Form.
3. Choose the New button. Or, if you have a mouse, drag the scroll box to the bottom of the scroll bar.

   Microsoft Excel scrolls to the first blank record after the last non-blank record, and the position indicator changes to "New Record."
4. Add the data to the fields of this record.

Note If there are no blank records at the end of the database, and there is room below the database, Microsoft Excel extends the database range to include a new, blank record at the bottom of the database. If there is no room below the database, Microsoft Excel displays a message. If any fields in the last non-blank record are computed, Microsoft Excel copies their formulas to the new record.

Deleting Data with a Data Form

1. Activate the worksheet containing the database.
2. Choose Data Form.
3. Select the record you want to delete.
4. Choose the Delete button.
   Microsoft Excel displays a message asking for confirmation.

Important Deleted data cannot be restored with the Restore button. Before choosing the OK button, make sure you want to delete all the information in the record.

5. Choose the OK button.

Finding Specific Data with a Data Form

The data form scrolls through all records in your database. However, you can define criteria and use the Find Next or Find Prev button to quickly find records matching the criteria.

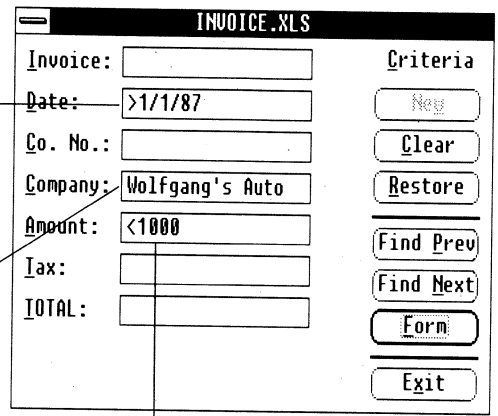
You can search the database for records that match these types of criteria:

- **A series of characters you want matched.** Specify text, numbers, or logical values.
- **A quantity you want compared.** Use the standard comparison operators: =, >, <, >=, <=, <>.
- **A wildcard — a special character that stands for one or more characters.** Use a question mark (*?*) to find any single character in the same position as the question mark; for example, type *sm?th* to search for *smith* or *smyth*. Use an asterisk (*) to find any number of characters in the same position as the asterisk — for example, type **Inc.* to find all companies with *Inc.* at the end of their company names.

Note All text strings in comparison criteria have an implicit * appended to them. To find an actual question mark or asterisk, precede it with a tilde (~).

You cannot specify computed criteria in a data form. For information on specifying comparison and computed criteria in a database, see "Setting Up a Criteria Range," later in this topic.

The following illustration shows how criteria might be specified in the data form example used earlier in this topic:



This criterion tells Microsoft Excel to search for invoices dated after January 1,1987.

This criterion specifies a search for invoices, where the company name starts with "Wolfgangs's Auto."

This criterion searches for invoices with amounts of less than $1000.

To search the database for records matching your criteria:

1. Activate the worksheet containing the database.
2. Choose Data Form.
3. Choose the Criteria button.

   The position indicator changes to the word "Criteria" and the Criteria button changes to the Form button. The Delete button changes to the Clear button. You can choose the Clear button to quickly clear all existing criteria.

4 Select each field you want and in the text boxes next to the field name, type the criteria you want Microsoft Excel to use when searching the database.

If you want to return to the regular form without searching the database, choose the Form button.

5 Choose the Find Next button to search forward through the database and display the next record that matches the criteria.

Choose the Find Prev button to search backward through the database and display the previous record that matches the criteria.

6 When you finish, choose the Exit button to exit the data form.

A Prototype for a Custom Data Form

You can create a custom data form that Microsoft Excel displays whenever you choose the Data Form command. A custom data form is an ideal tool for setting up easy-to-use databases in applications you may develop for other users, especially those less familiar with database procedures.

The basis of a custom data form is a description of a valid custom dialog box. With this description, you specify a custom form that contains the same types of elements as the default form. Then you define the name Data_Form to refer to the range in which you entered the description of the dialog box.

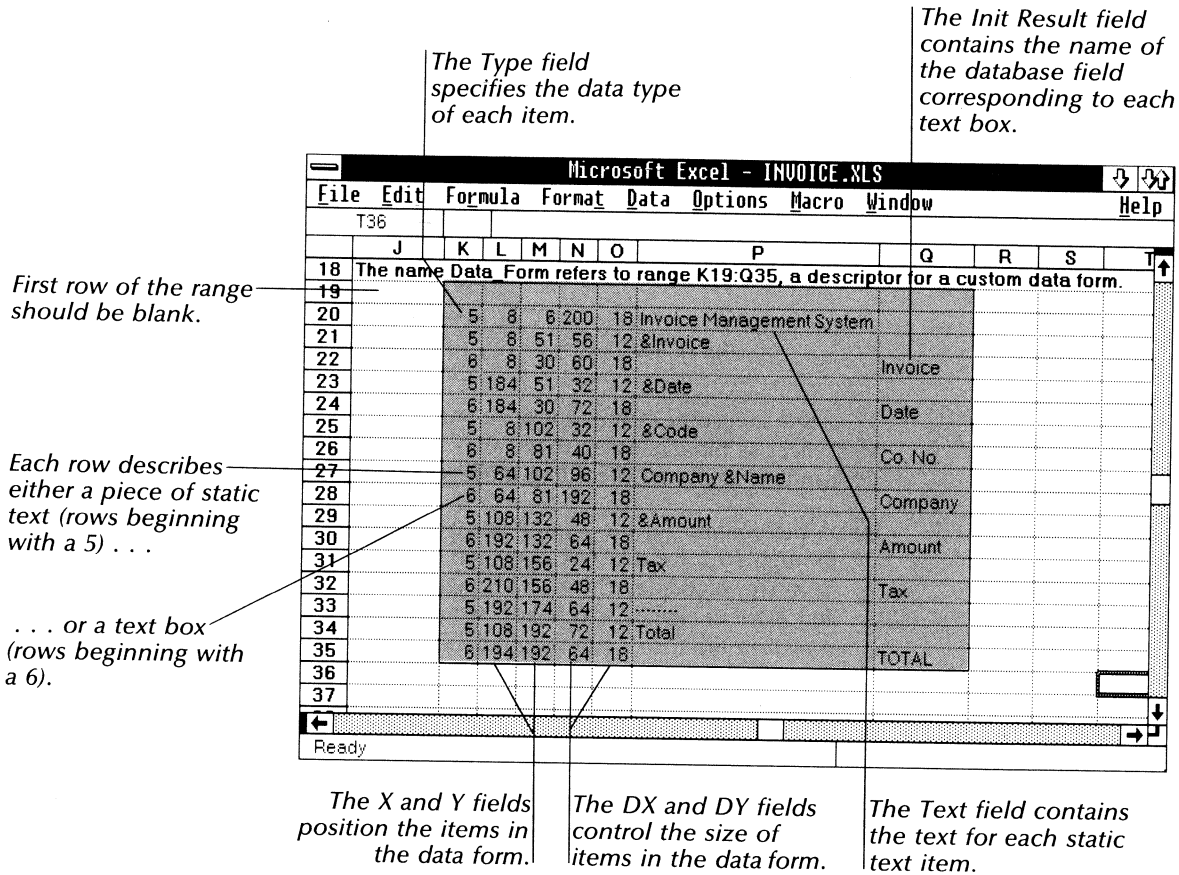
Your custom form contains the same elements as the default form:

- **Static text** — the labels that identify fields and any extra labels you want to add to your form.
- **Text boxes** — boxes in which you can type and edit text for fields that are not protected or computed. For fields that are protected or computed, Microsoft Excel displays the field contents without the box and does not allow you to edit them. Each text box corresponds to a field in the database.

The customized data form replaces the part of the standard data form to the left of the scroll bar. The scroll bar and command buttons do not change.

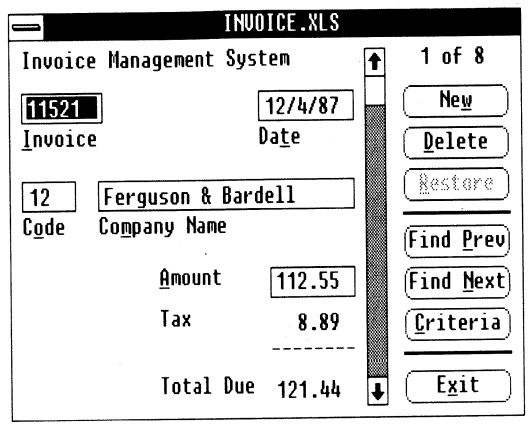
Microsoft Excel Functions and Macros, a separate manual included in your Microsoft Excel package, provides guidelines for creating custom dialog boxes. However, you can start creating your own custom data forms right away by using the example in this section as a prototype.

The following illustration shows a description for a custom dialog box for the database example used earlier in this topic. The description is in the named range Data_Form (K19:Q35, shown tinted):



Note the ampersands (&) in the Text field. Characters following an ampersand are underlined in the custom dialog box. As for a normal dialog box, you can press ALT+the underlined letter to move quickly to an item.

The description in the preceding illustration produces the custom data form shown in the following illustration:



To create a custom form, choose an area for the description on the same worksheet as the database. Then follow these steps to enter each row of the description, using the preceding illustration as a guide:

1. In the column for the Type field, type *5* for a piece of static text or *6* through *10* for a text box. You can add extra text items to enhance the form (for example, "Invoice Management System" in the illustration) or add extra unlabeled text boxes. If you want computed or protected fields shown in the form, you should define text boxes for them even though they cannot be edited; Microsoft Excel automatically displays the fields without boxes. You do not have to include every field in the database in your form.
2. In the columns for the X, Y, DX, and DY fields, use the same numbers that are in the example. Items will be positioned and sized just like in the example. For information on changing size and position of items, see "Making Customized Menus and Dialog Boxes" in Chapter 6 of *Microsoft Excel Functions and Macros*.
3. For every piece of static text you define (a row that begins with a 5), type the static text you want in the Text field. You can use any text you want; it doesn't have to be the actual database field names.
4. For every text box you define (a row that begins with a 6, 7, 8, 9, or 10), type the corresponding database field name in the Init/Result field. Use exactly the same field name that you used in the first row of the database.
5. Select the range in which you have entered the description.
6. Choose Formula Define Name.
7. In the Name box, type *Data_Form*

8 Make sure the range containing the description is correct in the Refers To box. Edit the range, if necessary.

9 Choose the OK button.

Whenever you choose the Data Form command, Microsoft Excel brings up the custom form by default.

If you are developing a custom application, you can make the form even easier to use by adding custom Help to it. The procedure for doing this is the same as for custom dialog boxes. For more information on custom dialog boxes, see *Microsoft Excel Functions and Macros*.

Setting Up a Criteria Range

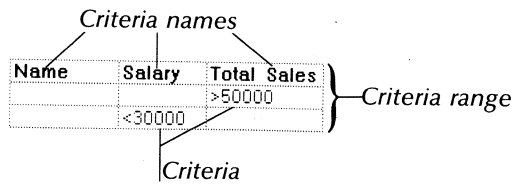
After you have created a database, you can use criteria to tell Microsoft Excel what database entries you want to work with. For example, you could use criteria in a database of a company's customers to find all the records of customers who live in Florida or who have purchased more than $100 worth of products in the past year. You specify criteria in a criteria range on your worksheet, then use database commands with those criteria to find, extract, or delete records.

Note | The criteria range on your worksheet is completely different from any criteria you define while using a data form.

Creating the Criteria Range

You enter the criteria range on the same worksheet your database is on. The criteria range can be any area on the worksheet outside your database range.

The first row of the criteria range contains the criteria names; the rows below the criteria names contain the criteria. The criteria range must be at least two rows high and one column wide, but can be as large as you wish.



Tip | You may make frequent changes in the criteria range, so put your criteria range where it will be easy to edit. You may want the criteria range right above the database, or on one side of the database.

For information on what to enter in your criteria range, see "Types of Criteria," the next section of this topic.

To let Microsoft Excel know where your criteria range is, you define the criteria range with the Data Set Criteria command. You can keep more than one criteria range on your worksheet, and then define each one as you need to use it, but you can have only one criteria range defined at a time. You can define the criteria range before or after you enter your criteria names and criteria.

To define the criteria range:

1. Select the criteria range.
2. Choose Data Set Criteria.

Microsoft Excel names the range Criteria. You can use the name Criteria as you would any other named reference. For example, you may want to quickly select the criteria range with the Formula Goto command.

Instead of using the Data Set Criteria command, you can name a criteria range by selecting the range, choosing the Formula Define Name command, and typing the name *Criteria* in the text box. You can also use Formula Define Name to set up your worksheet to perform database operations using a database or criteria range on another worksheet or macro sheet. For more information, see "Creating a Database," earlier in this topic.

Types of Criteria

There are two types of criteria:

- **Comparison criteria.** Use comparison criteria to compare values in a database field to numbers or text. For example, in a database of invoices you might use comparison criteria to find records where the Balance Due is greater than $500 or where the company name begins with the letter C.
- **Computed criteria.** Use computed criteria to find records based on the relationship between two parts of the database or between one part of the database and a value outside the database. For example, you might use computed criteria in a database of invoices to find records where the Balance minus the Amount Due is greater than $500, or where the Available Quantity plus a number stored in a cell outside the database is less than 1000.

You can combine these two types of criteria in many ways. For more information, see "Combining Criteria," later in this topic.

Criteria Names

When you are using comparison criteria, use field names as criteria names. The criteria names should be exactly identical to the field names in the database (except for capitalization, which is ignored), and must be in the first row of the criteria range. The easiest way to make sure the names are exactly the same is to copy the field names from the database to the criteria range. You must have at least one field name. You can include as many field names as you want.

When you are using computed criteria, you can enter any value you want as the criteria name, as long as you don't use a field name from your database. It's usually helpful to use a text value that explains the computed criterion. You can also leave the criteria name cell blank.

Matching Values with Comparison Criteria

If you want to find records that contain a specific value, type the text, number, or logical value under the criteria name.

This criteria range finds all the records of customers in this database whose zip code is 98111.

Criteria range

	A	B	C	D	E	F
1	Zip					
2	98111					
3						
4	**Last Name**	**First Name**	**Zip**	**1st Purch**	**2nd Purch**	**Date 1st Purch**
5	Braun	Edna	00107	$145.75	$0.00	7/2/87
6	Brown	Phillip	44935	$27.35	$0.00	11/10/87
7	Frei	John	62101	$50.00	$15.75	12/28/87
8	McIntyre	Janet	98111	$6.95	$0.00	1/19/87
9	Samuels	Carol	30033	$12.95	$32.35	6/30/87
10	Smith	Jane	94117	$21.07	$172.50	1/19/87
11	Smithson	Rosalie	99234	$87.95	$27.85	3/4/87
12	Wright	Mari	55607	$45.60	$127.85	11/16/87

When you type text as a criterion, Microsoft Excel matches everything that begins with what you type. For example, if you type *br* instead of *braun* Microsoft Excel finds records for both Braun and Brown.

Note

To match the value *text* exactly, use the following form:

="=*text*"

For example, in the preceding database, you would type ="=*Smith*" to find only the record for Smith, but not for Smithson.

For more information on using formulas as criteria, see the next section in this topic, "Comparing Values with Comparison Criteria."

You can also use "wildcards" to find text that shares some characters but not others. A wildcard is a special character that stands for other characters in text. Microsoft Excel recognizes two wildcards:

Character	Meaning
? (question mark)	Any single character in the same position as the question mark
* (asterisk)	Any number of characters in the same position as the asterisk

To find an actual question mark or asterisk, precede it with a tilde (~).

Comparing Values with Comparison Criteria

If you want to find records that fall within certain limits, type a Microsoft Excel comparison operator followed by the value, under the criteria name. For example, to find all the transactions of more than $10,000 you would type *>10000* as your criterion.

For information on comparison operators, see **Operator**. The six comparison operators are:

Operator	Meaning
=	Equal to
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to
<>	Not equal to

Note

To use the equal to comparison operator (=), use the following form:

="="text"

A comparison criterion must start with one of the comparison operators.

The criterion can also be the result of a formula that produces text. For example, to select all records for the last 30 days you could use the criterion *=">="&NOW()−30* in a field that lists dates.

To find records that match values within a certain range, use two comparison criteria in two cells using the same criteria name. For example, to find records of customers whose zip codes are between 40000 and 90000, you could type *>40000* in a cell under the Zip criteria name, and *<90000* next to it, under a second Zip criteria name.

Using Computed Criteria

A computed criterion is a formula that refers to fields of your database and returns TRUE or FALSE. The formula can refer to one or more fields, either by field name or by a reference to that field in the first record of your database. The formula can also refer to constant values, or to values outside the database. When referring to values outside the database, use absolute references.

Microsoft Excel evaluates the formula once for each record. The record is selected if the formula's result is TRUE or a number other than zero. The record is not selected if the formula's result is FALSE, zero, or a text value or error value. The following criteria range will find records of all customers whose first purchase plus second purchase totals more than $100.

Criteria range

Contains formula =D5+E5>100

Displays TRUE because this formula is TRUE for the first record.

	A	B	C	D	E	F
1	Total					
2	TRUE					
3						
4	Last Name	First Name	Zip	1st Purch	2nd Purch	Date 1st Purch
5	Braun	Edna	00107	$145.75	$0.00	7/2/87
6	Brown	Phillip	44935	$27.35	$0.00	11/10/87
7	Frei	John	62101	$50.00	$15.75	12/28/87
8	McIntyre	Janet	98111	$6.95	$0.00	1/19/87
9	Samuels	Carol	30033	$12.95	$32.35	6/30/87
10	Smith	Jane	94117	$21.07	$172.50	1/19/87

If you want to use a formula that depends upon a field in a record other than the one being tested, refer to the field above or below the first record in the database. For example, you might want to find records where one client's first purchase was more than 10 days after the previous client's first purchase. You would build the formula so that you referred to the field containing the date in the first record (F5 in the example), minus the field directly above that field (the field containing the field name "Date 1st Purch." in the example).

If you refer to a field by using its name in a formula, make sure it is a valid Microsoft Excel name, with no spaces. You can enter field names in formulas without defining them with the Formula Define Name command; if you enter a field name you didn't define, the error value #NAME? is displayed in the criterion cell, but the name is still recognized as a field name.

Combining Criteria

You can combine criteria to find records that match more than one criterion or match some combination of several criteria.

There are three ways to combine criteria:

- Select records that match one criterion **and** another criterion.

  For example, find records of customers whose last name begins with B **and** who made a first purchase greater than $50.

- Select records that match one criterion **or** another criterion.

  For example, find records of customers who have zip codes less than 40000 **or** greater than 90000.

- Any combination of "and's" and "or's."

  For example, find records of customers who spent more than $50 on their first purchase **and** whose zip codes are less than 40000 **or** greater than 90000.

You specify "and's" and "or's" by where you enter different criteria within a criteria range. To connect criteria by an "and" relation, enter them in the same row. To connect criteria by an "or" relation, enter them in different rows. Microsoft Excel finds any records that meet all the criteria in any one row of the criteria range.

Last Name	1st Purch
B	>50

This criteria range will find all customers whose last name begins with B **and** who made a first purchase greater than $50.

Zip
<40000
>90000

This criteria range will find records of all customers whose zip codes are less than 40000 **or** greater than 90000.

1st Purch	Zip
>50	<40000
>50	>90000

This criteria range will find records of all customers who spent more than $50 on their first purchase **and** whose zip codes are less than 40000 **or** greater than 90000.

Matching Every Record in a Database

To match every record in a database, use a blank row in your criteria range.

Last Name	1st Purch	Zip
	>50	

This criteria range will find every record in the database.

Using Database Commands

After you have set up your criteria range, you can use criteria to:

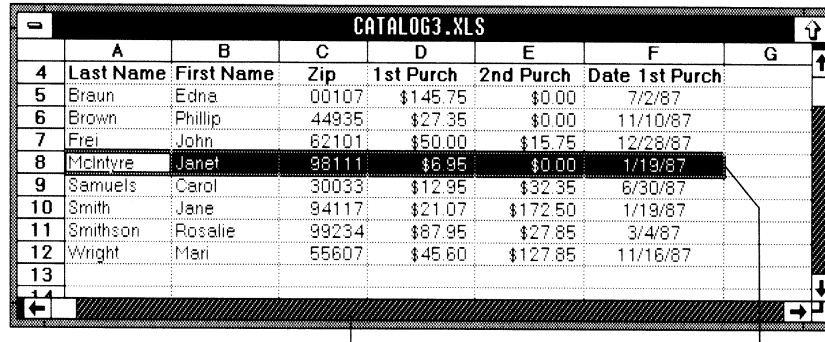
- Find and select records
- Extract records (that is, find records and copy them to another part of your worksheet)
- Delete records

Finding Records

Use the Data Find command to find and select records in the database that match the criteria in the criteria range. If the active cell is outside the database when you choose Data Find, Microsoft Excel selects the first record in the database that matches the criteria. If the active cell is inside the database when you choose Data Find, Microsoft Excel selects the first record below the active cell that matches the criteria. If no records match, a message is displayed.

If you hold down SHIFT when you choose Data Find, the initial search is in reverse order — Microsoft Excel selects the last record in the database that matches the criteria or, if the active cell is inside the database, the first record above the active cell that matches the criteria.

This is how a worksheet looks in Data Find.



To find records:

1. Make sure you have defined both your database range and your criteria range.
2. Choose Data Find.

The scroll bars become striped to show that you are in Data Find. Scrolling is different in Data Find, as described in the next section.

Scrolling in Data Find

When Microsoft Excel is in Data Find, your movement is restricted to those records that match the criteria.



To scroll in Data Find, using the keyboard:

To find	Press
The next matching record	DOWN key
The previous matching record	UP key
The first matching record at least one screen down from the selection	PAGE DOWN
The last matching record at least one screen up from the selection	PAGE UP

If there are no matching records in the direction you scroll, Microsoft Excel beeps and does not change the selection.

To move horizontally, press the RIGHT key to move right and the LEFT key to move left. You cannot, however, move beyond the right or left boundary of the database.



To scroll in Data Find with the mouse:

To find	Do this
The next or previous matching record	Click the down or up arrow
The next or previous matching record at least one window away	Click below or above the scroll box
The next or previous matching record, closest to the relative position shown by the scroll box	Drag the scroll box

Exiting Data Find

▣ Select any cell outside the database, choose Data Exit Find, or press ESCAPE.

The scroll bars return to their normal pattern.

Deleting Records (Full Menus)

Use the Data Delete command to delete records in the database that match the criteria.

Important

Data Delete permanently deletes all records matching the criteria. If you are not sure that Data Delete will delete the right records, save your worksheet before choosing this command. You can see what records will be deleted by creating your criteria, then extracting using Data Extract or finding records with Data Find.

To delete records:

1. Define a criteria range that contains criteria for records you want to delete.
2. Choose Data Delete.

   A message warns that records will be permanently deleted from the database.
3. Choose the OK button.

Creating an Extract Range

Before extracting records from a database, you must select an extract range. An extract range is a range on your worksheet, just like a criteria range or the database, except that no special name is assigned to it. The extract range must be outside of your database.

The first row of your extract range should contain field names identical to those in your database. You don't need to include every field name from your database in the extract range, however. When you extract, only the fields that you specify in the first row of your extract range will be copied into the extract range. For example, you could use criteria that find records for clients who did less than $50,000 of business with you last year, but extract only their names and addresses.

You select the extract range before extracting. If you select a range that's more than one row high, Microsoft Excel extracts only as many records as will fit in that range. If there are more records than will fit, a message is displayed. If you select just the field names as your extract range, Microsoft Excel extracts all the records that match the criteria.

Important

When you choose the Data Extract command, Microsoft Excel clears the entire extract range before it copies the records that match the criteria into the range.

If you select just the field names as your extract range, the extract range extends from below the field names to the bottom of the worksheet. When you choose Data Extract, everything below the field names is cleared.

Extracting Records
(Full Menus)

When you use the Data Extract command, Microsoft Excel copies all records matching your criteria and pastes those records into the extract range.

1. Make sure the database and criteria range are defined.
2. Select the extract range.
3. Choose Data Extract.
4. If you only want to extract one copy of repeated or partially repeated records, turn on the Unique Records Only check box in the Data Extract dialog box.
5. Choose the OK button.

   Matching records are copied into the extract range.

Using Database Functions

There are 11 worksheet functions designed especially to work with databases.

To	Use
Average numbers	DAVERAGE
Count numbers	DCOUNT
Count non-blank cells	DCOUNTA
Find a maximum	DMAX
Find a minimum	DMIN
Multiply numbers	DPRODUCT
Calculate standard deviation	DSTDEV or DSTDEVP
Add numbers	DSUM
Calculate variance	DVAR or DVARP

For complete information on the database worksheet functions, see Chapter 2, "Worksheet Function Directory," in *Microsoft Excel Functions and Macros*.

Related Information

Reference

For information on	See
Sorting in a database and a worksheet	Sorting data
Comparison operators	Operator
Using wildcards	Wildcard
Editing in a database	Editing a document
Formatting in a database	Formatting a document

You can find information about Microsoft Excel basics in the other core topics: **Chart**; **Command, menu, and dialog box**; **Help**; **Windows**; and **Worksheet**.

Functions and Macros

"Database Functions" in Chapter 2, "Worksheet Function Directory"

Sampler

Correcting for Instrument Drift

Managing Accounts Receivable

Tutorial

What Is a Database?

Database Basics

Using a Database

Date

You can use several built-in date formats or create custom date formats for use in your Microsoft Excel documents.

This topic explains:

- How Microsoft Excel stores dates

- Built-in date formats

  Formatting dates as you type

  Trouble-shooting date formats

  Using the Format Number command date to assign date formats

- Custom date formats

  Creating your own date formats

  Using a custom date format

  Deleting a custom date format

Note | All worksheet date formats also apply to macro sheets.

How Microsoft Excel Stores Dates

Though you can display dates in several standard formats, Microsoft Excel stores all dates as serial numbers. In Microsoft Excel, serial numbers for dates run from 1 to 65380, where 1 is the number for January 1, 1900, and 65380 is the number for December 31, 2078. For example, the serial number for 6/1/85 is 31199.

Note | In Microsoft Excel for Windows, version 2.0 or higher, the serial number 1 represents January 1, 1900. In Microsoft Excel for the Apple Macintosh, the serial number 1 represents January 2, 1904. If you create a file on the Macintosh and then open it under Windows, Microsoft Excel automatically changes to the 1904 date system and displays the dates correctly.

However, if you are creating a worksheet in the Windows version of Microsoft Excel, and plan to use that worksheet on the Macintosh version, you have to enter all dates under the 1904 date system or the dates will not display correctly on the Macintosh. For more information on controlling the 1904 date system, see **Options Calculation command**.

With dates stored as serial numbers, you can perform calculations using dates as you would other numbers. For example, using normal date formats, you can enter the date you purchase stock in one cell and enter the date you sell the stock in another cell. In a third cell, you can build a formula with references to these cells to subtract the two dates and find the number of days you held the stock. To calculate the formula, Microsoft Excel uses the serial numbers for those dates and displays the result.

Note | Microsoft Excel uses a decimal fraction added to the serial number to represent a specific time on a given date. For example, 31199.5 represents 12 noon on 6/1/85. For more information on time formats, see **Time**.

Built-in Date Formats

In Microsoft Excel, you can use the following built-in date formats:

Format	Examples
m/d/yy	2/13/88
d-mmm-yy	13-Feb-88
d-mmm	13-Feb
mmm-yy	Feb-88
m/d/yy h:mm	2/13/88 19:50

There are two ways to apply a built-in date format on a worksheet:

- **Format the date as you type.** You can type a date using one of the built-in formats in the preceding table; Microsoft Excel automatically stores the serial number and assigns the date format to the cell.
- **Assign a built-in date format with the Format Number command**. You can assign any built-in date format to a cell or range with the Format Number command before or after you type the data.

Note | Microsoft Excel also has several built-in worksheet functions for manipulating dates, times, and serial numbers. For more information, see *Microsoft Excel Functions and Macros*, a separate manual in your Microsoft Excel package.

Formatting Dates As You Type

Microsoft Excel displays a date format as close as possible to what you type. If you type a date into a cell formatted in General format or one of the built-in date formats, Microsoft Excel stores its serial number and displays it as a date. For example, when you type *10/26/87* in a cell with General format, Microsoft Excel stores its serial number, 32076, and assigns the format m/d/yy to the cell.

You can also type dates in formats other than the built-in choices. Type the date as you want it, using the following guidelines:

- **Punctuation:** You can use a slash (/) instead of a hyphen (–), or vice versa.
- **Date and time:** You can type a date and time in the same cell. You must separate the date and time by a space. For example, you could type either *4/23/88 16:48* or *4:48 PM Apr-88*.

- **Capitalization:** Use upper- or lowercase letters in date formats. Microsoft Excel ignores capitalization when you type dates.

Trouble-shooting Date Formats

Microsoft Excel displays non-built-in date formats as precisely as possible, but in some cases, it may interpret your formats slightly differently. Use the following trouble-shooting parameters if you're unsure about how Microsoft Excel is interpreting non-built-in date formats you type in:

- **Month name and single or double digit:** Microsoft Excel interprets a month name followed by a single or double digit to be a month and year. For example, if you enter February 4, Microsoft Excel formats it as Feb-04 and interprets it as 2/1/04, not February 4th. If you type Feb-13, Microsoft Excel interprets it as 2/1/13.
- **Entering dates in previously formatted cells:** If you enter a date in a cell with neither the General nor a date format, Microsoft Excel converts the date to a serial number but displays the value in the cell's format. For example, if you type *4-Apr* into a cell formatted to display dollar values, Microsoft Excel stores the serial number for the date, 31871, and displays it as $31,871. To display the number as a date, choose the Format Number command and select the date format you want.
- **Date formats Microsoft Excel does not recognize:** If Microsoft Excel does not recognize a date format you type, it stores the date as text instead of as a serial number. If you try to use the date in calculations that expect a number, Microsoft Excel returns the error value #VALUE!.

Tip | The formula bar shows how Microsoft Excel interprets a date format you type in. Check the cell entry there if you have questions about the formatting.

Using the Format Number Command to Assign Date Formats

1. Select the cells you want to format.
2. Choose Format Number.
3. In the list box, select a date format.
4. Choose the OK button.

Custom Date Formats

You can create your own date formats for specialized uses in Microsoft Excel documents. Using a custom format can also simplify data entry. For example, you can format a range with a complex custom date format, type the data using a simpler format, and Microsoft Excel will display the data in your custom format.

The following table shows the date format symbols you can use for creating custom date formats.

This format symbol	Means this
General	Display the number in General format.
d	Display the day as a number without leading zeros (1–31).
dd	Display the day as a number with leading zeros (01–31).
ddd	Display the day as an abbreviation (Sun–Sat).
dddd	Display the day as a full name (Sunday–Saturday).
m	Display the month as a number without leading zeros (1–12).
mm	Display the month as a number with leading zeros (01–12).
mmm	Display the month as an abbreviation (Jan–Dec).
mmmm	Display the month as a full name (January–December).
yy	Display the year as a two-digit number (00–99).
yyyy	Display the year as a four-digit number (1900–2078).

Note | If you use *m* or *mm* immediately after the *h* or *hh* symbol, Microsoft Excel displays the minute rather than the month. For more information, see **Time**.

Here are some examples of date formats you can create:

If a cell has this format	And you enter	Microsoft Excel displays
m-d-yy	4/1/87	4-1-87
mm dd yy	4/1/87	04 01 87
mmm d, yy	4/1/87	Apr 1, 87
mmmm d, yyyy	4/1/87	April 1, 1987

Creating Your Own Date Formats

You can create a custom date format in two ways:

- **Edit a built-in date format in the Format Number dialog box.** You can quickly create a custom format similar to one that already exists by editing a built-in format in the list box. Use the date format symbols shown in the table earlier in this section. When you choose the OK button, Microsoft Excel retains both the built-in format and your newly created custom format.
- **Type your own date format in the Format Number dialog box.** Using the date format symbols in the table earlier in this section, type the format you want in the Format text box.

To create a custom date format:

1. Select the cells you want to format.
2. Choose Format Number.
3. In the Format box, edit a built-in format or type a new format.
   Refer to the guidelines and table earlier in this topic, if necessary.
4. Choose the OK button.

Microsoft Excel formats the cells with the new format and adds it at the end of the list box so you can reuse it.

Using a Custom Date Format

1. Select the cells you want to format.
2. Choose Format Number.
3. Scroll to the end of the list box and select the custom format you want.
4. Choose the OK button.

Deleting a Custom Date Format

1. Choose Format Number.
2. Scroll to the end of the list box and select the custom format you want to delete.
3. Choose the Delete button.
4. Choose the OK button.

Note | You cannot delete a built-in date format.

Related Information

Reference

For information on	See
Worksheet, chart, and database basics	Worksheet Chart Database
Time formats	Time
Using built-in number and text formats	Number Text
General overview of formatting options	Formatting a document

Functions and Macros

"Date and Time Functions" in Chapter 2, "Worksheet Function Directory"

Continued

Sampler

Creating Calendars, Diagrams, Tables, and Forms

Creating an Automated Invoice System

Feature Guide

Worksheet Formatting Practices, "Creating Custom Date Formats"

Default settings

Default settings are the settings Microsoft Excel automatically uses when you start Microsoft Excel or when you create a new document. The worksheet and chart default settings are designed to help you produce a standard, presentable document without having to select your own settings. However, if you want to customize a document or use special formats, you can change settings that apply to an individual document without changing the defaults Microsoft Excel uses for other documents. You control most settings through the dialog box options for commands.

Note | Some options, such as color selection, depend on the settings used in Control Panel. You access Control Panel through the Control Run command. For more information on using Control Panel, see "Control Panel" in the Appendix.

This topic explains:

- Preset worksheet defaults

  General worksheet defaults

  Worksheet window display defaults

  Worksheet printing defaults

- Preset chart defaults

  Defaults for chart objects, display, and formats

  Chart printing defaults

- Preset workspace defaults
- Changing defaults in the startup file

Preset Worksheet Defaults

The tables in this section summarize the defaults for various worksheet settings. The right side of the table indicates the commands you use to control these defaults. Certain defaults such as display and printing settings usually apply to an entire worksheet. Other defaults you can change and apply either to an entire worksheet or to specific cells or cell ranges on a worksheet.

Note | All worksheet defaults also apply to macro sheets.

General Worksheet Defaults

Setting	Default	Controlled by
Alignment of cell entries	General (text aligned left, numbers aligned right, error and logical values centered)	Format Alignment
Automatic backup	Off	File Save As (choose Options button)
Border	Off	Format Border
Calculation (automatic/manual)	Automatic for all open worksheets	Options Calculation
Cell protection	Locked	Format Cell Protection and Options Protect Document
Column width	Standard (eight characters)	Format Column Width
Date	Serial numbers start at January 1, 1900	Options Calculation
Document protection	Unprotected	File Save As (choose Options button)
Filename extensions (individual files)	.XLS (worksheets) .XLM (macro sheets)	File Save As
File format	Normal	File Save As (choose Options button)
Font	10-point Helv normal	Format Font
Font set	10-point Helv normal, bold, italic, bold italic	Format Font (choose Options button)

Setting	Default	Controlled by
Iteration	Off; maximum iterations set at 100; maximum change set at 0.001	Options Calculation
Precision as displayed	Disabled (full precision)	Options Calculation
Number display format	General	Format Number
Remote references	Automatic update	Options Calculation
Row height in cells	Standard height; differs for each font size	Format Row Height
Shading	Off	Format Border

Worksheet Window Display Defaults

The following table summarizes preset worksheet display settings. These settings apply to any new window opened on a worksheet.

Setting	Default	Controlled by
Cell contents display (values/formulas)	Values displayed (formulas displayed in macro sheets)	Options Display
Color (background)	White	Control Panel (Window Background setting)
Color (gridlines and row/column headings)	Automatic	Options Display
Color (window text)	Black	Control Panel (Window Text setting)
Color formats (text and numbers in worksheets and charts)	Colors you specify	Format Number
Gridlines (show/hide)	Show	Options Display

Setting	Default	Controlled by
Info window contents display	Cell reference, formula, note displayed	Window Show Info (choose Info menu)
Row and column headings (show/hide)	Show	Options Display
Zero values (show/hide)	Show	Options Display; Format Number

Worksheet Printing Defaults

All printing defaults apply to the entire worksheet.

Setting	Default	Controlled by
Row and column headings	Print with	File Page Setup
Footers	Center and print the word "Page" plus page number	File Page Setup
Gridlines	Print with	File Page Setup
Headers	Center and print document name	File Page Setup
Margins	Left/right: 0.75 inch; top/bottom: 1 inch	File Page Setup
Note headings (cell references)	Print with	Row and Column Headings check box in File Page Setup
Number of copies	One	File Print
Orientation: vertical or sideways (portrait or landscape)	Varies by printer	File Printer Setup (choose Setup button)
Page breaks	Automatic (fit maximum number of rows and columns in each page)	Options Set Page Break
Page range to print	All	File Print

Setting	Default	Controlled by
Paper type	Varies with printer	File Printer Setup (choose Setup button)
Printer fonts	Varies according to printer	File Printer Setup; Control Panel (choose Install Fonts)
Print titles	Print without	Options Set Print Titles

Preset Chart Defaults

The following tables summarize the preset defaults for various chart settings and indicate the commands you use to control these defaults.

Note

The Automatic setting has two different effects. If you have a color display, various parts of a chart will first be assigned solid colors up to the eight available colors (or more if your machine supports them). If more than eight colors are needed, Microsoft Excel will rotate through the eight-color sequence with the addition of a pattern. This rotation continues through the eight colors, using one of the 16 different patterns. If you have a monochrome display, then Microsoft Excel rotates among the 16 patterns.

Some defaults for Automatic settings will change if you use the Preferences Screen Colors command in Control Panel to change the window background or window text colors. You can override this default as you would other defaults, by using the Microsoft Excel commands listed below.

Most of these settings apply to specific chart objects rather than globally to the entire chart document. However, in a few cases, you can apply a setting globally. For example, you can format all of the text in a chart by selecting the chart and choosing the Format Text command. For information on formatting chart text, see **Chart text**.

Defaults for Chart Objects, Display, and Formats

Setting	Default	Controlled by
Area patterns (legend)	Automatic	Format Patterns
Area patterns (chart area, plot area, text)	Invisible	Format Patterns
Area patterns (chart markers)	Automatic	Format Patterns

Setting	Default	Controlled by
Axes (show/hide)	Main chart: show category and value axes; overlay chart: hide category and value axes	Chart Axes
Borders (legend, data markers)	Automatic	Format Patterns
Borders (chart area, plot area, text)	Invisible	Format Patterns
Category axis formats	Value axis crosses category axis at first category; one category between tickmark labels; value axis crosses between categories	Format Scale
	Tickmark label position next to axes; major tickmarks: cross; minor tickmarks: none	Format Patterns
	Axis lines: Automatic	Format Patterns
Chart legend (show/hide)	Hide	Chart Add Legend
Chart legend position	Vertical (centered along right side of chart)	Format Legend
Chart legend data series labels	Data series names in series formula	Editing the series formula
Chart type (main)	Column chart	Format Main Chart
Chart type (overlay)	Line chart	Format Overlay
Color (text)	Automatic	Format Font
Filename extension (charts)	.XLC	File Save As
Font	Helv 10, normal	Format Font

Setting	Default	Controlled by
Gridlines (category and value axes)	Hide	Chart Gridlines
Labels (category tick-marks)	Uses categories of series 1 (for more information, see **Series formula** and **Chart**)	Editing the series formula; Edit Copy/ Paste Special
Line patterns (axis, line charts, gridlines, hi-lo lines, drop lines)	Automatic	Format Patterns
Plotting of data series in chart (based on worksheet selection)	Plots fewer data series than data points	Edit Paste Special (for more information, see **Data series**)
Tickmark label patterns	Tickmark labels next to axis; major tick-marks: cross; minor tickmarks: none	Format Patterns

Chart Printing Defaults

Setting	Default	Controlled by
Dimensions (fit to page/screen size/full page)	Fit to page	File Page Setup
Footers	Center and print "Page" plus page number	File Page Setup
Headers	Center document name	File Page Setup
Image height and width	Varies by printer	File Page Setup
Margins	Right/left: 0.75 inch; top/bottom: 1 inch	File Page Setup
Number of copies	One	File Print
Orientation: vertical or sideways (portrait or landscape)	Varies by printer	File Printer Setup (choose Setup button)
Paper type	Varies by printer	File Printer Setup (choose Setup button)

Preset Workspace Defaults

The default workspace settings affect all open documents.

Setting	Default	Controlled by
Filename extension	.XLW	File Save Workspace
Fixed decimal placement	Off; when turned on, set to 2	Options Workspace
Formula bar (show/hide)	Show	Options Workspace
Menus displayed (full/short)	Short menus	Options Full Menus; Options Short Menus
Reference style	A1	Options Workspace
References (macro recording)	Absolute	Macro Relative Record; Macro Absolute Record
Remote requests from other applications (receive/ignore)	Receive remote requests	Options Workspace
Scroll bars (show/hide)	Show	Options Workspace
Status bar (show/hide)	Show	Options Workspace

Changing Defaults in the Startup File

You can customize some of the settings Microsoft Excel uses at startup. To do this, you modify the WIN.INI file, which determines many of these settings. The WIN.INI file is usually in the same DOS directory as Microsoft Excel.

Note Changing the startup file is recommended for advanced users only. The options discussed here are special features which only affect the way Microsoft Excel appears, but do not alter the way the program functions. You do not need to change these settings to use Microsoft Excel.

You can examine and change the WIN.INI file with almost any text-editor or word-processor such as Microsoft Word, Windows Write, or Edlin.

Important Be sure to save the WIN.INI file without any formatting — sometimes called "text only" or "ASCII format" by various word-processors.

Near the end of the file you will find a section labeled "[Microsoft Excel]." You can enter or change the following lines in that section.

- *open=c:\document name* Opens any documents you specify automatically when Microsoft Excel starts. You must type the entire DOS path for every document, with a space between documents. Otherwise, Microsoft Excel may not find the documents if you start it from the wrong directory.
- *font=font name, font size* Sets the font and font size for the formula bar, status bar, or Info window in new worksheets and new macro sheets. The styles of the four font choices listed in the Format Font dialog box will remain the same, and only the font and size change.
- *maximized=1* Causes Microsoft Excel to fill the entire screen when you start. If set to zero, Microsoft Excel only partially fills the screen, unless it was maximized the last time the program was used.
- *entermove=0* Determines whether the cell below the active cell becomes active after you enter a formula with the keyboard ENTER key. If set to 1, the next cell becomes active. If a range of cells is selected, the next cell always becomes active.

Note | For changes to the WIN.INI file to take effect, you must restart Microsoft Excel.

Related Information

Reference

For information on	See
Summary of major worksheet, chart, and database features; technical details	Features and specifications
Running Microsoft Excel off a network with your preferred settings	Networks with Microsoft Excel
Using Control Panel	Appendix
Worksheet, chart, database, worksheet, and windows basics	Worksheet Chart Database Windows Workspace file

For information on	See
General overview of formatting options for worksheets, macro sheets, and charts	Formatting a document
Printing worksheets, macro sheets, and charts	Printing a document

Deleting a document

When you need to delete a document from a disk, you don't have to quit Microsoft Excel. You can delete documents from within Microsoft Excel using the File Delete command.

Deleting a Document (Full Menus)

1. Choose File Delete.
2. In the list box, select the document you want to delete.
3. Choose the OK button.

   Microsoft Excel asks for confirmation before deleting the document. After you delete a document, the File Delete dialog box remains on the screen so you can select and delete other documents.
4. Choose the Cancel button to close the dialog box.

   The Cancel button does not cancel the command — it closes the dialog box. Documents you deleted before canceling remain deleted.

Important The File Delete command cannot be reversed with the Edit Undo command. If you delete a document from your disk, you can't retrieve it. However, File Delete removes the document from the disk, but not from memory. If you inadvertently delete a document, you can save it again on your disk with the File Save As command while the document is still open in memory.

Related Information

Reference

For information on	See
Worksheet and chart basics	Worksheet Chart
Saving documents	Saving and closing a document

Deleting and clearing data

Deleting and **clearing** are two ways to remove data from a Microsoft Excel document. The distinction between the two techniques is very important for worksheets and macro sheets. Clearing a cell clears the contents, formats, or notes — or all three — from that cell, but leaves the cleared cell within the structure of the worksheet. Deleting a cell completely removes the cell and everything in it from the worksheet, and closes up the space that was occupied by the deleted cell.

This topic explains:

- Clearing versus deleting cells
- Clearing data from a cell
- Deleting a cell
- Deleting a row or column
- Deleting data from a chart
- Deleting other types of data

Clearing Versus Deleting Cells

Clearing and deleting cells produce different results for formulas that reference those cells. If a cell is cleared, its value is zero; a formula referring to that cell will get a value of zero from that cell. If a cell is deleted, it no longer exists; a formula referring to the deleted cell will not be able to find it and returns the error value #REF!.

This difference can be very significant, because clearing a cell when you mean to delete it might produce erroneous data. For example, you might have a formula that gives you an average of the values in a group of cells. If you clear half of those cells, they will contain a value of zero, but are still counted as part of the average. If you delete the cells, the formula that gives you the average displays the error value #REF! to let you know that you have to adjust your formula.

Note | You should always use caution when deleting cells. However, should you inadvertently delete cells you want to keep, you can put them back by immediately choosing the Edit Undo command before doing anything else on your worksheet.

Notes that are attached to deleted cells are deleted with the cells. Notes which belong to shifted cells follow the cells to their new locations.

Clearing Data from a Cell

Use the Edit Clear command to clear a cell's contents, format, or note, or all three. A cell's format includes number format, alignment, protection, or borders you have set with a command from the Format menu.

1. Select the cell or cell range you want to clear.
2. Choose Edit Clear.
3. Select the option you want.
4. Choose the OK button.

Tip If you want to clear formulas, values, formats, and notes from an entire worksheet, it's easier to create a new worksheet using the File New command.

Deleting a Cell

1. Select the cell or cell range you want to delete.
2. Choose Edit Delete.

   If you delete a single cell or a cell range, Microsoft Excel displays a dialog box so you can decide how to shift the remaining cells.
3. Select Shift Cells Left or Shift Cells Up.
4. Choose the OK button.

Microsoft Excel deletes the selected cells and shifts the other cells in the worksheet to fill the space.

Deleting a Row or Column

1. Select the rows or columns you want to delete.
2. Choose Edit Delete.

crosoft Excel automatically shifts the remaining cells to the left or up to the space.

Deleting Data from a Chart

This section presents a brief summary of each procedure for deleting data from a chart. For more information, see the related topics, as indicated.

To delete attached or unattached text in a chart:

- Select text to display the contents in formula bar, press BACKSPACE, and press ENTER.
- For the step-by-step procedure, see **Chart text**.

To delete a data series from a chart:

- Select one of the data series markers to display series formula in formula bar, press BACKSPACE, and press ENTER.
- For the step-by-step procedure, see **Data series**.

Note

Deleting a data series from a chart does not delete the source data from the worksheet. However, deleting the source cells of the data series from the worksheet also deletes the data series from the chart and closes up the space along the category axis occupied by the data series markers. Clearing the source cells clears the data series from the chart, but does not close up the space occupied by the data series markers along the category axis.

Deleting Other Types of Data

This section presents a brief summary of each procedure for deleting other types of data. For more information, see the related topics, as indicated.

To delete a document (Full menus only):

- Choose File Delete, select the document in the list box, and choose the OK button.
- For the step-by-step procedure, see **Deleting a document**.

To delete a name:

- Choose Formula Define Name, select the name in the list box, and choose the Delete button.
- For the step-by-step procedure, see **Names**.

To delete a cell note:

- Choose Formula Note, select the note in the list box, and choose the Delete button.
- For the step-by-step procedure, see **Notes**.

To delete a custom number format:

- Choose Format Number, select the number format in the list box, and choose the Delete button.
- For the step-by-step procedure, see **Number**.

Related Information

Reference

For information on	See
Editing, formatting, or deleting documents	Editing a document Formatting a document Deleting a document
Editing text in a chart	Chart text
Chart data series	Data series
Using names and notes	Names Notes

Directories

A **directory** consists of a convenient grouping of documents and programs you store on a hard disk or floppy disk. In Microsoft Excel, as in most other MS-DOS-based and Microsoft Windows-based applications, you store documents and programs as **files** in directories. A directory is like a file drawer that stores a particular group of files. In addition to files, a directory can contain lower levels of directories called **subdirectories**, which can contain their own files.

Because Microsoft Excel operates in the Microsoft Windows graphics environment, an extension of the MS-DOS operating system, you can organize directories as you do for other MS-DOS-based applications. For example, you can set up the Microsoft Excel program files in one directory and keep a separate directory for document files you create with Microsoft Excel. If you're running Microsoft Excel under Microsoft Windows, version 2.0 or higher, you can access all Windows and non-Windows applications, files, directories, and disks from the Windows environment. You can also control all MS-DOS-related tasks such as directory or file management and formatting disks.

This topic explains:

- Essential terms
- How Microsoft Excel uses the current directory
- Techniques for working with directories

This topic does not discuss all procedures and conventions related to working with directories and files under MS-DOS or Microsoft Windows. For more information, see the MS-DOS documentation included with your computer or the *Microsoft Windows User's Guide*, a manual included in your Microsoft Windows package.

Essential Terms

This section lists key terms related to directories and file management with Microsoft Excel:

File — in Microsoft Excel, each separate document you create (worksheet, chart, or macro sheet), in the form in which it is stored on your disk.

Note

This topic focuses on managing document files in directories. There are two other types of Microsoft Excel files: workspace files and program files. A workspace file consists of a list of documents open in the workspace at one time that you can use to reopen those same documents together. Program file include, for example, EXCEL.EXE, the main program file for Microsoft Excel, and CONTROL.EXE, the file for the Control Panel, a utility program included with Microsoft Excel. For more information on workspace files and on utility programs included with Microsoft Excel, see **Workspace file** and **Windows**, respectively.

Filename — the name of a particular document or program, including its file extension (if any).

Drive — the disk drive in which a directory is stored.

Current directory — the default directory Microsoft Excel uses at a given time for file access operations such as opening and saving.

Root directory — the main or highest-level directory. There is one root directory for each of your computer's disk drives (A:, B:, C:, and so on).

Subdirectory — a directory within a directory. A root directory can have subdirectories, and those subdirectories can in turn have their own subdirectories. To get to a subdirectory, you must go through each directory in the levels above it, beginning with the root directory.

Pathname — the complete information needed to specify a particular file — for example, C:\WORK\REGIONS\WEST.XLS. This example is a full pathname that includes:

- Disk drive. In the example, C: is the disk drive.
- Root directory. In the example, the first backslash (\) represents the root directory.

- Each subdirectory leading to the file (each followed by a backslash). In the example, WORK and REGIONS are subdirectories in descending levels from the root directory.
- The filename and file extension (if any). In the example, WEST is the filename and .XLS is the file extension.

Note | For an illustration of the relationship between the root directory, subdirectories, and files plus additional examples of using pathnames see "Managing Linked Worksheets in Different Directories," under **Linking documents.**

How Microsoft Excel Uses the Current Directory

At any given time, Microsoft Excel is set to use a specific directory on your hard disk or floppy disks for file access operations such as opening or saving documents. This directory is called the current directory.

When you first start Microsoft Excel, the current directory will usually be the one in which you installed the Microsoft Excel program on your hard disk. You can store Microsoft Excel documents in this directory, but you may prefer to store them in one or more directories organized by types of documents, frequency of use, current documents and archived documents, and so on.

You can open or save a document in a directory other than the current directory by typing its full pathname in the File Open or File Save As dialog boxes. However, if you plan to access a different directory frequently during a work session, you can save yourself the work of typing full pathnames by changing the Microsoft Excel current directory (see the next section in this topic for techniques).

Microsoft Excel defaults to the current directory under the following conditions:

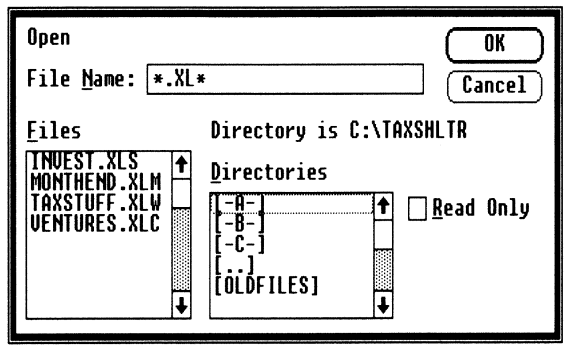
- If you use the File Save As command to save a document without specifying a path in the Save Worksheet As box, Microsoft Excel saves it in the current directory.
- If you choose the File Open command or File Delete command, Microsoft Excel displays in the Files list box the names of documents in the current directory.
- If you choose the File Open command, specify a document name without a path in the File Name box, and choose the OK button, Microsoft Excel looks for the specified document in the current directory.
- If you type a document name in an external reference in a formula without including a path, Microsoft Excel searches the current directory for the document referred to in the external reference.

For a summary of techniques for working with directories using the File Open dialog box, see the next section in this topic. For more information on using the File Open command, see **Opening a document**.

For more information on using the File Save As command or the File Delete command, see **Saving and closing a document** and **Deleting a document**, respectively. For more information on external references, see **Linking documents**.

Techniques for Working with Directories

You can use the File Open dialog box to work with directories in several ways. The following illustration shows the parts of the File Open dialog box:



The following table lists techniques for working with directories in the File Open dialog box:

To	Choose File Open and do this
Open a file in the current directory	Select the file in the Files list box, or type the name of the file in the File Name text box. Then choose the OK button.
Open a file in another directory without changing the current directory	Type the full pathname of the file in the File Name text box. Then choose the OK button.
Change the current directory to a different directory and display all files in that directory in the Files list box	In the File Name text box, type the entire path to the directory, followed by *.* (for example, *C:\OLDFILES**.*). Then choose the OK button.

To	Choose File Open and do this
Change the current directory to a different directory and display only files with Microsoft Excel extensions in the Files list box	In the File Name text box, type the entire path to the directory, followed by *.*XL** (for example, *C:\OLDFILES*.XL**). Then choose the OK button.
Change the current directory to the directory that is one level closer to the root directory	Select the double periods [..] in the Directories list box or type .. in the File Name text box. Then choose the OK button.
Change the current directory to a subdirectory of the current directory	Select a bracketed name in the Directories list box (for example, [OLDFILES]), or type the name without brackets in the File Name text box. Then choose the OK button.
Change the current directory to another drive	Select one of the bracketed drive letters in the Directories list box (for example, [-A-]) or type the name of the drive, followed by a colon (for example, *A:*). Then choose the OK button.

You can also change the current directory from the File Delete dialog box and from the File Links dialog box when you choose the Change button. For more information, see **Deleting a document** and **Linking documents**, respectively.

Note

If you are running Microsoft Excel under Microsoft Windows, version 2.0 or higher, you can use the MS-DOS Executive, an application for managing documents, directories, and other programs from Windows. For information on the MS-DOS Executive, see the *Microsoft Windows User's Guide*, a manual included in your Microsoft Windows package.

Related Information

Reference

For more on	See
Starting or quitting Microsoft Excel	Starting Microsoft Excel Quitting Microsoft Excel
Opening or saving documents	Opening a document Saving and closing a document
Guidelines for naming documents and using filename extensions	Saving and closing a document

Display options

The Microsoft Excel display options include techniques for viewing several areas of a worksheet at one time and freezing titles. These options simplify tasks involving large worksheets. Other options include display formats that streamline analysis or enhance the onscreen appearance of worksheets, especially for presentations.

This topic explains:

- Viewing several areas of a worksheet

  Opening multiple windows

  Splitting a worksheet window into panes

  Freezing worksheet titles

- Display formats

  Displaying formulas or values

  Hiding or displaying zero values

  Hiding or displaying gridlines

  Hiding or displaying row and column headings

  Changing the color of gridlines and headings

Note | All worksheet display options also apply to macro sheets.

Viewing Several Areas of a Worksheet

It's often helpful to look at different parts of a large worksheet or macro sheet at the same time. For example, you may want to compare the effects of a "what-if" analysis on widely scattered data on a worksheet. Or, if your worksheet contains a database, you might find it convenient to view your criteria range while finding records in the database range.

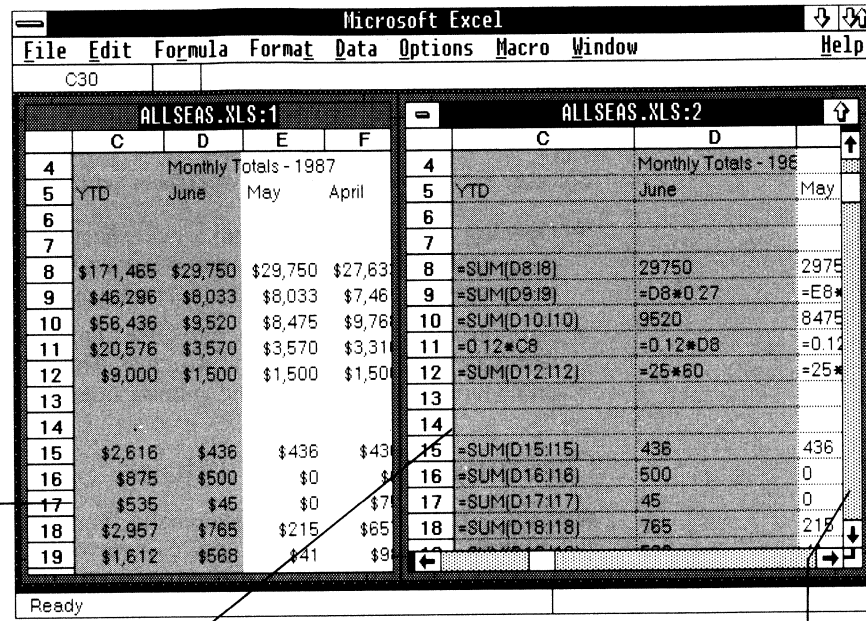
You can view several parts of a worksheet with two techniques:

- Opening multiple windows into a worksheet lets you look at different parts of the worksheet in separate windows that you manipulate like any other window. You can specify different settings for individual windows.
- Splitting a worksheet window into panes lets you see separate parts of the worksheet and also scroll them together. This technique is also part of the procedure for freezing row and column titles.

Opening Multiple Windows

With the Window New Window command, you can open as many windows as you want into one worksheet. You can move and size multiple windows however you like. This option also allows you to set different display options for the worksheet: for example, you can display values in one window and formulas in another.

The following illustration shows two windows into the same worksheet:



If you are viewing and working in different parts of the same worksheet, any change you make in one window takes effect in all other windows into the document. You see your change in the other windows when you scroll each window to the area where the change occurred.

Note that opening multiple windows is different than opening a new worksheet with the File New command, which creates a whole new worksheet. The Window New Window command simply creates another window into the same worksheet.

To open a new window into a worksheet:

1. Activate the window for the worksheet you want.

   To move between windows with the keyboard, press CONTROL + F6; with the mouse, click the window you want.

2. Choose Window New Window.

Tip If you want to see the formulas and values for a given worksheet area at the same time, open multiple windows into the worksheet. Display formulas in one and values in the other window. For more information, see "Displaying Formulas or Values," later in this topic.

Splitting a Worksheet Window into Panes

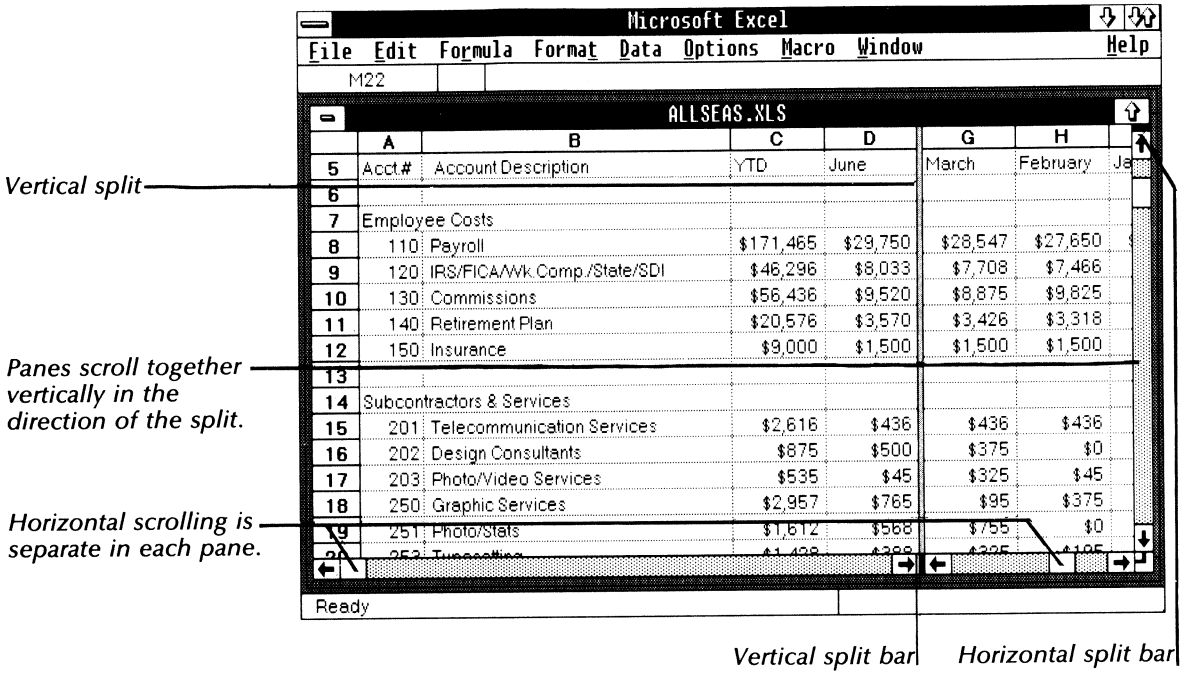
Splitting a worksheet window into panes has two uses, both of which are helpful for large worksheets:

- Opening two or more panes into a worksheet to view and scroll separate parts of the document in parallel. This technique streamlines tasks involving data entry, editing, and comparisons of data in widely scattered sections of the worksheet.
- Freezing row or column titles as points of reference for moving through a large worksheet (before you freeze titles, you use the procedure for splitting a window into panes). For more information on this technique, see the next section in this topic, "Freezing Worksheet Titles."

To view and scroll separate parts of a worksheet in parallel, you can split any worksheet window vertically, horizontally, or in both directions. The panes scroll together along the direction of the split: panes on either side of a vertical split scroll together vertically; panes above and below a horizontal split scroll together horizontally.

For example, with horizontal panes across the middle of the worksheet window, you can view a block of eight rows in the top half of your screen and eight rows in a different section of the worksheet on the bottom half. Scrolling horizontally displays the same columns in both panes.

The following illustration shows a worksheet window split into vertical panes:



	A	B	C	D	G	H
5	Acct.#	Account Description	YTD	June	March	February
6						
7	Employee Costs					
8	110	Payroll	$171,465	$29,750	$28,547	$27,650
9	120	IRS/FICA/Wk.Comp./State/SDI	$46,296	$8,033	$7,708	$7,466
10	130	Commissions	$56,436	$9,520	$8,875	$9,825
11	140	Retirement Plan	$20,576	$3,570	$3,426	$3,318
12	150	Insurance	$9,000	$1,500	$1,500	$1,500
13						
14	Subcontractors & Services					
15	201	Telecommunication Services	$2,616	$436	$436	$436
16	202	Design Consultants	$875	$500	$375	$0
17	203	Photo/Video Services	$535	$45	$325	$45
18	250	Graphic Services	$2,957	$765	$95	$375
19	251	Photo/Stats	$1,612	$568	$755	$0

Note If you have opened multiple windows into one worksheet (see preceding section in this topic) you can also specify different splits for panes in each of those windows.

To split a window into panes with the keyboard:

1. Activate the worksheet window.
2. Choose Control Split (ALT, HYPHEN, T).

   A four-headed arrow is displayed next to the Control menu. Two gray split bars extend from the arrow, one across the top of the column headings and one down the left side of the row headings.
3. For vertical panes, use the RIGHT and LEFT keys to line up the gray split bar with the right edge of the column where you want to divide the window.

   For horizontal panes, use the UP and DOWN keys to line up the split bar with the bottom edge of the desired row.
4. Press ENTER.

To move among panes, press F6.

To remove splits from a window with the keyboard:

1. Follow steps 1–3 of the preceding procedure to move the split bars back to the window border.
2. Press ENTER.



To split a window into panes with the mouse:

1. For vertical panes, point to the vertical split bar and press the mouse button (see preceding illustration). For horizontal panes, point to the horizontal split bar.

   The vertical split bar extends as a gray bar down the left side of the row headings. The horizontal split bar extends as a gray bar across the top of the column headings. The mouse pointer turns into a two-way arrow indicating vertical or horizontal direction.
2. Drag the split bar until it lines up with the right edge of the column or the bottom edge of the row where you want to divide the window.
3. Release the mouse button.

To move among panes, click the pane you want.

To remove splits from a window with the mouse:

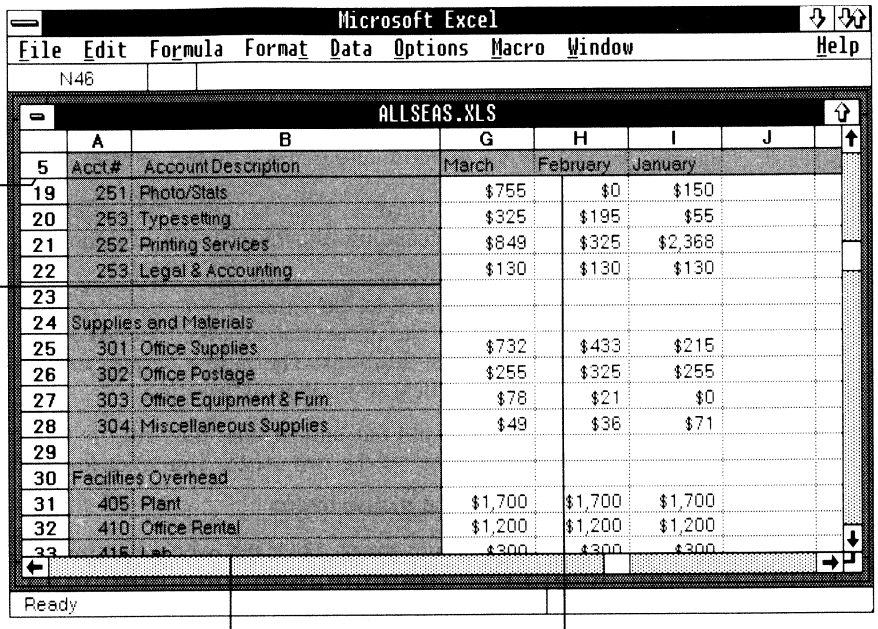
- Drag the split bars back to the window border.

For more information on the parts of a window, see **Windows**.

Freezing Worksheet Titles (Full Menus)

Freezing worksheet titles lets you display designated rows and/or columns on the screen at all times. This is useful for scrolling through a long worksheet and keeping track of titles that pertain to a given section of the worksheet but are out of the display boundary of the worksheet window. To freeze titles, you use the technique for splitting a window into panes (see preceding section in this topic) in combination with the Freeze Panes command.

The following illustration shows how this technique works:



Split window horizontally below row 5.

Split window vertically at right edge of column B.

Freeze Panes command freezes area shown tinted here, so that those titles remain displayed as you scroll vertically and horizontally.

To freeze titles in a column	To freeze titles in a row	To freeze both column and row titles
1 Create vertical panes. The split should be at the right edge of the cells with titles you want to freeze. 2 Choose Options Freeze Panes.	1 Create horizontal panes. The split should be at the bottom edge of the cells with titles you want to freeze. 2 Choose Options Freeze Panes.	1 Create vertical and horizontal panes. The splits should be to the right and just below the cells with the titles you want to freeze. 2 Choose Options Freeze Panes.

When a worksheet window with frozen titles is active, the Options Freeze Panes command changes to Options Unfreeze Panes.

To unfreeze titles:

1. Activate the window.
2. Choose Options Unfreeze Panes.

Note | If you have opened multiple windows into one worksheet (see "Opening Multiple Windows," earlier in this topic), you can freeze different titles in each window.

Display Formats

For each worksheet window, you can set any of the display formats discussed in this section. This means that you can use different display formats for each of several windows into a single worksheet.

Displaying Formulas or Values

When you first open a new worksheet window, Microsoft Excel automatically displays values in the worksheet cells. If a cell value is the result of a formula, you see the formula only when you select the cell, which displays the formula in the formula bar.

You can change the worksheet window so that cell formulas instead of values are displayed throughout the worksheet. This option is useful for creating templates or debugging a worksheet model.

A new macro sheet automatically displays formulas in cells. You can also change this default and display values instead.

Note | Formulas are always displayed left-aligned. Any special alignment formats you've set with the Format Alignment command appear only when you display values. For more information on aligning worksheet entries, see **Alignment**.

To display formulas	To display values
[1] Choose Options Display. [2] Turn on the Formulas check box. [3] Choose the OK button. Microsoft Excel doubles the widths of all columns and displays all cell formulas on the worksheet. If a formula is too long, Microsoft Excel displays as much as will fit in the cell.	[1] Choose Options Display. [2] Turn off the Formulas check box. [3] Choose the OK button.

For more information on macro sheets, see *Microsoft Excel Functions and Macros*, a separate manual included in your Microsoft Excel package.

Hiding or Displaying Zero Values

In each worksheet window, you can specify whether or not you want cell values equal to zero to be hidden or displayed. Hiding zero values keeps the worksheet from appearing cluttered with cells that contain only zeros.

Important Because cells with hidden zero values appear to be empty, it's very easy to inadvertently replace them with other cell entries. To avoid potential errors, you should lock the cells with the Format Cell Protection and Options Protect Document commands. For more information, see **Protecting or hiding data**.

To hide zero values:

[1] Choose Options Display.

[2] Turn off the Zero Values check box.

[3] Choose the OK button.

To display hidden zero values:

[1] Choose Options Display.

[2] Turn on the Zero Values check box.

Note The Zero Values setting will not take effect in cells already formatted with the Format Number command to display an explicit value for zeros — for example, 0.00 ;(0.00);0. The Format Number setting overrides the Options Display/Zero Values setting. For more information on number formats, see **Number**.

Hiding or Displaying Gridlines

To make worksheet formats such as borders and shading stand out, you can hide the gridlines.

1. Choose Options Display.
2. Turn off the Gridlines check box.
3. Choose the OK button.

To display hidden gridlines:

1. Choose Options Display.
2. Turn on the Gridlines check box.

Note

To hide or show gridlines when printing a worksheet, you use a separate setting in the File Page Setup command. For more information, see **File Page Setup command**.

Hiding or Displaying Row and Column Headings

You can hide the column and row headings (letters and numbers in A1 format; numbers in R1C1 format) usually displayed at the top and left edges of the worksheet window.

1. Choose Options Display.
2. Turn off the Row and Column Headings check box.
3. Choose the OK button.

To display hidden row and column headings:

1. Choose Options Display.
2. Turn on the Row and Column Headings check box.

Note

To hide or show column and row headings when printing a worksheet, you use a separate setting in the File Page Setup command. For more information, see **File Page Setup command**.

Changing the Color of Gridlines and Headings

You can specify a color for gridlines and row and column headings in each worksheet window. This makes it easy to identify different worksheets (or multiple windows into one worksheet) if you're working with several documents.

1. Choose Options Display.
2. In the Gridline and Heading Color box, select the color you want.
3. Choose the OK button.

Repeat steps 1–3 for each window you want to format.

Related Information

Reference

For information on	See
General overview of formatting worksheets (including display formats)	Formatting a document
Aligning cell entries in worksheets	Alignment
Using borders and shading in worksheets	Borders and shading
Displaying short or full menus	Command, menu, and dialog box
Using the R1C1 reference style	References
Color display options	Color
Keyboard commands for working in windows	Keyboard Windows

Sampler

Preparing a New Business Plan

Creating Calendars, Diagrams, Tables, and Forms

Calculating a Sales Commission

Tutorial

Changing How a Worksheet Looks

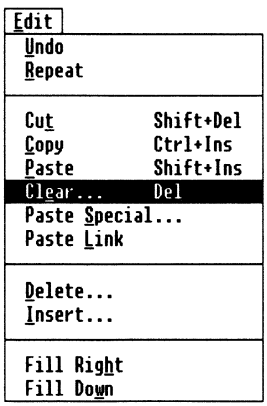
Feature Guide

Multiple Windows

Divergence

During iteration — a process of repeated calculation to resolve circular references — **divergence** occurs when the difference between results from one iteration to the next becomes larger and larger. When this happens, Microsoft Excel continues to iterate until it completes the maximum number of iterations you specified in the Options Calculation dialog box, or until you press ESCAPE to cancel iteration. For more information, see **Iteration** and **Convergence**.

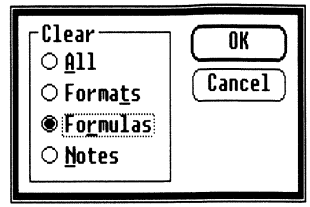
Edit Clear command



Removes data, formats, or both from the active document. Edit Clear works differently when a worksheet or macro sheet is the active document than when a chart is the active document. **Shortcut key:** DELETE.

Worksheet

When a worksheet or macro sheet is the active document, Edit Clear clears the contents, formats, notes, or all three from the selected cells. If the formula bar is active, Edit Clear clears only the part of the formula that is selected.



Clear

All	Clears the contents, formats, and notes from the selected cells. The cells become blank and return to General format.
Formats	Clears the formats of the selected cells, but leaves the contents and notes intact. The cells return to General format.
Formulas	Clears cell contents from the selected cells without affecting the formats or notes.
Notes	Clears the notes from the selected cells, but leaves the contents and formats intact.

Clearing Versus Deleting

Important

Edit Clear removes the contents of the selected cells; the Edit Delete command removes not only the contents, but also the cells themselves. This difference is important when other cells have formulas that refer to the cleared or deleted cells.

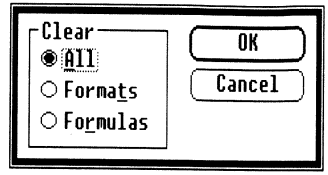
A formula containing a reference to a cleared cell assumes that the cleared cell has a value of zero. A formula containing a reference to a deleted cell is unable to find the deleted cell and displays the #REF! error value.

For example, if you have a formula that calculates the average of the values in a group of cells, and you clear half of the cells, the formula still calculates an average of all of those cells, even though half of them now have a zero value. If the same cells were deleted, the formula would produce the #REF! error value to let you know that you should change the formula to refer only to the cells you want the average of.

Chart

When a chart is the active document, and the entire chart has been selected with the Chart Select Chart command, Edit Clear clears the chart's data series, format, or both.

If the formula bar is active, Edit Clear clears only the part of the formula that is selected.

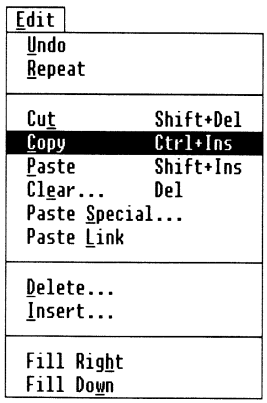


Clear

All	Clears all data series and the chart format
Formats	Clears the chart format without affecting the data series. The chart is reformatted with format 1 from the Gallery Column dialog box.
Formulas	Clears all data series from the chart without affecting the chart format

For more information, see **Formatting a document**.

Edit Copy command



Defines the selection that will be copied when you choose the Edit Paste or Edit Paste Special command. The selection can be cells on a worksheet, an entire chart, or characters in the formula bar of a worksheet or chart.
Shortcut key: CONTROL + INSERT.

When you choose Edit Copy while the formula bar is active, Microsoft Excel puts a copy of the selected characters into the Clipboard, replacing the Clipboard's contents. After you copy a selection, you can use the Edit Paste command to paste it in the formula bar at the insertion point.

Worksheet

You can copy cells from the worksheet or characters from the formula bar.

To copy cells, select the cell range you want to copy. The selection must be a single, continuous rectangular area. When you choose Edit Copy, Microsoft Excel outlines the selection with a marquee.

After you copy a cell range, you can paste it into other cells on the worksheet, or create a data series in a chart. For information on pasting copied data, see **Edit Paste command** and **Edit Paste Special command**.

If you move to a different application after choosing Edit Copy, the marqueed selection is copied to the Clipboard. You can then paste the data from the Clipboard into the other application. For more information, see **Copying data and formats**.

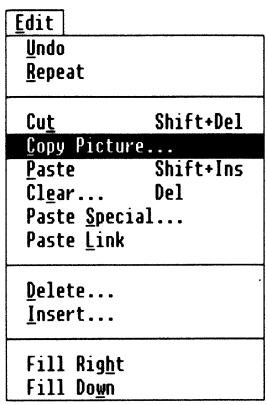
Chart

You can copy the data series and format of the whole chart, or of characters from the formula bar.

To copy a chart to another chart, choose Edit Copy, activate the chart you want to copy to, and use either the Edit Paste or Edit Paste Special command to paste the copied chart.

For more information on commands and procedures for copying a chart, see **Copying data and formats**. For more information on charts, see **Chart**.

Edit Copy Picture command

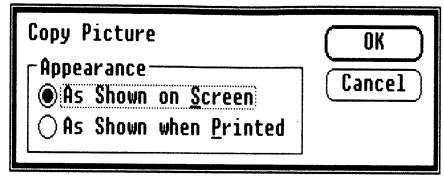


Copies a pictorial representation of the current selection into the Clipboard. From the Clipboard, you can paste the copied picture into another application. For example, you can paste a picture of a chart or part of a worksheet into a report you are creating in a word processor.

Copy Picture appears on the Edit menu only if you hold down SHIFT when you select the Edit menu. Copy Picture appears in place of the Copy command. For information on shifted commands, see **Command, menu, and dialog box**.

Worksheet

Edit Copy Picture copies a picture of the selected part of the worksheet. When you copy the selection, you can choose how you want it copied.

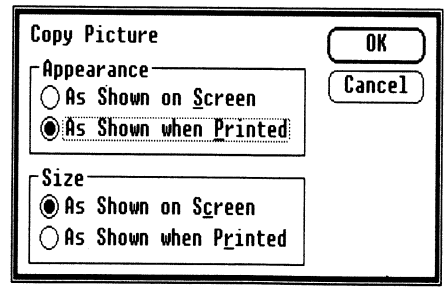


Appearance

As Shown On Screen	Copies exactly what you see on the screen. If you paste the picture into another document, when you print that document the picture may appear differently than if you were to print it directly from Microsoft Excel.
As Shown When Printed	Copies what you would see if you printed the selection. The picture varies depending on what kind of printer you have.

Chart

When you copy a picture of a chart, you can control both its appearance and its size.



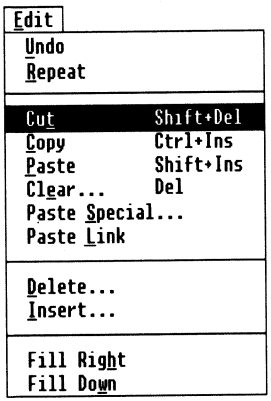
Appearance

As Shown On Screen	Copies exactly what you see on the screen. If you paste the picture into another document, when you print that document the picture may appear differently than if you were to print it directly from Microsoft Excel.
As Shown When Printed	Copies what you would see if you printed the chart. The picture varies depending on what kind of printer you have.

Size

As Shown On Screen	Copies the picture in the same size as the size of the window in which the chart is displayed. You can change the size of the picture by changing the size of the window before you copy the picture.
As Shown When Printed	Copies what you would see if you printed the chart. The picture varies depending on the shape of the window, the kind of printer you have, and the Size setting in the File Page Setup dialog box.

Edit Cut command



Defines a selection that will be moved when you choose the Edit Paste command. The selection can be cells on a worksheet, or characters in the formula bar of a worksheet or chart. If you want to use the Edit Paste Special command, you must precede it with the Edit Copy command. **Shortcut key:** **SHIFT + DELETE**.

When you choose Edit Cut while the formula bar is active, Microsoft Excel removes the selected characters from the formula and puts them into the Clipboard, replacing the Clipboard's contents. After you cut a selection, you can use the Edit Paste command to paste it in the formula bar at the insertion point.

Worksheet

You can cut cells from the worksheet or characters from the formula bar.

To move cells, select the cell range you want to move. The selection must be a single, continuous rectangular area. When you choose Edit Cut, Microsoft Excel outlines the selection with a marquee, but does not move it until you choose the Edit Paste command.

Important

Edit Cut and Edit Delete affect cells differently. Edit Cut is the first step in moving the contents and formats of cells to another part of the worksheet or to a different worksheet. Edit Delete completely removes cells from the worksheet and closes up the space they occupied. You cannot paste deleted cells.

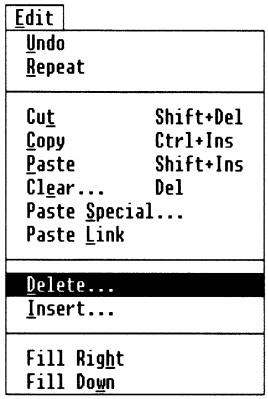
For more information, see **Moving data on a worksheet**.

Chart

In a chart, Edit Cut works only on characters in the formula bar. You cannot cut objects from a chart.

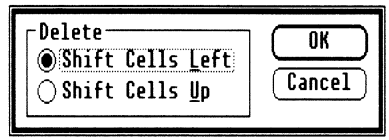
For more information, see **Moving data on a worksheet** and **Chart**.

Edit Delete command



Removes the selected cells from the worksheet and shifts other cells to close up the space. **Shortcut key:** CONTROL + – (minus sign).

When you delete entire rows or columns, there is only one direction to shift the remaining cells, so Edit Delete does it automatically. When you delete a selection smaller than an entire row or column, a dialog box appears:



Delete

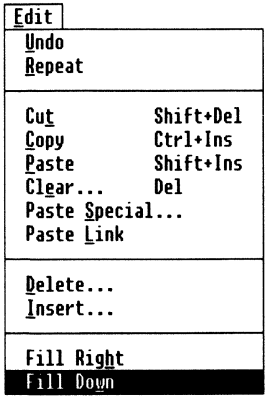
Shift Cells Left	Shifts the cells from the right of the selection into the deleted area
Shift Cells Up	Shifts the cells from below the selection into the deleted area

Important

Edit Delete completely removes the selected cells. If you only want to clear the contents or formats, use the Edit Clear command. For more information, see "Clearing Versus Deleting" under **Edit Clear command.**

For more information on deleting cells, see **Deleting and clearing data**.

Edit Fill Down command



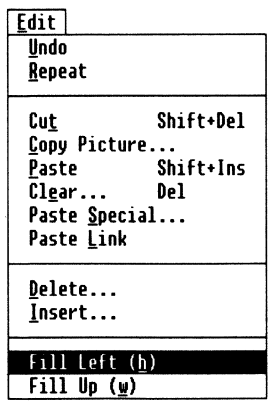
Copies the contents and formats of the cells in the top row of a selection into the rest of the rows in the selection. Any contents or formats in the filled rows are completely replaced. **Shortcut key:** CONTROL+<

If you have a multiple selection, each range in the selection is filled separately with the contents of the top row of each range.

If you hold down SHIFT when you choose the Edit menu, this command is replaced with the Edit Fill Up command.

For more information, see **Copying data and formats**.

Edit Fill Left command



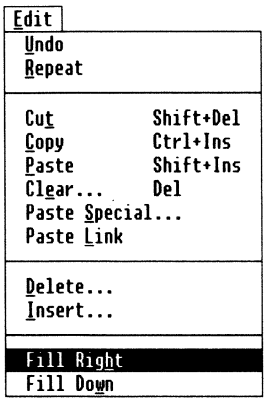
Copies the contents and formats of the cells in the right column of a selection into the rest of the columns in the selection. Any contents or formats in the filled columns are completely replaced.

If you have a multiple selection, each range in the selection is filled separately with the contents of the right column of each range.

Fill Left appears on the Edit menu only if you hold down SHIFT when you select the Edit menu. Edit Fill Left appears in place of the Edit Fill Right command.

For more information, see **Copying data and formats**.

Edit Fill Right command



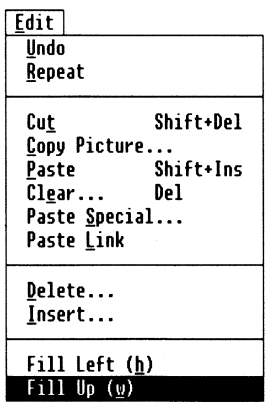
Copies the contents and formats of the cells in the left column of a selection into the rest of the columns in the selection. Any contents or formats in the filled columns are completely replaced. **Shortcut key:** CONTROL+>

If you have a multiple selection, each range in the selection is filled separately with the contents of the left column of each range.

If you hold down SHIFT when you choose the Edit menu, this command is replaced with the Edit Fill Left command.

For more information, see **Copying data and formats**.

Edit Fill Up command



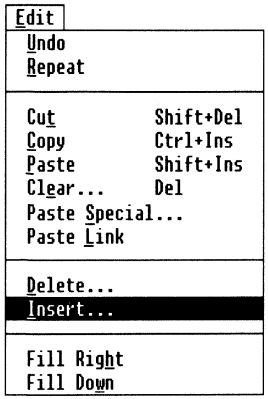
Copies the contents and formats of the cells in the bottom row of a selection into the rest of the rows in the selection. Any contents or formats in the filled rows are completely replaced.

If you have a multiple selection, each range in the selection is filled separately with the contents of the bottom row of each range.

Fill Up appears on the Edit menu only if you hold down SHIFT when you select the Edit menu. Fill Up appears in place of the Fill Down command.

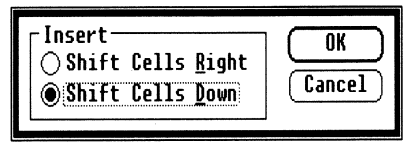
For more information, see **Copying data and formats**.

Edit Insert command



Inserts a blank cell or range of cells into the worksheet and shifts the selected cells to accommodate the new ones. Edit Insert always inserts a cell range equal in size and shape to the selected cell range. **Shortcut key:** CONTROL + + (plus sign).

When you insert entire rows or columns, there is only one direction to shift the other cells in the worksheet, so Edit Insert does it automatically. When you insert a range of cells smaller than a row or column, a dialog box appears:

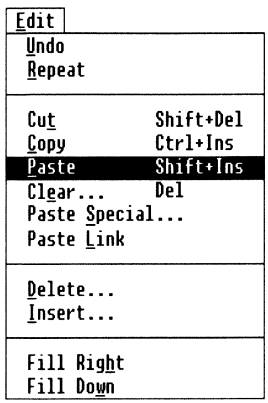


Insert

Shift Cells Right	Shifts the selected cells to the right to accommodate the new cells
Shift Cells Down	Shifts the selected cells down to accommodate the new cells

For more information, see **Inserting blank cells**.

Edit Paste command



Pastes a selection that you defined with the Edit Copy or Edit Cut command. **Shortcut key:** SHIFT + INSERT.

After you cut or copy cells from a worksheet or copy data from a chart, you can also paste the data by pressing ENTER. If you use ENTER instead of Edit Paste, Microsoft Excel pastes the data and cancels the marquee. Do not use ENTER if you want to paste multiple copies.

Worksheet

In a worksheet, Edit Paste puts the contents and formats of the copied or cut cells into the currently selected cells. The paste area can be a single cell, or a range of cells. If the paste area is a single cell, Microsoft Excel matches it to the upper-left cell of the copy or cut area, and fills the rest of the range downward and to the right.

Note | If you choose the Edit Cut command before pasting, the paste area must be the same size as the cut area. If you choose the Edit Copy command before pasting, you can vary the size of the paste area to paste multiple copies.

If you have copied data from another application into the Clipboard, Edit Paste pastes that data into your document.

If the formula bar is active, Edit Paste inserts the contents of the Clipboard into the formula bar at the insertion point. If any characters in the formula bar are selected, Edit Paste replaces them with the contents of the Clipboard.

Pasting Multiple Copies

If you choose the Edit Copy command before you paste, you can paste multiple copies, either simultaneously or sequentially. You cannot paste multiple copies sequentially after choosing Edit Cut.

To paste multiple copies simultaneously, the cell range of the paste area can be a single or multiple selection, and must be able to contain two or more rectangles of the same size and shape as the copy area. When you paste, Microsoft Excel duplicates the copy area to fill the paste area.

To paste multiple copies sequentially you don't have to choose the Edit Copy command each time you paste. Continue to select paste areas and choose Edit Paste until you have pasted the copy area everywhere you want. You can continue to paste the copy area until you choose another command or cancel the copy marquee with ESCAPE.

Edit Paste pastes all cell properties for every cell pasted, including cell contents, number format, borders, font, alignment, protection status, and notes. If you want to paste only certain cell properties, use the Paste Special command.

To copy the contents of cells and formats in a single row or column to adjoining cells, use the Fill Down, Fill Up, Fill Right, or Fill Left command.

For more information, see **Copying data and formats**.

Chart

When a chart is active, Edit Paste creates data series from copied worksheet cells and pastes them into the active chart, or pastes the data series and formats from a copied chart into the active chart. If you are working in the formula bar, Edit Paste pastes cut or copied characters at the insertion point, or replaces selected characters with the cut or copied characters.

Pasting from a Worksheet

To paste information from a worksheet, select and copy the cells, create a new chart or activate an existing chart, and choose Edit Paste. Microsoft Excel automatically creates data series and pastes them into the active chart. For information on how Microsoft Excel organizes data series, see **Data series**. For information on controlling how Microsoft Excel divides the copied selection into series and categories, see **Data series** and **Edit Paste Special command**.

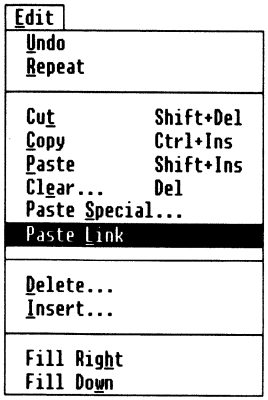
Pasting from a Chart

To paste information from another chart, copy the chart with the Edit Copy command, create a new chart or activate an existing chart, and then choose Edit Paste.

When Microsoft Excel pastes a copied chart, it adds the data series to any series already in the active chart and replaces the format of the active chart with the format of the copied chart. If you want to paste only the format or only the data series of a copied chart, use the Edit Paste Special command.

Edit Paste Link command

(Full menus)



Pastes copied data into the cells in the current selection and establishes a link with the source of the data. When the source data changes, your worksheet reflects those changes. The source of the data can be either another Microsoft Excel worksheet or another application.

Note

If you paste a link from another application, and the link contains more than one cell, Edit Paste Link pastes an array. The formulas in an array cannot be changed individually. If you do not want the link to be part of an array, create the link by typing the remote reference directly into the formula. For more information on arrays, see **Array**. For more information on creating links, see **Linking documents**.

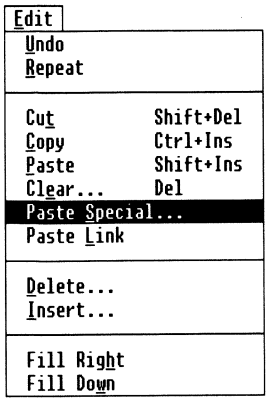
To paste a link, first copy the source data, then select the cell or cell range where you want to paste the data and choose Edit Paste Link. If the source of the data is another Microsoft Excel worksheet, the source must be a continuous cell range.

The paste area can be a single cell or a cell range. If the paste area is a single cell, and the copy area is from another Microsoft Excel worksheet, Microsoft Excel matches the upper-left cell of the copy area to the single cell and fills the rest of the range downward and to the right.

If the paste area is a cell range, the paste area must be able to contain one or more rectangles of exactly the same size and shape as the copy area. If the paste area contains two or more rectangles the size and shape of the copy area, Microsoft Excel duplicates the copy area to fill the paste area.

Edit Paste Special command

(Full menus)



Pastes selected parts of the copy area into the cells in the current selection. You select what parts Microsoft Excel pastes, and how they are pasted. For example, you can paste just the values from the copy area and have Microsoft Excel add those values to the values in the paste area.

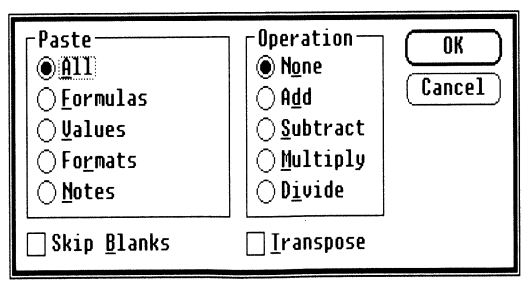
You must use the Edit Copy command before Edit Paste Special. Edit Paste Special does not work when preceded by the Edit Cut command.

For information on copying data, see **Copying data and formats**.

Worksheet

The paste area can be a single cell, a cell range, or a multiple selection. If the paste area is a single cell, Microsoft Excel matches the upper-left cell of the copy area to the single cell, and fills the rest of the range downward and to the right.

If the paste area is a cell range or multiple selection, each selection in the paste area must be able to contain one or more rectangles of exactly the same size and shape as the copy area. If the paste area contains two or more rectangles the size and shape of the copy area, Microsoft Excel duplicates the copy area to fill the paste area.



Paste

Select which part of the copied cells you want to paste.

All	Pastes all cell properties
Formulas	Pastes only contents in the cells as entered in the formula bar
Values	Pastes only values as displayed in the cells
Formats	Pastes only formats of the cells
Notes	Pastes only the notes attached to the cells

Operation

Select an option to define how you want the copy area cell parts (as specified under Paste) combined with the cells in the paste area.

None	Completely replaces the cells in the paste area with the cells in the copy area. Pasting all parts with None selected under Operation is the same as choosing the Edit Paste command.
Add	Adds the specified parts of the copy area cells to the paste area cells
Subtract	Subtracts the specified parts of the copy area cells from the paste area cells
Multiply	Multiplies the paste area cells by the specified parts of the copy area cells
Divide	Divides the paste area cells by the specified parts of the copy area cells

Skip Blanks

Microsoft Excel normally pastes any blank cells in the copy area onto the paste area. Turn on this option if you want Microsoft Excel to skip blank cells in the copy area when pasting.

Transpose

Switches the orientation of the data when you paste it. The data that was in the top row of the copied area appears in the left column, and the data that was in the left column appears along the top row.

Chart

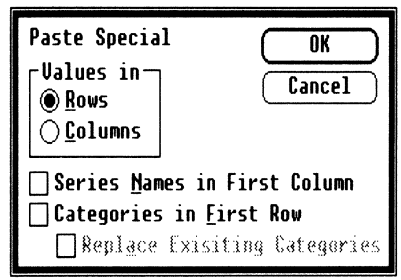
When a chart is active, Edit Paste Special creates data series from copied worksheet cells and pastes them into the active chart, or copies the data series and formats from another chart and pastes them into the active chart.

Edit Paste Special is different from Edit Paste because it lets you control how Microsoft Excel organizes a worksheet selection into data series.

For information on how Microsoft Excel defines data series, see **Data series**.

Pasting from a Worksheet

To paste information from a worksheet, select and copy the cells, create a new chart or activate an existing chart, and choose Edit Paste Special. Microsoft Excel displays a dialog box so you can define how you want the data in the worksheet selection added to the chart. The first two check boxes in the dialog box change according to what you select in the Values In box.



Values In

Rows	Contents of each row in the copied selection become a data series.
Columns	Contents of each column in the copied selection become a data series.

Series Names in First Column

When you turn on this check box, Microsoft Excel uses the contents of the cell in the first column of each row in the selection as the name of the data series in that row. If this check box is turned off, Microsoft Excel uses the contents of the cell in the first column of each row as the first data point of the data series.

Categories in First Row

When you turn on this check box, Microsoft Excel uses the contents of the first row of the selection as the categories for the chart. If this check box is turned off, Microsoft Excel uses the contents of the first row as the first data series in the chart.

Series Names in First Row

When you turn on this check box, Microsoft Excel uses the contents of the cell in the first row of each column in the selection as the name of the data series in that column. If this check box is turned off, Microsoft Excel uses the contents of the cell in the first row of each column as the first data point of the data series.

Categories in First Column

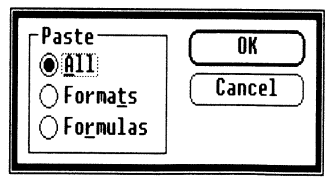
When you turn on this check box, Microsoft Excel uses the contents of the first column of the selection as the categories for the chart. If this check box is turned off, Microsoft Excel uses the contents of the first column as the first data series in the chart.

Replace Existing Categories

Uses the categories from the copied cell range for the data series already in the chart, as well as for the data series you are pasting. If you turn on this check box, the existing categories are completely replaced. Microsoft Excel asks you to confirm the loss of those categories.

Pasting from Another Chart

To paste the data series, format, or both from another chart, copy the chart with the Edit Copy command, then create a new chart or activate an existing chart and choose Edit Paste Special. Microsoft Excel displays the following dialog box when you are pasting a copied chart:



All

Select this option to paste the data series and the format of the copied chart. Microsoft Excel adds all of the data series from the copied chart to any data series already on the active chart.

Important If you paste with this option selected, the format of the copied chart completely replaces the format of the active chart.

Formats

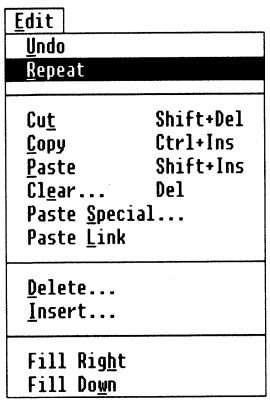
Select this option to replace the format of the active chart with the format of the chart you copied. This option does not affect the data in the chart you are pasting into.

Formulas

Select this option to add the data series from the copied chart to any data series already in the active chart. This option does not change the format of the chart you are pasting into.

Edit Repeat command

(Full menus)

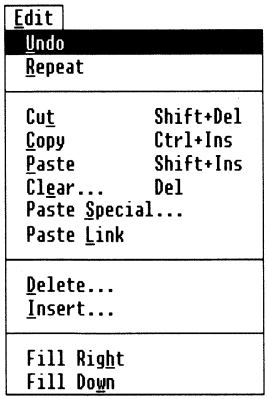


Repeats the last command you chose, if possible — including any options you changed in the dialog box. **Shortcut key:** **ALT + ENTER**.

Edit Repeat is especially useful for actions like applying the same formats to different groups of cells.

Edit Repeat only works for commands that can reasonably be repeated. It would not be possible, for example, to repeat the File Close All command, because there would be no open windows to close.

Edit Undo command



Reverses certain commands or actions. **Shortcut key:** ALT + BACKSPACE.

The Edit Undo command reverses:

- Typing in the formula bar after you enter a formula or value in a cell (worksheet only)
- All commands on the Edit menu (worksheets and charts)
- These worksheet commands:

  Formula Apply Names (Full menus)

  Formula Replace (Full menus)

  Format Justify (Full menus)

  Data Parse (Full menus)

  Data Sort

- Paste List in the Formula Paste Name dialog box

Note

- You cannot undo the File Delete, Data Delete, or Data Extract commands.
- You can only undo the last command you chose or the last cell entry you typed.

Editing a document

Editing typically involves revising a document to fine-tune its accuracy, content, or organization. This topic presents a brief summary of each procedure and option you can use for editing worksheets, macro sheets, and charts in Microsoft Excel. The cross-reference for each task tells you which topics to turn to for the detailed step-by-step procedure or for other related information.

This topic explains:

- Editing basics

  Undoing a command

  Repeating a command

- Editing a worksheet

  Worksheet editing reminders

  Display adjustments that simplify editing

  Editing in the formula bar

  Copying and moving data and formats

  Finding cells and replacing data quickly

  Editing rows and columns

  Deleting and clearing data and formats

- Editing in a chart

  Editing chart text

  Editing a series formula

Note | All worksheet editing procedures also apply to macro sheets.

Editing Basics

The editing basics in this section apply to both worksheets and charts.

Undoing a Command

If you change your mind or make a mistake while working on a document, you can choose the Edit Undo command to reverse certain commands and actions immediately after you complete them. For a list of commands and actions that you can reverse, see **Edit Undo command**.

The Undo command displayed on the Edit menu changes to reflect the most recent command or action that is affected by Edit Undo. If Edit Undo does not apply, the words "Can't Undo" appear grayed on the menu.

To undo a command or action:

▣ Choose Edit Undo.

Microsoft Excel changes the command name displayed on the Edit menu to Redo. If you want to reverse the Undo command itself, choose Edit Redo.

Repeating a Command

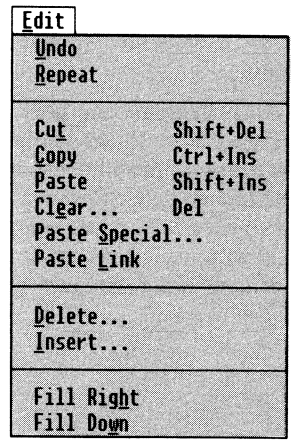
The Edit Repeat command is available for any command that can be reasonably repeated. Whenever the Edit Repeat command does not apply, it appears grayed on the menu.

To repeat a command:

▣ Choose Edit Repeat.

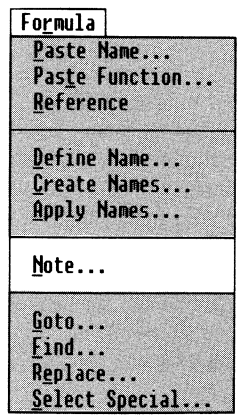
Editing a Worksheet

The worksheet editing commands are on the Edit and Formula menus (Full menus shown).



Edit menu — includes commands to:

- Undo or repeat commands and actions.
- Move, copy, and link data.
- Insert or delete rows and columns and fill a range with the same values or formulas.



Formula menu — includes commands to:

- Simplify the editing of complex formulas.
- Create and use names for cells and ranges.
- Find specific cells and data quickly or search for and replace information.

For information on each command, see the topic of the same name (for example, **Edit Undo command**).

Worksheet Editing Reminders

- **"Copy area," "cut area," and "paste area" are key terms that apply to copy and move procedures.** "Copy area" refers to cells you want to copy, while "cut area" refers to cells you want to move. "Paste area" refers to the section of the worksheet to which you are copying or moving cells.
- **In a copy operation with the Edit Copy and Edit Paste commands, Microsoft Excel adjusts relative references and the relative portions of mixed references.** In the paste area, Microsoft Excel adjusts references so that they refer to cells in the same relative position as they did in the copy area. Absolute references are unaffected by a copy operation. For more information on how copying or transposing the selection with the Edit Paste Special command affects relative and mixed references, see **Copying data and formats**.
- **When you move cells (cut cells from one part of the worksheet and paste them in another), Microsoft Excel adjusts references.** Relative, mixed, and absolute references *to* moved cells are adjusted so they refer to the new location of the moved cells. Relative and mixed references *in* moved cells are adjusted so they refer to the same cells as before the move. Absolute references *in* moved cells are unaffected. For more information on how moving cells affects references, see **Moving data on a worksheet**.

Editing in the Fast Lane

Whether you use the keyboard or mouse, in Microsoft Excel you can edit your way through a worksheet with speed and efficiency.

If you prefer the keyboard, check out the Microsoft Excel keyboard commands. Many are shortcuts for menu commands and move/select actions. For example, to bypass the menu and take a shortcut right to the dialog box for the Formula Paste Name command, press F3. To zoom right to the end of the area containing data or formats in a worksheet, press CONTROL+END. For more information, see **Keyboard**.

If you have a mouse, try using both keyboard and mouse techniques, whichever is easier for the task at hand. In addition, take advantage of mouse-oriented shortcuts built right into each worksheet window. For example, drag the title bar to move a window — a fast alternative to the Control Move command. Or, drag the scroll box in a scroll bar to zip through vast expanses of a worksheet. For information on using the mouse, see **Mouse** and **Windows**.

- **Microsoft Excel replaces the contents of any existing cells in the paste area when you paste copied or cut cells into that area.** Before you paste copied or cut cells with the Edit Paste command, make sure the paste area doesn't include cell entries you want to keep.
- **When you insert or delete rows or columns, Microsoft Excel adjusts all references in formulas.**

Display Adjustments That Simplify Editing

With Microsoft Excel you can open and view several documents on the screen at one time. This is particularly helpful for cross-checking between documents as you edit. Just arrange your screen by sizing and moving the document windows with the procedures outlined in this section.

When revising a large worksheet, consider the freeze titles, multiple windows, and panes options outlined below. These simplify editing tasks such as entering new data into long rows or columns, and copying or moving data between widely scattered parts of the document.

To size a document window:

- With keyboard, choose Control Size (ALT, HYPHEN, S), move the shadow border with DIRECTION keys, and press ENTER; with mouse, drag the shadow border.
- For step-by-step procedure, see **Windows**.

To move a document window:

- With keyboard, choose Control Move (ALT, HYPHEN, M), move the shadow border with DIRECTION keys, and press ENTER; with mouse, drag the window's title bar.
- For step-by-step procedure, see **Windows**.

To view and work in different parts of a worksheet with multiple windows:

- Choose Window New Window; if desired, size the windows separately and scroll them to different parts of the worksheet.
- For step-by-step procedure, see **Display options**.

To view and work in different parts of a worksheet with panes:

- With keyboard, choose Control Split (ALT, HYPHEN, T) and use DIRECTION keys to move pointer to where you want the split; press ENTER. With mouse, drag vertical and/or horizontal split bar to where you want the split.
- For step-by-step procedure, see **Display options**.

To freeze column and/or row titles on the display (Full menus):

- Split window into panes (see preceding procedure) along right and/or bottom edge of cells with titles you want to freeze; choose Options Freeze Panes.
- For step-by-step procedure, see **Display options**.

Editing in the Formula Bar

You edit worksheet cells in the formula bar. Selecting a cell displays its contents in the formula bar. When editing in the formula bar, you can type changes directly or use commands on the Edit and Formula menus. While the formula bar is active, you can also use the Formula Goto command if you need to find a specific cell.

To edit the contents of a cell:

- Select cell. With keyboard, press F2 and select the insertion point for the edit by moving with DIRECTION keys in formula bar; type the edit and press ENTER. With mouse, select the insertion point for the edit by clicking where you want it in formula bar; type the edit, and click the enter box (or press ENTER).
- For step-by-step procedure, see **Formula bar**.

Note | Use the preceding instructions to first activate the formula bar and select the insertion point for the edit when performing any of the following formula bar procedures in this section.

To insert a cell reference into a formula:

- Select insertion point in formula bar. With keyboard, make sure insertion point follows an operator, comma, or left parenthesis; if not in Enter mode, press F2 until you are; use the DIRECTION keys to select the cell you want referenced, and press ENTER. With mouse, click the cell you want referenced, then click the enter box.
- For step-by-step procedure, see **Formula bar** and **Formula**.

To paste a function into a formula:

- With insertion point selected in formula bar, choose Formula Paste Function; select a function from list box and choose the OK button.
- For step-by-step procedure, see **Function**.

To paste a name into a formula:

- With insertion point selected in formula bar, choose Formula Paste Name; select a name from list box and choose the OK button.
- For step-by-step procedure, see **Names**.

To copy a sequence of characters in the formula bar:

- In formula bar, select characters you want to copy, and choose Edit Copy; select insertion point and choose Edit Paste.
- For step-by-step procedure, see **Copying data and formats**.

To cycle the currently selected reference(s) in the active formula bar through the relative, absolute, and mixed reference types:

- Choose Formula Reference or press F4 until Microsoft Excel changes to the reference type you want.
- For step-by-step procedure, see **References**.

To replace the currently displayed formula (or part of the currently displayed formula) with its calculated value:

- With formula bar active (and, if replacing part of formula only, with that part selected in formula bar), choose Options Calculate Now.
- For step-by-step procedure, see **Calculation**.

To clear data from the formula bar:

- Select characters you want to clear; choose Edit Clear.
- For step-by-step procedure, see **Formula bar**.

Copying and Moving Data and Formats

The following procedures apply to copying or moving data and formats within the same worksheet or between worksheets.

Tip | For any of the following procedures, select only the top-left cell of the paste area; in this way, you can avoid an error caused when the copy or cut area is a different shape from the paste area.

To copy to another part of the worksheet or to a different worksheet:

- Select the copy area and choose Edit Copy; select the paste area and choose Edit Paste.
- For step-by-step procedure, see **Copying data and formats**.

To copy the same cells to many areas of a worksheet:

- Select the copy area and choose Edit Copy; select the paste areas one at a time and choose Edit Paste for each area.
- For step-by-step procedure, see **Copying data and formats**.

To copy to adjacent cells (fill):

- Select the fill area, including the cells to be copied and the cells to be filled with copied data; choose Edit Fill Right, Edit Fill Left (shifted command), Edit Fill Down, or Edit Fill Up (shifted command).
- For step-by-step procedure, see **Copying data and formats**.

To copy specific cell or range attributes (formulas, values, formats, or notes) (Full menus):

- Select the copy area, choose Edit Copy, and select the paste area; choose Edit Paste Special, select the cell attribute you want to copy, and choose the OK button.
- For step-by-step procedure, see **Copying data and formats**.

To combine the contents of the copy and paste areas using a specified operator (Full menus):

- Select the copy area, choose Edit Copy, and select the paste area; choose Edit Paste Special, select the operator you want from the Operation box, and choose the OK button.
- For step-by-step procedure, see **Copying data and formats**.

To move a cell or range to another part of the worksheet or to a different worksheet:

- Select the cells you want to move (the cut area) and choose Edit Cut; select the paste area and choose Edit Paste.
- For step-by-step procedure, see **Moving data on a worksheet**.

Finding Cells and Replacing Data Quickly

To jump to a specific cell or named range:

- Choose Formula Goto; select a name from the list or type the reference you want and choose the OK button.
- For step-by-step procedure, see **Finding cells and data quickly**.

To find cells with specific references or values:

- Choose Formula Find; specify the options you want and choose the OK button.
- For step-by-step procedure, see **Finding cells and data quickly**.

To find cells or formulas of a certain type (Full menus):

- Select the search range (select a single cell to search the entire worksheet) and choose Formula Select Special; select the options you want and choose the OK button.
- For step-by-step procedure, see **Finding cells and data quickly**.

To search for and replace a sequence of characters in one or more formulas (Full menus):

- Select search range (select a single cell to search the entire worksheet) and choose Formula Replace; specify characters to be replaced and replacement characters, select search options, and choose Replace All to replace all occurrences or Replace to replace only if there is an occurrence in active cell.
- For step-by-step procedure, see **Finding cells and data quickly**.

To select cells that are annotated with cell notes (Full menus):

- Select entire worksheet (CONTROL+SHIFT+SPACEBAR) and choose Formula Select Special; select Notes option in dialog box and choose the OK button.
- For step-by-step procedure, see **Notes**.

To see a list of worksheet cells that are annotated with cell notes:

- Choose Formula Note, scroll through the Notes in Sheet box, and choose Cancel to close the dialog box.
- For step-by-step procedure, see **Notes**.

To read a cell note:

- Choose Formula Note; in the Notes in Sheet list box, select the note you want; read the note in the Note text box and choose Cancel to close the dialog box when you're finished reading.
- For step-by-step procedure, see **Notes**.

To edit a cell note:

- Choose Formula Note and select the note you want to edit from the Notes in Sheet list box; edit the note in the Note text box and choose the OK button.
- For step-by-step procedure, see **Notes**.

Editing Rows and Columns

To insert a row or column (or partial row or column):

- Select the area in which you want to insert the row or column and choose Edit Insert; if you are inserting a partial row or column, select the option you want and choose the OK button.
- For step-by-step procedure, see **Inserting blank cells**.

To delete a row or column (or partial row or column):

- Select the area you want to delete and choose Edit Delete; if you are deleting a partial row or column, select the option you want and choose the OK button.
- For step-by-step procedure, see **Deleting and clearing data**.

To create a series of time periods or numbers that increase by a constant amount or factor (Full menus):

- Enter the starting value for the series in a cell and select as many cells as you want to fill in the same row or column; choose Data Series, select the options you want, and choose the OK button.
- For step-by-step procedure, see **Values**.

To divide a column of long text entries into multiple columns (Full menus):

- Select the column of text and choose Data Parse.
- For step-by-step procedure, see **Values**.

Deleting and Clearing Data and Formats

Important

Clearing cells erases the contents of the cells and leaves the cleared cells within the structure of the worksheet. Deleting cells removes the cells and their contents from the worksheet, closing up the space occupied by the deleted cells.

Clearing data from a cell and deleting a cell entirely have different consequences for formulas that reference the cell. If a cell is cleared, its value is then zero. A formula referencing that cell will get a value of zero from the cell. If the cell is deleted, it no longer has any value, and any formula referencing the deleted cell will return the error value #REF!.

To clear data and/or formats from cells:

- Select the cells you want to clear and choose Edit Clear; select an option to indicate what you want cleared and choose the OK button.
- For step-by-step procedure, see **Deleting and clearing data**.

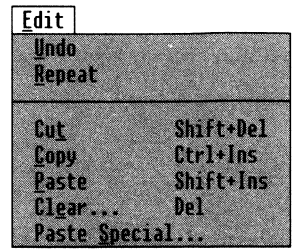
To delete cells and close up space:

- Select the cells you want to delete and choose Edit Delete; select an option to indicate the way you want the space to be closed up and choose the OK button.
- For step-by-step procedure, see **Deleting and clearing data**.

Editing in a Chart

You can revise a chart by editing any of the text that appears on the chart. In addition, by editing the series formulas that Microsoft Excel uses to plot the chart, you can control several aspects of the chart, such as plotting order and data series names used in the chart legend.

The chart editing commands are on the Edit menu (Full menu shown).



Edit menu — includes commands to:

- Undo or repeat commands and actions.
- Move, copy, and clear data.

For information on each command, see the topic of the same name (for example, **Edit Copy command**).

Editing Chart Text

Microsoft Excel charts can have two kinds of text. Attached text is any label linked to a specific chart object such as an axis label or the chart title. Unattached text is any text not linked to a chart object.

To edit attached (chart title, axis labels, and data point labels only) or unattached text in a chart:

- Select the text to display it in the formula bar; edit the text, using standard procedures for editing in the formula bar, and press ENTER.
- For step-by-step procedure, see **Chart text**.

To delete attached (chart title, axis labels, and data point labels only) or unattached text in a chart:

- Select text to display it in the formula bar, press BACKSPACE, and then press ENTER.
- For step-by-step procedure, see **Chart text**.

To edit linked chart text or axis tickmark labels:

- Activate source worksheet window; use standard editing procedures in formula bar to edit worksheet cells used for linked chart text or to edit cells used for values and categories in the chart (the basis for axis tickmark labels).
- For more information, see **Chart axis**.

Editing a Series Formula

By editing a series formula, you can control the following aspects of a data series: the data series name as it appears on the chart legend, its category or value references, and its plot order. You can also delete an entire data series.

To change a data series name:

- Select one of the data series markers to display its series formula in formula bar; revise data series name argument, using standard procedures for editing in the formula bar, and press ENTER.
- For step-by-step procedure, see **Series formula**.

To change references for categories or values in a series formula:

- Select one of the data series markers to display its series formula in formula bar; revise categories and/or values argument, using standard procedures for editing in the formula bar, and press ENTER.
- For step-by-step procedure, see **Series formula**.

To change the plot order of data series:

- For each data series, select a marker to display its series formula in formula bar; revise plot order argument, using standard procedures for editing in the formula bar, and press ENTER.
- For step-by-step procedure and an explanation of how Microsoft Excel adjusts plotting order, see **Series formula**.

To delete a data series from a chart:

- Select one of the data series markers to display its series formula in formula bar; select entire formula, press BACKSPACE, and then press ENTER.
- For step-by-step procedure, see **Data series**.

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Chart basics	Chart
Adding, editing, formatting, deleting chart text	Chart text
Formatting worksheets and charts	Formatting a document

Tutorial

Worksheet Basics

Changing How a Chart Looks

Feature Guide

Basic Mechanics, "Entering" and "Editing"

Worksheet Formatting

Charts

Error value

Microsoft Excel displays an **error value** in a cell when it cannot properly calculate the formula for that cell. Error values always begin with the number sign (#). If a formula includes a reference to a cell that contains an error value, that formula also produces an error value (unless you are using the special error-trapping worksheet functions ISERR, ISERROR, or ISNA). You may have to trace the references back through a series of cells to discover the source of the error.

This topic explains trouble-shooting measures for each type of error value in Microsoft Excel:

- #DIV/0!
- #N/A
- #NAME?
- #NULL!
- #NUM!
- #REF!
- #VALUE!

Note | Even if a worksheet is free of error values, it may contain faulty logic. For information on checking the internal consistency and accuracy of a worksheet, see **Auditing worksheet models**.

#DIV/0!

The #DIV/0! error value means that a formula is trying to divide by zero.

Possible cause	Suggested correction
Using a reference to a blank cell or a cell containing zero as a divisor. (If an operand should be a number but is blank, Microsoft Excel interprets that blank as zero.)	Change the reference or enter a non-zero value in the cell used as a divisor.
Entering a formula that contains an explicit division by 0 (for example, =5/0).	Correct the formula.
Writing a macro using a macro function that returns #DIV/0! in certain situations.	Look up the functions you are using in Chapter 7, "Macro Function Directory," in *Microsoft Excel Functions and Macros*, and see if one or more of your functions returns #DIV/0! in certain situations.

#N/A

The #N/A error value stands for "No value is available."

This error value can help you make sure you don't accidentally refer to a blank cell. If there are cells on your worksheet that should contain data, but the data is not available yet, you can enter #N/A in those cells. Formulas that refer to those cells will return #N/A, instead of calculating a value.

Possible cause	Suggested correction
Giving an inappropriate argument for *lookup_value* in the HLOOKUP, LOOKUP, MATCH, or VLOOKUP functions.	Adjust the *lookup_value* argument.
Using an array argument that was expanded.	Change the array argument so that it can be expanded without #N/A, or so that it is the same size as other array arguments. For more information, see **Array**.
Omitting one or more arguments to a function macro. For example, if the function macro Ltjo on the macro sheet CALC.XLM uses three numbers as arguments, the following formula will return #N/A: =CALC.XLM!Ltjo(1,2).	Enter all arguments in the function.
Using a function macro that did not run successfully. For example, if the function macro Ltjo contains an error that prevents it from running, any formula using Ltjo will return #N/A.	Correct the function macro, or don't use it.
Writing a macro using a macro function that returns #N/A in certain situations.	Look up the functions you are using in Chapter 7, "Macro Function Directory," in *Microsoft Excel Functions and Macros*, and see if one or more of your functions returns #N/A in certain situations.

Possible cause	Suggested correction
Using a remote reference to an application that has not yet returned requested data. (For information on remote references, see **Linking documents**.)	Wait for the data to be returned. The #N/A will then be replaced by the data, if the request was successful, or by #NAME? if the requested item is unavailable.

#NAME?

The #NAME? error value results when you use a name that Microsoft Excel doesn't recognize.

Possible cause	Suggested correction
Not yet defining the name.	Define the name.
Deleting the name.	Redefine the name.
Misspelling the name.	Correct the spelling. You can use the Formula Paste Name command to insert the correct name into the formula.
Misspelled the name of a function.	Correct the spelling. You can use the Formula Paste Function command to insert the correct function name into the formula.
Entering text without double quotation marks in the formula. Microsoft Excel interprets your entry as a name even though you intended it to be text.	Edit the formula to enclose the text in double quotation marks.
Omitting a colon in a range reference. For example, if you enter the formula =SUM(A1D10), Microsoft Excel interprets A1D10 as a name.	Correct the formula, for example =SUM(A1:D10).
Using a remote reference to an item that is unavailable. (For information on remote references, see **Linking documents**.)	Make sure you've used the correct item.

#NULL!

The #NULL! error value means that you specified an intersection of two areas that do not intersect.

Possible cause	Suggested correction
Using an incorrect range operator, or incorrect cell reference.	Use the union operator, the comma (,), if you want to refer to two areas that don't intersect. Or check for typing errors in the range specification. For more information, see **Operator**.

#NUM!

The #NUM! error value indicates a problem with a number.

Possible cause	Suggested correction
Using an unacceptable argument in a function that requires a numeric argument. For example, using a negative number as an argument in functions that require positive numbers, such as SQRT(−1), produces #NUM!.	Correct the argument.
Using a worksheet function that iterates, such as IRR or RATE, and the function is unable to find a result that works.	Try using a different starting guess to the function.
Entering a formula that produces a number that is too large or too small to be represented by Microsoft Excel. For information on limits on the size of numbers in Microsoft Excel, see **Number**.	Change the formula so that its result is within the allowed range of numbers.

#REF!

The #REF! error value occurs when you refer to a cell that is not valid.

Possible cause	Suggested correction
Deleting cells that other formulas refer to.	Change the formulas or reinstate the cells on the worksheet.
Closing a supporting worksheet referred to by a complex external reference. For information on external reference formulas, see **Linking documents**.	Reopen the worksheet, or change to a simple external reference.
Writing a macro using a macro function that returns #REF! in certain situations.	Look up the functions you are using in Chapter 7, "Macro Function Directory," in *Microsoft Excel Functions and Macros,* and see if one or more of your functions returns #REF! in certain situations.
Using a remote reference to an application that is not running, or to a topic that is unavailable. (For information on remote references, see **Exchanging data between applications**.)	Start the application; make sure you've used the correct topic.

#VALUE!

The #VALUE! error value occurs when you use the wrong type of argument or operand.

Possible cause	Suggested correction
Entering text where a number or logical value is required, and the text can't be translated into the correct data type.	Check the formula or function for the required operand or argument.
Supplying a range to a function that requires a single value, when Microsoft Excel is unable to resolve the reference by implicit intersection (where a cell refers to a range).	Change the range to a single value. (For more information on implicit intersections, see **Names**.)

Possible cause	Suggested correction
Using an invalid matrix in one of the matrix worksheet functions.	Correct the matrix.
Writing a macro using a macro function that returns #VALUE! in certain situations.	Look up the functions you are using in Chapter 7, "Macro Function Directory," in *Microsoft Excel Functions and Macros*, and see if one or more of your functions returns #VALUE! in certain situations.

Related Information

Reference

For information on	See
Operators	Operator
External references	Linking documents
Finding error values	Auditing worksheet models Finding cells and data quickly

Functions and Macros

"Data Types" in Chapter 1, "Worksheet Function Basics"

"Information Functions" in Chapter 2, "Worksheet Function Directory"

"Running a Function Macro" in Chapter 3, "Macro Basics"

Exchanging data between applications

There are two ways to exchange data with another application:

- Use the Clipboard, a temporary data repository.
- Use Dynamic Data Exchange (DDE) to communicate with other applications running under Microsoft Windows, version 2.0 or higher.

Note To use the techniques described in this topic, you must be running Microsoft Excel under Microsoft Windows, version 2.0 or higher.

This topic explains:

- Copying data between applications
  - Displaying the Clipboard
  - Copying data from Microsoft Excel
  - Copying data to Microsoft Excel
- Dynamic Data Exchange
- Accessing Microsoft Excel from other applications
  - Disabling remote requests
  - Apps, topics, and items
  - Requesting information
  - Executing commands

Copying Data Between Applications

When you cut or copy data in an application, that data is stored in the Clipboard.

Displaying the Clipboard

You can see what's in the Clipboard by running the Clipboard utility program.

If you copy or cut data and then display the Clipboard, you'll see below the Clipboard title bar a term or list of terms, such as "Picture, Bitmap." This is a list of formats in which Microsoft Excel can provide the contents of the Clipboard to another application. This information can be useful if the application you are copying to allows you to specify different formats when copying from the Clipboard.

If you copy data using the Edit Cut or Edit Copy commands and then look in the Clipboard, you won't see the cells displayed. Instead, you'll see something like "Copy 2R x 3C" or "Cut 4R x 2C." If you then paste to another application, the cells you selected will be pasted. The cells aren't displayed in the Clipboard because that enables Microsoft Excel to save time when you move data between documents within Microsoft Excel.

To see what is in the Clipboard:

1. Choose Control Run (ALT, SPACEBAR, U).
2. Select Clipboard.
3. Choose the OK button.

The Clipboard window is displayed. For information on the Clipboard, see the Appendix.

Copying Data from Microsoft Excel

1. Activate the window containing what you want to copy.
2. Select what you want to copy.
3. Choose Edit Cut, Edit Copy, or Edit Copy Picture.
   For information on these commands, see **Edit Cut command**, **Edit Copy command**, **Edit Copy Picture command**, or **Copying data and formats**.
4. Activate the window you want to copy to.
5. Paste the information, using the procedure for pasting data in the application you are copying to.

Note When copying data to another application, the Edit Cut command is equivalent to the Edit Copy command. When you paste the data in the destination application, Microsoft Excel does not remove the data from the cut worksheet range.

Copying Data to Microsoft Excel

1. Activate the window containing what you want to copy.
2. Cut or copy the information, using the procedure for cutting or copying in the application you are copying from.
3. Activate the Microsoft Excel window.
4. Select the cells to paste the data in.
5. Choose Edit Paste.

You can easily arrange the imported data into columns and rows by using the Data Parse command. For more information, see **Values**.

Dynamic Data Exchange

Dynamic Data Exchange (DDE) is a method Windows applications can use to communicate with each other. There are two basic methods in Microsoft Excel for using DDE to communicate with other applications:

- Use "remote references" — that is, references to other applications — in formulas.

  These references allow you to create a "hot link" between a Microsoft Excel document and a document in another application. With a hot link, changes made to the document in the other application are immediately reflected in the Microsoft Excel document. For more information on linking a Microsoft Excel document to a document in another application, see **Linking documents**.

- Use DDE with macros.

With macros, you can:

- Start another application.
- Send data to another application.
- Get data from another application.
- Carry out commands in another application.

For information on using DDE with macros, see "Using Macros to Start Other Applications" in Chapter 6, "Advanced Macros," in *Microsoft Excel Functions and Macros*.

Accessing Microsoft Excel from Other Applications

In addition to initiating DDE requests to other applications, Microsoft Excel can also respond to DDE requests initiated by another application. For example, Microsoft Excel allows other applications to establish links to Microsoft Excel documents in the same way it supports links from Microsoft Excel documents to documents in other applications.

Note | Information in this section is intended for advanced users.

Disabling Remote Requests
(Full Menus)

When Microsoft Excel is running, it responds to any DDE requests from other applications unless you have disabled remote requests.

To disable remote requests	To re-enable remote requests
1 Choose Options Workspace.	1 Choose Options Workspace.
2 Turn on the Ignore Remote Requests check box.	2 Turn off the Ignore Remote Requests check box.

Apps, Topics, and Items

All applications using the DDE method for exchanging data must have three elements defined:

App	The name of the application
Topic	The basic data grouping
Item	Data within a topic

When accessing Microsoft Excel from another application, you may need to know which values Microsoft Excel recognizes for apps, topics, and items:

For this	Microsoft Excel recognizes
App	The text value "Excel." If more than one instance of Microsoft Excel is running, all instances will respond to another application asking for "Excel." To refer to a specific instance of Microsoft Excel, append the task identification of that instance to the name "Excel." The task identification is a unique number that identifies a program running under Microsoft Windows, version 2.0 or higher. For example, if you want to access an instance of Microsoft Excel that has task identification 1239, you would use "Excel1239." If you launched an application using the EXEC macro function, the task identification of that instance of the application is the value returned by the function. For information on EXEC, see Chapter 7, "Macro Function Directory," in *Microsoft Excel Functions and Macros*. For more information on task identification, see your Microsoft Windows documentation.

For this	Microsoft Excel recognizes
Topic	Either "System" or the name of any currently open document, just as it appears in the title bar, as text. For example, "SALES.XLS."
Item	Any reference or name that is recognized as the name of a reference.

If you are using the "System" topic, there are some special items that Microsoft Excel recognizes, described in the following sections.

Requesting Information

To ask Microsoft Excel for specific information, use the following items along with the "System" topic:

Item	Value returned
"SysItems"	A list of all the items you can use with the "System" topic (that is, SysItems, Topics, Status, and so on)
"Topics"	A list of all currently open documents, including their full pathnames
"Status"	"Ready" if Microsoft Excel is ready to execute commands; "Busy" otherwise
"Formats"	A list of all the Clipboard formats supported by Microsoft Excel
"Selection"	A list of the external references of all ranges currently selected in Microsoft Excel. References are given in absolute R1C1 style. For example, if the selection is A1 on document Sheet1, the Selection item returns "Sheet1!R1C1."

All values are returned by Microsoft Excel in CF_TEXT format (ASCII text). If a list is returned, the items in the list are separated by tab characters.

Executing Commands

To execute a Microsoft Excel command:

1. For the app name, use "Excel" (or "Excel" plus a task identification).
2. For the topic, use "System".
3. For the item, use a text value consisting of Microsoft Excel command-equivalent macro functions, with each function enclosed in brackets.

   For example, the following item instructs Microsoft Excel to open the file C:\EXCEL\SURVEY.XLS:

   "[OPEN("C:\\EXCEL\\SURVEY.XLS")]"

The macro functions used in the item must be command-equivalent macro functions, and any arguments to the functions must be constants. If you use a reference as an argument, give it as text in R1C1 style. To use more than one function, concatenate the macro functions. For example, the item "[RUN("R1C1")][BEEP()]" instructs Microsoft Excel to first run the macro starting in cell R1C1, and then beep. For information on command-equivalent macro functions, see Chapter 7, "Macro Function Directory," in *Microsoft Excel Functions and Macros*.

Related Information

Reference

For information on	See
Linking to other documents	Linking documents
Copying data	Copying data and formats
Clipboard	Appendix

Functions and Macros

"Using Macros to Start Other Applications," in Chapter 6, "Advanced Macros"

Chapter 7, "Macro Function Directory"

Sampler

Downloading and Charting Stock Quotes from CompuServe

External reference

An **external reference** is a reference to a specific cell or group of cells on a particular worksheet. For example, SALES.XLS!$C$7 refers to the cell in column C, row 7 on a worksheet named SALES.XLS. An external reference links the document containing it to a supporting worksheet. To calculate the external reference, Microsoft Excel refers to the supporting worksheet for a value. For more information on external references, see **Absolute reference** and **Linking documents**.

Features and specifications

The following tables list the features and specifications of Microsoft Excel. You will find a features and a specifications section for each of the following areas:

- Worksheet
- Chart
- Application development
- Data exchange
- General

Worksheet

Features

- Presentation:

  Multiple fonts per worksheet
  Variable row heights
  Cell borders
  Cell shading
  Text justification
  Optional worksheet gridlines
  User-defined number and text formats
  Control of cell display color
  Independent formats for positive values, negative values, zeros, and text
  Last 3-, 6-, or 9-digit elimination for financial reporting
  Sheet-wide or per-cell zero suppression
  Frozen titles option in display and in printing
  Automatic or manual page break control
  Printing of a worksheet followed by its notes
  Printing of multiple ranges in a single print operation

- Modeling:

  Worksheet linking
  Formula Apply Names command for structuring models
  Naming of ranges and calculated expressions
  Absolute and relative range names
  Range arithmetic (intersection, union)
  Array formulas
  Matrix and multiple regression functions
  One-way (horizontal and vertical) and two-way tables
  Automatic update of tables

- Auditing:

  Cell notes
  Info window for display and printing of cell attributes
  Selection of cell precedents and dependents
  Selection of formula and data cells
  Selection of error cells, number cells, text cells, and logical cells
  Selection of inconsistent formulas in a row or column
  Circular reference indicator pointing to specific cell
  Show values/show formulas display options
  A1/R1C1 reference style options
  Cell locking and formula hiding

- Editing:

  Formula Find and Formula Replace commands
  Insertion and deletion of individual cells or cell ranges
  Copying of cell ranges applying an operation
  Copying of cell ranges skipping blank cells
  Transposing of ranges
  Filling of ranges with a series of numbers or dates
  One-step selection of current cell region
  One-step selection of current array
  One-step selection of current row, current column, or whole worksheet
  Simultaneous selection of multiple cell ranges
  Assisted typing of functions and their arguments
  Assisted typing of names

- Database:

  Forms interface
  Computed and protected fields in forms
  Simple or computed criteria in worksheet
  Extracts from databases on other worksheets
  Linking to databases on other worksheets

- Calculation/memory:

  High-performance, intelligent calculation
  Sparse matrix memory management
  Calculation of all worksheets or active worksheet only
  Manual, Automatic, and Automatic Except Tables calculation

Specifications

Maximum worksheet size	16,384 rows by 256 columns
Column width	0–255 characters
Row height	0–409 points
Maximum length of cell contents (text)	255 characters
Formats:	
Built-in number formats	12
Built-in time/date formats	9
Custom formats	43
Total formats	64
Maximum number of colors per worksheet (actual number depends on number of colors supported by display or printer)	8
Maximum number of fonts per worksheet	4
Number precision	15 digits
Functions	
Built-in worksheet functions:	
Database	11
Date and time	12
Financial	13
Information	20
Logical	6
Lookup	8
Mathematical	15
Matrix	4
Statistical	14
Text	21
Trigonometric	7
Total worksheet functions	131

Built-in macro functions:	
Command equivalent	115
Customizing	29
Action equivalent	46
Control	10
Value-returning	24
Total macro functions	224
Maximum number of arguments per function	14
Maximum number of custom functions	Limited only by available memory
Maximum number of names per worksheet	Limited only by available memory
Maximum number of tables per worksheet	Limited only by available memory
Maximum number of iterations	32,767
Maximum number of different linked worksheets	Limited only by available memory
Maximum number of windows per worksheet	Limited only by available memory
Maximum number of panes per window	4
Maximum number of selected ranges	2,048
Database:	
Maximum number of records	16,383
Maximum number of fields	256
Maximum length of field	255 characters
Number of sorting keys	3 for a single sort, unlimited when using sequential sorts

Chart

Features

One-step creation of charts based on worksheet selection
One-step chart formatting with Gallery commands
Jump buttons for easy movement between Format commands
Arrows, legends, title, floating and attached text labels
Linking of legend, title, and text labels to worksheet cells
Bypassing of missing data points

Optional marker pattern inversion for negative values
Linear, logarithmic, and semi-logarithmic axis scales
Major and minor axis gridlines
Control of spacing between category tickmarks
Control of chart width/height ratio
Gallery Set Preferred command to make a chart the default
Main/overlay combination charts

Specifications

Built-in chart types available:

Area	5
Bar	7
Column	8
Line	8
Pie	6
Scatter	5
Combination	5
Total	44

Maximum number of charts linked to a worksheet	Limited only by available memory
Maximum number of worksheets referred to by a chart	255
Maximum number of series in one chart	256
Maximum number of data points per series	2,045
Maximum number of total data points	8,100
Maximum number of different fonts in one chart	All installed fonts
Available line styles	5
Available line weights*	3
Available area patterns (screen display)	16
Available foreground colors (color screen display)	8
Available background colors (color screen display)	8

*Dotted and dashed lines are available in a single weight.

Total area pattern/color combinations (color screen display)	624
Maximum number of area patterns** (printer)	16
Maximum number of foreground colors** (color printer)	16
Maximum number of background colors** (color printer)	16
Maximum number of pattern/color combinations** (color printer)	2,656

**Actual number will depend on your printer and its driver software. To take advantage of more than eight colors when printing a chart, the color of the chart's objects has to be set to Automatic.

Application Development

Features

Procedural macro language
Dedicated macro sheets
Sharing of macros among documents
Macro recorder
Assignment and looping macro statements
Macro control of all Microsoft Excel modules
Macro control of other applications
Macro data exchange with other applications
Macro calling of subroutine libraries
Macro keyboard reassignment
Macro access to ASCII files
Triggering of macros when opening and closing files (autoexec)
Triggering of macros at specified times
Triggering of macros upon activation of a window
Triggering of macros upon receipt of data from another application
User-defined menus
User-defined dialog boxes
User-defined database forms
User-defined Help
Protection of document contents
Protection of window layout
Hiding of windows, status bar, scroll bars, and formula bar

Specifications

Macro sheet functions:

Macro	224
Worksheet	131
Total functions available	355
Maximum number of ASCII files simultaneously accessed by macro	Limited only by operating system
Maximum number of user-defined menu bars active at any time	15

Data Exchange

Features

Direct opening and saving of files in all supported formats
Macro Translation Assistant to import Lotus 1-2-3 macros
Parsing of text files by fixed-width columns
Copying of data to/from other applications through Clipboard
Data links to/from other applications through Dynamic Data Exchange (DDE)

Specifications

Supported file formats (open/save):

Format	Extension
Microsoft Excel file format	.XLS, .XLC, .XLM, .XLW
Text (tab delimited)	.TXT
Comma separated values	.CSV
Symbolic link format	.SLK
Lotus 1-2-3 version 1A format	.WKS
Lotus 1-2-3 version 2.0 format	.WK1
Data interchange format	.DIF
dBase II format	.DBF
dBase III format	.DBF

Supported Clipboard formats (to/from Microsoft Excel):

Format	Clipboard type identifier
Microsoft Excel file format	CF_BIFF
Text (tab delimited)	CF_TEXT
Formatted text	CF_RTF*
Comma separated values	CF_CSV
Symbolic link format	CF_SYLK
Lotus 1-2-3 version 2.0 format	CF_WK1
Data interchange format	CF_DIF
Picture	CF_METAFILEPICT*
Bitmap	CF_BITMAP*

*From Microsoft Excel only

General

Features

- Program:

  Multitasking with other applications
  Expanded memory support

- Interface:

  Comprehensive keyboard interface (mouse use optional)
  Undo command
  Repeat command
  Short and full menus
  Progress indication in time-intensive operations

- Document management:

  Workspace files
  Automatic tiling of document windows
  Hiding and unhiding of windows
  One-step access to any visible window

- File management:

  Network support
  File protection and encryption
  Automatic file backup

- Printing:

  Print preview
  Sideways printing (available on printers supporting landscape printing)
  Printing with page headers and footers
  Full laser printer support

- Online documentation:

  Context-sensitive Help
  Help for Lotus 1-2-3 users
  Help for Microsoft Multiplan® users
  Tutorial with product interaction
  Guide to advanced features

Specifications

Maximum basic memory addressable	640 K bytes
Maximum expanded memory addressable (cell table)	16 MB
Maximum expanded memory addressable (heap)	2 MB
Number of documents open at any given time	Limited only by available memory
Number of applications running at the same time	Limited only by available memory*

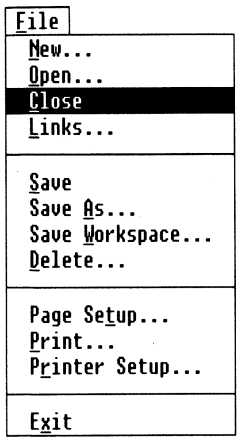
* Microsoft Windows 2.0 or higher is required for running multiple applications.

Related Information

Reference

For information on	**See**
Defaults for Microsoft Excel start-up file and program options	Default settings
Running Microsoft Excel on a network with your preferred settings	Networks with Microsoft Excel
Using Control Panel	Appendix
Using WIN.INI startup file	Hardware and system configuration

File Close command



Closes the active document. If a document has more than one open window, File Close closes all of the document's windows.

If the document contains unsaved changes, Microsoft Excel asks if you want to save the changes:

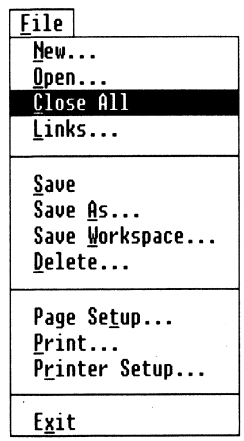
Yes	Saves the changes in that document
No	Ignores the changes in that document
Cancel	Cancels the File Close command

If you choose the Cancel button, no windows are closed, no documents are saved, and you return to the document you were working on before you chose File Close.

If you have more than one window open for a single document, and you want to close one of those windows, use the Control Close command for that window (ALT, HYPHEN, C).

If you want to close all windows for all documents, use the File Close All command. File Close All replaces File Close if you hold down SHIFT when you select the File menu.

File Close All command



Closes all of the windows on your screen. File Close All appears only when you hold down SHIFT when you select the File menu. File Close All appears in place of the File Close command. A dialog box appears for each document with unsaved changes; Microsoft Excel asks if you want to save the changes:

Yes	Saves the changes in that document
No	Ignores the changes in that document
Cancel	Cancels the File Close All command

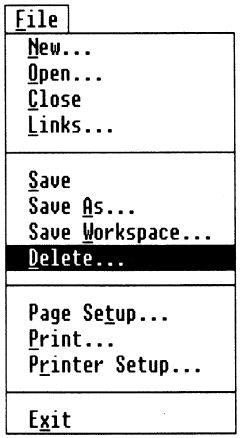
If you choose the Cancel button, no windows are closed, no documents are saved, and you return to the document you were working on when you chose File Close All.

If you want to close just the windows for a single document, use the File Close command.

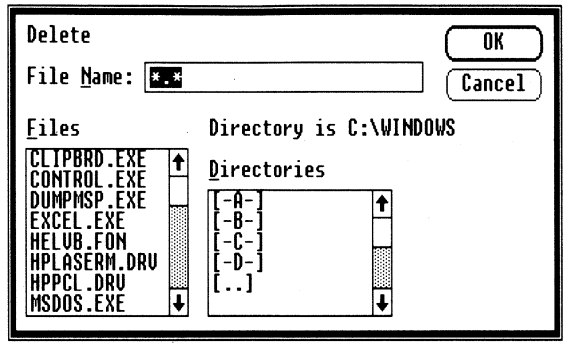
If you have more than one window open for a single document, and you want to close one of those windows, use the Control Close command for that window (ALT, HYPHEN, C).

File Delete command

(Full menus)



Deletes files from your disk.



File Name

The text in this text box determines which files are shown in the Files list box. For example, to see all of the files in the current directory, type *.* into this text box. To see all Microsoft Excel chart files in the current directory, type *.*XLC* into this text box.

If you type a complete filename in this text box, Microsoft Excel deletes that file.

To change drive or directory — and the files displayed in the Files list box — select a drive or directory in the Directories list box and choose the OK button.

Files

Lists files in the current directory, which is shown in the middle of the dialog box. The files that are listed depend on what is in the File Name text box.

To delete a file, select the filename and choose the OK button. If the document you want to use is in a different directory or on a different drive, first select the drive or directory in the Directories list box and choose the OK button.

Directories

Lists the available disk drives, the subdirectories, and the directory above the current directory (represented by two periods). You can change directories by selecting a different directory or drive and choosing the OK button.

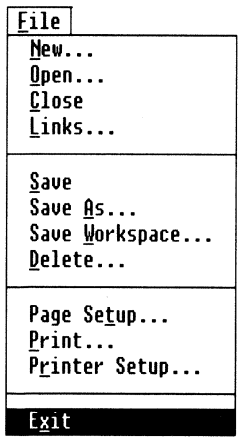
Important File Delete cannot be reversed with the Edit Undo command. If you delete a document, it is not retrievable. However, deleting a document removes it from the disk, not from memory. If you inadvertently delete a document from a disk, you can save the document with the File Save As command while the document is still open.

Because you cannot undo File Delete, Microsoft Excel asks you to confirm that it is deleting the correct file.

Yes	Deletes the file from your disk and returns to the dialog box so you can delete other files
No	Returns to the Delete dialog box so you can select a different file to delete
Cancel	Puts away the dialog box and ends the command

Note Choosing the Cancel button does not reverse any deletions made up to that point. The Cancel button just closes the dialog box and ends the command.

File Exit command



Ends a Microsoft Excel session. If you have made changes to the open documents, Microsoft Excel asks if you want to save the changes:

Yes	Saves the changes to that document
No	Ignores the changes to that document
Cancel	Cancels the File Exit command

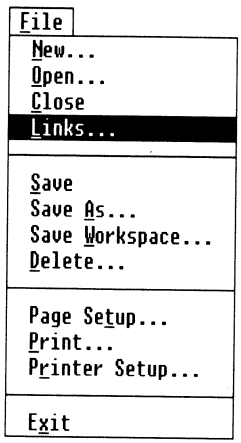
If you choose the Cancel button, no documents are saved and you return to the document you were working on when you chose File Exit.

For more information on saving documents, see **Saving and closing a document**.

The Clipboard is also saved when you exit. If a copied selection is outlined by a marquee on the worksheet when you exit, Microsoft Excel copies the selection to the Clipboard.

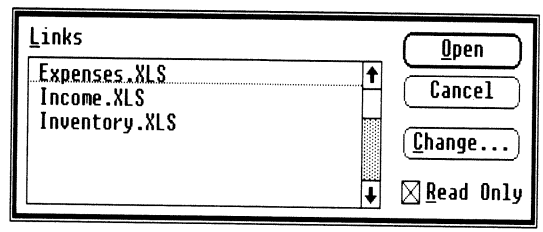
File Links command

(Full menus)



Opens supporting documents that are linked to the active document. You can also change links.

For more information, see **Linking documents**.



Links

Lists the names of the supporting documents in the current directory. If a supporting document is closed, Microsoft Excel shows the entire pathname in the list box. To open linked documents, select as many as you want to open, then choose the Open button. Use a DIRECTION key to select one document, SHIFT + DIRECTION key to select several documents that are together, or CONTROL + DIRECTION key and SPACEBAR to select several documents that are not together.

If you usually open the same linked documents each time you use a particular worksheet, you may find it more efficient to create a workspace file. For more information, see **File Save Workspace command**.

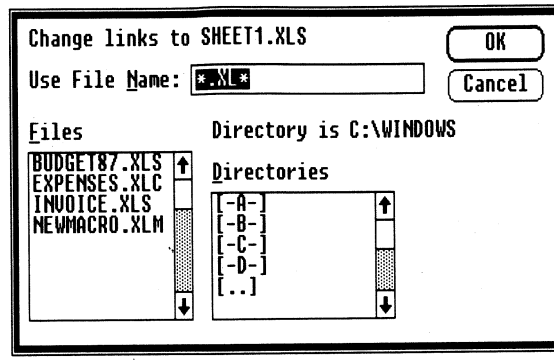
Read Only

This option is most useful when you are using Microsoft Excel on a network. If you open a document with the Read Only check box turned on, others can open the same document at the same time. However, you cannot change a document opened with the Read Only check box turned on.

If you open a document with the Read Only check box turned off, others on the network can open the document, but you are the only one who can change it.

Change

Changes the supporting documents used by external references in the active document. To change a link, select the supporting document in the Links list box and choose the Change button. You can select more than one supporting document. For each link you want to change, Microsoft Excel displays a dialog box.



Use File Name

Initially displays the type of files displayed in the Files list box, then changes to reflect a selection in the Files list box. You can also use this text box to type the name of the document you want to use as the new supporting document. To change drive or directory — and the files displayed in the Files list box — select a drive or directory in the Directories list box and choose the OK button.

Files

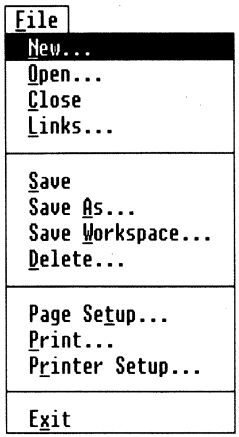
Lists the files in the current directory, which is shown in the middle of the dialog box. The files that are listed depend on what is in the Use File Name text box.

To replace the current supporting document in the link, select a new supporting document and choose the OK button. If the document you want to use is in a different directory or on a different drive, first select the drive or directory in the Directories list box.

Directories

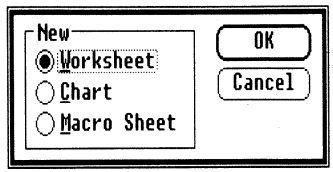
Lists the available disk drives, the subdirectories, and the directory above the current directory (represented by two periods). You can change directory or drive by selecting a different directory or drive and choosing the OK button.

File New command



Creates an empty document in a new window. **Shortcut key:** **SHIFT+F11** (new worksheet); **F11** (new chart); **CONTROL+F11** (new macro sheet).

To create an additional window or windows for a document that is already open, use the Window New Window command. To open an existing document, use the File Open command.



Worksheet

Creates a new worksheet. The new worksheet uses the settings in the Options Workspace dialog box (Full menus).

Chart

Creates a new chart. If you create a new chart while there is a selection on a worksheet, the contents of the selected cells are automatically plotted on the chart using the preferred chart format.

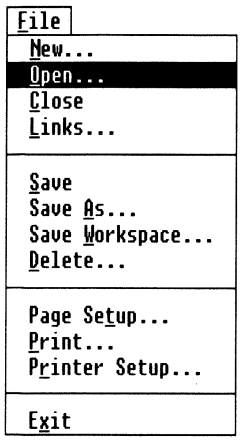
If you create a new chart while there is data on the Clipboard (when you have cut or copied data), Microsoft Excel creates a blank chart. Use the Edit Paste or Edit Paste Special command to plot the data in the chart.

For more information on charts, see **Chart**.

Macro Sheet

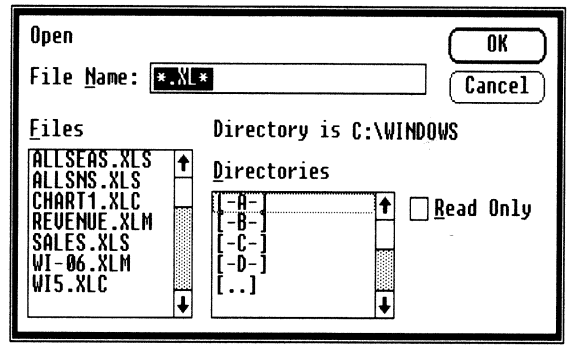
Creates a new macro sheet. You also create a new macro sheet when you choose the Macro Record command. The new macro sheet uses the settings in the Options Workspace dialog box (Full menus).

File Open command



Opens an existing document from the disk and displays it on your screen. If you open a workspace file, which usually has the .XLW filename extension, the workspace file opens several documents from the disk and displays all of them. **Shortcut key:** CONTROL+F12.

Microsoft Excel can open a document that is in Normal, Text (ASCII), CSV, SYLK, WKS, WK1, DIF, DBF 2, or DBF 3 format. Microsoft Excel automatically recognizes the format and opens the document.



File Name

The text in this text box determines which files are shown in the Files list box. For example, to see all of the files in the current directory, type *.* into this text box. To see all Microsoft Excel chart files in the current directory, type *.*XLC* into this text box.

If you type a complete filename in this text box, Microsoft Excel opens that file.

To change drive or directory — and the files displayed in the Files list box — select a drive or directory in the Directories list box and choose the OK button.

Files

Lists files in the current directory, which is shown in the middle of the dialog box. The files that are listed depend on what is in the File Name text box.

To open a file, select the filename and choose the OK button. If the document you want to use is in a different directory or on a different drive, first select the drive or directory in the Directories list box and choose the OK button.

Directories

Lists the available disk drives, the subdirectories of the current directory, and the directory above the current directory (represented by two periods). You can change directories by selecting a different directory or disk drive and choosing the OK button.

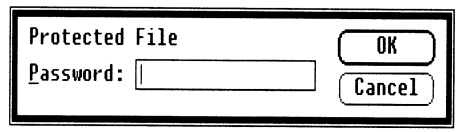
Read Only

This option is most useful when you are using Microsoft Excel on a network. If you open a document with the Read Only check box turned on, others can open the same document at the same time. However, you cannot change a document opened with the Read Only check box turned on.

If you open a document with the Read Only check box turned off, others on the network can open the document, but you are the only one who can change it.

Opening a Protected Document

If the document was saved with a password, Microsoft Excel will not open the document until you provide the password. This password protection is different from protecting a document from changes with the Options Protect Document command. For information on using a password to protect a document from being opened, see **File Save As command** and **Protecting or hiding data**. For information on using a password to protect a document from being changed, see **Options Protect Document command**.

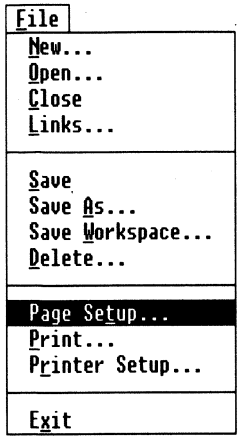


Password

Type the password you used when you saved the document.

For more information, see **Opening a document**.

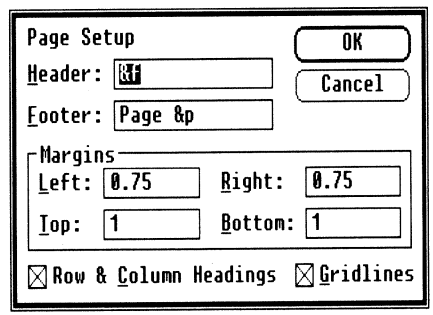
File Page Setup command



Controls the appearance of the printed document. When you save a document, Microsoft Excel saves the Page Setup settings with the document.

Worksheet

When a worksheet or macro sheet is active, File Page Setup determines the appearance of the document when you print it.



Header

Type the text and codes you want to use as the page header. All new worksheets are set to print the document name as the header. Headers are always printed one-half inch from the top of the page and three-fourths inch from the side of the page, regardless of how your margins are set.

By using the following codes in the Header or Footer boxes, you can align parts of the header or footer to the left, right, or center; include the page number, date, time, or document name; or print the header or footer in bold or italic.

Type	To
&L	Left-align the characters that follow.
&C	Center the characters that follow.
&R	Right-align the characters that follow.
&B	Print the left, center, or right part of the header or footer in bold.
&I	Print the left, center, or right part of the header or footer in italic.
&D	Print the current date.
&T	Print the current time.
&F	Print the name of the document.
&P	Print the page number.
&P + *number*	Add *number* to the page number and print it. (Use to change the starting page number. For example, &P + 3 makes the page numbering start at 4.)
&P − *number*	Subtract *number* from the page number and print it.
&&	Print a single ampersand.

You can include any or all of these codes in a single header or footer. For example, you would type *&LBudget&C&P&R&D* to print "Budget" left-aligned, center the page number, and print the current date right-aligned.

Footer

Type the text and codes you want to use as the footer. All new worksheets are set to print the word "Page" and the page number as the footer.

Footers are always printed one-half inch from the bottom of the page and three-fourths inch from the side of the page, regardless of how your margins are set.

Codes are the same as for headers. For the list of codes, see the preceding description of the Header box.

Margins

The margin settings determine the amount of space between the edge of the paper and the printed area. To change a margin, select the box containing the margin setting you want to change and type a new number.

Note | Margin settings do not affect the placement of headers and footers. When you set your margins, make sure they are large enough to allow space for your headers and footers.

Row & Column Headings

Prints the row and column headings.

Gridlines

Prints the gridlines.

Info Window

When the Info window is active, File Page Setup determines the appearance of the page when you print the information displayed in the Info window.

The File Page Setup dialog box options that appear when the Info window is active work the same as those in the File Page Setup dialog box for worksheets. For a complete description of each of those options, see the preceding "Worksheet" section in this topic.

Chart

File Page Setup displays a slightly different dialog box for a chart than for a worksheet. The Header, Footer, and Margins options all work the same way for printing a chart as for printing a worksheet. For a complete description of each of those options, see the "Worksheet" section earlier in this topic.

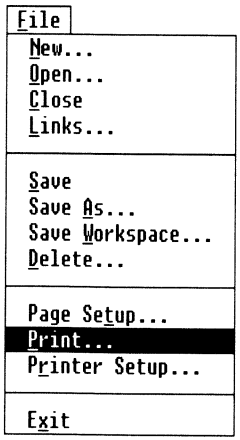
Size

Determines how you want the chart printed on the page within the margins.

Screen Size	Prints the chart the same size as on the screen
Fit to Page	Prints the chart as large as possible while retaining the height to width ratio shown on the screen
Full Page	Prints the chart to fit the entire page, regardless of the height to width ratio shown on the screen

For more information, see **Printing a document**.

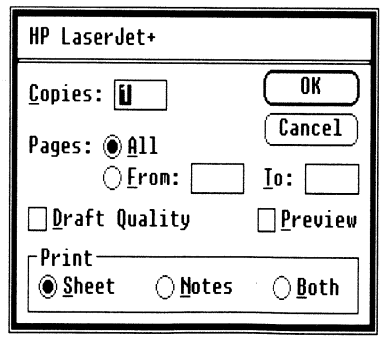
File Print command



Prints the active document according to the settings in the File Page Setup dialog box and File Printer Setup dialog box for your printer. **Shortcut key:** **CONTROL + SHIFT + F12.**

Worksheet

If the active document is a worksheet, and you have defined a print area with the Options Set Print Area command, Microsoft Excel prints only that area. If you do not set a print area, Microsoft Excel prints the entire worksheet. When Microsoft Excel prints a document, it applies all File Page Setup command settings, manual page breaks set with the Options Set Page Break command, and titles defined with the Options Set Print Titles command.



Copies

Determines how many copies of the document will print.

Pages

All	Prints all the pages in the print area
From	Prints a range of pages from the print area. Type the number of the first page of the range you want to print.
To	Type the number of the last page of the range

Draft Quality

Prints the document by using your printer's built-in character set. The result is usually somewhat lower quality but much faster printing.

Preview

Allows you to preview the pages and page breaks on the screen before printing. If Preview is turned on when you choose the OK button, the first page of the document as it will be printed appears in the Preview window. In the Preview window, you can use the following command buttons:

Next	Shows you the next page of the printed document
Previous	Shows you the previous page of the printed document
Zoom	Expands the page to show it full size. You can then scroll to see different parts of the page. Choose the Zoom button again to return the page to preview size.
Print	Prints the document with the options you set in the File Print dialog box
Cancel	Cancels the entire command and returns you to the document you were working on when you chose File Print

Print

Sheet	Prints the entire worksheet, or just the part of the worksheet defined by the Options Set Print Area command, but not the notes
Notes	Prints only the notes from the worksheet. If the Row and Column Headings check box is turned on in the File Page Setup dialog box, the cell reference of each note is printed before the note.
Both	Prints the entire worksheet, or just the part of the worksheet defined by the Options Set Print Area command, followed by all of the notes. If the Row and Column Headings check box is turned on in the File Page Setup dialog box, the cell reference of each note is printed before the note.

Notes are printed by rows. For example, all notes attached to cells in row 1 are printed before the notes attached to cells in row 2.

Info Window

When the Info window is active, File Print prints the information displayed in the Info window for the selected cells on the worksheet. To print all of the information about the worksheet, select the entire worksheet before you activate the Info window for printing.

You can change what is displayed in the Info window with the Info menu commands, which are available when the Info window is active.

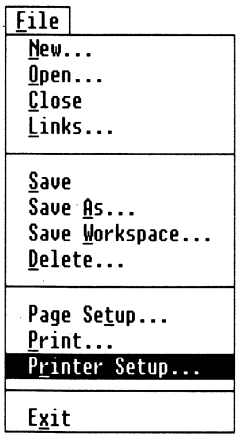
All of the File Print dialog box options available for the Info window work the same way as those available for a worksheet. For more information, see "Worksheet," earlier in this topic.

Chart

When a chart is the active document, File Print prints the chart. The size of the chart is determined by the File Page Setup dialog box settings.

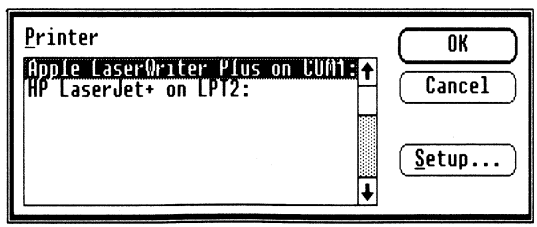
The File Print dialog box for charts has fewer options than the dialog box for worksheets, but all of the options in the dialog box for charts work the same way as the options for worksheets. For more information, see "Worksheet," earlier in this topic.

File Printer Setup command



Identifies the printer you want to use. Use File Printer Setup:

- The first time you install a printer.
- When you want to change the printer you are using.
- When you want to change the settings in your printer's dialog box.



Printer

Lists all currently installed printers. To change which printer you are using, select the printer from the list and choose the OK button.

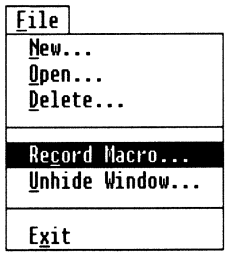
Setup

Displays a dialog box for the printer selected in the Printer list box. The options displayed in this dialog box depend on your printer.

For information on your printer's settings, see the owner's manual for your printer. For information on printing, see **Printing a document**.

To install a printer, start Control Panel by using the Control Run command (ALT, SPACEBAR, U). For information on Control Run, see **Control Run command**. For information on Control Panel, see the Appendix.

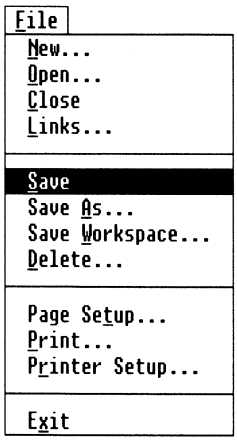
File Record Macro command



Records subsequent actions as a macro, so you can later repeat those actions by running the macro. This command normally appears on the Macro menu as Macro Record, but is available on the File menu when all documents are either closed or hidden.

For more information, see **Macro Record command**. For information on macros, see *Microsoft Excel Functions and Macros*.

File Save command



Saves changes made to the active document. The active document is saved on the disk under the same name you used the last time you saved it, and replaces the old copy on the disk. If you want to save the document under a different name or in a different file format, use the File Save As command. **Shortcut key:** SHIFT + F12.

If the document has not previously been saved in Normal or SYLK file format, or if you deleted the document from your disk with the File Delete command, the File Save As dialog box appears when you choose File Save. For more information, see **File Save As command**.

After you save a document, the document remains on the screen and in memory so you can continue working on it.

It is a good idea to save your work often, because a power interruption or failure may cause you to lose changes you've made since the last time you saved.

Important

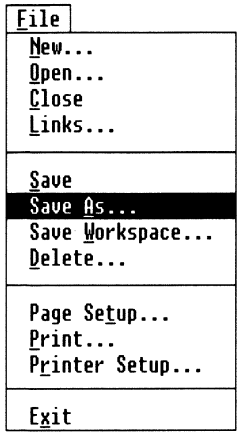
Microsoft Excel saves documents by first removing the old version from your disk, then saving the version currently in memory. If you interrupt File Save by pressing ESCAPE, no copy of the document is left on the disk.

If this happens, you can use the File Save As command to save the document on your disk as long as the document is still open in memory.

If the Make Backup check box is turned on in the File Save As dialog box, File Save renames the old version of the document by giving it the .BAK filename extension, then saves the current version of the document under its previous name. For more information on backup files, see **File Save As command**.

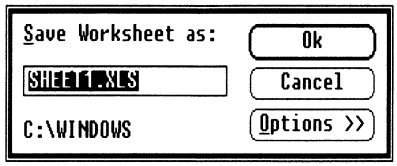
For more information, see **Saving and closing a document**.

File Save As command



Saves new documents or new versions of existing ones. Use File Save As to save a document that you have not previously saved, to save a document under a different name or file format, or to save a document in another directory. **Shortcut key:** F12.

To just save changes to an existing document, use the File Save command.



Save Document As

If the document already has a name, it appears in the text box. To accept the proposed name, choose the OK button. To save the document under another name, edit the proposed name or type a new one.

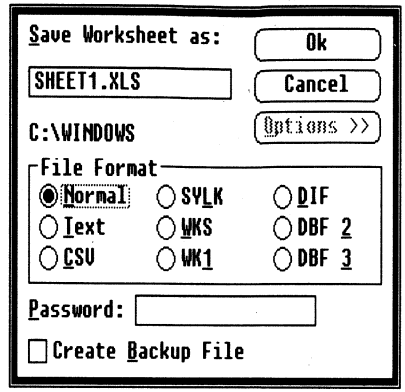
If the name you type has already been used for another document on the disk, Microsoft Excel asks you if you want to replace the existing document.

OK	Replaces the document on your disk with the active document.
Cancel	Cancels the command without saving the document.

Microsoft Excel saves the document in the current directory, shown at the bottom of the list box. If you want to save the document in a different directory, type the full pathname.

Options

The Options button displays the options described following.



File Format

The formats available in the File Save As dialog box depend on what kind of document you are saving. For example, a chart can be saved only in Normal format, while a worksheet can be saved in any one of the following nine formats.

Normal	The Microsoft Excel standard format. Save a document in Normal format if you are going to use the document with Microsoft Excel or if you plan to link worksheets.
Text	For transferring data to or from a word processor. Saves only the text and values as they are displayed in the cells on the worksheet. Columns are separated by tabs, and rows by carriage returns, but all other format information is lost. If a cell contains a comma or a tab, the value from the cell is enclosed in double quotation marks.
CSV	Comma Separated Values (CSV) format is similar to Text format, except that CSV file format uses a comma to separate fields, instead of a tab. If a cell contains a comma, the value from the cell is enclosed in double quotation marks. You should save CSV files with the extension .CSV. If you open a CSV file that has an extension other than .CSV, Microsoft Excel interprets it as a normal text file.
SYLK	For transferring data to another Microsoft worksheet, such as Microsoft Multiplan or Microsoft Excel for the Apple Macintosh.

WKS	For transferring data to Lotus 1-2-3, version 1A, or Symphony on the IBM PC
WK1	For transferring data to Lotus 1-2-3, version 2, on the IBM PC
DIF	For transferring data to an application that requires Data Interchange Format (DIF), such as Visicalc. DIF format saves values, but not the formulas that produce them.
DBF 2	For transferring the database range to dBASE II
DBF 3	For transferring the database range to dBASE III

Password

Prevents others from opening the document. If you save the document with a password, Microsoft Excel does not allow the document to be opened without the password. A password can be up to 16 characters long.

Using a password to protect a document from being opened is different from using a password to protect a document from changes. For information on using a password to protect a document from being changed, see **Options Protect Document command** and **Protecting or hiding data**.

Create Backup File

Creates a backup copy of the document every time you save the document in the future. To create the backup file, Microsoft Excel renames the old version of the document by giving it the .BAK filename extension, then saves the current version of the document under its previous name.

This way you can have the last two versions of a document on your disk: the version you just saved and the previous version with a .BAK extension.

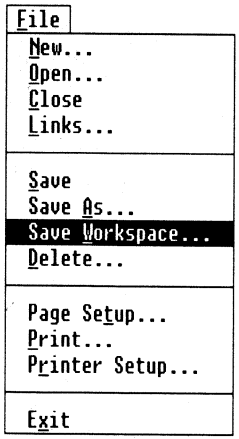
Important Microsoft Excel always uses the .BAK extension when making backups. For example, if you have a chart named SALES.XLC and a worksheet named SALES.XLS, there will only be one SALES.BAK, and it will only contain a backup of the document you saved last.

After you save a document with File Save As, it remains on the screen, but its name changes to the name you gave it. You can continue to change it and save it under the same name with the File Save command, or under another name with File Save As if you want to keep different versions.

For more information, see **Saving and closing a document**.

File Save Workspace command

(Full menus)



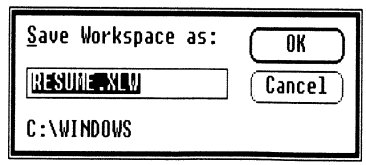
Saves a list of the windows and documents open in Microsoft Excel when you choose the command. File Save Workspace also saves all open documents that you have changed since you last saved them.

File Save Workspace is useful whenever you want to save changes in all your open documents — for example, before you quit Microsoft Excel.

Important

A workspace file contains only a list of the documents that were open when the file was created, not the documents themselves. Do not delete files you need just because they are recorded in a workspace file.

For example, if you have a certain arrangement of worksheets, charts, and macro sheets open for doing your payroll, you can save that arrangement in a workspace file called PAYROLL.XLW. Then, whenever you want to do the payroll, you need only open PAYROLL.XLW, and Microsoft Excel automatically opens all of the necessary worksheets, charts, and macro sheets in the same size and position as they were when you last saved them.



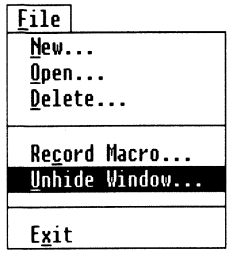
Save Workspace As

Type the name for the workspace file you are creating. If you have opened an existing workspace file, Microsoft Excel proposes that workspace name. You can save any changes you've made to the workspace by accepting the

proposed name and choosing the OK button. Otherwise, Microsoft Excel proposes the name RESUME.XLW. You can create a new workspace file by accepting that name or by typing a new name.

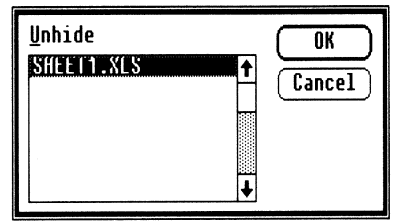
If you don't add an extension to the filename, Microsoft Excel automatically adds .XLW to the name you type.

File Unhide Window command



Makes a hidden window visible.

Normally, the Unhide command appears on the Window menu, but it appears on the File menu when there are no open, unhidden windows in the workspace. For information on hiding or unhiding a window, see **Window Hide command**, **Window Unhide command**, and **Protecting or hiding data**.



Unhide

Lists all hidden windows. Select the window you want to unhide and choose the OK button.

If you protected the window with the Options Protect Document command, Microsoft Excel asks for the password before the window is unhidden.

Finding cells and data quickly

When you want to select specific cells or find cells that contain certain data, you don't have to scroll through the rows and columns of your worksheet browsing for the specific cells or data. You can use commands from the Formula menu to go directly to the desired location in the worksheet.

This topic explains:

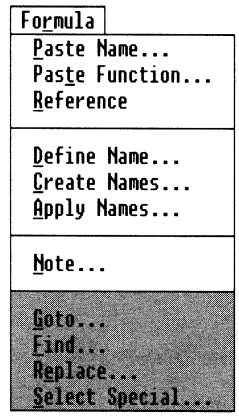
- Commands for finding cells and data
- Finding specific cells or named ranges

- Finding specific data
- Finding and replacing data
- Finding cells with specific types of contents
- Finding cells that are part of a group
- Finding cells that are different
- Finding cells that refer to each other

For information on finding records in a database, see **Database** and **Data Find command**.

Commands for Finding Cells and Data

You use commands on the Formula menu to find cells and data (Full menu shown):



- Use Formula Goto to select the part of the worksheet you specify.
- Use Formula Find to select the first cell that has the contents you specify.
- Use Formula Replace to find the cells that have the contents you specify and to insert new contents.
- Use Formula Select Special to select a cell or cells that contain a specific type of contents, are different, or refer to each other.

Finding Specific Cells or Named Ranges

The Formula Goto command quickly scrolls the worksheet and selects a cell, cell range, or named area. Using the Formula Goto command is just like selecting cells on the worksheet; you can extend the selection from the active cell to the Goto area by either holding down SHIFT when you choose the OK button, or by pressing F8 before choosing the command. You can also add the Goto area to a multiple selection by holding down the CONTROL key when you choose the OK button, or by pressing SHIFT+F8 before choosing the command.

After using Formula Goto, you can easily return to the previous cell location. The next time you choose Formula Goto, Microsoft Excel proposes the previous location.

To find a specific cell or named range:

1. Choose Formula Goto.
2. Select a name from the list box or type a reference in the Reference text box.
3. Choose the OK button.

Note When the formula bar is active, you can choose the Goto command to include a name or reference in the formula. When you do so, the worksheet scrolls to that part of the worksheet.

Finding Specific Data

To find cells containing specific formulas, values, or any sequence of characters, use the Formula Find command. For example, you might want to find all cells that are formatted with a percent sign (%), contain the error value #REF!, have formulas that contain the name Sales_1987, or have formulas that contain the reference A1.

If you have a single cell selected, Microsoft Excel starts at that cell and searches the entire worksheet. If you have a range of cells selected, Microsoft Excel looks only within that range.

To find data:

1. To search the entire worksheet, select a single cell.

   To limit the search, select the cell range you want to search.
2. Choose Formula Find.
3. In the Find What box, type the characters you want to find.
4. To look in the formulas as displayed in the formula bar, select Formula under Look In.

   To look in the values as displayed in the cells, select Values.

   To look in the notes that are attached to cells on the worksheet, select Notes.
5. Under Look At, select Whole to match the entire formula, value, or note; select Part to match part of the formula, value, or note.

6 Under Look By, select Rows to search through rows. Use this option if the cell you are looking for is probably to the left or right of the active cell.

Select Columns to search through columns. Use this option if the cell you are looking for is probably above or below the active cell.

7 Choose the OK button to start the search.

You can search backward from the active cell by holding down SHIFT when you choose the OK button.

To find the next occurrence of what you last specified, press F7. To find the previous occurrence, press SHIFT+F7.

Finding and Replacing Data (Full Menus)

Use the Formula Replace command to find and replace specific sequences of characters with another sequence of characters in one or more cells on a worksheet.

1 To search the entire worksheet, select a single cell.

To limit the search, select the cell range you want to search.

2 Choose Formula Replace.

3 In the Replace box, type the characters you want to replace.

4 In the With box, type the characters that will replace what you typed in the Replace box.

5 Under Look At, select Whole to match the entire formula or value; select Part to match part of the formula or value.

6 Under Look By, select Rows to search through rows; select Columns to search through columns.

7 To replace data in the active cell and find the next occurrence, choose the Replace button. To search backward, hold down SHIFT while choosing the Replace button.

To skip the active cell and find the next occurrence of the data, choose the Find Next button. To search backward, hold down SHIFT while choosing the Find Next button.

To replace all occurrences of the data in the selection, choose the Replace All button.

When there are no more occurrences of the data, Microsoft Excel displays a message.

Finding Cells with Specific Types of Contents (Full Menus)

You can select all of the cells containing specific types of cell contents in a range or in the entire worksheet. Use the Formula Select Special command to make a multiple selection of all cells in a range or in the entire worksheet that contain any of the following:

- **Notes** — to select cells that have notes.
- **Constants** — to select cells with constant numbers, text, logical values, error values, or any combination of these. Useful for clearing data while retaining formulas.
- **Formulas** — to select cells with formulas that produce number values, text, logical values, error values, or any combination of these. Useful for finding errors.
- **Blanks** — to select cells that are blank. Useful for finding cells that should contain data, but don't, and are therefore causing formulas to produce misleading results.

To find cells with specific contents:

1. To search the entire worksheet, select a single cell.
   To limit the search, select the cell range you want to search.
2. Choose Formula Select Special.
3. Select the appropriate option for what you want to find.
4. Choose the OK button.

Microsoft Excel makes a multiple selection of all cells in the search area that contain the type of contents you selected in the dialog box. You can then move through the cells in the selection with TAB and SHIFT+TAB, and move among areas of a multiple selection with CONTROL+TAB.

Finding Cells That Are Part of a Group (Full Menus)

You can select the cell range that the active cell is a part of. Use the Formula Select Special command to select the array that the active cell is a part of, if any, or to select a rectangular area containing the active cell and bordered by a blank row or column, or the edge of the worksheet.

1. Select the cell for which you want to select the current region or array.
2. Choose Formula Select Special.
3. Select Current Region or Current Array.
4. Choose the OK button.

Finding Cells That Are Different (Full Menus)

You can select cells with contents different from the cell contents of the active cell or cell range. Use Row Differences and Column Differences in the Formula Select Special dialog box to make a multiple selection of all cells in a range or multiple selection that contain formulas that are different from the corresponding cells in the row or column containing the active cell.

Row Differences and Column Differences work the same way, except that Row Differences selects cells in the same row that are different, while Column Differences selects cells in the same column that are different. This section describes how Row Differences works. To use Column Differences, follow the same general rules and procedures.

Note | When looking for column differences, Microsoft Excel searches columns, rather than rows as described in the following guidelines.

Microsoft Excel determines how to select row differences by looking at what you have selected:

- The position of the active cell determines which cells Microsoft Excel uses as the comparison cells, which are the basis for finding row differences. When searching for row differences, Microsoft Excel compares the cells in the selection to the cells in the same column as the active cell.

  The active cell, and thus the comparison cells, can be within the selection or outside of it.

- The cells in the selection determine the area Microsoft Excel searches for differences. Within the selection, Microsoft Excel finds the cells in each row that are different from the comparison cell in the column containing the active cell, and makes a multiple selection of all the cells that are different.

To select cells that are different in the same row or column:

1. Select the range or ranges you want Microsoft Excel to search for row or column differences.
2. Place the active cell in the row or column you want Microsft Excel to use as the basis for the comparison.
3. Choose Formula Select Special.
4. Select Row Differences or Column Differences.
5. Choose the OK button.

Finding Cells That Refer to Each Other (Full Menus)

Use the Formula Select Special command to find precedents (cells that the formulas in the selected cell or cell range refer to), or dependents (cells with formulas that refer to the selected cell or cell range).

Note When searching for precedents and dependents, Microsoft Excel always searches the entire worksheet. If you select a cell range before searching for precedents or dependents, Microsoft Excel selects all cells in the worksheet that are precedents or dependents for any cell in that range.

You can select direct precedents or dependents, or you can select an entire network of precedents or dependents. This is a useful tool for tracing how cells are connected in your worksheet, or for building macros that trace references.

To find related cells:

1. Select the cell or cell range whose precedents or dependents you want to select.
2. Choose Formula Select Special.
3. Select Precedents to find the cells referred to by the formulas in the cell or cells you selected before choosing the command.

   Select Dependents to find the cells with formulas that refer to the cell or cells you selected before choosing the command.
4. Select Direct Only to find only the cells with precedents that are specifically referred to by the selected cell or cells, or the dependents that specifically refer to the selection.

   Select All Levels to find all precedents, including the precedents of the precedents, or all dependents, including dependents of the dependents.
5. Choose the OK button.

Related Information

Reference

For information on	See
Selecting in worksheets and macro sheets	Keyboard Mouse Worksheet
Using Info window to display precedents and dependents	Info window

Font

The term **font** refers to the design of the typeface (letters, numbers, and punctuation marks) in which text and numbers are displayed or printed for worksheets and charts. **Font name** refers to a particular typeface design — for example, Helvetica or Times-Roman. **Font size** refers to the height of the characters and is usually measured in points (for example, 9-point type, 12-point type). **Font style** is how the font appears (for example, normal, bold, italic). Varying the fonts, font sizes, and font styles in a worksheet or chart is one way to make the document more attractive and easier to read.

This topic explains:

- Available fonts in Microsoft Excel

  How to check available fonts

- Worksheet fonts

  Applying a worksheet font

  Changing the worksheet font set

- Chart fonts

  Changing a chart text font

Note | All worksheet font options also apply to macro sheets.

Available Fonts in Microsoft Excel

The fonts available with Microsoft Excel vary according to your system configuration. Screen fonts depend on whether you're running Microsoft Excel by itself or under Microsoft Windows, version 2.0 or higher. Printer fonts depend on the specific printer or printers you've set up to work with Microsoft Excel.

The default screen font for worksheets and charts is Helv 10, or the font in your system configuration that most closely matches it. Data you enter in a new, unformatted worksheet is automatically displayed in this font.

How to Check Available Fonts

The dialog box for the Format Font command tells you which screen and printer fonts you can use with Microsoft Excel. When you choose Format Font while the worksheet window is active, the dialog box first displays your current font set for worksheets (four-font maximum); choosing the Fonts button expands the dialog box to display additional font options. If a chart window is active, the dialog box immediately displays all font options.

In either the worksheet or chart Format Font dialog box, the Font and Size list boxes display the specific font information. You can check available printer and screen fonts in the dialog box, as follows:

- To see available printer fonts and font sizes for the current printer, make sure the Printer Fonts check box is turned on.
- To see available screen fonts and font sizes, make sure the Printer Fonts check box is turned off.

For information on the dialog box options, see **Format Font command**. For information on printing and printers, see **Printing a document** and **File Printer Setup command**.

Worksheet Fonts

You can use up to four fonts in a worksheet. These can be a combination of size and style variations for one or more fonts. The current font set for a worksheet consists of the four choices you see when the Format Font dialog box is first displayed.

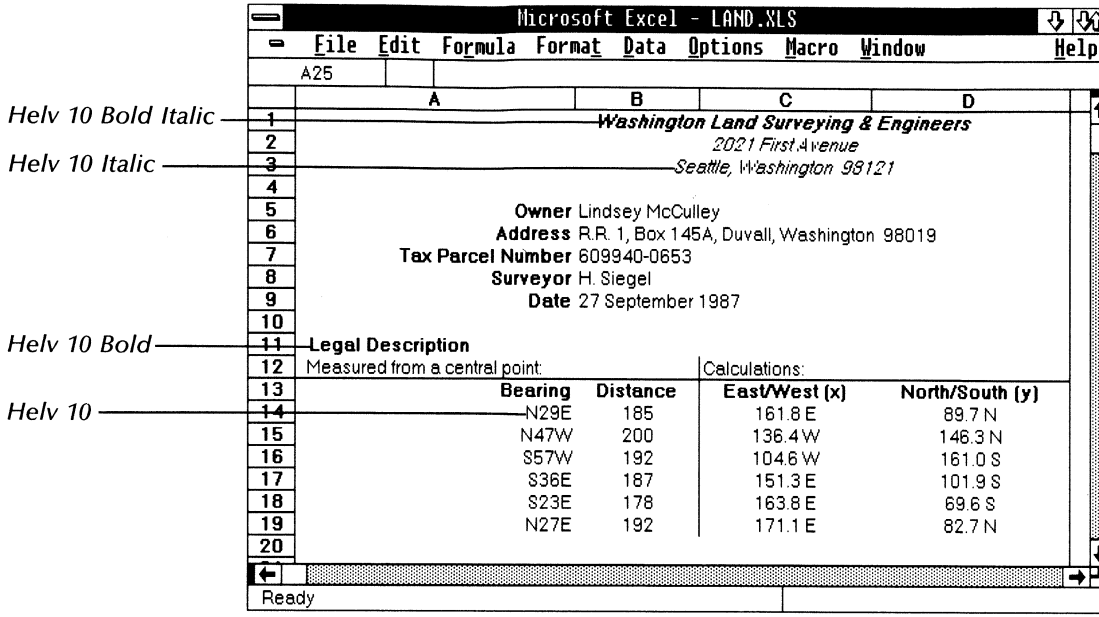
Microsoft Excel initially uses the following screen font set (or the fonts closest to these in your system configuration):

- Helv 10
- Helv 10, Bold
- Helv 10, Italic
- Helv 10, Bold Italic

The default font (font number 1 in the Format Font dialog box) is Helv 10. Microsoft Excel automatically applies the default font unless you apply one of the other three fonts in the the font set. To apply any of the other fonts, follow the procedure under "Applying a Worksheet Font," in the next section of this topic.

If you print a worksheet formatted with these screen fonts, Microsoft Excel uses the closest printer font. To replace any of these fonts so that you can format the worksheet with different screen or printer fonts, follow the procedure under "Changing the Worksheet Font Set," later in this topic.

The following illustration shows the four default screen fonts.



Microsoft Excel automatically makes the following adjustments when you make font changes in a worksheet:

- **Row height** — If the Format Row Height dialog box is set to Standard Row Height, Microsoft Excel adjusts the height of rows to accommodate the largest font in each row.
- **Column width** — If you change the definition of font number 1 in the Format Font dialog box, Microsoft Excel adjusts the width of all columns proportional to the change in the size of the font. The adjustment preserves the number of default font characters that fit in each column.

Note that the column width adjustment occurs only when the font change involves the default font, the first font listed in the Format Font dialog box. You can make additional manual adjustments to column width and row height to accommodate borders and shading or long cell entries. For more information, see **Column**, **Row**, and **Borders and shading**.

Applying a Worksheet Font

1. Select the cells you want to format.
2. Choose Format Font.

   A dialog box displays the current font set.

3. Select the font you want.
4. Choose the OK button.

For more information, see **Format Font command**.

Changing the Worksheet Font Set

You can replace one or more of the choices in the current font set with any other font available through your system configuration.

Before you replace a font, decide if you want to use screen or printer fonts. If you print a worksheet formatted in a specific screen font, Microsoft Excel uses the printer font closest to that screen font. If you display a worksheet formatted in a specific printer font, Microsoft Excel uses the screen font closest to that printer font. You may want to format worksheets in printer fonts and only use specific screen fonts if you plan to display a worksheet in a presentation.

Note When you replace a font in the current font set, Microsoft Excel reformats all worksheet entries in the old font with the new font replacing it.

To replace a font in the current worksheet font set:

1. Choose Format Font.
2. Under Fonts, select the font you want to replace.
3. Choose the Fonts button.

   The dialog box expands to display other available font options.
4. If you want to use a printer font, make sure the Printer Fonts check box is turned on.

   If you want to use a screen font, make sure the Printer Fonts check box is turned off.
5. In the Fonts list box, select a font.

   The numbers in the Size list box change to show the available sizes for the font you select.
6. In the Size box, select a font size.
7. Under Style, turn on the check boxes for the options you want.
8. Choose the Replace button.

   The new font replaces the font you had selected before you chose the Fonts button.

Note | The Cancel button in the Format Font dialog box does not undo a font replacement; it only cancels the command and closes the dialog box. If you change your mind after choosing the Replace button, follow steps 2–8 and change back to the original font choice.

9 Follow steps 2–8 for each font you want to change.

10 Choose the OK button.

To apply any font in the new font set, follow the procedure under "Applying a Worksheet Font," earlier in this topic.

Chart Fonts

Any text in a new chart is initially formatted in Helv 10. You can reformat chart text with any font available through your system configuration. Font changes in chart text do not affect the worksheet. For more information, see **Chart text** and **Format Font command.**

Changing a Chart Text Font

You can change font for one piece of chart text, or for all text in the chart.

To change font, size, color, and style for one piece of chart text

1 Select the text.

2 Choose Format Font.

3 Select the options you want.

4 Choose the OK button.

To change font, size, color, and style for all chart text

1 Select the chart with Chart Select Chart.

2 Choose Format Font.

3 Select the options you want.

4 Choose the OK button.

Related Information

Reference

For information on	See
Adding fonts to your system configuration	Appendix
General overview of formatting worksheets and charts	Formatting a document
Aligning text	Alignment

Continued

Formatting borders and adding shading	Borders and shading
Using color formats for numbers and text	Number Text

Sampler

Creating Calendars, Diagrams, Tables, and Forms

Preparing a New Business Plan

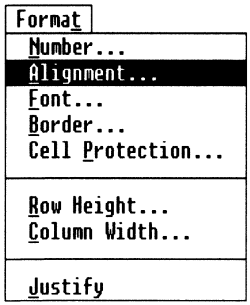
Tutorial

Changing How a Chart Looks

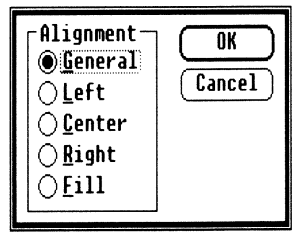
Feature Guide

Worksheet Formatting

Format Alignment command



Aligns the contents of the selected cells. Initially, all cells in the worksheet use General alignment.

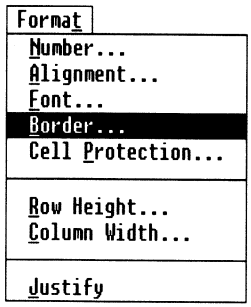


Alignment

General	Aligns text to the left, numbers to the right, and centers logical and error values
Left	Aligns all cell contents to the left
Center	Centers all cell contents
Right	Aligns all cell contents to the right
Fill	Repeats the contents of the cell until the cell is full. If there are blank cells to the right that also have the Fill format, they are filled as well.

For more information, see **Alignment**.

Format Border command



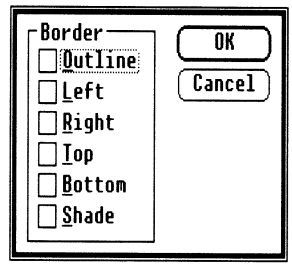
Adds solid border lines and/or shading to the cells in the selection.

Use Format Border to add emphasis. For example, you can add top borders to cells containing totals to separate them from data above, or you can use shading or boxes to bring attention to important parts of your worksheet.

Adjoining cells share borders. For example, putting a bottom border on one cell usually produces the same effect as putting a top border on the cell below it.

Select the cells you want to format, then choose Format Border. You can turn on any combination of borders or shading.

Borders are different from gridlines. For information on controlling gridlines, see **Options Display command**. For information on printing gridlines, see **File Page Setup command**.



Outline

Puts a border around the outermost edges of the entire selection.

Left

Puts a border on the left edge of every cell in the selection.

Right

Puts a border on the right edge of every cell in the selection.

Top

Puts a border on the top edge of every cell in the selection.

Bottom

Puts a border on the bottom edge of every cell in the selection.

Shade

Shades every cell in the selection.

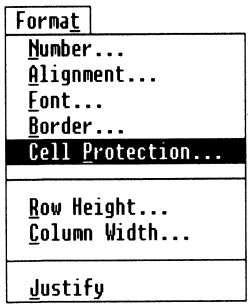
Tip

You can create a double-underline under a row of cells with the following procedure:

1. Insert a blank row between the row you want to underline and the row below it.
2. Put top and bottom borders on the blank row.
3. Use Format Row Height to make the blank row as narrow as the distance you want between the double-underlines.

Format Cell Protection command

(Full menus)



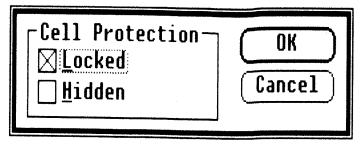
Controls whether the formulas in the selected cells can be edited and whether they are displayed in a protected worksheet.

Generally, you lock cells to protect them from being changed accidentally; you hide and lock cells for security, so that others can neither see nor change your formulas.

Note

Format Cell Protection affects only individual cells when the worksheet has been protected with the Options Protect Document command. If the worksheet is not protected, the Format Cell Protection settings are ignored.

For more information, see **Options Protect Document command** and **Protecting or hiding data**.



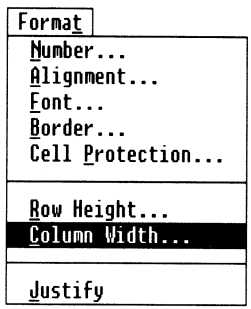
Locked

On a new worksheet, all cells are locked. If you protect a worksheet with the Options Protect Document command, you cannot edit locked cells. You can unlock individual cells or cell ranges by selecting them and turning off the Locked check box while the worksheet is unprotected.

Hidden

On a new worksheet, no cells are hidden. If you turn on the Hidden check box for a range of cells, then protect the worksheet with the Options Protect Document command, the formulas in that range of cells do not appear in the formula bar.

Format Column Width command

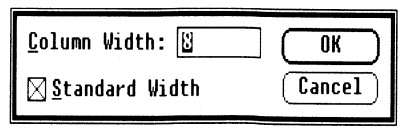


Sets the width of the selected columns.

You need not select the entire column. If any cell in a column is selected, the new column width applies to all cells in that column. Format Column Width changes the width of all columns in the selection, including hidden columns.

Note | To change the width of a column with the mouse, point to the line to the right of the column heading for the column you want to change, and drag.

For more information, see **Column**.



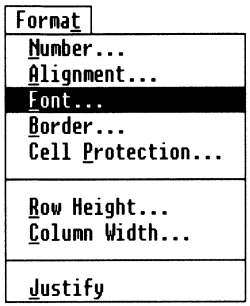
Column Width

Accept the proposed response or type a different width. You can define column widths in decimal fractions. A column can be up to 255 characters wide, or it can be hidden by setting its width to 0.

Standard Width

Standard column width is eight characters.

Format Font command



Changes the font for all or part of the active document.

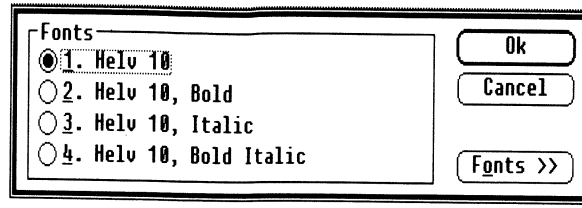
Worksheet

You can change the font for the entire worksheet, for a single cell, or for a range of cells. You can have as many as four different fonts on your worksheet, and you can change those four fonts to any of the fonts installed on your computer.

Note

There are two parts to the Format Font dialog box for worksheets. To change the font for the selected cells, select one of the four available fonts and choose the OK button.

If you choose the Fonts button, additional options appear in the dialog box. You can redefine any of the available fonts. To redefine a font, select the font you want to redefine, choose the Fonts button, and select the font options you want. Then choose the Replace button to redefine the font you selected.



Fonts

Allows you to change the font used by the cell or cell range you selected before choosing Format Font. All cells in your worksheet use font 1 until you apply one of the other fonts. If you select one of the other three fonts and choose the OK button, that font will apply to the selected cell or cell range.

If the row height is set to Standard Row Height for the row or rows containing the cells you are formatting, Microsoft Excel automatically adjusts the row height to accommodate the largest font in the row.

If the font you apply to the selected cell or cell range is taller than the current row height, the row height increases; if a new font reduces the size of the largest font in the row(s), the row height decreases.

Note

If you have set the row height to a specific height in the Format Row Height dialog box, the row stays that height until you change it or set it to Standard Row Height. Fonts larger than the row height will appear clipped. For more information on changing the row height, see **Format Row Height command**.

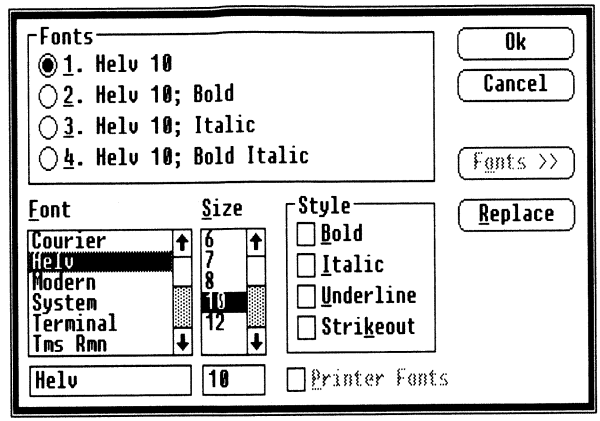
Fonts Button

The Fonts button displays the options available for changing the definition of the selected font. Make sure you select the font you want to redefine before you choose the Fonts button.

Note

If you change the definition of a font, all cells formatted with that font take on the new definition. For example, if cells B3 and D4 are formatted with font 2, and you change font 2 from Helv Bold to TmsRmn Italic, cells B3 and D4 automatically change from Helv Bold to TmsRmn Italic.

Also note that font 1 is the default font for the entire worksheet. If you change the definition of font 1, you change the font used by all cells in the worksheet that have not been formatted with one of the other three fonts. If you change font 1, Microsoft Excel also adjusts the displayed column width of all columns to fit the new font.



Font List Box

Lists available fonts. If the Printer Fonts check box is turned off, only fonts that can be displayed on your screen are listed. If the Printer Fonts check box is turned on, only the fonts your printer driver is designed to print are listed.

Size

Lists the available sizes for the font selected in the Font list box. The sizes available may vary depending on whether the Printer Fonts check box is turned on. You can select one of these sizes, or type a size in the text box below the Size list box.

If you type a size that is different from one of those listed in the list box, Microsoft Excel attempts to produce that size as closely as possible. Depending on your screen display and your printer driver, the results may appear ragged.

Style

Turn on any combination of the available font styles.

Bold	Makes the selected text bold
Italic	Makes the selected text italic
Underline	Underlines the selected text
Strikeout	Puts a horizontal line through the selected text

Printer Fonts

Controls which fonts are displayed in the Font list box. If the Printer Fonts check box is turned on, the Font list box lists only those fonts that your printer driver is designed to print. If the Printer Fonts check box is turned off, only screen display fonts are listed.

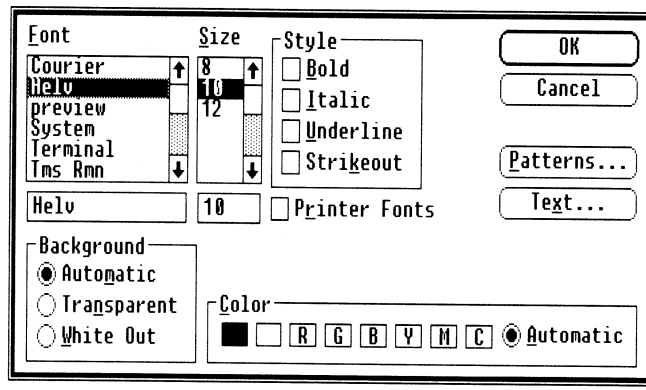
Replace

Changes the definition of the font selected under Fonts at the top of the dialog box, but does not apply that font to the selected cells or close the dialog box.

Chart

If you choose Format Font when a chart is the active document, Microsoft Excel displays a dialog box that allows you to change the font of the selected text. If you select the entire chart with the Chart Select Chart command before choosing Format Font, all text in the chart uses the new font.

If there is no text on the chart, or if there is no text selected, Format Font is grayed on the menu. For information on adding text to your chart, see **Chart Attach Text command** and **Chart text**.



Font

Lists available fonts. If the Printer Fonts check box is turned off, only fonts that can be displayed on your screen are listed. If the Printer Fonts check box is turned on, only the fonts your printer driver is designed to print are listed.

Size

Lists the available sizes for the font selected in the Font list box. The sizes available may vary depending on whether the Printer Fonts check box is turned on. You can select one of these sizes, or type a size in the text box below the Size list box.

If you type a size that is different from one of those listed in the list box, Microsoft Excel attempts to produce that size as closely as possible. Depending on your screen display and your printer driver, the results may appear ragged.

Style

Turn on any combination of the available font styles.

Bold	Makes the selected text bold
Italic	Makes the selected text italic
Underline	Underlines the selected text
Strikeout	Puts a horizontal line through the selected text

Printer Fonts

Controls which fonts are displayed in the Font list box. If the Printer Fonts check box is turned on, the Font box lists only those fonts that your printer driver is designed to print. If the Printer Fonts check box is turned off, Font lists only screen display fonts.

Background

Controls the appearance of the area behind the text.

Automatic	Microsoft Excel selects the background pattern for you
Transparent	Leaves the background area transparent, so you can see what is behind the text
White Out	Whites out a rectangular area large enough to accommodate the text

Note White Out does not always use white. If you have a background pattern defined for the text, or if you use a background color other than white, Microsoft Excel uses that pattern or color instead of white.

Color

Controls the color of the text. You can select black, white, red, green, blue, yellow, magenta, cyan, or Automatic. If you select Automatic, Microsoft Excel uses the Window Text Color defined in Control Panel. For information on starting Control Panel, see **Control Run command**. For information on using Control Panel, see the Appendix.

Note If you print a chart with text set to Automatic color, the text always prints as black no matter what color is set for Window Text Color in Control Panel. The background for text with Automatic color always prints out white.

Patterns

Carries out any changes you have made in the Format Font dialog box and displays the Format Patterns dialog box.

Scale

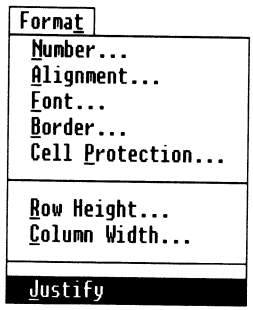
Carries out any changes you have made in the Format Font dialog box and displays the Format Scale dialog box.

Text

Carries out any changes you have made in the Format Font dialog box and displays the Format Text dialog box.

Format Justify command

(Full menus)



Rearranges the text in the left column of a range so that all cells in the range display text of approximately the same width.

All of the cells in the left column of the range must either contain text or be blank. Although the other cells in the range can contain text, values, or formulas, they should be blank or they will interfere with the display of the text.

Format Justify evenly distributes all of the text in the left column of the selection by merging the text into a single string of text, then putting enough text in the upper-left cell to fill to the edge of that row of the selection, then enough text in the next cell down to fill to the edge of that row of the selection, and so on.

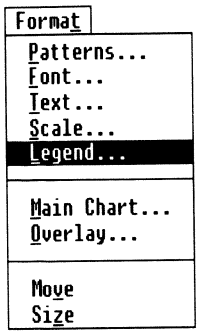
If the range you have selected is not large enough to accommodate the text, Microsoft Excel asks you if it can go beyond the current length of the selection. If you choose the OK button, and there is data in cells that will be overlapped by the justification, the contents of those cells is replaced by the justified text.

If you replace data that you wanted to keep, you can choose the Edit Undo command to reverse Format Justify and return the text to the way it was before you justified it.

Blank Cells

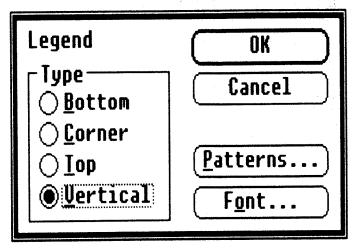
Blank cells in the left column act as paragraph separators. A blank cell or cells divide the range into separate sections that are each justified individually. For example, if the selected cell range is five rows high, and the third cell in the left column is blank, then the top two rows of the selection are justified together and the bottom two rows of the selection are justified together.

Format Legend command



Determines the position and orientation of the legend on a chart.

For information on adding a legend to your chart, see **Chart Add Legend command** and **Chart**.



Type

Bottom	Moves legend to bottom of chart and orients legend horizontally
Corner	Moves legend to upper-right corner of chart and orients legend vertically
Top	Moves legend to top of chart and orients legend horizontally
Vertical	Moves legend to right side of chart and orients legend vertically

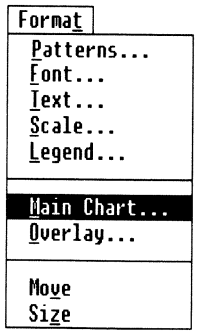
Patterns

Carries out any changes you made in the Format Legend dialog box and displays the Format Patterns dialog box.

Font

Carries out any changes you made in the Format Legend dialog box and displays the Format Font dialog box.

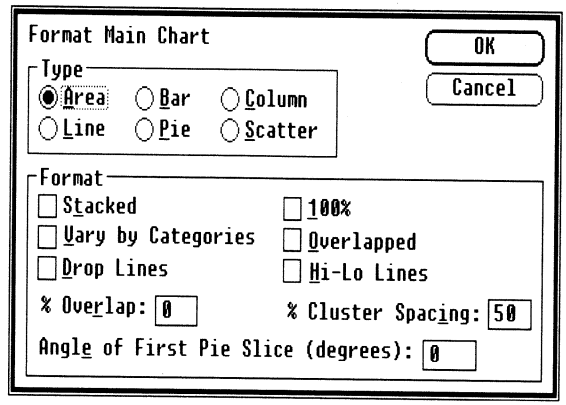
Format Main Chart command



Controls the main chart's type and formats.

Although the dialog box contains all of the format options the various chart types use, only those relevant to the selected chart type are available. Options that are not relevant to the selected chart type are grayed.

For information on formatting charts, see **Chart**.



Type

The chart type options are similar to the commands in the Gallery menu.

Area	Makes the main chart an area chart
Bar	Makes the main chart a bar chart
Column	Makes the main chart a column chart
Line	Makes the main chart a line chart
Pie	Makes the main chart a pie chart
Scatter	Makes the main chart a scatter chart

Stacked

Within a category, the value from the first series is measured from the series axis. The value from the second series is measured from the top of the value from the first series, and so on. (See format 3 in the column gallery.)

Vary by Categories

Applies only when the chart includes a single series. If this check box is turned on, Microsoft Excel assigns a different color or pattern to each data point. (See format 2 in the column gallery.)

Drop Lines

Drop lines extend from the highest value in each category to the category axis. (See format 3 in the area gallery.)

100%

The values in each category are shown as percentages adding up to 100 percent. The absolute values do not appear on the chart. The series themselves are not altered. (See format 5 in the column gallery.)

Overlapped

When this check box is turned on, the number you type in the % Overlap box determines how much the markers within a cluster overlap, rather than how far apart they are. (See format 4 in the column gallery.)

Hi-lo Lines

Hi-lo lines extend from the highest to the lowest value in each category. (See format 7 in the line gallery.)

% Overlap

If the Overlapped check box is turned on, this option determines how much the markers in a cluster overlap. If the Overlapped check box is turned off, this option determines how much space there is between bars or columns within a cluster. The number you type here represents a percentage of the width of a bar or column.

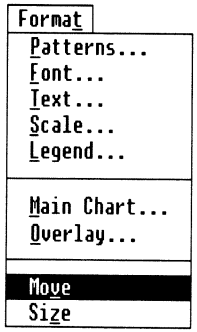
% Cluster Spacing

Determines how much space there is between clusters of bars or columns. The number you type here represents a percentage of the width of a bar or column.

Angle of First Pie Slice

In a pie chart, this represents the angle of the first edge of the first slice. The angle is measured in degrees clockwise from vertical.

Format Move command



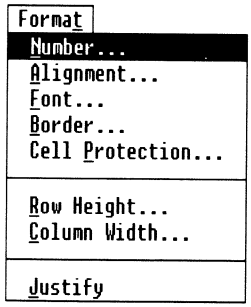
Allows you to move a chart object with the keyboard. Format Move is different from the Control Move command, which you use to move the entire window.

To move a chart object, select the object, choose Format Move, move the object with the DIRECTION keys, then press ENTER.

Note | If you have a mouse, you can move a chart object by dragging it. When dragging to move an object, avoid dragging the black selection squares.

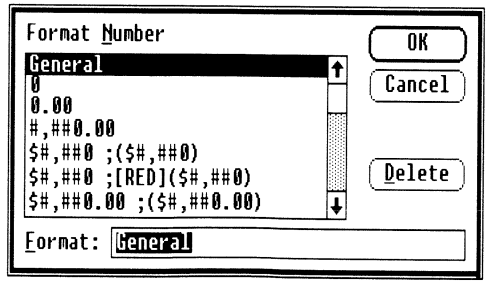
For information on selecting chart objects, see **Chart**.

Format Number command



Determines how Microsoft Excel displays numbers, dates, and times. You can use one of the twenty-one built-in formats, or you can create your own custom formats.

When you choose Format Number, Microsoft Excel displays a dialog box with number formatting choices in a list box. Scroll the list box to see all the available formats.



Format Number

Lists all available number formats. Except for General format, the choices in the list box are combinations of symbols that represent what each format looks like. Each number format except General is called a **picture**.

Unless you specify a different format, Microsoft Excel uses General format. General format displays numbers in the selection as precisely as possible. If the number is longer than what will fit in the cell, Microsoft Excel displays it in scientific notation.

Format

Shows the picture currently selected in the Format Number list box. When you want to create custom formats, you use this text box either to edit an existing format or type an entirely new one. If you edit an existing format, Microsoft Excel keeps the old format when it saves the new one.

Delete

Deletes the selected custom format. You can only delete formats you have created; you cannot delete the Microsoft Excel built-in formats.

Number Formats

The following table lists the built-in number formats and shows examples of each format and what is displayed when the cell contains a positive number, a negative number, and a fraction.

A number format is composed of up to four sections separated by semicolons: three number sections and a text section. The text section may be omitted, and the number sections may be collapsed into only one or two sections.

If there are three sections, the first section is the format used for a positive number, the second section is the format used for a negative number, and the third section is the format used for zeros. If there are two sections, the first one is used for positive numbers and zeros, and the second one for negative numbers. If there is only one section, that format applies to all numbers.

A text section, if included, is always the last in the list. Unless it is preceded by three number sections, a text section must include the text placeholder (@). For information on the text section and on creating your own number formats, see **Number**.

If you have semicolons with nothing between them, the missing section prevents that type of number from being displayed. For example, you could create a picture format like the following:

format if positive;;;format if text

Because this number format does not define how to display negative numbers (the second section) or zeros (the third section), any cells with this format appear blank if they contain a negative number or zero.

The following table lists the built-in number formats and shows examples of each format for positive numbers, negative numbers, and fractions.

	Number typed		
Format	**5**	**−5**	**.5**
General	5	−5	0.5
0	5	−5	1
0.00	5.00	−5.00	0.50
#,##0	5	−5	1
#,##0.00	5.00	−5.00	0.50
$#,##0 ;($#,##0)	$5	($5)	$1
$#,##0 ;[RED]($#,##0)	$5	($5)*	$1
$#,##0.00 ;($#,##0.00)	$5.00	($5.00)	$0.50
$#,##0.00 ;[RED]($#,##0.00)	$5.00	($5.00)*	$0.50
0%	500%	−500%	50%
0.00%	500.00%	−500.00%	50.00%
0.00E+00	5.00E+00	−5.00E+00	5.00E−01

*Will display red.

Note

Note that the dollar formats produce trailing spaces for positive numbers.

Date and Time Formats

The list box also includes date and time formats. The following table lists the built-in date and time formats, and shows examples of each.

Format	**Display**
m/d/yy	12/7/58
d-mmm-yy	7-Dec-58
d-mmm	7-Dec
mmm-yy	Dec-58
h:mm AM/PM	8:50 PM
h:mm:ss AM/PM	8:50:35 PM
h:mm	20:50
h:mm:ss	20:50:35
m/d/yy h:mm	12/7/58 20:50

Automatic Formats

Microsoft Excel applies some of the date and time formats automatically, depending on how you enter the date or time. For information on date formats, see **Date**. For information on time formats, see **Time**.

Format Symbols

The following list shows all of the symbols used in the Microsoft Excel number formats. You use these same formats when you create your own custom number formats. For information on custom number formats, see **Number**.

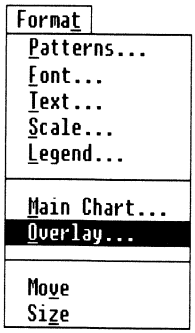
This symbol	Means this
General	Display the number in General format.
0	Digit placeholder. If the number has fewer digits on either side of the decimal point than there are zeros on either side of the decimal point in the format, Microsoft Excel displays the extra zeros. If the number has more digits to the right of the decimal point than there are zeros to the right in the format, Microsoft Excel rounds the number to as many decimal places as there are zeros to the right. If the number has more digits to the left of the decimal point than there are zeros to the left in the format, Microsoft Excel displays the extra digits.
#	Digit placeholder. Follows the same rules as for 0 above, except that Microsoft Excel does not display extra zeros if the number has fewer digits on either side of the decimal point than there are #'s on either side in the format.
.	Decimal point. This symbol determines how many digits (0's or #'s) Microsoft Excel displays to the right and left of the decimal point. If the format contains only #'s to the left of this symbol, Microsoft Excel begins numbers smaller than 1 with a decimal point. To avoid this, you should use 0 as the first digit placeholder to the left of a decimal point instead of #.
%	Percentage. Microsoft Excel multiplies by 100 and inserts the % character.

This symbol	Means this
,	Thousands separator. Microsoft Excel separates thousands by commas if the format contains a comma surrounded by #'s or 0's.
E− E+ e− e+	Scientific format. If a format contains one 0 or # to the right of an E−, E+, e−, or e+, Microsoft Excel displays the number in scientific format and inserts an E or e. The number of 0's or #'s to the right determines the number of digits in the exponent. Use E− or e− to place a minus sign by negative exponents. Use E+ or e+ to place a minus sign by negative exponents and a plus sign by positive exponents.
: $ − + ( ) space	Display that character. To display a character other than one of these, precede the character(s) with a backslash (\) or enclose the character(s) in double quotation marks(" ").
\	Display the next character in the format. Microsoft Excel does not display the backslash. This is the same as enclosing the next character in double quotation marks.
*	Repeat the next character in the format enough times to fill the column width. You cannot have more than one asterisk in one section of a format.
"Text"	Display whatever text is inside the double quotation marks.
@	Text placeholder. If there is text in the cell, the text from the cell is placed in the format where the @ character appears.
m mm mmm mmmm	Display the month as a number without leading zeros (1–12), as a number with leading zeros (01–12), as an abbreviation (Jan–Dec), or as a full name (January–December). If you use m or mm immediately after the h or hh symbol, Microsoft Excel displays the minute rather than the month.
d dd ddd dddd	Display the day as a number without leading zeros (1–31), as a number with leading zeros (01–31), as an abbreviation (Sun–Sat), or as a full name (Sunday–Saturday).
yy yyyy	Display the year as a two-digit number (00–99), or as a four-digit number (1900–2040).

This symbol	Means this
h hh	Display the hour as a number without leading zeros (0–23), or as a number with leading zeros (00–23). If the format contains an AM or PM, the hour is based on the 12-hour clock. Otherwise, the hour is based on the 24-hour clock.
m mm	Display the minute as a number without leading zeros (0–59), or as a number with leading zeros (00–59). The m or mm must appear after an h or hh, or Microsoft Excel displays the month rather than the minute.
s ss	Display the second as a number without leading zeros (0-59), or as a number with leading zeros (00-59).
AM/PM am/pm A/P a/p	Display the hour using a 12-hour clock. Microsoft Excel displays AM, am, A, or a for times up until noon, and PM, pm, P, or p for times between noon and midnight.
[BLACK]	Changes the color of the characters displayed in the cell to black.
[WHITE]	Changes the color of the characters displayed in the cell to white.
[RED]	Changes the color of the characters displayed in the cell to red.
[GREEN]	Changes the color of the characters displayed in the cell to green.
[BLUE]	Changes the color of the characters displayed in the cell to blue.
[YELLOW]	Changes the color of the characters displayed in the cell to yellow.
[MAGENTA]	Changes the color of the characters displayed in the cell to magenta.
[CYAN]	Changes the color of the characters displayed in the cell to cyan.

Format Overlay command

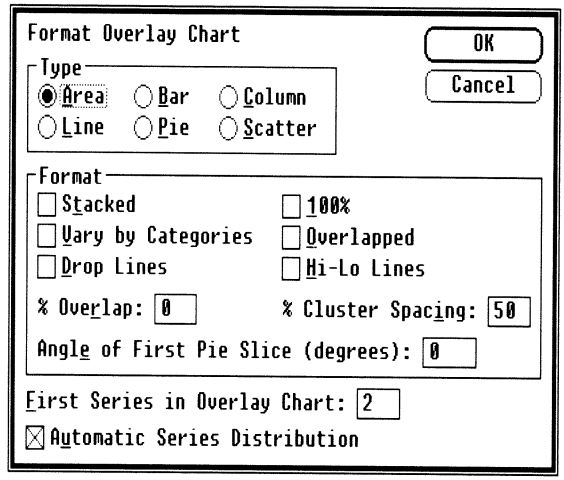
(Full menus)



Controls the overlay chart's type and formats.

Although the dialog box contains all of the format options the various chart types use, only those relevant to the selected chart type are available. Options that are not relevant to the selected chart type are grayed.

For more information on formatting charts, see **Chart**.



Type

The chart type options are similar to the commands in the Gallery menu.

Area	Makes the overlay chart an area chart
Bar	Makes the overlay chart a bar chart
Column	Makes the overlay chart a column chart
Line	Makes the overlay chart a line chart
Pie	Makes the overlay chart a pie chart
Scatter	Makes the overlay chart a scatter chart

Stacked

Within a category, the value from the first series is measured from the series axis. The value from the second series is measured from the top of the value from the first series, and so on. (See format 3 in the column gallery.)

Vary by Categories

Applies only when the chart includes a single series. If this check box is turned on, Microsoft Excel assigns a different color or pattern to each data point. (See format 2 in the column gallery.)

Drop Lines

Drop lines extend from the highest value in each category to the category axis. (See format 3 in the area gallery.)

100%

The values in each category are shown as percentages adding up to 100 percent. The absolute values do not appear on the chart. The series themselves are not altered. (See format 5 in the column gallery.)

Overlapped

When this check box is turned on, the number you type in the % Overlap box determines how much the markers within a cluster overlap, rather than how far apart they are. (See format 4 in the column gallery.)

Hi-lo Lines

Hi-lo lines extend from the highest to the lowest value in each category. (See format 7 in the line gallery.)

% Overlap

If the Overlapped check box is turned on, this option determines how much the markers in a cluster overlap. If the Overlapped check box is turned off, this option determines how much space there is between bars or columns within a cluster. The number you type here represents a percentage of the width of a bar or column.

% Cluster Spacing

Determines how much space there is between clusters of bars or columns. The number you type here represents a percentage of the width of a bar or column.

Angle of First Pie Slice

In a pie chart, this represents the angle of the first edge of the first slice. The angle is measured in degrees clockwise from vertical.

First Series in Overlay Chart

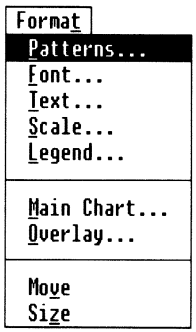
Controls which data series Microsoft Excel puts in the overlay chart. Type the plot order number, as displayed in the series formula, of the first series you want Microsoft Excel to plot in the overlay chart. Microsoft Excel plots that series, and any other series with higher plot order numbers, in the overlay chart.

For example, if you have six series, and you type *4*, the series with plot order numbers 4, 5, and 6 appear on the overlay chart while the series with plot order numbers 1, 2, and 3 remain on the main chart.

Automatic Series Distribution

If this check box is turned on, Microsoft Excel automatically divides the data series evenly between the main chart and the overlay chart. If there is an odd number of data series, the main chart has one more than the overlay chart.

Format Patterns command



Changes the appearance of the selected object in a chart.

Before you choose Format Patterns, select the object or objects you want to change. To select the entire chart, use the Chart Select Chart command. To select the entire plot area, use the Chart Select Plot Area command.

For more information on selecting in a chart, see **Chart**, **Chart Select Chart command**, and **Chart Select Plot Area command**.

When you choose Format Patterns, Microsoft Excel displays a dialog box with only those options that apply to what you have selected. Look in the following list for the options you see in the dialog box.

Invisible

◉ Invisible

The selected part does not appear on the chart. For example, you might want the text background pattern to be invisible so that whatever is behind the text will be visible.

Some parts of a chart cannot have an invisible pattern; use the commands from the Chart menu to add or delete axes, tickmark labels, and gridlines.

Automatic

◉ Automatic

If a data point or series is selected, Automatic picks a color or pattern that distinguishes each data point or series from the others.

If something other than a data point or series is selected, Automatic makes the color or pattern the same as the window background.

Apply to All

☒ Apply to All

Appears in the dialog box only when a data point, a data series, or text attached to a data point is selected. This option applies the choices you make in the dialog box to all data points in the chart.

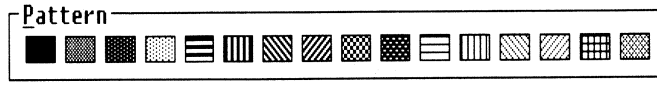
If you have a combination chart, and the selected object is in the overlay chart, the formats are applied only to the data points in the overlay chart. If the selected object is in the main chart, the formats are applied only to data points in the main chart.

Invert If Negative

☐ Invert if
Negative

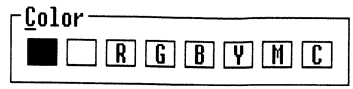
Reverses the pattern for markers representing negative values. For example, if the foreground is set to blue and the background to red, positive markers have a blue foreground and negative markers have a red foreground.

Pattern



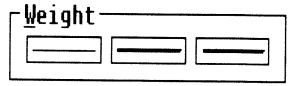
Controls background, border, area, line, axis, and arrow patterns. A pattern other than solid is a combination of the foreground and background colors. If you have a color monitor, you can create an almost unlimited number of patterns by changing the pattern and the foreground and background colors.

Color



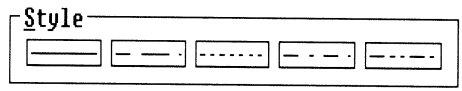
Controls the color of the object, its foreground, its background, or its border. You can select from black, white, red, green, blue, yellow, magenta, or cyan.

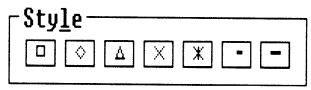
Weight



Changes the weight of a line, border, arrow shaft, or axis. If the weight of a line is medium or heavy, the style of the line automatically changes to solid.

Style





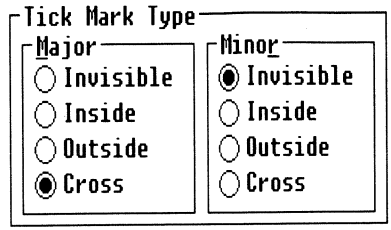
Controls the line style of axes or of an object's border. Also controls the style of markers in a line chart. You can only change the style of a line that has a light weight. If the weight of the line is medium or heavy, the only style you can use is solid.

Shadow



Adds a shadow to the bottom and right sides of the selected chart, text, or legend.

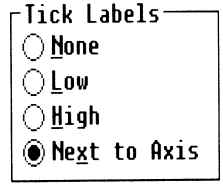
Tick Mark Type



Controls the appearance of tickmarks on your axes.

Invisible	Tickmarks are invisible
Inside	Tickmarks appear only on the side of the axes next to the chart
Outside	Tickmarks appear only on the side of the axes away from the chart
Cross	Tickmarks cross the axes

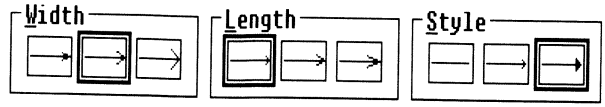
Tick Labels



Controls the position of the labels that appear next to the tickmarks on the axes of your chart.

None	Removes tickmark labels
Low	Labels appear at low end of axis
High	Labels appear at high end of axis
Next to Axis	Labels appear next to axis This is the usual placement for tickmark labels

Arrowhead



Controls the width, length, and style of selected arrowhead. Select any combination to make the arrowhead appear the way you want.

Font

Font...

Carries out any changes you have made in the Format Patterns dialog box and displays the Format Font dialog box.

Legend

Legend...

Carries out any changes you have made in the Format Patterns dialog box and displays the Format Legend dialog box.

Scale

Scale...

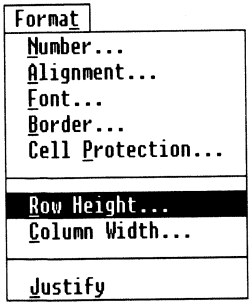
Carries out any changes you have made in the Format Patterns dialog box and displays the Format Scale dialog box.

Text

Text...

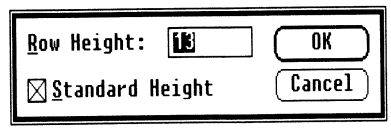
Carries out any changes you have made in the Format Patterns dialog box and displays the Format Text dialog box.

Format Row Height command



Sets the height of the selected rows. Row height is measured in points, as are fonts.

You need not select the entire row. If any cell in a row is selected, the new row height applies to all cells in that row. Format Row Height changes the height of all rows in the selection, including hidden rows.



Row Height

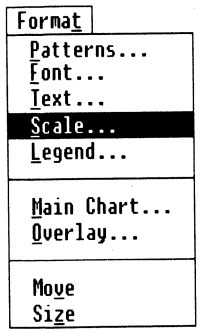
Accept the proposed response or type in a different height. You can define row height in decimal fractions. You can hide a row by setting its height to zero.

Standard Height

Changes the row height to accommodate the largest font in each row of the selection.

Note | To change the height of a row with the mouse, drag the line below the row heading for the row you want to change.

Format Scale command

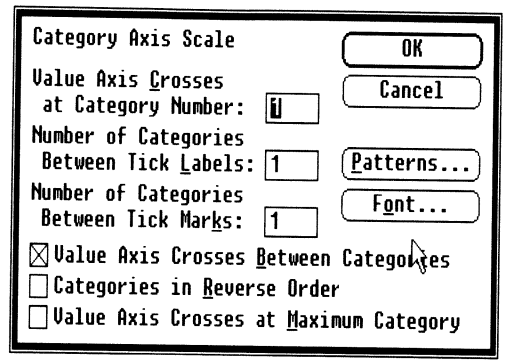


Controls the appearance of the axes, the order in which the categories or values are given, and where the axes cross each other. For the category axis, this command also controls the interval between tickmarks and the interval between tickmark labels. For the value axis, this command also controls the range of values displayed, the scale used, and whether the scale is logarithmic.

Microsoft Excel displays a different dialog box for each axis, depending on which axis is selected when you choose Format Scale.

Note For all chart types except scatter charts, there is a difference between the category axis dialog box and the value axis dialog box. When you are formatting the axes of a scatter chart, both dialog boxes look like the value axis dialog box.

Category Axis



Value Axis Crosses at Category Number

Type the number of the category at which you want the value axis to cross the category axis. Normally this number is 1.

Number of Categories Between Tick Labels

Initially, every category has a tickmark label, so this number is 1. Type *2* to label only every other category, type *3* to label every third category, and so on.

Number of Categories Between Tick Marks

Controls the number of categories that appear between each pair of tickmarks.

Value Axis Crosses Between Categories

When this check box is turned off, the value axis crosses through the center of the category indicated in the Value Axis Crosses at Category Number box. Turn on this check box to make the value axis cross between two categories.

Categories in Reverse Order

Microsoft Excel normally presents categories from left to right. Turn on this check box to reverse the order.

Value Axis Crosses at Maximum Category

Turn on this option to make the value axis cross the category axis at the last category.

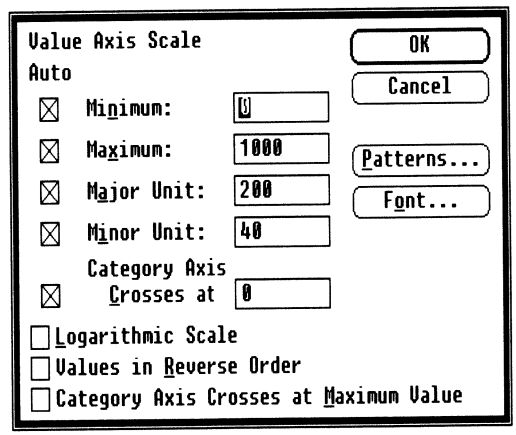
Patterns

Carries out any changes you have made in the Format Scale dialog box and displays the Format Patterns dialog box.

Font

Carries out any changes you have made in the Format Scale dialog box and displays the Format Font dialog box.

Value Axis



This dialog box appears when you select the value axis before choosing Format Scale. A nearly identical dialog box appears when you select the category axis of a scatter chart before choosing Format Scale.

The first five options in the dialog box are initially set to Automatic. For each of these options, you can either let Microsoft Excel set the option automatically or set it yourself.

Minimum

When the Automatic check box is turned on, Microsoft Excel includes the lowest values in all included series in the chart. If you type a number in the text box, values below the number you type are not shown on the chart. The data series themselves are not affected.

Maximum

When the Automatic check box is turned on, Microsoft Excel includes the highest values in all included series in the chart. If you type a number in the text box, values above the number you type are not shown on the chart. The data series themselves are not affected.

Major Unit

When the Automatic check box is turned on, Microsoft Excel calculates the distance between major tickmarks. If you type a number in the text box, Microsoft Excel uses that number instead.

Minor Unit

When the Automatic check box is turned on, Microsoft Excel calculates the distance between minor tickmarks. If you type a number in the text box, Microsoft Excel uses that number instead.

Category Axis Crosses At

When the Automatic check box is turned on, the category axis crosses the value axis at zero. If the value axis range doesn't include zero, the category axis crosses at the value closest to zero. Either turn on the Automatic check box or type the value at which you want the category axis to cross the value axis.

Logarithmic Scale

When the scale is logarithmic, Microsoft Excel recalculates the following values and units:

Minimum value	The automatic minimum value is the largest power of ten that is less than the lowest data point. If all values are zero or less, the minimum value is 0.1.
Maximum value	The automatic maximum value is the smallest power of ten that is greater than the highest value. If all values are zero or less, the maximum value is 1.
Major unit	Must be a power of ten.
Minor unit	The automatic minor unit is the same as for a nonlogarithmic scale. If you change the minor unit, it must be one-half or one-tenth of the major unit.

Values in Reverse Order

Microsoft Excel normally presents values in descending order from top to bottom. Turn on this check box to reverse the order.

Category Axis Crosses at Maximum Value

Turn on this check box to make the category axis cross the value axis at the last value.

Value Axis Crosses at Maximum Category

This option only appears when the category axis is selected in a scatter chart when you choose Format Scale. Turn on this check box to make the value axis cross the category axis at the last category.

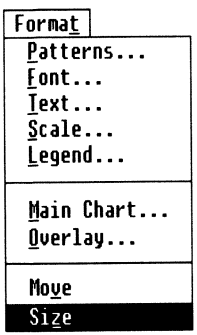
Patterns

Carries out any changes you have made in the Format Scale dialog box and displays the Format Patterns dialog box.

Font

Carries out any changes you have made in the Format Scale dialog box and displays the Format Font dialog box.

Format Size command



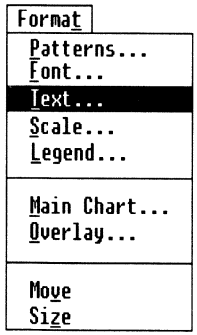
Allows you to change the size of a chart object with the keyboard. Format Size is different from the Control Size command, which allows you to resize the entire window.

To resize a chart object, select the object, choose Format Size, resize the object with the DIRECTION keys, then press ENTER.

Note | If you have a mouse, you can resize a chart object by dragging the black selection squares.

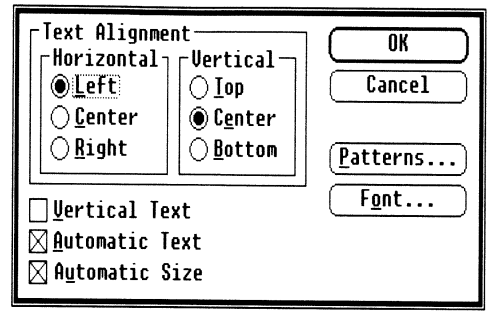
For information on selecting chart objects, see **Chart**.

Format Text command



Controls the alignment of the selected chart text.

When you select text on a chart and choose Format Text, Microsoft Excel displays the dialog box shown below.



Text Alignment

Controls horizontal and vertical alignment of the text within the text border.

Vertical Text

Stacks text vertically, so that it can be read top to bottom rather than sideways.

Automatic Text

If the selected text was created with the Attach Text command and later edited, this option restores the original text.

Automatic Size

If you have changed the size of the border around the selected text, this option restores the border to automatic size. Automatic size makes the border fit exactly around the text no matter how you change the text.

Show Value

If the selected text is attached to a data point, this option replaces the text with the data point's value.

Show Key

If the selected text is attached to a data point or data series, this option shows the pattern used by the data point or series next to the text.

Patterns

Carries out any changes you have made in the Format Text dialog box and displays the Format Patterns dialog box.

Font

Carries out any changes you have made in the Format Text dialog box and displays the Format Font dialog box.

Formatting a document

Formatting typically involves changing the appearance of a document and its elements or enhancing the document's overall presentation and design.

This topic presents a brief summary of each procedure you can use for formatting worksheets, macro sheets, and charts in Microsoft Excel. The cross-reference for each task tells you where to look in *Microsoft Excel Reference* for more detailed information on a dialog box option or the related step-by-step procedure.

This topic explains:

- Formatting a worksheet

  General worksheet formatting guidelines

  Standard and custom formats for numbers and text

  Font and alignment formats

  Border, row/column heading, and gridline formats

  Window display formats

  Print formats

- Formatting a chart

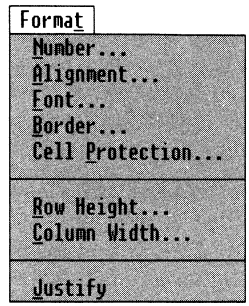
  Adding or formatting chart objects

  Adding or formatting chart text

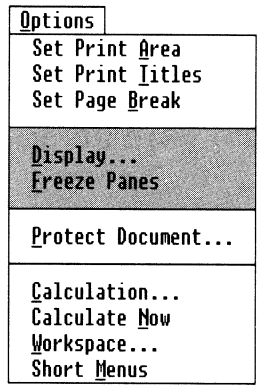
Note | All worksheet formats also apply to macro sheets.

Formatting a Worksheet

The main worksheet formatting commands are on two menus (Full menus shown):



The Format menu commands control the formats of specific cells and ranges.



The Options menu commands shown tinted here control format settings for the entire worksheet.

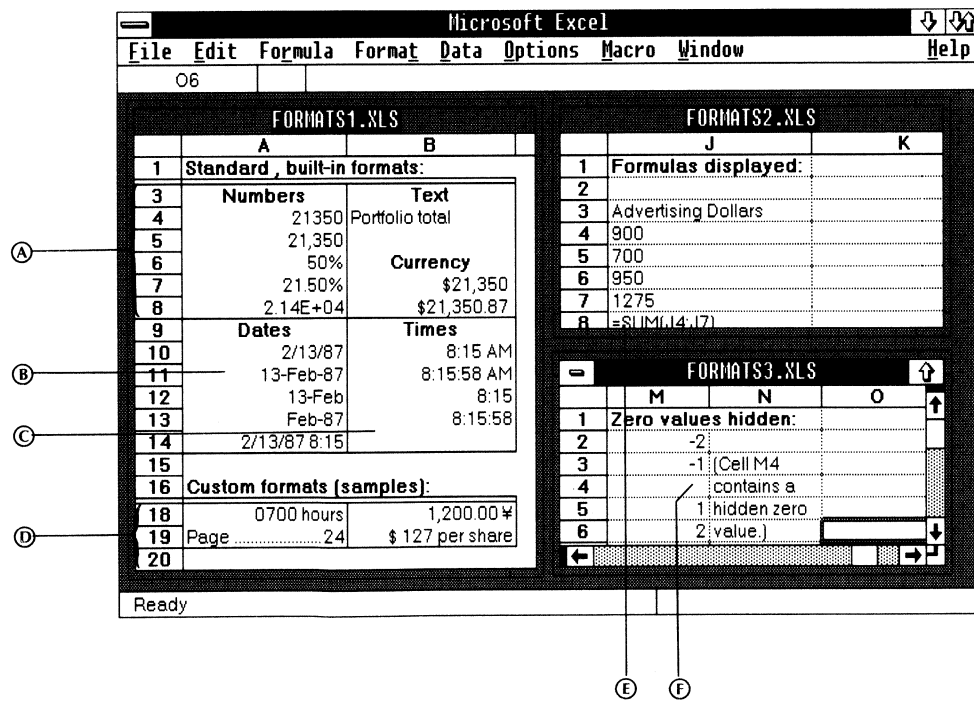
For information on each command, see the topic of the same name (for example, **Format Number command**).

General Worksheet Formatting Guidelines

- **When you change a cell's format, its underlying value does not change.** You can change the appearance of a cell without affecting its formula or value. For example, number formats affect only the way numbers are displayed; in calculating a formula, Microsoft Excel always uses the underlying cell value. (Microsoft Excel calculates on the basis of values displayed only when you turn on Precision As Displayed with the Options Calculation command; for more information, see **Calculation**.)

- **You can assign the following formats to cells and ranges in a new worksheet as you type: dollar, percent, negative number, date, and text.** Microsoft Excel automatically adjusts the alignment of text or numbers appropriately for each format. No additional formatting is necessary, unless you want to change the format.
- **You can format a cell or range before or after you enter the data.** If you're entering a lot of data that uses the same numeric format, for example, you might find it easier to format the selected cells before you start typing. Then the data appears in that format as you enter it. You can also select and format the cells after you enter the data.
- **A cell remains formatted, even after you clear the contents of the cell.** Unless you also clear the format or reformat a cell, new data of the same data type entered in the cell is displayed in the existing format. For example, if you enter a currency figure in a cell that already has a date format, Microsoft Excel displays the figure in the date format. To correctly display the currency figure, you reformat the cell with the Format Number command.
- **When you use the Edit Copy command or one of the Edit Fill commands to copy a cell, its format is copied along with the cell contents.**

Standard and Custom Formats for Numbers and Text



A To use the Microsoft Excel standard formats for numbers, text, or currency:

- Select cell/range and choose Format Number; select format from dialog box and choose OK.
- For step-by-step procedure, see **Number**.

B To use the Microsoft Excel standard formats for dates:

- Select cell/range and choose Format Number; select format from dialog box and choose OK.
- For step-by-step procedure, see **Date**.

C To use the Microsoft Excel standard formats for times:

- Select cell/range and choose Format Number; select format from dialog box and choose OK.
- For step-by-step procedure, see **Time**.

D To create a custom format for numbers, text, currency, dates, or times:

- Select cell/range and choose Format Number; in the text box, edit an existing format or type your own format and choose OK.
- For step-by-step procedure and a table of codes you can use to create custom formats, see **Number** (for numbers, text, and currency), **Date**, or **Time**.

E To display formulas (or values) in a worksheet:

- Choose Options Display; turn on (or turn off) Formulas check box and choose OK.
- For step-by-step procedure, see **Display options**.

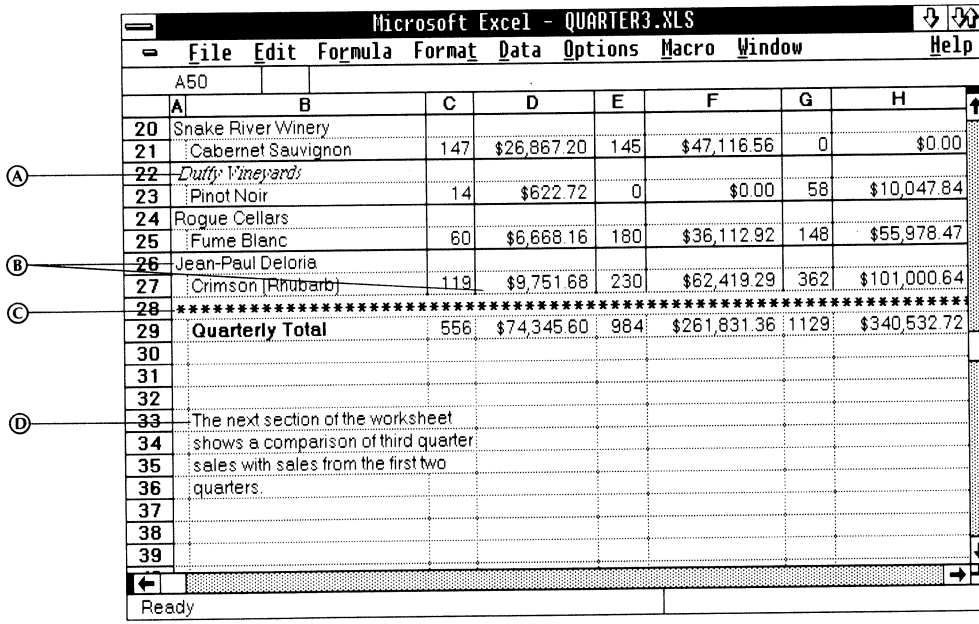
F To hide (or display) zero values in a worksheet:

- Choose Options Display; turn off (or turn on) Zero Values check box and choose OK.
- For step-by-step procedure, see **Display options**.

G To use color (red, green, blue, yellow, cyan, magenta, black, or white) in standard or custom formats for numbers and text (not shown):

- Select cell/range, choose Format Number, and select a format; in the text box, type the color you want in square brackets in the space before the format characters (for example, *[blue]m/d/yy*), and choose OK.
- For more information, see **Number**.

Font and Alignment Formats



A To apply a font to a cell or range:

- Select cell/range and choose Format Font; select font from dialog box and choose OK.
- For step-by-step procedure, see **Font**.

B To align text and numbers:

- Select cell/range and choose Format Alignment; select option in dialog box and choose OK.
- For step-by-step procedure, see **Alignment**.

C To fill a cell or row (partial or complete) with a repeated character or characters:

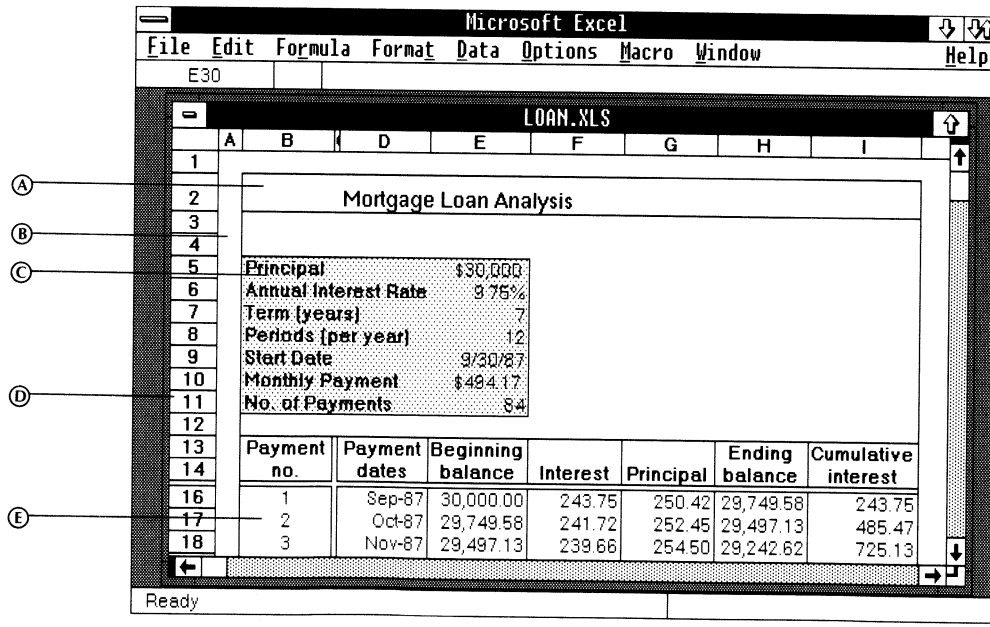
- Enter the character(s) in one cell and select cells you want to fill; choose Format Alignment, select Fill option, and choose OK.
- For step-by-step procedure, see **Alignment**.

D To justify a paragraph of text to fit a single- or multiple-column width (Full menus):

- Select the cells containing text and include the range in which you want the text to fit; choose Format Justify.
- For step-by-step procedure, see **Alignment**.

For information on replacing a font in the font set for a worksheet, see **Font**.

Border, Row/Column Heading, and Gridline Formats



A To adjust row heights:

- Select cell/range; with keyboard, choose Format Row Height, specify row height in text box, and choose OK. With mouse, drag the line below the row heading.
- For step-by-step procedure, see **Row**.

B To adjust column widths:

- Select cell/range; with keyboard, choose Format Column Width, specify width in dialog box, and choose OK. With mouse, drag the line to the right of the column heading.
- For step-by-step procedure, see **Column**.

C To add borders or shading to a cell or range:

- Select cell/range and choose Format Border; turn on check boxes for options you want in dialog box, and choose OK.
- For step-by-step procedure, see **Borders and shading**.

D To use R1C1 (or A1) format for row and column headings (Full menus):

- Choose Options Workspace; turn on (or turn off) R1C1 check box and choose OK.
- For step-by-step procedure, see **Display options**.

To hide (or display) row and column headings on screen display:

- Choose Options Display; turn off (or turn on) Row and Column Headings check box and choose OK.
- For step-by-step procedure, see **Display options**.

To hide (or display) row and column headings when you print:

- Choose File Page Setup; turn off (or turn on) Row and Column Headings check box and choose OK.
- For information on dialog box option, see **File Page Setup command**.

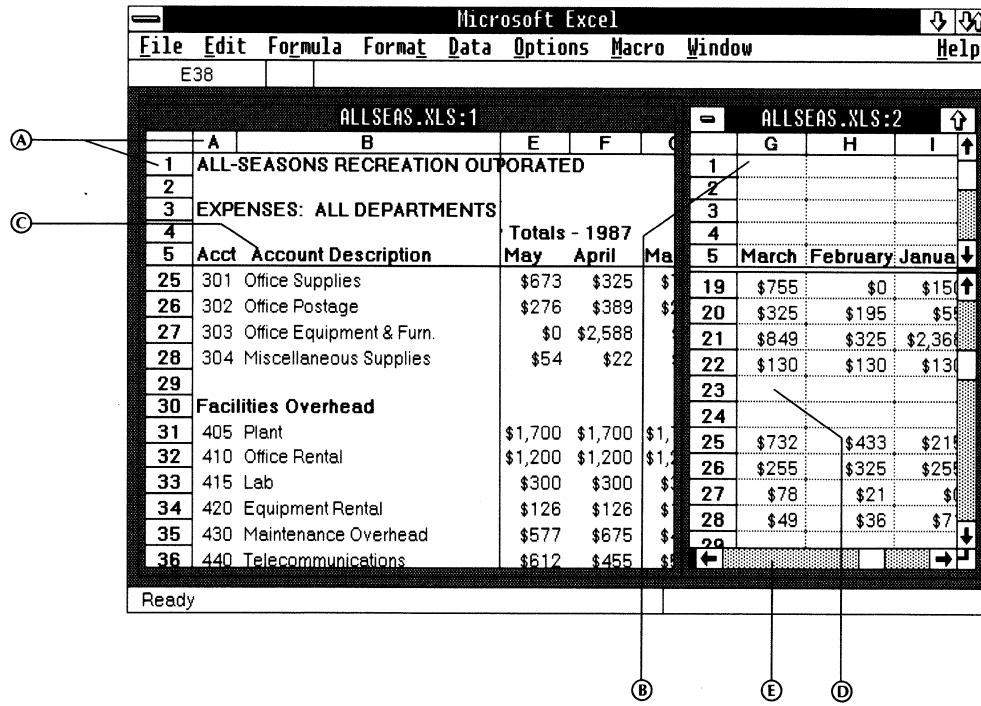
E To hide (or display) gridlines on screen display:

- Choose Options Display; turn off (or turn on) Gridlines check box and choose OK.
- For step-by-step procedure, see **Display options**.

To hide (or display) gridlines when you print:

- Choose File Page Setup; turn off (or turn on) Gridlines check box and choose OK.
- For information on dialog box option, see **File Page Setup command**.

Window Display Formats



A To control screen colors for gridlines and row and column headings:

- Choose Options Display; select options from dialog box and choose OK.
- For step-by-step procedure, see **Display options**.

B To split a window into panes:

- With keyboard, choose Control Split (ALT, HYPHEN, T) and use DIRECTION keys to move pointer to where you want the split; press ENTER. With mouse, drag vertical and/or horizontal split bar to where you want the split.
- For step-by-step procedure, see **Display options**.

C To freeze column and/or row titles on the display (Full menus):

- Split window into panes (see preceding procedure) along right and/or bottom edge of cells with titles you want to freeze; choose Options Freeze Panes.
- For step-by-step procedure, see **Display options**.

D To open multiple windows into a worksheet:

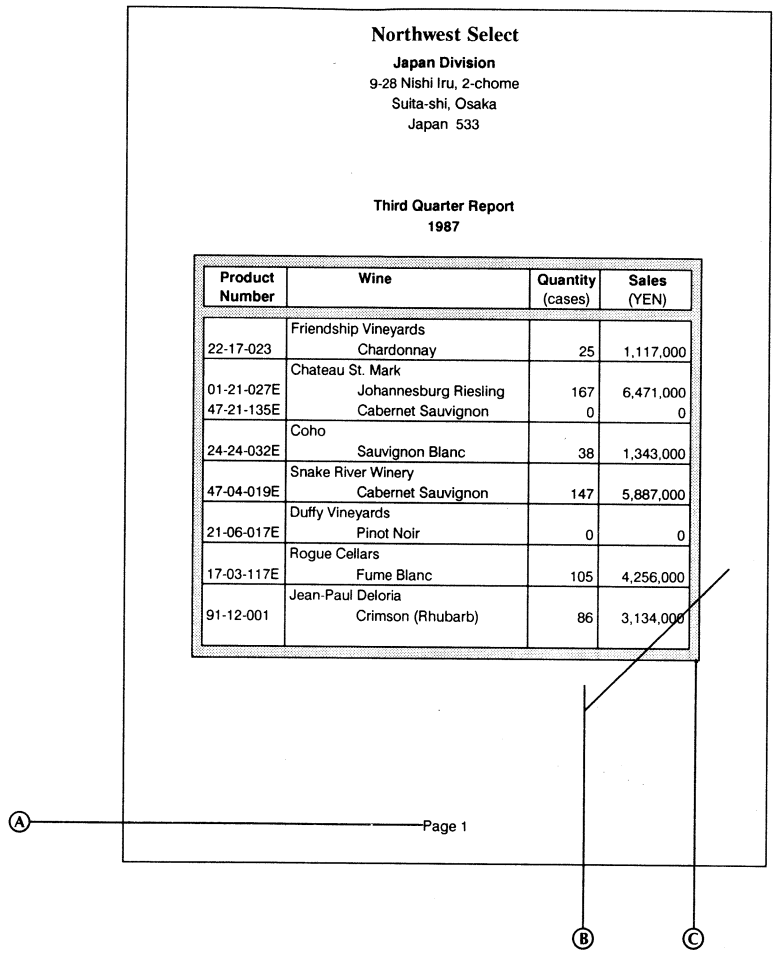
- Choose Window New Window; if desired, size the windows separately and scroll them to different parts of the worksheet.
- For step-by-step procedure, see **Display options**.

E To turn on (or turn off) display of scroll bars (Full menus):

- Choose Options Workspace; turn on (or turn off) Scroll Bars check box in dialog box, and choose OK.
- For more information on dialog box option, see **Options Workspace command**.

See also items D and E under "Border, Row/Column Heading, and Gridline Formats," earlier in this topic. To control screen colors in Microsoft Excel, see "Control Panel" in the Appendix.

Print Formats



Northwest Select

Japan Division
9-28 Nishi Iru, 2-chome
Suita-shi, Osaka
Japan 533

Third Quarter Report
1987

Product Number	Wine	Quantity (cases)	Sales (YEN)
	Friendship Vineyards		
22-17-023	Chardonnay	25	1,117,000
	Chateau St. Mark		
01-21-027E	Johannesburg Riesling	167	6,471,000
47-21-135E	Cabernet Sauvignon	0	0
	Coho		
24-24-032E	Sauvignon Blanc	38	1,343,000
	Snake River Winery		
47-04-019E	Cabernet Sauvignon	147	5,887,000
	Duffy Vineyards		
21-06-017E	Pinot Noir	0	0
	Rogue Cellars		
17-03-117E	Fume Blanc	105	4,256,000
	Jean-Paul Deloria		
91-12-001	Crimson (Rhubarb)	86	3,134,000

A To format headers and footers in a printed document:

- Choose File Page Setup, type header and/or footer codes in Header and Footer text boxes, and choose OK.
- For step-by-step procedure and a table of codes you can use to customize headers and footers, see **Headers and footers**.

B To set margins for a printed document:

- Choose File Page Setup, specify measurements you want in the Margins text boxes, and choose OK.
- For more information on dialog box option, see **File Page Setup command**.

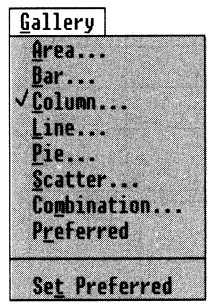
C To specify horizontal or vertical page orientation:

- Choose File Printer Setup, select printer, and choose Setup button; under Orientation, select Portrait for vertical or Landscape for sideways, and choose OK.
- For step-by-step procedure, see **Printing a document**.

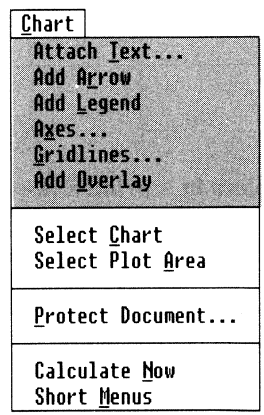
See also items D and E under "Border, Row/Column Heading, and Gridline Formats," earlier in this topic.

Formatting a Chart

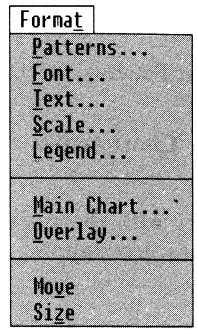
Formatting a chart involves adding chart objects (such as arrows and legends) and chart text, as well as changing their appearance with different patterns, styles, and text fonts. The commands you need for formatting a chart are on these three menus (Full menus shown):



The Gallery menu commands include many preset options that are formatting shortcuts. Check these options before you customize a chart.



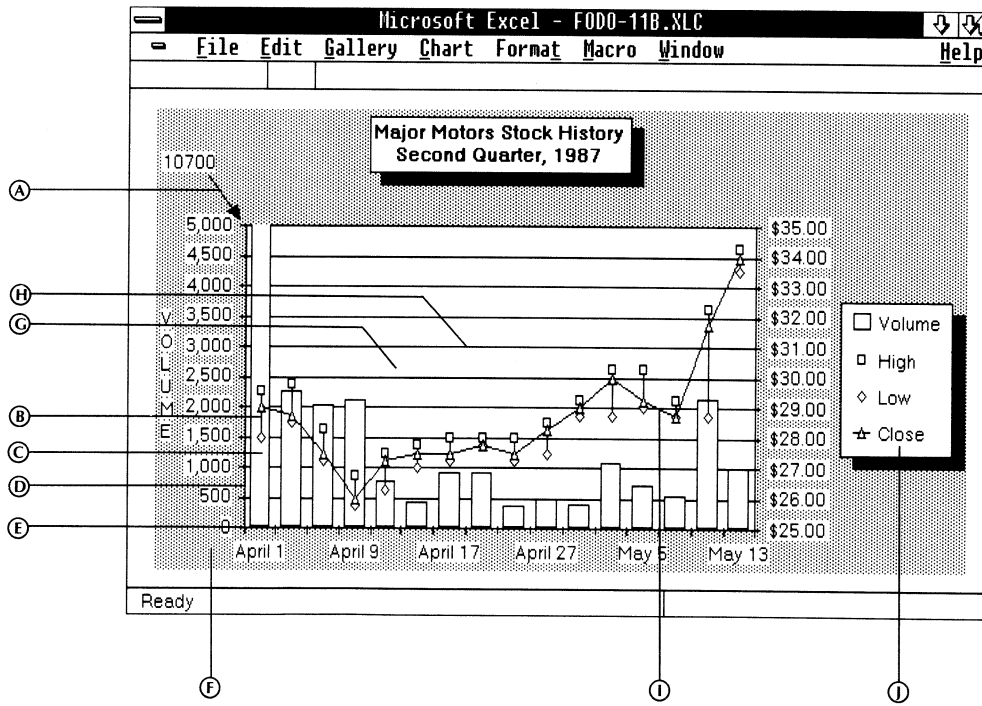
The Chart menu commands shown tinted here control the text and objects you add to a chart.



The Format commands control the styles, patterns, colors, sizes, and positions of chart text and chart objects.

For more information about each command, see the topic of the same name (for example, **Chart Attach Text command**).

Adding or Formatting Chart Objects



A To add a chart arrow:

- Choose Chart Add Arrow; to move and size arrow with keyboard, choose Format Move or Format Size and use DIRECTION keys to manipulate arrow. With mouse, drag arrow shaft to move arrow, and drag on a black selection square to size it.
- For step-by-step procedure, see **Chart arrow**.

To format a chart arrow:

- Select arrow and choose Format Patterns; select options from dialog box and choose OK.
- For step-by-step procedure, see **Chart arrow**.

B To format data series markers with the stacking, 100%, vary by category, drop lines, hi-lo lines, overlapping, or cluster spacing option:

- Choose Format Main Chart; select options in dialog box and choose OK.
- For step-by-step procedure, see **Data series**.

C To format data series markers, patterns, colors, lines, or borders:

- Select the data series and choose Format Patterns; select options in dialog box and choose OK.
- For step-by-step procedure, see **Data series**.

D To format physical appearance of chart axes, tickmarks, and tick-mark labels:

- Select category or value axis and choose Format Patterns; select options from dialog box and choose OK.
- For step-by-step procedure, see **Chart axis**.

E To change the intersection of chart axes or make numeric adjustments in axes:

- Select value or category axis and choose Format Scale; specify the options and settings in dialog box and choose OK.
- For step-by-step procedure, see **Chart axis**.

F To format chart background area:

- Choose Chart Select Chart, then Format Patterns; select options in dialog box and choose OK.
- For step-by-step procedure, see **Chart area**.

G To format chart plot area:

- Choose Chart Select Plot Area, then Format Patterns; select options in dialog box, and choose OK.
- For step-by-step procedure, see **Chart plot area**.

H To add major or minor chart gridlines:

- Choose Chart Gridlines; turn on check boxes for options in dialog box and choose OK.
- For step-by-step procedure, see **Chart axis**.

To format chart gridlines:

- Select a gridline and choose Format Patterns; select options in dialog box and choose OK.
- For more information on dialog box options, see **Format Patterns command**.

I To add an overlay chart to a chart (Full menus):

- Choose Chart Add Overlay.
- For step-by-step procedure, see **Overlay chart**.

To format an overlay chart (Full menus):

- Choose Format Overlay; select options in dialog box and choose OK.
- For step-by-step procedure, see **Overlay chart**.

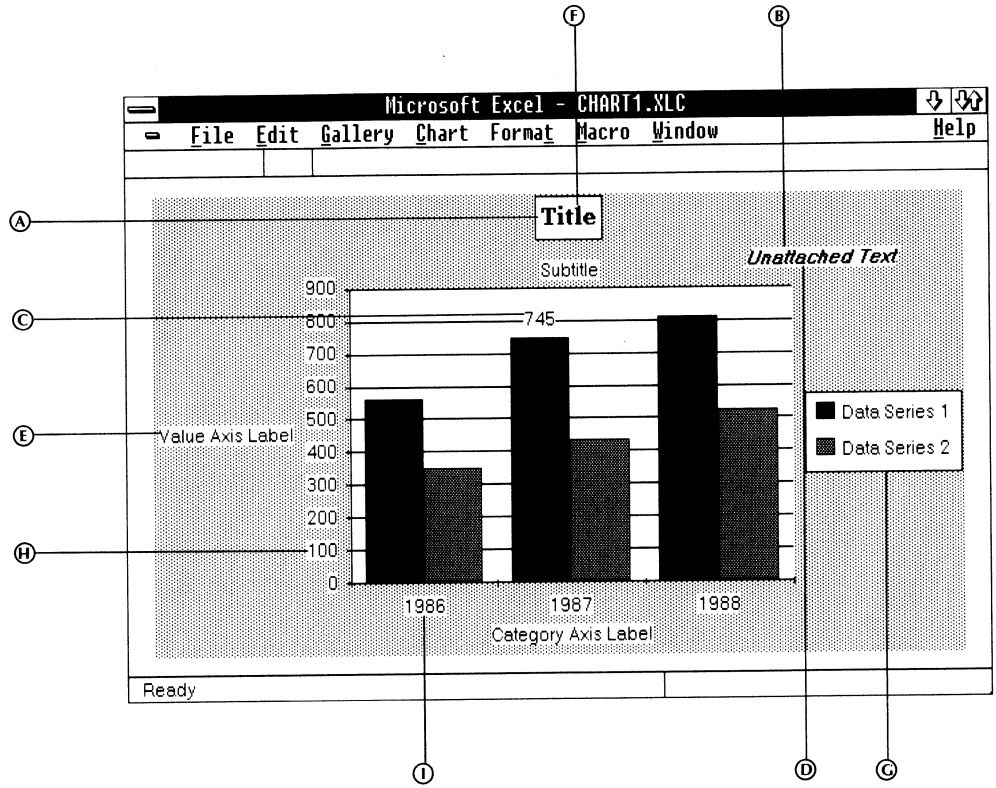
J To add a chart legend:

- Choose Chart Add Legend.
- For step-by-step procedure, see **Chart legend**.

To format chart legend background or border patterns, weights, or styles:

- Select legend and choose Format Patterns; select options from dialog box and choose OK.
- For step-by-step procedure, see **Chart legend**.

Adding or Formatting Chart Text



A To add attached text to a chart:

- Choose Chart Attach Text; select options in dialog box and choose OK.
- For step-by-step procedure, see **Chart text**.

B To add unattached text to a chart:

- With no other text selected, type text and press ENTER.
- For step-by-step procedure, see **Chart text**.

To move or size unattached text:

- Select text. With keyboard, choose Format Move or Format Size and use DIRECTION keys to manipulate text. With mouse, move text by pointing inside area surrounded by selection squares and dragging text; size text by dragging a black selection square.
- For step-by-step procedure, see **Chart text**.

C To add a data point label to a data series marker:

- Choose Chart Attach Text and select Series or Data Point option; in Series Number and Point Number boxes, type series number and data point number and choose OK.
- For step-by-step procedure, see **Chart text**.

D To format font, size, style, or color of attached or unattached text:

- Select text and choose Format Font; select options in dialog box and choose OK.
- For step-by-step procedure, see **Chart text**.

E To format orientation and alignment of attached or unattached text:

- Select text and choose Format Text; select options in dialog box and choose OK.
- For step-by-step procedure, see **Chart text**.

F To format background or border patterns, colors, weight, or styles of attached or unattached text:

- Select text and choose Format Patterns; select options in dialog box and choose OK.
- For step-by-step procedure, see **Chart text**.

G To format chart legend text, font, size, color, or style:

- Select the legend and choose Format Font; select the options in dialog box and choose OK.
- For step-by-step procedure, see **Chart legend**.

H To change the number format used for value axis tickmark labels:

- Activate source worksheet window and select worksheet cells that were used for values in chart; choose Format Number, select a format, and choose OK.
- For step-by-step procedure, see **Number**.

I To format font used for chart axis tickmark labels:

- Select category or value axis and choose Format Font; select options in dialog box and choose OK.
- For step-by-step procedure, see **Chart axis**.

For information on editing chart text, see **Editing a document**.

Tip

If you've customized a chart with several formatting changes and want to rework aspects of the chart, you don't necessarily have to go back to the drawing board. Use the Edit Clear command to:

- **Keep your data series but delete formatting changes.** Choose Chart Select Chart and then Edit Clear. Select the Formats option in the dialog box, and choose OK.
- **Keep your formatting changes but delete data series.** Choose Chart Select Chart and then Edit Clear. Select the Formulas option in the dialog box, and choose OK.

Related Information

Reference

For information on	See
Choosing commands and working in dialog boxes	Command, menu, and dialog box
Worksheet basics	Worksheet
Chart basics	Chart
Working with windows (moving, sizing, etc.)	Windows

Sampler

Creating Calendars, Diagrams, Tables, and Forms

Preparing a New Business Plan

Changing Coordinate Systems

Generating Mailing Labels

Tutorial

Changing How a Worksheet Looks

Printing a Worksheet

Changing How a Chart Looks

Printing a Chart

Feature Guide

Worksheet Formatting

Charts

Formula

A **formula** is a sequence of values, cell references, names, functions, or operators that is contained in a cell and produces a new value from existing values. You enter a formula in the formula bar, just below the menu bar in the Microsoft Excel window.

This topic explains:

- The parts of a formula
- Entering a formula
- Canceling a formula

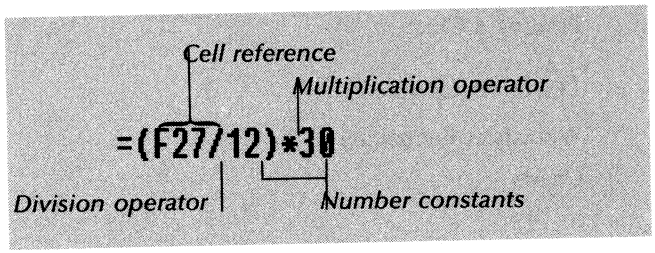
You also use the formula bar to enter data other than formulas in worksheet cells and in charts. This topic does not discuss the step-by-step procedures for using the formula bar. For information on using the formula bar, see **Formula bar**.

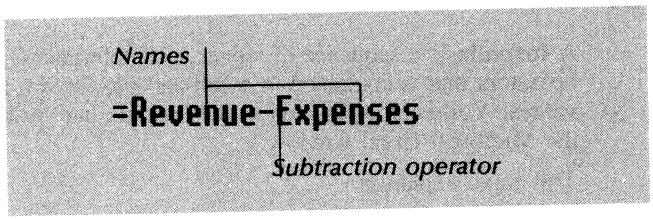
Note | All procedures related to formulas in worksheets also apply to macro sheets.

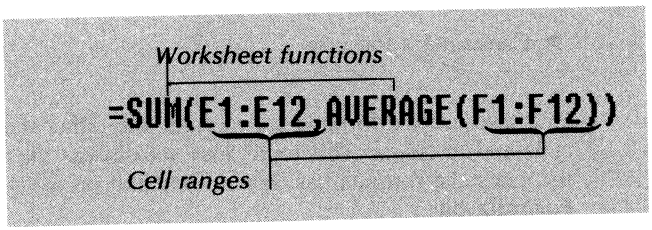
The Parts of a Formula

A formula always begins with an equal sign (=) followed by the desired sequence of values, cell references, names, functions, or operators. A formula calculates a new value from existing values. The existing values can be constants that are entered as a part of the formula itself, or the existing values can be in other cells that are referenced or named in the formula. The operators and functions specify what calculations Microsoft Excel performs in the formula.

The following illustration shows the types of data you can include in a formula:







Microsoft Excel uses four kinds of operators:

Type of operator	Operators
Arithmetic	+ – / * % ^
Text	&
Comparison	= > < >= <= <>
Reference	: , space

For information on how the operators work, including the order in which operators are processed in a formula, see **Operator**.

Entering a Formula

When the formula bar is active, you can use the following techniques for entering a formula or part of a formula:

- **Type the formula.** You can type in values, references, names, functions, and operators.
- **Select cells with the keyboard or mouse.** While the formula bar is active and in Enter mode (the status bar says "Enter"), you can select cells in the worksheet to insert references in your formula. To do this, use the DIRECTION keys to select a cell or range immediately after typing the equal sign to start the formula, or an operator, comma, or left parenthesis within a formula. The status bar indicates you are in Point mode and a dotted marquee surrounds the cell or range you select. To exit Point mode, type another operator, comma, or left parenthesis, or complete the formula by pressing ENTER. You can change the type of reference with the Formula Reference command. For information on how to select, see **Formula bar**.
- **Paste a function.** You can use the Formula Paste Function command to paste in a built-in worksheet function. To do this, select an insertion point in the formula bar. Choose Formula Paste Function. Select the function you want from the list box. Choose the OK button. For information on using functions, see **Function**.
- **Paste a name.** To paste a name, select an insertion point in the formula bar. Choose Formula Paste Name. In the list box, select the name you want to paste. Choose the OK button. For information about using names, see **Names**.
- **Paste a link to another worksheet.** This allows you to link the worksheets so that one worksheet is dependent on the values in another worksheet. For more information on the principles and procedures of linking, see **Linking documents**.

To enter a formula:

1. Select the cell in which you want to enter the formula.
2. Type an equal sign (=) to activate the formula bar.
   If you begin a formula by pasting a function or name, Microsoft Excel automatically inserts the equal sign.
3. Enter the formula, using any or all of the procedures discussed above.
4. Press ENTER or choose the enter box.
   You can use a DIRECTION key to enter the formula and move in the direction you want if the status bar indicates that you are in Enter mode (and not in Edit or Point mode) and if the insertion point does not immediately follow an operator, comma, or left parenthesis.

Tip To enter the same formula into a range of cells, first select the range, then type the formula, then enter it by holding down the CONTROL key and pressing ENTER. For information on selecting a range of cells, see **Keyboard**.

Canceling a Formula

While entering a formula or immediately after you enter a formula, you can undo your entry and restore the previous contents of the cell.

To cancel a formula before you enter it	**To undo a formula after you enter it**
▣ Press ESCAPE or choose the cancel box.	▣ Choose Edit Undo.

Microsoft Excel cancels the formula and restores the previous contents of the formula bar.

Related Information

Reference

For information on	**See**
Editing formulas	Formula bar
Formulas used to plot charts	Series formula Data series

For information on	See
References	References Formula Reference command
Using names	Names Formula Paste Name command
Using built-in worksheet functions	Function Formula Paste Function command

Functions and Macros

Chapter 1, "Worksheet Function Basics"

Chapter 2, "Worksheet Function Directory"

Tutorial

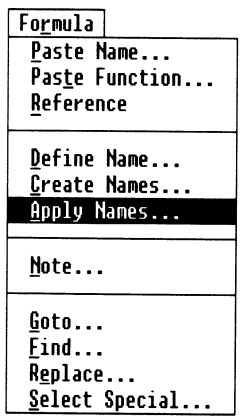
Creating a Worksheet

Using Worksheet Functions

Feature Guide

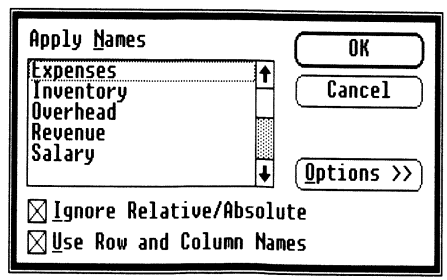
Basic Mechanics, "Entering and Editing" and "Copying"

Formula Apply Names command



Searches through the formulas in the selected cells and replaces cell references with names, if they exist. If a single cell is selected when you choose Formula Apply Names, Microsoft Excel applies names to the entire worksheet.

Because names are more descriptive than references, you can use Formula Apply Names to quickly simplify and clarify the formulas in your worksheet. For information on names, see **Names**.



Apply Names

Lists all names defined on your worksheet. Select the names you want Microsoft Excel to use in place of references. You can select as many names as you want by holding down the CONTROL key while pressing the UP or DOWN key to move the dotted box, and pressing the SPACEBAR to add the name to, or remove it from, the selection.

If you have a mouse, you can select more than one name by holding down the SHIFT key and clicking on the names you want to select.

Ignore Relative/Absolute

When this check box is turned on, Microsoft Excel replaces references with names regardless of the reference type of either the names or the references. If you turn off this check box, Microsoft Excel replaces absolute references only with absolute names, relative references only with relative names, and mixed references only with mixed names.

Since names are usually defined as absolute references, and references are usually entered into formulas as relative references, turning off this check box usually results in few names being applied. You should leave this check box turned on unless you plan to copy the cells to a new location and need to preserve the reference types in the formulas.

For information on absolute and relative references, see **References**.

Use Row and Column Names

Uses the names of the ranges containing the referred-to cells if an exact match cannot be found.

If this check box is turned off, Microsoft Excel replaces only references that are an exact match to the definition of a name. If this check box is turned on, Microsoft Excel replaces all references that are exact matches, then, for the remaining references, tries to find named ranges no more than one column wide or one row high that contain the cell referred to.

For example, if a formula contains a reference to cell A5, and you turn off this check box, A5 is only replaced by a name if there is a name defined as A5, $A$5, $A5, or A$5. If the check box is turned on, A5 is replaced by a name if there is a name defined as any cell range that falls entirely within column A or entirely within row 5.

There are three situations that affect how Microsoft Excel decides to change references to names when there is not an exact match:

- The reference refers to a cell that is in a different row and column than the cell containing the reference.

If the reference is in a different row and column than the cell containing the reference, the reference is replaced with the names of the row-oriented range and the column-oriented range containing the cell. The two names appear in the formula one after the other, separated by a space, which is the intersection operator. If the reference is not within both a row-oriented and a column-oriented range, the reference is not replaced with a name.

- The reference refers to a cell in the same row, but a different column than the cell containing the reference.

  If the reference is in the same row, but a different column, the reference is replaced with the column-oriented name, if there is one.

  If there are both a column-oriented range and a row-oriented range containing the referenced cell, and if the Omit Row Name If Same Row check box is turned off, the row name is also added. This check box is available when you choose the Options button, and is normally turned on.

- The reference refers to a cell in the same column, but a different row than the cell containing the reference.

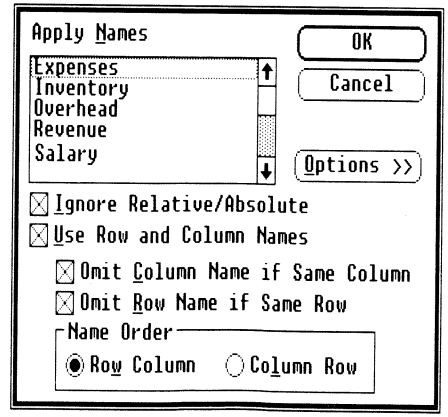
  If the reference is in the same column, but a different row, the reference is replaced with the row-oriented name, if there is one.

  If there are both a column-oriented range and a row-oriented range containing the referenced cell, and if the Omit Column Name If Same Column check box is turned off, the column name is also added. The Omit Column Name check box is available when you choose the Options button, and is normally turned on.

Note | For more information and to see an example of how names are applied, see **Names**.

Options

The options button displays the options described below.



Omit Column Name If Same Column

If the referenced cell is in the same column but a different row, and if the referenced cell is within a row-oriented named range, Microsoft Excel replaces the reference with the row-oriented name, but ignores the column-oriented name, if there is one.

Turn off this check box if you want the reference to be replaced with both the column name and the row name, if both exist.

Omit Row Name If Same Row

If the referenced cell is in the same row but a different column, and if the referenced cell is within a column-oriented named range, Microsoft Excel replaces the reference with the column-oriented name, but ignores the row-oriented name, if there is one.

Turn off this check box if you want the reference to be replaced with both the column name and the row name, if both exist.

Name Order

Determines which range name is listed first when a cell reference is replaced by a row-oriented range name and a column-oriented range name. Select the combination you prefer.

Row Column	Lists the row name first
Column Row	Lists the column name first

Formula bar

The **formula bar** is the part of your Microsoft Excel window that you use to enter values and formulas into cells or charts.

This topic explains:

- Formula bar basics

  Entering data in the formula bar

  Canceling data in the formula bar

- Formula bar techniques

  Moving and selecting in the formula bar

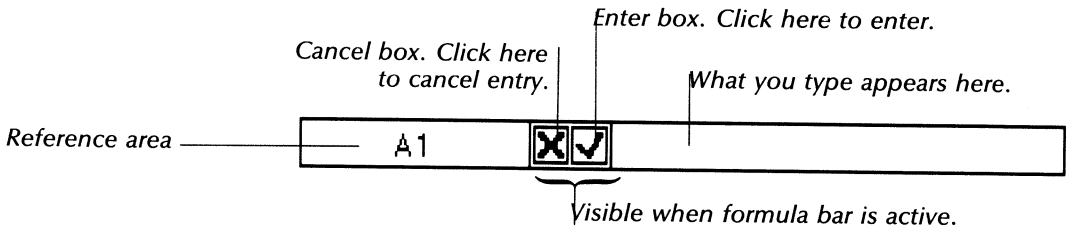
  Editing in the formula bar

  Inserting cell or range references in a formula

  Hiding or displaying the formula bar

Formula Bar Basics

Whenever you want to enter or change a value or formula in a document, you enter and edit it in the formula bar.



When a worksheet or macro sheet is the active document, the reference area displays the reference of the active cell. While you are selecting a range of cells, this area displays the size of the selected range. For example, if you have the range A1:B1 selected, you will see "1RX2C" in the reference area. This tells you that the selected area is 1 row by 2 columns.

When a chart is the active document, the reference area tells you what is selected. If the legend is selected, for example, this area displays "Legend". If the third point of the first series is selected, this area displays "S1P3". For more information on what codes stand for what parts of a chart, see the SELECT macro function in Chapter 7 of *Microsoft Excel Functions and Macros*.

During certain operations, like opening or saving a document or sorting a database, the reference area indicates the progress of the operation. Depending on the operation, Microsoft Excel indicates progress in percent accomplished (such as "Sort: 80%") or in cells processed (such as "Recalc: 454").

Entering Data in the Formula Bar

To enter data in the formula bar, type the data. In addition, you can use any of the following techniques:

- Use the Formula Paste Name or Formula Paste Function command, to paste names or worksheet functions into the formula bar. For more information, see **Function** and **Names**.

- Use the Edit Paste command to paste characters you previously copied. For more information, see **Copying data and formats**.
- Select cells with the keyboard or mouse to enter their references into the formula bar. For more information, see "Inserting Cell or Range References in a Formula" later in this topic.

Note | Microsoft Excel formulas start with an equal sign (=). To enter a formula, make sure you type an equal sign before you type anything else.

To enter data:

1. Type or paste the data into the formula bar; or select cells to insert references.
2. Press ENTER. If you have a mouse, click the enter box.

For step-by-step procedures for entering data in a single cell or range, or moving around in a selected range, see **Worksheet**.

Canceling Data in the Formula Bar

■ Press ESCAPE. If you have a mouse, click the cancel box.

Formula Bar Techniques

The following sections discuss techniques you can use to enter and edit data in the formula bar. Included is a procedure for hiding the formula bar to suppress the display of formulas in worksheets and charts.

Moving and Selecting in the Formula Bar

To work in the formula bar, use the techniques in this section to move the insertion point and to select the characters you want to work with.



To move and select in the formula bar with the keyboard, make sure Microsoft Excel is in Edit mode: the left side of the status bar should display the message "Edit." If the status bar displays "Ready" or "Enter," press F2. While in Edit mode, use the keys in the following table to move and select:

To	Press
Move to beginning of line	HOME
Move to beginning of formula bar	CONTROL+HOME
Move to end of line	END

To	Press
Move to end of formula bar	CONTROL + END
Move one character left, right, up, down	DIRECTION key
Move one word left, right, up, down	CONTROL + DIRECTION key

To extend a selection in the formula bar, use one of the following techniques while in Edit mode:

- **The SHIFT key method.** Hold down SHIFT and press a key or key sequence listed in the preceding table. For example, to extend the selection to the end of the line, press SHIFT + END.
- **The Extend key method.** Press F8 to turn on the Extend key. This lets you extend the selection using any of the keys in the preceding table without holding down SHIFT. To turn off the Extend key, press F8 again.

For more information on moving and selecting with the keyboard, see **Keyboard**. For more information on the status bar, see **Status bar**.



To move and select in the formula bar with the mouse, use the techniques in the following table:

To	Do this
Move in the formula bar	Click where you want the insertion point
Select characters in the formula bar	Drag through the characters you want
Select a word in the formula bar	Double-click the word you want

You may also find it convenient to combine keyboard and mouse techniques when entering or editing data in the formula bar. Clicking in the formula bar with the mouse turns on Edit mode (see explanation in keyboard information above), and allows you to use the movement-selection keys described above.

For more information on moving and selecting with the mouse, see **Mouse**.

Editing in the Formula Bar

To edit data in the formula bar, first move the insertion point where you want or select the characters you want to work with (see the preceding section, "Moving and Selecting in the Formula Bar"). Then use the editing keys in the following tables. The first table lists standard editing keys. The second table lists special keys that let you insert times and dates, or copy data into the formula bar.

To use these keys, make sure Microsoft Excel is in Edit mode: from Ready or Enter mode, press F2 or click in the formula bar with the mouse. The left side of the status bar should display the message "Edit."

Note In the first table, the term "Clipboard" refers to the Clipboard utility program. The Clipboard acts as a holding area for data that you are copying or moving. For more information on the Clipboard, see the Appendix.

Key	With no characters selected	With characters selected
DELETE	Deletes the character to the right of the insertion point	Deletes the selection
SHIFT + DELETE	Same as DELETE	Cuts the selection to the Clipboard
BACKSPACE	Deletes the character to the left of the insertion point	Deletes the character at the end of the selection
SHIFT + INSERT	Pastes the Clipboard data at the insertion point	Pastes the Clipboard data over the selection
CONTROL + DELETE	Deletes from the insertion point to the end of the line	Deletes from the beginning of the selection to the end of the line
CONTROL + INSERT	—	Copies the selection to the Clipboard

Note When the formula bar is not active (that is, you cannot see the cancel and enter boxes), pressing BACKSPACE activates the formula bar and deletes its contents.

Key	Action
CONTROL+;	Inserts current date in formula bar
CONTROL+:	Inserts current time in formula bar
CONTROL+'	Copies the formula from the cell above into formula bar
CONTROL+"	Copies the value from the cell above into formula bar

Inserting Cell or Range References in a Formula

When entering a formula, you can either type in cell or range references or you can use Point mode, a special mode that simplifies this procedure. This method is especially useful when you are working with the worksheet functions, many of which use ranges as arguments.

Follow these guidelines to use Point mode:

- **When to use Point mode.** You can use Point mode only from Enter mode and only when entering a formula. The status bar displays the message "Enter" when Microsoft Excel is in Enter mode. If the status bar displays "Ready," just start the formula by typing an equal sign to turn on Enter mode. If the status bar displays "Edit," press F2 to turn on Enter mode.
- **Where to insert references with Point mode.** You can use Point mode to insert a cell or range reference immediately following any of these elements in a formula: an equal sign, a left parenthesis, a comma, or an operator (for example, +, −, *, or /).
- **How to insert a reference.** Immediately following any of the elements listed above, use the keyboard or mouse to select a cell or range whose reference you want to insert in the formula.

  With the keyboard, press a DIRECTION key to select a cell; press SHIFT+DIRECTION key to extend the selection if you want to insert a range. With the mouse, click the cell or drag through the range you want.

  In both procedures, the cell or range you select is surrounded by a dotted line called a marquee. The reference to the cell or range appears in the formula bar.

- **How to continue the formula after inserting a reference.** After you insert the reference in the formula, type the next operator, comma, or parenthesis. Or, complete the formula by pressing ENTER or clicking the enter box.

For more information on entering a formula or using worksheet functions, see **Formula** and **Function**, respectively. For more information on modes in Microsoft Excel, see **Worksheet**.

Hiding or Displaying the Formula Bar

Normally, Microsoft Excel displays the formula bar. If you want, you can hide the formula bar. Then, when you type data into a cell, you will see the data in that cell but not in the formula bar. After you've entered a formula, the formula will not be visible anywhere on the worksheet.

To hide the formula bar	To display the formula bar
1 Choose Options Workspace.	1 Choose Options Workspace.
2 Turn off the Formula Bar check box.	2 Turn on the Formula Bar check box.

For information on hiding formulas for security purposes, see **Protecting or hiding data**.

Related Information

Reference

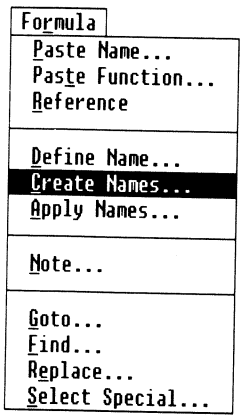
For information on	See
Formulas	Formula
Selecting with the keyboard or mouse	Keyboard Mouse
Editing in worksheets and charts	Editing a document

Feature Guide

Basic Mechanics, "Entering and Editing" and "Copying"

Formula Create Names command

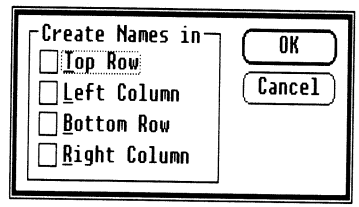
(Full menus)



Quickly names several areas of a worksheet at once by using text at the edge of the area you want to name. **Shortcut key:** CONTROL + SHIFT + F3.

When you select the range of cells you want to name, include the text to be used as names in the left or right column, or the top or bottom row, or some combination of them, then choose Formula Create Names.

You can use any combination of options to create names in any direction. If you use two options that overlap, such as the top row and left column, and the cell in the corner of the selection contains text, that text also becomes the name for the entire selected range.



Top Row

The text in each cell of the top row of the selection becomes the name for the column below it.

Left Column

The text in each cell of the left column of the selection becomes the name for the row to the right of it.

Bottom Row

The text in each cell of the bottom row of the selection becomes the name for the column above it.

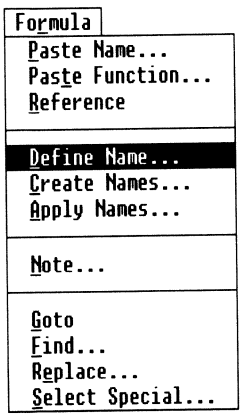
Right Column

The text in each cell of the right column of the selection becomes the name for the row to the left of it.

When you choose the OK button, Microsoft Excel creates the names. If any of the names are already defined, Microsoft Excel asks if you want to change the existing definition of the name.

Yes	Gives the name the new definition
No	Keeps the current definition of the name, and leaves the cells that would have been affected unnamed
Cancel	Ends the command, but retains any names already defined before you chose the Cancel button

Formula Define Name command



Creates a name for a cell range, value, or formula. You can create, delete, or change a name with Formula Define Name. You can use a name in formulas or other name definitions. **Shortcut key:** CONTROL + F3.

You can also use Formula Define Name to define values or formulas that aren't in cells. For example, you can define Inflation without putting the value for Inflation in a cell. Choose Formula Define Name, type *Inflation* in the Name box, and type the current rate of inflation in the Refers To box. You can then include the name Inflation in any formula, and Microsoft Excel uses the value you typed in the Refers To box.

You can change the rate of inflation as often as you want by changing the value for Inflation in the Refers To box. Every time you change that value, Microsoft Excel updates all formulas that contain the name Inflation.

Define a name by accepting the proposed name or typing a new one, accepting or changing what the name refers to, then choosing the OK button.

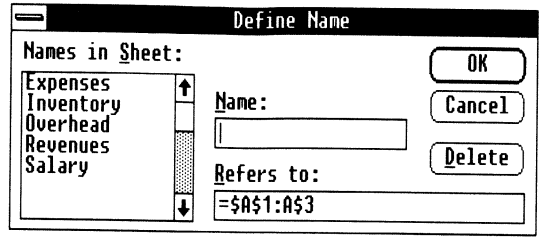
The first character of any name must be a letter. Names can be up to 255 characters long, and can contain any letter or digit, an underline (_) or a period. A name cannot contain spaces; use the underline character instead. Microsoft Excel does not accept names that resemble a number or cell reference.

You can name a cell range containing any number of cells. You can also name a multiple selection.

If the Formula Define Name dialog box is covering a cell you want to select, you can move the dialog box with the Control Move command for the dialog box (ALT, SPACEBAR, M), or by dragging the title bar with the mouse.

For more information, see **Names**.

Worksheet



Names in Sheet

Lists all names currently defined on the worksheet. If you select a name from this list, the name appears in the Name box, and whatever the name refers to is shown in the Refers To box.

Name

If there is text in the active cell, Microsoft Excel proposes that text as the name. If the active cell is blank, Microsoft Excel proposes text in the cell to the left or above as the name.

You can accept the proposed name, select one of the names in the list box, type a new name, or edit the proposed response. You edit a name in the Name box the same way you edit text in the formula bar.

If you use a name that you have already defined, the new definition of the name completely replaces the old definition.

Refers To

If you are defining a new name, Microsoft Excel proposes the selected cell range. If the name is already defined, Microsoft Excel proposes the range, value, or formula that this name currently refers to.

You edit the contents of the Refers To box the same way you edit the contents of the formula bar. While you are editing, you can make worksheet selections, choose formula editing commands, and activate and move windows.

The Refers To box accepts cell references, values, or formulas. Formulas can include other names, functions, and references. For example:

=Inflation/2

=Gross – Taxes

=$A$2 – $A$1

Delete

Deletes the name selected in the Names in Sheet list box.

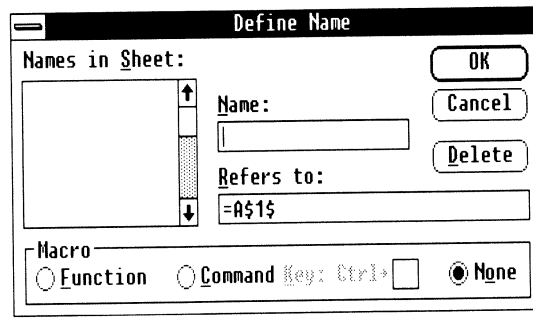
Note If the name in the Name box is different from the name selected in the Names in Sheet list box, the Delete button deletes only the name selected in the Names in Sheet list box.

When you delete a name, the named cells and their contents are not affected; you remove just the name. If the deleted name is a part of any formulas, the #NAME? error value appears in those formulas in place of the deleted name, and any cell containing that formula displays #NAME? as its value.

Macro Sheet

If you choose Formula Define Name when a macro sheet is active, you will see a slightly different dialog box. This dialog box is the same as the worksheet dialog box except for the Macro options.

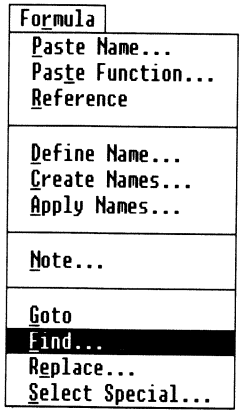
For information on macros, see *Microsoft Excel Functions and Macros.*



Macro

When you define a macro name, select either Function or Command to define the type of macro it is. For a command macro, you can also assign a shortcut key that you press with the CONTROL key to run the macro. The shortcut key can be any upper- or lowercase letter except *e*, *i*, *n*, or *u*. The shortcut key cannot be a number.

Formula Find command



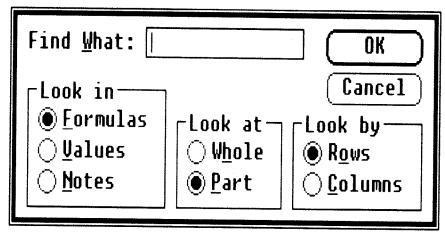
Locates text or a number in a cell. **Shortcut key:** F7.

Use Formula Find to find all occurrences of a name or function. For example, Formula Find is particularly useful for finding #REF! and #NAME? error values caused by deleting cells or names. To find specific records in a database, use the Data Find command.

If you select a range of cells, Formula Find searches only within that selection. If only one cell is selected, Formula Find searches the entire worksheet.

When you have set all the options, choose the OK button to find the next occurrence. To search for the previous occurrence, hold down SHIFT when you choose the OK button.

For more information, see **Finding cells and data quickly**.



Find What

Proposes the last text or number searched for. You can either accept the proposed response or type in a new one. The value may include the characters =, >, <, >=, <=, and <>, but they are treated as text, not as operators.

The characters ? and * are treated as wildcards. A question mark stands for any single character, and an asterisk stands for any group of characters. For more information on wildcard characters and comparison operators, see **Operator**.

If you want to find a question mark or asterisk, precede it with a tilde (~). For example, *to?* finds all three-letter words that begin with the letters *to*, while *to~?* finds all occurrences of *to?*.

Look In

Formulas	Searches the contents of each cell as displayed in the formula bar
Values	Searches the formatted value displayed in each cell
Notes	Searches the text of the note for each cell

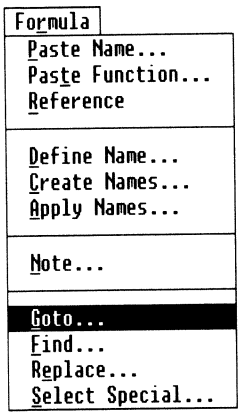
Look At

Whole	Matches the text or number you want to find with the entire value, formula, or note in the cell
Part	Matches the text or number you want to find with any part of the value, formula, or note in the cell

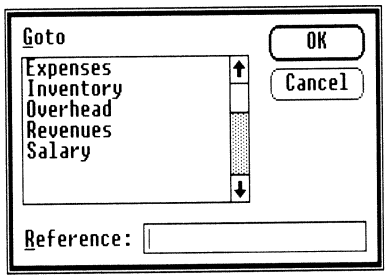
Look By

Rows	Searches horizontally through rows
Columns	Searches vertically through columns

Formula Goto command



Quickly scrolls the worksheet and selects a named area or a reference. You can select a name from the list box or type a name or reference into the Reference box. **Shortcut key:** F5.



Goto

Lists all of the names defined in the active worksheet. Select a name from the list and choose the OK button.

Reference

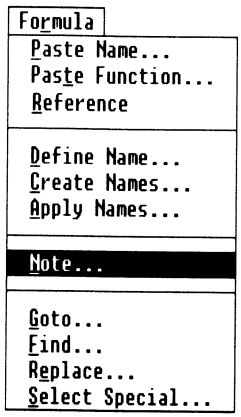
Specifies the named area or reference. Type a name or reference and choose the OK button.

To go to a named area or a reference on another worksheet, type the name of the worksheet, an exclamation point, and the reference or name. For example, to go to B3 on a worksheet named Budget, type *Budget!B3*

Going Back

Each time you use Formula Goto to go to another part of the worksheet, Microsoft Excel remembers where you were and automatically puts that last cell reference in the Reference text box the next time you choose the command. You can toggle back and forth between two parts of your worksheet by repeatedly choosing Formula Goto.

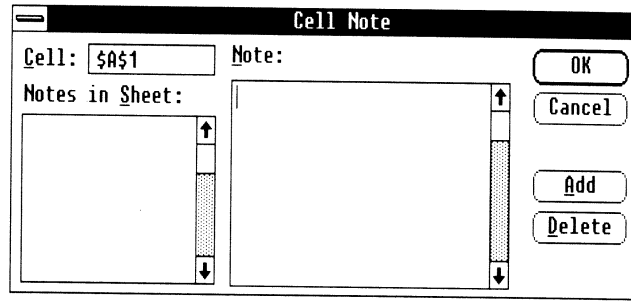
Formula Note command



Allows you to attach extra information to a cell. You can add, delete, and edit notes for specific cells on the active worksheet. **Shortcut key:** SHIFT + F2.

Notes do not appear in the cell, but can be printed with the worksheet or viewed in the Info window with the Window Show Info command.

For more information on notes, see **Notes**.



Cell

Gives the cell reference for the note selected in the Notes in Sheet list box.

Notes in Sheet

Lists all notes on the worksheet, preceded by each note's cell reference.

Note

Shows the complete text of the note selected in the Notes in Sheet list box. You can edit this text the same way you edit text and formulas in the formula bar.

Add

Adds the text in the Note box to the cell in the Cell box. The Add button does not close the dialog box, so you can continue adding or editing other notes.

Delete

Deletes the note selected in the Notes in Sheet list box. The cell the note was attached to is unaffected.

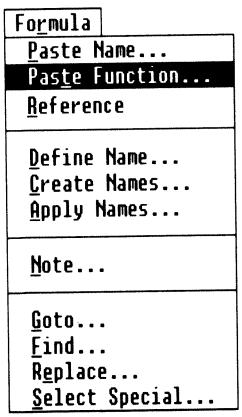
OK

Adds any text in the Note box to the cell in the Cell box, and closes the dialog box.

Cancel

Closes the dialog box, but does not cancel your actions. Any notes you have added, edited, or deleted remain as you changed them.

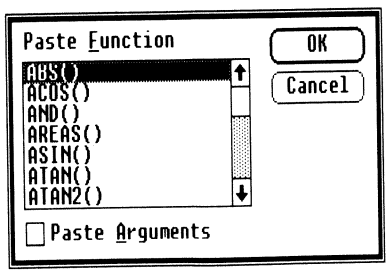
Formula Paste Function command



Pastes a function into the formula bar. If the formula bar is active, the function is pasted at the insertion point. If the formula bar is not active, the formula bar is activated and the function pasted into it. **Shortcut key:** **SHIFT + F3**.

It is usually more accurate to paste a function than to type it. Pasting a function also provides an easy way to remember which functions are available and what their arguments are.

For a quick-reference list of functions and their arguments, see **Function**. For a complete list of functions, their arguments, and what they do, see *Microsoft Excel Functions and Macros*.



Paste Function

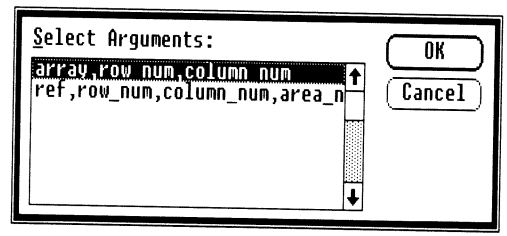
Lists all available Microsoft Excel functions, followed by any function macros defined on open macro sheets. A function macro is preceded by the name of its macro sheet and an exclamation point.

To paste a function, select the function you want from the list, then choose the OK button. Scroll the list box to see the entire list of functions.

Paste Arguments

If this check box is turned on, Microsoft Excel pastes text descriptions of the function's arguments into the formula bar along with the function. You must replace these argument placeholders with the actual arguments you want to use.

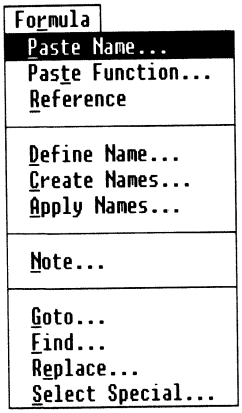
Some functions, such as the Index function, have more than one form. If you paste a function that has more than one form while the Paste Arguments check box is turned on, Microsoft Excel displays another dialog box so you can select the form you want to paste.



Select Arguments

Lists the sets of arguments available for the function you chose. Select the set you want and choose the OK button.

Formula Paste Name command



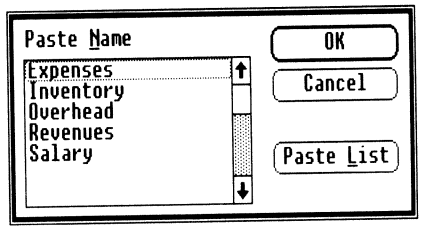
Pastes a name into the formula bar. You can also paste into your worksheet a list of all names defined for the worksheet and what they refer to. **Shortcut key:** F3.

If the formula bar is active, the name is pasted at the insertion point. If the formula bar is not active, the formula bar is activated and the name pasted into it.

Formula Paste Name is particularly useful when you construct large worksheets because you can refer to areas of your worksheet without having to remember specific cell references. Use Formula Paste Name to remember what names you have defined and to paste them into the formula bar.

The command is grayed if there are no names defined on the current worksheet. Use the Formula Define Name and Formula Create Names commands to define names.

For more information, see **Names**.



Paste Name

Lists all names defined on the active worksheet. Select the name you want to paste and choose the OK button.

Paste List

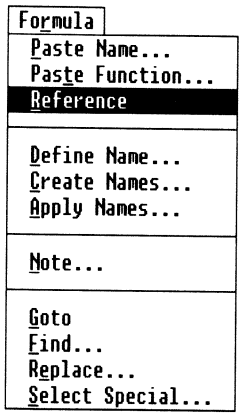
Lists all names defined on your worksheet. When you choose the Paste List button, Microsoft Excel starts at the active cell and fills an area two columns wide and as many rows long as there are names. The left column lists the names defined on the worksheet and the right column lists what the names refer to.

In a macro sheet, the list is four columns wide. The first column lists the names defined on the macro sheet, the second column lists what the names refer to, the third column contains a "1" to indicate the name is for a function macro or a "2" to indicate the name is for a command macro, and the fourth column lists the shortcut key you can use to run the macro.

Important

When you choose the Paste List button, Microsoft Excel completely replaces the contents of the cells it pastes into. If you paste the list of names into a part of your worksheet containing data you want to keep, immediately choose the Edit Undo command.

Formula Reference command



Converts the selected references in the formula bar from relative to absolute, from absolute to mixed, and from mixed back to relative. **Shortcut key:** F4.

Formula Reference converts a reference in the formula bar if you have selected the reference, or if the insertion point is within or next to the reference. You can select and convert as many references in the formula bar as you want.

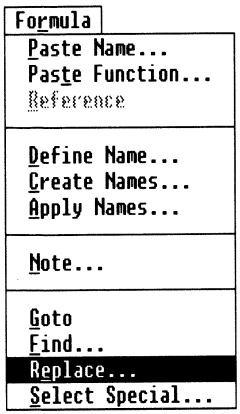
The following table shows how the selected cell references are converted when you choose Formula Reference:

This	Becomes
A1	$A$1
$A$1	A$1
A$1	$A1
$A1	A1

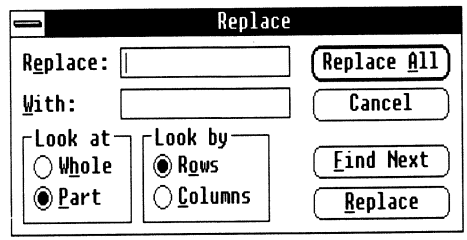
For more information, see **References**.

Formula Replace command

(Full menus)



Finds and replaces characters in the cells on your worksheet. If you select a cell range, Microsoft Excel searches only that range. If you select a single cell, Microsoft Excel searches the entire worksheet.



Replace

Microsoft Excel proposes the last characters you searched for. Accept the proposed response or type the text, number, formula, or part of a formula that you want to find.

You can include the question mark and asterisk wildcards in the Replace text box. For more information, see **Wildcard**.

With

Microsoft Excel proposes the last characters you used as a replacement. Accept the proposed response or type the text, number, formula, or part of a formula that you want to use as the replacement.

Look At

Whole	Matches the characters you want to find with the entire formula or value in the cell.
Part	Matches the characters you want to find with any part of the formula or value in the cell.

Look By

Rows	Searches horizontally through rows.
Columns	Searches vertically through columns.

Replace All

Finds and replaces all occurrences of the characters in the Replace box with the characters in the With box.

Cancel

Ends the command and closes the dialog box, but does not reverse any replacements made up to the time you cancel.

Find Next

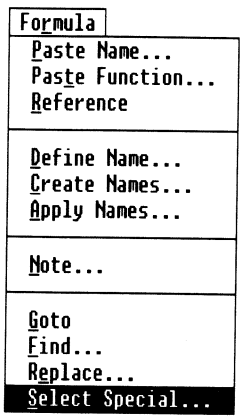
Finds the next occurrence of the characters in the Replace box. You can find the previous occurrence by holding down SHIFT when you choose Find Next. When you are at the last occurrence, Microsoft Excel finds the first occurrence in the worksheet. When there are no occurrences at all in the worksheet, Microsoft Excel displays a message.

Replace

If the active cell contains what you are searching for, Microsoft Excel replaces it, and looks for the next occurrence. When you are at the last occurrence, Microsoft Excel finds the first occurrence in the worksheet. When there are no occurrences at all in the worksheet, Microsoft Excel displays a message.

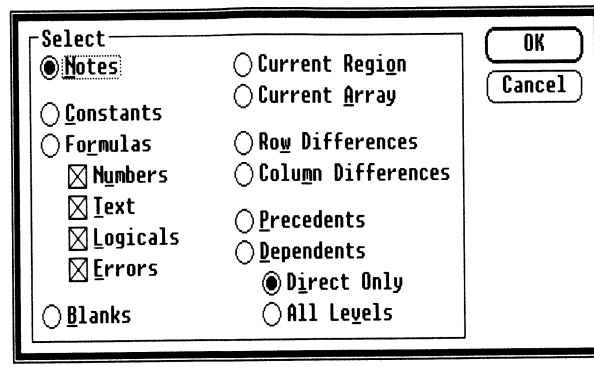
Formula Select Special command

(Full menus)



Selects cells that have the characteristics specified in the dialog box.

The selection that results from Formula Select Special can contain many cells and cell ranges. To move to individual cells within a selected range, press TAB or ENTER; to move in the opposite direction, press SHIFT+TAB or SHIFT+ENTER. To move between selected ranges, press CONTROL+TAB or SHIFT+CONTROL+TAB.



Notes

Makes a multiple selection of all cells that contain a note. For information on notes, see **Notes** and **Formula Note command**.

If you have a single cell selected when you choose the command, the entire worksheet is searched. If you have a cell range selected, the search is limited to that range.

Constants

Makes a multiple selection of cells that contain a constant, based on which check boxes you turn on or off. You can have any combination of the four check boxes turned on or off. The check boxes under Formulas also control constants when Constants is selected. A constant is a number or text that does not start with an equal sign.

If you have a single cell selected when you choose the command, the entire worksheet is searched. If you have a cell range selected, the search is limited to that range.

Numbers	Selects constant numbers
Text	Selects constant text
Logicals	Selects the logical values TRUE and FALSE that have been entered in the cell as constants, rather than as the result of a formula
Errors	Selects cells containing error values that have been entered in the cell as constants, rather than as the result of a formula

Formulas

Makes a multiple selection of cells that contain a formula, based on which check boxes you turn on or off. You can have any combination of the four check boxes turned on or off. The check boxes also control constants when Constants is selected.

Except for some special formulas in macro sheets, a formula starts with an equal sign and produces a value. For information on formulas, see **Formula**.

If you have a single cell selected when you choose the command, the entire worksheet is searched. If you have a cell range selected, the search is limited to that range.

Numbers	Selects cells with formulas that produce numbers
Text	Selects cells with formulas that produce text
Logicals	Selects cells with formulas that produce the logical values TRUE or FALSE
Errors	Selects cells with formulas that produce an error value

Blanks

Makes a multiple selection of all cells that are blank. If you have a single cell selected when you choose the command, the entire worksheet is searched. If you have a cell range selected, the search is limited to that range.

Current Region

Selects a rectangular range of cells around the active cell. The region selected is an area bounded by any combination of blank rows, blank columns, or worksheet borders.

Current Array

Selects the entire array to which the active cell belongs, if any. For information on arrays, see **Array**.

Row Differences

Searches each row of the selection and selects the cells that are different from the comparison cell in each row. The comparison cell for each row is the cell that is in the same column as the active cell. The selection can be a cell range or a multiple selection, and the active cell can be inside or outside of the selection.

Microsoft Excel determines how to select row differences by looking at what you have selected:

- The position of the active cell determines which cells Microsoft Excel uses as the comparison cells, which are the basis for finding row differences. When searching for row differences, Microsoft Excel compares the cells in the selection to the cells in the same column as the active cell. The active cell, and thus the comparison cells, can be within the selection or outside of it.
- The cells in the selection determine the area Microsoft Excel searches for differences. Within the selection, Microsoft Excel finds the cells in each row that are different from the comparison cell in the column containing the active cell, and makes a multiple selection of all the cells that are different.

Microsoft Excel compares formulas based on R1C1 reference style, which shows relative references more clearly than A1 reference style. This way, cells with identical relative references will not be selected as being different.

For example, if the active cell is D2 and contains the formula =E2, the identical relative reference in cell D3 would be =E3, since each refers to the cell to the right of it. The similarity is clearer in R1C1 style, since both cells would contain the formula =RC[1]. The result is that Microsoft Excel correctly considers the formulas in cells D2 and D3 to be the same. For information on R1C1 reference style, see **References** and **Options Workspace command**.

Column Differences

The Column Differences option works like the Row Differences option, except that it selects cells in the same column that are different from the comparison cells rather than cells in the same row that are different.

Microsoft Excel determines how to select column differences by looking at what you have selected:

- The position of the active cell determines which cells Microsoft Excel uses as the comparison cells, which are the basis for finding column differences. When searching for column differences, Microsoft Excel compares the cells in the selection to the cells in the same row as the active cell. The active cell, and thus the comparison cells, can be within the selection or outside of it.
- The cells in the selection determine the area Microsoft Excel searches for differences. Within the selection, Microsoft Excel finds the cells in each column that are different from the comparison cell in the row containing the active cell, and makes a multiple selection of all the cells that are different.

Microsoft Excel compares formulas based on R1C1 reference style, which shows relative references more clearly than A1 reference style. This way, cells with identical relative references will not be selected as being different.

For example, if the active cell is C2 and contains the formula =C1, the identical relative reference in cell B2 would be =B1, since each refers to the cell above it. The similarity is clearer in R1C1 style, since both cells would contain the formula =R[−1]C. The result is that Microsoft Excel correctly considers the formulas in cells B2 and C2 to be the same. For information on R1C1 reference style, see **References** and **Options Workspace command**.

Precedents

Selects cells that the formulas in the cells in the selection refer to. For information on what level of precedents Microsoft Excel selects, see "Direct Only" and "All Levels," following.

Dependents

Selects cells with formulas that refer to the cells in the selection. For information on what level of dependents Microsoft Excel selects, see "Direct Only" and "All Levels," following.

Direct Only

When you search for precedents, Direct Only selects only the cells that the formulas in the selection directly refer to. When you search for dependents, Direct Only selects only the cells containing formulas that directly refer to the cells in the selection.

All Levels

When you search for precedents or dependents, All Levels selects all cells that are directly and indirectly connected to the cells in the selection.

For example, if you select Precedents and All Levels, Microsoft Excel selects the cells referred to by the cells in the selection, the cells that those cells refer to, and so on.

All Levels is especially useful for selecting the entire network of cells that depend on or affect a particular cell in a complex worksheet.

Function

A **function** is a special prewritten formula that takes a value or values, performs some operation on them, and returns a value or values. Functions are abbreviated formulas that can be used alone or as building blocks in other formulas. You can use functions to simplify and shorten formulas in your worksheets, especially those that perform lengthy or complex calculations.

Microsoft Excel has a set of built-in worksheet functions that serve as shortcuts for many worksheet computations. You can also create your own functions for specialized calculations you routinely perform. Such functions are called **function macros**.

This topic explains:

- Overview of worksheet functions
- How to use functions

  Function arguments

  Pasting a worksheet function
- The Microsoft Excel built-in worksheet functions

This topic provides a brief introduction to the Microsoft Excel built-in worksheet functions. For a brief overview of function macros (user-defined functions), see **Macro**. For complete information on both types of functions, see *Microsoft Excel Functions and Macros,* a separate manual included in your Microsoft Excel package.

Overview of Worksheet Functions

You use the Microsoft Excel built-in worksheet functions to perform standard worksheet and macro sheet computations. The values that you give to a function to perform operations on are called **arguments** to the function. The values that the function returns are called the **results** of the function.

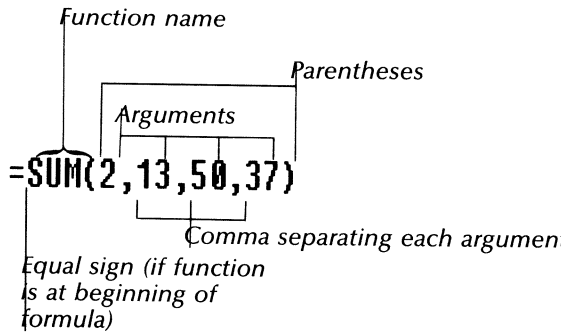
Here are some examples of commonly used worksheet functions and what they do:

This function	Performs this action
SUM(1,2,3)	Adds 1, 2, and 3
AVERAGE(1,2,3)	Calculates the average of 1, 2, and 3

This function	Performs this action
SIN(0.53)	Calculates the sine of an angle of 0.53 radians
LEN("Isabel Corley")	Counts the number of characters in the text Isabel Corley

How to Use Functions

You use functions by entering them in formulas on your worksheet or on a macro sheet. The sequence of characters you use in a function is called the syntax of the function. All functions have the same basic syntax, as in this example:



The parentheses are very important. They tell Microsoft Excel where the arguments begin and end. Whenever you type a function in the formula bar, remember to include both parentheses, with no space preceding the left parenthesis. If you do not follow this syntax, Microsoft Excel displays a message indicating that there is an error in the formula. One easy way to enter a function and avoid syntax errors is to paste the function in the formula bar using the Formula Paste Function command, explained later in this topic.

In working with functions, you can use uppercase or lowercase letters or a combination of both. Microsoft Excel does not distinguish between cases in function names.

Function Arguments

Function arguments can be numbers, text, logical values, arrays, error values, or references. The description of each function in Chapter 2, "Worksheet Function Directory," in *Microsoft Excel Functions and Macros* specifies what data type each argument should be. The argument you give can be anything, such as a reference or name, that produces the desired data type.

Pasting a Worksheet Function

As for any formula, a function begins with an equal sign. An easy way to enter a function is to paste it.

1. Select the cell or cells in which you want to paste the function.
2. Choose Formula Paste Function.

   Microsoft Excel displays a dialog box that lists all of the built-in worksheet functions. If you created your own functions (function macros), these appear at the end of the list.
3. Select the function you want.
4. If you want Microsoft Excel to paste placeholders to remind you what arguments are needed for the function, turn on the Paste Arguments check box.

   If you paste placeholders, you need to change them into real arguments. For more information on placeholders, see **Formula Paste Function command**.
5. Choose the OK button.
6. Type in or edit the arguments.

   If there's more than one argument, separate them with commas.
7. When you finish editing the formula, press ENTER or choose the enter box.

Functioning at 100 Percent

You can start using worksheet functions and increase your productivity right away without having to do a lot of memorizing:

- Help provides concise, convenient information on all the worksheet functions and their syntax. You can work with the Help window open on the screen at the same time you're working on a worksheet.
- If you forget exact spellings for functions, use the Formula Paste Function command. The dialog box contains a complete list of functions. To jump directly to the section of the list that begins with the first letter of the function you want, simply type the letter.
- Use the Paste Arguments option of the Formula Paste Function command to insert placeholders for a function's arguments. This reminds you what arguments are needed and in what order. You can then edit the formula and change the placeholders to real arguments.

The Microsoft Excel Built-in Worksheet Functions

This section provides a complete list of the Microsoft Excel built-in worksheet functions and their arguments. The functions are arranged by the following categories and appear in alphabetical order within each category:

- Database functions
- Date functions
- Financial functions
- Information functions
- Logical functions
- Lookup functions
- Mathematical functions
- Matrix functions
- Statistical functions
- Text functions
- Trigonometric functions

Function listings use the following conventions:

- *Italics* indicate optional arguments within a function.
- An ellipsis (. . .) indicates an argument that can be repeated.

For a thorough directory that includes explanations and examples, see Chapter 2, "Worksheet Function Directory," in *Microsoft Excel Functions and Macros*.

Database Functions

DAVERAGE(database,field,criteria)
Average of numbers in specified *field* of records in *database* that match *criteria*

DCOUNT(database,field,criteria)
Count of numbers in specified *field* of records in *database* that match *criteria*

DCOUNTA(database,field,criteria)
Count of nonblank cells in specified *field* of records in *database* that match *criteria*

DMAX(database,field,criteria)
Maximum of numbers in specified *field* of records in *database* that match *criteria*

DMIN(database,field,criteria)
Minimum of numbers in specified *field* of records in *database* that match *criteria*

DPRODUCT(database,field,criteria)
Product of numbers in specified *field* of records in *database* that match *criteria*

DSTDEV(database,field,criteria)
Estimates standard deviation of a population based on a sample, using numbers in specified *field* of records in *database* that match *criteria*

DSTDEVP(database,field,criteria)
Standard deviation of a population, based on the entire population, using numbers in specified *field* of records in *database* that match *criteria*

DSUM(database,field,criteria)
Sum of numbers in specified *field* of records in *database* that match *criteria*

DVAR(database,field,criteria)
Estimates variance of a population based on a sample, using numbers in specified *field* of records in *database* that match *criteria*

DVARP(database,field,criteria)
Variance of a population, based on the entire population, using numbers in specified *field* of records in *database* that match *criteria*

Date Functions

DATE(year,month,day)
Serial number of specified date

DATEVALUE(date_text)
Serial number of *date_text*

DAY(serial_number)
Converts *serial_number* to a day of the month

HOUR(serial_number)
Converts *serial_number* to an hour of the day

MINUTE(serial_number)
Converts *serial_number* to a minute

MONTH(serial_number)
Converts *serial_number* to a month of the year

NOW()
Serial_number of current date and time

SECOND(serial_number)
Converts *serial_number* to a second

TIME(hour,minute,second)
Serial number of specified time

TIMEVALUE(time_text)
Serial number of time specified by *time_text*

WEEKDAY(serial_number)
Converts *serial_number* to a day of the week

YEAR(serial_number)
Converts *serial_number* to a year

Financial Functions

DDB(cost,salvage,life,period)
Depreciation of an asset, using the double-declining balance method

FV(rate,nper,pmt,*pv*,*type*)
Future value of investment

IPMT(rate,per,nper,pv,*fv*,*type*)
Interest payment for an investment

IRR(values,*guess*)
Internal rate of return of *values*

MIRR(values,finance_rate,reinvest_rate)
Modified internal rate of return of *values*

NPER(rate,pmt,pv,*fv*,*type*)
Number of payments of investment

NPV(rate,value1,*value2*,...)
Net present value of *values*

PMT(rate,nper,pv,*fv*,*type*)
Periodic payment of investment

PPMT(rate,per,nper,pv,*fv*,*type*)
Payment on the principal for an investment

PV(rate,nper,pmt,*fv*,*type*)
Present value of investment

RATE(nper,pmt,pv,*fv*,*type*,*guess*)
Rate returned on investment

SLN(cost,salvage,life)
Straight-line depreciation for an asset

SYD(cost,salvage,life,per)
Sum-of-years' digits depreciation for an asset

Information Functions

AREAS(reference)
Number of areas in *reference*

CELL(type_of_info,*reference*)
Information about formatting, location, or contents of *reference*

COLUMN(*reference*)
Column numbers in *reference*

COLUMNS(array)
Number of columns in *array*

INDIRECT(ref,*type_of_ref*)
Contents of the cell from its *ref*

ISBLANK(value)
True if *value* is blank

ISERR(value)
True if *value* is any error value except #N/A

ISERROR(value)
True if *value* is any error value

ISLOGICAL(value)
True if *value* is a logical value

ISNA(value)
True if *value* is the error value #N/A

ISNONTEXT(value)
True if *value* is not text

ISNUMBER(value)
True if *value* is a number

ISREF(value)
True if *value* is a reference

ISTEXT(value)
True if *value* is text

N(value)
Value translated into a number

NA()
Error value #N/A

ROW(*reference*)
Row numbers in *reference*

ROWS(array)
Number of rows in *array*

T(value)
Value translated into text

TYPE(value)
Type of *value*

Logical Functions

AND(logical1,*logical2*,...)
True if every argument is TRUE; otherwise, FALSE

FALSE()
Logical value FALSE

IF(logical_test,value_if_true,*value_if_false*)
Value_if_true if *logical_test* is TRUE; *value_if_false* if *logical_test* is FALSE

NOT(logical)
True if *logical* is FALSE; false if *logical* is TRUE

OR(logical1,*logical2*,...)
True if any argument is TRUE; otherwise, FALSE

TRUE()
Logical value TRUE

Lookup Functions

CHOOSE(index_number,value1,*value2*,...)
Uses *index_number* to select a value from *values*

HLOOKUP(lookup_value,table_array,row_index_num)
Value in a table selected by *lookup_value*

INDEX(ref,row_num,column_num,*area_num*)
INDEX(array,row_num,column_num)
Reference in *ref* or value in *array* selected by index values

LOOKUP(lookup_value,lookup_vector,result_vector)
LOOKUP(lookup_value,array)
Value in a table selected by *lookup_value*

MATCH(lookup_value,lookup_ref,*type_of_match*)
Number of a value selected by *lookup_value*

VLOOKUP(lookup_value,table_array,col_index)
Value in a table selected by *lookup_value*

Mathematical Functions

ABS(number)
Absolute value of *number*

EXP(number)
e to the power *number*

FACT(number)
Factorial of *number*

INT(number)
Number rounded down to the nearest integer

LN(number)
Natural logarithm of *number*

LOG(number,*base*)
Logarithm of *number* in base *base*

LOG10(number)
Base 10 logarithm of *number*

MOD(number,divisor_number)
Remainder of *number* divided by *divisor_number*

PI()
Value of π

PRODUCT(number1,*number2*,...)
Product of *numbers*

RAND()
Random number between 0 and 1

ROUND(number,number_of_digits)
Rounds *number* to *number_of_digits* digits

SIGN(number)
Sign of *number*

SQRT(number)
Square root of *number*

TRUNC(number)
Integer part of *number*

Matrix Functions

MDETERM(array)
Determinant of *array*

MINVERSE(array)
Inverse of *array*

MMULT(array1,array2)
Product of two arrays

TRANSPOSE(array)
Transpose of *array*

Statistical Functions

AVERAGE(number1,*number2*,...)
Average of numbers

COUNT(value1,*value2*,...)
Count of numbers in *values*

COUNTA(value1,*value2*,...)
Count of values in *values*

GROWTH(known_y's,*known_x's*,*new_x's*)
Values on exponential trend

LINEST(known_y's,*known_x's*)
Parameters of linear trend

LOGEST(known_y's,*known_x's*)
Parameters of exponential trend

MAX(number1,*number2*,...)
Maximum number in *numbers*

MIN(number1,*number2*,...)
Minimum number in *numbers*

STDEV(number1,*number2*,...)
Estimates standard deviation of a population based on a sample

STDEVP(number1,*number2*,...)
Standard deviation of a population based on the entire population

SUM(number1,*number2*,...)
Sum of *numbers*

TREND(known_y's,*known_x's*,*new_x's*)
Values on linear trend

VAR(number1,*number2*,...)
Estimates variance of population based on a sample

VARP(number1,*number2*,...)
Variance of a population based on the entire population

Text Functions

CHAR(number)
ASCII character corresponding to *number*

CLEAN(text)
Removes control characters from *text*

CODE(text)
ASCII code of the first character in *text*

DOLLAR(number,*decimals*)
Rounds *number* and gives as text in currency format

EXACT(text1,text2)
Tests to see if *text1* and *text2* are exactly the same

FIND(find_text,within_text,*start_at_num*)
Finds *find_text* within *within_text*

FIXED(number,*decimals*)
Rounds *number* and gives as text

LEFT(text,*number_of_characters*)
Extracts first *number_of_characters* from *text*

LEN(text)
Length of *text*

LOWER(text)
Converts *text* to lowercase

MID(text,start_number,number_of_characters)
Extracts *number_of_characters* from *text*

PROPER(text)
Converts *text* to initial capitals

REPLACE(old_text,start_num,num_chars,new_text)
Replaces *num_chars* characters in *old_text* with *new_text*

REPT(text,number_times)
Repeats *text number_times* times

RIGHT(text,*number_of_chars*)
Last *number_of_chars* characters in *text*

SEARCH(find_text,within_text,*start_at_num*)
Searches for *find_text* within *within_text*

SUBSTITUTE(text,old_text,new_text,*instance_number*)
Substitutes *new_text* for *old_text* in *text*

TEXT(value,format_text)
Converts *value* to text using format *format_text*

TRIM(text)
Removes spaces from *text*

UPPER(text)
Converts *text* to uppercase

VALUE(text)
Converts *text* to a number

Trigonometric Functions

ACOS(number)
Arccosine of *number*

ASIN(number)
Arcsine of *number*

ATAN(number)
Arctangent of *number*

ATAN2(x_number,y_number)
Arctangent of point (*x_number,y_number*)

COS(radians)
Cosine of *radians*

SIN(radians)
Sine of *radians*

TAN(radians)
Tangent of *radians*

Related Information

Reference

For information on	See
Creating user-defined functions	Macro
Formulas and using the formula bar	Formula Formula bar
Calculation	Calculation

Functions and Macros

For complete information about worksheet functions and macros

Continued

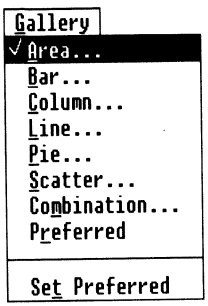
Sampler

Calculating a Sales Commission

Tutorial

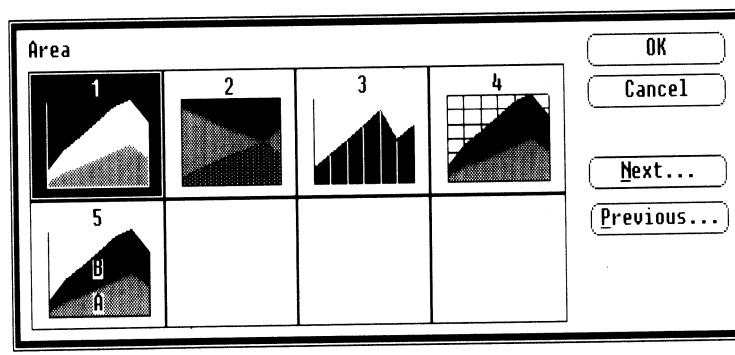
Using Worksheet Functions

Gallery Area command



Changes the format of the active chart to the area format you select from the gallery. If you have an overlay chart, it is removed and all of its data series are added to the main chart. To preserve the overlay, hold down SHIFT while you choose the OK button; Microsoft Excel applies the area format to either the main chart or the overlay, whichever is selected.

For information on creating and formatting charts, see **Chart**.



You can select from the following area chart formats:

- Simple area chart
- 100% area chart
- With drop lines
- With gridlines
- With areas labeled

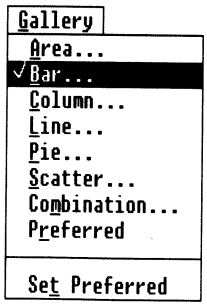
Next

Displays the gallery for the next chart type on the Gallery menu.

Previous

Displays the gallery for the previous chart type on the Gallery menu.

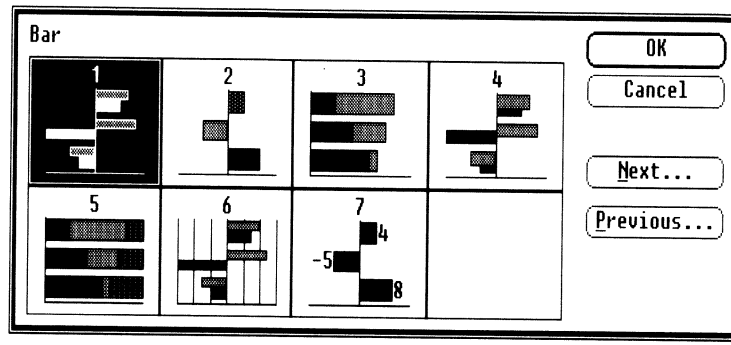
Gallery Bar command



Changes the format of the active chart to the bar format you select from the gallery.

If you have an overlay chart, it is removed and all of its data series are added to the main chart. To preserve the overlay, hold down SHIFT while you choose the OK button; Microsoft Excel applies the bar format to either the main chart or the overlay, whichever is selected.

For information on creating and formatting charts, see **Chart**.



You can select from the following bar chart formats:

- Simple bar chart
- Bar chart for one series with varied patterns
- Stacked
- Overlapped
- 100% stacked
- With vertical gridlines
- With value labels

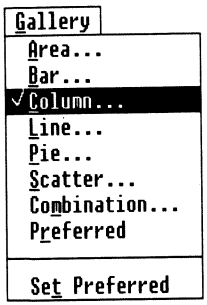
Next

Displays the gallery for the next chart type on the Gallery menu.

Previous

Displays the gallery for the previous chart type on the Gallery menu.

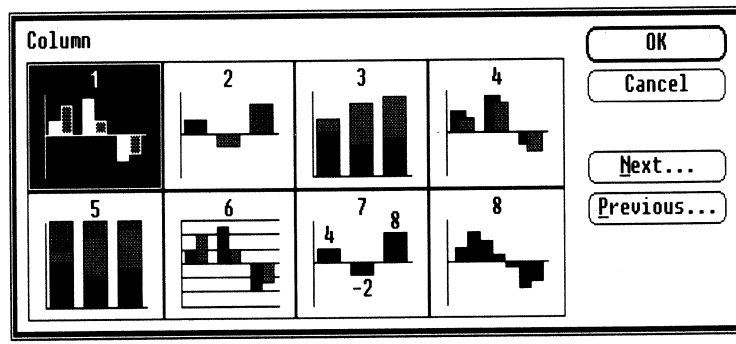
Gallery Column command



Changes the format of the active chart to the column format you select from the gallery.

If you have an overlay chart, it is removed and all of its data series are added to the main chart. To preserve the overlay, hold down SHIFT while you choose the OK button; Microsoft Excel applies the column format to either the main chart or the overlay, whichever is selected.

For information on creating and formatting charts, see **Chart**.



You can select from the following column chart formats:

- Simple column chart
- Column chart for one series with varied patterns
- Stacked
- Overlapped
- 100% stacked
- With horizontal gridlines
- With value labels
- Step chart (no space between categories)

Next

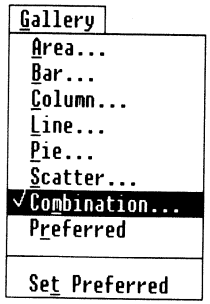
Displays the gallery for the next chart type on the Gallery menu.

Previous

Displays the gallery for the previous chart type on the Gallery menu.

Gallery Combination command

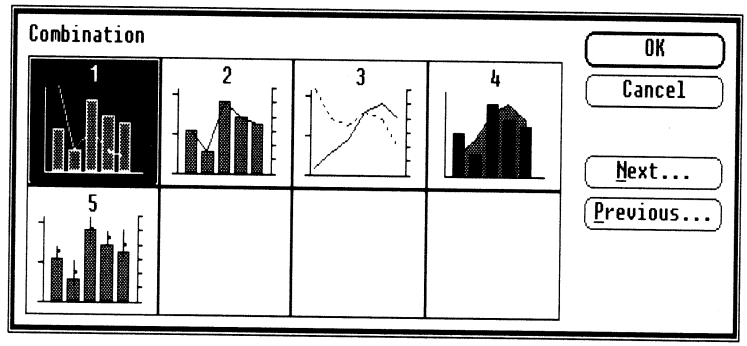
(Full menus)



Changes the format of the active chart to the combination format you select from the gallery.

Microsoft Excel divides the data series equally between the main chart and the overlay chart. If there is an odd number of data series, the main chart takes one more than the overlay chart.

For information on creating and formatting charts, and controlling how a chart distributes data series between the main chart and the overlay chart, see **Chart**. For information on changing distribution of series, see **Format Overlay command** and **Overlay chart**.



You can select from the following combination chart formats:

- Column chart overlaid by line chart
- Column chart overlaid by line chart with independent scale
- Line chart overlaid by line chart with independent scale
- Area chart overlaid by column chart
- Bar chart overlaid by line chart containing three data series (for showing stock volumes related to high, low, and closing prices).

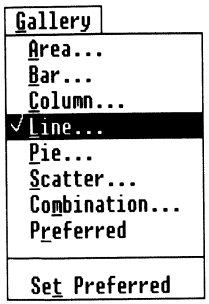
Next

Displays the gallery for the next chart type on the Gallery menu.

Previous

Displays the gallery for the previous chart type on the Gallery menu.

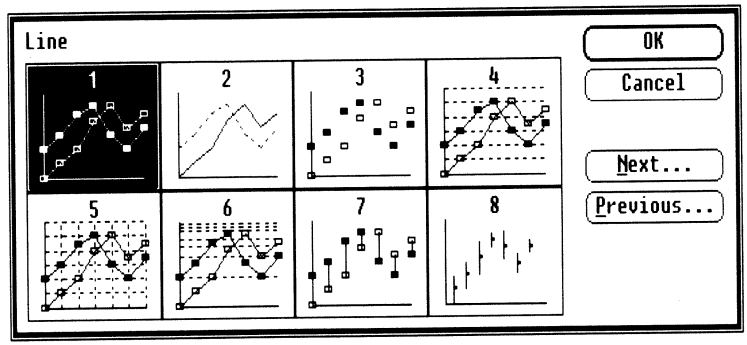
Gallery Line command



Changes the format of the active chart to the line format you select from the gallery.

If you have an overlay chart, it is removed and all of its data series are added to the main chart. To preserve the overlay, hold down SHIFT while you choose the OK button; Microsoft Excel applies the line format to either the main chart or the overlay, whichever is selected.

For information on creating and formatting charts, see **Chart**.



You can select from the following line chart formats:

- Lines and markers
- Lines only
- Markers only
- Lines and markers with horizontal gridlines
- Lines and markers with horizontal and vertical gridlines
- Lines and markers with logarithmic scale and gridlines
- Hi-lo chart with markers and hi-lo lines
- High, low, close chart (for stock quotes)

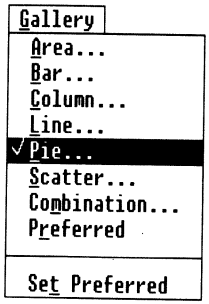
Next

Displays the gallery for the next chart type on the Gallery menu.

Previous

Displays the gallery for the previous chart type on the Gallery menu.

Gallery Pie command

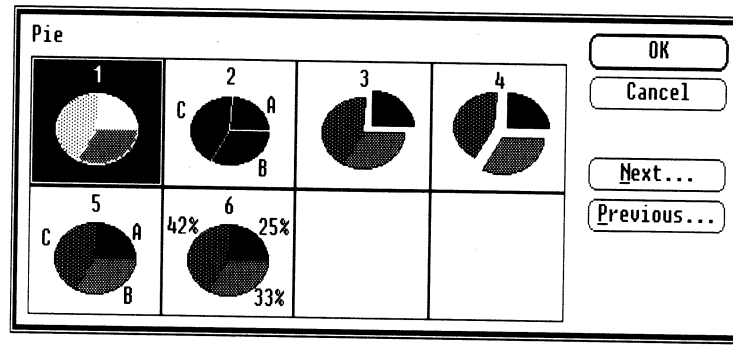


Changes the format of the active chart to the pie format you select from the gallery.

If you have an overlay chart, it is removed and all of its data series are added to the main chart. To preserve the overlay, hold down SHIFT while you choose the OK button; Microsoft Excel applies the pie format to either the main chart or the overlay, whichever is selected.

If you have more than one data series, a pie chart plots only the first one.

For information on creating and formatting charts, see **Chart**.



You can select from the following pie chart formats:

- Simple pie chart
- All wedges patterned the same and labeled with categories
- First wedge exploded
- All wedges exploded
- With category labels
- With value labels expressed as percentages

Next

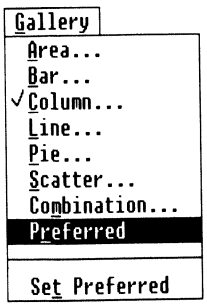
Displays the gallery for the next chart type on the Gallery menu.

Previous

Displays the gallery for the previous chart type on the Gallery menu.

Gallery Preferred command

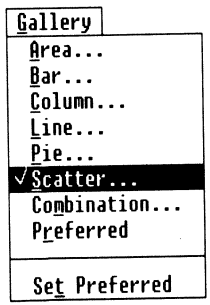
(Full menus)



Changes the format of the active chart to the format you define with Gallery Set Preferred. Initially, the preferred chart format is format 1 from the Gallery Column dialog box.

For information on the preferred format, see **Gallery Set Preferred command**. For information on charts, see **Chart**.

Gallery Scatter command

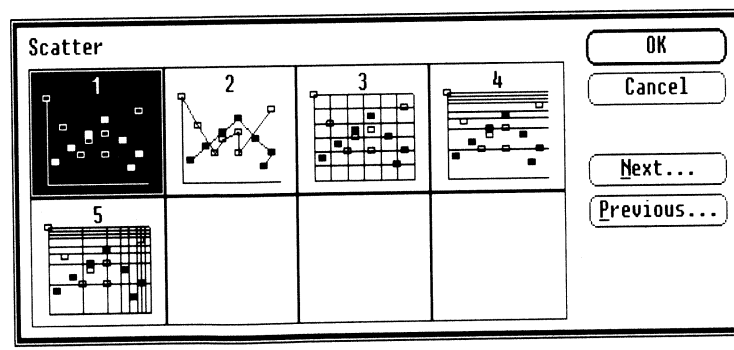


Changes the format of the active chart to the scatter format you select from the gallery.

If you have an overlay chart, it is removed and all of its data series are added to the main chart. To preserve the overlay, hold down SHIFT while you choose the OK button; Microsoft Excel applies the scatter format to either the main chart or the overlay, whichever is selected.

In a scatter chart, categories must be numbers. Microsoft Excel calculates the scale and tickmark labels for the category axis, just as it does for the value axis in all charts.

For information on creating and formatting charts, see **Chart**.



You can select from the following scatter chart formats:

- Markers only
- Markers from the same series connected by lines
- Markers with horizontal and vertical gridlines
- Markers with semi-logarithmic gridlines
- Markers with log-log gridlines

Next

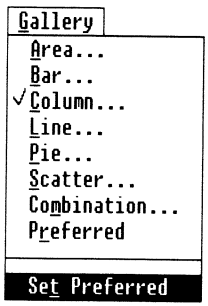
Displays the gallery for the next chart type on the Gallery menu.

Previous

Displays the gallery for the previous chart type on the Gallery menu.

Gallery Set Preferred command

(Full menus)



Changes the default format that Microsoft Excel uses when you create a new chart or when you format a chart with the Gallery Preferred command.

Initially, the preferred chart format is format 1 from the Gallery Column dialog box.

To change the preferred format, change the format of your active chart to the format you want and choose Gallery Set Preferred.

When you choose Gallery Set Preferred, the format of the active chart becomes the preferred format, and Microsoft Excel uses that format when you create a new chart or change the format of an existing chart with the Gallery Preferred command.

You can save the settings of the preferred format by saving the workspace with the File Save Workspace command (Full menus). When you restart Microsoft Excel and open the workspace file, Microsoft Excel sets the preferred format to what it was when the workspace file was saved. For more information, see **File Save Workspace command**.

For information on creating and formatting charts, see **Chart**. For more information on giving a chart the preferred format, see **Gallery Preferred command**.

Hardware and system configuration

This topic explains:

- System requirements
- Optional system components

  Printing devices

  Expanded memory cards

  Mouse

  Math coprocessor

  Microsoft Windows

  Microsoft Windows/386

  Networks

System Requirements

To be able to run Microsoft Excel, your computer system must include the following components:

Personal computer	IBM Personal System/2 or compatible
	IBM AT or compatible
	Compaq 386 Deskpro or compatible
Graphics card	IBM VGA or compatible
	IBM EGA or compatible
	Hercules Graphics card or compatible
	Other graphics card compatible with Microsoft Windows, version 2.0 or higher
Hard disk	A hard disk with at least 5 megabytes of free space
Memory	640K
Operating system	DOS 3.0 or higher

Versions of DOS higher than 3.0 may be required for personal computers operating on a network, or for certain models of personal computers. For information on what version of DOS is required for your personal computer, consult your dealer.

Note The image quality and display speed of Microsoft Excel may vary widely depending on the type of graphics card you use.

To perform the basic installation of your system, follow the manufacturer's instructions or consult your dealer. To install Microsoft Excel on your system, run the Setup program. If your system configuration changes, install Microsoft Excel again, specifying the new configuration. For information on the Setup program, see *Getting Started and Quick Reference*.

Optional System Components

Microsoft Excel supports several different optional system components. The following is a guide to the supported components, listing their benefits and explaining how to install them.

Printing Devices

Microsoft Excel supports the following printing devices:

Laser printers	Hewlett-Packard Laserjet and compatibles
	IBM Personal Pageprinter
	Apple LaserWriter and compatibles
	PostScript-compatible devices
Other printers	IBM Proprinter
	IBM Graphics printer and compatibles
	Epson FX 80 and compatibles
	Any printer compatible with Microsoft Windows, version 2.0 or higher
Plotters	Hewlett-Packard plotters such as 7470A and compatibles
	Any plotter compatible with Microsoft Windows, version 2.0 or higher

The output quality of printers depends upon their resolution. Laser printers typically have high resolutions, and are therefore ideal for presentation-quality output.

Other printers, such as dot-matrix and daisywheel printers, are suitable for general purpose output. Some printer models support printing of both text (such as worksheet data) and graphics (such as charts). Some printers can print in multiple colors.

Plotters are especially powerful for printing complex graphics, or for printing in sizes that are too large to be handled by most printers. Plotters have the ability to plot text and graphics and typically support plotting in multiple colors. Because the images are drawn, plotters usually operate more slowly than printers.

To add a printer or plotter to your computer, follow the manufacturer's instructions, or consult your dealer. Specify the type of printer or plotter when you install Microsoft Excel with the Setup program. To set up a printer or plotter after Microsoft Excel has been installed, use Control Panel. For information on installing Microsoft Excel, see *Getting Started and Quick Reference*, a separate manual included in your Microsoft Excel package. For information on Control Panel, see "Control Panel" in the Appendix.

Expanded Memory Cards

EMS and EEMS cards add memory beyond the basic 640K. This has three potential advantages:

- You can build larger models. The maximum recommended model size for a personal computer with 640K is 100K. If your personal computer has expanded memory, you can use Microsoft Excel with models beyond this size.
- For a given model size, Microsoft Excel runs faster with an expanded memory board than without one. The expanded memory board accommodates some of the data that would otherwise reside in your computer's 640K of main memory. The Microsoft Excel program can then occupy more room in the 640K of main memory, and thus runs faster.
- You can run other large applications while also running Microsoft Excel.

Note To run large multiple applications at the same time, you must run Microsoft Excel under Microsoft Windows, version 2.0 or higher, and with an expanded memory board supporting the Lotus/Intel/Microsoft specification, version 4.0, or an equivalent specification.

To install an expanded memory card in your computer, follow the instructions provided by the card manufacturer or consult your dealer. For information on making Microsoft Excel work with a specific expanded memory board, see the special information option of the Setup program. For information on Setup, see *Getting Started and Quick Reference*.

Mouse

Microsoft Excel supports the Microsoft Mouse, or any other pointing device compatible with Microsoft Windows, version 2.0 or higher.

To install a mouse in your computer, follow the instructions of the mouse manufacturer, or consult your dealer. Specify the type of mouse you own when you install Microsoft Excel. To add a mouse after Microsoft Excel has been installed, install Microsoft Excel again using the Setup program and specify the type of mouse you wish to install. For information on the Setup program, see *Getting Started and Quick Reference*. For information on using the mouse with Microsoft Excel, see **Mouse**.

Math Coprocessor

Microsoft Excel supports the Intel 8087, 80287 and 80387 math coprocessors. To determine which coprocessor is supported by your personal computer, consult your dealer.

A math coprocessor makes Microsoft Excel run faster when performing calculations involving multiplication, division, exponentiation, or trigonometric functions.

To install a math coprocessor in your computer, follow the coprocessor manufacturer's instructions. You need to make no changes to Microsoft Excel to make it work with a math coprocessor.

Microsoft Windows

Microsoft Excel can run by itself or under Microsoft Windows, version 2.0 or higher.

If you have a version of Microsoft Windows lower than 2.0, install Microsoft Excel in a different directory than your Windows directory. When you run Microsoft Excel, you will not be able to run Windows (versions lower than 2.0) or other applications. To have access to all the features of Windows while running Microsoft Excel, you must upgrade to Windows, version 2.0 or higher. For more information on upgrading, see your dealer or call the Microsoft Product Support number shown on your registration card.

Running Microsoft Excel under Microsoft Windows, version 2.0 or higher, allows you to run two or more applications side by side, to easily switch between them, and to transfer data from one to another using the Clipboard. In addition, Microsoft Windows provides easy access to most DOS commands such as copying, renaming, and deleting files, and formatting a disk.

To install Microsoft Windows, version 2.0 or higher, follow the Microsoft Windows Setup instructions. The Microsoft Windows Setup program is independent of the Microsoft Excel Setup program. You can install Microsoft Windows first and then Microsoft Excel, or vice versa. Be sure to specify the same directory when installing both programs. For example, if you install Microsoft Windows in the C:\WINDOWS directory (the default directory proposed by the Windows Setup program) be sure to install Microsoft Excel in the C:\WINDOWS directory (also the default proposed by the Microsoft Excel Setup program).

Important Do not attempt to install a version of Microsoft Windows lower than version 2.0 and Microsoft Excel in the same directory. Doing so will result in certain files being overwritten, and neither Microsoft Excel nor Microsoft Windows will operate properly.

Microsoft Windows/386

On personal computers based on the Intel 80386 processor, such as the IBM Personal System/2 Model 80, you can use Microsoft Windows/386. This special version of Microsoft Windows is not required, but it allows Microsoft Excel to take advantage of special features and memory management built into the Intel 80386 processor. For example, it allows Microsoft Excel to use extra memory beyond 640K that may have been built into your personal computer. It also runs Microsoft Excel at the same time with other applications which were not originally designed for Microsoft Windows. For information on Windows/386, see your dealer.

Networks

Microsoft Excel supports the following networks:

- IBM PC Network
- IBM Token Ring Network
- AT&T Starlan
- Ungermann-Bass/One
- 3Com 3+
- 3Com EtherSeries
- Novell Netware
- Any network compatible under Microsoft Windows, version 2.0 or higher

Using Microsoft Excel on a computer attached to a network allows you to:

- Access Microsoft Excel documents stored in network directories. Documents can be shared by more than one user, so that you can easily exchange them with other users on the same network.
- Print Microsoft Excel documents on printers and/or plotters attached to the network.
- Run Microsoft Excel from program files stored on a network drive. This saves space on your hard disk since you do not need to keep a set of program files on it.

Note | The performance of Microsoft Excel or other application programs running from program files stored on a network drive will typically be slower than when running from program files stored on your hard disk.

To attach your computer to a network, follow the instructions of the network manufacturer or consult your dealer. For information on accessing Microsoft Excel documents stored on a network directory or running Microsoft Excel from a network drive, see **Networks with Microsoft Excel**.

Related Information

Reference

For information on	See
Efficient memory use	Memory management
Copying or moving data between Microsoft Excel and other applications	Exchanging data between applications
Linking Microsoft Excel worksheets to other applications	Linking documents

Headers and footers

A **header** (also called a running head) is a line of text printed at the top of each page of a document. A **footer** is a line of text printed at the bottom of each page of a document. You can create headers and footers to identify documents or parts of documents and to "time-stamp" your work with dates and times.

This topic explains:

- Defaults for headers and footers
- Setting up headers and footers

Defaults for Headers and Footers

Unless you specify otherwise, Microsoft Excel automatically prints headers and footers for any document, using the following default settings:

- **Content** — document name as header; the word "Page" and the page number as footer
- **Alignment** — centered
- **Position** — one-half inch from top or bottom of page
- **Font** — font 1 in the Format Font dialog box

You can modify the content, style, and alignment of headers and footers. For example, if your worksheet or chart is part of a larger report, you might revise the header to reflect the name and pagination of the overall report. Or, you might include your company's name in a header if the document is for presentation. You can also enter dates and times in a header or footer as a way of "time-stamping" a document.

Each worksheet, macro sheet, and chart document has its own headers and footers. When you print the Info window, the headers and footers come from the document the Info window contains information on.

Setting Up Headers and Footers

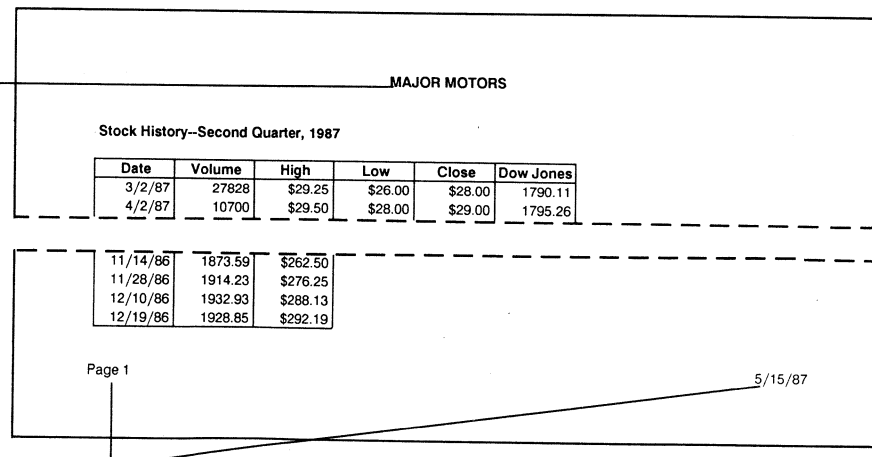
The File Page Setup command controls the content, alignment, or style (bold or italics) of headers and footers. In the dialog box, you specify headers and footers by using special codes in the Header or Footer text boxes. You can use any or all of the following instructions in a header or footer:

Type	To
&L	Align the following characters to the left.
&C	Center the following characters.
&R	Align the following characters to the right.

Type	To
&B	Print the left, center, or right part of the header or footer in bold.
&I	Print the left, center, or right part of the header or footer in italics.
&D	Print the current date.
&T	Print the current time.
&F	Print the name of the document.
&P	Print the page number.
&P+*number*	Add *number* to the page number and print it. (Use to change starting page numbers.)
&P-*number*	Subtract *number* from the page number and print it.
&&	Print a single ampersand.

The following example indicates the formatting instructions entered in the File Page Setup dialog box to produce a worksheet with headers and footers as shown:

This header is printed from these instructions in the Header box: &C&BMAJOR MOTORS



This footer—with page number and date aligned as shown—is printed from these instructions in the Footer box: &LPage &P&R&D

For information on printing and page setup, see **Printing a document** and **File Page Setup command**.

Note For headers and footers, Microsoft Excel uses font 1 in the Format Font dialog box. Before you set up the document for printing, make any necessary font adjustments with the Format Font command. For information on using fonts, see **Font**.

To set up headers and footers for a document:

1. Choose File Page Setup.
2. Edit or delete the existing instructions in the Header and Footer boxes.
3. Choose the OK button.

Related Information

Reference

For information on	See
Printing worksheets and charts	Printing a document
General overview of formatting options (including print and display options)	Formatting a document

Tutorial

Printing a Worksheet

Feature Guide

Worksheet Formatting Practices, "Adding Page Headers and Footers"

Help

Microsoft Help is a complete online reference tool that you use with Microsoft Excel. Help provides information on Microsoft Excel commands, worksheet functions, concepts, basic tasks, and messages. You can get help on the keyboard, a selected command, or an open dialog box or message, or you can browse through Help as a general reference. Within a Help topic, you can "jump" to a related topic or get a quick definition of a term.

The commands on the Microsoft Excel Help menu allow you to quickly access Microsoft Help plus other handy learning tools. The Help Tutorial and Help Feature Guide commands let you save and exit your document for a lesson or demonstration of a procedure. The Help Lotus 123 and Help Multiplan commands give you fast information on Microsoft Excel equivalents for Lotus 1-2-3 and Microsoft Multiplan commands.

This topic explains:

- Help basics
  - The Help window
  - Special features of the Help window
  - Using the keyboard in the Help window
  - Using the mouse in the Help window
- Using Microsoft Help
  - Getting help on Help
  - Getting help on commands, dialog boxes and messages (context-sensitive help)
  - Getting help on the keyboard
  - Using Help as a general reference
- Other tools on the Help menu
  - Running the Tutorial or the Feature Guide
  - Getting help on Lotus 1-2-3 or Microsoft Multiplan

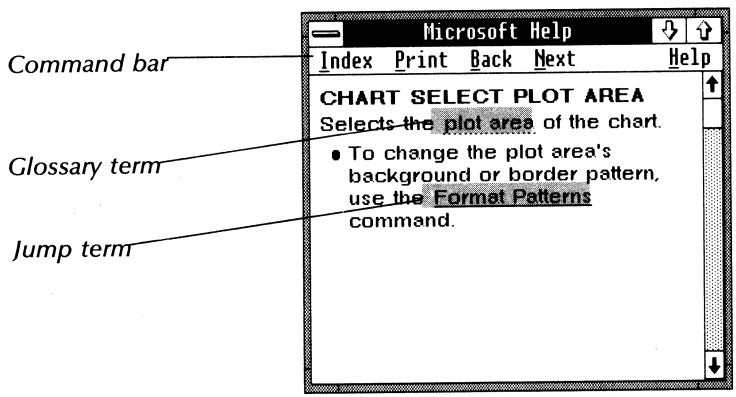
Help Basics

Microsoft Help appears in its own window. By moving and sizing the Help window and your document, you can view Help alongside your work. Within the Help window, you'll find some unusual features:

- **Commands** that you use only when Help is active. The Help window commands allow you to display the index, print a topic, move easily between topics, or get help on how to use Help.
- **Glossary terms** that allow you to get quick definitions. Select a glossary term in a Help topic to temporarily display its definition on the screen.
- **Jump terms** that allow you to get additional information fast. Select a jump term in a Help topic to jump instantly to a related Help topic.

The Help Window

You view the information in Help through the Help window. Here's a quick look at the Help window. Step-by-step procedures for using Help are discussed in the sections that follow.



Command bar — a bar similar to a menu bar that contains commands instead of menus:

Index	Displays the Help index
Print	Prints the current topic
Back	Displays the last topic you looked at
Next	Displays the next topic in the Help index
Help	Displays information on how to use Help

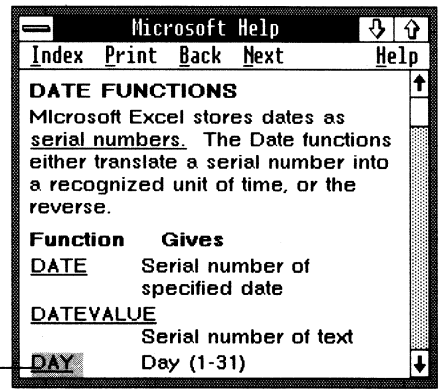
Glossary term — a word or phrase with a dotted underline. A glossary term temporarily displays a brief definition in a small box that overlaps the Help window. The "Glossary" topic in the Help index contains every glossary term used in Microsoft Help.

Jump term — an underlined word or phrase. A jump term allows you to move directly to a Help topic related to the topic currently displayed in the Help window. Every item in the Help index is a jump term that you can use to jump directly to the Help topic of that name.

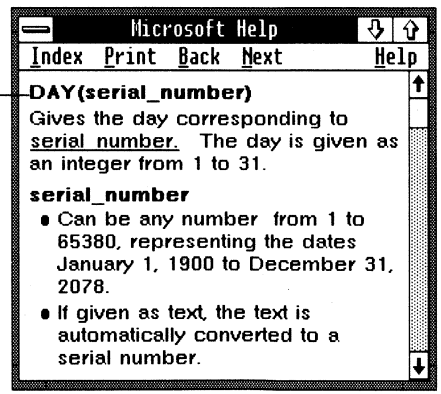
Special Features of the Help Window

Microsoft Help allows you to choose your own path through the information available to you. You do this with Help's jump terms and glossary terms.

The following illustrations show a jump term and its related topic:



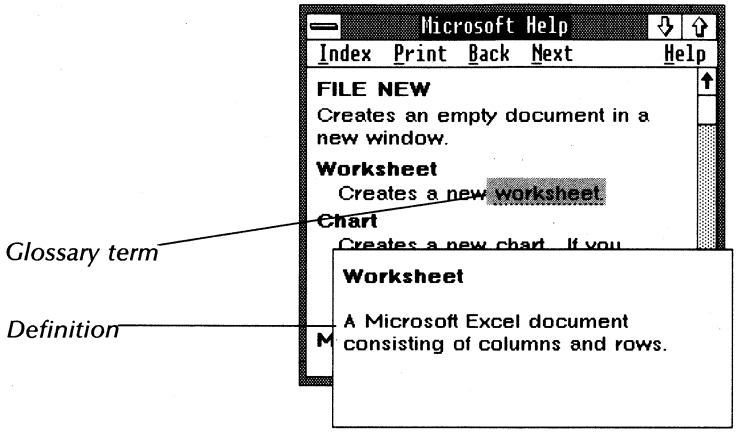
Jump term



Related topic

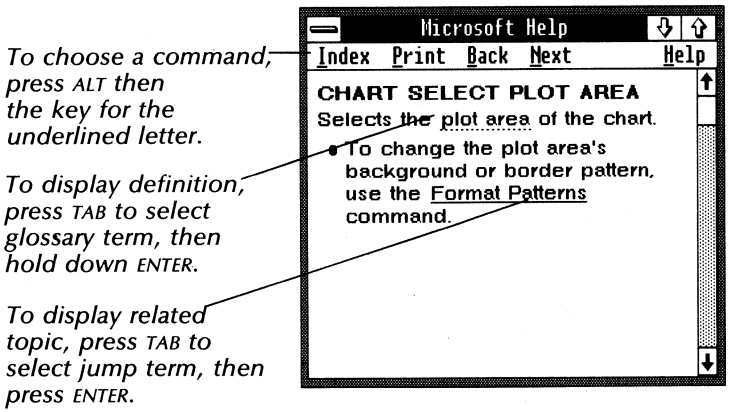
Note Every item in the Help index is a jump term.

The following illustration shows a glossary term and its displayed definition:



Using the Keyboard in the Help Window

The following illustration shows how you move and select within the Help window when it's active:



Usually the Help window has only a vertical scroll bar. Occasionally it will appear with a horizontal scroll bar as well. You can scroll the Help window vertically and horizontally using the following keys:

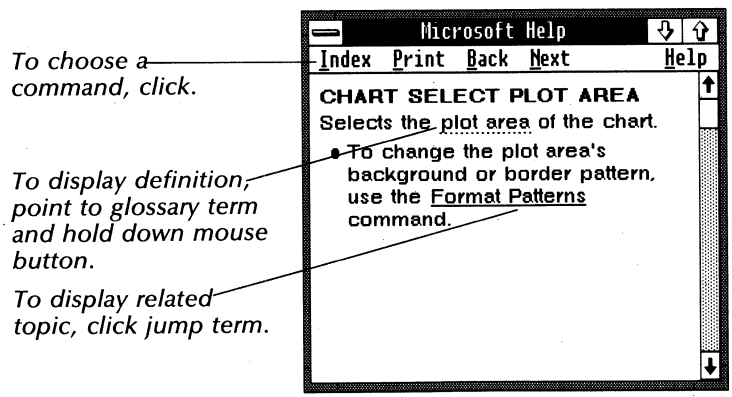
To scroll	Press
One line down or up	DOWN or UP key
One full window down or up	PAGE DOWN or PAGE UP

To scroll	Press
To beginning of topic	CONTROL + HOME
To end of topic	CONTROL + END
One full window right or left (for windows with horizontal scroll bar)	CONTROL + PAGE DOWN or CONTROL + PAGE UP
One quarter window right or left (for windows with horizontal scroll bar)	RIGHT or LEFT key
All the way to the left (for windows with horizontal scroll bar)	HOME
All the way to the right (for windows with horizontal scroll bar)	END

You can use the keyboard to move and size the Help window just as you would any document window. For more information, see **Windows**.

Using the Mouse in the Help Window

The following illustration shows how you move and select within the Help window when it's active:



You can use the mouse to move and size the Help window just as you would any document window. For information on using the mouse to scroll, move, and size a window, see **Mouse** and **Windows**.

Using Microsoft Help

You can get help with Microsoft Excel in several ways. This section provides step-by-step instructions for the various ways to use Help.

Getting Help on Help

Use this procedure to view the Help topic that explains how to use Microsoft Help:

1. If the Help window is not already active, press F1.
2. Press ALT, H. If using the mouse, click Help in the Help window command bar.

Getting Help on Commands, Dialog Boxes, and Messages (Context-sensitive Help)

Each Microsoft Excel command name on a menu, dialog box, and message is a "context" that is directly connected to a Help topic. When you ask for help on one of these contexts, you're using "context-sensitive" Help. There are two ways to get context-sensitive Help:

- **Help on the current context.** When a command is selected, or a dialog box or message is displayed, you can immediately get help on that context by pressing F1.
- **Help on the context you specify.** If you know you want help on a command before you choose it, you can press SHIFT+F1 to go into Help and then choose the command. Mouse users can also use this method to get help on regions of the screen such as a scroll bar. You cannot specify a dialog box or a message context.

To get help on the current context	To specify a context for Help
▣ Press F1. This activates the Help window and displays the related Help topic.	1 Press SHIFT+F1. A question mark appears in the middle of the screen, or the mouse pointer changes to a question mark. 2 Choose a command, using normal keyboard or mouse methods. Mouse users can also click a region of the screen. This activates the Help window and displays the related Help topic. If you choose a command, you get help on that command instead of executing it.

To return to the document window from Help:

▣ Press F1 again.

You can also use the following techniques with Help:

- Start from the Help index and jump to the Help topics you want to browse through. For more information, see "Using Help As a General Reference," later in this topic.
- Press F1 when there is no command selected, or no dialog box or message is displayed. Help becomes active and displays the last topic you viewed. If this is the first time you have asked for help, Help displays the Help index.

Getting Help on the Keyboard

Use this procedure to get help on special keys you use with Microsoft Excel, including keyboard commands and keys for moving and selecting in a document:

1 Choose Help Keyboard.

2 Scroll through the topic to the information you want.

For information on using the keyboard with Microsoft Excel, see **Keyboard**.

Using Help As a General Reference

Much of the information contained in Help, such as worksheet function topics and the glossary, is not associated with a specific context. The easiest way to find this information, or to browse through information on the commands, is to start with the Help index.

To browse through Help as a general reference:

1. Press F1 or choose Help Index.

   If the index is not displayed in the Help window, press ALT, I. If using the mouse, click Index in the command bar.

2. Press TAB until you select the index category you want; then press ENTER.

   If using the mouse, point to the category and click.

3. Scroll through the index until the topic you want is displayed in the Help window.

4. To select the topic, press TAB to move to it and press ENTER. With the mouse, point to the topic and click.

   The Help window displays the topic.

Tip | A quick scrolling technique is to type the first letter of the topic you want. The Help window will scroll to the first topic starting with that letter.

Other Tools on the Help Menu

In addition to the Help Index and Help Keyboard commands, the Microsoft Excel Help menu contains four special commands that can help you do your job more quickly and easily:

- **Help Tutorial command** — starts online interactive lessons in basic skills and concepts for worksheets, charts, databases, and macros.
- **Help Feature Guide command** — starts an online overview of some unique and high-powered features of Microsoft Excel, with a chance for guided practice.
- **Help Lotus 123 command** — lets you type the letter sequence for a Lotus 1-2-3 command and displays a Help topic on the Microsoft Excel equivalent.
- **Help Multiplan command** — lets you type the letter sequence for a Multiplan command and displays a Help topic on the Microsoft Excel equivalent.

Running the Tutorial or the Feature Guide

Microsoft Excel has two online learning tools that can help you quickly familiarize yourself with the product and find out about all of its features. The Tutorial consists of interactive lessons on the fundamental skills and concepts you need for using Microsoft Excel. The Feature Guide teaches you about worksheet and chart formatting, multiple windows, command and function macros, and auditing techniques.

To run the Tutorial or Feature Guide:

1. Choose Help Tutorial or Help Feature Guide.

   Microsoft Excel allows you to save your work and then starts the Tutorial or Feature Guide.

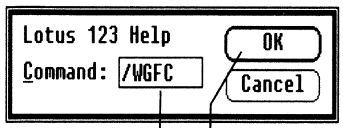
2. Follow the instructions on the screen.

Note When you choose the Help Tutorial or Help Feature Guide command, Microsoft Excel closes any open documents and asks if you want to save any unsaved documents. Then your documents are cleared from the screen and Microsoft Excel saves the workspace in a special file. When you quit the Tutorial or Feature Guide, Microsoft Excel reopens the same documents you had open when you chose Help Tutorial or Help Feature Guide.

Getting Help on Lotus 1-2-3 or Microsoft Multiplan

If you're familiar with Lotus 1-2-3 or Microsoft Multiplan, you can quickly find out the Microsoft Excel equivalents to 1-2-3 or Multiplan commands. With the Help Lotus 123 or Help Multiplan command, you can type a command sequence as you would in 1-2-3 or Multiplan, and Help will display the Help topic for the Microsoft Excel equivalent (or closest equivalent) to that command.

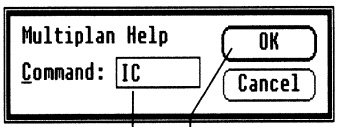
For example, to get help on the Microsoft Excel equivalent to the Lotus 1-2-3 Worksheet Global Format Currency command, you would choose the Help Lotus 123 command and, in the dialog box, type the Lotus command sequence, as shown in the following illustration:



In the text box, type a command as you would in Lotus 1-2-3: type the slash, followed by the Lotus command.

Choose the OK button to display the Help topic for the equivalent (or nearest equivalent) Microsoft Excel command.

To get help on the Microsoft Excel equivalent for Multiplan's Insert Column command, you would choose the Help Multiplan command and, in the dialog box, type the Multiplan command sequence, as shown in the following illustration:



In the text box, type a command as you would in Multiplan.

Choose the OK button to display the Help topic for the equivalent (or nearest equivalent) Microsoft Excel command.

To get help on the Microsoft Excel equivalent to a Lotus 1-2-3 command or Multiplan command:

1. Choose Help Lotus 123 or Help Multiplan.
2. In the dialog box, type a Lotus or Multiplan command sequence. You can type upper- or lowercase characters.

   Microsoft Excel activates the Help window and displays the Help topic for the Microsoft Excel equivalent to the Lotus or Multiplan command. If there is no exact equivalent, you see a topic explaining which Microsoft Excel command or commands accomplish the most similar task.

For information on conversion between programs, see **Lotus 123** and **Multiplan**.

Related Information

Reference

For information on	See
Worksheet, chart, database basics	Worksheet Chart Database
Choosing commands and working in dialog boxes	Command, menu, and dialog box

You can find information about Microsoft Excel basics in the other core topics: **Chart**; **Command, menu, and dialog box**; **Database**; **Windows**; and **Worksheet**.

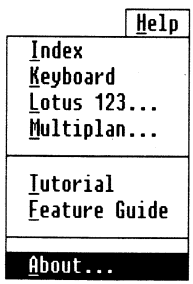
Functions and Macros

"Using Custom Help" in Chapter 6, "Advanced Macros"

Tutorial

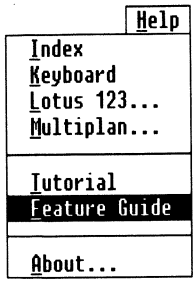
How to Use Help

Help About command



Displays information about Microsoft Excel and how much memory is available.

Help Feature Guide command



Starts the Microsoft Excel Feature Guide. This online guide provides overview information about some of the Microsoft Excel features, as well as interactive practices to help you learn about those features.

Using the Feature Guide

To use the Feature Guide your Microsoft Excel workspace must be empty. If any documents are open when you choose Help Feature Guide, Microsoft Excel saves the workspace in a special file, lets you save any changes you have made to the open documents, then closes all documents. When you finish using the Feature Guide, Microsoft Excel opens all your documents in the same size and location as when you chose Help Feature Guide.

You can start and use the Feature Guide at any time. The modular organization of the Feature Guide allows you to view or practice any module or section independently.

The Feature Guide is organized into seven modules. The first two cover basic procedures and information. The other five modules cover Microsoft Excel features; each is organized into three main parts:

- Overview — provides a quick overview of the capabilities of the feature.
- Guide — a "how to" section with procedural information on how to implement the feature. During each Guide you will be able to take short "Side Trips," which provide more extensive details or chances to use the feature. After you take a Side Trip, you return to the place you left off in the Guide.
- Practice — hands-on examples where you can practice some of the advanced procedures in a guided situation.

Note You don't have to go through all parts of a module. You can, for example, go through just the overview of each of the five feature modules.

The following list outlines the Feature Guide:

What's in the Feature Guide

Teaches the basics of how to move around in the Feature Guide and how to use the Course Controls.

Basic Mechanics

Provides summaries of procedures and quick practices for basic Microsoft Excel skills. This section covers the skills you need for using the rest of the Feature Guide.

Selecting and Moving Around

- Cell, Row, Column, or Worksheet
- Range and Named Range
- Multiple Selections
- Moving Around

Using Menus and Dialog Boxes

- Choosing Commands
- Using Dialog Boxes

Entering and Editing

- Keyboard Entering and Correcting
- Editing in the Formula Bar

Copying

- Basic Copying
- Parts of Cell Contents
- With Operators
- In the Formula Bar
- Charts

Saving

- New or Existing Document
- Renaming a Document
- Closing a Document
- Workspace

Printing

- Select a Printer
- Page Setup
- Print Preview
- Printing Options

Multiple Windows

Teaches you how to create multiple views of a document, split and freeze panes, and link documents. The practices included are:

- Creating Formulas with Simple External References
- Creating Formulas with Complex External References
- Pasting Complex External References
- Deleting External References and Freezing Values

Worksheet Formatting

Teaches you about custom formatting for fonts, borders, numbers, times, dates, and the printed page. The practices included are:

- Creating Custom Number Formats
- Creating Custom Date Formats
- Adding Page Headers and Footers

Charts

Teaches you how to create and customize a chart by adding legends, labels, arrows, positioning text, and setting preferred defaults. The practices included are:

- Adding Series with Paste Special
- Editing Axes
- Formatting Scatter Charts
- Editing Combination Charts

Macros

Teaches you about the macro language and how to record, write, edit, and use function and command macros. The practices included are:

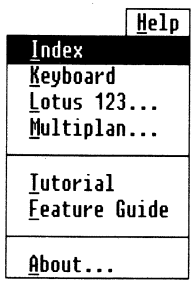
- Recording, Editing, and Running Command Macros
- Writing and Using Function Macros
- Creating Custom Menu Bars and Dialog Boxes

Auditing and Documenting

Teaches you about defining, creating and applying names, adding notes to cells, using the Formula Select Special and Formula Find commands to locate specific information, and using the Info window. The practices included are:

- Creating and Applying Names
- Creating, Reading, and Printing Notes

Help Index command



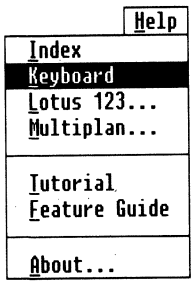
Displays the index for Microsoft Excel Help. The index is a complete list of the topics, commands, and functions documented in the Help window.

If Help is open, Microsoft Excel activates the Help window and displays the index. If Help is not open, Microsoft Excel starts Help and then displays the index.

You can get help on any topic in the Help index by selecting the topic with TAB and pressing ENTER.

For more information, see **Help**.

Help Keyboard command

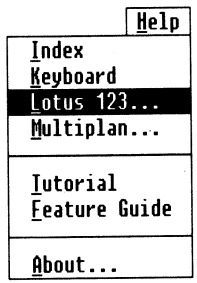


Displays Help on the keys you can use when working with Microsoft Excel.

If Help is open, Microsoft Excel activates the Help window and displays the keyboard topic. If Help is not open, Microsoft Excel starts Help and then displays the keyboard topic.

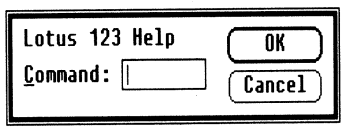
For more information on the keyboard, see **Keyboard**.

Help Lotus 123 command



Allows you to get Help on the Microsoft Excel equivalent of a Lotus 1-2-3 key sequence for choosing a command.

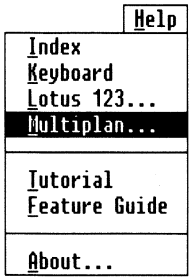
For more information on Help, see **Help**.



Command

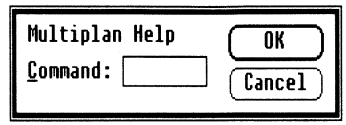
Type the letters the same way you would to choose a Lotus 1-2-3 command. You can type a slash (/) before the letters for the command, but it is not necessary. For example, if you want information on the Microsoft Excel equivalent of the Lotus 1-2-3 File Save command, type *fs* and press ENTER. Help displays the topic with the appropriate information.

Help Multiplan command



Allows you to get Help on the Microsoft Excel equivalent of a Microsoft Multiplan key sequence for choosing a command.

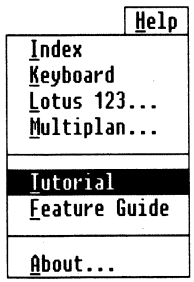
For information on Help, see **Help**.



Command

Type the letters the same way you would to choose a Multiplan command. For example, if you want information on the Microsoft Excel equivalent of the Multiplan Transfer Save command, type *ts* and press ENTER. Help displays the topic with the appropriate information.

Help Tutorial command



Starts the Microsoft Excel Tutorial. The Tutorial provides an online introduction to Microsoft Excel, as well as interactive practices.

Using the Tutorial

To use the Tutorial, your Microsoft Excel workspace must be empty. If any documents are open when you choose Help Tutorial, Microsoft Excel saves the workspace in a special file, lets you save any changes you have made to the open documents, then closes all documents. When you finish using the Tutorial, Microsoft Excel opens all your documents in the same size and location as when you chose Help Tutorial.

You can start and use the Tutorial at any time, and you can use any Tutorial lesson you want without going through the entire Tutorial.

The Tutorial contains interactive lessons on basic concepts and skills in the following areas.

How to Use This Tutorial

Introduces the Microsoft Excel Tutorial and how to use it.

Introduction Module

- What Is Microsoft Excel?

  Introduces the key features of Microsoft Excel.

- How to Use Help

  Teaches you how to use the Help system to get online assistance while you are working.

Worksheets Module

- What Is a Worksheet?

  Introduces Microsoft Excel worksheets and demonstrates ways you can use them.

- Worksheet Basics

  Teaches basic skills you need for all the other lessons in this tutorial, including choosing commands, selecting cells, and entering and editing data.

- Creating a Worksheet

  Teaches you how to use formulas in worksheets and about absolute and relative references.

- Changing How a Worksheet Looks

  Teaches you how to format numbers and text to change the appearance of your worksheet.

- Using Worksheet Functions

  Teaches you what functions are and how to use them on your worksheet.

- Printing a Worksheet

  Teaches you how to preview and print your worksheet.

Charts Module

- What Is a Chart?

  Introduces charts and demonstrates ways to use the charts available in Microsoft Excel.

- Chart Basics

  Teaches you how to create a chart.

- Changing How a Chart Looks

  Teaches you how to customize your chart.

- Printing a Chart

  Teaches you how to print charts.

Databases Module

- What Is a Database?

  Introduces databases and demonstrates ways you can use them.

- Database Basics

  Introduces you to the Data Form command and teaches you how to set up a database.

- Using a Database

  Teaches you how to find information in a database.

Macros Module

- What Is a Macro?

  Introduces macros and ways you can use them.

- Using a Command Macro

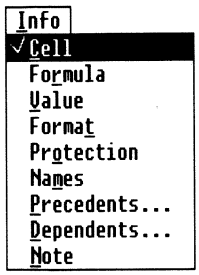
  Teaches you how to run command macros.

- Recording a Macro

  Teaches you how to record, run, and edit your own macros.

Info Cell command

(Full menus)



Controls whether the Info window displays the reference of the active cell.

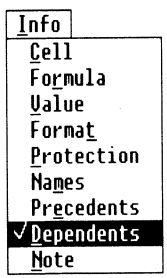
The Info window displays information about the worksheet that was active when you chose the Window Show Info command. If the Info Cell command is in effect, the Info window displays the reference of the active cell in that worksheet.

Choosing Info Cell puts the command in effect; the cell reference appears in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Cell again reverses the command.

The Info menu appears only when the Info window is active. For more information, see **Window Show Info command**.

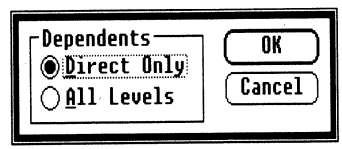
Info Dependents command

(Full menus)



Controls whether the Info window lists the cells with formulas that refer to the active cell. **Dependents** are cells with formulas that depend on the active cell for their calculations.

The Info menu appears only when the Info window is active. The Info window displays information about the worksheet that was active when you chose the Window Show Info command. For more information, see **Window Show Info command**.



Dependents

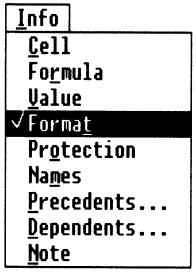
Direct Only	Lists only the cells containing a formula that refers directly to the active cell
All Levels	Lists the cells that are direct dependents of the active cell, the direct dependents of those cells, and so on

For example, you might have a worksheet where the formula in cell A1 refers to cell B2, and cell B2 refers to cell C3. If C3 is the active cell, its direct dependent is B2, because B2 depends on C3 for data.

All levels of dependents for C3 include both B2 and A1. A1 is included because it is a dependent for B2, which is in turn a dependent for C3.

Info Format command

(Full menus)



Controls whether the Info window displays the formats that have been applied to the active cell.

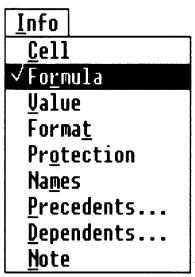
The Info window displays information about the worksheet that was active when you chose the Window Show Info command. If the Info Format command is in effect, the Info window displays the number, alignment, font, border, and shading formats of the active cell in that worksheet. For information on changing these formats, see **Format Number command**, **Format Alignment command**, **Format Font command**, and **Format Border command**.

Choosing Info Format puts the command in effect; the cell formats appear in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Format again reverses the command.

The Info menu appears only when the Info window is active. For more information, see **Window Show Info command**.

Info Formula command

(Full menus)



Controls whether the Info window displays the active cell's contents as displayed in the formula bar of the worksheet.

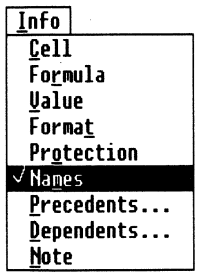
The Info window displays information about the worksheet that was active when you chose the Window Show Info command. If the Info Formula command is in effect, the Info window displays the contents of the active cell in that worksheet.

Choosing Info Formula puts the command in effect; the cell contents appear in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Formula again reverses the command.

The Info menu appears only when the Info window is active. For more information, see **Window Show Info command.**

Info Names command

(Full menus)



Controls whether the Info window displays names of any named areas that include the active cell.

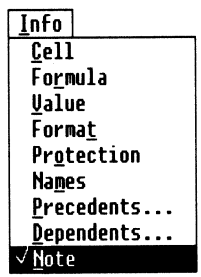
The Info window displays information about the worksheet that was active when you chose the Window Show Info command. If the Info Names command is in effect, the Info window displays all of the names in that worksheet referring to a cell range that includes the active cell. For information on names, see **Names**.

Choosing Info Names puts the command in effect; the cell names appear in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Names again reverses the command.

The Info menu appears only when the Info window is active. For more information, see **Window Show Info command**.

Info Note command

(Full menus)



Controls whether the Info window displays the note — if there is one — that is attached to the active cell.

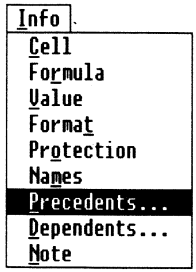
The Info window displays information about the worksheet that was active when you chose the Window Show Info command. If the Info Note command is in effect, and if the active cell in that worksheet has a note attached to it, the Info window displays the note. For information on adding or editing a note, see **Formula Note command**.

Choosing Info Note puts the command in effect; the cell note appears in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Note again reverses the command.

The Info menu appears only when the Info window is active. For more information, see **Window Show Info command**.

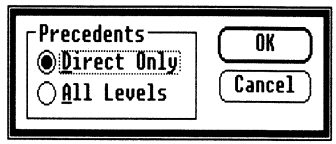
Info Precedents command

(Full menus)



Controls whether the Info window lists the cells that the formula in the active cell refers to. **Precedents** are cells that are calculated before the active cell, and upon which the formula in the active cell depends for its calculations.

The Info menu appears only when the Info window is active. The Info window displays information about the worksheet that was active when you chose the Window Show Info command. For more information, see **Window Show Info command**.



Precedents

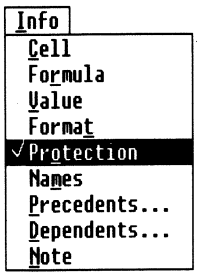
Direct Only	Lists only the cells that the formula in the active cell directly refers to
All Levels	Lists the cells that are direct precedents of the active cell, the direct precedents of those cells, and so on

For example, you might have a worksheet where the formula in cell A1 refers to cell B2, and cell B2 refers to cell C3. If A1 is the active cell, its direct precedent is B2. B2 precedes A1 in the order of calculation because the formula in A1 makes its calculation based on the data in B2.

All levels of precedents for A1 include both B2 and C3. C3 is included because it is a precedent for B2, which is in turn a precedent for A1.

Info Protection command

(Full menus)



Controls whether the Info window displays cell protection status of the active cell.

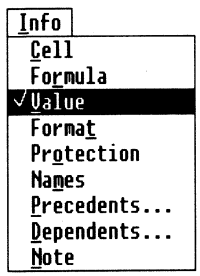
The Info menu displays information about the worksheet that was active when you chose the Window Show Info command. If the Info Protection command is in effect, the Info window displays the status of protection for the active cell in that worksheet. An individual cell can be locked or its formula hidden. For information on cell protection, see **Format Cell Protection command** and **Protecting or hiding data**.

Choosing Info Protection puts the command in effect; the cell protection status appears in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Protection again reverses the command.

The Info menu appears only when the Info window is active. For more information, see **Window Show Info command**.

Info Value command

(Full menus)



Controls whether the Info window displays the value produced by the contents of the active cell.

The Info window displays information about the worksheet that was active when you chose the Window Show Info command. If the Info Value command is in effect, the Info window displays the value produced by the contents of the active cell in that worksheet.

Choosing Info Value puts the command in effect; the cell value appears in the Info window and a checkmark appears next to the command on the Info menu. Choosing Info Value again reverses the command.

The Info menu appears only when the Info window is active. For more information, see **Window Show Info command**.

Info window

The **Info window** displays detailed information about the active cell, such as notes or formats attached to the cell, the underlying formula of the cell, names or named ranges associated with it, or the cell's protection status.

You can open the Info window whenever you want to look up details about a specific cell, or you can keep the Info window displayed while you work so you can monitor the underlying contents of your worksheets and macro sheets. You can also generate Info window print-outs that contain all the data listed in the Info window.

This topic explains:

- Info window basics

  Opening and closing the Info window

  Specifying the information displayed

  Working with the Info window displayed

  Keeping the Info window open in the workspace

- Using the Info window

  Getting information about a specific cell

  Direct and indirect precedents and dependents

  Scrolling through cell notes in the Info window

  Finding data quickly with the Info window

  Printing Info window information

This topic does not discuss basic information about the Microsoft Excel cell note feature, which you can use to document your worksheet models and macro sheets. For information on using cell notes, see **Notes**.

Note | All Info window procedures for worksheets also apply to macro sheets.

Info Window Basics

The Info window acts as a "magnifying glass" so you can see detailed information about the active cell. Because the Info window lets you probe for detail quickly, it's especially useful for the following tasks:

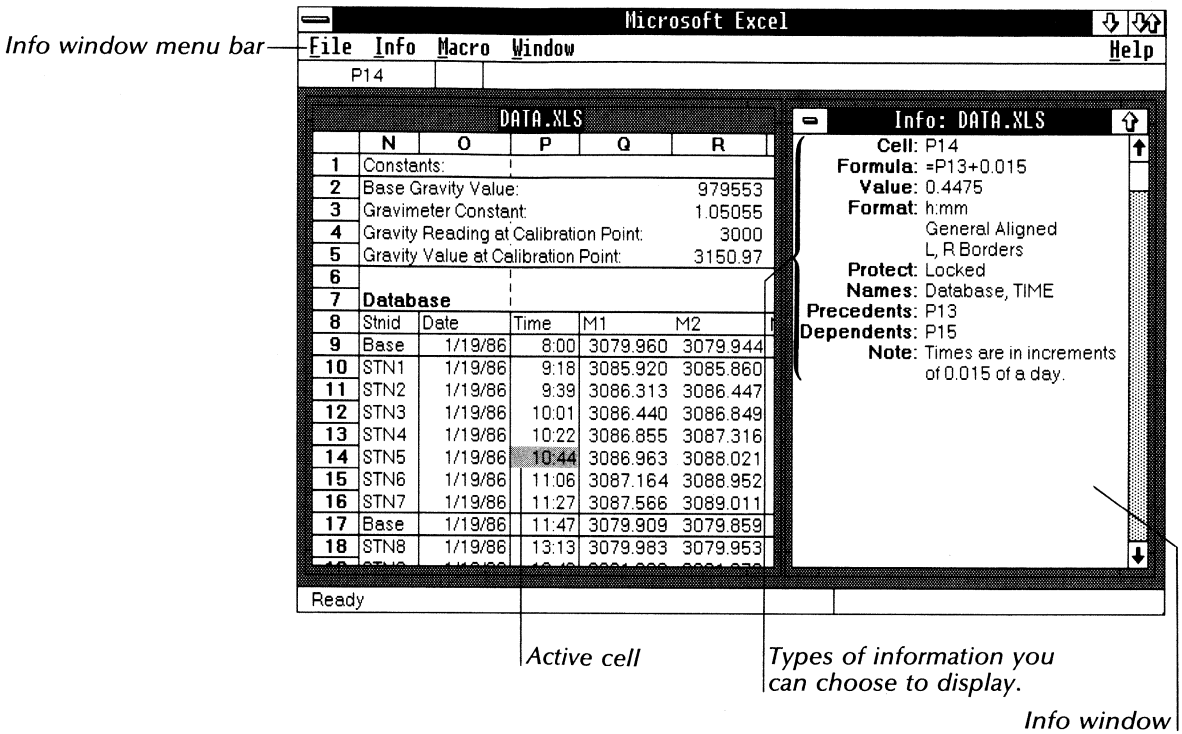
- **Auditing and debugging a model.** For example, you might want to verify the formula used in a given cell, or check for unexpected or missing precedents of the cell.
- **Taking a "guided tour" of a worksheet model or a macro.** You can use the Info window with the Formula Select Special command to quickly scan all notes attached to cells in a worksheet or macro sheet as you move around the document.
- **Locating cell information quickly.** You can use the Info window with the Formula Find command to find specific cell information quickly. For example, if you attached a note to a cell and later wanted to find that note, you could search for a series of characters (such as a name) contained in the note.

Opening and Closing the Info Window (Full Menus)

You open the Info window with the Window Show Info command.

When you open the Info window, the menu bar changes to display the Info window menus. Initially, the Info window opens in the upper-right corner of your worksheet. You can move or adjust the Info window as you do any other window.

You can also change the types of information displayed by selecting options from the Info menu. In the following illustration, the Info window is set up to display all nine types of data you can specify for the active cell.



	N	O	P	Q	R
1	Constants:				
2	Base Gravity Value:				979553
3	Gravimeter Constant:				1.05055
4	Gravity Reading at Calibration Point:				3000
5	Gravity Value at Calibration Point:				3150.97
6					
7	**Database**				
8	Stnid	Date	Time	M1	M2
9	Base	1/19/86	8:00	3079.960	3079.944
10	STN1	1/19/86	9:18	3085.920	3085.860
11	STN2	1/19/86	9:39	3086.313	3086.447
12	STN3	1/19/86	10:01	3086.440	3086.849
13	STN4	1/19/86	10:22	3086.855	3087.316
14	STN5	1/19/86	10:44	3086.963	3088.021
15	STN6	1/19/86	11:06	3087.164	3088.952
16	STN7	1/19/86	11:27	3087.566	3089.011
17	Base	1/19/86	11:47	3079.909	3079.859
18	STN8	1/19/86	13:13	3079.983	3079.953

To open the Info window:

▣ Choose Window Show Info.

To close the Info window:

▣ With the Info window active, choose Control Close (ALT, HYPHEN, C).

Note | The title bar of the Info window indicates the name of the worksheet for which it is displaying information.

Specifying the Information Displayed (Full Menus)

When you first open the Info window, it displays three types of information about the active cell: the cell reference, the formula, and any notes attached to the cell. You can modify the types of information displayed by choosing commands from the Info menu. For example, if you choose the Info Format command, the Info window displays the formats of the active cell, including number format, alignment, font, borders, and shading.

You can display any or all of the following types of information in the Info window:

- **Cell** — the reference of the active cell.
- **Formula** — the contents of the active cell as displayed in the formula bar.
- **Value** — the value produced by the contents of the active cell.
- **Format** — the format settings of the active cell (number format, alignment, font, borders, and shading).
- **Protection** — the protection settings for the active cell (whether the cell is locked or the formula is hidden).
- **Names** — the list of the named cell ranges that include the active cell.
- **Precedents** — the list of the cells that the active cell refers to. For example, if A1 is the active cell and its formula is =A2+A3, the precedents would be A2 and A3.
- **Dependents** — the list of the cells that refer to the active cell. For example, if A1 is the active cell and the formula for A2 is =A1+A4, then A2 would be displayed as a dependent of A1.
- **Note** — the text of the note, if any, attached to the active cell.

To specify the information displayed in the Info window:

1. If necessary, choose Window Show Info to open the Info window.
2. With the Info window active, select the Info menu.
3. Choose the command for the type of information you want to display. Microsoft Excel places a checkmark next to the command.
4. Repeat steps 2–3 for each type of data you want displayed.

Note When you choose the Info Precedents or Info Dependents command, Microsoft Excel displays a dialog box requesting further details about the kinds of precedents or dependents to include in the displayed data. For more information, see "Direct and Indirect Precedents and Dependents," later in this topic.

To turn off an information type in the Info window:

1. With the Info window active, select the Info menu.
2. Choose the command for the type of information you want to turn off. Microsoft Excel removes the checkmark next to the command.
3. Repeat steps 1–2 for each information type you want to turn off.

Working with the Info Window Displayed (Full Menus)

Using the Info window to display information on the active cell while you work allows you to monitor the underlying details of a worksheet or macro sheet as you move through the document.

For example, you might want to keep the Info window open so that you can verify or trace cell relationships (dependents and precedents) while building a worksheet. Or you might want to verify number formatting in the range of cells you're working with.

Using the standard procedures for moving and sizing windows, you can arrange the Info window and any open document windows so that all windows are visible in the workspace. You can also automatically "tile" the Info window and any open document windows so that all open windows are visible in the workspace. With automatic tiling, Microsoft Excel arranges the windows so that the borders interlock in the workspace with no blank space between them.

To tile the Info window and all other open windows:

1. If necessary, choose Window Show Info to open the Info window.
2. Choose Window Arrange All.

Use standard keyboard and mouse procedures for moving among the windows. For information on windows techniques and procedures, see **Windows**.

Keeping the Info Window Open in the Workspace (Full Menus)

You can keep the Info window open but not necessarily displayed in the workspace. Use the following procedures to switch between the active document window and the Info window if the open windows are overlapped in the workspace.

To switch to the document window from the Info window	**To switch to the Info window from the active document window**
▣ Choose Window Show Document.	▣ Choose Window Show Info.

Using the Info Window

This section discusses basic procedures for using the Info window when building, editing, or auditing worksheets. For information on additional worksheet auditing procedures, see **Auditing worksheet models**.

Getting Information About a Specific Cell (Full Menus)

1. Select the cell you want to examine.
2. Choose Window Show Info.
3. If necessary, change the information displayed by selecting the appropriate Info menu commands (see "Specifying the Information Displayed," earlier in this topic).

Direct and Indirect Precedents and Dependents

When you choose the Info Precedents or Info Dependents command, Microsoft Excel displays a dialog box so you can specify whether you want to display all precedents or dependents or only direct precedents or dependents. Use the following definitions as guidelines when determining the type of precedents or dependents you want displayed in the Info window:

A **direct precedent** of the active cell is a cell that is directly referred to in the formula of the active cell. For example, if A1 is the active cell and its formula is =A2+A3, then A2 and A3 are direct precedents of A1.

An **indirect precedent** of the active cell is a cell that is indirectly referred to in the formula of the active cell. For example, if A1 is the active cell and its formula is =A2, and the formula for A2 is =A3, then A3 is an indirect precedent of A1 (and a direct precedent of A2).

A **direct dependent** of the active cell is a cell whose formula directly refers to the active cell. For example, if A1 is the active cell and the formula for A2 is =A1+4, then A2 is a direct dependent of A1.

An **indirect dependent** of the active cell is a cell whose formula indirectly refers to the active cell. For example if A1 is the active cell and the formula for A2 is =A1, and the formula for A3 is =A2, then A3 is an indirect dependent of A1 (and a direct dependent of A2).

Scrolling Through Cell Notes in the Info Window (Full Menus)

Microsoft Excel includes a cell notes feature for documenting worksheets and macro sheets. With the Info window displayed, you can quickly scan all cell notes in a worksheet or macro sheet, using the Formula Select Special command.

To scroll through cell notes:

1. If necessary, choose Window Show Info to open the Info window. Make sure you have chosen Info Note to display notes in the Info window.
2. Move and size the windows so both the worksheet window and Info window are visible.

   If you want to see all open windows, choose Window Arrange All.
3. Activate the worksheet window.
4. Choose Formula Select Special.
5. In the dialog box, select Notes.
6. Choose the OK button.

   Microsoft Excel makes a multiple selection that includes all cells with notes attached to them.
7. Press TAB to move cell-by-cell through the selected cells and display the note for each in the Info window.

   To jump quickly between the selected cell ranges, press CONTROL+TAB.

Tip

If other users will be working with your model, you can attach notes to cells explaining the worksheet model. Or, you can attach notes to key cells in a macro sheet, giving instructions for running the macro. Then you can set up a guided tour of the worksheet or macro sheet that includes viewing the cell notes with the procedure explained in this section. For information on cell notes, see **Notes**.

Finding Data Quickly with the Info Window (Full Menus)

Use this procedure to locate a specific series of characters contained in a cell note or in a formula.

1. If necessary, choose Window Show Info to open the Info window.
2. Move and size the windows so that both the worksheet window and Info window are visible.

   If you want to see all open windows, choose Window Arrange All.
3. Activate the worksheet window.
4. Choose Formula Find.
5. In the Find What text box, type the characters you want to find.
6. Depending on where you want Microsoft Excel to look for the specified characters, select Formulas or Notes in the Look In box.
7. Choose the OK button.

For information on finding data fast, see **Finding cells and data quickly**.

Printing Info Window Information (Full Menus)

You can print the information displayed in the Info window. Microsoft Excel prints the Info window information for all cells currently selected in the worksheet window.

To print information only for selected cells

1. Make sure the Info window is open.
2. Activate the worksheet window.
3. Select the cells for which you want to print information.
4. Activate the Info window.
5. Choose File Print.
6. Change any options you want.
7. Choose the OK button.

To print information for all cells in the worksheet

1. Select the entire worksheet.
2. Choose Window Show Info.
3. Choose File Print.
4. Change any options you want.
5. Choose the OK button.

Note | You can also use other worksheet printing options for Info window print-outs. For example, you can preview the document before printing or specify a different printer. For more information, see **Printing a document**.

Related Information

Reference

For information on	See
Tracing relationships among cells, verifying range names	Auditing worksheet models
Absolute, relative, and mixed references	References
Resolving circular references	Circular reference
Troubleshooting error values	Error value

Sampler

Correcting for Instrument Drift

Feature Guide

Auditing and Documenting

Inserting blank cells

You may want to insert one or more blank cells, rows, or columns to make room for more data or to include more white space on the worksheet.

Inserting Cells

To insert blank cells:

1. Select the area where you want blank cells inserted.
   The area you select should be the same size as the area of blank cells you want to insert.
2. Choose Edit Insert.
   If you insert entire rows or columns, Microsoft Excel automatically shifts the other cells in the worksheet. If you insert a single cell or a cell range, Microsoft Excel displays a dialog box so you can decide how to shift the selected cells.
3. Select Shift Cells Right or Shift Cells Down.
4. Choose the OK button.

Microsoft Excel inserts blank cells in place of your selection, shifts the other cells in your worksheet to accommodate the new cells, and adjusts references to the shifted cells to reflect their new locations.

Note When Microsoft Excel shifts cells to accommodate an insertion, other areas of your worksheet may be disrupted. For example, suppose you are inserting cells in column B, and further down the worksheet you have a list of clients in column A and their phone numbers in column B. If you shift cells down, you will find that the phone numbers are no longer next to the appropriate clients.

When you insert cells, Microsoft Excel also tries to give the new cells an appropriate format. Generally, this means the new cells are given the same formats as the cells around them.

Related Information

Reference

For information on	See
Columns and rows	Column Row
Formatting text and numbers	Formatting a document
Adjusting references to moved cells	References

Insertion point

The **insertion point** is the blinking vertical line that indicates where text will be inserted when you begin typing. The insertion point appears in the formula bar when it's active, or in an active text box in a dialog box. What you type appears at the left of the insertion point. You can move the insertion point either by pressing the LEFT or RIGHT keys or by clicking the mouse. For more information, see **Formula bar** and **Editing a document**.

Iteration

Iteration is a technique of repeated calculation of a worksheet until a specific numerical condition is met. Iteration is used in conjunction with intentional circular references as an analysis tool. Iteration allows you to create models for goal-seeking analysis, and to solve simultaneous equations and other complex tasks.

This topic explains:

- Using iteration
- Convergence and divergence

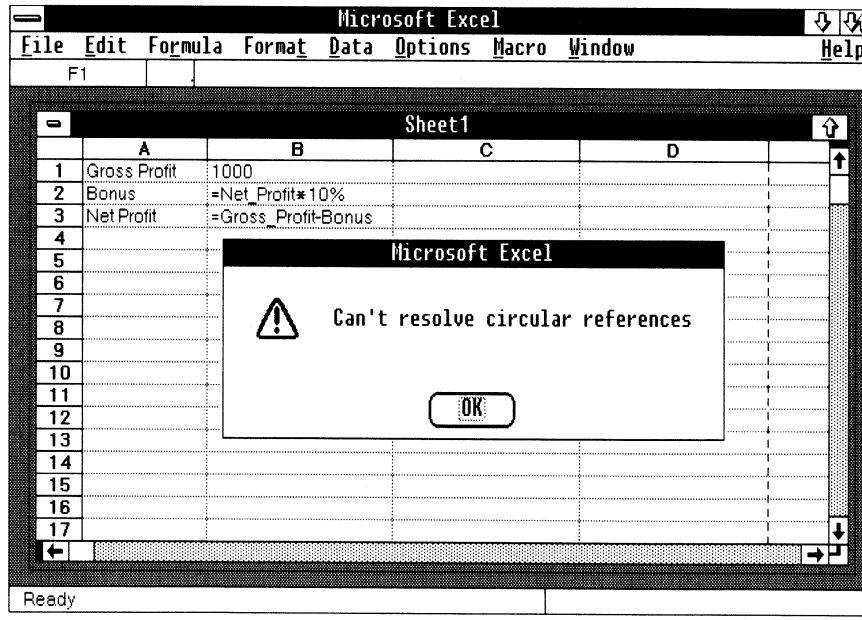
Using Iteration

Circular references involve formulas that depend on each other for their calculated results. Microsoft Excel cannot resolve such formulas using normal calculation. When you make a circular reference, Microsoft Excel displays a message, and the status bar indicates a cell involved in the circular reference. If the circular reference is accidental, you need to redesign the formulas or logic to break the circular reference. For more information, see **Circular reference**.

Iteration can find solutions for models with formulas that depend on each other for results. When Microsoft Excel iterates, it calculates the worksheet over and over. For each iteration cycle, Microsoft Excel uses the results of the previous calculation. You control iteration with the Options Calculation command either by limiting the number of iteration cycles or by setting a limit to the maximum amount of change in a value from one iteration cycle to the next.

The following example shows how to use iteration to solve a worksheet model that contains circular references. The example computes a bonus that is 10 percent of net profit, where the net profit depends on the amount of the bonus.

Gross Profit is $1,000. Net Profit is Gross Profit minus Bonus, and Bonus is 10 percent of Net Profit. The formulas for Bonus and Net Profit depend on each other — they are circular references.



After you enter the Net Profit formula, Microsoft Excel displays the message noting the circular references and produces 0 for the values of both Bonus and Net Profit.

To use iteration to calculate your worksheet:

1. Choose Options Calculation.
2. Turn on the Iteration check box.
3. In the Maximum Iteration box, type the maximum number of iterations you want Microsoft Excel to perform.
4. In the Maximum Change box, type the maximum change between iterations.
5. Choose the OK button.

When Microsoft Excel calculates the worksheet, it calculates circular references until it either iterates the number of times set in the Maximum Iterations box, or until all cells change by less than the amount in the Maximum Change box, whichever is first. Unless you change these settings, Microsoft Excel stops iterating after 100 iterations, or all values on the model change by less than 0.001 between iterations. The latter condition assures results precise to at least one-tenth of one percent.

In the preceding example, Microsoft Excel calculates the worksheet and produces the following results at each iteration:

After this iteration	The results are
Bonus	0.1*0=0
Net Profit	1000−0=1000
Bonus	0.1*1000=100
Net Profit	1000−100=900
Bonus	0.1*900=90
Net Profit	1000−90=910
Bonus	0.1*910=91
Net Profit	1000−91=909
Bonus	0.1*909=90.9
Net Profit	1000−90.9=909.1
Bonus	0.1*909.1=90.91
Net Profit	1000−90.91=909.09
Bonus	0.1*909.09=90.909
Net Profit	1000−90.909=909.091
Bonus	0.1*909.091=90.9091
Net Profit	1000−90.9091=909.0909

After each iteration, Bonus and Net Profit change less and less and get closer to the solution. Microsoft Excel stops after eight iterations because Bonus and Net Profit both change by less than 0.001 between iterations seven and eight.

	A	B	C
1	Gross Profit	$1,000.00	
2	Bonus	$90.91	
3	Net Profit	$909.09	
4			
5			

Convergence and Divergence

In the preceding example, the values became closer to the correct solution with each iteration. This is called convergence. As the model converges, the values change less and less between iterations.

During iteration, the difference in values between one iteration and the next sometimes becomes larger instead of smaller. This is called divergence. Both the starting values and the way you create the model affect whether it converges or diverges.

For example, if you want to find the solution to the simultaneous equations $x = y$ and $y = -2x + 3$, you can set up a model in two different ways:

	A	B
1	=A2	
2	=-2*A1+3	
3		

Example 1

	A	B
1	=A2	
2	=(3-A1)/2	
3		

Example 2

Only Example 2 converges to the solution; Example 1 diverges. The solutions for both models are:

A1 = 1

A2 = 1

These values satisfy both sets of formulas. But even though there is a correct solution for Example 1, it diverges because of the way the formula is entered Example 2 arrives at the values .9997559 and 1.0001221, which are within 0.001 of the solutions.

Note | Because Microsoft Excel calculates worksheets based on dependent formulas, the order of calculation is not by row or column. Therefore, do not build an iteration model whose convergence or divergence depends upon the order of calculation. Microsoft Excel calculates each cell involved in the circular reference once for each iteration.

Related Information

Reference

For information on	See
Resolving circular references	Circular reference
Convergence and divergence	Convergence Divergence
Calculations in Microsoft Excel	Calculation

Keyboard

Microsoft Excel has a set of command shortcut keys, special keys, and keyboard techniques for use with your documents. Many of the shortcut keys let you bypass the drop-down menus and carry out commands directly from the keyboard. Other techniques allow you to move, select, and edit large documents efficiently.

This topic explains:

- Basic keyboard information
  - Keyboard conventions used in this book
  - General patterns in keyboard commands
- Worksheet keys
  - Moving and selecting in a worksheet
  - Making a multiple selection
  - Moving within a selection
  - Scrolling a worksheet window

- Command shortcut keys and special keys

  Function key shortcuts for commands and actions

  Control key shortcuts for commands and dialog box options

  Miscellaneous keyboard features

Except for the section, "Keyboard Conventions Used in This Book," this topic does not discuss basic keyboard procedures for working with menus, commands, and dialog boxes; editing in the formula bar; moving and selecting in charts; or controlling windows. For information on those procedures, see **Command, menu, and dialog box**; **Formula bar**; **Chart**; and **Windows** respectively.

Note | All keyboard commands for worksheets also apply to macro sheets.

Basic Keyboard Information

The keys listed here and elsewhere in the *Microsoft Excel Reference* correspond to the keyboard for the IBM PS/2, IBM PC AT, and computers with fully compatible keyboards.

Keyboard Conventions Used in This Book

A keyboard command can consist of one keystroke, a sequence of two or more keys you press individually, or a combination of two or more keys you press at one time. The *Microsoft Excel Reference* uses the following conventions to indicate which technique you should use for a given keyboard command or technique:

Comma (,) — A comma indicates that you should press the individual keys in sequence. For example, to press ALT, C, follow these steps:

1. Press ALT and release the key.
2. Press C and release the key.

Plus sign (+) — A plus sign indicates that you should hold down one or more keys at the same time. For example, to press ALT+C, follow these steps:

1. Hold down the ALT key.
2. Press C and release it.
3. Release the ALT key.

General Patterns in Keyboard Commands

Understanding the logic behind keyboard commands can help you learn them more easily. Each shortcut key, editing key, and movement/selection key performs a particular action. You combine those keys with the SHIFT, CONTROL, and ALT keys to add different meanings to that instruction.

The following list summarizes the general patterns in keyboard commands:

- **ENTER** and **ESCAPE** are used to confirm or cancel an action, respectively.
- **Function keys** (F1, F2, and so on) are used for shortcuts for frequently carried out commands and actions.
- **INSERT, DELETE,** and **BACKSPACE** are used primarily for editing.
- **TAB, HOME, END, PAGE UP, PAGE DOWN,** and the **DIRECTION** keys are used primarily for moving and selecting.
- **ALT** is generally used for actions related to application windows, such as moving, sizing, and restoring, or for choosing commands and dialog box options.
- **SHIFT** usually means one of the following:

  Extend

  Perform the opposite action

  Go in the opposite direction

Quick Reference for the Keyboard

The Help Keyboard command provides extensive information on the Microsoft Excel keyboard commands and techniques. Here's how to use Help Keyboard as a handy, quick reference:

1. Choose Help Keyboard.
2. This opens the Help window or activates it if Microsoft Help is already running. Microsoft Help displays the keyboard topic in the Help window.
3. Use the Control Move and Control Size commands to arrange your workspace so that you can view both the document window you're working with and the Help window.
4. As you work, switch to the Help window and use the keyboard topic to check which key you need for a particular task or action.

For more information on Microsoft Help, see **Help**.

- **CONTROL** is used in several keyboard shortcuts for applying options in the Format Number, Format Font, and Formula Select Special dialog boxes. In addition, it can mean one of the following:

  Perform the same action on a different scale.

  Perform a slightly different action on the same object.

Worksheet Keys

This section explains how to move around a worksheet and a selection, scroll a worksheet window, and make the following types of selections:

- **Single cell** — a selection of one cell, the active cell.
- **Range** — a selection of two or more cells within one rectangular area.
- **Multiple selection** — a selection consisting of any combination of single cells or ranges.

Moving and Selecting in a Worksheet

Use the keys in the following table to move and select within a worksheet. Once you have selected a range or made a multiple selection, you can move within the selection and still keep the cells selected. For more information, see "Moving Within a Selection," later in this topic.

To	Press
Move to and select one cell up, down, right, left	DIRECTION key
Extend the selection one cell up, down, left, right	SHIFT + DIRECTION key
Move by one block of data left, right, up, down	CONTROL + DIRECTION key
Extend selection by one block of data left, right, up, down	CONTROL + SHIFT + DIRECTION key
Move to start of row containing active cell	HOME
Extend selection to start of row	SHIFT + HOME

To	Press
Move to end of row containing active cell (last occupied column of sheet)	END
Extend selection to end of row (last occupied column of sheet)	SHIFT + END
Select entire rows containing selected cell or range	SHIFT + SPACEBAR
Extend selection of entire row to additional entire rows	SHIFT + DIRECTION (UP or DOWN) key
Select entire columns containing selected cell or range	CONTROL + SPACEBAR
Extend selection of entire column to additional entire columns	SHIFT + DIRECTION (LEFT or RIGHT) key
Move to start of data	CONTROL + HOME
Extend selection to start of data	CONTROL + SHIFT + HOME
Move to end of data	CONTROL + END
Extend selection to end of data	CONTROL + SHIFT + END
Move to start of window	HOME (SCROLL LOCK on)
Extend selection to start of window	SHIFT + HOME (SCROLL LOCK on)
Move to end of window	END (SCROLL LOCK on)
Extend selection to end of window	SHIFT + END (SCROLL LOCK on)
Select the entire worksheet	CONTROL + SHIFT + SPACEBAR
Collapse selection to single cell	SHIFT + BACKSPACE

In addition to using the SHIFT key to extend a selection, as described in the preceding table, you can also turn on Extend. To turn on Extend, press F8. While in Extend, use any of the DIRECTION keys to extend the selection. The area on the right side of the status bar displays the message "EXT" whenever you are in Extend. To turn off Extend, press F8 again.

Tip

Another way to move quickly to a specific cell, range, or named area on the worksheet is to use the Formula Goto command. You can also extend the selection from the active cell to the Goto area by pressing F8 before you choose the command or by holding down SHIFT when you choose the OK button in the Formula Goto dialog box. For more information on finding specific cells or named ranges, see **Finding cells and data quickly**.

Making a Multiple Selection

1. Select the first cell.
2. Press F8 to turn on Extend.
3. Use DIRECTION keys to extend the selection.
4. Press SHIFT+F8 to turn on Add and keep the selection you just made.
5. Move to the next cell or range you want to select.
6. Repeat steps 2–5 to add selections.

Moving Within a Selection

For a range selection or multiple selection, you can use keys in the following table to move around and maintain the selection on the screen:

To	Press
Move down one cell in the selection	ENTER
Move up one cell in the selection	SHIFT+ENTER
Move right one cell	TAB
Move left one cell in the selection	SHIFT+TAB
Move to next corner of area	CONTROL+.
In a multiple selection, move to next area	CONTROL+TAB
In a multiple selection, move to previous area	CONTROL+SHIFT+TAB

Scrolling a Worksheet Window

Scrolling causes the contents of the active window to move up, down, left, or right so that you see another part of the worksheet. When you scroll through a worksheet, only the screen display changes; the active cell or current selection does not change.

To scroll the active window, use the key combinations in the following table with the SCROLL LOCK key turned on. This causes the movement-selection keys to scroll instead of select cells. When you turn on the SCROLL LOCK key, the right side of the status bar displays the indicator "SCRL." When you are finished scrolling, press SCROLL LOCK again to turn it off.

To scroll	Turn on SCROLL LOCK and press
One row up or down	UP or DOWN
One column left or right	LEFT or RIGHT
One windowful up or down	PAGE UP or PAGE DOWN
One windowful left or right	CONTROL + PAGE UP or CONTROL + PAGE DOWN
Back to display the active cell	CONTROL + BACKSPACE

If you scroll away from the selection and then want to quickly bring the active cell into the part of the worksheet currently displayed, press HOME while SCROLL LOCK is turned on.

Tip

The Options Freeze Pane command allows you to freeze titles in columns or rows. This makes it easy to scroll the worksheet and keep track of which columns and rows you're working in. For more information on freezing titles, see **Display options**.

Command Shortcut Keys and Special Keys

The function key shortcuts serve as convenient alternatives for choosing many of the most often used worksheet, chart, and macro sheet commands directly from the keyboard. Most of the CONTROL key shortcuts apply to worksheets.

Function Key Shortcuts for Commands and Actions

Function key shortcuts generally bypass drop-down menus and carry out commands and actions directly from the keyboard or display the dialog boxes for given commands.

For information on each command listed, see the corresponding command topic.

Key		Command or Action
F1	F1	Help
	SHIFT + F1	Context-sensitive Help
	ALT + F1	File New command (Chart option)
	ALT + SHIFT + F1	File New command (Worksheet option)
	ALT + CONTROL + F1	File New command (Macro sheet option)
F2	F2	Activate formula bar, in Edit mode
	SHIFT + F2	Formula Note command
	CONTROL + F2	Window Show Info command
	ALT + F2	File Save As command
	ALT + SHIFT + F2	File Save command
	ALT + CONTROL + F2	File Open command
	ALT + CONTROL + SHIFT + F2	File Print command
F3	F3	Formula Paste Name command
	SHIFT + F3	Formula Paste Function command
	CONTROL + F3	Formula Define Name command
	CONTROL + SHIFT + F3	Formula Create Names command
F4	F4	Formula Reference command
	CONTROL + F4	Control Close command (active document window)
	ALT + F4	Control Close command (application window)
F5	F5	Formula Goto command
	SHIFT + F5	Formula Find command (find cell with specific contents)
	CONTROL + F5	Control Restore command (active document window)
	ALT + F5	Control Restore command (application window)
F6	F6	Next pane
	SHIFT + F6	Previous pane
	CONTROL + F6	Next document window
	CONTROL + SHIFT + F6	Previous document window
F7	F7	Formula Find command (find next cell)
	SHIFT + F7	Formula Find command (find previous cell)
	CONTROL + F7	Control Move command (active document window)
	ALT + F7	Control Move command (application window)
F8	F8	Turns Extend on or off; if you are already in Add, changes to Extend
	SHIFT + F8	Turns on Add
	CONTROL + F8	Control Size command (active document window)
	ALT + F8	Control Size command (application window)
F9	F9	Options Calculate Now command
	SHIFT + F9	Options Calculate Document command
	ALT + F9	Control Minimize command (application window)

Key	Command or Action
F10	Activate menu bar
CONTROL+F10	Control Maximize command (active document window)
ALT+F10	Control Maximize command (application window)
F11	File New command (Chart option)
SHIFT+F11	File New command (Worksheet option)
CONTROL+F11	File New command (Macro sheet option)
F12	File Save As command
SHIFT+F12	File Save command
CONTROL+F12	File Open command
CONTROL+SHIFT+F12	File Print command

Control Key Shortcuts for Commands and Dialog Box Options

Control key shortcuts generally bypass drop-down menus and carry out commands directly from the keyboard, including specific dialog box options. For example, certain shortcuts allow you to format cells and ranges with one of the four fonts in the current font set, bypassing the Format Font command and dialog box. With other shortcuts you can apply built-in number formats, bypassing the Format Number command and dialog box.

For information on each command and dialog box option listed, see the corresponding command topic.

Key	Command and dialog box option
CONTROL+~	Format Number (General format)
CONTROL+!	Format Number (0.00 format)
CONTROL+@	Format Number (h:mm AM/PM format)
CONTROL+#	Format Number (d-mmm-yy format)

Key	Command and dialog box option
CONTROL + $	Format Number ($#,##0.00;($#,##0.00) format)
CONTROL + %	Format Number (0% format)
CONTROL + ^	Format Number (0.00E + 00 format)
CONTROL + 1	Format Font (Font 1 option)
CONTROL + 2	Format Font (Font 2 option)
CONTROL + 3	Format Font (Font 3 option)
CONTROL + 4	Format Font (Font 4 option)
CONTROL + ?	Formula Select Special (Notes option)
CONTROL + *	Formula Select Special (Current Region option)
CONTROL + /	Formula Select Special (Current Array option)
CONTROL + \	Formula Select Special (Row Differences option)
CONTROL + |	Formula Select Special (Column Differences option)
CONTROL + [	Formula Select Special (Precedents: Direct Only option)
CONTROL + {	Formula Select Special (Precedents: All Levels option)
CONTROL +]	Formula Select Special (Dependents: Direct Only option)
CONTROL + }	Formula Select Special (Dependents: All Levels option)
CONTROL + =	Calculate Now
CONTROL + ‘(backquote)	Options Display (Formulas option — toggles between formulas and values)

Miscellaneous Keyboard Features

Here are some other keyboard conveniences you can use with Microsoft Excel:

- **"Accountant's keypad" feature.** You can set up "fixed decimals" with Microsoft Excel just as you would on a 10-key adding machine. With the Options Workspace command (Fixed Decimal check box), you can specify a number of decimal places, and Microsoft Excel will automatically insert the decimal point correctly for each number you enter. If you use the numeric keypad (located on the right side of most keyboards) to enter the numbers, be sure to turn on the NUM LOCK key. For more information, see **Options Workspace command**.
- **Quick scrolling.** Within the Help window and in any dialog box that contains a list box, you can scroll quickly by typing the initial letter of the item you want when the list box is active. The list box or Help window scrolls to the first item starting with that letter. If there is more than one item beginning with that letter, you can press the letter key again to see each of those items. This technique applies to the dialog boxes for the File Open, File Links, File Delete, Formula Paste Name, and Formula Paste Function commands.
- **Shortcut keys for macros.** As a shortcut for the Macro Run command, you can run a command macro with a shortcut key you define when you record the macro. For more information on recording a macro, see **Macro**.
- **Undoing and repeating commands.** You can press ALT+BACKSPACE to undo the last command (if applicable). To repeat the last command (if applicable), you can press ALT+ENTER.

Related Information

Reference

For information on	See
Worksheet basics, including summary chart of parallel keyboard procedures for the worksheet and formula bar	Worksheet
General overviews of editing and formatting a worksheet	Worksheet Editing a document Formatting a document

For information on	See
Finding specific cells and data in a worksheet	Finding cells and data quickly
Mouse procedures and techniques for moving, selecting, and editing	Mouse

Tutorial

Focuses throughout on keyboard techniques for working with Microsoft Excel worksheets, charts, databases, and macros.

Feature Guide

Basic Mechanics, "Entering and Editing" and "Selecting and Moving Around"

Linking documents

You **link** two documents by creating a formula in one that refers to a value in the other document. The link enables Microsoft Excel to update the value in the reference whenever the value changes in the other worksheet. Linking enables you to consolidate data among several worksheets or data sources in other applications. You can link two or more Microsoft Excel worksheets. If you are running Microsoft Excel under Microsoft Windows, version 2.0 or higher, you can link a Microsoft Excel worksheet to a document in a different application, such as a stock quote table in a communications application.

This topic explains:

- Basic concepts of linking

  Essential terms

- Linking Microsoft Excel worksheets

  The parts of an external reference formula

  Guidelines for creating links between worksheets

  Creating a link between worksheets

  Saving linked worksheets

  Opening and updating linked worksheets

  Managing linked worksheets in different directories

  Redirecting links for worksheets you rename or move

  Removing links between worksheets

- Linking worksheets to other applications

  The parts of a remote reference formula

  Creating a link between a worksheet and another application

  Opening and updating a worksheet linked to another application

  Removing links to other applications

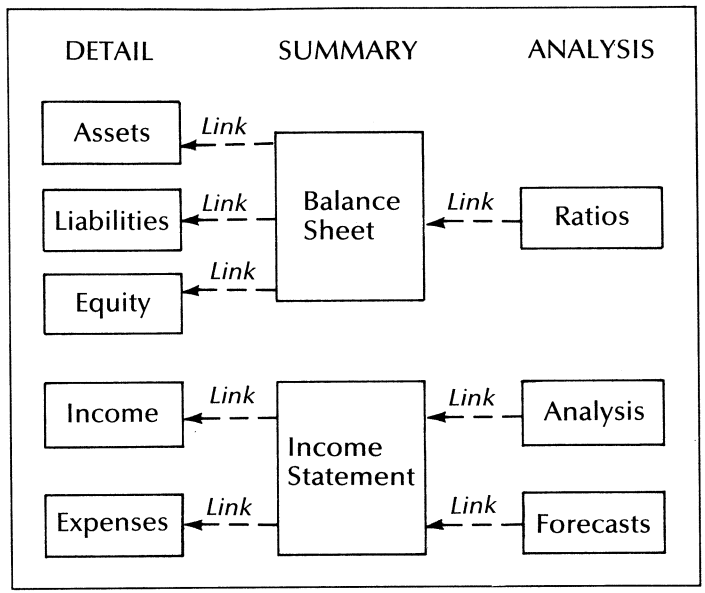
When you create a new chart from a worksheet, Microsoft Excel automatically links the chart to the worksheet. This topic does not discuss links between a chart and worksheet, which use a special kind of formula called a series formula. For information on series formulas, see **Series formula**.

Basic Concepts of Linking

Linking is especially useful for working with large worksheet models or systems of documents. Here are a few ways you can use linking most effectively:

- **Consolidating data from several worksheets, data sources, or different applications.** For example, you can link worksheets from different departments or several users, and integrate the pertinent data into a master summary worksheet. Breaking down a large model into smaller linked worksheets enables several users who must enter data into the model to work on it at the same time. You can also use Microsoft Excel worksheets to consolidate data from other applications such as financial databases.
- **Creating different "views" of your data.** For example, you can create a working copy of the data that includes extra information or tables for calculation, intermediate results, and no special formats. To your working copy, you can link a final version of the worksheet for reports, including special formats and data pertinent only to the reports. You can use the same worksheet as the source of several reports.
- **Streamlining large, complex models.** By breaking down a complicated financial model into a series of compact, interdependent worksheets, you save room in memory because you can work on the model without opening all worksheets related to it. Smaller worksheets are faster to load, save, and calculate, and are easier to edit.
- **Designing flexible models or systems.** For example, you might design an effective model around separate worksheets for modules you deal with daily and those you work with only periodically. Again, more compact worksheets can streamline your work significantly.

Linking is not restricted to simple links between two documents; you can construct hierarchies of linked documents. For example, the following illustration shows a possible accounting model based on worksheets linked this way:



Essential Terms

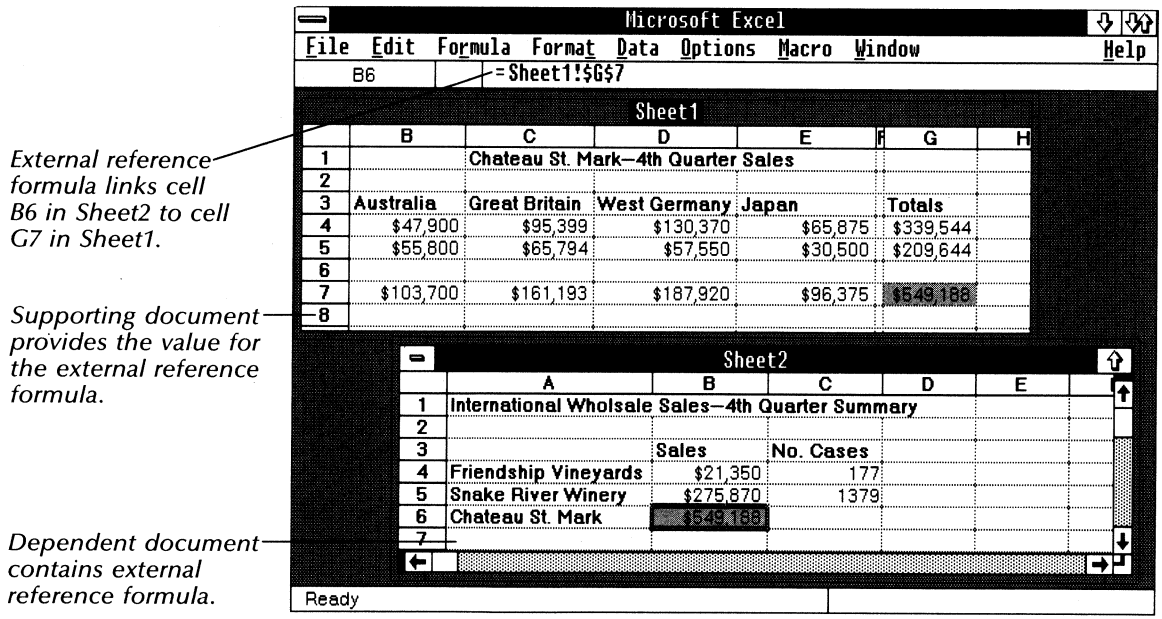
The following terms apply to linking documents and are used throughout this topic:

- **External reference** — a reference to another Microsoft Excel worksheet. An external reference can designate a single cell, a cell range, or a named cell or range.
- **External reference formula** — a formula in a worksheet that contains a reference to a single cell, cell range, or named cell or range in another worksheet. An external reference formula creates the actual link between Microsoft Excel worksheets.
- **Remote reference** — a reference to a document in a different application. A remote reference can designate a single cell, cell range, value, or field of data in the other document.
- **Remote reference formula** — a formula in a Microsoft Excel worksheet that contains a reference to a cell, cell range, value, or field of data in a document from a different application. A remote reference formula creates the actual link between a Microsoft Excel worksheet and the other document.

- **Dependent worksheet** — a worksheet that contains an external reference formula or a remote reference formula. When you link two Microsoft Excel worksheets, the dependent worksheet relies on another worksheet for the value in the external reference formula. When you link a Microsoft Excel worksheet to a document in a different application, the worksheet is dependent on that document for the value in the remote reference formula.
- **Supporting document** — a Microsoft Excel worksheet referred to by an external reference; also, a document in a different application referred to by a remote reference. The supporting document is the source of the value contained in the external reference formula or remote reference formula and therefore provides "supporting data" to the dependent worksheet.

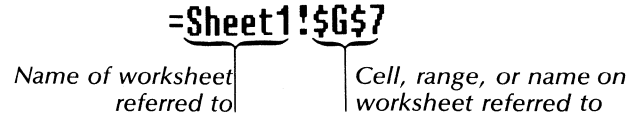
Linking Microsoft Excel Worksheets

Anytime you build a formula or define a name in one worksheet by entering a reference to a cell, cell range, or name from another worksheet, Microsoft Excel links those worksheets. The following illustration shows a simple link between two Microsoft Excel worksheets:



The Parts of an External Reference Formula

Here's a closer look at the external reference formula used to link the worksheets in the preceding illustration:



An external reference formula must appear in this syntax:

- **Name of worksheet being referred to** — if it is the first element of the formula, should be preceded by an equal sign and should always be immediately followed by an exclamation point (!). It should be a legal Microsoft Excel name; (for information on guidelines for legal Microsoft Excel names, see **Names**). If it is not a legal Microsoft Excel name, it must be enclosed in single quotation marks.
- **Cell, range, or named cell or range referred to** — can be a simple external reference (an absolute reference to a cell, cell range, or named cell or range in the other worksheet) or a complex external reference (any other type of reference that is not a simple external reference). In the preceding example, =Sheet1!$G$7 is a simple external reference formula. Changing it to =Sheet1!$G$7+Sheet2!$G$7 would make it a complex external reference.

Guidelines for Creating Links Between Worksheets

Follow these guidelines when deciding how you want to set up links between worksheets:

- **In general, use simple external reference formulas.** The difference between simple and complex external reference formulas is important when you build external reference formulas to create links, or when you open linked worksheets. Microsoft Excel can update values for simple external references without supporting worksheets being open. This makes the most efficient use of memory with large models or multiple-sheet models because you don't have to open all supporting worksheets. However, for Microsoft Excel to update complex external references, supporting worksheets must be open.
- **Use names to ensure that external references are correctly adjusted when you edit the worksheet.** When you move or cut cells, Microsoft Excel adjusts external references differently than normal references. When you move supporting cells, external references in dependent formulas are not adjusted to reflect the new location of the supporting cells. Using names in external references ensures that the formulas will always refer to the data you originally referenced.

- **Use complex external reference formulas only when necessary.** A simple external reference formula should cover most linking conditions. Check the logic of your model if you think you need to use anything other than a simple external reference formula. If you're not sure whether your model requires a complex external reference formula, refer to the following table for syntax examples that contrast simple and complex external reference formulas.

Simple external reference formula	Complex external reference formula
=BUDGET.XLS!$B$1 (absolute reference)	=BUDGET.XLS!B1 (relative reference)
=BUDGET.XLS!$B$1:$B$5 (range)	=SUM(BUDGET.XLS!$B$1:$B$5) (function using range)
=BUDGET.XLS!Inflation (if the name Inflation refers to a cell, range, or constant)	=BUDGET.XLS!Inflation (if the name Inflation refers to a formula like =B7*B8)

Tip | The most common complex references are consolidation formulas such as =EAST.XLS!$B$3+WEST.XLS!$B$3. You can avoid using this kind of reference by entering each component reference in its own cell and consolidating the results in another cell. In the above example, you could enter =EAST.XLS!$B$3 in one cell, =WEST.XLS!$B$3 in another cell, and then add the result of these two cells in a third cell.

Creating a Link Between Worksheets (Full Menus)

1. Open the worksheets you want to link.
2. Activate the supporting worksheet window.
3. Select the cell or range you want to be referenced in the dependent worksheet.
4. Choose Edit Copy.

   The dotted marquee appears around the selected cell or range.
5. Activate the dependent worksheet window.
6. Select the cell or the upper-left corner of the range that will contain the external reference.
7. Choose Edit Paste Link.

   Microsoft Excel creates the external reference formula that links the worksheets.

Note Microsoft Excel automatically creates a simple external reference formula—one using absolute references. Simple external reference formulas should cover most conditions for linking worksheets. If you think you need to use a complex external reference formula, see "Guidelines for Creating Links Between Worksheets," earlier in this topic.

You can also create a link by typing the external reference formula in the formula bar. For example, entering =SHEET1.XLS!$A$1 as the formula for a cell links that cell to cell A1 in the worksheet called SHEET1.XLS. For information on entering formulas, see **Formula** and **Formula bar**.

Note If the worksheet data to be linked is not accessible when you establish a link by entering the formula, Microsoft Excel displays a message. For information on corrective steps you can take, see "Opening and Updating Linked Worksheets," later in this topic.

Saving Linked Worksheets

In general, always save supporting worksheets before saving the dependent worksheet linked to them. This ensures that document names in external references are current. Anytime you name or rename a supporting worksheet, the dependent worksheet must be open for the name change to be updated in the external reference.

If you try to save a dependent document that contains a reference to an unsaved supporting worksheet, Microsoft Excel displays a message. Choose the Cancel button, and follow the appropriate procedure:

To save new, unnamed linked worksheets

1. Activate the supporting worksheet window.
2. Choose File Save As.
3. In the text box, type a document name.
4. Choose the OK button.
5. Follow steps 1–4 for each additional supporting worksheet.
6. Activate the dependent worksheet window.
7. Choose File Save As.
8. In the text box, type a document name.
9. Choose the OK button.

To save changes in previously linked worksheets

1. Activate the supporting worksheet window.
2. Choose File Save.
3. Follow steps 1–2 for each additional supporting worksheet.
4. Activate the dependent worksheet window.
5. Choose File Save.

Important If you save linked worksheets in different directories, make sure that you use the File Save As command to save all supporting worksheets before you save the dependent worksheet. For information on managing linked files in different directories, see "Redirecting Links for Worksheets You Rename or Move," later in this topic. For information on working with directories, see **Directories**.

Opening and Updating Linked Worksheets (Full Menus)

Use the following guidelines for opening or updating linked worksheets:

- **Dependent worksheets with simple external references.** If you open a dependent worksheet before opening its supporting worksheets or if you choose to leave supporting sheets closed to save memory, Microsoft Excel displays a message asking if you want to update references to nonresident worksheets. Choose the OK button to update simple external references. Choose the Cancel button if you want to use the last values in the simple external reference formulas.
- **Dependent worksheets with complex external references.** If you open a dependent worksheet with complex external reference formulas before you open the supporting worksheets, you'll see the #REF! error value in cells containing the formulas. To resolve the error values and update the references, open the supporting worksheets.
- **External references for closed or open supporting worksheets.** External references are displayed differently in the dependent worksheet, depending on whether or not the supporting worksheets are open. When viewed in the formula bar, an external reference to a supporting worksheet that is closed is displayed with the full pathname — drive, directory name, and name of document (for example, C:\TABLES\TAX.XLS!$A$1). If the supporting worksheet is open, it appears without the pathname (for example, TAX.XLS!$A$1).
- **Worksheets with the same document name in different directories.** If you have multiple supporting worksheets with the same basic document name in different directories, you can open only one of those documents at a given time. For example, if you open a document called EAST.XLS from the C:\WORK\REGIONS directory, you cannot also open another document called EAST.XLS from a different directory.

Important If you have renamed a supporting worksheet or have saved either a supporting or dependent worksheet in a different directory, you may have to redirect the links. For more information, see "Managing Linked Worksheets in Different Directories," later in this topic. For information on working within directories, see **Directories**.

You can easily open one or more supporting worksheets for the active dependent worksheet with the File Links command. You can also use this command to view a list of the supporting worksheets.

To open or view the list of the supporting worksheets for the active worksheet:

1. Make sure the dependent worksheet is open and in the active window.
2. Choose File Links.

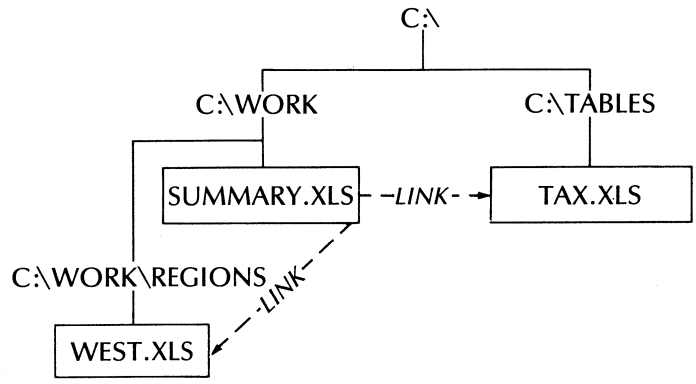
   The dialog box displays a list of all supporting worksheets for the dependent worksheet.
3. In the list box, select the names of the worksheets you want to open.

   To select several documents at one time in the list box: with the keyboard, hold down CONTROL as you press the UP or DOWN key to move to each document. As you move to a document, press SPACEBAR to add it to the selection. With the mouse, hold down SHIFT and click each document you want to open.
4. Choose the Open button to open the sheets. If you are just viewing the list, choose the Cancel button when you are finished.

For more information, see **File Links command**.

Managing Linked Worksheets in Different Directories

Whenever possible, you should try to save linked worksheets in the same directory. However, you might find it more efficient to set up certain models with linked worksheets in different directories, as shown in the following illustration.



- *C:\WORK and C:\TABLES are two directories at the same level.*
- *SUMMARY.XLS is a document in the C:\WORK directory and is the dependent worksheet for all the links indicated.*
- *TAX.XLS is a document in the C:\TABLES directory and is a supporting worksheet for SUMMARY.XLS.*
- *C:\WORK\REGIONS is a subdirectory of C:\WORK.*
- *WEST.XLS is a document in the C:\WORK\REGIONS directory and is also a supporting worksheet for SUMMARY.XLS.*

The following guidelines apply to managing linked worksheets in different directories:

- **Save the supporting worksheets before saving the dependent worksheet to correctly maintain links.** Use the File Save As command, and, in the File Save As dialog box, type the full pathname (drive, directory name, document name). This ensures that Microsoft Excel can correctly track the link and update references. For example, if you're saving the TAX.XLS worksheet and SUMMARY.XLS worksheet for the first time after creating the link, you should first save TAX.XLS by typing *C:\TABLES\TAX.XLS* in the File Save As dialog box.
- **If you use MS-DOS or Microsoft Windows to move Microsoft Excel documents between directories, you should also move all linked worksheets stored in the same directory or in subdirectories of that directory.** For example, if you move SUMMARY.XLS to a different directory, you should also create a REGIONS subdirectory in that directory and move WEST.XLS to the REGIONS subdirectory to correctly maintain the links. This is because Microsoft Excel tracks linked worksheets in "relative" terms if the worksheets are originally stored in the same directory or a subdirectory thereof. In the preceding illustration, Microsoft Excel tracks the external reference in SUMMARY.XLS to WEST.XLS as "one subdirectory down." However, Microsoft Excel

tracks supporting worksheets outside a given directory (or its subdirectories) in "absolute" terms (like an absolute reference in worksheet cells). Thus, if you moved SUMMARY.XLS to a new directory, its link to TAX.XLS would not be affected.

- **Redirect the links, if necessary.** If you haven't followed the above guidelines, your links may have gotten disconnected. When you try to open the dependent worksheet, Microsoft Excel displays a message indicating that it can't find the supporting worksheet. If this happens, use the File Links command to redirect links for dependent or supporting worksheets you've moved to different directories. This procedure allows Microsoft Excel to correctly reestablish the links and update references properly. For information on this procedure, see the next section in this topic.

For more information on working with directories, see **Directories**.

Redirecting Links for Worksheets You Rename or Move
(Full Menus)

Use this procedure to redirect links if you:

- Renamed a supporting worksheet without the dependent worksheet being open.
- Moved a dependent or supporting worksheet to another directory without opening the linked worksheets and first saving the supporting worksheets and then the dependent worksheet with the File Save As command.

Note If you moved a linked worksheet and the links are only to documents in other directories, rather than to documents in the same directory or a subdirectory thereof, you don't need to redirect links. For more information, see the previous section in this topic. For information on working with directories, see **Directories**.

To redirect links for supporting worksheets you rename or move:

1. Open the dependent worksheet.
2. Choose File Links.
3. Select the name of the supporting worksheets you want to redirect links for.

   To select several documents at one time in the list box: with the keyboard, hold down the CONTROL key as you press the UP or DOWN key to move to and select each document. As you move to a document, press SPACEBAR to add it to the selection. With the mouse, hold down SHIFT and click each document you want to redirect links for.

4. Choose the Change button.
   Microsoft Excel displays a dialog box for each document you selected.
5. In the text box, type the complete, new document name, including its pathname.
6. Choose the OK button.
7. Follow steps 5–6 for each document you selected.

Removing Links Between Worksheets

You can remove links between worksheets in the following ways:

- **"Freeze" the value of an entire external reference formula.** This removes the link and finalizes the formula as a value in the dependent worksheet. Use this procedure if the external reference formula comprises an entire cell entry.
- **"Freeze" the value of an external reference that is part of a larger formula.** This freezes only the value for the external reference portion of a larger formula in the dependent worksheet. Use this procedure if you want to preserve the rest of the formula as a formula and not a value.
- **Delete all external references to the supporting worksheet from the dependent worksheet.** This erases the external references entirely from the dependent worksheet. Use this procedure if you no longer need the values from the supporting worksheet in the dependent worksheet. (Use standard procedures for editing in the formula bar: select the cell with the external reference, press BACKSPACE to delete it from the formula bar, then press ENTER or choose the enter box.)

To freeze values of entire external reference formulas (Full menus)

1. Select the cell or cells with external references.
2. Choose Edit Copy.
3. Choose Edit Paste Special.
4. Select the Values option.
5. Choose the OK button.

To freeze the external reference portion of a larger formula

1. Select the cell with the external reference.
2. In the formula bar, select the external reference part of the formula.
3. Choose Options Calculate Now.
4. Press ENTER or choose the enter box.

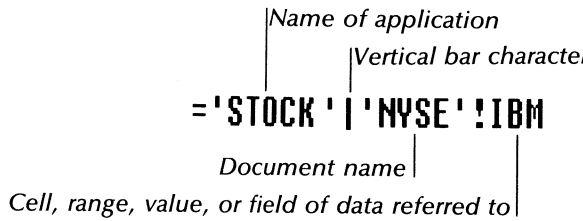
Tip To make sure all links are deleted, scan the worksheet by choosing the Formula Find command. Type an exclamation point (!) in the Find What box and select the Formulas option. When you choose the OK button, Microsoft Excel looks for any formula containing the ! character. For more information, see **Formula Find command**.

Linking Worksheets to Other Applications

If you are running Microsoft Excel under Microsoft Windows, version 2.0 or higher, you can link a Microsoft Excel worksheet to a document in a different application, such as a communications server with current stock listings or a database application.

The Parts of a Remote Reference Formula

Linking a Microsoft Excel worksheet to a document in another application is similar to linking Microsoft Excel worksheets. In the worksheet, you build a remote reference formula — similar to an external reference formula — that contains a remote reference to a single cell, cell range, value, or field of data in a document from the other application. The following illustration shows the parts of a remote reference formula:



A remote reference formula must appear in this syntax:

- **Name of the other application** — must be immediately preceded by an equal sign and immediately followed by a vertical bar character. (To type the vertical bar character, you press the ¦ key.) The application name should be a legal Microsoft Excel name. If it is not a legal name, enclose it in single quotation marks. In the preceding illustration, "STOCK" is the name of a hypothetical application.
- **Name of the document (or topic) in the other application** — must be immediately followed by an exclamation point (!). It should be a legal Microsoft Excel name. If it is not a legal name, enclose it in single quotation marks. In the preceding illustration, "NYSE" is the name of a document that contains New York Stock Exchange data. Some applications, such as certain servers, may not manage data as documents but as "topics" instead. For more information, see **Exchanging data between applications**. For information on guidelines for legal Microsoft Excel names, see **Names**. For information on how a specific application manages data, see the documentation accompanying the application.

- **Cell, range, value, or field of data referred to** — in the preceding illustration, "IBM" specifies a field of data in the document being referred to by the formula. If the name of the data resembles a cell reference, enclose it in single quotation marks (for example, =DATABASE¦FILE1!'A1').

Creating a Link Between a Worksheet and Another Application
(Full Menus)

To create a link between a Microsoft Excel worksheet and another application, you must already be running both applications under Microsoft Windows, version 2.0 or higher.

Note

In the following procedure, the term "dependent worksheet" refers to the Microsoft Excel worksheet in which you are building the remote reference formula. The term "supporting document" refers to the document in the other application.

1. Open the dependent worksheet and the supporting document you want to link.
2. Activate the supporting document window.
3. Select the cell, cell range, value, or field of data you want to refer to.
4. Choose Edit Copy.
5. Activate the dependent worksheet window.
6. Select the cell or the upper-left corner of the range that will contain the remote reference.
7. Choose Edit Paste Link.

   Microsoft Excel creates the remote reference formula that links the documents.

Note

If a link to a remote data item is pasted into more than one cell, the Edit Paste Link command will enter it as an array. For information on editing arrays, see **Array**.

If the Edit Paste Link command is grayed when you select the Edit menu, the application in which you copied does not support linking of data compatible with the Microsoft Windows Dynamic Data Exchange, or cannot supply the data in a format that Microsoft Excel understands. For more information, see the documentation accompanying the specific application.

You can also create the link by typing the remote reference formula in the formula bar. When you establish a link by typing the formula, if the remote

data to be linked is not accessible, Microsoft Excel displays a message. For more information, see "Opening and Updating a Worksheet Linked to Another Application," the next section in this topic. For information on entering formulas, see **Formula** and **Formula bar**.

Opening and Updating a Worksheet Linked to Another Application

When you open a worksheet containing remote references, Microsoft Excel displays a message asking if you want to re-establish links to the other application. Choosing the OK button re-establishes the links; choosing the Cancel button freezes the linked references and uses their last values.

When Microsoft Excel tries to re-establish a link, if the supporting application is not running or cannot be accessed, Microsoft Excel displays a message asking if you want to start the supporting application. If you choose the OK button, Microsoft Excel starts the application. If Microsoft Excel still cannot access the data after the application is started, the cells linked to the data display an error value.

If you want your formulas to use the last values saved instead of the error values, close the worksheet without saving changes, then reopen it. If you do this, however, you will also lose any other changes you have made to your worksheet.

There may be times when you want to continue using a specific set of values received from a remote reference rather than having the values further updated.

To suspend a link and use only the last set of values received from remote references when calculating formulas:

1. Activate the dependent worksheet containing the remote references.
2. Choose Options Calculation.
3. Turn off the Update Remote References check box.
4. Choose the OK button.

Note | This procedure affects the active dependent worksheet only.

When you want to re-establish links, you need to choose Options Calculation and turn on the Update Remote References check box.

Removing Links to Other Applications

To remove links between a Microsoft Excel worksheet and a document in another application, follow one of the procedures for removing links between worksheets. For more information, see "Removing Links Between Worksheets," earlier in this topic.

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Controlling windows	Windows
Copying or moving data between Microsoft Excel documents	Copying data and formats Moving data on a worksheet
Copying or transferring data between Microsoft Excel and other applications	Exchanging data between applications
DDE protocol	Features and specifications

Functions and Macros

"Communicating with Other Applications" in Chapter 6, "Advanced Macros"

Sampler

Writing a Report with Microsoft Excel and Windows Write

Calculating a Sales Commission

Analyzing the Break-even Point

Consolidating Reports

Downloading and Charting Stock Quotes from CompuServe

Preparing a New Business Plan

Feature Guide

Multiple Windows Practices

Logical value

In Microsoft Excel, a **logical value** is either the value TRUE or the value FALSE. Usually, logical values result from formulas that contain a logical function, or an equation that is either true or false, such as $=1>0$. Logical values can also reside in a cell as constant values, when you type them in directly.

Microsoft Excel recognizes the words "true" and "false" as logical values regardless of capitalization, and converts the word to all capitals. Microsoft Excel also recognizes the values of one and zero (1,0) as logical values.

For information on using logical values in functions, see *Microsoft Excel Functions and Macros*.

Lookup table

A **lookup table** is a range of cells used by one of the worksheet functions HLOOKUP, VLOOKUP, or LOOKUP. These functions look up a value you specify and return a value from the lookup table as the result of the function.

To use a lookup table, just enter the data in a range of cells, then use the appropriate worksheet function to look up values in the table. Lookup tables are useful for having Microsoft Excel find data in a table of values. For example, a worksheet that calculates shipping and handling charges might use a lookup table that lists shipping charges based on how far an item must be shipped.

This topic explains:

- Setting up a lookup table
- Using the HLOOKUP, VLOOKUP, and LOOKUP functions

Setting Up a Lookup Table

This lookup table shows the discounts used for different customers, depending on the type of account they have and the amount of their invoice. The first column contains the compare values, the rest of the table contains the data.

	A	B	C
1		Major Account	Other Account
2	Invoice	Discount	Discount
3	0	5%	0%
4	500	7.50%	2.50%
5	1000	15%	5%
6	5000	25%	10%
7	50000	40%	20%
8			

Compare values *Data*

The table also could have been set up with the compare values in the first row of the table, and the data in the rows below.

Compare values must be listed in ascending order. The lowest value must be at the top of the column, or the left of the row, and compare values should ascend as you move down the column or across the row. The order of values, from lowest to highest, is shown on the next page.

- Negative numbers (. . . −11, −10, −9. . .)
- Zero (0)
- Positive numbers (. . .9,10,11. . .)
- Text values, in alphabetical order (A–Z)
- Logical values (FALSE, TRUE)

Uppercase text (such as "WORD") and lowercase text (such as "word") are equivalent in the lookup functions.

Using the HLOOKUP, VLOOKUP, and LOOKUP Functions

Which function you use depends on how your lookup table is set up.

If	Use
Your compare values are in the first row of the lookup table	HLOOKUP
Your compare values are in the first column of the lookup table	VLOOKUP
Your compare values aren't adjacent to your data	LOOKUP

For example, in the discount lookup table in the preceding illustration, the compare values are in the first column, so you would use the VLOOKUP worksheet function.

For information on each worksheet function, see Chapter 2, "Worksheet Function Directory," in *Microsoft Excel Functions and Macros*.

Each of the lookup functions has a similar form. The syntax of VLOOKUP is:

VLOOKUP(lookup_value,table_array,col_index)

Lookup_value is the value to look up.

Table_array is the reference of the lookup table.

Col_index is an index number. In VLOOKUP, this tells what column to look in to find the value to return. In HLOOKUP, this tells what row to look in.

In the discount lookup table shown in the preceding illustration, the function VLOOKUP(1200,A3:C7,3) looks in the first column of the table to find the largest value less than or equal to 1200, then looks in the third column of the lookup table to find 5%.

Related Information

Reference

For information on	See
Using worksheet functions	Function

Functions and Macros

"Lookup Functions" in Chapter 2, "Worksheet Function Directory"

Sampler

Calculating a Sales Commission

Lotus 1-2-3

Microsoft Excel can both open and save Lotus 1-2-3 worksheets. This makes it easy for you to use your 1-2-3 worksheets with Microsoft Excel or to exchange Microsoft Excel worksheets with others who may be using 1-2-3. If you are a Lotus 1-2-3 user, you will find that a lot of what you know also applies to Microsoft Excel. You'll also find some useful Help features that will make it easy for you to familiarize yourself with Microsoft Excel.

This topic explains file conversion between Lotus 1-2-3 and Microsoft Excel. At the end of the topic is a table of terminology differences between the two programs. Check this table if you come across an unfamiliar term as you read.

This topic explains:

- How to convert files

  Opening a Lotus 1-2-3 worksheet as a Microsoft Excel worksheet

  Saving a Microsoft Excel worksheet as a Lotus 1-2-3 worksheet

- How formulas convert

  Constants, arguments, and operands

  Operators

  Calculation

- How formats convert

  Numbers

  Alignment

  Protection

- How tables and databases convert

  Tables

  Databases

- Converting Lotus 1-2-3 macros to Microsoft Excel macros
- Terminology differences

The Help Lotus 123 command lets you quickly access the Microsoft Excel online Help system to get information on the Microsoft Excel equivalents of Lotus 1-2-3 commands. For information on Help on Lotus 1-2-3, see **Help**. Under "Functions" in the Help index, you'll find a topic about the Microsoft Excel equivalents of every 1-2-3 function. In addition, the Macro Translation Assistant is a Microsoft Excel utility program that can help you convert most 1-2-3 macros into Microsoft Excel macros. For more information, see the procedures under "Converting Lotus 1-2-3 Macros to Microsoft Excel Macros," later in this topic.

How to Convert Files

You can open Lotus 1-2-3 files in Microsoft Excel and you can save Microsoft Excel files as Lotus 1-2-3 files. Microsoft Excel understands both 1-2-3 file formats, WKS (Lotus 1-2-3, version 1A) and WK1 (Lotus 1-2-3, version 2.0 or higher). Worksheet files can be transferred in either direction. If a 1-2-3 worksheet contains graphs, each graph is converted to a Microsoft Excel chart document. Microsoft Excel charts do not convert to 1-2-3.

In general, when you transfer worksheet files between Microsoft Excel and Lotus 1-2-3, the following convert:

- Cell attributes such as formulas, values, formatting, and protection status
- Names

Window and worksheet options such as panes, titles, number of windows, and location of the selection do not convert. Printing settings such as margins, headers, and footers also do not convert.

You can convert most Lotus 1-2-3 macros to Microsoft Excel macros by using the Macro Translation Assistant. For more information, see "Converting Lotus 1-2-3 Macros to Microsoft Excel Macros," later in this topic.

Opening a Lotus 1-2-3 Worksheet as a Microsoft Excel Worksheet

You can open any 1-2-3 worksheet as a Microsoft Excel worksheet. Microsoft Excel automatically recognizes a WKS file or a WK1 file. Conversion occurs when you open the file.

1. Choose File Open.
2. Type **.wk** in the File Name box.

   If the worksheet is in a different directory than the one indicated in the dialog box, include the full pathname before **.wk** in the File Name box. For more information on working with directories, see **Directories**.
3. Press ENTER.
4. In the list box, select the 1-2-3 worksheet name.
5. Choose the OK button.

Saving a Microsoft Excel Worksheet as a Lotus 1-2-3 Worksheet

You can save a Microsoft Excel worksheet in WKS or WK1 format so that the file can be read by Lotus 1-2-3.

1. Choose File Save As.
2. Choose the Options button.
3. Under File Format, select WKS (to convert the file for Lotus 1-2-3, version 1A) or WK1 (to convert the file for Lotus 1-2-3, version 2.0 or higher).
4. In the Save Worksheet As box, type a name for the 1-2-3 worksheet.

   If you want to save the worksheet in a directory other than the one indicated in the dialog box, type the full pathname before the document name in the Save Worksheet As box. For more information on working with directories, see **Directories**.

How Formulas Convert

Microsoft Excel tries to convert all formulas when you open or save a WKS or WK1 file. If Microsoft Excel encounters a formula that it cannot convert, it displays a message that gives the reference of the cell containing the formula.

The dialog box also asks if you want to see the next formula that cannot convert. If you choose the Yes button, this message comes up for the next formula. If you keep choosing the Yes button, you'll see a message for every formula that cannot convert. When you have seen the last message, or whenever you choose the No button, a dialog box appears telling you the

total number of formulas that did not convert. When a formula does not convert, Microsoft Excel preserves the value of the formula.

Constants, Arguments, and Operands

Numbers: Both Lotus 1-2-3 and Microsoft Excel allow numbers as constants in cells and in formulas, and allow formulas that produce numbers as results.

Text: Both programs allow text as constants in cells. Microsoft Excel and Lotus 1-2-3, version 2.0 and higher, allow text constants to be included in formulas, as well as formulas that produce text as a result; Lotus 1-2-3, version 1A, does not. Thus, any Microsoft Excel formula containing a text argument or operand can convert when you save to WK1, but not to WKS.

Logical values: Microsoft Excel supports the logical values TRUE and FALSE as constants in cells and formulas, and as the result of logical formulas. In Lotus 1-2-3, TRUE and FALSE are represented by the numbers 1 and 0 in logical formulas and as the results of logical formulas, but they are not considered logical values. Microsoft Excel has TRUE and FALSE functions that produce the values TRUE and FALSE, while 1-2-3 has @TRUE and @FALSE functions that produce the values 1 and 0. The Microsoft Excel constant logical values TRUE and FALSE convert to 1-2-3's functions @TRUE and @FALSE.

Error values: Microsoft Excel supports the error values #N/A, #VALUE!, #DIV/0!, #NAME?, #NULL!, #NUM!, and #REF! as constants in cells and formulas, and as the result of formulas. Lotus 1-2-3 supports two error values, NA and ERR, and only as the result of formulas. Microsoft Excel has an NA function that produces the error value #N/A, while 1-2-3 has @NA and @ERR functions that produce the values NA and ERR. The Microsoft Excel constant error value #N/A converts to the 1-2-3 @NA function, and all other constant error values convert to @ERR.

Arrays: Lotus 1-2-3 does not support arrays. Any Microsoft Excel formula involving arrays does not convert.

References: Microsoft Excel supports references to single cells, to ranges of cells, and to multiple selections. Lotus 1-2-3 supports references to single cells and to ranges of cells, but not to multiple areas. 1-2-3 version 1A does not allow functions that produce references as a result. No version of 1-2-3 has operators that produce references like the Microsoft Excel intersection ( ), range (:), and union (,) operators.

Any Microsoft Excel formula involving a reference to multiple selections does not convert. The Lotus 1-2-3 version 1A worksheet is 2,048 rows by 256 columns, and its version 2.0 (or higher) worksheet is 8,192 rows by 256 columns. The Microsoft Excel worksheet is 16,384 rows by 256 columns. Therefore, any references in a Microsoft Excel worksheet to rows beyond 2,048 or 8,192 do not convert when you save to WKS or WK1, respectively. Also, 1-2-3 does not support external references to other worksheets, so any Microsoft Excel formulas containing external references do not convert.

Names: Lotus 1-2-3 supports range names for single cells and ranges. Microsoft Excel supports these, as well as named constant values, named formulas, and named references to multiple selections. Named constants and named formulas in Microsoft Excel do not convert as names in 1-2-3. Rather, formulas that use such names will contain the constant or formula, enclosed in parentheses, if necessary. Named references to multiple selections do not convert.

Operators

Microsoft Excel supports these operators in the following order of evaluation:

:

space

,

+ or − (unary)

%

^

* or /

+ or −

&

= < > <= >= <>

Lotus 1-2-3 supports the following operators in the following order of evaluation:

^

+ or − (unary)

* or /

+ or −

= < > <= >= <>

#NOT# (unary)

#AND# #OR#

& (version 2.0 or higher, only)

In Lotus 1-2-3, the exponentiation operator (^) is evaluated before the negation operator (−); in Microsoft Excel, negation is evaluated first. So, the formula = −2^4 produces the value −16 in 1-2-3, and 16 in Microsoft Excel. 1-2-3 does not have a union operator (,) or an intersection operator ( ). Microsoft Excel formulas containing one of these operators do not convert. A concatenation operator (&) is supported in 1-2-3, version 2.0 or higher, but not in version 1A.

Lotus 1-2-3 does not use a range operator (:) like Microsoft Excel. In 1-2-3 you can express a range using two dots, as in A1..C3. However, if A1 is named Top and C3 is named Bottom, you can't enter a range as Top..Bottom. 1-2-3 does not have a percentage (%) operator either. An expression such as 3% in a Microsoft Excel formula converts to 0.03 in 1-2-3.

Microsoft Excel does not have #AND#, #OR#, or #NOT# operators; it uses the AND, OR, and NOT functions instead. In conversion, the operators convert to the functions and vice versa.

Calculation

In Lotus 1-2-3, you can calculate a worksheet by row, by column, or by natural order (according to dependent formulas). Microsoft Excel supports only natural order. In conversion, order of calculation is always made natural.

Lotus 1-2-3 and Microsoft Excel both support automatic and manual calculation, but 1-2-3 automatic calculation is actually equivalent to "automatic except tables" calculation in Microsoft Excel. Automatic in Microsoft Excel includes the calculation of tables since tables in Microsoft Excel are formulas. In conversion from 1-2-3 to Microsoft Excel, automatic and manual convert to automatic and manual in Microsoft Excel. In conversion from Microsoft Excel to 1-2-3, automatic and automatic except tables convert to automatic, and manual converts to manual. Both 1-2-3 and Microsoft Excel allow you to specify a number of iterations. In addition, Microsoft Excel allows you to specify a maximum change between iterations. Only the number of iterations converts.

How Formats Convert

Numbers

Microsoft Excel converts Lotus 1-2-3 number formats according to the following table. In general, Microsoft Excel always tries to convert to a format with the same number of decimal places as specified in 1-2-3. If necessary, Microsoft Excel creates a custom format to accommodate extra decimal places.

In conversion from Microsoft Excel to Lotus 1-2-3, number formats convert according to the same table. Microsoft Excel formats other than those in the table are formatted as General in 1-2-3.

Lotus 1-2-3 format	Microsoft Excel format
Fixed, 0 decimals	0
Fixed, 2 decimals	0.00
Scientific, 0 decimals	0E+00
Scientific, 2 decimals	0.00E+00
Currency, 0 decimals	$#,##0 ;($#,##0)
Currency, 2 decimals	$#,##0.00 ;($#,##0.00)
Percent, 0 decimals	0%
Percent, 2 decimals	0.00%
Comma, 0 decimals	#,##0 ;(#,##0)
Comma, 2 decimals	#,##00.00 ;(#,##0.00)
General	General
+/−	General
Date1 (dd-mmm-yy)	d-mmm-yy
Date2 (dd-mmm)	d-mmm
Date3 (mmm-yy)	mmm-yy
Text	General
Hidden (version.2.0 or higher)	;

Alignment

In Lotus 1-2-3, cells containing text can be aligned to the left, right, or center; or text can be repeated to fill the cell. In conversion, these formats translate to Left, Right, Center, and Fill alignments in Microsoft Excel. Numbers in 1-2-3 are always right-aligned, and will remain so in conversion. The default alignment (global) in 1-2-3 does not convert.

In Microsoft Excel, you can align the contents of any cell. In conversion from Microsoft Excel to Lotus 1-2-3, cells that contain constant text have their alignment preserved. All non-text cells become right-aligned.

Protection

Cells that are protected in Lotus 1-2-3 are protected (locked) in Microsoft Excel and vice versa. In Microsoft Excel, you can also hide cell formulas. Hidden formulas are visible when converted to 1-2-3.

Note | Both Microsoft Excel and 1-2-3, version 2.0 or higher, have a number format that hides cell values. For more information, see "Numbers," earlier in this topic.

How Tables and Databases Convert

Tables

Microsoft Excel tables are slightly different from those in Lotus 1-2-3. Because Microsoft Excel tables are formulas, they can be calculated automatically like all other formulas on the worksheet. In 1-2-3, tables have to be calculated with a command or function key.

Lotus 1-2-3 requires the input values in a one-input table (Data table 1) to be in the first column of the table range. Microsoft Excel has no restriction on whether a one-input table has its input values in the first column or the first row of the table.

When converting tables in either direction, the formulas and values in the top row and left column, as well as the values within the tables, are converted. To calculate the tables after conversion, you have to specify them as tables again.

Databases

Microsoft Excel and Lotus 1-2-3 database commands and actions are similar. The Microsoft Excel database range and criteria range correspond respectively to the 1-2-3 input range and criterion range. Both ranges convert in either direction. Microsoft Excel and 1-2-3 can both extract database records, but the 1-2-3 output range does not convert to a Microsoft Excel extract range since Microsoft Excel extracts to the current selection.

There are minor differences in the ways Microsoft Excel and Lotus 1-2-3 interpret database criteria. For information on how criteria are specified, see your Lotus 1-2-3 manual, and **Database** in this manual.

Some Microsoft Excel database functions (DPRODUCT) have no equivalents in Lotus 1-2-3.

Converting Lotus 1-2-3 Macros to Microsoft Excel Macros

Most Lotus 1-2-3 macros can be converted into functioning Microsoft Excel macros with the Microsoft Excel Macro Translation Assistant. You can get information on how to use this utility program by choosing the Macro Translation Assistant topic in the Help index.

To start the Macro Translation Assistant:

1. If the Help window is open, close it.
   Lotus 1-2-3 macros convert more efficiently with more free memory.
2. Choose Control Run (ALT, SPACEBAR, U)
3. Select Macro Translator Assistant.
4. Choose the OK button.

The Macro Translation Assistant converts macros in one direction only. Most Microsoft Excel macros cannot be converted into 1-2-3 macros without significant functionality losses.

Terminology Differences

The terminology used by Lotus 1-2-3 and Microsoft Excel is similar in many ways, but differences do exist. Use this table to compare terms:

Lotus 1-2-3	Microsoft Excel
Data table 1	One-input table
Data table 2	Two-input table
Graph	Chart
XY graph	Scatter chart
Strings	Text
Labels	Text constants
Current cell	Active cell
Protected cell	Locked/protected cell
Cell address/reference	Cell reference
Worksheet titles	Freeze panes
Window	Pane

Lotus 1-2-3	Microsoft Excel
Print range	Print area
Label/matching criteria	Comparison criteria
Number/matching criteria	Comparison criteria
Formula criteria	Computed criteria
Input range	Database range
Output range	Extract range
Copy	Copy and paste
Move	Cut and paste
Retrieve	Open
Erase	Clear
Highlight	Select

Related Information

Reference

For information on	See
Opening and saving documents in Microsoft Excel	Opening a document Saving and closing a document
Formulas and operators in Microsoft Excel	Formula Formula bar Operator
Converting Multiplan files to Microsoft Excel	Multiplan
Data tables and lookup tables in Microsoft Excel	Data table Lookup table
Using database features in Microsoft Excel	Database
General overview of formatting options (display and print)	Formatting a document
General overview of built-in worksheet functions and macros in Microsoft Excel	Function Macro

Sampler

Creating an Automated Invoice System

Getting Started and Quick Reference

Importing Macros

Macro

A **macro** is a set of instructions that you create for Microsoft Excel to follow. You store the macro so you can use it anytime. Think of macros as a shortcut: a keystroke or two tells the macro to carry out your instructions — whether for routine tasks like worksheet formatting or complex number-crunching with specialized formulas.

Macros are also the key to customizing. With the functions, menus, and dialog boxes you define, you can use macros to create customized applications that work with Microsoft Excel.

This topic includes:

- An overview of macros

  Types of macros

  Macro tools

- A closer look at command macros

  Recording a command macro

  Running a command macro

- A closer look at function macros

  Using Function Macros

This topic explains only the basics of working with Microsoft Excel macros. For complete information on macros, see *Microsoft Excel Functions and Macros*, a separate manual included in your Microsoft Excel package. For ideas and examples for using macros, see *Microsoft Excel Sampler*, also included in your Microsoft Excel package.

An Overview of Macros

Macros can be very simple or extremely complex. No matter how elementary or complex the macro, the time invested in creating the macro buys you extra time and accuracy, while saving you considerable effort in the long run.

For example, if you create a regular monthly summary using data on worksheets supplied by four people, imagine creating the summary with just a few keystrokes. The macro you've designed for this purpose can open the correct documents, gather the data, enter the data in the summary, and format it to your specifications.

Macros are particularly effective for:

- **Automating frequently performed tasks — simple or complex.** For example, you may tend to repeat steps when creating a new worksheet or performing a task. Any procedure in Microsoft Excel that you find yourself doing repeatedly is a good candidate for a macro.
- **Creating custom calculation tools and simplifying complex worksheets.** If you work with specialized formulas and complex calculations, you can create your own functions to extend the Microsoft Excel calculation capabilities beyond the built-in worksheet functions.
- **Designing custom applications that work with Microsoft Excel.** You can use macros to develop specialized applications with menus and dialog boxes tailored to your design. Interactive macros will pause and request data from the user while they run. If you create applications for other users less familiar with spreadsheets, such macros can become your mainstays.
- **Running other applications under Windows, version 2.0 or higher, with Microsoft Excel.** If you are running Microsoft Excel under Windows, version 2.0 or higher, you can use macros to run other applications and to move data to and from other applications.

In short, a macro is a powerful way of doing the most in the least amount of time with the greatest accuracy.

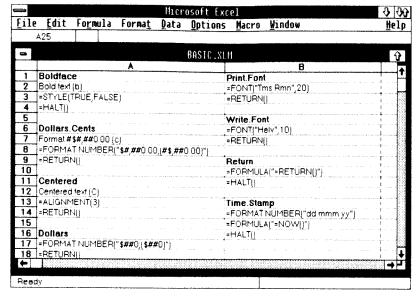
Types of Macros

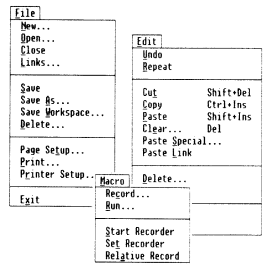
In Microsoft Excel you can create two kinds of macros: command macros and function macros.

- A **command macro** automatically carries out a planned sequence of actions, such as choosing commands, entering data, and selecting cells or parts of a chart.
- A **function macro** is a "user-defined function." Function macros take values, make calculations, and return values, just like the built-in worksheet functions.

Macro Tools

Here's a quick survey of the Microsoft Excel main macro tools:





	A
1	Underline
2	=SELECT("R")
3	=INSERT(2)
4	=ROW.HEIGHT(3,"R")
5	=BORDER(FALSE,,,TRUE,TRUE,FALSE)
6	=RETURN()
7	
8	

Macro sheet

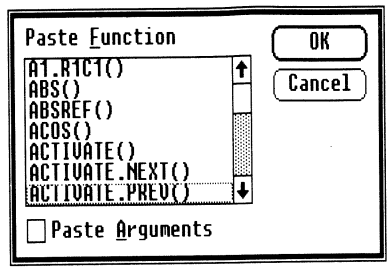
You create and store a Microsoft Excel macro on a macro sheet. One macro sheet can contain many macros, so you can conveniently group macros related to a set of tasks. Because macros aren't confined to particular worksheets, you can use the same macro with any worksheet you want.

Commands

You use commands on the File menu to create, save, and open macro sheets, just as you do other documents. You use commands on the Edit menu to edit a macro sheet, just as you edit a worksheet. With the commands on the Macro menu, you create, name, and run macros.

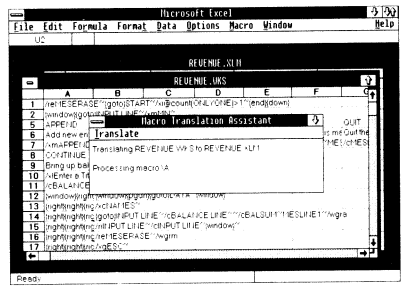
Macro recorder

With the recorder, creating a command macro is easy. You simply switch on the recorder (through the Macro menu) and carry out the commands and actions you want the macro to perform; meanwhile, the recorder enters each instruction of the macro — correct syntax and all — on the macro sheet for you.



Functions

Functions are the building blocks used to create a macro. Any worksheet functions, such as SUM or AVERAGE, can be used in a macro. There is also another set of functions, called macro functions, that are for use only in macros. (Note that a macro function is not the same as a function macro. You create a command macro or a function macro from macro functions.)



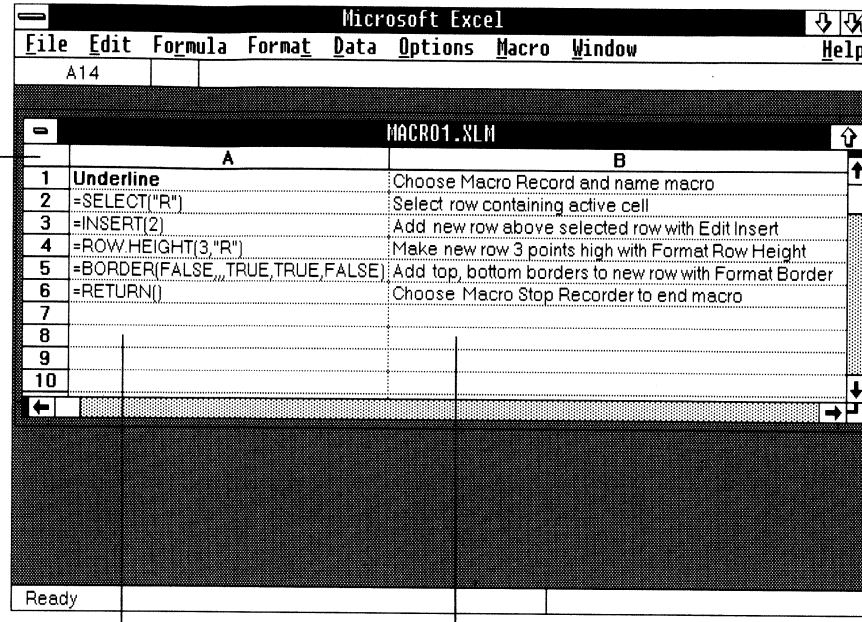
Macro Translation Assistant

If you're converting Lotus 1-2-3 worksheets with macros to Microsoft Excel, the Macro Translation Assistant can help convert most Lotus 1-2-3 macros into functioning Microsoft Excel macros. For information on this helpful utility program, see **Lotus 123**.

For complete information on macros, as well as directories of the worksheet functions and macro functions, see *Microsoft Excel Functions and Macros*.

A Closer Look at Command Macros

The easiest way to create a command macro is by recording it. The following example shows a command macro created with the recorder. This macro makes a double underline above the row containing the active cell in a worksheet.



Microsoft Excel automatically records the macro on a macro sheet when you choose the Macro Record command.

Column A shows the actual contents of the macro as Microsoft Excel recorded it.

Comments in column B were added after recording the macro to describe the command or action in each line of the macro.

You could have also typed each line of the macro yourself. But you can edit or fine-tune a recorded command macro later on, so the quickest, easiest way to build an initial command macro is to use the macro recorder.

Recording a Command Macro

Before you start recording a command macro, plan out the steps involved and the commands and actions you want to include. If you make a mistake while recording, remember that you can edit the macro later.

1 Choose Macro Record.

In the dialog box, Microsoft Excel proposes a name and shortcut key combination you can use later to run the macro.

2 Make any changes you want in the proposed name and shortcut key.

Make sure the name you specify is a legal Microsoft Excel name and that the shortcut key is a single letter other than *e*, *i*, *n*, or *u*.

3 Choose the OK button.

Microsoft Excel opens a macro sheet under your worksheet (unless you've already recorded on an open macro sheet), and enters the macro name. If the status bar is on, the Recording indicator is displayed.

4 Carry out whatever actions you want recorded in the macro.

Microsoft Excel records the actions on the macro sheet.

5 When you are finished, choose Macro Stop Recorder.

Running a Command Macro

You can run any command macro with the Macro Run command. If you defined a shortcut key when you recorded the macro, you can also run the macro by holding down the CONTROL key and pressing the shortcut key.

To run a command macro with the Macro Run command

1 If necessary, choose File Open to open the macro sheet containing the command macro.

2 Choose Macro Run.

3 In the list box, select the name of the command macro you want to run, or, in the Reference box, enter the reference of the first cell of the command macro you want to run.

4 Choose the OK button.

To run a command macro with a shortcut key

1 If necessary, choose File Open to open the macro sheet containing the command macro.

2 Hold down the CONTROL key and press the shortcut key you defined when you created the macro.

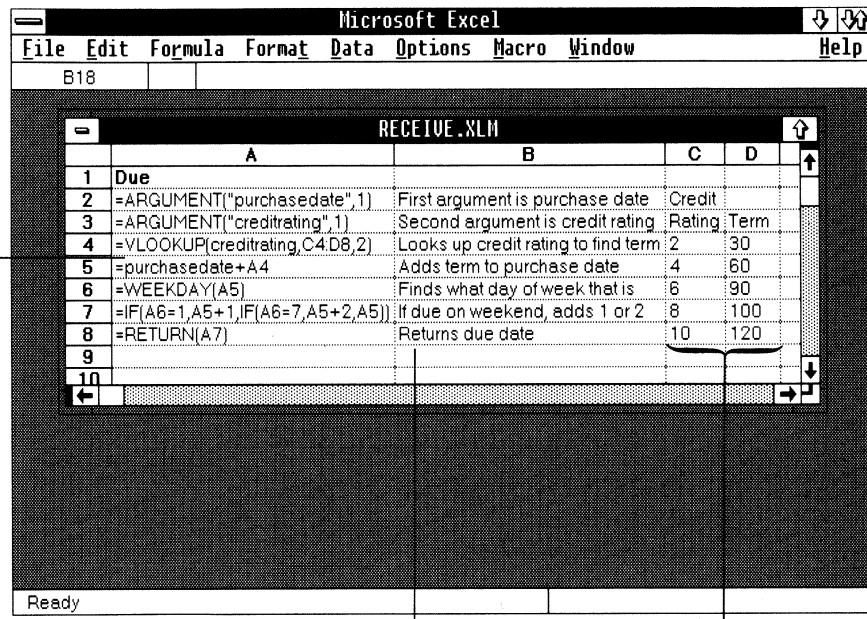
Since command macros are like the commands built into Microsoft Excel, you can even put them on their own menus. For information on making your own menus and dialog boxes, see "Creating Customized Menus and Dialog Boxes" in Chapter 6, "Advanced Macros," in *Microsoft Excel Functions and Macros*.

A Closer Look at Function Macros

Function macros are essentially user-defined functions — custom functions you create that aren't included among the built-in worksheet functions. For example, maybe you regularly use a set of formulas that calculates when a payment is due, based on the date of purchase and the credit rating of the customer. You can enter these formulas on a macro sheet and give them a name such as Due. Then, you can use the Due function on your worksheets, without having to repeatedly build the formulas that comprise Due.

Unlike a command macro, a function macro can't be created with the recorder because this type of macro doesn't perform actions — it makes calculations. Instead, you build a function macro by entering formulas and text on a macro sheet. If you've used the worksheet functions, you're already familiar with some of the conventions involved.

Microsoft Excel Functions and Macros fully explains the procedures for creating a function macro. But to give you an idea of what a function macro is like, here's a simple example of what the Due function macro might look like:



Column A of the macro sheet shows the content of the macro.

Each comment in column B describes one line of the macro.

Columns C and D comprise a lookup table for the formula in cell A4 (VLOOKUP function).

Using Function Macros

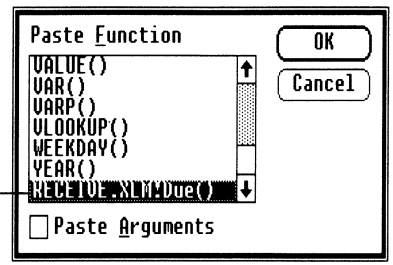
To use a function macro, first make sure the macro sheet containing the function macro is open, then enter the function in a formula the same way you enter the built-in worksheet functions. You can do either of the following:

- Type in the function name yourself.

  First type the name of the macro sheet that the function is on, then an exclamation mark, then the name of the function macro. For example: *PAYROLL.XLM!FICA()*

- Use the Formula Paste Function command to paste the function for you.

  In the Formula Paste Function dialog box, Microsoft Excel lists any function macros on all open macro sheets. Choose the Formula Paste Function command, select the function macro you want from the dialog box, and choose the OK button. Function macros are listed last in the Formula Paste Function dialog box, so you'll have to scroll the list to see them. For instance, here's how the example function macro for calculating the due date of a payment would appear in the Formula Paste Function dialog box:



The function macros you create appear at the end of the list in the Formula Paste Function dialog box.

If you can't find the name of the function macro you're looking for in the dialog box, first make sure its macro sheet is open. If the macro sheet is open but the name is not listed, the function macro's name probably wasn't defined. For information on defining function macro names, see *Microsoft Excel Functions and Macros*.

Related Information

Reference

For information on	**See**
The Microsoft Excel built-in worksheet functions	Function

Functions and Macros

For complete information about the worksheet functions and about macros

Sampler

Solving Simultaneous Equations

Consolidating Reports

Calculating a Sales Commission

Changing Coordinate Systems

Tutorial

What Is a Macro?

Using a Command Macro

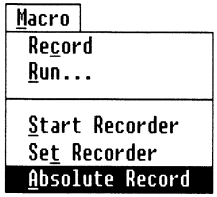
Recording a Macro

Feature Guide

Macros

Macro Absolute Record command

(Full menus)

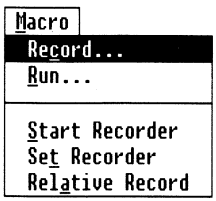


Records cell references in a macro as absolute references.

Initially, cell references in macros are recorded as absolute references. When recording absolute references, this command appears on the Macro menu as Relative Record, allowing you to change to relative reference recording. If you choose the Macro Relative Record command, the command changes to Macro Absolute Record. Choose Macro Absolute Record to go back to recording cell references as absolute references.

For information on macros, see *Microsoft Excel Functions and Macros*.

Macro Record command



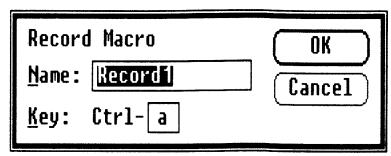
Records subsequent actions as a macro, so you can later repeat those actions by running the macro.

If no macro sheet is open, or if none of the open macro sheets has the recorder range set, Macro Record opens a new macro sheet and starts recording in cell A1. If a macro sheet is open, and has the recorder range set, Macro Record starts recording in the recorder range if it is blank, or in the first blank column if the recorder range is not blank.

This command appears on the File menu as Record Macro if all documents are closed or hidden.

For information on macros, see *Microsoft Excel Functions and Macros*.

Before recording starts, a dialog box appears:



Name

Type a short name that will remind you of what the macro does.

Key

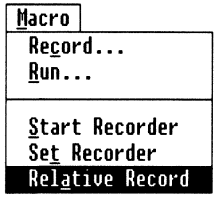
Type a shortcut key you can use to quickly run the macro later. The shortcut key can be any upper- or lowercase letter except *e*, *i*, *n*, or *u*. The shortcut key cannot be a number.

While you are recording, the command changes to Stop Recorder. When you are finished recording your actions, choose Macro Stop Recorder.

All recording you do in one work session is recorded on the same macro sheet. If you are using short menus, you can't add a macro to a macro sheet you created in a previous work session. You have to use the Macro commands that appear only on full menus in order to specify where the recorder should be placed.

Macro Relative Record command

(Full menus)

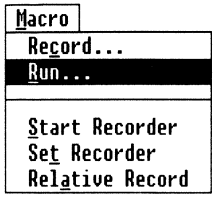


Records cell references in a macro as relative references.

Initially, cell references in macros are recorded as absolute references. When recording relative references, this command appears on the Macro menu as Absolute Record, allowing you to change back to absolute reference recording.

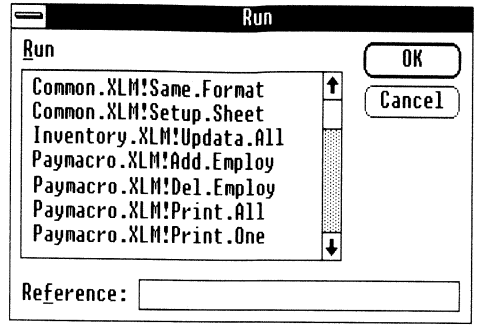
For information on macros, see *Microsoft Excel Functions and Macros*.

Macro Run command



Runs a command macro from an open macro sheet.

For information on macros, see *Microsoft Excel Functions and Macros*.



Run

Lists all named macros on all open macro sheets. Each macro name is preceded by the name of the macro sheet containing the macro, and an exclamation point. Select the macro you want to run from this list box, or use the Reference text box.

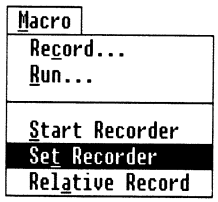
Reference

Displays the macro selected in the Run list box. You can also run a macro by typing the name or cell reference of the first cell of the macro in the Reference box.

If you type the macro name yourself, make sure you use the same format that Microsoft Excel uses in the Run list box.

Macro Set Recorder command

(Full menus)



Defines the selection on your macro sheet as the recorder range. If the selection is a range of cells, that range becomes the recorder range. If the selection is a single cell, all the cells below that cell in the same column become the recorder range.

Use Macro Set Recorder when you want to start recording a macro on a specific macro sheet or part of a macro sheet.

Recording starts in the upper-left corner of the range and proceeds down the left column. At the bottom of each column within the selected range, recording is redirected to the cell at the top of the next column in the range with a GOTO function and continues down from there.

If the selection is a single blank cell, or the first cell in the recorder range is a blank cell, recording starts in that cell and continues down in the same column.

If the selection is a single, non-blank cell, or the first cell in the recorder range is a non-blank cell, recording starts at the end of the recorder range and continues downward. If the end of the recorder range contains a RETURN function, RETURN is overwritten. If the end of the range contains any other function, recording begins after that cell.

For information on macros, see *Microsoft Excel Functions and Macros*.

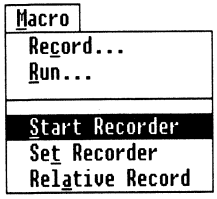
Macro sheet

A **macro sheet** is a worksheet that contains macros. Everything in a macro sheet works like a regular worksheet with the following exceptions:

- Worksheets normally display values, while macro sheets normally display formulas. For information on displaying formulas and values, see **Options Display command**.
- Macro sheets start with a wider column width to accommodate the formulas.
- When a macro sheet is the active document, the Formula Define Name dialog box has an extra set of options because there are different types of macros. For more information, see **Formula Define Name command**.

Macro Start Recorder command

(Full menus)



Records subsequent actions and commands until you choose Macro Stop Recorder. The actions and commands are recorded as Microsoft Excel macro functions.

Before you start recording, you have to set the recorder range on your macro sheet with the Macro Set Recorder command, or by recording a macro with the Macro Record command. You cannot choose Macro Start Recorder until you set the récorder range. For more information, see **Macro Set Recorder command**.

While you are recording, Stop Recorder appears in place of Record on the Macro menu. When you choose Stop Recorder to stop recording, the command changes back to Record.

You can use Macro Start Recorder and Macro Stop Recorder to temporarily pause while recording a macro. You can also use them to add to an existing macro.

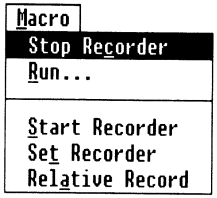
Initially, cell references are recorded as absolute references. References can also be recorded as relative references. For more information, see **Macro Absolute Record command** and **Macro Relative Record command**.

If Microsoft Excel encounters a non-blank cell, it stops recording and displays a message telling you that the recorder range is full.

For information on macros, see *Microsoft Excel Functions and Macros.*

Macro Stop Recorder command

(Full menus)



Ends macro recording you started with the Macro Record or Macro Start Recorder command.

Stop Recorder appears in place of Record on the Macro menu while you are recording a macro. When you choose Macro Stop Recorder to stop recording, the command changes back to Macro Record.

For information on macros, see *Microsoft Excel Functions and Macros.*

Memory management

When you open a document, Microsoft Excel keeps it in your computer's memory while you are using it. To get the best performance from Microsoft Excel, use memory efficiently when you run Microsoft Excel, and make sure there is sufficient memory available to Microsoft Excel.

This topic explains:

- How Microsoft Excel uses memory
- Reducing amount of memory used
  Reducing memory used by Microsoft Excel
  Reducing memory used by other programs
- Increasing available memory
  Adding memory
  Using extra memory

How Microsoft Excel Uses Memory

When you start Microsoft Excel, your computer has a certain amount of free memory which Microsoft Excel can use to store the documents you are using. You can find out how much free memory you have by choosing the Help About command. The amount of free memory depends on:

- How much total memory your computer has (that is, basic memory plus expanded memory).
- How much memory your computer is using for accessory programs and drivers, such as "terminate-and-stay-resident" programs and network drivers.
- How large the open documents are.
- How many fonts are used by all open documents.
- What other programs are running with Microsoft Excel.

  If you run Microsoft Excel without Microsoft Windows, for example, you may also be running Control Panel or Help. If you run Microsoft Excel with Microsoft Windows, version 2.0 or higher, you may also be running other Windows applications.

On a computer with 640K of basic memory, with no expanded memory and no accessory programs or drivers in use, Microsoft Excel can accommodate approximately 100K of data. If you have more than 100K of data on such a computer, Microsoft Excel performs more slowly than normal. If Microsoft Excel completely runs out of memory, it displays a message.

If you try to start Microsoft Excel when your computer doesn't have enough memory for the program to run adequately, a message is displayed and Microsoft Excel does not start.

Reducing Amount of Memory Used

You can reduce the amount of memory being used by Microsoft Excel or by other programs.

Reducing Memory Used by Microsoft Excel

To save memory when using Microsoft Excel, you can:

- Reduce the number of documents open at one time.

  Closing documents as soon as you're done with them frees the memory they occupied.

- Reduce the number of fonts used in your Microsoft Excel documents.

  Microsoft Excel keeps in memory the fonts used by all open documents. The fewer fonts used, the less memory is used.

- Break large worksheet models into small, linked worksheets.

  Large worksheets use a lot of memory, and are also hard to maintain. Breaking a worksheet into several smaller worksheets and connecting those worksheets with links reduces the amount of memory you need.

  For example, suppose you use a large worksheet to process your income taxes. To break it down, you could use one worksheet for each schedule or form. You would usually need only one of the worksheets open at a time, and so you would use much less memory. For information on linking, see **Linking documents**.

- Avoid large blank areas between occupied columns of a worksheet.

  Microsoft Excel automatically reduces memory used by blank rows and columns at the beginning and end of a worksheet. However, blank columns in the middle of a worksheet use memory even though they contain no data.

- Convert repetitive worksheet formulas into array formulas.

  If several adjacent cells have equivalent formulas, you can often save memory by replacing their formulas with one array formula.

  For example, if the cells A1:A3 of a worksheet contain the formulas =B1*2, =B2*2, and =B3*2, you can enter the array formula =B1:B3*2 into the range A1:A3. Microsoft Excel keeps one array formula in memory, instead of the three formulas it would keep otherwise.

Note | Formulas that return arrays must be entered as array formulas. To enter an array formula, press CONTROL+SHIFT+ENTER, or, with a mouse, press CONTROL+SHIFT while you click the enter box in the formula bar. For information on entering array formulas, see **Array**.

Reducing Memory Used by Other Programs

To reduce the amount of memory being used by other programs, you can:

- Avoid using "terminate-and-stay-resident" programs.

  Terminate-and-stay-resident programs are accessory programs that stay in memory, such as desktop accessory packages and keyboard macro packages. These programs can use large amounts of memory, and may interact unpredictably with the Microsoft Windows environment in which Microsoft Excel operates.

- Minimize the number of device drivers loaded on your computer.

  Device drivers, such as network drivers, mouse drivers, and terminal drivers, use memory. Special terminal drivers (for example, ANSI.SYS, VT52.SYS), and separate mouse drivers (for example, MOUSE.SYS) are not needed by Microsoft Excel. If unnecessary drivers are automatically loaded when you start your computer, you may need to remove their entries from your computer's configuration file. For information on configuring your system, consult your dealer.

- Avoid running other applications while running Microsoft Excel.

  If you are running Microsoft Excel under Microsoft Windows, version 2.0 or higher, you can simultaneously run many other applications, such as word processors, communication programs, and so on. When running Microsoft Excel without Windows, you can still run the Tutorial, Feature Guide, Help, Macro Translation Assistant, Control Panel, Clipboard, and Spooler. If you are using large documents in Microsoft Excel, you may want to avoid running other applications at the same time.

Note | By modifying your WIN.INI file, you can avoid running Spooler when printing. For more information, see **Printing a document** and **Default settings**.

Increasing Available Memory

If you want to have more memory available to Microsoft Excel, you can add memory to your computer or use your computer's unused memory, if any.

Adding Memory

Microsoft Excel requires that your computer have 640K of basic memory. If your computer has less than 640K of basic memory, you need to add the necessary memory to run Microsoft Excel.

You can increase the memory of your computer beyond 640K by adding expanded memory. For more information, see **Hardware and system configuration**.

Note | When using expanded memory, Microsoft Excel can place a larger fraction of your worksheet in expanded memory if you place most of your worksheet's data to the left of column 160.

Using Extra Memory

Some computers based on the Intel 80286 and 80386 processors have more than 640K of basic memory. To find out whether your computer has more than 640K of basic memory, consult your dealer.

If your computer has more than 640K of basic memory, there are two ways you may be able to use to take advantage of the extra memory:

- Emulate expanded memory.

  If your computer is based on the Intel 80386 processor, this is the best way to make its extra memory, if any, available to Microsoft Excel. For more information on emulating expanded memory, run the Setup program. For information on running the Setup program, see *Getting Started* and *Quick Reference*.

- Switch basic memory to expanded memory.

  The memory boards of some computers, such as the IBM Personal System/2 models 50 and 60, can be switched to be used as expanded memory. For information on expanded memory, see **Hardware and system configuration**.

Related Information

Reference

For information on	See
Configuring your system	Hardware and system configuration

Sampler

Solving Simultaneous Equations

Menu and menu bar

A **menu** is a grouping of available commands. The Microsoft Excel commands are organized in drop-down menus along the **menu bar**, a bar that displays menu names at the top of the Microsoft Excel window.

This topic explains:

- Short menus and full menus
- Menu bars in Microsoft Excel
- Menu bars in the Microsoft Excel utility programs

This topic does not cover step-by-step procedures for displaying menus and choosing commands. For the basics of working with commands using either the keyboard or the mouse, see **Command, menu, and dialog box**.

Short Menus and Full Menus

Microsoft Excel has two sets of command menus for working with worksheets, charts, and macro sheets:

- **Short menus** — display the most commonly used commands for routine worksheet, database, macro sheet, and chart tasks.
- **Full menus** — contain all commands on short menus plus commands for more specialized or advanced tasks (for example, linking or special search-and-replace techniques).

The first time you start Microsoft Excel, short menus are displayed. To use a command on a full menu, you must display full menus.

To switch to full menus if you are in short menus:

▣ Choose Options Full Menus.

To switch to short menus if you are in full menus:

▣ Choose Options Short Menus.

For more information on short and full menus, see **Command, menu, and dialog box**.

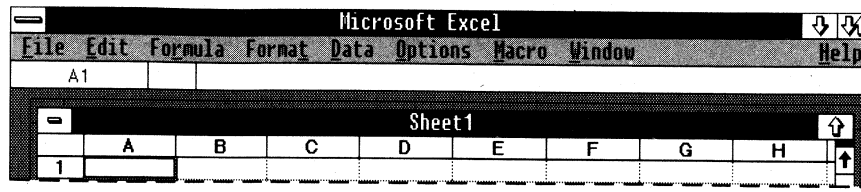
Note | If you use Microsoft Excel to create applications for other users, you can create custom menus and dialog boxes for those applications. For more information, see Chapter 6, "Advanced Macros," in *Microsoft Excel Functions and Macros*, a separate manual included in your Microsoft Excel package.

Menu Bars in Microsoft Excel

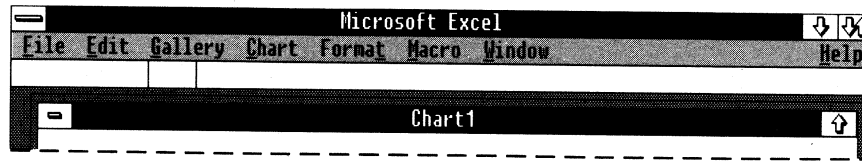
Menu bars are displayed across the top of the Microsoft Excel main application window. A menu bar contains the names of all menus that you can use while in the active window. Depending on which type of window is active, a different menu bar is displayed.

Here are the menu bars displayed in Microsoft Excel:

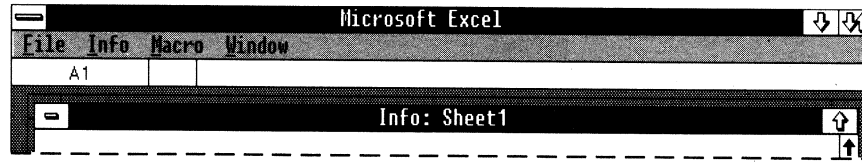
- **Worksheet menu bar** — displayed when a worksheet or macro sheet window is active:



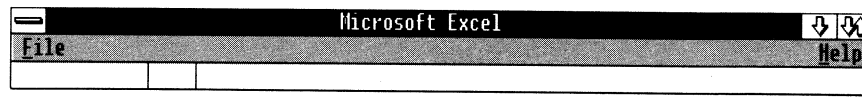
- **Chart menu bar** — displayed when a chart window is active:



- **Info menu bar** — displayed when an Info window is active:



- **Nil menu bar** — displayed when no documents are open:



For information on the basics of working in each type of window, see **Worksheet**, **Chart**, and **Info window**. For information on macros, see *Microsoft Excel Functions and Macros*.

Menu Bars for the Microsoft Excel Utility Programs

Three of the Microsoft Excel accompanying utility programs, Control Panel, Spooler, and Macro Translation Assistant, also display their own menu bars:

- **Control Panel** — use to adjust system settings such as screen colors in windows, date and time, printer assignments, and communications port designations; displays this menu bar:



- **Spooler** — lets you print documents while you are doing other tasks; displays this menu bar:



- **Macro Translation Assistant** — helps you convert Lotus 1-2-3 macros into Microsoft Excel macros; displays this menu bar:



For information on Control Panel and Spooler, see the Appendix. For information on Macro Translation Assistant, see **Lotus 123**.

Related Information

Reference

For information on	See
Working with windows	Windows
Screen formats that enhance document display or simplify working with large documents	Color Display options
Commands and dialog boxes	Command, menu, and dialog box

Functions and Macros

"Creating Customized Menus and Dialog Boxes" in Chapter 6, "Advanced Macros"

Tutorial

Worksheet Basics

Feature Guide

Basic Mechanics, "Using Menus and Dialog Boxes"

Microsoft Excel for the Apple Macintosh

Microsoft Excel can exchange worksheets and macro sheets with Microsoft Excel for the Apple Macintosh, using the SYLK (symbolic link) file format. This makes it easy for you to transfer files in either direction between the MS-DOS and Macintosh versions of Microsoft Excel.

This topic explains:

- How files convert
- Opening a SYLK worksheet created in Microsoft Excel for the Macintosh
- Adjusting dates for proper calculation
- Saving a worksheet in SYLK for use in Microsoft Excel for the Macintosh

The information in this topic is applicable only when you are transferring files between Microsoft Excel for MS-DOS and Microsoft Excel for the Apple Macintosh, version 1.04 or lower.

Note | All worksheet conversion procedures discussed in this topic also apply to macro sheets.

How Files Convert

When you transfer SYLK worksheet files from the Macintosh version to the MS-DOS version of Microsoft Excel, all of the following convert:

- Cell attributes such as formulas, values, formatting, and protection status.
- Names.
- Calculation settings such as manual or automatic calculation.
- Display settings such as displaying or hiding gridlines or row and column headings.

Window characteristics do not convert. This includes window size, position, splits, the location of the current selection, and the position of scroll bars. Printing formats such as margins, headers, and footers do not convert.

Opening a SYLK Worksheet Created in Microsoft Excel for the Macintosh

You can directly open any SYLK worksheet created with Microsoft Excel for the Macintosh in Microsoft Excel for MS-DOS. Conversion occurs when you open the file.

Note If your Macintosh-version worksheet is in a format other than SYLK, you should resave it in SYLK format before attempting to open it in the MS-DOS version. Choose File Save As and select the SYLK option in the dialog box. For more information about this procedure, see the *Microsoft Excel User's Guide* included in your Microsoft Excel for the Apple Macintosh package.

To open a worksheet created in Microsoft Excel for the Macintosh as a worksheet in Microsoft Excel for MS-DOS:

1. Choose File Open.
2. Type the worksheet name in the File Name box.

   If the worksheet is in a different directory than the one indicated in the dialog box, include the full pathname before the worksheet name in the File Name box.
3. Choose the OK button.

Adjusting Dates for Proper Calculation

In Microsoft Excel for the Macintosh, the serial number 1 represents January 2, 1904, instead of January 1, 1900, as in Microsoft Excel for MS-DOS. You can change a worksheet's date system in Microsoft Excel for MS-DOS to be the same as in Microsoft Excel for the Apple Macintosh. When you open a Macintosh-version worksheet as an MS-DOS-version worksheet, Microsoft Excel makes this change automatically.

If you are creating a worksheet in Microsoft Excel for MS-DOS for eventual use in the Macintosh version, use the following procedure to adjust dates *before* you enter any data on the worksheet:

1. Choose Options Calculation.
2. Turn on the 1904 Date System check box.
3. Choose the OK button.

Saving a Worksheet in SYLK for Use in Microsoft Excel for the Macintosh

Use this procedure to save a Microsoft Excel for MS-DOS worksheet in the SYLK format so that the file can be opened by Microsoft Excel for the Macintosh:

1. Choose File Save As.
2. Choose the Options button.
3. Under File Format, select SYLK.
4. In the Save Worksheet As box, type a name for the Microsoft Excel SYLK worksheet.

   If you want to save the worksheet in a directory other than the one indicated in the dialog box, type the full pathname before the document name in the Save Worksheet As box.
5. Choose the OK button.

Related Information

Reference

For information on	See
Opening documents	Opening a document
Saving documents	Saving and closing a document
Managing directories	Directories
Exchanging files between Microsoft Excel and other spreadsheet programs	Lotus 123 Multiplan

Mixed reference

A **mixed reference** is a reference that uses an absolute column reference and a relative row reference, or vice versa. You can change an absolute reference or relative reference to a mixed reference by selecting the reference in the formula bar and choosing the Formula Reference command. For more information, see **References**.

Mouse

The **mouse** is a small pointing and input device designed to fit under your hand. You can use a mouse instead of your keyboard for tasks such as scrolling, sizing and moving windows, choosing commands, and moving and selecting in worksheets and charts. If you have a mouse, you can still use keyboard techniques with Microsoft Excel. You may find mixing mouse and keyboard techniques to be convenient for many tasks.

This topic explains:

- The mouse buttons
- Moving the mouse
- The mouse pointer
- Basic mouse techniques
- Using the mouse with Microsoft Excel

The Mouse Buttons

You can use either a single- or multiple-button mouse with Microsoft Excel. Microsoft Excel mouse techniques require only one mouse button; if you installed a multiple-button mouse during Setup, the default is set for the left button. You can change the setting to the right button with Control Panel. For information on changing the mouse button, see "Control Panel" in the Appendix.

Moving the Mouse

The mouse controls a pointer on the screen. You move the pointer by moving the mouse over your desk top or any flat surface in the direction you want the pointer to move. You use the mouse to move the pointer to a particular location on the screen.

If you run out of room for the mouse — by reaching the edge of the desk, for instance — lift the mouse and put it back down where you have more room. Lifting the mouse does not move the pointer.

The Mouse Pointer

In Microsoft Excel, the pointer takes on different shapes, depending on where it is on the screen. The following table shows the pointer shapes you see in various parts of the Microsoft Excel screen and describes the mouse action you use with each pointer shape:

Pointer shape	Screen location	Mouse action
	In menu bar, scroll bars, and in chart window	Use to point and select.
	Inside worksheet	Click to select cell or drag to select range.
	In formula bar and in text box within a dialog box	Click to place insertion point where you want to start editing text or numbers.
	Along row headings	Drag to adjust row height.
	Along column headings	Drag to adjust column width.

Pointer shape	Screen location	Mouse action
	Along window border	Drag to size window vertically or horizontally.
	Along window border corners	Drag to size window vertically and horizontally at the same time.
	At vertical split bar	Drag to move split bar and divide worksheet window into vertical panes.
	At horizontal split bar	Drag to move split bar and divide worksheet window into horizontal panes.
	In upper-left corner of screen (displayed when you choose Control Split command)	Drag to move both the vertical and horizontal split bars and divide worksheet window into vertical and horizontal panes.
	On sample page when previewing pages before printing	Click to select and magnify a detail of the page for closer inspection.
	Near center of screen when you press SHIFT+F1 for help	Click the command or area of screen you want help on.
	In Help window on a word underlined by dotted or solid line	Point to the word or phrase with dotted underline and hold down mouse button to see definition; click the word or phrase with solid underline to see related information.
	Any area of screen	Means "wait for command or action to be carried out."

Basic Mouse Techniques

The following table describes the basic mouse techniques you use with Microsoft Excel:

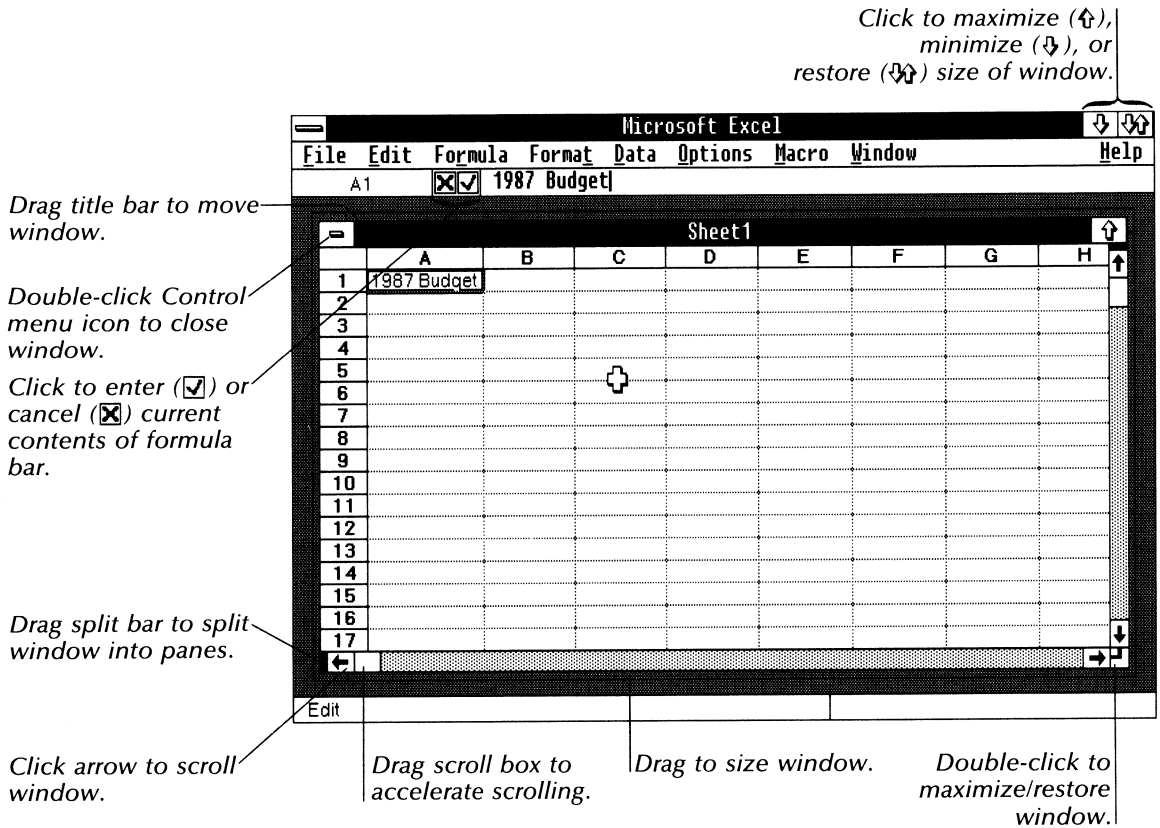
Technique	Description
Point	Move the mouse until the tip of the pointer rests on what you want to point to.
Press	Hold down the mouse button.
Click	Press and release the mouse button.
Drag	Press the mouse button, then move the mouse.
Double-click	Click the mouse button twice in rapid succession.
Choose	Pick a command by pointing at the menu name and clicking, then pointing to the command you want and clicking. Choose a command button in a dialog box by clicking the button.
Scroll	Click a scroll arrow or drag the scroll box in the scroll bar. This moves a document in its window so that another part of the document is visible.
Select	Point and click or drag to identify the portion of the worksheet or chart that you want the next command to affect, or to change the settings in a dialog box.
Turn on/off	Click a check box to turn a dialog box option on or off.

Using the Mouse with Microsoft Excel

Although you can perform all Microsoft Excel tasks with the keyboard, you'll find that the mouse is especially efficient for:

- Manipulating windows — sizing, moving, enlarging, shrinking, and closing
- Choosing commands and selecting options in dialog boxes
- Moving and selecting in a worksheet or a chart
- Working with charts and manipulating chart objects

The following illustration shows the built-in screen elements that are designed to be used easily and effectively with the mouse:



The following table describes basic procedures for using the mouse with Microsoft Excel:

To	Do this
Scroll one row or column at a time	Click the scroll arrow at either end of the vertical or horizontal scroll bar.
Scroll one window vertically or horizontally	Click in the area on either side of the scroll box in the vertical or horizontal scroll bar.

To	Do this
Scroll to a general location	Drag the scroll box to a position in the scroll bar corresponding to the general location you want (beginning, middle, or end of the document).
Select a single cell	Click the cell you want.
Select a range	Drag through the cells you want.
Select one row or column	Click the row or column heading.
Select many rows or columns	Click a row or column heading and drag in the headings.
Select the entire worksheet	Click the rectangle below the Control menu icon.
Make a multiple selection	Drag through the first selection, then hold down the Control key as you drag through each additional selection.
Edit in the formula bar	Click where you want the insertion point and make your edit; click the enter box to confirm the edit, or click the cancel box to cancel the edit.
Select a chart object or chart text	Click the object or text.

Tip You can select a whole word in the formula bar by double-clicking any part of the word.

Related Information

Reference

For information on	See
Moving and selecting in a chart	Chart
Mouse techniques with windows	Windows
Using the keyboard with Microsoft Excel	Keyboard

Moving data on a worksheet

Moving data in a cell or range transfers the contents and any formats or notes attached to the cell or range. You can move data within a worksheet and between worksheets. If you're running Microsoft Excel under Microsoft Windows, version 2.0 or higher, you can also move data between Windows applications.

This topic explains:

- Moving data, formats, and notes in a worksheet

  How moving data affects references

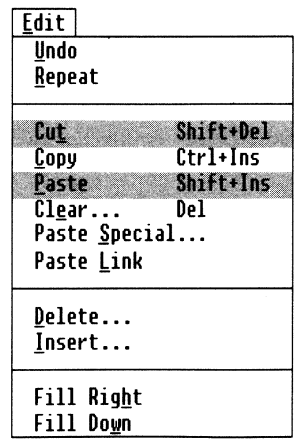
  Moving data in cells and ranges

This topic does not discuss moving data from Microsoft Excel to other applications. For more information, see **Exchanging data between applications**.

Note | All concepts and procedures for moving data in worksheets also apply to macro sheets.

Moving Data, Formats, and Notes in a Worksheet

The commands for moving data in cells and ranges in a worksheet are on the Edit menu (Full menu shown):



- Use Edit Cut to define the **cut area**, the cell or range containing the data you want to move.
- Use Edit Paste to place the cell or range containing the data you cut in the **paste area**, the new location you specify.

For information about each command, see **Edit Cut command** and **Edit Paste command**.

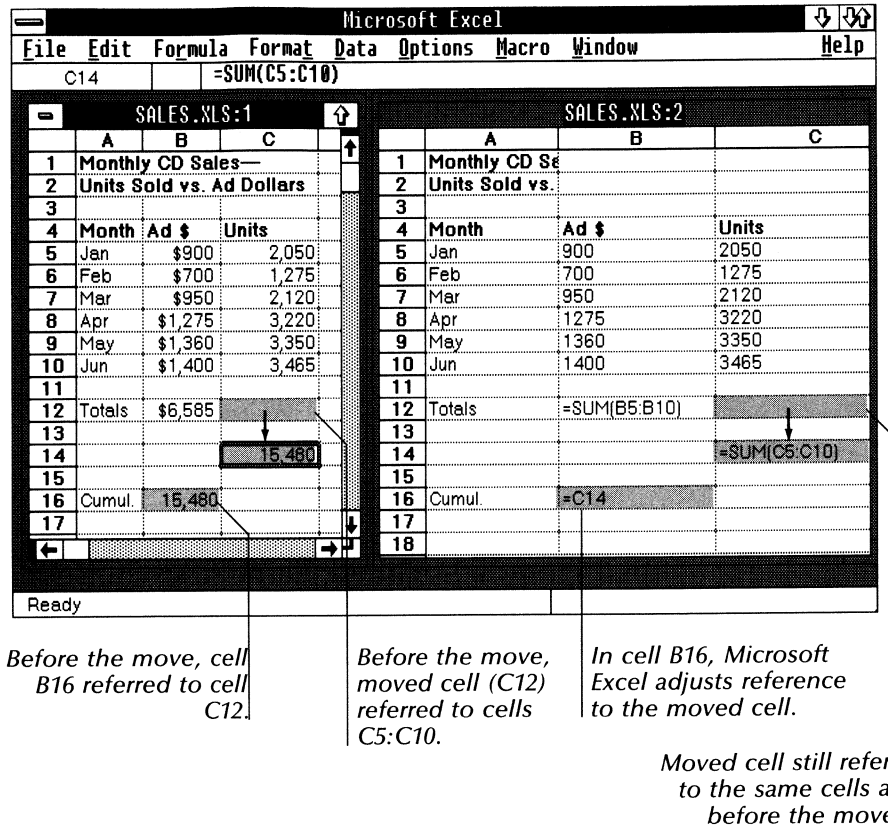
How Moving Data Affects References

Moving data is like physically cutting out the cells and pasting them into a new location — either in the same worksheet or in a different worksheet. Moving data has the following effects on references:

- Microsoft Excel automatically adjusts references to the moved cells. When you move the cells to the new location (the paste area), the references designate the same cells as they did before the cut; the formulas still calculate from the same values.
- Inside the cut area, Microsoft Excel does not change references to cells outside the cut area. After you move data, references in the paste area designate the same cells that they did in the cut area (see the illustration later in this section).
- Cells referring to the paste area (as it exists before you paste in the moved cells) produce the error value #REF! since you are essentially "deleting" the area by pasting the moved cells over it.
- Outside the cut area, references to the cut area produce the error value #REF! if you move the cut cells to another worksheet.

For example, each of the next two illustrations shows two windows into the same worksheet — one window displaying values and one displaying formulas. In the following illustration, cell C12 is moved to cell C14. Notice that references within the cut area (cell C12) don't change when the cell is moved, but that Microsoft Excel does adjust references (cell B16) to the moved cell.

Worksheet after moving cell C12 to cell C14



Before the move, cell B16 referred to cell C12.

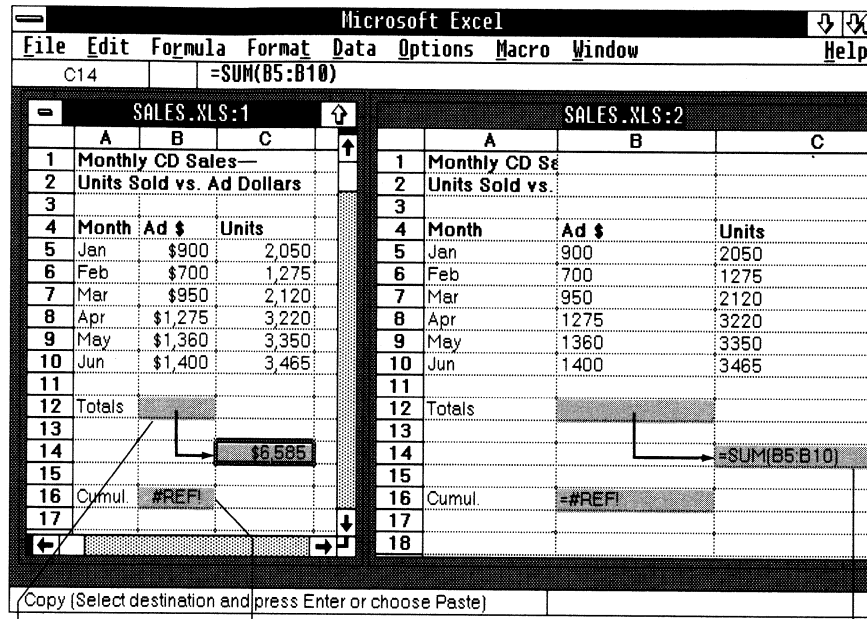
Before the move, moved cell (C12) referred to cells C5:C10.

In cell B16, Microsoft Excel adjusts reference to the moved cell.

Moved cell still refers to the same cells as before the move.

Now look what happens if cell B12 is moved and pasted over cell C14:

Worksheet after moving cell B12 to cell C14



Before the move, moved cell (B12) referred to cells B5:B10.

Before the move, cell B16 referred to cell C14 (total units sold). After the move, cell B16 shows an error value because the cell it originally referred to was pasted over (and so deleted).

Moved cell still refers to same cells as before.

If you run into problems while moving cells, you can try the following:

- Immediately choose the Edit Undo Paste command to restore the worksheet as it was before the move. This also restores error values such as #REF! to their original references.
- Choose the Formula Find command to find the cells with error values. After finding the error values, you can still undo the paste with Edit Undo Paste if you want.

Moving Data in Cells and Ranges

Tip | The easiest way to paste moved cells into the paste area is to select only the cell in the upper-left corner of the paste area. That way you can avoid accidentally specifying a differently shaped paste area, which produces an error. Just make sure the pasted cells will not replace other data you want to keep.

1. Select the cell or range containing the data you want to move.
2. Choose Edit Cut.
   Microsoft Excel surrounds the selection with a dotted line called a marquee.
3. Select the paste area, the cells you want to move the data to.
   If you are moving the data to another worksheet, activate that worksheet window and select the paste area.
4. Choose Edit Paste.

You can also overlap the cut area and paste areas.

Related Information

Reference

For information on	See
Moving information between applications	Exchanging data between applications
Copying information in worksheets and charts	Copying data and formats
References	References

Tutorial

Creating a Worksheet

Feature Guide

Basic Mechanics, "Copying"

Multiplan

Microsoft Excel can exchange worksheets with Microsoft Multiplan using the SYLK (symbolic link) format. This makes it easy for you to use your Multiplan worksheets with Microsoft Excel and to share Microsoft Excel worksheets with others who may be using Multiplan.

This topic explains file conversion between Multiplan and Microsoft Excel. It also describes key differences between the two applications that you should be aware of when converting files.

This topic explains:

- How to convert files

  Opening a Multiplan SYLK worksheet as a Microsoft Excel worksheet

  Saving a Microsoft Excel worksheet in SYLK for use in Multiplan

- How formulas convert

  Constants, arguments, and operands

  Operators

  Functions

- Calculation and iteration

  Solving iteration problems when converting files

- How formats convert

  Number formats

  Alignment and column width formats

The Help Multiplan command lets you quickly access the Microsoft Excel online Help system to obtain information on the Microsoft Excel equivalents of Multiplan commands. For information on Help on Multiplan, see **Help**.

How to Convert Files

You can transfer files in either direction between Microsoft Excel and Multiplan.

In general, when you transfer worksheet files from Multiplan to Microsoft Excel, the following convert:

- Cell attributes such as formulas, values, formatting, and protection status
- Names

Macros are not converted; nor are window and worksheet characteristics such as splits and panes, frozen row and column titles, the location of the current selection, and the position of scroll bars. Printing formats such as margins, headers, and footers also do not convert.

Opening a Multiplan SYLK Worksheet as a Microsoft Excel Worksheet

You can open any Multiplan SYLK worksheet as a Microsoft Excel worksheet. Microsoft Excel automatically recognizes a SYLK file. Conversion occurs when you open the file.

Note If your Multiplan worksheet is in a format other than SYLK, you should resave it in SYLK format before attempting to open it in Microsoft Excel. To save a Multiplan worksheet in SYLK, load the worksheet in Multiplan. Choose the Symbolic option of the Transfer Options command, and then choose Transfer Save. For information on this procedure, see your Multiplan manual.

To open a Multiplan worksheet as a Microsoft Excel worksheet:

1. Choose File Open.
2. Type **.slk* in the File Name box.

   If the worksheet is in a different directory than the one indicated in the dialog box, type the full pathname before **.slk* in the File Name box. For more information on working with directories, see **Directories**.
3. Press ENTER.
4. In the list box, select the Multiplan worksheet name.
5. Choose the OK button.

Saving a Microsoft Excel Worksheet in SYLK for Use in Multiplan

You can save a Microsoft Excel worksheet in the SYLK format so that the file can be opened by Multiplan.

1. Choose File Save As.
2. Choose the Options button.
3. Under File Format, select SYLK.
4. In the Save Worksheet As box, type a name for the Multiplan SYLK worksheet.

   If you want to save the worksheet in a different directory than the one indicated in the dialog box, type the full pathname before the document name in the Save Worksheet As box. For more information on working with directories, see **Directories**.

How Formulas Convert

When you open a Multiplan SYLK worksheet as a Microsoft Excel worksheet, Microsoft Excel automatically converts the formulas. If Microsoft Excel encounters a formula that it cannot convert, it displays a message that gives the reference of the cell containing the formula. The message also asks if you want to see the next formula that cannot convert. If you choose the Yes button, the message comes up for the next formula. If you keep choosing the Yes button, you'll see a message for every formula that cannot convert. When you have seen the last message, or whenever you choose the No button, a dialog box appears telling you the total number of formulas that did not convert. When a formula does not convert, Microsoft Excel preserves the value of the formula.

When you save a Microsoft Excel worksheet as a SYLK file, no formula conversion occurs. The formulas are stored in the SYLK file exactly as they appear in Microsoft Excel. This means that Multiplan might not be able to read some of the formulas used in Microsoft Excel.

Any information Multiplan does not understand, such as formulas containing functions Multiplan does not support, will be ignored completely, or will produce an error. If your Microsoft Excel worksheets use only the formulas that Multiplan supports, you can transfer them both ways without formula conversion problems.

The following sections provide specific information regarding formula conversion between the two programs. The information applies to Multiplan, version 2.0 and higher. Conversion between Microsoft Excel and earlier versions of Multiplan is possible but less complete.

Constants, Arguments, and Operands

Numbers and text: Microsoft Excel supports a larger range of numbers than Multiplan. The two applications support the same formats for numbers used in formulas, but Microsoft Excel also supports numbers formatted as dates, currency, and percentages enclosed in double quotation marks. For example, the formula ="Jan 5, 1988"+90 is valid in Microsoft Excel but not in Multiplan. Text is treated the same in both programs. Multiplan does not support arrays.

Logical values: Both applications support the logical values TRUE and FALSE as results of formulas, and both have functions TRUE and FALSE that produce these values. Microsoft Excel also supports TRUE and FALSE as constant values in cells and in formulas.

Error values: Both applications support the error values #N/A, #VALUE!, #NAME?, #REF!, #NUM!, and #DIV/0! as the results of formulas. Both also have a function NA that gives the error value #N/A. Microsoft Excel also supports the error values as constant values in cells and in formulas.

In Microsoft Excel, when an argument to a function or operator is not the correct type (number, text, or logical value), Microsoft Excel tries to convert it before producing an error value. Multiplan does not attempt any conversion. If the argument is not the correct type, the formula produces an error value.

References: Microsoft Excel and Multiplan support references to single cells, to ranges of cells, and to multiple areas. Both have the reference operators range (:), intersection ( ), and union (,). Multiplan's worksheet is 4,095 rows by 255 columns, while the Microsoft Excel worksheet is 16,384 rows by 256 columns.

Multiplan allows a range of cells in one worksheet to be linked to a second range of cells of the same size in another worksheet. Microsoft Excel allows you to refer to cells in a second worksheet using external references. When a Multiplan document is converted, the formulas in linked cells are converted to external reference array formulas. For example, suppose that on the worksheet COMPANY, cells A1:A3 are linked to values from cells B2:B4 on the worksheet NORTHWEST. When COMPANY is converted from a Multiplan worksheet to a Microsoft Excel worksheet, the array external reference formula =NORTHWEST!$B$2:$B$4 will be entered in cells A1:A3. Microsoft Excel also supports external references that are part of larger formulas; Multiplan does not. For example, a cell in a Microsoft Excel worksheet can contain the formula =JULY.XLS!TOTAL*2. A cell in a Multiplan worksheet cannot contain an equivalent formula.

Operators

Microsoft Excel and Multiplan support the same operators and the same order of evaluation, except that the precedence of the range operator (:) and the intersection operator ( ) are reversed in the two applications. In Microsoft Excel, range is higher than intersection. Microsoft Excel comparison operators allow you to compare arguments of any type — number, text, and logical. Comparison operators in Multiplan cannot be used with logical arguments.

Functions

Microsoft Excel supports all of Multiplan's functions except the DELTA and ITERCNT functions. Microsoft Excel does not convert Multiplan formulas that contain either of these functions. Microsoft Excel supports many functions not supported in Multiplan.

The compatible functions behave the same way in Microsoft Excel as they do in Multiplan — if they are used in the same formulas. However, Microsoft Excel allows up to 14 arguments per function (Multiplan allows 5). Microsoft Excel also allows you to use some of the compatible functions in ways that Multiplan does not.

For information on function descriptions, see *Microsoft Excel Functions and Macros*.

Calculation and Iteration

You can specify automatic or manual calculation in both Microsoft Excel and Multiplan. Microsoft Excel also has an Automatic Except Tables option, which is converted to Automatic in Microsoft Multiplan.

In Multiplan, you control iteration with the Iteration and Completion Test At settings of the Options command. The ITERCNT and DELTA functions return the number of iterations and maximum change between iterations in the completion test formula.

In Microsoft Excel, you control iteration with the dialog box options for the Options Calculation command. The Iteration check box turns iteration on and off. The Maximum Iterations and Maximum Change boxes allow you to limit the number of iterations and to specify the maximum acceptable change between iterations.

Solving Iteration Problems When Converting Files

Most Multiplan worksheets involving iteration will behave the same way in Microsoft Excel. Microsoft Excel has no DELTA or ITERCNT functions, but, if you used these functions in Multiplan only in the worksheet completion test, you can accomplish the same thing in Microsoft Excel using the Maximum Iterations and Maximum Change check boxes. However, if the iteration model in Multiplan has a more complicated completion test, or if the model depends on a fixed order of calculation, such as Newton's method does, then it will not work on a Microsoft Excel worksheet.

Such a model will, however, work on a Microsoft Excel macro sheet. To put a Multiplan model on a Microsoft Excel macro sheet:

1. Save the Multiplan worksheet in SYLK format.
2. Open the worksheet in Microsoft Excel.
3. Select the entire worksheet.
4. Choose Edit Copy.
5. Choose File New.
6. Select Macro Sheet.
7. Choose the OK button.
8. Choose Edit Paste.

   Microsoft Excel pastes the copy of the worksheet into a macro sheet. You can now calculate the model by running it as a macro. For more information on running a macro, see *Microsoft Excel Functions and Macros*.

How Formats Convert

Number Formats

For every Multiplan number format except Bar Graph, Microsoft Excel has a corresponding format, as shown in the following table. When you move documents from Multiplan to Microsoft Excel, the Multiplan number formats are converted according to this table. Microsoft Excel converts Multiplan's Bar Graph format to General format.

Microsoft Excel always tries to convert to a format that uses the same number of decimal places as specified in Multiplan. If necessary, Microsoft Excel creates a custom format to accommodate extra decimal places. Also, if you checked the Commas command in Multiplan, the Microsoft Excel formats all have commas.

Multiplan format	Microsoft Excel format
General	General
Dollar, Commas, 0 decimals	$#,##0 ;($#,##0)
Dollar, Commas, 2 decimals	$#,##0.00 ;($#,##0.00)
Dollar, 0 decimals	$0 ;($0)
Dollar, 2 decimals	$0.00 ;(0.00)
Percent, Commas, 0 decimals	#,##0%
Percent, Commas, 2 decimals	#,##0.00%
Percent, 0 decimals	0%
Percent, 2 decimals	0.00%
No decimal, Commas	#,##0
No decimal	0
Decimal, Commas, 2 decimals	#,##0.00
Decimal, 2 decimals	0.00
Scientific, 0 decimals	0E+00
Scientific, 2 decimals	0.00E+00

If you save a Microsoft Excel document as a SYLK file, both the Microsoft Excel and corresponding Multiplan formats are saved. Any Microsoft Excel formats not supported by Multiplan (date and custom formats) are saved in Multiplan's General format.

Alignment and Column Width Formats

Microsoft Excel preserves alignment and column width formats of documents transferred from Multiplan. These formats are also preserved when you save a Microsoft Excel worksheet as a SYLK file for use in Multiplan.

Related Information

Reference

For information on	See
Converting Lotus 1-2-3 files to Microsoft Excel	Lotus 123
Opening and saving documents in Microsoft Excel	Opening a document Saving and closing a document
Formulas and operators in Microsoft Excel	Formula Formula bar Operator
General overview of formatting options (display and print)	Formatting a document
General overview of Microsoft Excel built-in worksheet functions	Function

Functions and Macros

"Data Types" in Chapter 1, "Worksheet Function Basics"
Chapter 2, "Worksheet Function Directory"

Multiple selection

A **multiple selection** is a selection of cells that includes more than one single rectangular range of cells. You can make a multiple selection by holding down the CONTROL key and selecting with the mouse, or by using the Add key (press SHIFT+F8). For more information, see **Selection** and **Keyboard**.

Names

A **name** is an easy-to-remember identifier you create as a reference to a cell, a group of cells, a constant value, or a formula. Using names in a formula — for example, =Assets−Liabilities — makes the formula easier to read and remember than using cell references for the formula — for example, =F6−D6.

By using names in formulas on a worksheet, you can also save time later if you need to change the value in the named cell. All formulas using that name are automatically updated.

This topic explains:

- Basic information and procedures

  Guidelines for defining a name

  Naming a cell or range

  Creating several names at one time

  Naming a value or formula

  Editing and deleting names

- Using names

  Pasting a name

  Naming relative references

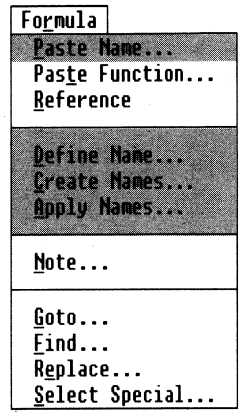
- Replacing references with names

  Applying names

  How names are applied

Basic Information and Procedures

The main commands for defining and using names are on the Formula menu (Full menu shown):



- Use Formula Define Name to define a single name.
- Use Formula Create Names to quickly create names for several rows or columns using text in the selected range.
- Use Formula Paste Name to remember what names you've defined and to paste them into the formula bar.
- Use Formula Apply Names to search through a selected range and replace all references to a cell or range with the name you've defined for that cell or range.

Guidelines for Defining a Name

Follow these guidelines for defining a name:

- **Valid characters.** The first character must be a letter. Other characters can be letters, numbers, periods, and underlines. The name cannot look like a reference (such as A$1 or R1C1).
- **Separators.** Spaces are not allowed. An underline (_) or a period (.) works well as a word separator.
- **Length of name.** The name can be as long as 255 characters.
- **Capitalization.** You can use uppercase or lowercase letters. Microsoft Excel ignores the difference between uppercase and lowercase letters when dealing with names.

Naming a Cell or Range

Most often, you create a name to refer to a cell or group of cells. When you choose the Formula Define Name command, Microsoft Excel assumes you are naming cells and may propose a name from any text in the active cell or in the cell either above or to the left of the active cell. It also proposes the absolute reference of the current selection.

1. Select the cell, cell range, or multiple selection you want to name.
2. Choose Formula Define Name.
3. In the Name box, type a name or accept the proposed name.
4. In the Refers To box, type the cell reference or accept the proposed reference.

   If you type in a different reference in the Refers To box, it must begin with an equal sign (=), just like a formula.
5. Choose the OK button.

Microsoft Excel adds the name to its list of names for the worksheet.

Tip | Use names for cells or ranges in a worksheet that you update or print often. To move quickly to the named cell or range, specify it with the Formula Goto command. For more information, see **Finding cells and data quickly**.

Creating Several Names at One Time (Full Menus)

You can use the Formula Create Names command to create names for columns or rows of data in a selected range. This command creates the names from text in cells in the top or bottom row of the selected range, the left or right column of the range, or any combination of the four.

To create several names at one time:

1. Select the range of data to be named, including the text you want to use as names.
2. Choose Formula Create Names.
3. To name the columns using the text in the top row of the range, turn on the Top Row check box.

   To name the columns using the text in the bottom row of the range, turn on the Bottom Row check box.

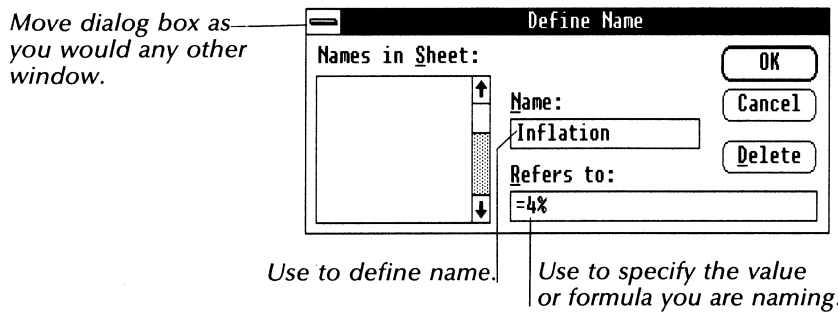
   To name the rows using the text in the left column of the range, turn on the Left Column check box.

   To name the rows using the text in the right column of the range, turn on the Right Column check box.
4. Choose the OK button.

Naming a Value or Formula

In Microsoft Excel, you can name a value or formula without putting that value or formula in a cell. For example, you can specify that the name Inflation equals 4%, rather than have Inflation refer to the contents of a particular cell. This allows you to avoid cluttering your worksheet with such values, and also makes it easier to find and change the value. If you define a name as a value or formula, you can include that name in other formulas in the worksheet just as you can with other names.

You specify the value or formula you want to name in the Refers To box in the Formula Define Name dialog box, as shown in the following illustration:



You edit a formula or value in the Refers To box the same way you edit a formula in the formula bar. When the Refers To box is active, you can scroll the worksheet and select cells. Microsoft Excel adds the references for you. The Formula Define Name dialog box also has its own Control menu. If you need to select a cell that is covered by the dialog box, you can use the Control Move command or drag the title bar with the mouse to move the dialog box.

Later, if you want to change the inflation rate, you change the definition of Inflation in the Define Name dialog box, and all formulas on the worksheet using the name Inflation are automatically updated when you calculate the worksheet.

To name a value or formula:

1. Choose Formula Define Name.
2. In the Name box, type the name.
3. In the Refers To box, type the value or formula.
4. Choose the OK button.

Editing and Deleting Names

Microsoft Excel displays the names you have already defined in a list box in the Formula Define Name dialog box. If you select a name from the list, Microsoft Excel displays that name in the Name box and its reference in the Refers To box. You can then edit the name or the reference.

To delete a name:

1. Choose Formula Define Name.
2. In the list box, select the name you want to delete.
3. Choose the Delete button.

Microsoft Excel deletes the name and leaves the dialog box on the screen so you can edit or delete other names. Choose the OK button to put away the dialog box.

Note | Choosing the Cancel button does not cancel any deletions you have made; it just puts away the dialog box.

Using Names

Pasting a Name

After you define a name, you can place that name in a formula by typing in the name, or you can use the Formula Paste Name command.

1. In the formula bar, select an insertion point where you want to paste the name.
2. Choose Formula Paste Name.
3. In the list box, select the name you want to paste.
4. Choose the OK button.

You can also refer to a name you defined on another worksheet. Type the name of the worksheet, an exclamation point (!), and the name defined on that worksheet. For example, you can type *Expenses.xls!Salaries* to refer to a group of cells named Salaries on the Expenses worksheet. For information on referring to names on other worksheets, see **Linking documents**.

Naming Relative References

Usually, you will want names that refer to cells to be defined as absolute references. The name will then point to a specific region of cells on the worksheet, and will not change if you cut and copy data on the worksheet. This way you always know exactly what cells the name refers to.

Although you can use relative references in defining a name, you should do so with caution, because the actual cell being referenced will change when a formula using the name is cut or copied. It's easy to lose track of exactly which cell is being referenced.

To verify which cell is being referenced, select the cell where the name is being used, choose Formula Define Name, and select the name being used from the list box.

When you build a formula in the Refers To box, Microsoft Excel adds absolute references, unlike in the formula bar where it adds relative references. You can, however, type a relative reference or change a reference to relative using the Formula Reference command. For example, suppose the active cell is B2 and you define the name Previous_Month to be the relative reference A2. Then, whenever you use the name Previous_Month in a formula, Microsoft Excel looks in the cell to the left of the cell containing the formula.

Replacing References with Names

The consistent use of names in a worksheet makes it much easier to follow the structure of the worksheet. If you have a worksheet with few or no names, you may want to go through the worksheet and change cell references to names.

Applying Names (Full Menus)

Once you have defined a name, you can use the Formula Apply Names command to scan all or part of a worksheet and replace equivalent references with the name. For example, if you define the name Sales as =$C$12, the Formula Apply Names command replaces all occurrences of C12 in formulas with the name Sales.

To apply names on a worksheet:

1. Select the range in which you want references replaced with names. To apply names to the entire worksheet, select a single cell.
2. Choose Formula Apply Names.
3. In the list box, select one or more names to be applied.

   Microsoft Excel initially selects the last name or names you defined. To change the names that are selected, hold down the CONTROL key while pressing the UP or DOWN keys to move the dotted box, and press SPACEBAR to add or remove the name.

   If you have a mouse, you can select more than one name by holding down the SHIFT key and clicking the names you want to select.

4 Adjust the options, if necessary.

To help you decide if you want to change any of the options, see the following section for a description of how names are applied.

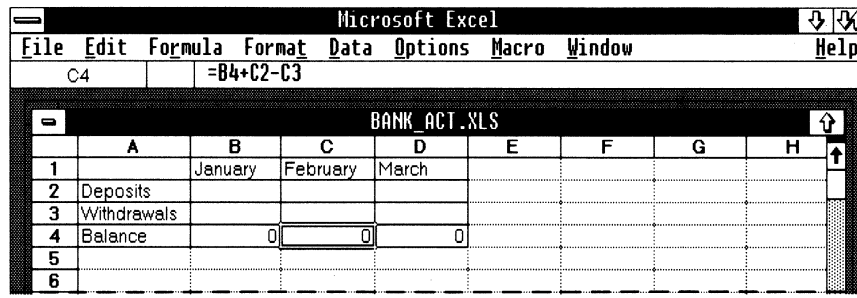
5 Choose the OK button.

Microsoft Excel applies the names to the worksheet according to the guidelines discussed below.

How Names Are Applied

The best way to understand how names are applied is to look at an example:

In the illustration, a worksheet shows the activity of a bank account on a monthly basis. Cell C4 will be used to show how names are applied.



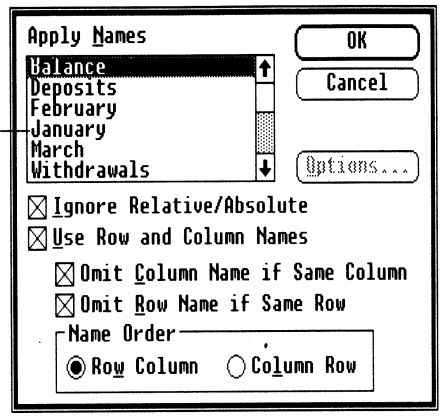
In this worksheet, the Formula Create Names command was used on the range A1:D4, with both Left Column and Top Row turned on. As a result, the following names were created:

Name	Refers to
Deposits	$B$2:$D$2
Withdrawals	$B$3:$D$3
Balance	$B$4:$D$4
January	$B$2:$B$4
February	$C$2:$C$4
March	$D$2:$D$4

The Deposits and Withdrawals rows will contain constant numbers. The Balance row contains formulas that compute totals. The formula we are interested in is the one in cell $C$4, which contains the formula =B4+C2−C3.

When you choose Formula Apply Names, a dialog box appears. If you choose the Options button in the dialog box, the full dialog box looks like this:

The list box indicates the names defined for the worksheet BANK_ACT.XLS.



Ignore Relative/Absolute

When the Ignore Relative/Absolute check box is turned on, Microsoft Excel replaces references with names regardless of the reference style of either the names or the references. If you turn off this check box, Microsoft Excel replaces only absolute references with absolute names, only relative references with relative names, and only mixed references with mixed names.

In the example worksheet, all of the references in the formula are relative and all of the names are absolute, so no names would be applied if you turned off this check box. Since most worksheets also have mostly relative references and absolute names, it's a good idea to leave Ignore Relative/Absolute turned on unless you plan to copy the cells to another part of the worksheet after you apply the names.

For information on absolute and relative references, see **References**.

Use Row and Column Names

Uses the names of the ranges containing the referred-to cells if an exact match cannot be found.

In the example worksheet, none of the references in the formula exactly match the definition of a name, so no names would be applied if you turned this check box off. If you leave this check box on, references are replaced with the name of the column containing the referred-to cell, the row containing the referred-to cell, or both, depending on whether the two Omit check boxes are turned on.

The following table shows how names are applied in the example, depending on the settings in the dialog box:

Use Row and Column Names	Omit Column Names if Same Column	Omit Row Name if Same Row	Formula =B4+C2−C3
ON	ON	ON	=January+Deposits−Withdrawals
ON	ON	OFF	=January Balance+ Deposits−Withdrawals
ON	OFF	ON	=January+February Deposits− February Withdrawals
ON	OFF	OFF	=January Balance+ February Deposits− February Withdrawals
OFF	ON or OFF	ON or OFF	=B4+C2−C3

The two names appear in the formula one after the other, separated by a space, which is the intersection operator. If the reference is not within both a row-oriented and a column-oriented range, the reference is not replaced with a name.

Note

If the reference is in a different row and column than the cell containing the reference, the reference is replaced with the name of both the row-oriented range and the column-oriented range containing the cell. When the reference is not in the same row or column, the two Omit Name options are irrelevant.

If the reference is in a different row and column than the cell containing the reference, and the reference does not lie within both a row-oriented named range and a column-oriented named range, the reference is left unchanged, because replacing it with only one name would produce an erroneous name.

Name Order

Determines which range name is listed first when a cell reference is replaced by a row-oriented range name and a column-oriented range name. Select the combination you prefer.

Row Column — Lists the row name first

Column Row — Lists the column name first

Related Information

Reference

For information on	See
Entering and editing formulas	Formula Formula bar
Selecting cells on a worksheet	Keyboard Mouse
References	References

Sampler

Analyzing a Loan

Analyzing the Break-even Point

Solving Simultaneous Equations

Tutorial

Creating a Worksheet

Feature Guide

Auditing and Documenting, "Creating and Applying Names"

Networks with Microsoft Excel

A **network** allows several computers that are connected electronically to share data. If your computer is linked with other computers on a network, you can run Microsoft Excel from that network and also maintain your personal preferences for settings such as screen colors, default printers, and printer ports.

This topic explains:

- Running Microsoft Excel from a network

  Installing Microsoft Excel on a network

  Creating a WIN.INI file for your preferred settings

  Running Microsoft Excel with your preferred settings

- Data access, data protection, and printing

  Accessing shared documents

  Protecting shared documents

  Using printers on a network

Running Microsoft Excel from a Network

The Microsoft Excel program files that are typically installed on your computer's hard disk can also be placed in a network file directory. You can then run Microsoft Excel on any workstation that has access to the network file directory. For information on restrictions on network use, see your Microsoft Excel license agreement.

Installing Microsoft Excel on a Network

To install the Microsoft Excel program files on a network file directory:

▣ Run the Setup program as specified in *Getting Started and Quick Reference*, a separate manual included in your Microsoft Excel package. When the setup program asks you for the name of the directory where you want to install Microsoft Excel, type the name of the network directory.

Note | You must have read-write access to the network file directory in order for the Setup program to install Microsoft Excel on a network. For information on read-write access, see your network software manual.

Creating a WIN.INI File for Your Preferred Settings

You can run Microsoft Excel from a network and still maintain your personal preferences for features such as screen colors, font sets, short or full menus, system default printers, printer ports, insertion point blink rate, and mouse double-click rate. Microsoft Excel stores such settings in a special file called a WIN.INI file. Whenever you start Microsoft Excel, the program checks this file and uses the settings it finds there.

When you install Microsoft Excel on a network, the network file directory contains one version of the WIN.INI file with network-wide settings. If you want to run Microsoft Excel from the network but use your own preferred settings, you can create a personal WIN.INI file that overrides the network-wide file.

To create a personal WIN.INI file:

1. If necessary, use the DOS CHDIR command to change to the directory in which you want to create the WIN.INI file.
2. Connect with the network file directory in which Microsoft Excel is installed.

   If necessary, refer to your network software manual for specific procedures that apply to your network.
3. Use the DOS COPY command to copy the file WIN.INI from the network file directory to your personal directory.

Running Microsoft Excel with Your Preferred Settings

At start-up, Microsoft Excel (or Microsoft Windows, if you're running the program under Microsoft Windows, version 2.0 or higher) uses the first WIN.INI file it finds in your machine's path. This path is a list of directories that can be specified in your AUTOEXEC.BAT file, with a line like this:

SET PATH=C:\DOS;C:\NETWORK;D:\EXCEL

This path configuration means that when looking for WIN.INI, the program would look first in the directory from which it was started, then in the directory DOS on drive C:, then the directory NETWORK, and finally in the directory EXCEL on drive D:. If the program looked in all four directories and didn't find a WIN.INI file, it would use the default values for the options that can be set in the WIN.INI file.

To ensure that Microsoft Excel uses your personal WIN.INI file settings, you can do either of the following:

- **Start from the directory containing your WIN.INI file.** If necessary, use the DOS CHDIR command to change to the directory that contains your personal WIN.INI file and then start Microsoft Excel. If you're running Microsoft Excel under Microsoft Windows, version 2.0 or higher, start Windows from this directory.
- **Set the path correctly.** Make sure you place your personal WIN.INI file in one of the path directories that precedes the directory containing the network version of Microsoft Excel. If you use this method, also make sure that no other WIN.INI files exist in the preceding path directories or in the directory from which you start Microsoft Excel or Microsoft Windows, version 2.0 or higher.

For information on paths and the AUTOEXEC.BAT file, see your MS-DOS documentation.

As you work with Microsoft Excel, your personal WIN.INI file records certain settings as you specify them in the following ways:

- **Commands.** The WIN.INI file stores certain settings for the Microsoft Excel workspace that are controlled by given commands. For example, the file stores your preferences for displaying short menus or full menus (controlled by the Options Short Menus or Options Full Menus command) and displaying A1 or R1C1 reference style (controlled by the Options Workspace command).
- **Control Panel.** The WIN.INI file also stores adjustments you make through Control Panel, a utility program included with Microsoft Excel. These adjustments include certain system settings such as screen colors in windows, date and time, printer assignments, insertion point blink rate, and mouse double-click rate. For more information on using Control Panel, see "Control Panel" in the Appendix.

The settings in the WIN.INI file are in effect each time you start Microsoft Excel.

Data Access, Data Protection, and Printing

Running Microsoft Excel from a network allows many users to share and print out the same documents. When documents are shared on a network, there are several ways you can access and protect them.

Accessing Shared Documents

You can access a shared document on the network in the following ways:

- Open the document with "read-only" access. That means that you can open the document, but you can't edit it.
- Open the document with "read-write" access. That means that you can open the document and edit it. To prevent multiple users from making changes to the document at the same time, only one user at a time can open a document with read-write access.
- Create links between your personal Microsoft Excel document and a shared document on the network. You can create links between two or more Microsoft Excel documents. If you're running Microsoft Excel under Microsoft Windows, version 2.0 or higher, you can link Microsoft Excel documents and those in different applications, such as online information services. The links ensure that your personal documents are updated along with the shared documents. For information on linking, see **Linking documents**.

In a shared data environment such as a network, it's a good idea to open a document as read-only unless you need to edit the document.

To open a document with read-only access	To open a document with read-write access
1 Choose File Open.	1 Choose File Open.
2 Type the name of the document. If the document is in a directory other than the current one, type the full pathname.	2 Type the name of the document. If the document is in a directory other than the current one, type the full pathname.
3 Turn on the Read Only check box.	3 Turn off the Read Only check box.
4 Choose the OK button.	4 Choose the OK button.

Note If you try to open a document with read-write access while another user with read-write access is working on the document, Microsoft Excel displays a message indicating that the document is read-only. Choosing the OK button opens the document with read-only access; choosing the Cancel button cancels the command.

Protecting Shared Documents

The following table summarizes ways to use the Microsoft Excel data protection features when storing data on a network:

To store a document on the network	You can
And only allow authorized users to access it	Save the document with a password using the File Save As command. Give the password only to authorized users.
And prevent anyone from editing it	Lock all the cells in the documents using the Format Cell Protection command. Protect the document with a password, using the Options Protect Document command.
And only allow authorized users to edit it	Lock all the cells in the documents using the Format Cell Protection command. Protect the document with a password, using the Options Protect Document command. Give the password to anyone authorized to edit it.

To store a document on the network	You can
But hide part of that document from unauthorized users	Hide those cells using the Format Cell Protection command and set the column width or row height for the columns or rows containing the cells to zero. Protect the document with a password, using the Options Protect Document command. Give the password to anyone who's authorized to edit it.

For more information on specific procedures for using the Microsoft Excel data protection options, see **Protecting or hiding data**.

Using Printers on a Network

Generally, the procedures for printing from a network are the same as regular printing procedures. Initially, you use the Setup program for Microsoft Excel (and Microsoft Windows, if you're running the program under Microsoft Windows, version 2.0 or higher) to set up all printers or plotters available to you. To add any new printers later on, you can use Control Panel. If you've set up more than one printer to run with Microsoft Excel, you use the File Printer Setup command to select the printer you want. You also use the File Printer Setup command to change the settings for a printer, no matter how many printers you set up.

For information on printing and printer setup, see **Printing a document** and **File Printer Setup command**.

Note | Your network software may require you to issue a DOS command to make a network printer available to your computer. For specific procedures that apply to your network, see your network software manual.

Related Information

Reference

For information on	See
Start-up procedures	Starting Microsoft Excel
Opening files	Opening a document
Copying or moving data between Microsoft Excel documents and between Microsoft Excel and other applications	Copying data and formats Moving data on a worksheet Exchanging data between applications

For information on	See
Saving files	Saving and closing a document
Ending a work session	Quitting Microsoft Excel
Data protection	Protecting or hiding data

Notes

A cell **note** is an annotation or comment attached to a particular cell in a worksheet or macro sheet. Notes are useful for documenting your data sources, explaining underlying assumptions of a worksheet model, or detailing the way a macro works. They can function as memory joggers for yourself and as quick reference aids for others who use your model. You can view all notes in a worksheet in sequence or print them out — with or without the main document. By creating a series of notes to follow, you can map out online or printed "guided tours" of worksheet models or macros for others who use your documents.

This topic explains:

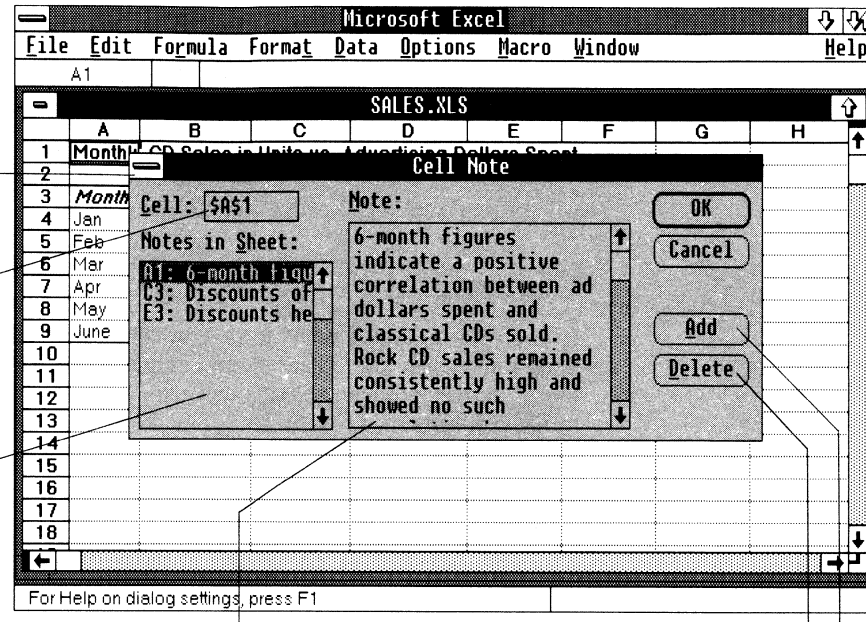
- Cell notes basics
  - Creating a note
  - Creating multiple notes quickly
  - Deleting a note
- Using notes
  - Viewing notes
  - Scrolling through notes in the Info window
  - Printing notes

This topic does not discuss detailed procedures for using the Info window, from which you can also display and print cell notes. For more information, see **Info window**.

Note | All cell note procedures for worksheets also apply to macro sheets.

Cell Notes Basics

You create notes in the Formula Note command dialog box. The following illustration shows the features of this dialog box.



Move dialog box as you would any other window to refer to a worksheet cell.

Indicates cell note currently selected in Notes in Sheet box or cell for which you are creating a new note.

Use to view list of all notes in sheet. Select a note to display its text in the Note box.

Use to create and edit notes or to view note that is currently selected in the Notes in Sheet box.

Use to delete note selected in the list box.

Use to create multiple notes with the dialog box open.

The Formula Note dialog box has its own Control menu. If you need to refer to a cell behind the dialog box, you can move the dialog box with the Control Move command or by dragging it with the mouse. When the Cell text box is active, you can also scroll the worksheet window and select cells on the worksheet.

To edit a note, use standard procedures for editing in the formula bar. For information on keyboard and mouse procedures for editing in the formula bar, see **Formula bar**.

Tip | If a cell has a note attached to it, double-clicking with the mouse on that cell displays the Formula Note dialog box.

Creating a Note

1 Select the cell you want to annotate.

2 Choose Formula Note.

The flashing insertion point indicates the Note box is the active area.

3 Type the text of the note in the Note box.

Do not press ENTER to insert a line break. The text you type automatically wraps down to the next line. To insert a line or paragraph break, press CONTROL + ENTER.

4 Choose the OK button.

Microsoft Excel attaches the note to the cell, along with its cell reference.

Creating Multiple Notes Quickly

If you want to attach notes to several cells, you can leave the Formula Note dialog box open and create multiple notes at one time. When the Cell text box is active, you can select a cell with either the keyboard or mouse, or type in the cell reference.

1 Select the first cell you want to annotate.

2 Choose Formula Note.

3 In the Note box, type the text of the note.

Do not press ENTER to insert a line break. The text you type automatically wraps down to the next line. To insert a line or paragraph break, press CONTROL + ENTER.

4 Choose the Add button.

Microsoft Excel attaches the note to the cell and lists the cell reference and first few words of the note in the Notes in Sheet box. Then it activates the Cell box and selects the cell reference.

5 Use the DIRECTION keys or the mouse to select the next cell you want to annotate, or type the reference in the Cell box.

As soon as you select a new cell or start typing, the old cell reference is replaced by the new reference.

6 Press ALT + N to move to the Note box.

Microsoft Excel activates the Note box and selects the text of the previous note.

7 Type the text of the next note.

As soon as you start typing, the text of the old note is replaced by the text you are typing for the new note.

8 Choose the Add button.

9 Repeat steps 5–8 for each additional note you want to create.

10 When you are finished adding notes, choose the OK button.

Deleting a Note

1. Choose Formula Note.
2. Select the note in the Notes in Sheet box.
3. Choose the Delete button.

   Microsoft Excel displays a message asking you to confirm the deletion.
4. To confirm the deletion, choose the OK button.

   To cancel the message and return to the Formula Note dialog box, choose the Cancel button.
5. Repeat steps 2–4 for each note you want to delete.
6. When you are finished deleting notes, choose the OK button to close the Formula Note dialog box.

Note Choosing the Cancel button in the Cell Note dialog box does not cancel any deletions you have made; it just closes the dialog box.

Using Notes

This section explains techniques for viewing and printing cell notes.

Viewing Notes

Use this procedure to view a particular note, or to see a list of the notes in the worksheet.

1. Select any cell in the worksheet.
2. Choose Formula Note.
3. To see the list of notes, scroll through the Notes in Sheet box.

   To view a particular note, select it in the Notes in Sheet box. The Note box displays the text of the note.
4. When you are finished viewing the notes, choose the Cancel button.

Scrolling Through Notes in the Info Window (Full Menus)

An easy way to browse through notes for a worksheet or macro sheet is to view them in the Info window. The Info window can display nine different kinds of detailed information about the active cell, including the note attached to the cell. With the Info window displayed, you can quickly scroll through all cell notes in a worksheet or in a range of the worksheet, using the Formula Select Special command.

To scroll through notes in the Info window:

1. Choose Window Show Info to display the Info window.
2. If the Info window is not set to display notes, choose Info Notes.
3. Move and size the windows so that the worksheet window and Info window are both visible.

   Or, choose Window Arrange All to tile all open windows.
4. Activate the worksheet window.
5. To view notes in a certain range of the worksheet, select that range.

   To view all notes in the worksheet, select a single cell.
6. Choose Formula Select Special.
7. In the dialog box, select Notes.
8. Choose the OK button.

   Microsoft Excel makes a multiple selection that includes all cells with notes attached to them.
9. Press TAB to move cell-by-cell through the selected cells and display the note for each in the Info window.

   Press CONTROL+TAB to jump between ranges of the selected cells.

For information on specifying data displayed in the Info window or turning off the display of data, see **Info window**.

Printing Notes

You can print cell notes either with or without their accompanying worksheet. If you specify that both the worksheet and notes be printed, Microsoft Excel first prints the worksheet, followed by the notes.

To print notes with or without the worksheet:

1. Choose File Page Setup.
2. Select the options you want in the dialog box.

   To print notes with cell references before each note, turn on the Row and Headings check box. To print notes without cell references before each note, turn off the Row and Headings check box.
3. Choose the OK button.
4. Choose File Print.
5. Select the options you want in the dialog box.

   To print only notes, select Notes. To print the worksheet and its notes, select Both.
6. Choose the OK button.

Note If you have previously specified a print area (a section of a worksheet you want to print), Microsoft Excel prints notes only for cells in the print area.

For information on the File Page Setup command dialog box options, see **File Page Setup command**. For information on printing options and procedures, see **Printing a document**.

Tip You can create Info window print-outs for all cells in a worksheet or for selected cells only. An Info window print-out can contain any or all the types of data you display in the Info window for each cell: reference, formula, value, formats, protection status, names associated with the cell, precedents, dependents, and any note attached to the cell. For information on creating an Info window print-out, see **Info window**.

Related Information

Reference

For information on	See
Using the Info window	Info window
Printing procedures	Printing a document
Using dialog boxes	Command, menu, and dialog box
Tracing relationships among cells, verifying range names	Auditing worksheet models

Functions and Macros

"Documenting Macro Sheets" in Chapter 3, "Macro Basics"

Sampler

Correcting for Instrument Drift

Solving Simultaneous Equations

Feature Guide

Auditing and Documenting, "Creating, Reading, and Printing Notes"

Number

In Microsoft Excel, a number can be entered directly into a cell or can be produced as the result of a formula. A number entered directly into a cell is called a **constant number**.

This topic explains:

- Entering a number in a formula
- Entering a number in a cell
- How Microsoft Excel stores numbers
- Controlling the accuracy of numbers
- Using built-in number formats
- Creating your own number formats

Entering a Number in a Formula

Numbers can include any of the following characters:

1 2 3 4 5 6 7 8 9 0 − + . E e

When you enter a number in a formula, Microsoft Excel recognizes the following formats:

Integer	789, −789
Decimal fraction	7.89, 0.789, −.789
Scientific notation	7.89e1, 789E−12

If you enter a number in a format other than integer, decimal fraction, or scientific notation, Microsoft Excel interprets it as text.

Entering a Number in a Cell

When you enter a number as a constant in a cell, you can include the following characters along with one of the above number formats:

( ) $ % ,

Microsoft Excel ignores plus signs (+) that come before numbers. To enter a negative number, either precede it by a minus sign (−) or enclose it within parentheses ( ). You can also include commas in numbers you enter as constants, such as 1,000,000.

When you create a new worksheet, all cells have General format. In General format, Microsoft Excel displays numbers as precisely as possible, using integer format (789), decimal fraction format (7.89), or scientific notation (7.89E+08) if the number is longer than will fit in the cell.

When you enter a number that contains a dollar sign ($) before the number, or a percent sign (%) after the number, Microsoft Excel automatically changes the cell's format from General format to dollar format or a percentage, respectively. If you use one of the built-in date or time formats when you enter a date or time, Microsoft Excel automatically changes the cell's format from General to the appropriate date or time format. For information on date and time formats, see **Date** and **Time**.

How Microsoft Excel Stores Numbers

Microsoft Excel stores numbers to 15 digits of accuracy. This is called **full precision**. The largest positive number you can use is 1.789E305, and the smallest number you can use is 2.225E−307. If you enter a number that does not fall within this range, Microsoft Excel stores the number as text.

Microsoft Excel displays a number according to the format of the cell containing it, so the number you see in a cell may be different from the number Microsoft Excel stores. In calculations, however, Microsoft Excel uses the number stored in the cell no matter how it is displayed on the screen.

If a number is too long to display within the width of the cell, Microsoft Excel displays all number signs (######) in the cell. If you widen the column enough, either by using the Format Column Width command or by dragging with the mouse, Microsoft Excel displays the number in the cell's format. For more information, see **Column**.

Controlling the Accuracy of Numbers

Because a cell's displayed value and the stored value can be different (usually because a number is rounded off when displaying less than full precision), your formulas may sometimes produce results that appear to be wrong.

For example, you might have a worksheet where two cells have formulas that produce the value 2.006, and another cell has a formula that adds the two cells together for a total of 4.012. If the cells were formatted with dollar format, however, the results would appear to be $2.01 + $2.01 = $4.01 due to rounding. You can resolve this by storing numbers at less than full precision with the Precision As Displayed option in the Options Calculation dialog box.

If you use Precision As Displayed, the value stored in the cell and used in calculations becomes the same as what is displayed in the cell.

To change to Precision As Displayed:

1. Choose Options Calculation.
2. Turn on the Precision As Displayed check box.

Important Microsoft Excel displays a message warning you that the worksheet data will permanently lose accuracy as a result of this selection.

3. Choose the OK button.

The next time your worksheet is calculated, the numbers stored in the cells change to Precision As Displayed.

Note Calculating with Precision As Displayed may slow calculation, as it forces Microsoft Excel to round numbers as it calculates them.

Using Built-in Number Formats

You control how a number is displayed primarily with the number formats in the Format Number dialog box. You can use one of the built-in number formats or create your own custom number formats. Custom number formats are covered in the next section of this topic.

To use a built-in number format:

1. Select the cells you want to format.
2. Choose Format Number.
3. Select a format from the list.
4. Choose the OK button.

Microsoft Excel assigns the number format to the selected cells.

The following table shows some examples of Microsoft Excel number formats. You can use these built-in formats, or create your own. For more information, see **Formatting a document** and **Format Number command**.

	Number typed		
Format	**5**	**−5**	**.5**
General	5	−5	0.5
0	5	−5	1
0.00	5.00	−5.00	0.50
#,##0	5	−5	1
#,##0.00	5.00	−5.00	0.50
$#,##0 ;($#,##0)	$5	($5)	$1
$#,##0 ;[RED]($#,##0)	$ 5	($ 5)*	$ 1
$#,##0.00 ;($#,##0.00)	$5.00	($5.00)	$0.50
$#,##0.00 ;[RED]($#,##0.00)	$ 5.00	($5.00)*	$0.50
0%	500%	−500%	50%
0.00%	500.00%	−500.00%	50.00%
0.00E+00	5.00E+00	−5.00E+00	5.00E−01

*Will display red.

Note that the dollar formats produce trailing spaces for positive numbers.

Creating Your Own Number Formats

For each worksheet, you can create your own number formats to use in addition to Microsoft Excel number formats. Because you can create your own number formats, you can display numbers however you want, and reduce data entry time.

Some examples of the custom number formats you can create are:

- Formats for social security numbers or telephone numbers. You enter just the numbers into the cells, and Microsoft Excel supplies the hyphens or other punctuation marks.
- Formats that use text. You enter just the numbers, and Microsoft Excel supplies the quantifiers such as "lbs." or "DM."
- A format that makes positive numbers blue, negative numbers red and in parentheses, zeros green, and text black.

Microsoft Excel represents number formats with a "picture" that uses symbols to show how the numbers will appear in the formatted cells. Each picture consists of up to four sections separated by semicolons: three number sections and a text section.

If there are three number sections in the picture, the first section is the format used for a positive number, the second section is the format used for a negative number, and the third section is the format used for zeros. If there are two sections, the first one is used for positive numbers and zeros, and the second one for negative numbers. With one section, all numbers use the format in that section.

For each part of the picture, you type symbols that represent how you want the number to look. The symbols are listed later in this section.

If you create your own number formats, you can also add a text formatting section to a custom number format. You identify a text format with the text placeholder (@).

A text format, if included, is always the last in the list. If you have a text section, it changes how Microsoft Excel applies the number sections. For example, a picture format with three sections, the last of which is not a text format, is interpreted as "format if positive; format if negative; format if zero." If a picture format has three sections, and the last section is a text format, Microsoft Excel interprets it as "format if positive or zero; format if negative; format if text."

To set the color for a section of the format, just type a color indicator in that section.

If you have semicolons with nothing between them, the missing section prevents that type of number from being displayed. For example, you could create a picture format like the following:

format if positive;;;format if text

Because this number format does not define how to display negative numbers (the second section) or zeros (the third section), any cells with this format appear blank if they contain a negative number or zero.

To create your own number format:

1. Select the cells you want to format.
2. Choose Format Number.
3. In the Format box, edit an existing number format or type a completely new one.
4. Choose the OK button.

Microsoft Excel formats the cells with the new format and adds the format to the list box so you can use it for other cells whenever you want. If you edited an existing format, Microsoft Excel adds the new format to the list box without destroying the format you changed. The only way to lose a number format is to delete it with the Delete button. You cannot delete any of the built-in number formats.

Here are some examples of number formats you can create:

With this format	This number	Is displayed this way
#.##	1234.568 0.1	1234.57 .1
#.0#	1234.458 12	1234.57 12.0
#,##0"CR"; #,##0"DR";0	1234.568 −12.34 0	1235CR 12DR 0
#,	12000	12
"X="0.0	1234.568 −12.34	X=1234.6 −X=12.3
"X="0.0;"X="−0.0	−12.34	X=−12.3
$* #,##0.00; $* −#,##0.00	1234.568 −12.34	$ 1,234.57 $ −12.34
000-00-0000	435690891	435-69-0891
"Acct No." 00000	8967	Acct. No. 8967
0;−0;	0	NOT DISPLAYED
;;	Any number	NOT DISPLAYED
"Number"	Any number	Number

Each format symbol has its own meaning. Microsoft Excel uses these symbols in its built-in formats. You can also use these symbols to create your own formats.

This symbol	Means this
General	Display the number in General format.
0	Digit placeholder. If the number has fewer digits on either side of the decimal point than there are zeros on either side of the decimal point in the format, then Microsoft Excel displays the extra zeros. If the number has more digits to the right of the decimal point than there are zeros to the right in the format, Microsoft Excel rounds the number to as many decimal places as there are zeros to the right. If the number has more digits to the left of the decimal point than there are zeros to the left in the format, Microsoft Excel displays the extra digits.
#	Digit placeholder. Follows the same rules as for 0 above, except that Microsoft Excel does not display the extra zeros if the number has fewer digits on either side of the decimal point than there are #'s on either side in the format.
.	Decimal point. This symbol determines how many digits (0's or #'s) Microsoft Excel displays to the right and left of the decimal point. If the format contains only #'s to the left of this symbol, Microsoft Excel begins numbers smaller than 1 with a decimal point. To avoid this, you should use 0 as the first digit placeholder to the left of a decimal point instead of #.
%	Percentage. Microsoft Excel multiplies by 100 and adds the % character.
,	Thousands separator. Microsoft Excel separates thousands by commas if the format contains a comma surrounded by #'s or 0's. You can place two commas in a row, or a comma followed by a period, to scale financial figures by a thousand, a million, etc.
E− E+ e− e+	Scientific format. If a format contains one 0 or # to the right of an E−, E+, e−, or e+, Microsoft Excel displays the number in scientific format and inserts an E or e. The number of 0's or #'s to the right determines the number of digits in the exponent. Use E− or e− to place a minus sign by negative exponents. Use E+ or e+ to place a minus sign by negative exponents and a plus sign by positive exponents.

This symbol	Means this
$ − + ( ) space	Display that character. To display a character other than one of these, precede the character(s) with a backslash (\) or enclose the character(s) in double quotation marks (" ").
\	Display the next character in the format. Microsoft Excel does not display the backslash. This is the same as enclosing the next character in double quotation marks.
*	Repeat the next character in the format enough times to fill the column width. You cannot have more than one asterisk in one section of a format.
"Text"	Display whatever text is inside the double quotation marks.
@	Text placeholder. If there is text in the cell, the text from the cell is placed in the format where the @ character appears.
[BLACK]	Changes the color of the characters displayed in the cell to black.
[WHITE]	Changes the color of the characters displayed in the cell to white.
[RED]	Changes the color of the characters displayed in the cell to red.
[GREEN]	Changes the color of the characters displayed in the cell to green.
[BLUE]	Changes the color of the characters displayed in the cell to blue.
[YELLOW]	Changes the color of the characters displayed in the cell to yellow.
[MAGENTA]	Changes the color of the characters displayed in the cell to magenta.
[CYAN]	Changes the color of the characters displayed in the cell to cyan.

Related Information

Reference

For information on	See
Constant numbers	Constant value
Entering and editing formulas	Formula
Formatting numbers	Formula bar
Calculations in Microsoft Excel	Formatting a document Calculation

Sampler

Preparing a New Business Plan

Changing Coordinate Systems

Generating Mailing Labels

Tutorial

Changing How a Worksheet Looks

Feature Guide

Worksheet Formatting Practices, "Creating Custom Number Formats"

One-input table

A **one-input table** consists of:

- One group of values that are substituted for a single variable in one or more formulas.
- The formula results that occur when the values are substituted for the variable.

Data tables are useful for "what-if" analysis. For more information, see **Data table**.

Opening a document

This topic explains the various procedures for opening a document, including:

- Creating a new document
- Opening an existing document
- Opening a document in a different drive or directory

This topic does not discuss workspace files or opening linked documents. For information on opening a workspace file, see **Workspace file**. For information on opening linked documents, see **Linking documents**.

Creating a New Document

1. Choose File New.
2. Select the type of document you want to create: Worksheet, Chart, or Macro Sheet.
3. Choose the OK button.

Microsoft Excel shows the new document in a new window, with its upper-left corner in the upper-left of the screen. If a window already occupies that area, Microsoft Excel places the new document window slightly lower and to the right.

Microsoft Excel gives the new document a temporary name, such as Sheet1 or Chart1. When you create more than one new document of the same kind during a session, Microsoft Excel numbers them sequentially (Sheet2, Sheet3, and so on). You name each new document when you save it using the File Save As command.

Until you change a document's settings, the Microsoft Excel default settings apply to the new document. When you save the document, Microsoft Excel stores any changes to defaults along with the document. Your settings override the defaults whenever you reopen and activate the document.

For information on the Microsoft Excel default settings, see **Default settings**. For information on saving a new document, see **Saving and closing a document**.

Opening an Existing Document

Once you've saved a document with a particular name, use that name whenever you want to open the document. For example, if you want to open a chart that you've saved with the name ASSETS.XLC, choose the File Open command and select ASSETS.XLC in the dialog box. Microsoft Excel looks in the current drive and directory for the document named ASSETS.XLC.

To open an existing document in the current drive and directory:

1. Choose File Open.
2. In the list box, select the name of the document you want to open.
   You can also type the name in the File Name box.
3. Choose the OK button.

Note If Microsoft Excel can't find the document you specify, it displays a message telling you it can't find the document and asking whether you want to check again or cancel. If the document you want is not in the current directory and drive, follow one of the procedures in the next section of this topic, "Opening a Document in a Different Drive or Directory." For more information on directories, see **Directories**.

Opening a Document in a Different Drive or Directory

If the document you want is in a different drive or directory, you can do either of the following:

- Stay in the current drive and directory and open the document by using the full pathname. You may want to do this if you're planning on working with other documents in the current directory. For example, to open a worksheet named ARTSALES in the REVENUE directory, you type *c: revenue artsales.xls* in the File Open dialog box.
- Change the current drive or directory and then open the document. You may want to do this if you can't remember the exact name of the document or if you want to open more than one document in the other directory. For example, to find and open a document in the IMPORTS directory, the path would be *c: imports* *.* in the File Open dialog box. (The asterisks are wildcard characters that tell Microsoft Excel to display in the list box all documents in that directory. For more information, see **Wildcard**.)

To keep the current drive/directory and open a document	To change the drive/directory and open a document
1 Choose File Open.	1 Choose File Open.
2 Type the full pathname, followed by the name of the document you want.	2 Type the name of the drive and/or directory, followed by *.* to list every document on that drive or in that directory.
3 Choose the OK button.	3 Choose the OK button.
	4 In the list box, select the name of the document you want to open.
	5 Choose the OK button.

Note | You can also type *.* in the File Name box and choose the OK button to list every document in the current drive or directory.

For more information on directories, see **Directories**.

Related Information

Reference

For information on	See
Procedures for starting or quitting Microsoft Excel	Starting Microsoft Excel Quitting Microsoft Excel

Tutorial

Worksheet Basics

Operator

An **operator** is an instruction, such as a plus sign (+) or a minus sign (−) in a formula that tells Microsoft Excel to produce a new value from existing values. Operators act on **operands**. For example, in the formula =5+2, the plus sign (+) is the operator that instructs Microsoft Excel to add the operands 5 and 2 and produce the value 7.

This topic explains:

- Types of operators
- Arithmetic operators
- Text operator
- Comparison operators
- Reference operators
- Order of operations

Types of Operators

Microsoft Excel has four types of operators:

- Arithmetic
- Text
- Comparison
- Reference

Some operators act on two operands; others act on one. The formula =5+2 uses two operands. In the formula =3%, the percentage operator divides the operand (3) by 100 to produce the value 0.03.

Operands should be single values, references to single cells, or names that refer to single cells or constant values. In a formula, if you specify a reference to a row or column of cells that should be a reference to a single cell, Microsoft Excel chooses just one cell from that reference on which to perform the operation or function. If the reference is a row, Microsoft Excel chooses the cell that is in the same column as the cell containing the formula; if the reference is a column, Microsoft Excel chooses the cell that is in the same row as the cell containing the formula. For example, if you enter the formula =A1:J1 − A2:J2 in C3, Microsoft Excel subtracts C2 from C1.

Arithmetic Operators

The arithmetic operators perform basic mathematical operations. They combine numeric values and produce numeric results. The arithmetic operators are:

+	Addition
−	Subtraction
−	Negation (if used with one operand only)
*	Multiplication
/	Division
%	Percentage
^	Exponentiation

Text Operator

The ampersand (&) is the text operator. Use it to join two or more text values into a new text value. For example, the formula ="Dr."&"Jones" produces the text value Dr. Jones. Another example of how you might use the text operator is in a formula such as ="Line "&ROW(). This combines the text "Line" with the value produced by the ROW function. If you copy this formula into a column of cells, the cell in row 1 will display the text "Line 1." The cell in row 2 will display "Line 2," and so on.

Comparison Operators

A comparison operator compares two values and produces the logical value TRUE or FALSE.

For example, the formula =Profit<25000 produces the value TRUE if the value of Profit is less than 25000. If the value is greater than or equal to 25000, this formula produces the logical value FALSE.

The comparison operators are:

=	Equal
<	Less than
<=	Less than or equal to
>	Greater than
>=	Greater than or equal to
<>	Not equal to

Note If you include any of the comparison operators in the Find What text box when you choose the Formula Find command, they do not function as comparison operators. In the Formula Find command, Microsoft Excel treats comparison operators as normal characters.

Reference Operators

Reference operators combine two references and produce a new reference. The reference operators are:

:	Range — Produces one reference to all the cells between and including the two references.
space	Intersection — Produces one reference to the cells common to the two references, or the #NULL error value when the two references have no cells in common.
,	Union — Produces one reference that includes the two references.

With reference operators, you can combine absolute references, relative references, and named areas.

When using a range reference operator to refer to entire columns, rows, or a range of columns or rows, you can use the following:

To refer to	Type
All of column A	*A:A*
All of row 1	*1:1*
All of rows 1 through 3	*1:3*
Entire worksheet	*A:IV* or *1:16384*

When you build formulas, Microsoft Excel uses these range references if you select entire rows or columns.

Order of Operations

If you combine several operators in a single formula, Microsoft Excel performs the operations in the following order:

:	Range
space	Intersection
,	Union

–	Negation
%	Percent
^	Exponentiation
* and /	Multiplication and division
+ and –	Addition and subtraction
&	Text operator
= < > <= >= <>	Comparison operators

If you want to alter this order, use parentheses to group expressions in your formula. Microsoft Excel first calculates the expressions in parentheses, and then uses those results to calculate the formula. For example:

This formula	Produces this value
=5*4+2	22
=5*(4+2)	30

Related Information

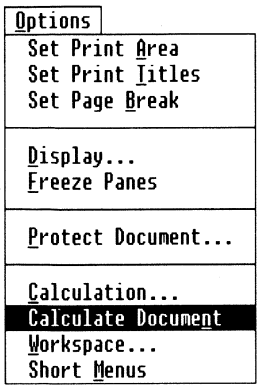
Reference

For information on	See
Calculations in Microsoft Excel	Calculation
Using references	References
Logical values	Logical value
Entering and editing formulas	Formula Formula bar

Feature Guide

Basic Mechanics, "Copying, With Operators"

Options Calculate Document command



Calculates only the active worksheet, chart, or macro sheet. Like the Options Calculate Now command, which calculates all open documents, Options Calculate Document calculates according to the Update Remote References and Precision As Displayed settings in the Options Calculation dialog box. **Shortcut key:** SHIFT + F9.

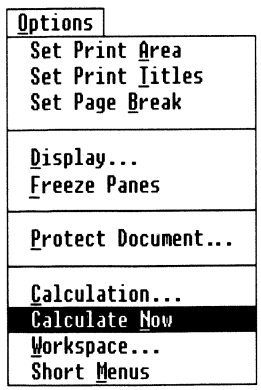
Calculate Document only appears on the Options menu if you hold down SHIFT when you select the Options menu. Calculate Document appears in place of the Calculate Now command.

Normally, you use Options Calculate Document only when the Options Calculation dialog box is set to Manual. When Options Calculation is set to Automatic, calculation is done for you automatically.

Note

Even when your worksheet is set to automatic calculation, the Options Calculate Document command is useful for calculating the circular portion of an iterative model. For more information, see **Iteration**.

Options Calculate Now command



Calculates worksheets and charts, or a formula you are creating in the formula bar. **Shortcut key:** F9.

You need to use Options Calculate Now on a worksheet or chart only when the Options Calculation dialog box is set to Manual. When Options Calculation is set to Automatic, you don't need to use Options Calculate Now because Microsoft Excel calculates automatically.

Note

Even when your worksheet is set for automatic calculation, Options Calculate Now is useful for calculating the circular portion of an iterative model. For more information, see **Iteration**.

For All Documents

Options Calculate Now normally calculates all formulas in all open documents.

For Active Document Only

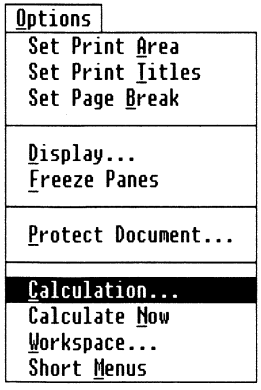
If you want to calculate the formulas on only the active document, hold down SHIFT when you select the Options menu. The Options Calculate Document command appears in place of Options Calculate Now.

In the Formula Bar

When the formula bar is active, and the formula you are editing begins with an equal sign, Options Calculate Now calculates the formula and replaces it with the result of that formula. For example, if you want to enter a number that is the result of a formula, you can enter that formula and choose Options Calculate Now.

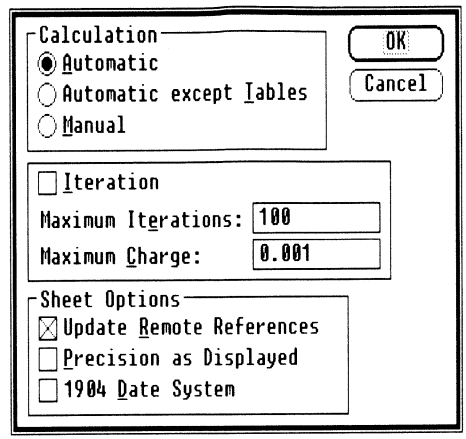
You can also calculate part of a formula by selecting the part and choosing Options Calculate Now. This changes that part of the formula from a variable to a constant.

Options Calculation command



Controls when formulas in open documents are calculated.

The time it takes to calculate the open documents depends on the number and size of the open documents and the complexity of the formulas. Microsoft Excel calculates as few formulas as possible whenever you make a change to a document, but you may want to turn off automatic calculation for quicker response when making many entries in a complex worksheet.



Calculation

Automatic	Every time you change a value, formula, or name, all formulas that depend on that value, formula, or name are automatically calculated, including tables. All worksheets start with and use automatic calculation until you change it.
Automatic except Tables	Calculates all dependent formulas except tables. This option is available because tables slow the calculation of the rest of the worksheet. You can calculate all open worksheets, including their tables, with the Options Calculate Now command.
Manual	Calculates all open documents only when you choose the Options Calculate Now or Chart Calculate Now command. Calculates just the active document when you choose the Options Calculate Document command.

Iteration

Controls iteration. When this check box is turned on, you can limit iteration by setting either or both of the following options. If you type a number in both boxes, iteration ends as soon as either maximum is reached. Unless you specify otherwise, Microsoft Excel stops iterating after 100 iterations, or when all iterating values on the model change by less than 0.001. For more information, see **Iteration**.

Maximum Iterations

Limits the number of iterations before calculation stops.

Maximum Change

Also limits the number of iterations; when all the iterating values change by less than the number in this box, iteration stops.

Update Remote References

Calculates formulas that include references to other applications. When this check box is turned off, formulas with references to other applications use the last value received from the remote application. For information on remote references, see **Exchanging data between applications**.

Precision As Displayed

Controls how values are stored in cells.

When you create a new worksheet, values are stored at full precision — 15 digits — and all calculations use the entire stored value no matter how the values are formatted and displayed.

If you turn on this check box, the value of each cell is altered to be whatever is displayed, and only the displayed value of each cell is used for calculations.

For example, if a cell contains the value 23.158, and is formatted to show only two decimal places, the displayed value is 23.16. If you calculate your worksheet with Precision As Displayed, the value of that cell changes to 23.16, and 23.16 is used by any formula that refers to that cell.

Important

Any constant values on your worksheet that are formatted to display a value other than the full stored value change when you choose Precision As Displayed, and the rounded number is stored in place of the full value. Turning off Precision As Displayed does not restore the numbers to their original values.

Because you lose accuracy with Precision As Displayed, Microsoft Excel asks you to confirm the change when you choose the OK button.

Use Precision As Displayed only when the results of formulas do not seem to match the values used to calculate the formulas. For example, if you have two cells containing the value 23.006, and you add them together, the result is 46.012. If all three cells are formatted to display only two decimal places, the result is $23.01 + $23.01 = $46.01, which appears to be wrong. On the other hand, Precision As Displayed would produce a result of $23.01 + $23.01 = $46.02.

Precision As Displayed does not affect numbers in General format. Numbers in General format are always calculated to full precision.

Microsoft Excel calculates faster when using full precision, because with Precision As Displayed, Microsoft Excel has to round off the numbers as it calculates.

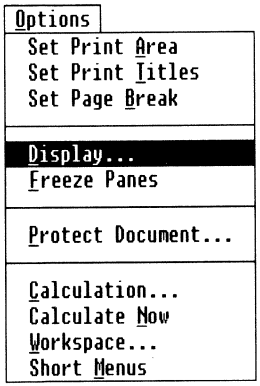
1904 Date System

Changes the starting date from which all dates on the worksheet are calculated. Dates are stored internally as serial numbers. You can view a date as a serial number by using the Format Number command to change the cell's format to General.

In the 1900 date system, which is used in the WKS, WK1, and Normal (Microsoft Excel) file formats, the date serial number 1 produces a date of January 1, 1900. In the 1904 date system, which is used by Microsoft Excel for the Apple Macintosh, the date serial number 1 produces a date of January 2, 1904.

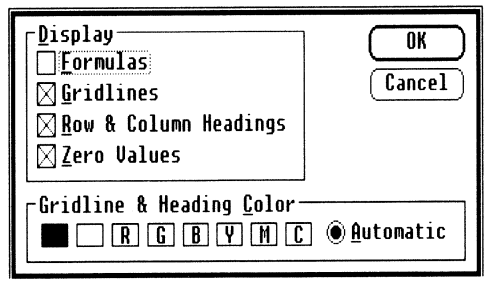
Microsoft Excel normally recognizes the file format and sets this option for you. If the dates in your worksheet are off by four years, change this option. For information on dates, see **Date**.

Options Display command



Controls whether the screen displays formulas, gridlines, row and column headings, and zero values. Options Display also controls the color of gridlines and row and column headings.

The settings in the Options Display dialog box affect only the active worksheet window.



Formulas

Displays the contents of each cell instead of the values produced. This option also left-aligns all cell contents and doubles the width of all columns to accommodate the formulas.

Gridlines

Displays gridlines on your screen; to remove them, turn off this check box. If you don't want gridlines in your printed document, use the Page Setup command to turn them off.

Row & Column Headings

Displays the numbered headings at the left of each row, and the lettered or numbered headings at the top of each column.

If you don't want row and column headings in your printed document, use the Page Setup command to turn them off.

Zero Values

Displays all zero values. If you turn off this check box, Microsoft Excel displays all zero values as blank cells.

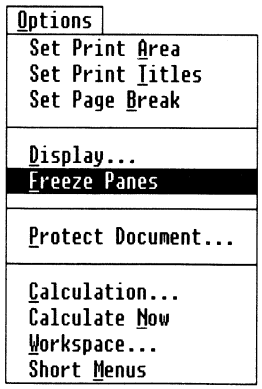
This option does not affect cells that have been formatted specifically to show zeros. For information on formatting numbers, see **Format Number command**.

Gridline and Heading Color

Sets gridline and heading color for the active worksheet window. Normally, gridline and heading color is the same as the text color defined in Control Panel.

Options Freeze Panes command

(Full menus)



Freezes the top and/or left panes you have created on the active worksheet with the Control Split command. Use Options Freeze Panes when you want to keep row or column titles on the screen while scrolling to other parts of the worksheet.

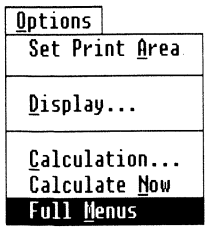
When you choose Options Freeze Panes, panes to the left of a vertical split do not scroll horizontally; panes above a horizontal split do not scroll vertically.

With frozen panes, you cannot scroll into the frozen part of the worksheet. For example, if you choose Options Freeze Panes and the top pane contains rows 1 through 4, you cannot scroll the lower pane above row 5.

The difference between frozen panes and unfrozen panes is that with unfrozen panes you can independently scroll the panes above a horizontal split or to the left of a vertical split.

For information on creating panes on your worksheet, see **Control Split command**. The **Display options** topic also has information on both splitting a worksheet into panes and freezing panes.

Options Full Menus command



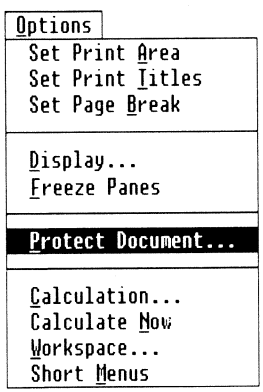
Changes the menus to show all available commands. Options Full Menus affects all menus for all documents, including charts.

Use full menus when you want to use commands that aren't available on short menus.

Full Menus appears on the Options menu when you are using short menus. When a chart is the active document, Full Menus appears on the Chart menu.

Options Protect Document command

(Full menus)



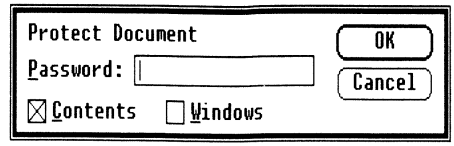
Controls whether cell protection formats take effect and whether windows can be moved, sized, or otherwise altered. You specify cell protection formats with the Format Cell Protection command. When the active worksheet is protected, the command changes to Options Unprotect Document.

Options Protect Document is similar to Chart Protect Document, which you use to protect charts.

Options Protect Document affects the entire worksheet. If you turn off gridlines with the Options Display command, Microsoft Excel underlines any unlocked cells on the protected worksheet.

Individual cells can be locked, unlocked, hidden, and unhidden with the Format Cell Protection command. For information on changing protection for individual cells, see **Format Cell Protection command**.

For more information, see **Protecting or hiding data** and **Options Unprotect Document command**.



Password

Type a password, using any combination of letters, numbers, and symbols. The password you type when you reverse protection of a worksheet must be identical to the password you type when you protect the worksheet. A password can be up to 16 characters long.

Important | If you lose your password, you cannot reverse protection of the worksheet. It's a good idea to keep a list of your passwords in a safe place.

If you are protecting your worksheet from yourself to avoid inadvertent changes of important information, you may want to protect your document without a password. If you choose the OK button in the Protect Document dialog box without typing a password, you don't need to type a password when you unprotect the document.

Using a password to protect a document from being changed is different from using a password to protect a document from being opened. For information on using a password to protect a document from being opened, see **File Save As command**.

Contents

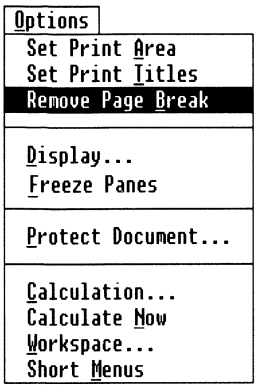
Protects all aspects of a worksheet except its windows. In a protected worksheet you cannot change the contents or format of locked cells.

Windows

Prevents the worksheet's windows from being moved, sized, or hidden. A protected window can be closed only with the File Close command.

Options Remove Page Break command

(Full menus)



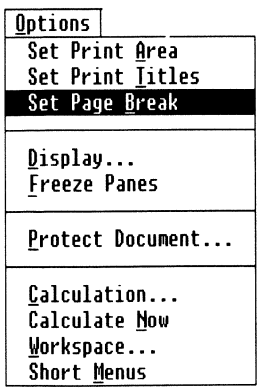
Removes manual page breaks that you set with the Options Set Page Break command. Does not remove automatic page breaks.

This command appears only when the active cell is directly below or to the right of a manual page break. When it appears, Options Remove Page Break replaces the Options Set Page Break command.

For more information, see **Printing a document**.

Options Set Page Break command

(Full menus)



Sets manual page breaks for a printed worksheet.

When you print a worksheet that is too large to fit on one page, Microsoft Excel breaks pages automatically based on cell size and the margin settings in the Page Setup dialog box. Use Options Set Page Break to override the automatic page breaks by setting your own manual ones. Setting a manual page break changes the automatic page breaks that follow.

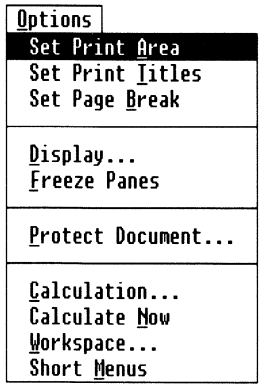
When you choose Options Set Page Break, manual page breaks appear above and to the left of the active cell. If the active cell is in column A, a manual page break is added only above the cell. If the active cell is in row 1, a manual page break is added only at the left edge of the cell.

Manual page breaks appear darker than automatic page breaks and remain on a worksheet until you remove them with the Options Remove Page Break command.

Manual page breaks shift if you insert or delete entire columns or rows.

For information on removing page breaks, see **Options Remove Page Break command**. For information on printing a document, see **Printing a document**.

Options Set Print Area command



Defines the print area — the area of the worksheet that prints when you choose the File Print command. The print area also controls which notes are printed.

A new worksheet does not have a set print area, so all cells containing data are printed until you set a smaller print area.

To print an area smaller than the entire data-containing area of the worksheet, select the range of cells you want to print and choose Options Set Print Area. Microsoft Excel names the selection Print_Area. To print the area, use the File Print command.

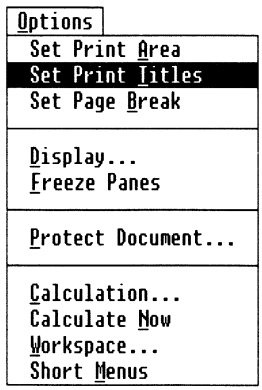
If you choose Options Set Print Area while you have a multiple selection, when you choose the File Print command, the individual selections are printed one after the other in the order they were selected.

You can remove a print area by deleting the name Print_Area with the Formula Define Name command.

For more information, see **Printing a document**.

Options Set Print Titles command

(Full menus)



Defines text you want as titles in the printed document.

Microsoft Excel prints the titles whenever it prints any cells in a row or column that intersects the area you define. The titles are printed on every page containing such cells. You can define one or more rows and/or columns as print titles, as long as the rows or columns are adjoining.

The rows and/or columns that you define as titles can be anywhere in the worksheet. A print title applies to all cells in the same row or column, in the same way that a row or column heading number does: a cell need only share the row or column with a print title for the title to be printed above or to the left of that cell.

To define print titles, select the entire rows and/or columns containing the text you want to use for titles, then choose Options Set Print Titles. Microsoft Excel names the selection Print_Titles.

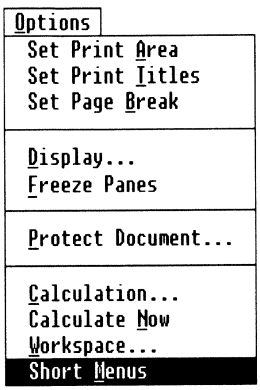
Select all of the rows and columns you want to define as the Print_Titles area in the same way you make any multiple selection. For information on multiple selections, see **Selection**, **Keyboard**, and **Mouse**.

Note | Do not include the print titles as part of the print area, or the titles will be printed twice on the first page.

For more information on printing, see **Printing a document**.

Options Short Menus command

(Full menus)



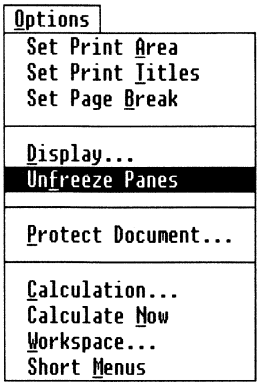
Changes the menus to show fewer commands. Options Short Menus affects menus for all documents, including charts.

Short menus contain the commands you use most often, so you can find them more quickly and use Microsoft Excel more efficiently. Use short menus for normal work, or when you are first learning to use Microsoft Excel.

Short Menus appears on the Options menu when you are using full menus. Options Short Menus works exactly the same as Chart Short Menus, which appears when you are using full menus and a chart is the active document.

Options Unfreeze Panes command

(Full menus)

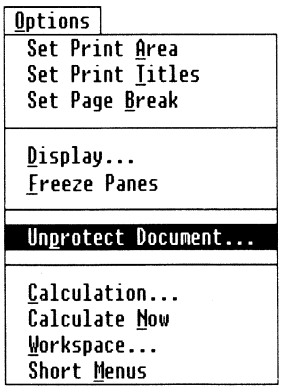


Unfreezes frozen panes in your worksheet. Unfreeze Panes appears on the Options menu only when you have frozen panes created with the Options Freeze Panes command.

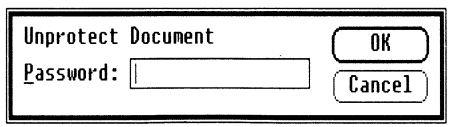
For information on freezing panes, see **Options Freeze Panes command**. For information on creating panes on your worksheet, see **Control Split command**. For information on splitting a worksheet into panes and freezing panes, see the **Display options** topic.

Options Unprotect Document command

(Full menus)



Reverses protection for a protected document. Options Unprotect Document is available when a protected worksheet is active. When the active worksheet is unprotected, the command changes to Protect Document.



Password

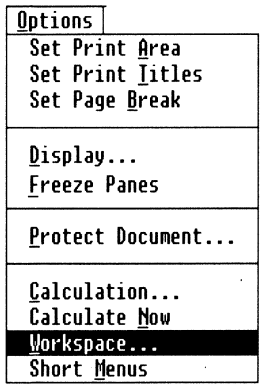
Type the password for the worksheet. The password must be identical to the password you typed when you protected the worksheet.

Note | If you did not use a password when you protected the document, Microsoft Excel unprotects the document without displaying the dialog box.

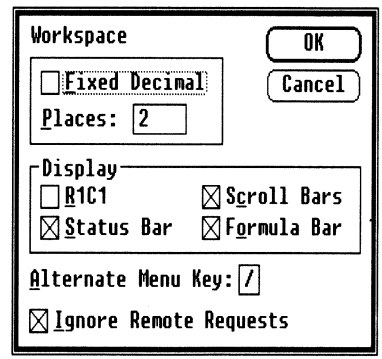
For more information, see **Protecting or hiding data** and **Options Protect Document command**.

Options Workspace command

(Full menus)



Controls settings that apply to the entire Microsoft Excel session.



Fixed Decimal Places

Automatically enters the number of decimal places you want so you don't have to type the decimal point for each number you enter. A positive number moves the decimal point to the left, a negative number moves the decimal point to the right, and a zero does not move the decimal point.

For example, if you set Fixed Decimal Places at 2, and you type *1234* in a cell, the number is entered as 12.34. If you set Fixed Decimal Places at −2 and you type *1234* in a cell, the number is entered as 123400.

Fixed Decimal Places only affects values for which you do not use a decimal point. If you include the decimal point when you enter a value into a cell, any settings in Fixed Decimal Places are ignored.

Note There is a difference between setting Fixed Decimal Places to 2 and formatting a cell to display two decimal places. If you enter 1234 into a cell when Fixed Decimal Places is set to two places, the stored value is 12.34 and the displayed value is 12.34. If you enter 1234 into a cell formatted to display two decimal places, the stored value is 1234 and the displayed value is 1234.00.

R1C1

Displays row and column headings and cell references in R1C1 reference style.

Your worksheets normally use the A1 style in row and column headings and for cell references in formulas. With the R1C1 style, rows and columns are both numbered, and references are different, as shown by the examples in the following table.

A1 reference	Corresponding R1C1 reference
=$B$3	=R3C2
=$E$7	=R7C5

Scroll Bars

Displays scroll bars for the active document. Scroll bars show your relative position in a worksheet and allow for fast scrolling with a mouse. Turn off this option to turn off scroll bars and see more of your document.

Formula Bar

Displays the formula bar. The formula bar is where you edit the contents of a cell. If you turn off this option, the formula bar does not appear even when you edit the contents of a cell.

Status Bar

Displays the status bar, which shows the current status of many conditions in Microsoft Excel, such as Num Lock and Edit mode.

Alternate Menu Key

You can choose commands in Microsoft Excel with the ALT key or the key specified in this option. If you want to choose commands with another key, type it here.

Ignore Remote Requests

This option only applies when you are using Microsoft Excel with other Windows applications that make remote requests to Microsoft Excel. Remote requests are Dynamic Data Exchange (DDE) requests that come from other Windows applications and temporarily use Microsoft Excel as a server.

Note | If you have not set up a situation that uses remote requests between applications, this setting is irrelevant. If someone else set up Microsoft Excel for you, find out if there are remote requests, and, if so, what this setting should be.

Ignore Remote Requests is primarily a security feature. Other Windows applications can only create a link with your worksheet if this check box is turned off. As long as Ignore Remote Requests is turned on, other applications are denied access to your data.

Ignore Remote Requests must be turned off if you want to use the Paste Links command to link a Microsoft Excel document to a document in another application.

For more information on remote requests, see **Exchanging data between applications** and **Linking Documents**.

Important | Remember that the settings in the Options Workspace dialog box apply to the entire Microsoft Excel Session.

Overlay chart

An **overlay chart** is a second chart plotted on top of the main chart in the same chart window; an overlay and main chart are identical in size and position. You can use a different chart type for an overlay and format it separately from the main chart. Adding axes to an overlay allows you to plot data with a different value scale or units of measure from the main chart.

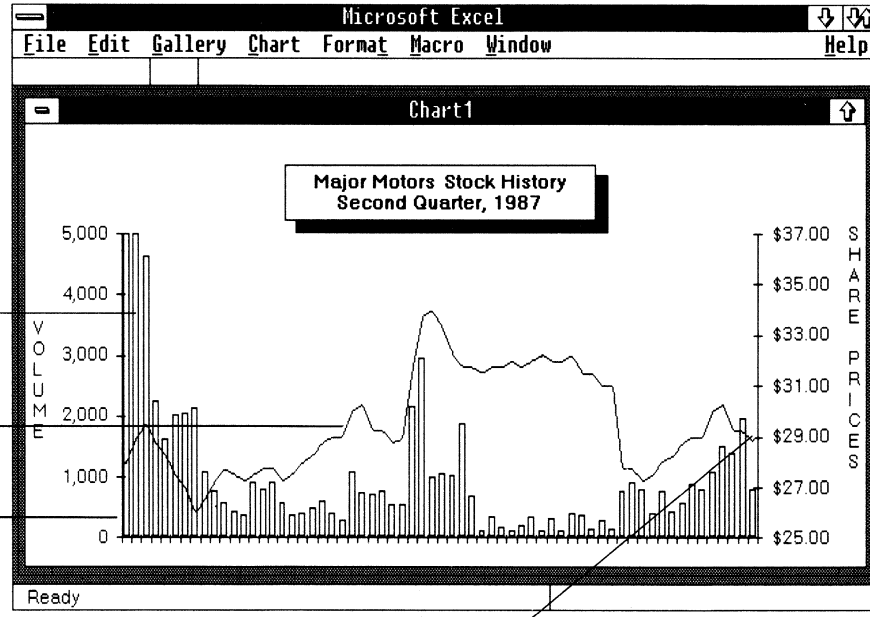
This topic explains:

- Uses for an overlay chart
- Creating an overlay chart
- Changing an overlay chart type
- Reformatting an overlay chart
- Adding or deleting axes for an overlay chart
- Changing data series distribution for an overlay chart
- Deleting an overlay chart

Uses for an Overlay Chart

You can use an overlay chart to create a complex graphic that compares two different kinds of data. Juxtaposing data this way often conveys more fully the correlations between the data. You can use a chart with an overlay to communicate a "message" of wider scope than if you were to present each set of data in an individual chart.

For instance, as one step in analyzing a company's stock performance, you might use a chart with an overlay to show the relationship between share prices and volume, as in the following illustration:



Column chart (main chart) shows volume sold.

Line chart (overlay) shows stock prices.

Value axis for main chart

Value axis for overlay (note different scale)

Creating an Overlay Chart
(Full Menus)

There are two ways to create an overlay chart:

- With the Gallery Combination command. This procedure is best if you've just created a new chart and haven't yet customized it.
- With the Chart Add Overlay command. This procedure preserves your formatting changes if you've already customized a chart.

When you create an overlay chart, Microsoft Excel divides the data series evenly between the main and overlay charts. Then it puts the first group of data series into the main chart and the second group into the overlay chart. In the case of an odd number of data series, the main chart has one data series more than the overlay chart. You can override these defaults (see "Changing Data Series Distribution for an Overlay Chart," later in this topic).

For example, if you have four data series, the first two are plotted in the main chart; the last two go into the overlay chart. If you have five data series, the first three go into the main chart, and the last two go into the overlay chart.

To create an overlay for a new chart

1. With the chart window active, choose Gallery Combination.
2. Select the format you want.
3. Choose the OK button.

To create an overlay for a customized chart

- With the chart window active, choose Chart Add Overlay.

  Microsoft Excel plots a line chart as the default overlay.

Changing an Overlay Chart Type (Full Menus)

You can switch to another overlay chart type and still keep your customized changes.

1. Choose Format Overlay.
2. Under "Type," select the chart type you want.
3. Choose the OK button.

For more information, see **Format Overlay command**.

Reformatting an Overlay Chart (Full Menus)

You can reformat elements of an overlay chart and still keep your other customized changes. For example, if you've just changed your overlay chart to a line chart, you can add drop lines with the Format Overlay command. Dialog box options vary according to chart type.

1. Choose Format Overlay.
2. Select the options you want.
3. Choose the OK button.

You format data series in an overlay chart the same way you do in the main chart. For information on formatting data series, see **Data series**.

Adding or Deleting Axes for an Overlay Chart (Full Menus)

You can add both a value and a category axis to an overlay chart. In other words, a chart with an overlay can have as many as four axes.

1. Choose Chart Axes.
2. Select the options you want.
3. Choose the OK button.

You reformat the scale, text, and design (line style and weight, color, and tickmark style and labels) of overlay chart axes the same as you do the axes on the main chart. For information on formatting axes, see **Chart axis**.

Note | You can add gridlines only to a main chart. For more information, see **Chart plot area**.

Changing Data Series Distribution for an Overlay Chart (Full Menus)

Use this procedure to override the Microsoft Excel default for data series distribution in an overlay chart.

1. Choose Format Overlay.
2. In the First Series in Overlay Chart box, type the number of the first data series you want plotted in the overlay chart.
3. Choose the OK button.

For more information, see **Format Overlay command**.

You can also override defaults for data series distribution by changing the plot order argument in the series formula, the formula Microsoft Excel uses to define and plot a data series. For information on editing the series formula, see **Series formula**.

Deleting an Overlay Chart (Full Menus)

The Chart Add Overlay command changes to Chart Delete Overlay on the menu whenever a chart window with an overlay chart is active.

Choose Chart Delete Overlay.

Microsoft Excel deletes the overlay chart and puts the data series from the overlay chart into the main chart. For information on deleting a data series, see **Data series**.

Related Information

Reference

For information on	See
Chart basics, chart customizing options	Chart

Sampler

Tracking and Forecasting Stock Prices

Feature Guide

Chart Practice, "Editing Combination Charts"

Printing a document

You can use a variety of printers and plotters and attractive formats to print your Microsoft Excel worksheets, charts, and macro sheets. In addition, you can create Info window print-outs that provide thorough information about any or all cells in a worksheet, including notes attached to the cells.

This topic explains:

- Printing basics

  Installing printers

  Choosing a printer and/or printer settings

- Page layout and pagination

  Setting up page layout for printing

  Setting manual page breaks

  Deleting manual page breaks

  Printing row and/or column titles

- Previewing and printing a document

  Previewing a printed page

  Printing a document

  Printing sections of a worksheet

- Using Spooler

  Displaying Spooler in a window

  Specifying printing speed

  Canceling a print job

  Pausing a printer

  Spooler messages

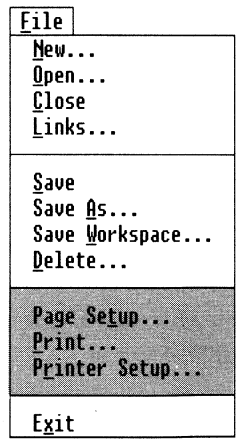
  Quitting Spooler

This topic does not discuss Info window print-outs in detail. For information on creating Info window print-outs, see **Info window**.

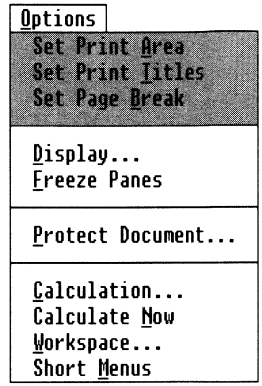
Note | All worksheet printing options also apply to macro sheets.

Printing Basics

The commands for printing documents are on these menus (Full menus shown):



- Use these File menu commands to control printer setup, page layout, page preview, and the main printing procedures for worksheets, macro sheets, and charts.



- Use these Options menu commands to control additional print options for worksheets and macro sheets only: printing part of a document, setting manual page breaks, and specifying rows and columns as print titles.

For more information on each command, see the topic of the same name (for example, **File Page Setup command**).

You can also use commands in Spooler, a utility program included with Microsoft Excel, to control the progress of your print job. For example, you can control printing speed or cancel a print job if you are printing several documents. Using Spooler is optional; you can print from Microsoft Excel without displaying the Spooler window. For more information, see "Using Spooler," later in this topic.

Installing Printers

The Setup program you used to install Microsoft Excel includes printer or plotter setup. At any time, you can install new printers in addition to those specified during Setup in one of the following ways:

- **Use Control Panel.** The easiest way to add new printers is with Control Panel, a separate utility program included with Microsoft Excel. For information on adding printers with Control Panel, see "Control Panel" in the Appendix.
- **Run Setup again.** You can rerun Setup and specify the new printers. For information on Setup, see *Getting Started and Quick Reference*, a separate manual included in your Microsoft Excel package.

Note | The Utilities disk included in your Microsoft Excel package includes the software you need for installing printers.

Choosing a Printer and/or Printer Settings

You use the File Printer Setup command to choose a printer from the printers you've installed and to specify related settings such as the following (options vary, depending on the printer):

- **Orientation** — printing vertically (also called "portrait mode") or sideways (also called "landscape mode") on the page.
- **Paper** — the size of the paper you'll be printing on; for example, letter size, legal size.
- **Paper source** — for example, a specific paper tray, manual or automatic feed.
- **Resolution** — usually measured in "dots per inch" (dpi).

If you installed one or more printers during Setup, use the following procedure before you print the first time and anytime you want to change the printer and/or printer settings. Until you specify otherwise, your printer choice and settings remain in effect each time you start Microsoft Excel.

Note | You can also change printer settings from Control Panel or from another application if you are running Microsoft Excel under Microsoft Windows, version 2.0 or higher. Changes to printer settings made in applications other than Microsoft Excel affect printing in Microsoft Excel.

To choose a printer and/or printer settings:

1. Choose File Printer Setup.
   A dialog box displays a list of printers installed for your system.
2. In the list box, select the printer you want.
3. If you don't want to check or change printer settings, go to step 7.
4. To check or change printer settings, choose the Setup button.
   Microsoft Excel displays a second dialog box. (Options vary, depending on the printer.) If the Setup dialog box for the printer you are using has a resolution setting, you can usually increase printing speed by setting the printer at lower resolutions.
5. Select the options you want.
6. Choose the OK button to close this dialog box.
7. Choose the OK button to close the main File Printer Setup dialog box.

For more information on printer setup, see **File Printer Setup command**. For more information on specific printer settings, see the user's manual for your printer.

Page Layout and Pagination

This section explains basic procedures for controlling page layout and using options such as print titles or manual page breaks.

Setting Up Page Layout for Printing

You control these page layout options with the File Page Setup command (settings vary, depending on which type of window is active — worksheet or macro sheet, chart, Info window):

- **Headers and footers** — specific content and position on page (for information on the codes you use to set up headers and footers, see **Headers and footers**).
- **Margins** — top, bottom, right, left.
- **Gridlines** — print with or without (worksheets and macro sheets only).
- **Row and column headings** — print with or without (worksheets and macro sheets; also controls whether or not cell references are included when printing cell notes only).
- **Size** — screen size, fit to page, full-page (charts only).

Note | Printing with or without gridlines or row and column headings is independent of their on-screen display, which you control with the Options Display command. For more information, see **Display options**.

To set up page layout for printing:

1. Choose File Page Setup.

   The dialog box presents different options, depending on the type of window that is active (worksheet, chart, or Info window).
2. Set the options you want.
3. Choose the OK button.

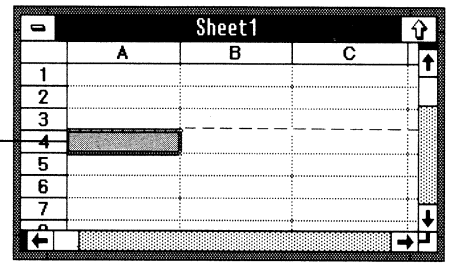
Note | Printing vertically or sideways on the page is controlled by the File Printer Setup command. For more information, see "Choosing a Printer and/or Printer Settings," earlier in this topic.

Setting Manual Page Breaks
(Full Menus)

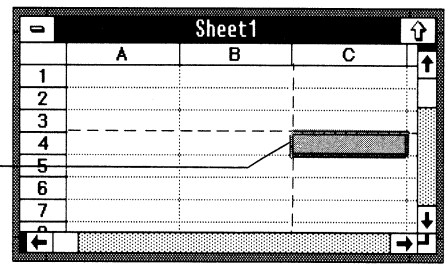
For a document longer than one page, Microsoft Excel automatically inserts page breaks to divide it into pages. Page breaks are placed according to the margin settings of the File Page Setup command. For worksheets and macro sheets, Microsoft Excel first paginates vertically to the last row of data, then horizontally to the last column of data.

You can also set manual page breaks with the Options Set Page Break command. The following illustrations show how to indicate where you want manual page breaks:

For this page break, select this cell and choose Options Set Page Break.



For these page breaks, select this cell and choose Options Set Page Break.



When you set a manual page break, Microsoft Excel adjusts the automatic page breaks in the rest of the worksheet. You can check page breaks by looking at the document; manual page breaks are displayed darker than automatic page breaks. Page breaks are saved with the document.

To set a manual page break:

1. Select the cell below or to the right of the gridline where you want the page breaks.
2. Choose Options Set Page Break.

For more information, see **Options Set Page Break command**.

Deleting Manual Page Breaks
(Full Menus)

The Options Set Page Break command changes to the Options Remove Page Break command when you select a cell below or to the right of a manual page break.

1. Select any cell directly below or to the right of the manual page break.
2. Choose Options Remove Page Break.

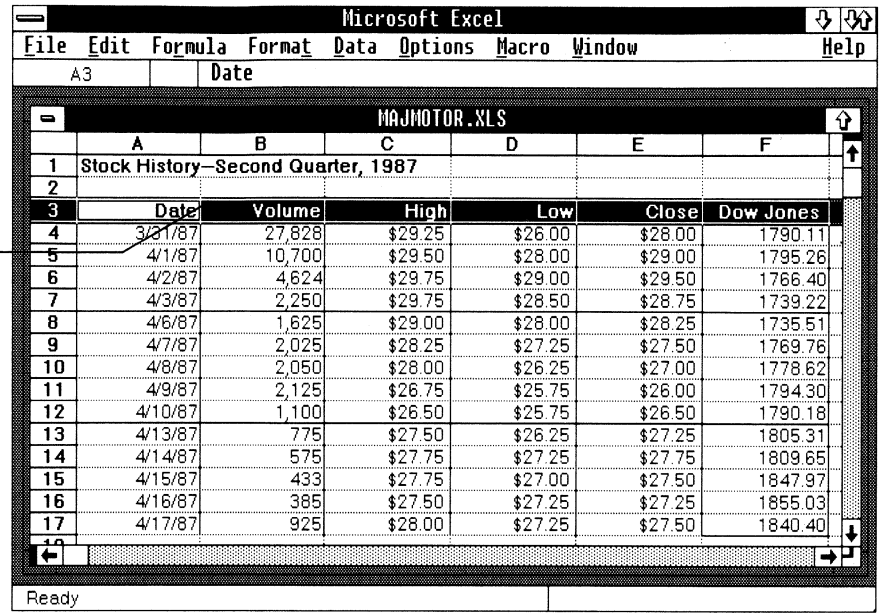
For more information, see **Options Remove Page Break command**.

Printing Row and/or Column Titles
(Full Menus)

You can specify "print titles," certain rows and/or columns to be printed as titles on each page when you print a worksheet. This option is especially useful for large documents in which you need to keep track of row or column labels that identify long sections of data. The rows or columns you use for print titles can be anywhere on the worksheet. Microsoft Excel prints them as titles whenever it prints any cells in the same column or row. Print titles in rows are printed at the top of a page; print titles in columns are printed at the left of a page.

Note | You must select an entire row or column for print titles. You can designate multiple rows and columns, but they must be adjacent rows (for example, rows 1 and 2) and/or adjacent columns (for example, columns D and E).

The following illustration shows print titles for a row:



	A	B	C	D	E	F
1	Stock History—Second Quarter, 1987					
2						
3	Date	Volume	High	Low	Close	Dow Jones
4	3/31/87	27,828	$29.25	$26.00	$28.00	1790.11
5	4/1/87	10,700	$29.50	$28.00	$29.00	1795.26
6	4/2/87	4,624	$29.75	$29.00	$29.50	1766.40
7	4/3/87	2,250	$29.75	$28.50	$28.75	1739.22
8	4/6/87	1,625	$29.00	$28.00	$28.25	1735.51
9	4/7/87	2,025	$28.25	$27.25	$27.50	1769.76
10	4/8/87	2,050	$28.00	$26.25	$27.00	1778.62
11	4/9/87	2,125	$26.75	$25.75	$26.00	1794.30
12	4/10/87	1,100	$26.50	$25.75	$26.50	1790.18
13	4/13/87	775	$27.50	$26.25	$27.25	1805.31
14	4/14/87	575	$27.75	$27.25	$27.75	1809.65
15	4/15/87	433	$27.75	$27.00	$27.50	1847.97
16	4/16/87	385	$27.50	$27.25	$27.25	1855.03
17	4/17/87	925	$28.00	$27.25	$27.50	1840.40

To print the titles in row 3 at the top of every page, select the row and choose Options Set Print Titles.

To print row and/or column titles:

1. Select the rows or columns that contain the titles you want.

   To specify both rows and columns, make a multiple selection, with one area for the title columns and one area for the title rows.
2. Choose Options Set Print Titles.

Microsoft Excel names the area you selected Print_Titles. You can refer to this area by that name as you would any other named range, unless you delete the name Print_Titles. Whenever you print the worksheet, Microsoft Excel prints with the titles you specified.

To cancel print titles:

1. Choose Formula Define Name.
2. In the list box, select the name Print_Titles.
3. Choose the Delete button.
4. Choose the OK button.

For more information, see **Options Set Print Titles command**.

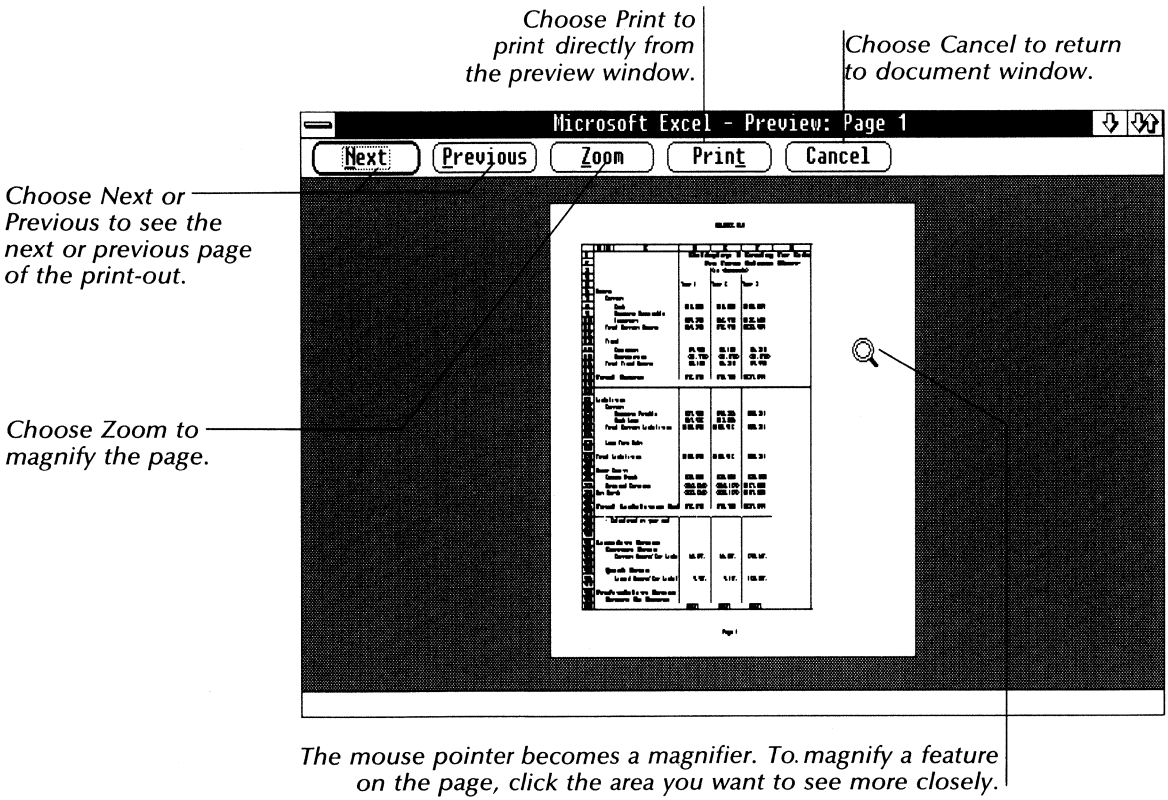
Previewing and Printing a Document

This section explains procedures for previewing printed pages of your documents and printing entire or partial documents.

Previewing a Printed Page

Before you actually print a document, you can use the Microsoft Excel Preview option to see exactly how printed pages will appear and make further adjustments, if necessary. You control the Preview option with the File Print command.

When you first choose Preview, the first page of the document is displayed in reduced size, as in the following illustration:



You can print from the print preview or go back and make further adjustments to page layout with the File Page Setup command or to printer settings with the File Printer Setup command.



To preview a page using the keyboard:

1. Choose File Print.
2. Turn on the Preview check box.
3. Press ENTER.

   Microsoft Excel displays the first page of the document in reduced size.
4. To magnify any feature on the page in more detail, press ALT+Z to choose the Zoom button.

   Use the DIRECTION keys to scroll the magnified page.

   You can also use the following keys to scroll the magnified page: Hold down CONTROL and press LEFT, RIGHT, UP, or DOWN to move to the left, right, top, or bottom edge of the page. Press CONTROL+HOME to scroll to the top left and CONTROL+END to scroll to the bottom right of the page.
5. To return to the reduced page, press ALT+Z again.

   To start printing the document, choose the Print button. To return to the document window to make further page setup adjustments, choose the Cancel button.



To preview a page using the mouse:

1. Choose File Print.
2. Turn on the Preview check box.
3. Click the OK button.

   Microsoft Excel displays the first page of the document in reduced size. The mouse pointer turns into a magnifier.
4. To examine any feature on the page in more detail, move the magnifier and click the area of the document you want to see.

   Microsoft Excel magnifies that area of the document.
5. To return to the reduced page, click anywhere on the document.

   To start printing the document, click the Print button. To return to the document window to make further page setup adjustments, click the Cancel button.

For more information on the print preview feature, see **File Print command**.

Printing a Document

You use the File Print command to print a document. If you are printing a worksheet, you can specify that Microsoft Excel print only the worksheet, only notes, or both. In addition, you can use the File Print command to specify page range, draft quality, or choose the preview option.

To print a document:

1. Choose File Print.
2. Select the options you want.
3. Choose the OK button.

Microsoft Excel displays a message indicating it is printing your document; if you want to cancel the print job, choose the Cancel button.

Printing Sections of a Worksheet

Use this procedure if you want to print out specific ranges of a worksheet or macro sheet that are not whole pages. If you want to print out certain pages of the document, follow the procedure in the preceding section, "Printing a Document," and specify the page range in the Pages setting in the File Print dialog box.

1. Select the range or ranges you want to print (make a multiple selection if you want noncontiguous areas of the worksheet included in the print-out).

   If you have specified print titles, do not include them in any range you select, or they will be printed twice.
2. Choose Options Set Print Area.

Microsoft Excel names the range or ranges you selected Print_Area. You can refer to this area by that name as you would any other named range unless you delete the name Print_Area. To print the worksheet, follow the procedure in the preceding section in this topic, "Printing a Document." Whenever you print the worksheet, Microsoft Excel prints the area you specified.

To delete the name Print_Area so you can print out the entire worksheet:

1. Choose Formula Define Name.
2. Select the name Print_Area in the list box.
3. Choose the Delete button.
4. Choose the OK button.

Tip | You can also print out the entire worksheet by selecting the whole sheet and choosing Options Set Print Area.

For more information, see **Options Set Print Area command**.

Using Spooler

Spooler is a utility program included with Microsoft Excel. Spooler allows you to queue up print jobs and continue with your work while they are sent to the printer. When you choose the File Print command, Microsoft Excel creates a print-spool file and sends it to Spooler. If Spooler isn't already running, it starts automatically.

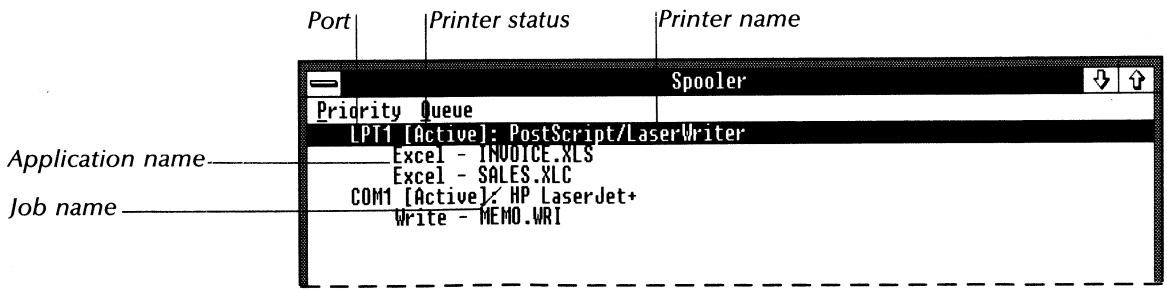
When Spooler receives the print file, it automatically runs in the background, allowing you to continue to work while your document is being printed. You can always print from Microsoft Excel without actively using Spooler. If you want to view the print queue, control printing speed, or interrupt or cancel a print job, however, you can enlarge the Spooler icon into a window.

Note | You can disable Spooler by changing the Spooler line in your WIN.INI file to read *Spooler=no*. Microsoft Excel then prints directly to your printer, and you cannot work with your computer while you print. For more information on changing the WIN.INI file, see **Default settings.**

Displaying Spooler in a Window

You can enlarge the Spooler icon to a window to view the print queue, the list of documents being printed, and to obtain additional information about the status of your printer. You can also work in the Spooler window to interrupt or cancel a print job.

The Spooler window displays the print queue list for each installed printer, one after the other, as in the following illustration:



The queue for each printer starts with an entry that indicates the port, status, and name of the printer, followed by entries with the names of the jobs in the printer's queue, if any.

The first file in the queue is the job that is currently being printed or, if the printer is paused, the first document that will be printed when the printer resumes. Spooler sends the jobs to each printer in the order that the jobs are listed. If the entire list cannot fit on your screen, the window has a vertical scroll bar you can use to see the rest of the list.

To view the print queue:

1. Start your print job, using one of the procedures under "Previewing and Printing a Document," earlier in this topic.
2. Press ALT+ESCAPE until the Spooler icon is selected.
3. Choose Control Restore (ALT, SPACEBAR, R).

Tip | If you are using a mouse, you can double-click the Spooler icon to open the Spooler window.

Specifying Printing Speed

You use the Priority menu commands to specify how fast you want to print your work. These commands change the rate at which information is transferred from Spooler to the printer ports. Setting Spooler to print more quickly uses more of your computer's processor time, causing other applications to run more slowly. Setting Spooler to print at a slower speed frees more processor time for other applications.

To set Spooler to print a job faster	To set the Spooler to print at a slower speed
1. Activate the Spooler window.	1. Activate the Spooler window.
2. Choose Priority High.	2. Choose Priority Low.

A checkmark next to the Priority High or Priority Low command indicates the current setting.

Canceling a Print Job

You use the Queue Terminate command to cancel a print job while you are in the Spooler window.

1. Display the Spooler window, if it is not already displayed.
2. Select the filename of the print job you want to cancel.
3. Choose Queue Terminate.
4. If you want to cancel the print job, choose the Yes button.
   If you want to cancel the command, choose the No button.

Important If you cancel a job that is printing in graphics mode, you may need to reset your printer to ensure that the buffer is cleared.

Pausing a Printer

You can pause a printer and then resume printing, using the Queue Pause command.

1. Display the Spooler window, if it is not already displayed.
2. Select the name of the printer you want to pause.
3. Choose Queue Pause.
   The print-queue listing for that job lists the port status as paused.
4. To resume printing, choose Queue Resume.

Spooler Messages

Spooler sometimes displays information about the status of your printing jobs. If Spooler needs to display a message, but the Spooler window or Spooler icon is not selected, the title bar or icon will flash. To display the message, select Spooler's window or icon.

Note You can adjust the amount of time Spooler waits before displaying messages. For more information, see "Control Panel" in the Appendix.

Quitting Spooler

After the files in the print queue have been printed, Spooler automatically closes. If you close Spooler while files are still in the print queue, the remaining print jobs will be terminated.

To quit Spooler:

1. Activate the Spooler window.
2. Choose Priority Exit.

If print jobs remain in the print queue, Microsoft Excel displays a message asking you to confirm the cancellation.

Related Information

Reference

For information on	See
Worksheet, chart, database basics	Worksheet Chart Database
General overview of print and display formats for worksheets and charts	Formatting a document

Sampler

Preparing a New Business Plan

Generating Mailing Labels

Tutorial

Printing a Worksheet

Printing a Chart

Feature Guide

Basic Mechanics, "Printing"

Protecting or hiding data

Protecting or hiding data helps safeguard a document from errors caused by accidental or unauthorized changes. This is especially important if the document is sensitive or if it must be shared by several users. You can protect a document:

- While it is stored on disk. You can prevent someone from opening a document or accessing linked data from a protected document.
- While it is open in Microsoft Excel. You can prevent someone from changing a document's contents, its windows, or both.

You use different passwords with the two different types of protection, so that you can allow a document to be opened but not changed.

This topic explains:

- Protecting a document on disk

  Limiting access to a document

  Turning off password protection

- Protecting the contents of a document

  Protecting worksheet cells

  Turning off worksheet cell protection

  Protecting a chart

  Turning off chart protection

  Protecting a document's window

  Turning off window protection

Note | All concepts and procedures for protecting or hiding data in worksheets also apply to macro sheets.

Protecting a Document on Disk

When you limit access to a document by assigning it a password, the password is required to open the document. The password is also required for any linked documents to read data from the document.

Limiting Access to a Document

1. Choose File Save As.
2. Choose the Options button.
3. Type a password in the text box.
4. Choose the OK button.

When you open that document in the future, Microsoft Excel requires you to type the correct password.

Important If you forget a password, you can't remove protection from the document. It's a good idea to keep a list of passwords in a safe place.

Turning Off Password Protection

1. Open the document.
2. Choose File Save As.
3. Choose the Options button.
4. In the Password box, select the password.
5. Press DELETE to remove the password.
6. Choose the OK button.

Protecting the Contents of a Document

You can protect the contents of worksheet cells, charts, and/or windows. This type of protection is useful when creating models or templates that you want other people to be able to use but not change.

Protecting Worksheet Cells (Full Menus)

You can lock and/or hide cells on a worksheet with the Format Cell Protection command.

- Locking a cell prevents its contents from being changed.
- Hiding a cell prevents the cell's formula from being displayed in the formula bar when the cell is selected; only the result of the formula is displayed.

You can specify that a cell be locked and/or hidden, but the protection does not take effect until you choose the Options Protect Document command. Choosing the Format Cell Protection command sets a cell's protection status; choosing Options Protect Document puts into effect the protection status of all the cells on the worksheet.

When you open a new worksheet, the protection status for all cells is set as locked and not hidden, and the worksheet is not protected.

To protect worksheet cells:

1. Select the cells whose protection you want to change.
2. Choose Format Cell Protection.
3. Set the protection as you want by turning the Locked and Hidden check boxes on or off.
4. Choose the OK button.
5. Repeat steps 1–4 until you've changed protection for all the cells you want to.
6. Choose Options Protect Document.
7. Turn on the Contents check box.
8. Type a password to prevent others from turning off the protection.

   If you just want to protect the document from yourself to avoid accidental changes, you don't have to type a password.
9. Choose the OK button.

Turning Off Worksheet Cell Protection (Full Menus)

1. Choose Options Unprotect Document.
2. If the document is protected with a password, type the password in the text box.
3. Choose the OK button.

Protecting a Chart (Full Menus)

1. Activate the chart window.
2. Choose Chart Protect Document.
3. Turn on the Contents check box.
4. Type a password to prevent others from turning off the protection.

   If you just want to protect the document from yourself to avoid accidental changes, you don't have to type a password.
5. Choose the OK button.

Turning Off Chart Protection
(Full Menus)

1. Choose Chart Unprotect Document.
2. If the chart is protected with a password, type the password in the text box.
3. Choose the OK button.

Protecting a Document's Window
(Full Menus)

Protecting a document's window prevents:

- Resizing or moving a document's windows.
- Opening new windows on the document.
- Closing windows of the document individually.

When other people will be using your model, limiting their view of the worksheet can make it easier to use. This type of protection can be used with or without a password, and is saved with the document.

A protected window does not display the Control menu, the maximize icon, or the borders.

COUNTRY.XLS

	A	B	C
1	Country	Capital	Capital Population
2	Japan	Tokyo	8,796,295
3	U.S.A.	Washington, D.C.	3,061,500
4	Senegal	Dakar	581,000
5	Italy	Rome	2,799,840
6	U.S.S.R.	Moscow	6,941,960
7	Afghanistan	Kabul	534,350
8			

As with cell protection, you turn on window protection with the Options Protect Document command.

To protect a document's windows:

1. Arrange the size and placement of the window or windows within the workspace.
2. If the active document is a worksheet or macro sheet, choose Options Protect Document.

   If the active document is a chart, choose Chart Protect Document.
3. Turn on the Windows check box.
4. Choose the OK button.

Tip

In certain applications you may want to prevent worksheet windows from being scrolled. To prevent scrolling in windows, use the Options Freeze Panes command. This command freezes the top and left panes of the active window. You can also restrict access to the bottom and right panes by reducing the size of the window after freezing its panes. For more information, see **Display options**, **Windows**, and **Options Freeze Panes command**.

Turning Off Window Protection (Full Menus)

1. If the active document is a worksheet or macro sheet, choose Options Unprotect Document.

   If the active document is a chart, choose Chart Unprotect Document.
2. If the document is protected with a password, type the password in the text box.
3. Choose the OK button.

Related Information

Reference

For information on	See
Linked documents	Linking documents
Preventing window scrolling	Display options Windows Options Freeze Panes command
Hiding rows or columns	Row Column

Sampler

Creating an Automated Invoice System

Quitting Microsoft Excel

Quitting a Microsoft Excel session returns you to the DOS prompt if you're running the program as a stand-alone application. If you're running Microsoft Excel under Microsoft Windows, version 2.0 or higher, quitting Microsoft Excel returns you to the next open Microsoft Windows application.

To quit Microsoft Excel:

1. Choose File Exit.

   If you have changed any of the files in the workspace since you last saved them, Microsoft Excel displays a message asking if you want to save changes.

2. To save changes to open documents, choose the Yes button.

   To quit without saving changes, choose the No button.

Related Information

Reference

For information on	See
Startup procedures	Starting Microsoft Excel Opening a document
Procedures for printing documents	Printing a document
Procedures for saving and closing documents	Saving and closing a document

References

A **reference** is the location of a cell or a group of cells on a worksheet. For example, the reference $C$4 refers to the cell in column C of row 4. Using references in formulas allows you to use data contained in different parts of a worksheet.

This topic explains:

- Using references

  Relative and absolute references

  Using mixed references

  Changing relative or absolute references

- R1C1 reference style

  Changing to R1C1 reference style

Microsoft Excel also allows you to refer to cells in other worksheets and data in other programs. References to cells in other worksheets are called **external references**. References to data in other programs are called **remote references**. For information on external references and remote references, see **Linking documents**.

Using References

References make formulas flexible. You can use the same value in many formulas by entering the value in a cell and entering the reference of that cell in the formulas. Then, if you change the value in the cell, Microsoft Excel calculates all the formulas using the new value.

Cell references are based on the column and row headings in a worksheet. When you first start Microsoft Excel, columns are labeled A through IV (A, B, C, . . . Z, AA, AB, AC . . . AZ, BA, BB, BC, and so on through IV). Rows are labeled 1 through 16384. This is known as "A1 reference style." You can also change the column headings to be numbers instead of letters to display "R1C1 reference style." For information on this reference style, see "R1C1 Reference Style," later in this topic.

The area to the far left of the formula bar displays the reference of the active cell. For more information, see **Formula bar**.

You enter a reference in a formula either by typing the reference or by selecting the cell while the formula bar is active.

Relative and Absolute References

There are two basic types of references: relative references and absolute references.

A relative reference is like giving someone directions — "go up two blocks and over one." An absolute reference is like a street address — "3812 Atlantic St."

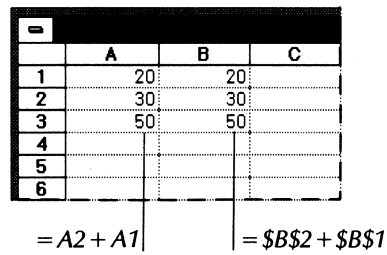
A relative reference tells Microsoft Excel how to find another cell, starting from the cell containing the formula. References like C4 and F7 are relative references.

An absolute reference tells Microsoft Excel how to find a cell based on the exact location of that cell. An absolute reference is designated by adding a dollar sign ($) before the column letter and the row number. References like $D$9 and $F$16 are absolute references.

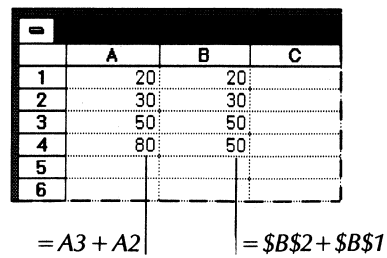
To enter	Type this
Relative reference	A1
Absolute reference	$A$1

The difference between absolute and relative references becomes apparent when you copy or move formulas from one cell to another.

In the following illustration, both cells in the third row have formulas that calculate the sum of the values in the two cells immediately above them. The formula in A3 is built with relative references; the one in B3 is built with absolute references.



When you copy the formulas from row 3 into row 4, the results of both formulas are correct, but the answers are different:



The formula =A3+A2 calculates the sum of the values in the cells in the same column, one row above and two rows above the cell containing the formula. No matter where you copy this formula, Microsoft Excel looks in the two cells immediately above it for values to add.

The formula =$B$2+$B$1 always adds the values in cells B2 and B1. No matter where you copy this formula on the worksheet, Microsoft Excel looks in B2 and B1 for values to add.

If you select a cell while the formula bar is active, Microsoft Excel enters a relative reference. For example, if you are building a formula in A3 and select A1, Microsoft Excel enters A1 as the reference and remembers "the cell two rows up in the same column."

Because a relative reference in a formula remembers the position of a cell relative to the cell containing the formula, Microsoft Excel adjusts the reference to reflect the new position when the formula is copied elsewhere. For example, suppose in cell A8 you enter =A6+A5+A4 as the formula. If you copy this formula into B8, Microsoft Excel changes the references to =B6+B5+B4.

Using Mixed References

If you want to refer to cells so that only the column or row reference is absolute or relative, you can use mixed references. For example, in the reference $A2, the column reference ($A) is absolute and the row reference (2) is relative.

You can type a mixed reference directly, or you can use the Formula Reference command to change a reference. The Formula Reference command cycles through the different combinations of mixed references, starting with the current reference, in the following order: $A$2, A$2, $A2, A2.

Changing Relative or Absolute References

You can use the Formula Reference command to quickly change the reference format of a cell reference to absolute, mixed, or relative format. The initial type of cell reference determines how Microsoft Excel converts it, as shown by the following table:

This	Becomes
A1	$A$1
$A$1	A$1
A$1	$A1
$A1	A1

To change relative or absolute references:

1. Select the cell containing the reference you want to change.
2. In the formula bar, select the reference or references you want to change.
3. Choose Formula Reference as many times as necessary to change the reference to the desired combination of absolute and relative references.

Tip If you are entering a formula and have just inserted a reference you want to change, choose the Formula Reference command. Microsoft Excel converts the reference to the left of the insertion point.

R1C1 Reference Style

Most of the examples in this manual use the A1 reference style, in which the columns are labeled with letters and the rows with numbers. However, there is another way of referring to cells in Microsoft Excel, called R1C1 reference style, in which both rows and columns have numbers. This style is useful for computing row and column position in macros, and especially useful for showing relative references.

In R1C1 style, a cell's location is indicated by an R followed by a row number and a C followed by a column number. In R1C1 style, column headings are labeled 1 to 256 rather than A to IV. For example, the reference R2C2 is equivalent to the absolute reference $B$2 in A1 reference style. When you choose R1C1 style, all formulas and row and column headings change accordingly.

You can change the reference style at any time, and Microsoft Excel adjusts all the references in your formulas for you.

Just as in A1 style, if you select a cell while building a formula in R1C1 style, you enter a relative reference. For example, if you are entering a formula in cell R3C1 and select cell R2C2, Microsoft Excel enters R[−1]C[1] as the reference. If the cell you select is in the same row or column, Microsoft Excel abbreviates and enters RC[1] or R[−1]C.

The following table shows other examples of references in R1C1 style:

This relative reference	Indicates the cell
R[−2]C	Two rows up, same column
RC[−2]	Same row, two columns to the left
R[2]C[2]	Two rows down, two columns to the right

You can enter references to an entire row or column by omitting one half of the reference. For example, enter R[−1] to indicate the entire row above the active cell.

You can also type references instead of selecting cells. For example, type *R[2]C[2]* to enter a relative reference. Type *R2C2* to enter an absolute reference.

You can also mix references in R1C1 style and use the Formula Reference command to change references, as in A1 style.

Changing to R1C1 Reference Style (Full Menus)

1. Choose Options Workspace.
2. Turn on the R1C1 check box.
3. Choose the OK button.

To change back to the A1 style of reference:

1. Choose Options Workspace.
2. Turn off the R1C1 check box.

Related Information

Reference

For information on	See
Absolute and relative references	Absolute reference Relative reference
References to other worksheets and applications	Remote reference External reference Linking documents
Using references in formulas	Formula Formula bar
Replacing references with names	Names
How moving and copying data affects references	Moving data on a worksheet Copying data and formats

Tutorial

Creating a Worksheet

Relative reference

A cell can refer to the contents of another cell in one of two ways: it can make a **relative reference** or an absolute reference to another cell.

A relative reference is like telling a friend where you live by saying "go down four blocks and over two." In the same way, you might use the relative reference C5 in cell A1 to have Microsoft Excel look in the cell four rows down and two columns over. If you were then to move or copy the contents of cell A1, Microsoft Excel would look in the cell four rows down and two rows over from the new location.

By contrast, an absolute reference always refers to one specific cell. An absolute reference is like giving your friend a specific address — for example, "1540 Maple Avenue."

In the A1 reference style, absolute references have a dollar sign before the column letter and row number (for example, $B$8); relative references do not (for example, B8). In the R1C1 reference style, relative references have brackets around the row and column numbers (for example, R[8]C[2]); absolute references do not (for example, R8C2).

For more information on relative and absolute references, or on reference styles, see **References**.

Remote reference

A **remote reference** is a reference to a document or topic in a different application. This type of reference can designate a single cell, range, value, or field of data in another application. You can use a remote reference in a formula within a Microsoft Excel worksheet to link the worksheet to the other application.

For more information on remote references, see **Linking documents** and **Exchanging data between applications**.

Row

On a Microsoft Excel worksheet, a **row** is a complete horizontal line of cells. Each worksheet contains 16,384 rows, numbered 1 through 16384.

This topic explains:

- Changing a row height
- Changing row heights for an entire worksheet
- Returning a row to standard height
- Adding a row of blank cells
- Deleting a row

This topic does not discuss basic procedures for selecting partial or entire rows. For information on those basic procedures, see **Keyboard**.

Note | All worksheet row options also apply to macro sheets.

Changing a Row Height

When you first create a Microsoft Excel worksheet, each row is set to a standard row height to accommodate the current font. If you change to a different-sized font, Microsoft Excel adjusts the row height automatically.

You can change the row height manually to adjust for font changes you make or to achieve different effects with borders and shading. For example, using a very narrow row height in combination with borders along the top and bottom of a range of cells produces a double underline.



To change a row height using the keyboard:

1. Select a cell in the row you want to change.
2. Choose Format Row Height.
3. In the Row Height box, type the number of points you want the row height to be.
4. Choose the OK button.



To change a row height using the mouse:

1. In the row you want to change, point to the bottom gridline in the row heading.
2. To make the row taller, drag the gridline down.
   To make the row shorter, drag the gridline up.

Note | Once you have altered the row height to any size other than the standard row height, Microsoft Excel stops adjusting the height when you change to a different font. To change back to automatic row height adjustment, select the row, choose Format Row Height, and turn on the Standard Height check box.

For information on border and shading options, see **Borders and shading**. For information on using fonts, see **Font**.

Changing Row Heights for an Entire Worksheet

1. Select an entire column of cells.
2. Choose Format Row Height.
3. In the Row Height box, type the row height you want or turn on the Standard Height check box.
4. Choose the OK button.

Returning a Row to Standard Height

To return one or more rows to the standard height for the current font:

1. Select the row you want to change.
   Select an entire column of cells if you want to return to standard row height throughout the whole worksheet.
2. Choose Format Row Height.
3. Turn on the Standard Height check box.
4. Choose the OK button.

Adding a Row of Blank Cells

1. Select the row above which you want to insert the new row of blank cells.
2. Choose Edit Insert.

Deleting a Row

1. Select the row you want to delete.
2. Choose Edit Delete.

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Adjusting, adding, and deleting columns in a worksheet	Column
General overviews of worksheet editing and formatting options	Editing a document Formatting a document
Moving worksheet cells and ranges	Moving data on a worksheet
Copying worksheet cells and ranges	Copying data and formats
Inserting rows and columns	Inserting blank cells

Sampler

Creating Calendars, Diagrams, Tables, and Forms

Saving and closing a document

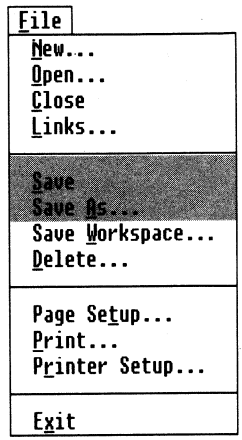
You'll usually want to save and close documents whenever you finish a session with Microsoft Excel. It's also a good idea to save work frequently during a session so that your work isn't lost in the event of a power interruption or hardware problem. Every document that you save in Microsoft Excel is stored as a file on a disk.

This topic explains:

- Procedures for saving documents
  - Guidelines for naming documents
  - Saving a new document
  - Saving an existing document
- Procedures for closing documents
  - Closing a document window
  - Closing all open documents

Procedures for Saving Documents

The commands for saving individual documents are on the File menu (Full menu shown):



- Use File Save As to save a new document or to save an existing document under a new name.
- Use File Save to save changes to an existing document.

Note You can also use the File Save Workspace command to save all your documents and their sizes and positions. For a brief description of workspace files, see "Picking Up Where You Left Off," later in this topic. For complete information on workspace files, see **File Save Workspace command**.

With the File Save As command you can also:

- Change the file format from the default (Normal) to other file formats that enable you to transfer files between Microsoft Excel and other non-Windows applications (for example, the WKS format for Lotus 1-2-3 files or the SYLK format for Multiplan files).
- Designate a password required for access to the document.
- Create a backup document.

For more information on each command, see **File Save command** and **File Save As command**.

Guidelines for Naming Documents

To name documents in Microsoft Excel, you follow the same basic rules for naming files under MS-DOS. These rules are listed below, along with other guidelines and information you need for naming Microsoft Excel documents:

- **Length of document name:** A document name can be a maximum of eight characters long. You can use any name you like within this character limit.

- **Capitalization:** A document name can use any combination of uppercase and lowercase letters. To Microsoft Excel, the document name CDSALES is identical to the document name cdsales.
- **Valid characters:** A document name can be any combination of letters (A–Z), numbers (0–9), or the following characters:
  $ & % ' () - @ ^ {} ~ ` ! _
- **Extensions:** A document name can have an extension, consisting of a period (.), followed by up to three characters. A document name followed by a period (.) and no extension is saved without an extension.
- **Microsoft Excel extensions:** Though not required, it's probably easiest to save Microsoft Excel documents with Microsoft Excel extensions. If you use these extensions for all your Microsoft Excel documents, anyone who knows Microsoft Excel will be able to tell what type of document each file contains. Also, documents with a Microsoft Excel extension are the only documents initially listed in the File Open dialog box, so you can save yourself an extra step each time you open a document by using a Microsoft Excel extension when you save a document. If you save a document with a document name but no period (.), Microsoft Excel automatically adds one of the following extensions when you save the document:

Document type	Microsoft Excel extension	Example filename
Worksheet	.XLS	TAXITEMS.XLS
Chart	.XLC	LEONARDO.XLC
Macro sheet	.XLM	MONTHEND.XLM
Workspace file	.XLW	FORECAST.XLW

For a description of workspace files, see "Picking Up Where You Left Off," later in this topic.

- **Saving to a different drive/directory:** The lower-left corner of the dialog box for the File Save As command (and the File Save command, if you choose it before first saving a document with File Save As) indicates the current directory. To save a document to a directory other than the current one, type the full pathname preceding the document name in the Save Worksheet As or Save Chart As box (for example, *C:\TAXFILES\SCHEDULE*, where *C:* is the drive name, *TAXFILES* is the directory name, and *SCHEDULE* is the document name.

Saving a New Document

1. Choose File Save As.

   Microsoft Excel proposes a name (for example, SHEET1.XLS) in the text box within the dialog box.

2. In the text box, type a name for the document.

   Refer to the guidelines discussed earlier in this topic, if necessary.

3. Choose the OK button.

Saving an Existing Document

To save changes to an existing document you have already named:

- Choose File Save.

If you later want to rename a document, save it with the File Save As command and specify a new filename in the dialog box.

Note If you are working with linked documents, be sure to save supporting worksheets before you save a dependent worksheet or chart so that external references in the dependent document are current. For more about saving linked documents, see **Linking documents**.

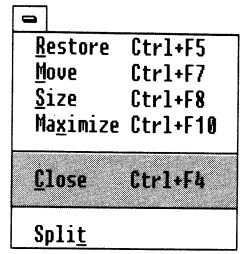
Picking Up Where You Left Off

If you often work with a particular set of documents for certain tasks — or, if busy schedules also mean interruptions to your Microsoft Excel work sessions — use workspace files to pick up where you left off and not miss a beat. You create a workspace file with the File Save Workspace command. The file consists of a list of the documents open in the workspace.

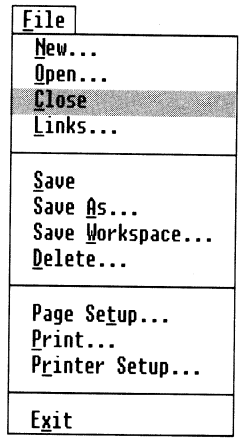
To get back to work, all you have to do is reopen the workspace file and — presto! — Microsoft Excel opens all of the documents you were working with. Worksheets, charts, macro sheets — everything you need is spread out for you on your "screen desktop." (You can also open the documents separately if you want.) For more information about workspace files, see **Workspace file** and **File Save Workspace command**.

Procedures for Closing Documents

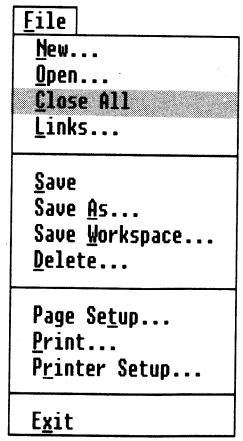
Closing a document means closing the window or multiple windows displaying the document and removing the document from the workspace. The commands for closing documents are on these menus (Full menus shown):



- Use Control Close (ALT, HYPHEN, C) to close a single document window.



- Use File Close to close all of the document's windows.



- When you press SHIFT and select the File menu, File Close becomes File Close All. You can choose File Close All to close all open documents.

If you have a mouse, you can also close a window by double-clicking the Control menu icon in the upper-left corner of the document window.

Any time you close a document before saving changes, Microsoft Excel asks if you want to save changes. Choose Yes to save changes, or No if you don't want to save changes. Choose Cancel to leave the document open.

For more information on each command, see **Control Close command** and **File Close command**. For more information on using the mouse with Microsoft Excel, see **Mouse**.

Closing a Document Window

To close all windows into a document with the keyboard or mouse:

- Choose File Close.



To close a document window with the keyboard:

- Choose Control Close (ALT, HYPHEN, C).



To close a document window with the mouse:

- Double-click the Control menu icon.

Closing All Open Documents

1. Hold down SHIFT and select the File menu.
   This displays the File Close All command instead of the File Close command.
2. Choose File Close All.

Related Information

Reference

For information on	See
Startup procedures	Starting Microsoft Excel Opening a document
Ending a Microsoft Excel session	Quitting Microsoft Excel
Protecting or hiding data in worksheets, macro sheets, and charts	Protecting or hiding data

For information on	See
Printing worksheets, charts, and macro sheets	Printing a document
File conversion between Microsoft Excel and Lotus 1-2-3 or Multiplan	Lotus 123 Multiplan

Tutorial

Worksheet Basics

Feature Guide

Basic Mechanics, "Saving"

Scatter chart

A **scatter chart** shows the relationship or degree of relationship between the numeric values in different groups of data. You can use a scatter chart to test hypotheses based on your data — for example, to discover whether the variables in one data series are dependent upon or affect those in another. Scatter charts are good analytical tools for exploring what trends, correlations, or patterns — if any — exist in your data.

This topic explains:

- Special requirements for scatter charts
- Plotting a scatter chart

Special Requirements for Scatter Charts

Scatter charts have different requirements from other types of charts that plot data against two axes. Area, bar, column, and line charts plot data as values and discrete categories taken from data series, using one axis for values and one axis for categories.

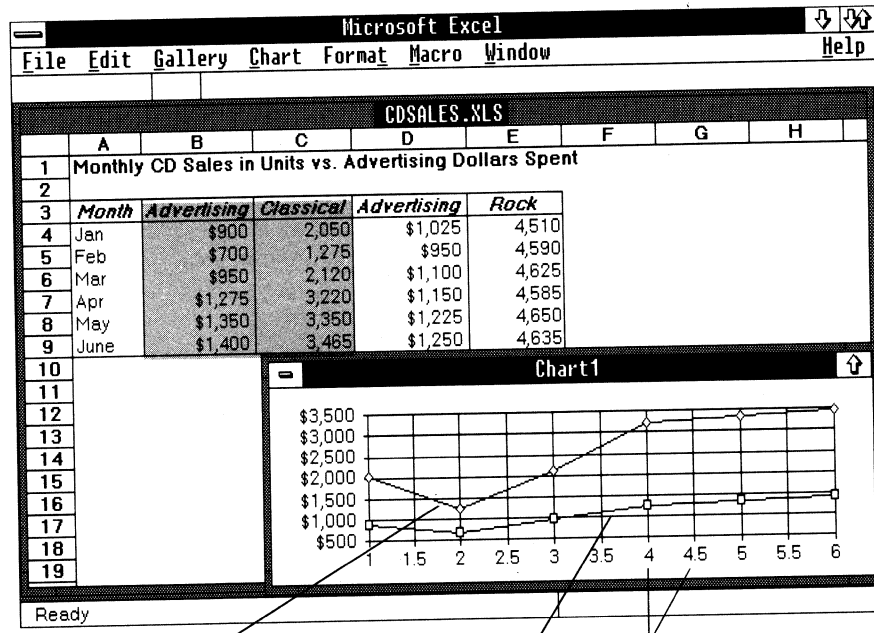
A scatter chart shows the relationship between only the numeric values in data — typically, between just two groups of data. This type of chart uses numeric values along *both* axes — numeric values from one group along the horizontal axis, and numeric values from the other group along the vertical axis. The final scatter chart shows how the two groups of data are related by plotting as an x-y coordinate the point at which each x-value intersects with a corresponding y-value. You can then analyze the way the plotted points appear on the chart. The more the points cluster together or reveal a definite visual pattern, the greater the possible correlations between the sets of values.

Note | You can think of x-values in a scatter chart as categories (that are always numeric) in a data series, and y-values as the numeric values in a data series.

To create a scatter chart correctly, you control the plotting so that both axes show numeric values. The following illustrations explain the adjustment you make to correctly plot scatter charts, and demonstrate one typical use of such charts. The illustrations use two scatter charts to analyze the degree to which money spent on advertising affects sales. The purpose of the charts is to explore whether or not correlations exist between the number of classical and rock music CDs sold and the amount of advertising dollars spent promoting each type of CD.

The tinted area on the CDSALES worksheet in the following illustration shows the source data for a scatter chart analyzing advertising dollars and classical CD sales. Selecting this data, creating a new chart with the File New command, and then changing the chart type with the Gallery Scatter command produces Chart1. Notice that Chart1 is *not* an accurate scatter chart. This chart plots the worksheet data as two separate data series and doesn't show the correlations between the values themselves:

Chart1 does not plot the scatter chart accurately. It shows the values plotted as two separate data series instead of as x-y coordinates.

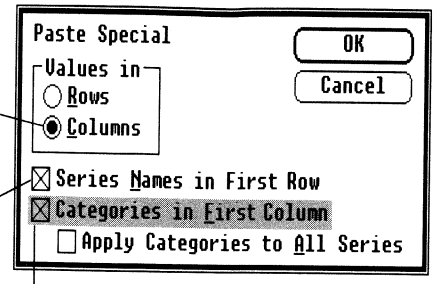


Top line plots Classical (column C) as one data series.

Bottom line plots Advertising (column B) as one data series.

Default tickmark labels used because data did not include categories.

To plot the chart correctly, you use the contents in cells B4:B9 as the basis of the horizontal (category) axis values. As a first step, you select the data (tinted) and choose the Edit Copy command. Then you create a new chart with the File New command. To plot the chart, you choose the Edit Paste Special command (Full menus) which displays the following dialog box.



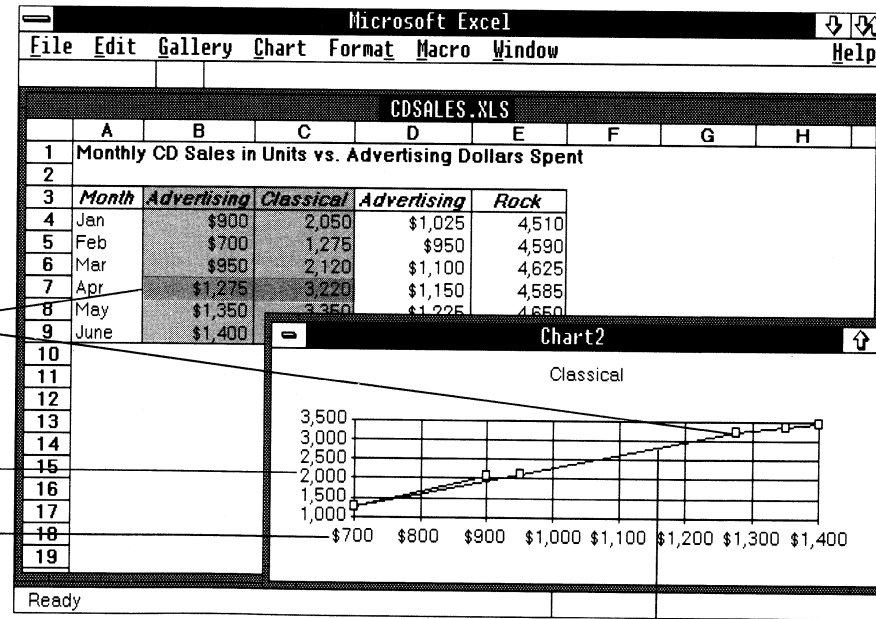
Source data is in columns, so Columns option is automatically selected.

Source data includes series names in first row, so dialog box indicates this.

To use the values in column B as category axis values, turn on this check box.

The steps in the above example produce Chart2, an accurate scatter chart that shows the correlations in the source data. As you can see in the following illustration, each point in Chart2 is a coordinate that represents the intersection of an advertising dollar value and a units-sold value:

Chart2 is a scatter chart that correctly plots the data as x-y coordinates.



Each data point represents an intersection of an advertising dollar and a units sold value.

Vertical axis values from Classical column

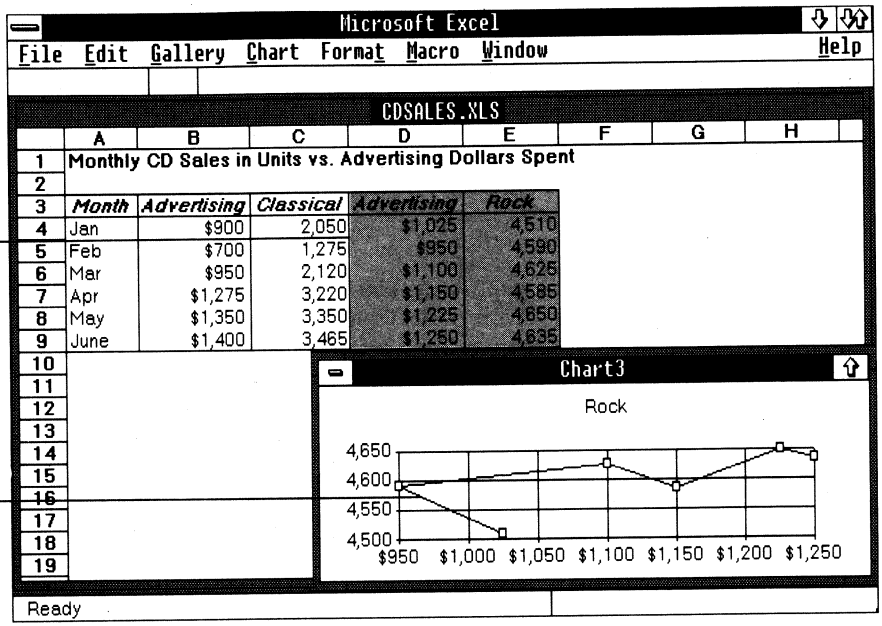
Horizontal axis values from Advertising column

Note the visible trend in the data, indicating a fairly high degree of correlation between the groups of values.

Chart2 shows some correlation between advertising dollars spent and sales — for classical CDs, at least. But do the same correlations hold true for the data on rock CDs? Chart3, created with the same procedure as Chart2, seems to reveal a different finding:

Source data for rock CDs

This scatter chart doesn't show a pattern or trend, indicating fewer correlations in the data.



In comparing Chart2 with Chart3, one possible conclusion is that it's wiser to spend more advertising dollars on classical CDs than on rock CDs. These are the types of factors you can analyze with scatter charts.

Scatter charts are also useful for:

- Analyzing data series in which categories do not increase or decrease by a constant amount or factor.
- Analyzing scientific data.

For information on creating a new chart, see **Chart**.

Plotting a Scatter Chart (Full Menus)

1. Select the data you want to plot.
2. Choose Edit Copy.
3. Choose File New.
4. Select Chart to open a blank chart window.

5. Choose the OK button.
6. Choose Edit Paste Special.
7. If the worksheet data is in columns, turn on the check box for Categories in the First Column.

   If the worksheet data is in rows, turn on the check box for Categories in the First Row.
8. Choose the OK button.
9. Choose Gallery Scatter.
10. Select the scatter chart format you want.

Note

If your data points extend over a wide range, you may want to choose format 4 or 5, which have logarithmic scales. Logarithmic scales are most useful for plotting widely divergent data because they spread out the lower values while keeping the higher values within the plot area.

11. Choose the OK button.

Related Information

Reference

For information on	See
Chart basics	Chart
Formatting and adjusting chart axes; adding gridlines	Chart axis
Microsoft Excel defaults for plotting charts; controlling how data series are plotted	Data series
Creating or modifying data series	Series formula

Functions and Macros

Chapter 7, "Macro Function Directory"

Sampler

Changing Coordinate Systems

Feature Guide

Charts Practices, "Formatting Scatter Charts"

Selection

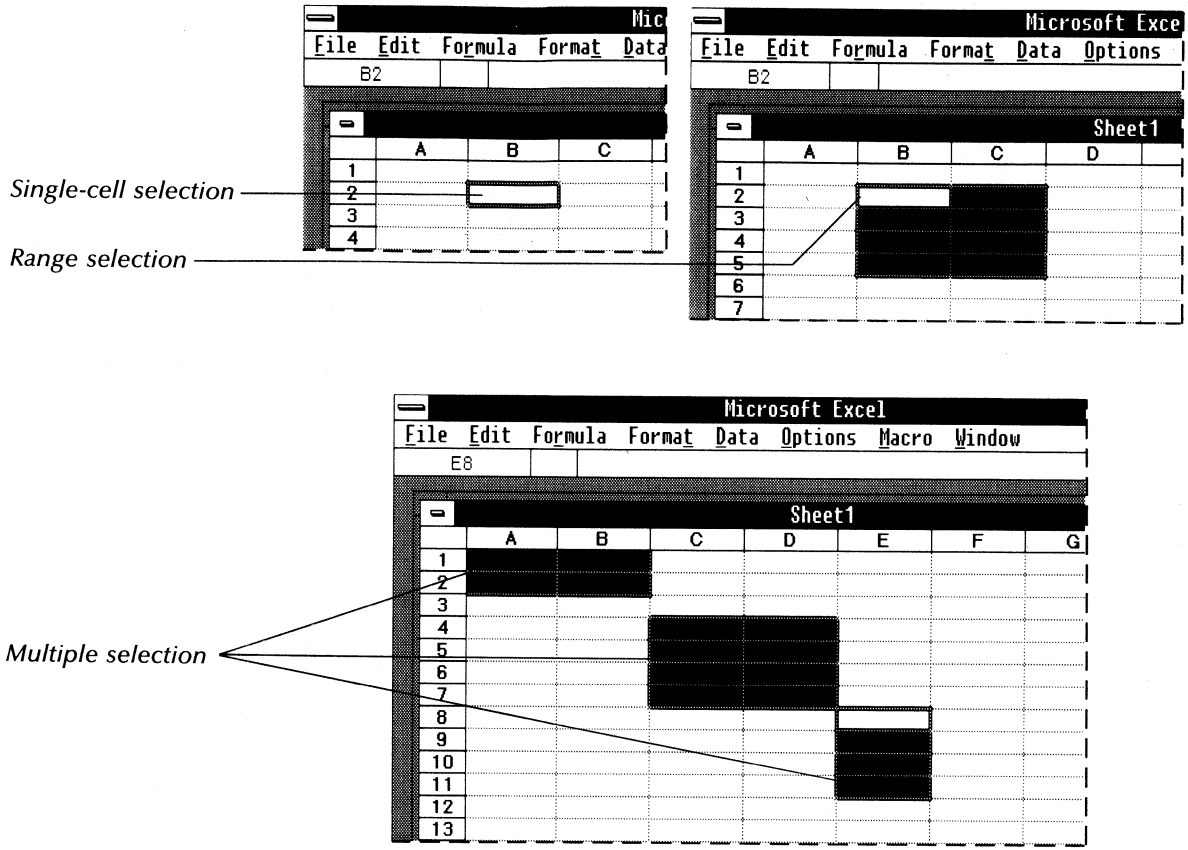
A **selection** consists of the highlighted item on your screen that will be affected by the next command or action. Before carrying out most commands and tasks in Microsoft Excel, you first select the part of the worksheet or chart you want to work with.

- **Worksheet selections.** In a worksheet, the selection can be a cell, range, or characters in the formula bar. A worksheet selection is usually highlighted — the active cell with a heavy dotted border, and any other selected cells with reverse-black. Selected characters in the formula bar also appear in reverse-black.
- **Chart selections.** In a chart, the selection can be a chart object or chart text. A chart object or piece of chart text that can be formatted with commands or moved and sized directly with the keyboard or mouse is marked with black selection squares. An object or piece of chart text that cannot be moved or sized directly is marked with white selection squares.

This topic describes general procedures for basic worksheet selections. For information on moving and selecting in the formula bar with either keyboard or mouse, see **Worksheet**. For information on moving and selecting in a chart, see **Chart**.

Types of Worksheet Selections

You can make three kinds of worksheet selections: a single cell, range, and multiple selection. The following illustrations show an example of each type of selection.



Single cell — a one-cell selection, consisting of the active cell.

To select a single cell:

- With the keyboard, press the DIRECTION keys to move to the cell you want to select.
- With the mouse, click the cell you want to select.

Range — a rectangular section of a worksheet containing two or more cells.

To select a range:

- With the keyboard, select the first cell. Hold down SHIFT and press individual DIRECTION keys, extending the selection to include the cells you want.
- With the mouse, drag through the cells you want.

Multiple selection — any combination of single cells or ranges of cells.

To make a multiple selection:

- With the keyboard, select the first cell, press F8 to turn on the Extend key, and use DIRECTION keys to extend the selection. Then press SHIFT+F8 to keep that selection, and move to the first cell of the next range you want to select. Repeat this sequence to add selections.
- With the mouse, click the first cell or drag through the first range. Then hold down the CONTROL key as you click each additional cell or drag through each range.

For information on moving within a selection and additional keyboard techniques for moving and selecting, see **Keyboard**. For more information on mouse techniques for moving and selecting, see **Mouse**.

Serial number

A **serial number** is a number Microsoft Excel uses to store a date or time. The integer number (to the left of the decimal point) represents the date. The fractional part (to the right of the decimal point) represents the time of day.

The numbers from 1 to 65380 represent the dates from January 1, 1900 to December 31, 2078 — one number for each consecutive day. The decimal fractions from 0.0 to 0.999 represent the times of a day from 00:00:00 (hours:minutes:seconds) or 12:00 a.m. midnight, to 23:59:59 or 11:59 p.m.

Note | If the 1904 Date System check box in the Options Calculation dialog box is turned on, 1 represents January 2, 1904.

Because Microsoft Excel uses serial numbers, you can easily perform calculations with dates and numbers. For example, you could store a start time and a stop time in two cells. Then, in a third cell, a formula could calculate the elapsed time by calculating the difference between the first two cells. You can perform these calculations for both dates and times.

You can easily enter dates or times by typing them in any of the Microsoft Excel date or time formats, or by using the DATE or TIME function. For more information about dates and times, see **Date** and **Time**. For more information about using functions, see *Microsoft Excel Functions and Macros*.

Series formula

A **series formula** consists of the information Microsoft Excel uses to plot a data series (one set of related worksheet values organized by categories) in a chart. The formula usually includes references to worksheet cells (or named ranges) that provide value and category names, as well as the plotting order of the data series. Microsoft Excel creates one series formula for each data series.

This topic explains:

- An overview of series formulas

  The parts of a series formula

- Working with series formulas

  Editing a series formula

  Building a series formula

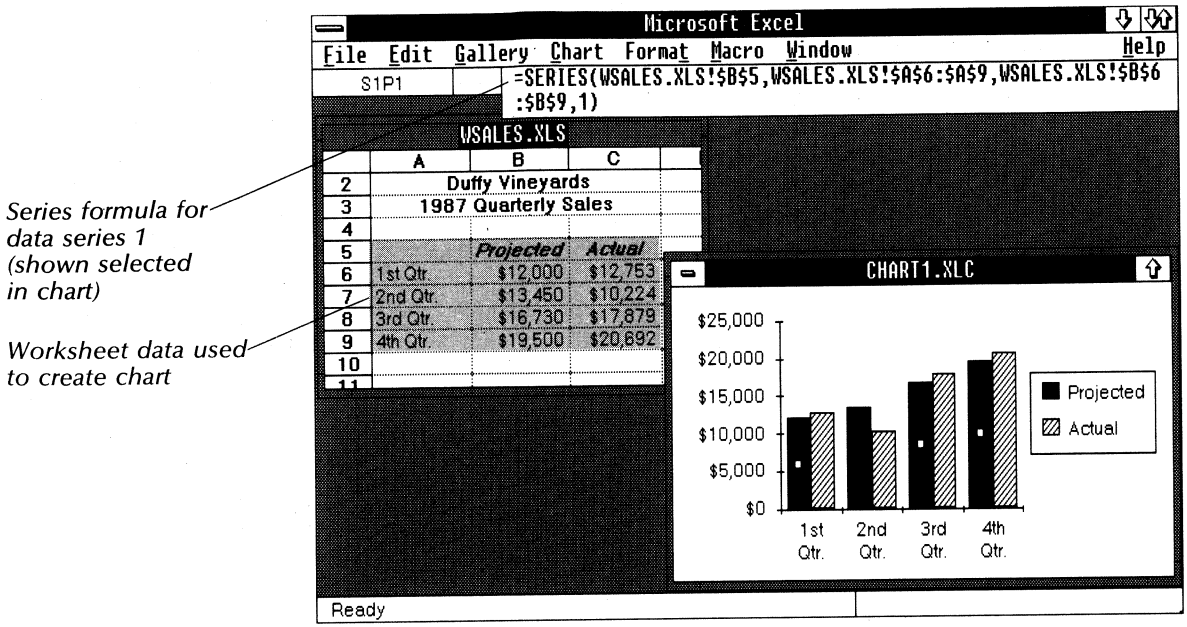
Note | A chart data series is different from the type of series you create with the Data Series command. You use the Data Series command in a worksheet to enter a row or column of dates or numbers that increase by a constant amount or factor. For more information, see **Data Series command**.

An Overview of Series Formulas

Understanding series formulas is useful for the following charting tasks:

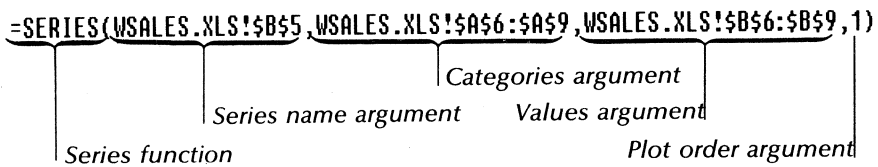
- Editing a series formula to change data series names in a chart legend or to control how data series are plotted in a chart.
- Building a series formula to add a data series to a chart or to create a new chart "from scratch."
- Deleting a data series from a chart by deleting its series formula in the formula bar.

A series formula is displayed in the formula bar any time you select a data series marker in the chart. The following example shows a chart and its source data in a worksheet. The series formula for the selected data series is displayed in the formula bar.



The Parts of a Series Formula

Here's a closer look at the series formula shown in the previous section:



The first element is a special SERIES function used to build the formula. Its use is limited to charts.

A series formula typically uses external references to categories and values on a specific worksheet. An external reference in a chart formula consists of the name of the source worksheet, followed by an exclamation point (!) and the absolute reference of the worksheet range referred to. External names (named cells and ranges) can substitute for the absolute references. The same rules that apply to external references between linked worksheets apply to external references between a chart and worksheet.

Tip If you plan on changing the worksheet at all, it's a good idea to use names in both your worksheet and chart. Even if you insert or delete columns in the worksheet, using names in external references ensures that your chart will always refer to the data you originally selected to create the chart. For more information, see **Names**.

A series formula, then, consists of the SERIES function, followed by its four arguments, each of which defines one aspect of the data series. A series formula must contain the following parts, in this sequence:

- **SERIES function** — must be preceded by an equal sign and immediately followed by a left parenthesis to mark the beginning of the arguments.
- **Series name argument** — can be an external reference to a single cell or a name defined to be a single cell or a sequence of characters. The argument is immediately followed by a comma. The series name argument can also be text, enclosed in quotation marks (for example: "*Mortgage*",). This argument provides the series name for a chart legend if you add one.
- **Categories argument** — must be an external reference to the worksheet name and cells that contain your categories, followed by a comma. You can substitute a named range or an array constant for the cell references.
- **Values argument** — must be an external reference to the worksheet name and the cells that contain your values, followed by a comma. You can substitute a named range or an array constant for the cell references.
- **Plot order argument** — must be an integer (1, 2, 3...), followed by a right parenthesis (to mark the end of the formula). This argument defines the order in which the data series is plotted in the chart.

If you change a worksheet value that provides data to a chart, the series formula is recalculated and Microsoft Excel redraws the chart to reflect the change.

For information on external references, see **Linking documents**.

Working with Series Formulas

When you create a new chart with the File New command, Microsoft Excel automatically builds a series formula for each data series, using the worksheet data you selected. You can edit existing series formulas and you can build series formulas "from scratch."

Editing a Series Formula

You can edit an existing series formula to:

- Change a data series name as it appears in a chart legend (edit the series name argument).
- Change the references for categories or values (edit the categories or values arguments).
- Alter the plotting order of data series — useful for working with overlay charts (edit the plot order argument).
- Delete a data series from a chart (select the data series and delete its series formula in the formula bar).

To edit a series formula:

1. Select a marker from the data series to display the series formula you want to edit.
2. Edit the formula, using standard procedures for editing in the formula bar.
3. When you are finished editing the formula, press ENTER or choose the enter box.

   Microsoft Excel redraws the chart to reflect the changes you made.

For more information on editing in the formula bar, see **Formula bar**. For more information on how to delete a data series, see **Data series**.

Building a Series Formula

You can build a series formula to:

- Add a data series to an existing chart.
- Create a new chart based on worksheet data (as an alternate method to selecting worksheet data and using the File New command) or to create a chart that is not linked to any worksheet data.

By building the formula yourself, you can control the plotting of the data and the data series name.

Note If you build a series formula for a new chart, open a blank chart window first (make sure that a blank worksheet cell is selected, choose the File New command, and select Chart). When you complete the series formula, Microsoft Excel plots the data series in the blank chart window.

Before you build a series formula, you might find it helpful to move and size the worksheet and chart windows so you can see both on your screen at the same time.

You can type the series formula, including the appropriate arguments. You can also build the series formula by typing and selecting cells on a worksheet, as described in the following procedure:

1. To start the formula, type *=series(*
2. If you want the data series name linked to the worksheet, select the cell on the worksheet that contains the text you want for the data series name, then type a comma. This enters the external reference in the formula.

   If you don't want the data series name linked to a worksheet cell, type a data series name enclosed in quotation marks and followed by a comma. You can also leave out the data series name and type just the comma.

3. Select the area on the worksheet that contains the data you want to use as categories, and type a comma. The reference appears in the formula.

   You can also type an absolute reference, a name, or an array constant, followed by a comma. If you don't want a categories reference, type just the comma.

4. Select the area on the worksheet that contains the data you want to use as values, then type a comma.

   You can also type an absolute reference, a name, or an array constant, followed by a comma.

5. Type the plot order number you want the data series to have, followed by a right parenthesis to finish the formula.

   If you type the plot order number of an existing data series, Microsoft Excel renumbers the existing data series appropriately. If you leave out the plot order number, Microsoft Excel plots the data series last, after existing data series (if any), and supplies the plot order number.

6. Press ENTER or choose the enter box.

   Microsoft Excel adds the data series to the chart.

For more information on formulas, see **Formula**. For other ways to add a data series to a chart, see **Data series**.

Related Information

Reference

For information on	See
Chart basics	Chart
Working with chart legends	Chart legend
Entering and editing formulas	Formula Formula bar
An overview of functions	Function

Sorting data

To reorganize data on a worksheet, use the Data Sort command. You can sort rows or columns in any rectangular block of cells.

This topic explains:

- Sorting
- Undoing a sort
- Using more than three keys

Sorting

You can sort either rows or columns.

If you sort by rows, you can sort based on the values in up to three key columns in a single sort. If you sort by columns, you can sort based on the values in up to three key rows in a single sort.

Microsoft Excel sorts in either ascending or descending order. You specify ascending or descending order for each key column or row. In ascending order, Microsoft Excel sorts in the following order, top to bottom or left to right:

- Numbers
- Text
- Logical values
- Error values
- Blanks

In ascending order, numbers are sorted from the largest negative number to the largest positive number. Text is sorted in the following order:

space	!	"	#	$	%	&	'	(	)	*	+	,	-	.	:	;	
<	=	>	?	@	[	\	]	^	_	`	{	|	}	~	¢	¥	±•
0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H
I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

The numbers in the text sort order refer to numbers that are typed on the worksheet as text values. Numbers that appear on the worksheet as number values are sorted separately. Microsoft Excel ignores case when sorting text. Uppercase letters and lowercase letters are equal.

The logical value FALSE is sorted before TRUE. All error values are equal.

In descending order, Microsoft Excel reverses the order of everything except blank cells, which are always sorted last.

To sort:

1. Select the range you want to sort.
   Everything within that range will be reordered, based on the key rows or columns you specify. Nothing outside of that range will be affected by the sort.
2. Choose Data Sort.
3. To sort rows, select Row.
   To sort columns, select Column.
4. Enter the reference of your first key in the 1st Key box.
   If you are sorting by rows, this can be the reference of any cell in the column you want to use as your first key column. If you are sorting by columns, this can be the reference of any cell in the row you want to use as your first key row.
5. To sort by more than one key, insert references in the 2nd Key and 3rd Key boxes.
6. Select Ascending or Descending order, for each key you specify.
7. Choose the OK button.

Note | If you are sorting a database, be careful not to select your field name row. If you select the field name row, it is sorted with the rest of your database.

Undoing a Sort

If you don't like the way your data was sorted, you can undo the sort immediately after you sort.

- Choose Edit Undo.

Using More Than Three Keys

You can sort based on more than three keys; you just need to use Data Sort more than once.

1. Sort using the three least important keys. Of those three keys, use the most important as the first key, the next as the second key, and the least important as the third key.
2. Sort using the next three keys, again using the most important of the three as the first key.
3. Continue sorting in this manner until you have sorted using the most important keys.

Related Information

Reference

For information on	See
Databases	Database

Tutorial

Database Basics

Starting Microsoft Excel

Before you start Microsoft Excel the first time, make sure you've run the Setup program to install Microsoft Excel on your hard disk and to set up the other devices you want to use with the program, such as printers or plotters. For information on Setup, see *Getting Started and Quick Reference*, a booklet included in your Microsoft Excel package.

When you start Microsoft Excel, the default settings apply to any new document you create until you change those settings. When you save a document, Microsoft Excel stores any changes to defaults along with the document. Your settings for the document will be in effect whenever you open and activate the document. For information on Microsoft Excel defaults, see **Default settings**. For information on opening new or existing documents, see **Opening a document**.

Starting Microsoft Excel from DOS

1. Turn on your computer.
2. If necessary, use the DOS CHDIR command to change to the directory in which you have installed Microsoft Excel.
3. At the DOS prompt, type *excel*
4. Press ENTER.

Note If you are running Microsoft Excel under Microsoft Windows, version 2.0 or higher, start Microsoft Excel the way you would any other application under Windows. The filename for Microsoft Excel is EXCEL.EXE. For more information, see *Microsoft Windows User's Guide*, version 2.0.

Related Information

Reference

For information on	See
Creating new documents and opening existing documents	Opening a document
Setting up page layout and printing documents	Headers and footers Printing a document
Saving documents	Saving and closing a document
Ending a session with Microsoft Excel	Quitting Microsoft Excel

Getting Started and Quick Reference

Setting Up Microsoft Excel

Status bar

The **status bar** is an area at the bottom of the Microsoft Excel window that displays information about the current activity or mode of Microsoft Excel.

This topic discusses:

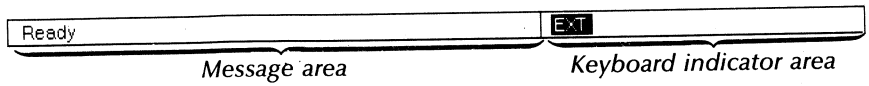
- The parts of the status bar
- The message area
- The keyboard indicator area
- Hiding or displaying the status bar

The Parts of the Status Bar

The status bar is divided into two parts:

- The **message area** displays information about commands and dialog boxes, and other processing information.
- The **keyboard indicator area** gives information such as whether the Extend key is turned on.

Here's a close-up view of the parts of the status bar:



The Message Area

Microsoft Excel displays several kinds of information in the message area at the left side of the status bar. When a command is selected, the message consists of a brief explanation of the selected command. When a dialog box or alert message is displayed in the workspace, the message specifies how to get help.

Other messages displayed in this area of the status bar serve as reminders of the current mode of Microsoft Excel, as indicators of a special operation in progress (such as copying cells or recording a macro), or as alerts for special conditions that apply to the active document (such as a circular reference). The following table lists these messages:

Message	Meaning
Ready	Microsoft Excel is in Ready mode, waiting for you to select cells, activate the formula bar and enter or edit data, or choose commands.
Enter	Microsoft Excel is in Enter mode, used for basic data entry in the active cell.
Point	Microsoft Excel is in Point mode, used for entering cell and range references in a formula in the active cell.
Edit	Microsoft Excel is in Edit mode, used for editing the content of the active cell in the formula bar.
Find (Use direction keys to view records)	Microsoft Excel is in Data Find, used for finding and selecting database records that meet specified criteria.
Help (To specify a topic, choose a command or click an object)	A Help request is in progress. Choosing a command displays a Help topic for that command rather than displaying the dialog box or carrying out the command. Clicking an object displays the help topic for that object.

Message	Meaning
Copy (Select destination and press Enter or choose Paste)	A worksheet or chart copy operation within Microsoft Excel is in progress. Once you select the destination area on a chart or worksheet, pressing ENTER or choosing the Edit Paste command inserts the copied data.
Cut (Select destination and press Enter or choose Paste)	Worksheet cells are selected for moving with the Edit Cut command. Once you select the destination area, pressing ENTER or choosing the Edit Paste command inserts the moved data.
Size (Use direction keys to size)	A window or chart item is selected for sizing with the Control Size command. Pressing DIRECTION keys adjusts the window or chart item to a new size.
Move (Use direction keys to move)	A window or chart item is selected for moving with the Control Move command. Pressing DIRECTION keys moves the window or chart item to a new location.
Split (Use direction keys to split)	A window is selected for splitting into panes with the Control Split command. Pressing DIRECTION keys moves the split bars on the screen.
Recording	The macro recorder is turned on with the Macro Record command.
Calculate	Calculation is set to manual, and the worksheet has been changed since the last time it was calculated. To ensure correct totals, choose Options Calculate Now to calculate the worksheet.
Circular: *reference*	Microsoft Excel has found a circular reference in the worksheet. The specific cell reference following the word "Circular" indicates one of the cells involved in the circular reference.

For a list of topics related to the messages in the preceding table, see "Related Information," later in this topic.

Note You can create macros to display your own messages in the status bar. For more information, see Chapter 3, "Macro Basics," in *Microsoft Excel Functions and Macros.*

The Keyboard Indicator Area

The keyboard indicator area on the right side of the status bar displays information about standard keys on your keyboard (such as CAPSLOCK and NUMLOCK) and special-purpose keys defined in Microsoft Excel (such as the Extend key or Overtype key).

The following table lists these indicators and their meanings:

Indicator	Meaning
CAPS	CAPSLOCK is turned on.
NUM	NUMLOCK is turned on.
SCRL	SCROLL LOCK is turned on. This allows you to scroll the worksheet window while keeping the current selection.
OVR	The Overtype key (INSERT) is turned on. You can type over characters in the formula bar without having to delete them first.
EXT	The Extend key (F8) is turned on. With the keyboard, you can extend a selection without using SHIFT.
ADD	The Add key (SHIFT+F8) is turned on. When making a multiple selection with the keyboard, you can keep the current selection and add the next part of the selection.
FIX	The Fixed Decimal option (Options Workspace command), a keyboard-related setting, is turned on. This option sets up fixed decimals as on a 10-key adding machine, so that in any number you enter, decimal points are automatically inserted for the number of decimal places you specify.

Note If you enter fixed decimal numbers with the regular number keys at the top of the keyboard, use the Fixed Decimal option alone. If you enter fixed decimal numbers with the numeric keypad (located on the right side of most keyboards), be sure to turn on NUM LOCK as well. The status bar will display both the FIX and NUM indicators.

For a list of topics related to the keyboard indicators in the preceding table, see "Related Information," later in this topic.

Hiding or Displaying the Status Bar (Full Menus)

When you start Microsoft Excel the first time, the status bar is displayed. If you want a little extra room in the workspace, you can hide the status bar.

To hide the status bar	To display the status bar
1 Choose Options Workspace.	1 Choose Options Workspace.
2 Turn off the Status Bar check box.	2 Turn on the Status Bar check box.
3 Choose the OK button.	3 Choose the OK button.

Related Information

Reference

For information on	See
Ready, Enter, Point, and Edit modes	Worksheet
Data Find	Database
Help	Help
Copying and moving cells and data	Copying data and formats Moving data on a worksheet
Moving and sizing a window	Windows
Splitting a window into panes Additional display formats	Display options
Recording a macro	Macro

Continued

For Information on	See
Manual and automatic calculation options	Calculation
Circular references	Circular reference
Resolving circular references	Auditing worksheet models
Multiple selections	Selection
Dialog box options for the Options Workspace command	Options Workspace command

Functions and Macros

"ALERT and MESSAGE Functions" in Chapter 3, "Macro Basics"

Table

A **table** is a range of cells whose values provide input for other formulas on a worksheet. Microsoft Excel has two different types of tables:

- A **data table** is used for testing the effect of "what-if" values using either one or two inputs. For more information, see **Data table**.
- A **lookup table** provides data that you retrieve based on the comparison of a value you specify with values in the table. For more information, see **Lookup table**.

Text

On a worksheet, **text** is any set of characters entered in a cell that Microsoft Excel does not interpret as a formula, number, date, time, logical value, or error value. As with constant numbers, Microsoft Excel does not change text unless you select the cell containing the text and then edit it.

You will also find text within formulas and within charts. In charts, the various labels that may be displayed are considered to be text. Within formulas, text includes those characters enclosed in double quotation marks (" ").

Note | For information on how to work with text in a chart, see **Chart**, **Chart text**, and **Format Text command**.

Entering Text

To enter text as a constant, you select a cell and type the text. What you type appears in the formula bar and is entered into the active cell when you press ENTER or click the enter box with the mouse. Text may contain letters, digits, and other special characters which you can produce on your printer. A cell can hold up to 255 characters of text.

If text is too long to fit in a cell, Microsoft Excel extends the display of text into the neighboring cells until it encounters a cell that is not empty. Microsoft Excel continues to store all of the text that was entered regardless of how much text is displayed. To increase or decrease the amount of text displayed in a cell, change the width of the column. For more information on changing column width, see **Column**.

If you want Microsoft Excel to interpret numbers as text, type the numbers within double quotation marks. If you type *="36419"* Microsoft Excel interprets this as the text 36419, not as the number 36419.

When you use text in a formula, be sure to include both the double quotation marks and the equal sign. Without the double quotation marks, Microsoft Excel interprets the text as a name or number. If you want to include quotation marks within the text, use two double quotation marks for each double quotation mark that you want to appear. For example, to enter the text *a"b"c* in a formula, type *="a""b""c"*

Related Information

Reference

For information on	See
Editing text	Formula bar Editing a document
Formatting text	Formatting a document
Constant values	Constant value
General overview of editing in documents	Editing a document
Fonts, alignment, and other formatting options	Font Alignment Formatting a document
Text in charts	Chart Chart text

Continued

Tutorial

Worksheet Basics
Changing How a Worksheet Looks

Feature Guide

Basic Mechanics, "Entering and Editing"
Worksheet Formatting

Time

You can use several built-in time formats or create custom time formats for use in your Microsoft Excel documents.

This topic explains:

- How Microsoft Excel stores times
- Built-in time formats

  Formatting times as you type

  Trouble-shooting time formats

  Using the Format Number command to assign time formats

- Custom time formats

  Creating a custom time format

  Using a custom time format

  Deleting a custom time format

Note | All worksheet time formats also apply to macro sheets.

How Microsoft Excel Stores Times

Microsoft Excel stores all times as decimal fractions. These fractions represent the portions of a day elapsed between a given time and 12 midnight, the beginning of the day. For example, the value 0.5 represents 12 noon — 12/24 or 1/2 of a day. The value 0.75 is equal to 6 P.M. — 18/24 or 3/4 of a day. Microsoft Excel has several built-in formats you can use to display a time.

Note

Microsoft Excel stores dates as serial numbers running from 1 to 65380, where 1 is the number for January 1, 1900, and 65380 is the number for December 31, 2078. For example, the serial number for 6/1/85 is 31199. To represent a specific date/time combination, Microsoft Excel stores the serial number for the date and a decimal fraction for the time. For example, 31199.5 represents 12 noon on 6/1/85. For more information on date formats, see **Date**.

With times stored as decimal fractions, you can perform calculations using times as you would other numbers. For example, using normal time formats, you can enter the starting time of an experiment in one cell and the ending time in another cell. In a third cell you can build a formula to calculate elapsed time. Microsoft Excel uses the decimal fraction equivalents for the times to calculate the formula and displays the resulting value.

Built-in Time Formats

In Microsoft Excel you can use the following built-in time formats:

Format	Example
h:mm AM/PM	4:48 AM
h:mm:ss AM/PM	4:48:20 PM
h:mm	16:48
h:mm:ss	16:48:45
m/d/yy h:mm	4/30/87 22:45

There are two ways to apply a built-in time format in a worksheet:

- **Format the time as you type.** You can type a time using one of the built-in formats in the preceding table; Microsoft Excel automatically stores the decimal fraction and assigns the time format to the cell.
- **Assign a built-in time format with the Format Number command.** You can assign any built-in time format to a cell or range with the Format Number command before or after you type the data.

Note

Microsoft Excel also has several built-in worksheet functions for manipulating times, dates, and serial numbers. For more information, see *Microsoft Excel Functions and Macros,* a separate manual in your Microsoft Excel package.

Formatting Times As You Type

Microsoft Excel displays a time format as close as possible to what you type. If you type a time into a cell formatted in General format or one of the built-in time formats, Microsoft Excel stores the decimal fraction (and serial number if you specify a particular date and time) and displays it as a time. For example, when you type *6:00 PM* in a cell with General format, Microsoft Excel stores the time as the decimal fraction 0.75, and assigns the format h:mm AM/PM for displaying the time.

You can also type times in formats other than the built-in choices. Type the time format as you want it, following these guidelines:

- **Indicating the 24-hour clock:** Unless you type *AM* or *PM*, Microsoft Excel automatically displays time using the 24-hour clock (military time).
- **Indicating the 12-hour clock:** If you want to display time using the 12-hour clock, type *AM* or *PM*. You can also type *A* or *P* instead of *AM* or *PM*, but you must include a space between the letter and the time.
- **Date and time:** You can type a date and a time in the same cell. You must separate the date and time by a space. For example, you could type either *4/23/86 16:48* or *4:48 PM Apr-86*
- **Capitalization:** Use upper- or lowercase letters in time formats. Microsoft Excel ignores capitalization when you enter times.

Trouble-shooting Time Formats

Microsoft Excel displays non-built-in time formats as precisely as possible, but in some cases, it may interpret your formats slightly differently. Use the following trouble-shooting parameters if you're unsure about how Microsoft Excel is interpreting non-built-in time formats you type in:

- **Month name and single or double digit:** Microsoft Excel interprets a month name followed by a single or double digit to be a month and a year. For example, if you type *February 4 23:45*, Microsoft Excel interprets it as 2/1/04 23:45, not February 4th 23:45. If you type *Feb-13 17:30* Microsoft Excel interprets it as 2/1/13 17:30.
- **Typing times in previously formatted cells:** If you type a time into a cell with neither the General format nor a time format, Microsoft Excel converts the time to a decimal fraction, but displays the value in the cell's format. For example, if you type *6:00 PM* in a cell formatted to display dollar values, Microsoft Excel stores the decimal fraction for the time, .075, and displays it as $1 (0.75 rounded off to 1). To correctly display the number as a time, choose the Format Number command and select the time format you want.

- **Time formats Microsoft Excel does not recognize:** If Microsoft Excel does not recognize a time format you type, it displays the data as precisely as possible, but stores the time as text instead of as a decimal fraction. If you try to use the time in calculations, Microsoft Excel returns the error value #VALUE!. For this reason, you should either use a built-in format or create a custom time format when using times in calculations.

Tip | The formula bar shows how Microsoft Excel interprets a time format you type in. Check the formula bar if you have questions about how Microsoft Excel has interpreted the contents of the cell.

Using the Format Number Command to Assign Time Formats

1. Select the cells you want to format.
2. Choose Format Number.
3. In the list box, select a time format.
4. Choose the OK button.

Custom Time Formats

You can create your own time formats for specialized uses in Microsoft Excel documents. Using a custom time format can also simplify data entry. For example, you can format a range with a complex custom time format, but enter the data using a simpler format, and Microsoft Excel will display the data in your custom format.

The following table shows the symbols you can use for creating custom time formats. Each time format symbol has its own meaning.

This format symbol	Means this
General	Display the number in General format.
h	Display the hour as a number without leading zeros (0–23).
hh	Display the hour as a number with leading zeros (00–23)
m	Display the minutes without leading zeros (0–59).

This format symbol	Means this
mm	Display the minutes with leading zeros (00–59).
s	Display the seconds without leading zeros (0–59).
ss	Display the seconds with leading zeros (00–59).
AM/PM am/pm A/P a/p	Display the hour using a 12-hour clock (AM, am, A, or a for times before noon; PM, pm, P, or p for times between noon and midnight); formats without one of these symbols display the hour using the 24-hour clock.

Note The m or mm symbol must appear after an h or hh symbol, or Microsoft Excel displays the month instead of the minute. For more information, see **Date**.

Here are some examples of time formats you can create:

If a cell has this format	And you enter	Microsoft Excel displays
hh"h" mm"m"	4:48 PM	16h 48m
h.mm AM/PM	16:48	4.48 PM
hhmm "hours"	2:00	0200 hours

Note Enclose characters you want to appear as literal parts of a custom format in quotation marks, as in the first example in the preceding table.

Creating a Custom Time Format

You can create a custom time format in two ways:

- **Edit a built-in time format in the Format Number dialog box.** You can quickly create a custom format similar to one that already exists by editing a built-in format in the list box. Use the time format symbols shown in the table earlier in this section. When you choose the OK button, Microsoft Excel retains both the built-in format and your newly created custom format.

- **Type your own format in the Format Number dialog box.** Using the time format symbols in the table earlier in this section, type the format you want in the Format text box.

To create a custom time format:

1. Select the cells you want to format.
2. Choose Format Number.
3. In the Format box, either edit a built-in format or type a new format. Refer to the guidelines and table earlier in this topic, if necessary.
4. Choose the OK button.

Microsoft Excel formats the selected cells with the new format and adds it to the end of the list box so you can reuse it.

Using a Custom Time Format

1. Select the cells you want to format.
2. Choose Format Number.
3. Scroll to the end of the list box and select the custom format you want.
4. Choose the OK button.

Deleting a Custom Time Format

1. Choose Format Number.
2. Scroll to the end of the list box and select the custom format you want to delete.
3. Choose the Delete button.
4. Choose the OK button.

Note | You cannot delete a built-in format.

Related Information

Reference

For information on	See
Worksheet, chart, database basics	Worksheet Chart Database
Using other built-in number and text formats	Number Text Date
General overview of formatting options for worksheets and charts	Formatting a document

Feature Guide

Worksheet Formatting Practices, "Creating Custom Number Formats"

Two-input table

A **two-input table** consists of:

- Two groups of values that are substituted for two variables in one formula.
- The formula results that occur when the two groups of values are substituted for the variables.

Data tables are useful for what-if analysis. For more information, see **Data table**.

Values

In a worksheet, a **value** is data contained in a cell. A value can either be data that you type directly into the cell, or a value can be the result of the formula in that cell.

This topic explains:

- Types of values
- How Microsoft Excel converts values
- Special techniques for entering values

  Creating a series of dates or numbers

  Parsing imported values

Types of Values

The following table shows the four basic types of values in Microsoft Excel:

Type of value	Examples
Numbers	3, 243, 5.3, 2E+3
Text	Mr. Hansen, Total Costs
Logical	TRUE, FALSE
Error	#NUM!, #VALUE!

Numbers also include dates and times. For more information, see **Date** and **Time**. For information on numbers and text, see **Number** and **Text**.

Logical values are the values TRUE and FALSE. These are produced by and used in formulas that perform comparisons, such as determining if the number in one cell is larger than a number in another cell. For more information, see **Logical value**.

Error values are values, such as #N/A or #NUM!, that Microsoft Excel displays when it cannot properly calculate a formula. For more information, see **Error value**.

Values are displayed on your worksheet either as the result of a formula or because you directly enter the value into a cell. A value that you enter directly (as opposed to one that is produced by a formula) is called a constant value. Constant values do not change unless you select that cell and edit the value yourself. A value that is produced as the result of a formula can change when other values in the worksheet change.

How Microsoft Excel Converts Values

Microsoft Excel often expects certain types of values when calculating a worksheet. If you enter something that is different from what Microsoft Excel expects, it tries to convert the value.

The ability of Microsoft Excel to convert operands and arguments gives you more flexibility when using formulas. You will rarely have to resort to special functions to convert between types of values.

The following list gives some examples of how Microsoft Excel converts values:

- **Converting to numbers.** In the formula ="1"+"2", the plus sign causes Microsoft Excel to expect numbers. Even though the quotation marks mean that "1" and "2" are text values, Microsoft Excel automatically converts the text to numbers and produces the number 3.

  When Microsoft Excel expects a number, it converts text if the number is in a format that the formula bar would accept for a number constant. For example, it converts the formula =1+"$4.00" and produces the value 5. For the formula =SQRT("Sunday"), Microsoft Excel cannot convert the text to a number because it is not in a format the formula bar would accept for a number constant. It would produce the error value #VALUE!. Microsoft Excel converts the value FALSE to the number 0, and TRUE to 1.

  Because Microsoft Excel can convert text to numbers, you can easily enter serial numbers for dates and times within formulas. You do this by entering into the formula, as text, the date formatted in one of the Microsoft Excel date or time formats. For example, in the formula ="6/1/85"– "5/1/85", Microsoft Excel converts the dates to serial numbers and produces the value 31.

- **Converting to text.** When Microsoft Excel expects text, it converts all numbers and logical values to text. For example, it converts the formula ="A="&TRUE to the text value A=TRUE, and the formula ="A="&5 to the text value A=5.

- **Converting to logical values.** When Microsoft Excel expects a logical value, it converts the number 0 to FALSE and other numbers to TRUE. For example, it converts the formula =IF(0,"right","wrong") and produces the value "wrong". When expecting a logical value, Microsoft Excel produces the #VALUE! error value when it encounters any text other than "true" or "false". For example, the formula =IF("true","right","wrong") produces the value "right", and the formula =IF("correct","right","wrong") produces the error value #VALUE!, because "correct" cannot be converted to a logical value.

Special Techniques for Entering Values

This section discusses two techniques you can use to enter values quickly when you are building a worksheet.

Creating a Series of Dates or Numbers (Full Menus)

When building a worksheet, you can use the Data Series command to quickly create a series of column or row titles based on incremental time periods or numbers that increase by a constant amount or factor. You specify the starting value, the direction you want to fill (row or column), the increments or factors of increase, and a stop value for the series, if desired. Microsoft Excel creates the series based on your specifications.

You can create three types of series in Microsoft Excel:

- **Date series**. When you use a date series, you can specify that Microsoft Excel build the series based on increments of days, weekdays, months, or years. For example, if you start a series with a date and specify increments of months, Microsoft Excel creates a series based on months of the year as column or row titles.
- **Linear series.** When you use a linear series, Microsoft Excel increases values by a constant increment. For example, if you start a linear series with 1 and specify a step value (constant increment) of 2, Microsoft Excel creates the series 1, 3, 5, 7, 9, and so on.
- **Growth series.** When you use a growth series, Microsoft Excel increases values by a constant factor. For example, if you start a growth series with 1 and specify a step value of 2, Microsoft Excel creates the series 1, 2, 4, 8, 16, and so on.

To create a series:

1. Enter the starting value for the series in a cell.
2. Select the row or column you want to fill with the series, including the starting value as the first cell in the selection.
3. Choose Data Series.
4. Under Series In, select Rows if you want the series in a row.
   Select Columns if you want the series in a column.
5. Under Type, select a series type.
   If you select Date, also specify the Date Unit you want to use.
6. In the Step Value box, type the increment you want to use.
   If you want Microsoft Excel to stop filling the selection when it reaches a certain value, type that value in the Stop Value box. Otherwise, Microsoft Excel fills the entire selection.
7. Choose the OK button.

You can also create several series at once by selecting a cell range before choosing the Data Series command. Then, depending on whether you select Rows or Columns in the dialog box, Microsoft Excel creates a series for each row or column in the range.

Tip Growth series are ideal for filling in compounded interest or growth rates. For example, if you want to see how $100 grows each month in a money market account that earns 10% interest, enter $100 as the starting value, select that cell and 12 other cells to fill, and choose Data Series. Select Growth as the series type, type an increment of 100.83% (100% plus 10% divided by 12), and choose the OK button. Microsoft Excel will fill the cells with values that show the compounded interest after each month.

For more information, see **Data Series command**.

Parsing Imported Values (Full Menus)

If you copy data into Microsoft Excel from another application, especially a database program, several columns of data may be condensed into a single column during the transfer. For example, if you open a database report file from another application as a worksheet in Microsoft Excel, each full record is typically placed in a single cell. Use the Data Parse command to separate the fields of each record into separate columns.

The range you parse can be any number of rows long, but only one column wide. The parse settings you create for the first cell in the range apply to all cells in the range.

You create parse settings by adding brackets to the parse line in the Data Parse dialog box. The parse line displays the contents of the first cell in the selection. The Guess button adds a set of brackets and the Clear button clears all brackets.

Whether you add all of the brackets yourself or change the brackets added by the Guess button, use the following keys to add or delete brackets in the Parse Line:

To	Press this
Move the flashing insertion point	LEFT and RIGHT keys
Delete unwanted brackets	BACKSPACE and DELETE
Add brackets	Left and right brackets ([and])

Important When you parse the data, Microsoft Excel fills cells to the right of the column you are parsing. If there is data in those cells, that data is lost when the parsed data overwrites it. Make sure you have enough blank cells to the right of the range you are parsing to accommodate the data.

To parse data:

1. Select the range of cells containing the data you want to separate. The range must be no more than one column wide.
2. Choose Data Parse.

   The Data Parse dialog box appears, and displays the contents of the first cell in the range. The parse settings you set for the first cell apply to all cells in the range.
3. Choose the Guess button.

   Microsoft Excel adds brackets to the parse line. Each set of brackets shows where a field will be separated into a different column.
4. If necessary, change the guess by adding or deleting brackets in the parse line.
5. When the brackets are set so the fields will be separated the way you want them, choose the OK button.

For more information, see **Data Parse command**.

Related Information

Reference

For information on	See
Calculations in Microsoft Excel	Calculation
Calculating with dates and times	Serial number
Formatting data	Formatting a document
Using formulas	Formula
Constant values	Constant value

Functions and Macros

"Translating Data Types" in Chapter 1, "Worksheet Function Basics"

Wildcard

A **wildcard** is a character that stands for one or more characters. You can use wildcards when finding data in your worksheet or as part of the criteria you use with a database. Microsoft Excel recognizes two wildcard characters: the question mark (?) and the asterisk (*).

The question mark (?) stands for any single character in the same position as the question mark. For example, if you want to search your database for a particular person, but aren't sure whether the name is Smith or Smyth, you could type *sm?th* as your criterion.

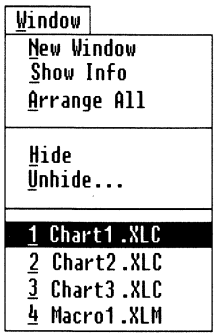
The asterisk (*) stands for any number of characters in that same position. For example, if you want to find all clients in a database whose companies are incorporated, and you have consistently typed *Inc.* at the end of their company names, you could type **inc.* as your criterion.

When you are searching a database, Microsoft Excel assumes there is an asterisk at the end of text you use as criteria. For example, if you type *smith* as your criterion, you find all clients whose names start with "Smith," such as Smith, Smithson, Smithsen, Smithers, and so on.

If you want Microsoft Excel to treat a question mark or asterisk as a regular character rather than as a wildcard character, precede the question mark or asterisk with a tilde (~). For example, to find FY87?, you type *FY87~?* as your criterion.

For more information on searching a worksheet or database, see **Finding cells and data quickly** and **Database**.

Window Activate Window command



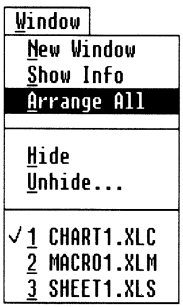
Activates the window you choose.

This command is actually a group of commands at the bottom of the Window menu that change according to the windows you have open.

Use this command to quickly make a window active. The window names shown here are examples; your menu will show whatever windows you have open.

If you have more than nine windows active at one time, the More Windows command appears on the Window menu below the first nine active windows. For more information, see **Window More Windows command**.

Window Arrange All command



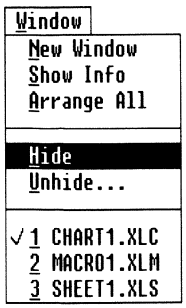
Rearranges windows open in Microsoft Excel so that your windows use the available workspace most efficiently.

Use Window Arrange All along with Control Move (ALT, HYPHEN, M) and Control Size (ALT, HYPHEN, S) for the individual document windows to arrange your workspace the way you want it.

For more information on moving a document window, see **Control Move command**. For more information on sizing a document window, see **Control Size command**.

Window Hide command

(Full menus)



Hides the active window from view. Although hidden, the window remains open and data in it can be accessed by documents that have external references to the hidden document. You also can run macros from a hidden macro sheet.

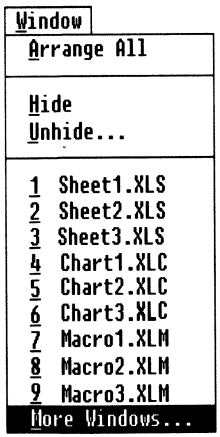
Window Hide is especially useful when you want to have worksheets or macro sheets open so you can use their data or macros, but you don't need to see the data or macros and don't want them taking up room on your screen.

If the window is protected with the Options Protect Document command, Microsoft Excel asks you for the password before hiding the window, and again when you unhide the window with the Window Unhide command.

If all of the open windows are hidden, the Unhide command appears on the File menu as Unhide Window.

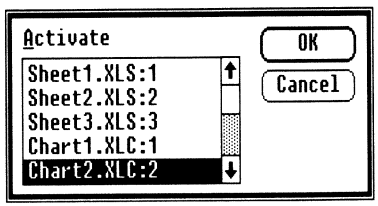
For more information on unhiding a window, see **Window Unhide command**.

Window More Windows command



Activates windows that are open but do not appear on the Window menu.

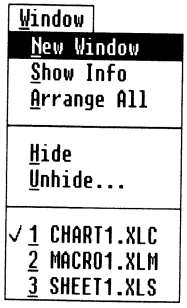
More Windows only appears on the Window menu when you have more than nine windows open at one time.



Activate

Lists all open windows. Select the window you want to activate, then choose the OK button.

Window New Window command

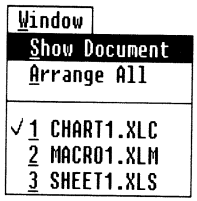


Creates an additional window for the active document. A second window is especially useful for simultaneously viewing and working on two widely separated parts of your worksheet, because you can scroll the two windows independently of each other. If you want synchronized scrolling in your worksheet, use the Control Split command (ALT, HYPHEN, T).

The new window has all the same properties as any other window. The title bar shows the name of the original document, followed by a colon and a number. The second window into a document has a 2 after the colon, the third has a 3, and so on. The number of additional windows you can have is limited only by the available memory.

Window Show Document command

(Full menus)

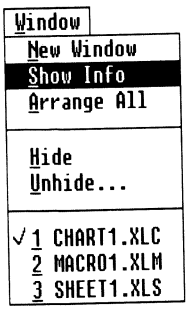


Activates the worksheet whose information is being displayed in the Info window. **Shortcut key:** CONTROL+F2.

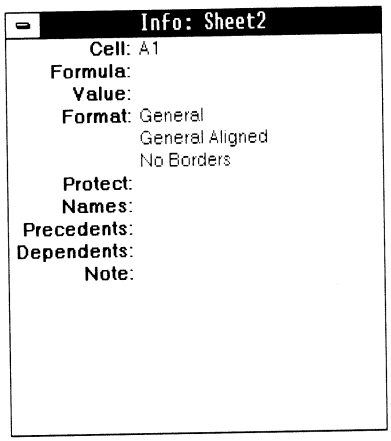
Window Show Document appears only when the Info window is the active window. Use the Window Show Info and Window Show Document commands to toggle between the Info window and the worksheet it shows information for.

Window Show Info command

(Full menus)



Shows the Info window, which displays information about the active worksheet or macro sheet. **Shortcut key:** CONTROL+F2.

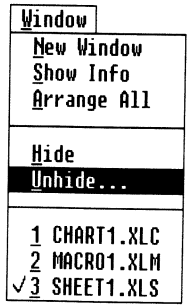


Window Show Info appears only when a worksheet or macro sheet is the active document. Use the Window Show Document command and Window Show Info to toggle between the Info window and the worksheet it shows information for.

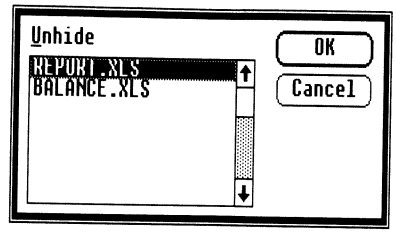
You can control what is displayed in the Info window with the commands on the Info menu. For more information, see **Info window**.

Window Unhide command

(Full menus)



Makes a hidden window visible.



Unhide

Lists all hidden windows. Select the window you want to unhide and choose the OK button. If the window is protected with the Options Protect Document command, Microsoft Excel asks for the password before unhiding the window.

When there are no open unhidden windows in the workspace, the command appears on the File menu as Unhide Window.

For more information on hiding a window, see **Window Hide command**.

Windows

A **window** is a rectangular area on your screen in which you use an application and view or work on a document. With windows you can organize documents and tasks on your screen like you do on a desk. For example, the Microsoft Excel window is a workspace in which you work with a separate window for each worksheet, chart, or macro sheet. If you're running Microsoft Excel under Microsoft Windows, version 2.0 or higher, you can open other applications in separate windows outside of the Microsoft Excel window. Using the keyboard or the mouse, you move, size, scroll through, switch between, or close windows — just as you might spread out or leaf through books and papers on your desk and put them aside when you're finished with them.

This topic explains:

- An overview of working with windows
  - Microsoft Excel main windows
  - Other application windows
- Window basics
  - The parts of a window
  - Controlling windows
- Window techniques
  - Selecting a window
  - Sizing a window
  - Moving a window
  - Enlarging a window to its maximum size
  - Shrinking a window to its minimum size
  - Restoring a window to its previous size
  - Scrolling a window
  - Displaying all open windows in the workspace
  - Closing a window

This topic does not discuss the basic procedures for displaying menus, choosing commands, or working in dialog boxes. For information on those procedures, see **Command, menu, and dialog box**.

Note | All worksheet window options also apply to macro sheets.

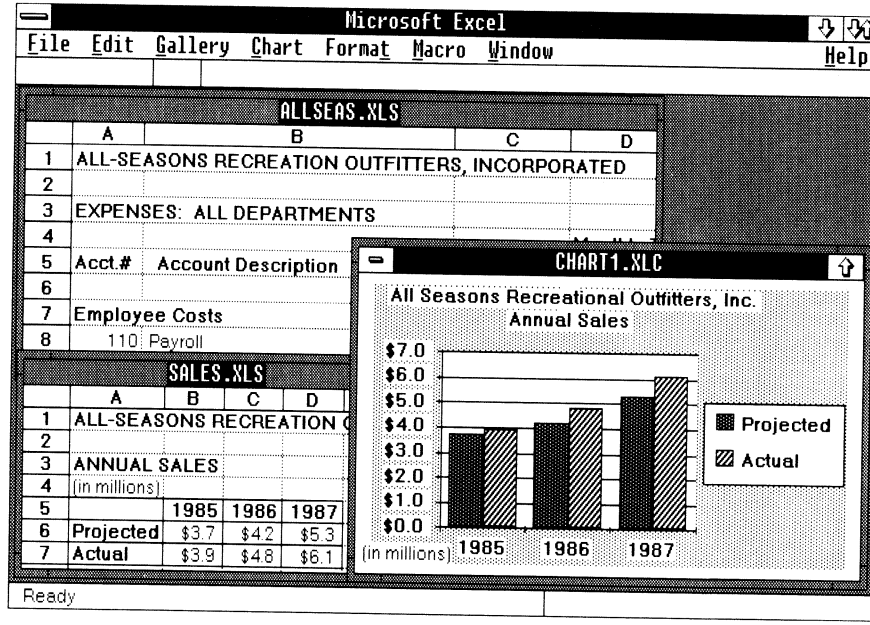
An Overview of Working with Windows

Working with windows lets you organize Microsoft Excel documents and tasks efficiently and provides powerful new ways to perform analysis. If you're running Microsoft Excel under Microsoft Windows, version 2.0 or higher, you can also open windows into other applications and have that data at hand as you work with Microsoft Excel.

Here are some effective ways to use windows with Microsoft Excel:

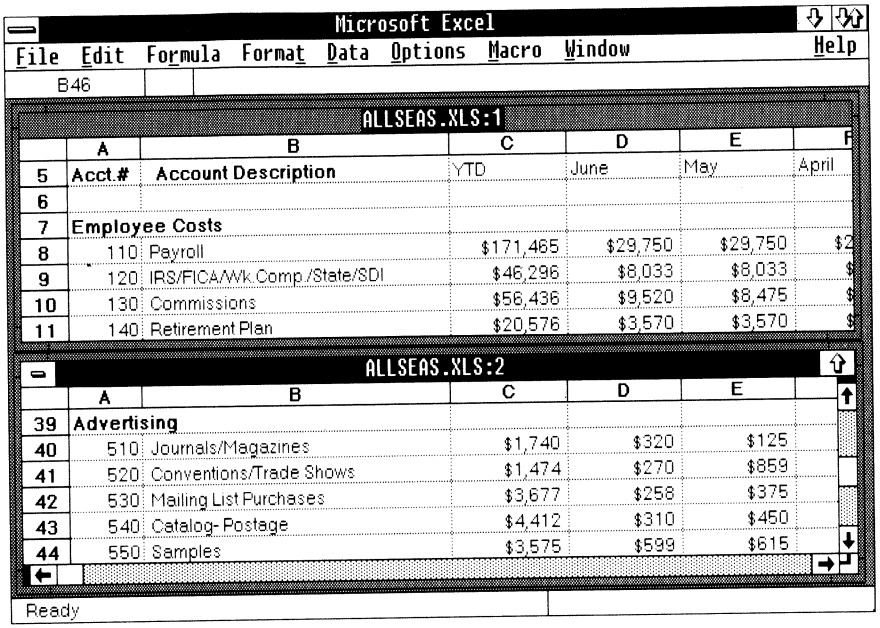
View and work on several documents, or different types of documents at the same time, easily switching between them.

You can open worksheets and charts in the Microsoft Excel workspace. This simplifies plotting worksheet data and lets you easily analyze and compare data between documents.



View and work with many parts of a large document at the same time.

By opening multiple windows into a large worksheet, you can easily work with widely scattered parts of the document. This simplifies data entry and lets you quickly compare several areas of data at once.



	A	B	C	D	E	F
5	Acct.#	Account Description	YTD	June	May	April
6						
7	Employee Costs					
8	110	Payroll	$171,465	$29,750	$29,750	$2
9	120	IRS/FICA/Wk.Comp./State/SDI	$46,296	$8,033	$8,033	$
10	130	Commissions	$56,436	$9,520	$8,475	$
11	140	Retirement Plan	$20,576	$3,570	$3,570	$

	A	B	C	D	E
39	Advertising				
40	510	Journals/Magazines	$1,740	$320	$125
41	520	Conventions/Trade Shows	$1,474	$270	$859
42	530	Mailing List Purchases	$3,677	$258	$375
43	540	Catalog-Postage	$4,412	$310	$450
44	550	Samples	$3,575	$599	$615

Microsoft Excel Main Windows

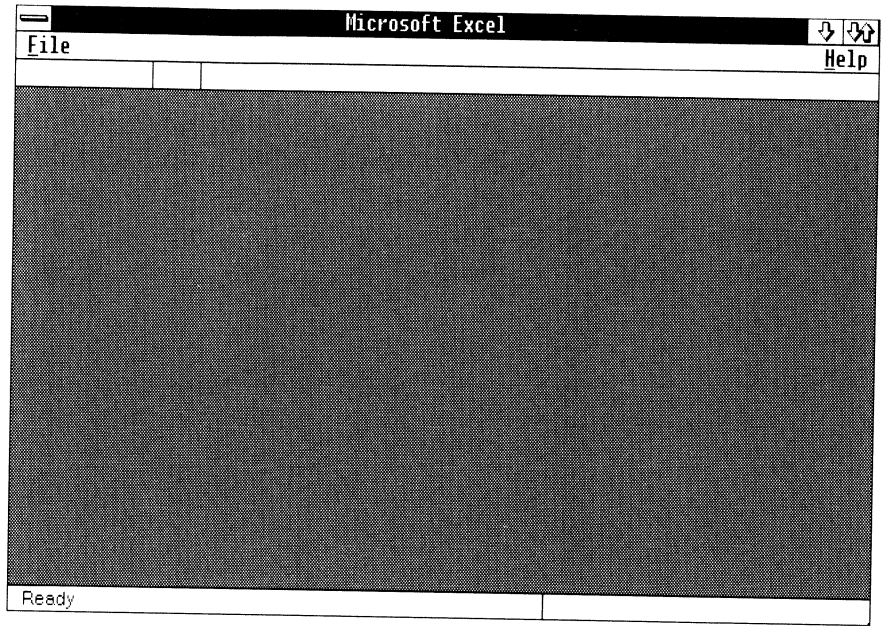
You work with two basic types of windows in Microsoft Excel:

- An **application window** displays the menus and provides the workspace for any documents used within the application.
- A **document window** displays the individual documents with which you work in an application window.

Following is an overview of Microsoft Excel main windows.

Microsoft Excel Window (Application)

The Microsoft Excel window provides the workspace for Microsoft Excel worksheets, charts, and macro sheets. The menu bar in the Microsoft Excel window displays a different set of menus, depending on which type of document window is currently active.



Worksheet Window (Document)

A worksheet window is a view into a worksheet. You can open multiple windows into a worksheet to work on different areas or display different views (formulas or values) of the worksheet at the same time. When a worksheet window is active, the Microsoft Excel application window displays worksheet menus. For information on worksheet basics, see **Worksheet**.

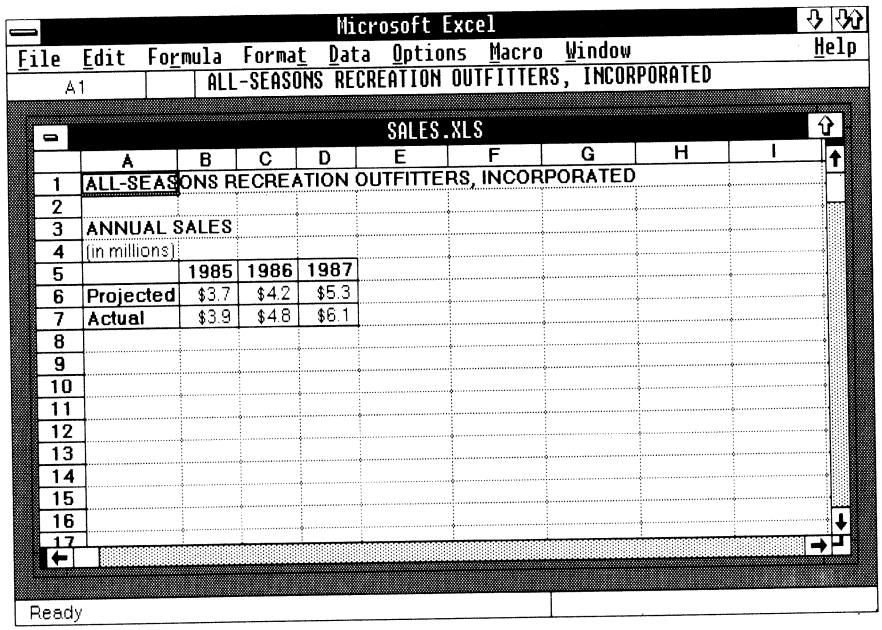
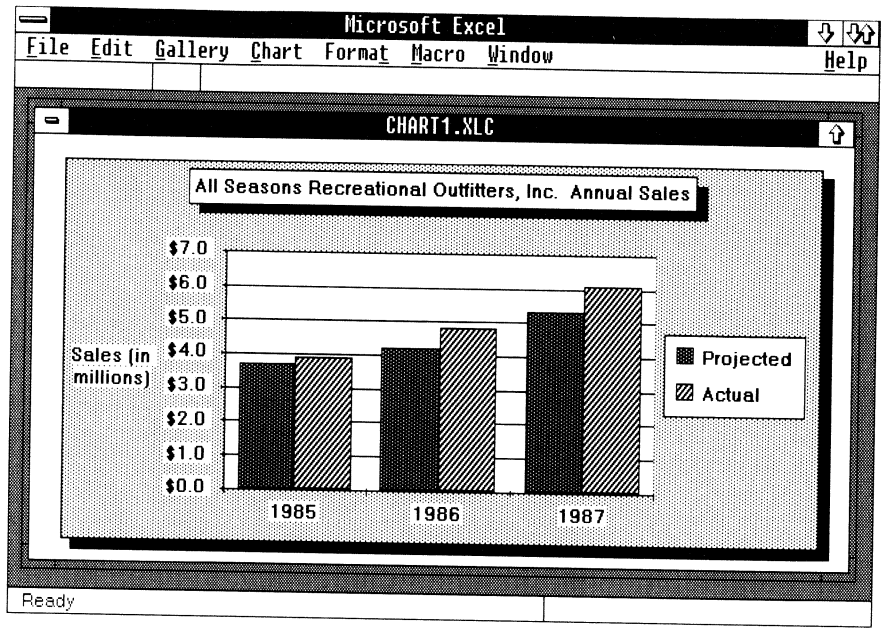


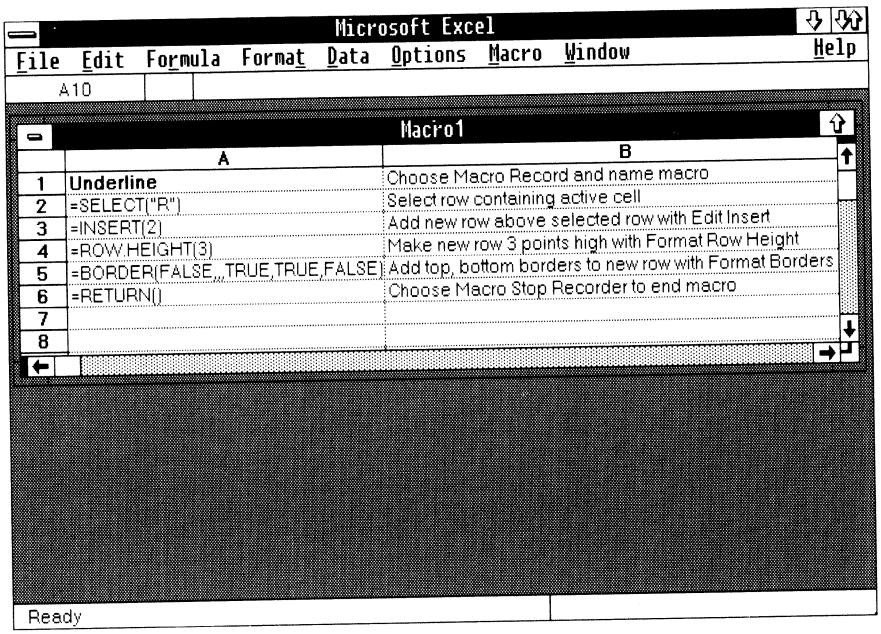
Chart Window (Document)

A chart window is a view into a chart. You can create 44 different types of predesigned charts or a variety of customized charts in a chart window. When a chart window is active, the Microsoft Excel application window displays chart menus. For information on chart basics, see **Chart**.



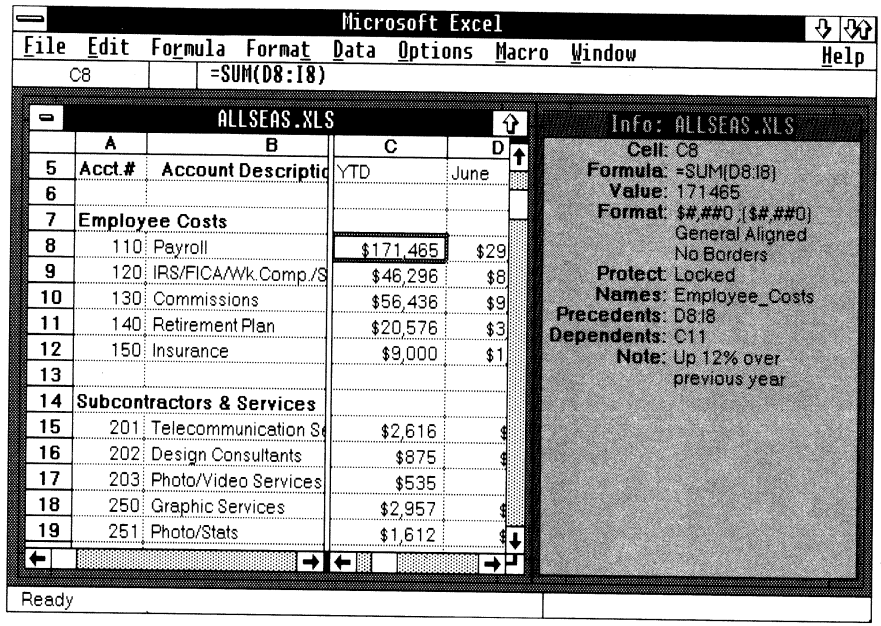
Macro Sheet Window (Document)

A macro sheet window is a view into a macro sheet, which you use to create and store macros. When a macro sheet is active, the Microsoft Excel application window displays the same menus as for a worksheet. For information on macro sheet basics, see Chapter 3, "Macro Basics," in *Microsoft Excel Functions and Macros,* a separate manual included in your Microsoft Excel package.



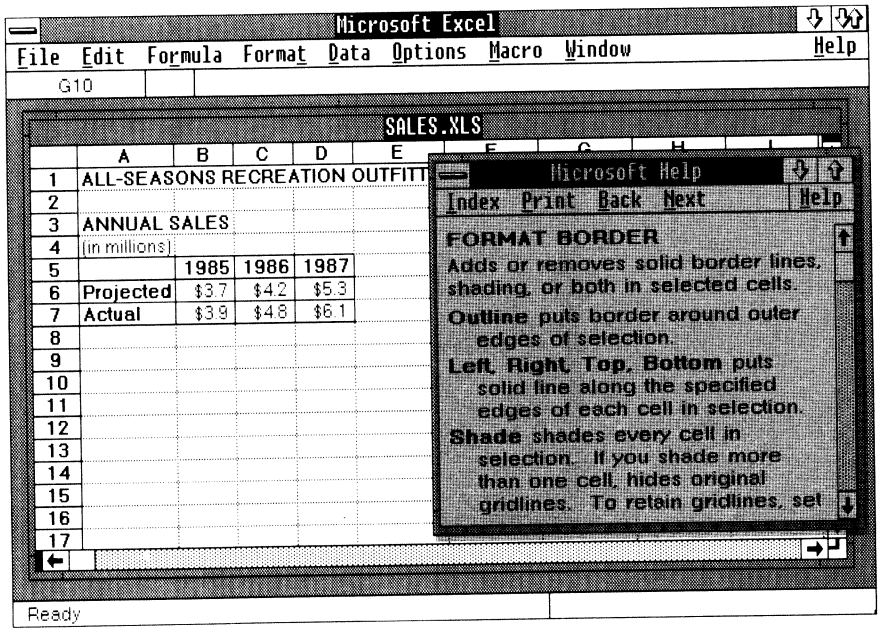
Info Window

The Info window is a view into a cell on a worksheet or macro sheet. You can use this window to examine information about the cell such as its underlying formula, formats assigned to it, references and names associated with it, or cell notes attached to it. When the Info window is active, the Microsoft Excel application window displays Info window menus. For more information, see **Info window**.



Help Window (Application)

The Help window is a view into Microsoft Help, an application that provides quick information on commands, dialog boxes, messages, concepts, basic tasks, worksheet functions, and Microsoft Excel equivalents for Lotus 1-2-3 and Multiplan commands. Microsoft Help is a separate application that you can also run stand-alone if you're running Microsoft Excel under Microsoft Windows, version 2.0 or higher. The Microsoft Help application window has its own set of commands across the top of the Help window. For information on using Microsoft Help, see **Help**.

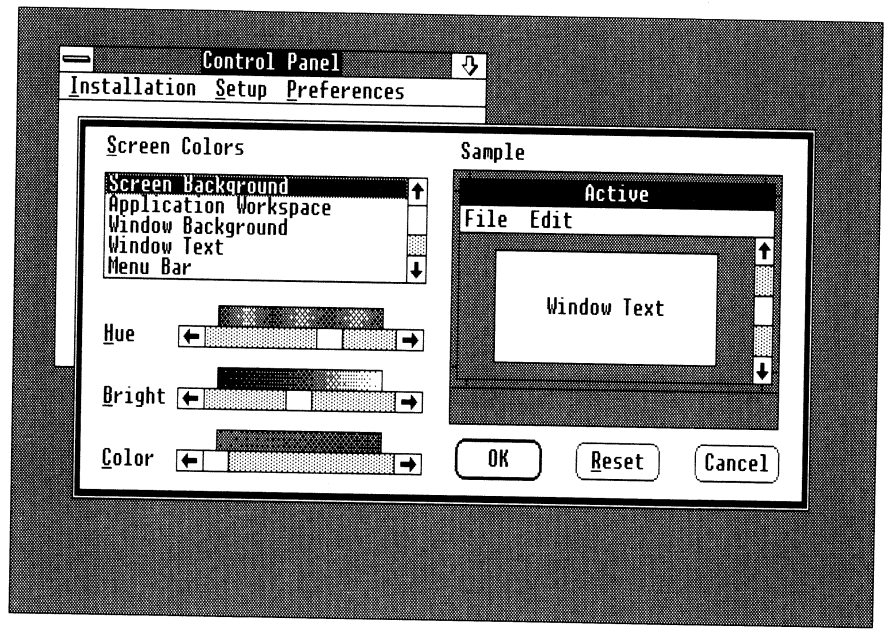


Other Application Windows

Also included with Microsoft Excel are a number of smaller applications called utility programs. Each of these appears in a separate application window with its own menus.

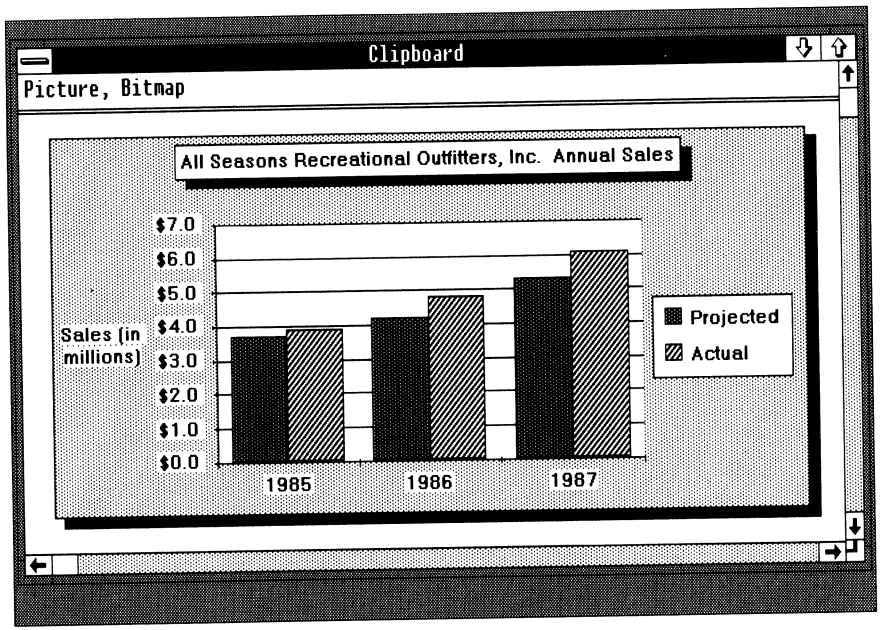
Control Panel Window

Control Panel is a utility program that you use to adjust system settings such as screen colors in windows, date and time, printer assignments, mouse settings, and communications port designations. You start Control Panel with the Control Run command on the Microsoft Excel application window Control menu. For more information, see "Control Panel" in the Appendix.



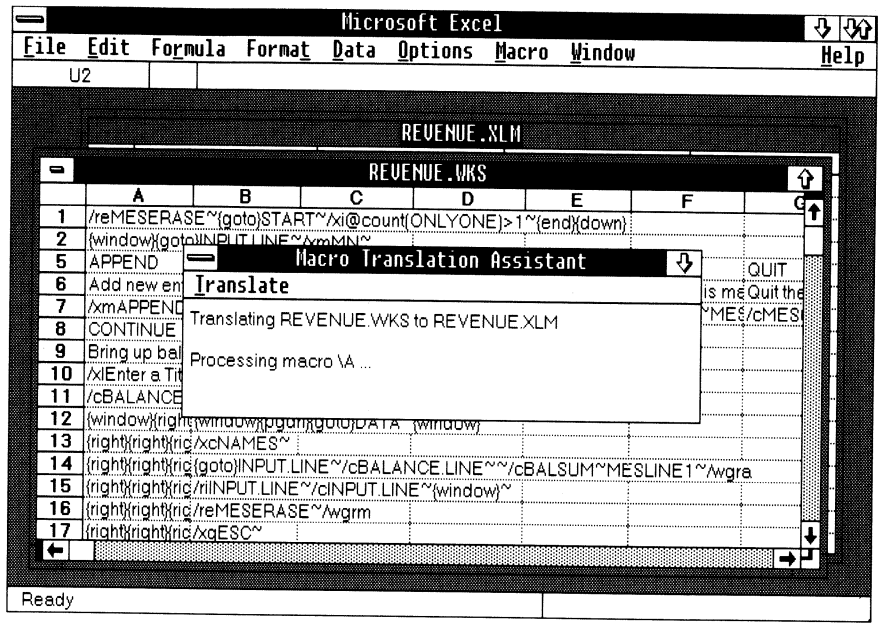
Clipboard Window

The Clipboard window is a view into the Windows Clipboard. The Clipboard acts as a storage area for holding text or data that you are copying or moving between applications if you are running Microsoft Excel under Microsoft Windows, version 2.0 or higher. You can view the contents of the Clipboard by choosing the Control Run command on the Microsoft Excel application window Control menu. For more information, see "Clipboard" in the Appendix.



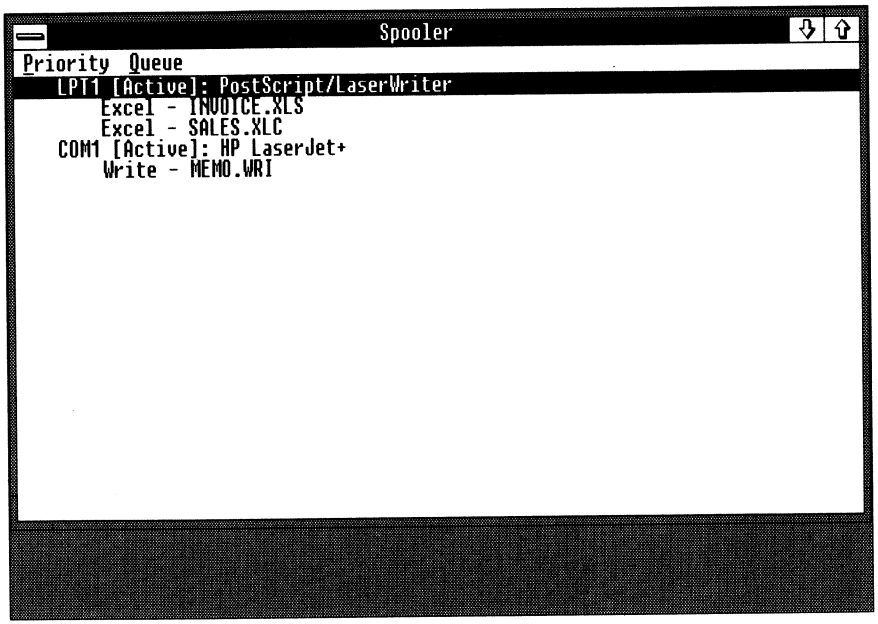
Macro Translation Assistant Window

The Macro Translation Assistant is a utility program that helps you convert most Lotus 1-2-3 macros into Microsoft Excel macros. You start the Macro Translation Assistant by choosing the Control Run command on the Microsoft Excel application window Control menu. For more information, see **Lotus 123**.



Spooler Window

The Spooler is a utility program that lets you print documents while you are doing other tasks. It can store several documents in a print queue. The Spooler is started automatically when you print a document. For more information on the Spooler, see **Printing a document**.

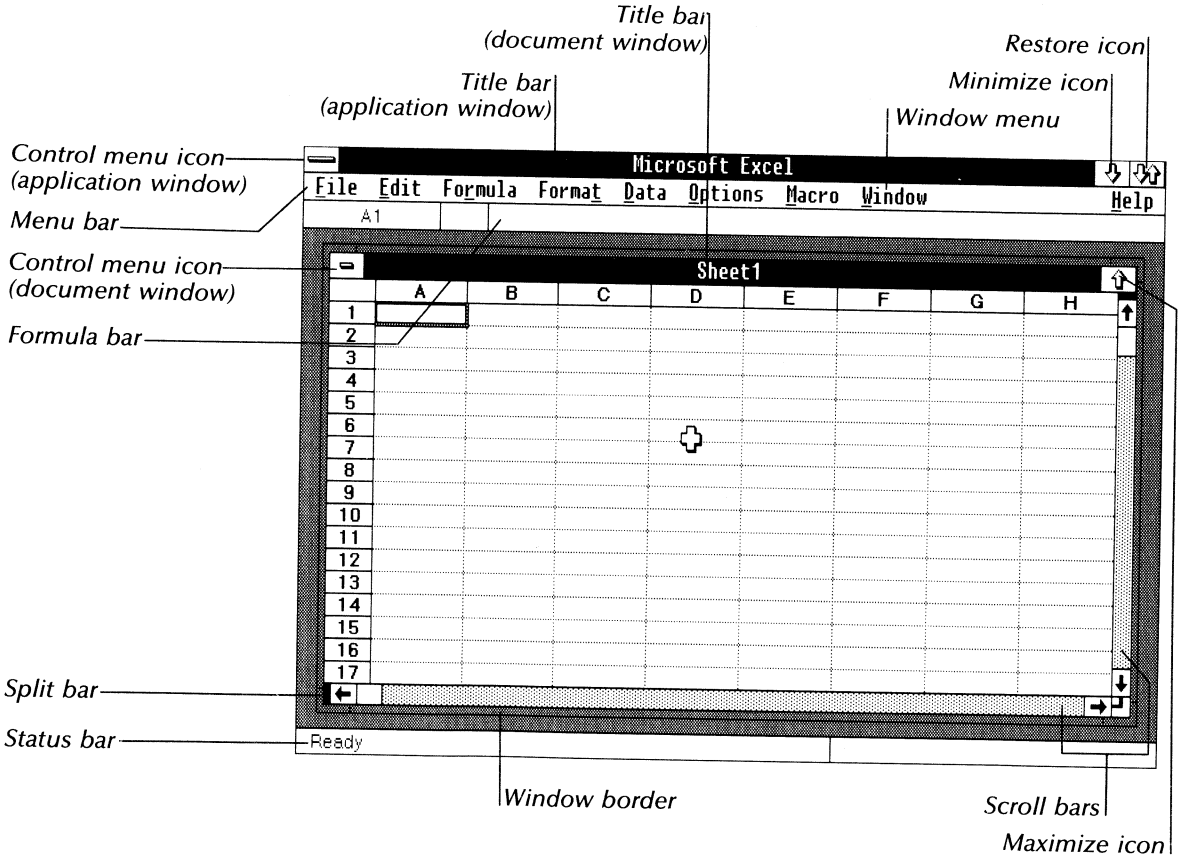


Window Basics

This section gives an overview of the parts of a window and the commands you use to control windows.

The Parts of a Window

The following illustration highlights the features built into application and document windows that allow you to easily control windows on your screen. The illustration shows a worksheet window displayed in the main workspace of the Microsoft Excel application window. This is how your screen looks when you start Microsoft Excel the first time:



Control menu icon — a symbol that displays the Control menu, which contains commands for manipulating an application or document window. A few commands vary between Control menus on application windows and those on document windows, but every Control menu includes commands for sizing, moving, maximizing, and restoring a window.

Note

Only a Control menu on an application window has the Control Minimize command, which you can use to shrink the window to an icon. The Microsoft Excel application window Control menu also includes the Control Run command, used to start the Control Panel, Clipboard, or Macro Translation Assistant utility programs. A Microsoft Excel worksheet window includes the Control Split command, which you can use to split the window into panes and view different parts of the worksheet.

Menu bar — a bar in an application window that displays the names of the drop-down menus for the application. The menu bar displays a different set of menus, depending on the type of document window that is active.

Window menu — a menu with additional commands for controlling document windows (selecting, hiding, and arranging windows; opening multiple windows into a large document) and displaying the Info window.

Maximize icon — a symbol used for enlarging a window to fill the available workspace; this icon appears only on windows that can be maximized.

Minimize icon — a symbol used for shrinking an application window to its smallest form, called an application icon. This icon appears only on windows that can be minimized.

Restore icon — a symbol used to return a window to its previous size and state before you last shrank or enlarged it.

Scroll bars — bars used to move through and view a document too long or wide to be displayed entirely in the document window.

Split bar — a bar used to divide a worksheet window into panes; the small black rectangle at the top of the vertical scroll bar splits a window horizontally; the one at the left of the horizontal scroll bar splits the window vertically.

Status bar — a bar across the bottom of the workspace that displays brief information about the currently selected command and the current state of the Microsoft Excel workspace.

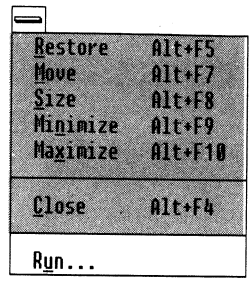
Title bar — the bar across the top of the window that contains the name of the application or of the document displayed in the window.

Window border — a frame that surrounds any window that can be sized.

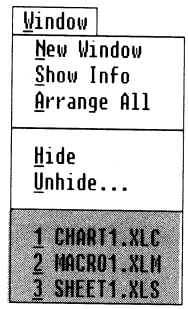
Workspace — the main work area within an application window that displays the application itself and any separate document windows that may be used in the application.

Controlling Windows

You can use a variety of techniques to control windows with the keyboard or mouse. Using either method, you can always control windows with commands on the following menus:



- Use these Control menu commands to manipulate application and document windows. The Control menu icon on each type of window shows the key you use to display the menu (after you press ALT): on an application window the icon shows a spacebar, and on a document window, a hyphen. Use the function key shortcut listed to the right of each command if you want to bypass the drop-down menu.



- Use the "Window Activate Window commands" to quickly activate the document window you want. These commands change to reflect the names of the documents you have open.

For information on each command and on the other commands on each menu, see the topic of the same name. For information on additional keyboard shortcuts, see **Keyboard**. For information on using the mouse with Microsoft Excel, see **Mouse**.

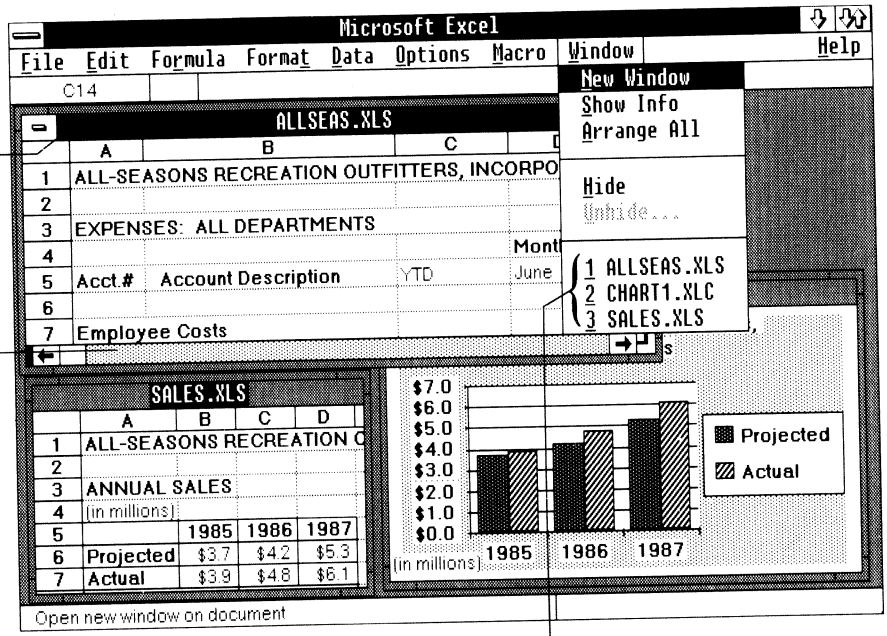
Window Techniques

Each of the following sections explains the basic keyboard and mouse procedure for an individual window technique. If you have a mouse, you may find mixing mouse and keyboard techniques to be the easiest way to perform certain tasks.

Note | You should be familiar with how to choose commands with either the keyboard or the mouse before you read these sections. For information on choosing a command, see **Command, menu, and dialog box**.

Selecting a Window

If you have opened several windows on the screen, you need to select the one you want to work in. Selecting a window makes it the active window. The title bar of the active window is highlighted and looks darker or more intense than title bars on inactive windows, as shown in the following illustration.



The title bar of the active window is darker.

If windows are overlapped, the active window is in front.

The Window menu lists document windows currently open. You can use this menu to select a window that is behind other windows.

The appearance of the title bar may vary depending on screen colors you've specified with Control Panel.



To select a document window with the keyboard:

1. Display the Window menu.

   The bottom section of the menu lists all document windows currently open. Each window name is preceded by an underlined number.

2. Press the key for the underlined number of the document you want.

If you have more than nine open windows, you may need to use the Window More Windows command to select the window you want. For more information, see **Window More Windows command**.



To select a visible document window with the mouse:

- Click anywhere in the window.

To select a document window with the mouse if the window is stacked under other windows on the screen:

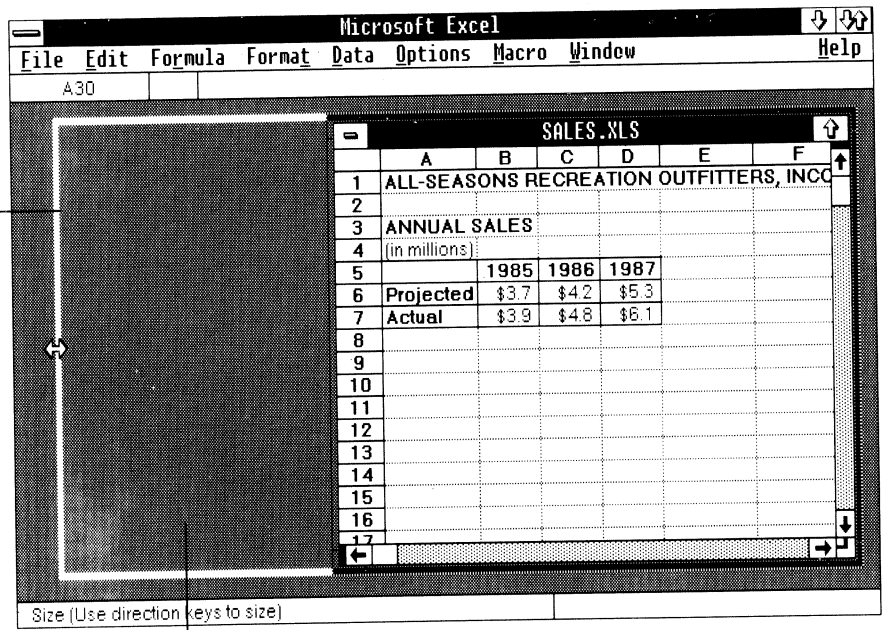
1. Click the Window menu.
2. In the list at the bottom of the menu, click the document you want.

If you have more than nine open windows, you may need to use the Window More Windows command to select the window you want. For more information, see **Window More Windows command**.

Note If you have opened more than one application window or have application icons in the workspace, press ALT+ESCAPE to move among them. If you are using the mouse, click anywhere in the window you want to select. If the window is beneath other windows, press ALT+ESCAPE until the window you want is displayed.

Sizing a Window

You can make windows larger or smaller to arrange documents in the workspace. Once you start the sizing procedure with either the keyboard or mouse, Microsoft Excel displays a "shadow" border outlining the active window. You use this shadow border to size the window the way you want, as shown in the following illustration:



When sizing a window, use the "shadow border" as a guide for the new size of the window.

The resized window will expand to fill this area of the screen.

To size a window with the keyboard:

1. Select the window you want to size.
2. Choose Control Size (ALT, HYPHEN, S for a document window; ALT, SPACEBAR, S for an application window).

   A shadow border outlines the window, and a four-headed arrow appears in the middle of the window.
3. To size the window horizontally, press the LEFT or RIGHT key to move the arrow to the left or right border. To size the window vertically, press the UP or DOWN key to move the arrow to the top or bottom border.

   The arrow changes to a two-headed arrow. The shadow border indicates the new size as you press the DIRECTION keys.
4. Using the DIRECTION keys, adjust the shadow border to the size you want.
5. Press ENTER to redraw the window to the new size.

To size a window with the mouse:

1. Point to the window border you want to size.

   The mouse pointer changes to a horizontal two-headed arrow along the right or left border for horizontal sizing, a vertical two-headed arrow along the top or bottom border for vertical sizing, and a diagonal two-headed arrow at each corner for both horizontal and vertical sizing.

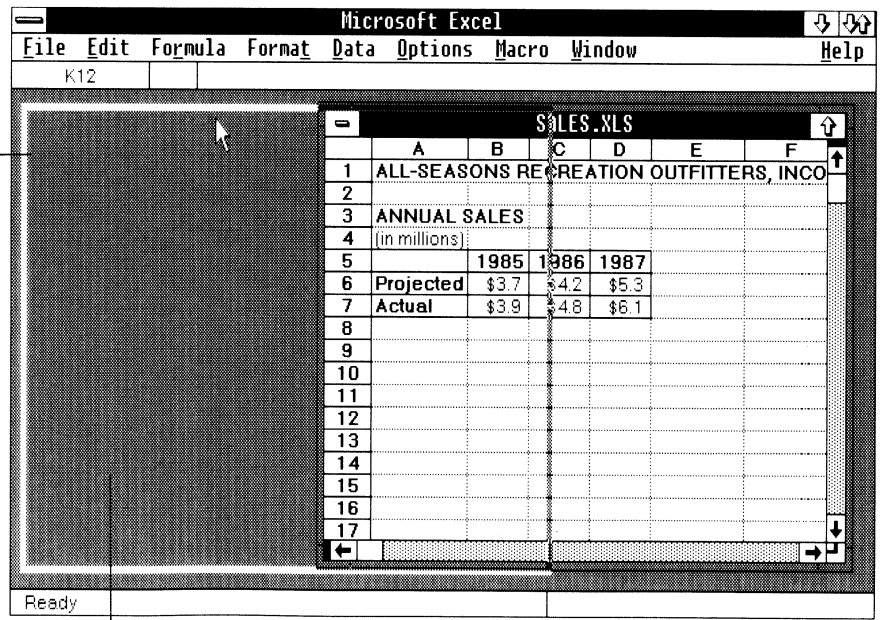
2. Drag the border until it's the size you want.

   As you drag, a shadow border indicates the adjusted size of the window.

3. Release the mouse button to redraw the window to the new size.

Moving a Window

You can arrange your documents the way you want them by moving document windows around in the workspace. Once you start the move procedure with either the keyboard or mouse, Microsoft Excel displays a "shadow" border outlining the active window. You use this shadow border to position the window the way you want, as shown in the following illustration:



When moving a window, use the "shadow border" as a guide for positioning a window.

The window will be moved to the area outlined by the shadow border.



To move a window with the keyboard:

1. Select the window you want to move.
2. Choose Control Move (ALT, HYPHEN, M for a document window; ALT, SPACEBAR, M for an application window).

   A shadow border outlines the window.
3. Press the DIRECTION keys to move the shadow border where you want the window repositioned.
4. Press ENTER to redraw the window in the new position.



To move a window with the mouse:

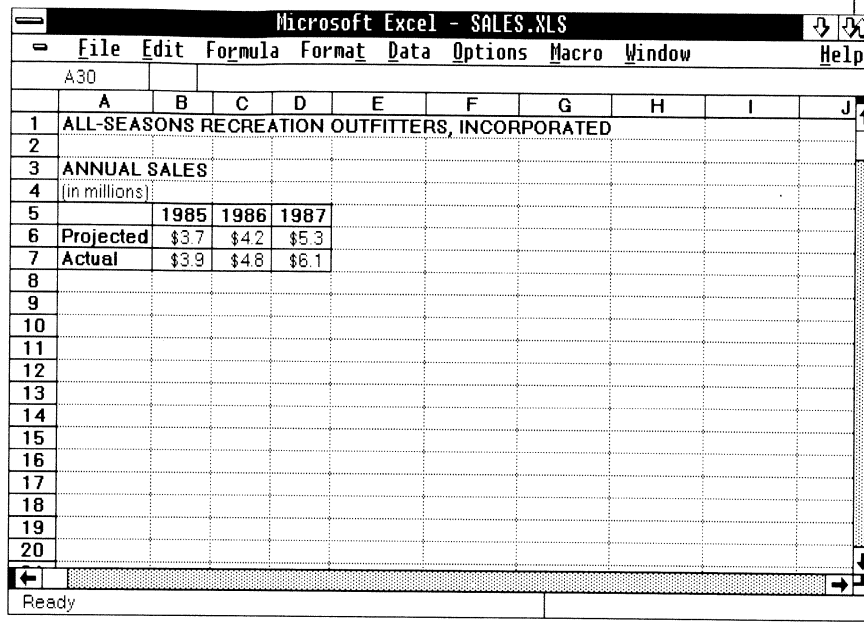
1. Point to the title bar of the window you want to move.
2. Drag the title bar to move the window.

   As you drag, a shadow border indicates the adjusted position of the window.
3. Release the mouse button to redraw the window in the new position.

Enlarging a Window to Its Maximum Size

When you enlarge a document window to maximum size, it takes up the full workspace area and includes the title bar but no borders. For example, a worksheet window looks like this when it is enlarged:

When you enlarge a window, the Maximize icon (⇧) changes to the Restore icon.



You can enlarge an application window only if it is not full-screen already or if you have reduced it to an application icon. For more information, see "Shrinking a Window to Its Minimum Size," the next section. When you enlarge it, the window takes up the full screen.



To enlarge a window with the keyboard:

1. Select the window you want to enlarge.
2. Choose Control Maximize (ALT, HYPHEN, X for a document window; ALT, SPACEBAR, X for an application window).



To enlarge a window with the mouse:

- Click the Maximize icon in the title bar of the window you want to enlarge.

Shrinking a Window to Its Minimum Size

You can shrink an application window into a small icon. This allows you to keep the application easily available for later use: the application remains in memory, but does not take up room on your desktop. If you're running a process such as calculating a large worksheet or printing several documents, you can put the application aside and return to it later.

While you cannot shrink document windows to icons, any documents open when you shrink the application window are reduced with it. The label under the application icon indicates what document window, if any, was last active.



To shrink an application window with the keyboard:

1. Select the window you want to shrink.
2. Choose Control Minimize (ALT, SPACEBAR, N).



To shrink a window with the mouse:

- Click the Minimize icon in the title bar.

Restoring a Window to Its Previous Size

Restoring a window returns it to its previous size and state before the last maximize or minimize operation. If you restore an application window after shrinking it, Microsoft Excel also restores any other windows, such as document windows, that were last open.



To restore a window with the keyboard:

1. Select the window or icon you want to restore.
2. Choose Control Restore (ALT, HYPHEN, R for a document window; ALT, SPACEBAR, R for an application window).

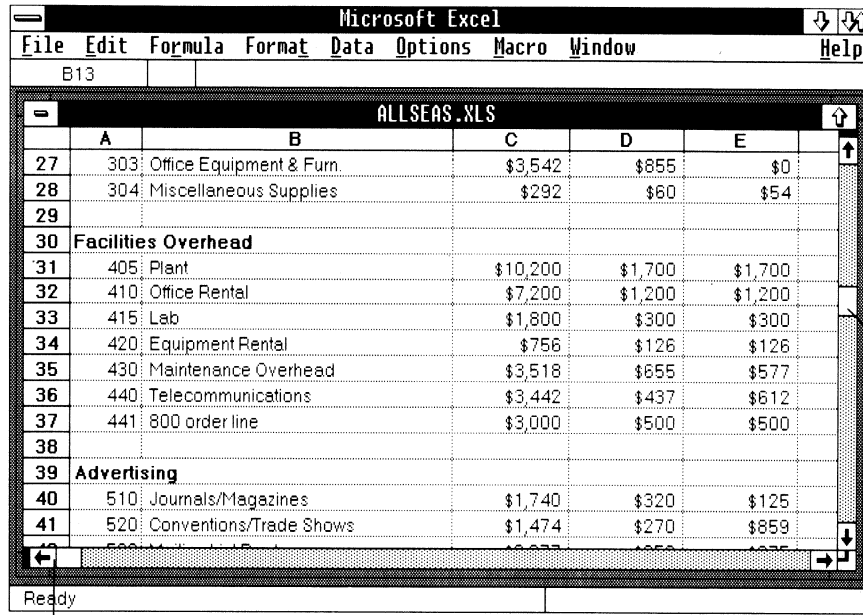


To restore a window with the mouse:

- Click the Restore icon of the window you want to restore. If you are restoring an application window that has been reduced to an icon, double-click the icon.

Scrolling a Window

The worksheet, macro sheet, and Help windows have scroll bars, which allow you to move through and view all parts of a document or Help topic that is too long to display in a window at one time. The entire horizontal or vertical length of a scroll bar represents the entire vertical or horizontal data area of the document or Help topic. The position of the white scroll box in the scroll bar indicates the part of the data area that is currently displayed in the window, as shown in the following example.



	A	B	C	D	E
27	303	Office Equipment & Furn.	$3,542	$855	$0
28	304	Miscellaneous Supplies	$292	$60	$54
29					
30	**Facilities Overhead**				
31	405	Plant	$10,200	$1,700	$1,700
32	410	Office Rental	$7,200	$1,200	$1,200
33	415	Lab	$1,800	$300	$300
34	420	Equipment Rental	$756	$126	$126
35	430	Maintenance Overhead	$3,518	$655	$577
36	440	Telecommunications	$3,442	$437	$612
37	441	800 order line	$3,000	$500	$500
38					
39	**Advertising**				
40	510	Journals/Magazines	$1,740	$320	$125
41	520	Conventions/Trade Shows	$1,474	$270	$859

The white scroll box in a scroll bar indicates approximately what part of the data area (horizontal or vertical) is currently displayed in the window.

The data area of this document is about 60 rows deep. When the window is scrolled to row 27, about halfway through the vertical data area, the scroll box moves almost halfway down the vertical scroll bar.



To scroll a window with the keyboard:

To	Turn on SCROLL LOCK and press
Scroll one row up or down or one column left or right	DIRECTION key
Scroll up one window	PAGE UP
Scroll left one window	CONTROL + PAGE UP
Scroll down one window	PAGE DOWN
Scroll right one window	CONTROL + PAGE DOWN
Make cell active at upper-left corner of window	HOME
Make cell active at end of window	END
Move to start of data	CONTROL + HOME
Move to end of data	CONTROL + END



To scroll a window with the mouse:

To	Do this
Scroll one row or column at a time	Click the scroll arrow at either end of the vertical or horizontal scroll bar.
Scroll one window vertically or horizontally	Click in the area on either side of the scroll box in the vertical or horizontal scroll bar.
Scroll to a general location	Drag the scroll box to a position in the scroll bar corresponding to the general location you want (beginning, middle, or end of the document).

For more information on moving around on a worksheet, see **Keyboard** or **Mouse**.

Displaying All Open Windows in the Workspace

To display all open windows in the workspace, you can use the techniques for moving and sizing windows discussed earlier in this topic to arrange the windows the way you want them. You can also use a technique called **automatic tiling** to display all open windows. With automatic tiling, Microsoft Excel arranges all open windows so that the window borders interlock in the workspace with no overlap or blank space between them.

To tile all open windows in the workspace:

▣ Choose Window Arrange All.

Closing a Window

You can close a document window at any time to clear your workspace. Closing an application window is the same as quitting the application. For example, you close the Microsoft Excel application window when you are ready to end a session with Microsoft Excel and want to remove it from memory. To run Microsoft Excel again, you must restart it.

Note | Any time you close a document before saving changes, Microsoft Excel displays a message asking if you want to save changes. Choose the Yes button to save changes, the No button to cancel changes to the document, or the Cancel button to cancel the command.

To close a document window	To close an application window
1 Select the document window you want to close.	1 Select the application window you want to close.
2 Choose Control Close (ALT, HYPHEN, C).	2 Choose Control Close (ALT, SPACEBAR, C).

Tip | If you're using a mouse, you can also close a document window by double-clicking the document window Control menu icon.

For more information on closing documents, see **Saving and closing a document**.

Related Information

Reference

For information on	See
Worksheet basics	Worksheet
Chart basics	Chart
Opening multiple windows into a document or splitting a window into panes	Display options

You can find information about Microsoft Excel basics in the other core topics: **Chart**; **Command, menu, and dialog box**; **Database**; **Help**; and **Worksheet**.

Sampler

Calculating a Sales Commission

Feature Guide

Multiple Windows

Worksheet

A **worksheet** (also called a spreadsheet) is the primary document you use in Microsoft Excel to store and manipulate data. Each Microsoft Excel worksheet is a rectangular grid of 256 columns and 16,384 rows. The intersection of each column and row is a **cell**, the basic unit of a worksheet in which you store data.

This topic explains:

- Worksheet basics
  - The worksheet window
  - Creating a new worksheet
  - Entering data in a cell
  - Entering data in a range
  - Types of data
  - Guidelines for entering data
  - Modes in Microsoft Excel
  - Moving and selecting with the keyboard
  - Moving and selecting with the mouse
  - Getting help
- Editing a worksheet
  - Guide to worksheet editing topics
- Formatting a worksheet
  - Guide to worksheet formatting topics
- Saving and printing a worksheet
  - Saving a new worksheet
  - Printing a worksheet

This topic does not discuss basic procedures for displaying menus, choosing commands, or working in dialog boxes. For information on those procedures, see **Command, menu, and dialog box**.

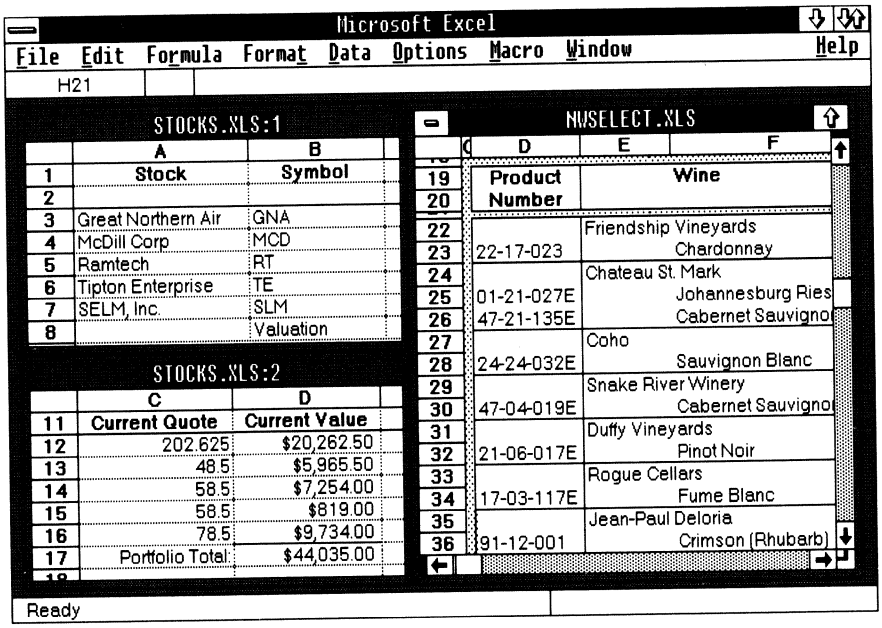
Note Most worksheet procedures and options also apply to macro sheets. A macro sheet is a special kind of worksheet that you use to create and store macros. For more information on macro sheets, see **Macro** and **Macro sheet** in this manual, and *Microsoft Excel Functions and Macros,* a separate manual included in your Microsoft Excel package.

Worksheet Basics

A Microsoft Excel worksheet provides the automated spreadsheet tools you need for projections, calculations, data analysis, decision-making, and reporting.

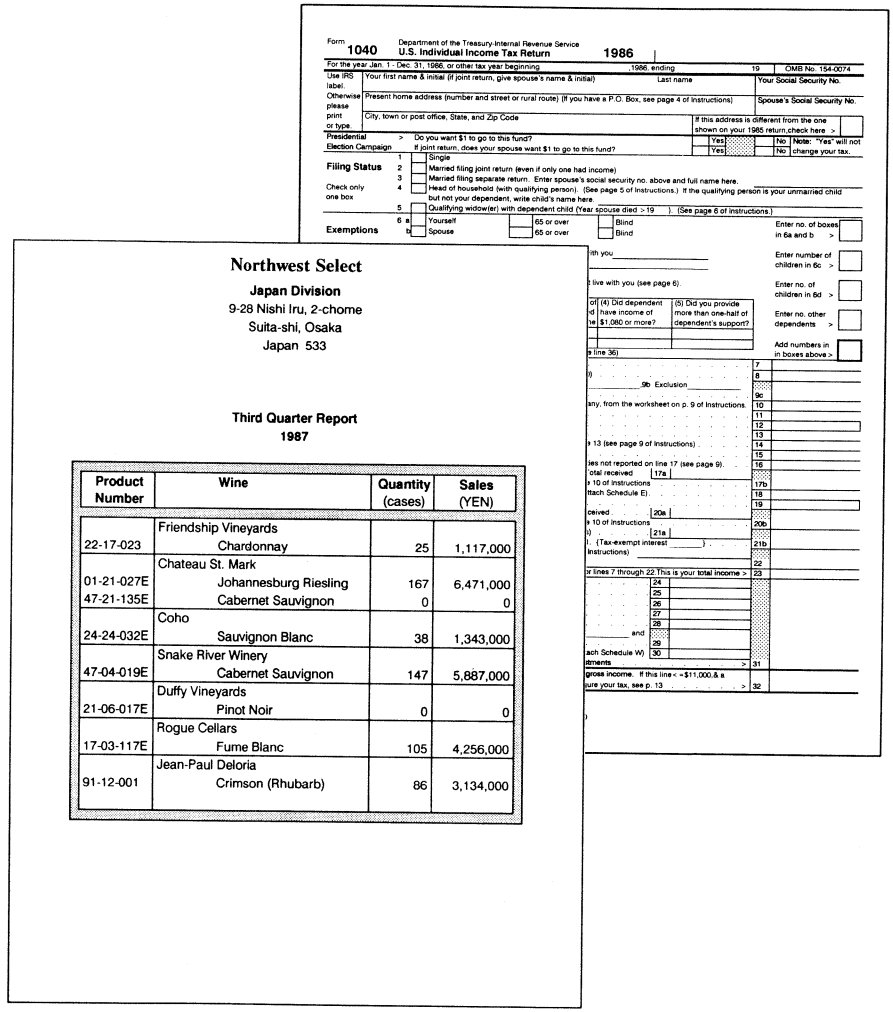
In Microsoft Excel you can work efficiently with several worksheets, charts, and macro sheets on your screen at one time, or create multiple views of a large worksheet.

Each Microsoft Excel worksheet is in a separate window. As shown here, you can open more than one worksheet and also open multiple views into a worksheet.



You can use Microsoft Excel worksheets to produce high-quality print-outs for a variety of purposes. For example, you can use worksheets for reports or for data entry forms.

These print-outs were created with Microsoft Excel and a laser printer.



Form 1040 Department of the Treasury-Internal Revenue Service
U.S. Individual Income Tax Return 1986

For the year Jan. 1 - Dec. 31, 1986, or other tax year beginning , 1986, ending 19 OMB No. 154-0074

Use IRS label. Otherwise please print or type.
Your first name & initial (if joint return, give spouse's name & initial) Last name Your Social Security No.
Present home address (number and street or rural route) (If you have a P.O. Box, see page 4 of instructions) Spouse's Social Security No.
City, town or post office, State, and Zip Code If this address is different from the one shown on your 1985 return, check here >

Presidential Election Campaign > Do you want $1 to go to this fund? Yes No Note: "Yes" will not change your tax.
If joint return, does your spouse want $1 to go to this fund? Yes No

Filing Status
1 Single
2 Married filing joint return (even if only one had income)
3 Married filing separate return. Enter spouse's social security no. above and full name here.
4 Head of household (with qualifying person). (See page 5 of Instructions.) If the qualifying person is your unmarried child but not your dependent, write child's name here.
5 Qualifying widow(er) with dependent child (Year spouse died > 19). (See page 6 of instructions.)

Check only one box

Exemptions
6 a Yourself 65 or over Blind
b Spouse 65 or over Blind
Enter no. of boxes in 6a and b >
Enter number of children in 6c >
Enter no. of children in 6d >
Enter no. other dependents >
Add numbers in in boxes above >

ith you
ive with you (see page 6).
of (4) Did dependent have income of e $1,080 or more? (5) Did you provide more than one-half of dependent's support?
s line 36)
7
8
9b Exclusion 9c
any, from the worksheet on p. 9 of Instructions. 10
11
12
13 (see page 9 of Instructions) 13
14
les not reported on line 17 (see page 9). 15
otal received 17a 16
10 of instructions 17b
ttach Schedule E). 18
19
ceived 20a 20b
10 of instructions
21a 21b
(Tax-exempt interest) .
Instructions)
r lines 7 through 22. This is your total income > 23
24
25
26
27
28
and 29
ach Schedule W) 30
djments > 31
gross income. If this line < =$11,000 & a
ure your tax, see p. 13 > 32

Northwest Select

Japan Division
9-28 Nishi Iru, 2-chome
Suita-shi, Osaka
Japan 533

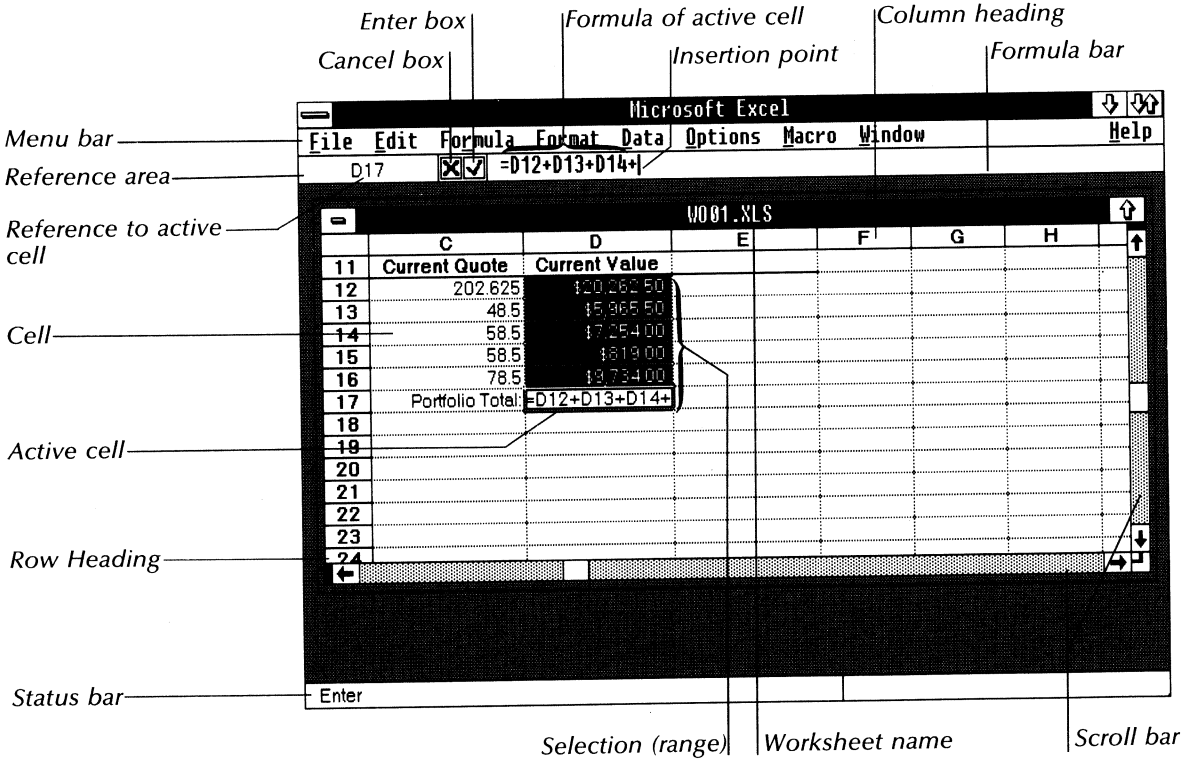
Third Quarter Report
1987

Product Number	Wine	Quantity (cases)	Sales (YEN)
22-17-023	Friendship Vineyards Chardonnay	25	1,117,000
01-21-027E	Chateau St. Mark Johannesburg Riesling	167	6,471,000
47-21-135E	Cabernet Sauvignon	0	0
24-24-032E	Coho Sauvignon Blanc	38	1,343,000
47-04-019E	Snake River Winery Cabernet Sauvignon	147	5,887,000
21-06-017E	Duffy Vineyards Pinot Noir	0	0
17-03-117E	Rogue Cellars Fume Blanc	105	4,256,000
91-12-001	Jean-Paul Deloria Crimson (Rhubarb)	86	3,134,000

The Worksheet Window

You display a worksheet in a worksheet window. Each worksheet window contains a separate document in the workspace, the main work area within the Microsoft Excel application window. You can move and size a worksheet window as you would any other window. This allows you to view one or more worksheet windows in the workspace at the same time. You can also open chart and macro sheet windows or work with the Help window open as you build or edit a worksheet.

The following illustration shows the main parts of a worksheet window and highlights essential terms used throughout this manual:



Menu bar — the bar at the top of the Microsoft Excel window that displays the names of the drop-down menus for worksheets when a worksheet window is active.

Column heading — a heading that identifies a column on a worksheet. Column headings are at the top of each column. In A1 reference style (the default), column headings are labeled A through IV (A, B, . . .Z; AA, AB, . . .AZ; . . .IV). In R1C1 reference style, column headings are labeled 1 through 256.

Row heading — a heading that identifies a row on a worksheet. Row headings are at the left of each row and are labeled 1 through 16384 (both A1 and R1C1 reference style).

Cell — the basic unit of a worksheet in which you can enter and store data. The intersection of every row and every column on a worksheet forms one cell. You can enter a **constant value** or a **formula** in a cell. A constant value can be a number (including a date or time), text, a logical value, or an error value. A formula calculates a new value from existing values.

Active cell — the cell displayed with a heavy, dotted border, which indicates that the cell is **selected** and that the next data you type will be entered into this cell. If you select more than one cell, the first cell selected is displayed as the active cell; the other cells are displayed in reverse-black (as in the preceding illustration).

Reference — the row/column location of a cell in a worksheet. For example, in A1 reference style, the reference D17 designates the cell in column D, row 17. In R1C1 reference style, the same cell would be designated R17C4, the cell in row 17, column 4.

Formula bar — the part of the Microsoft Excel window that you use to enter or edit data in a worksheet cell. The formula bar displays the constant value or formula contained in the active cell. The **reference area** displays a reference to the active cell. The **insertion point**, the blinking vertical line in the formula bar, indicates where text will be inserted when you begin typing. You complete a cell entry or an edit you've made to an entry by pressing ENTER or clicking on the **enter box** with the mouse. You cancel an entry or edit by pressing ESCAPE or clicking on the **cancel box** with the mouse.

Selection — the highlighted cell, range, or characters (in the formula bar) that will be affected by the next command or action. Before entering data and for most commands and operations, you first select (designate by highlighting) the cells you want to work with. A selection can be a single cell, a **range** (rectangular section of a worksheet containing two or more cells, as in the preceding illustration), or a **multiple selection** (any combination of single cells or ranges of cells). A worksheet selection is usually highlighted — the active cell with a heavy dotted border, any other selected cells with reverse-black; characters selected in the formula bar also appear in reverse-black.

Scroll bar — a bar used to move through and view a worksheet too large to be displayed in the worksheet window at one time.

Split bar — a bar used to divide a worksheet window into panes; the small black rectangle at the top of the vertical scroll bar splits a window horizontally; the one at the left of the horizontal scroll bar splits the window vertically.

Status bar — a bar across the bottom of the worksheet window that displays brief information about the currently selected command and the current state of the Microsoft Excel workspace.

Worksheet name — the name of the document that appears in the title bar of the window. Microsoft Excel automatically names each sheet you open Sheet1, Sheet2, and so on. You rename each sheet with a document name of your choice when you save it.

A worksheet window also contains other standard windows features such as a Control menu with commands for moving and sizing the window. For more information on the parts of a window, including the Control menu, and basic windows techniques, see **Windows**.

Note | In Microsoft Excel, the mouse pointer takes on a different shape, depending on its position on the screen. For more information on the mouse pointer, see **Mouse**.

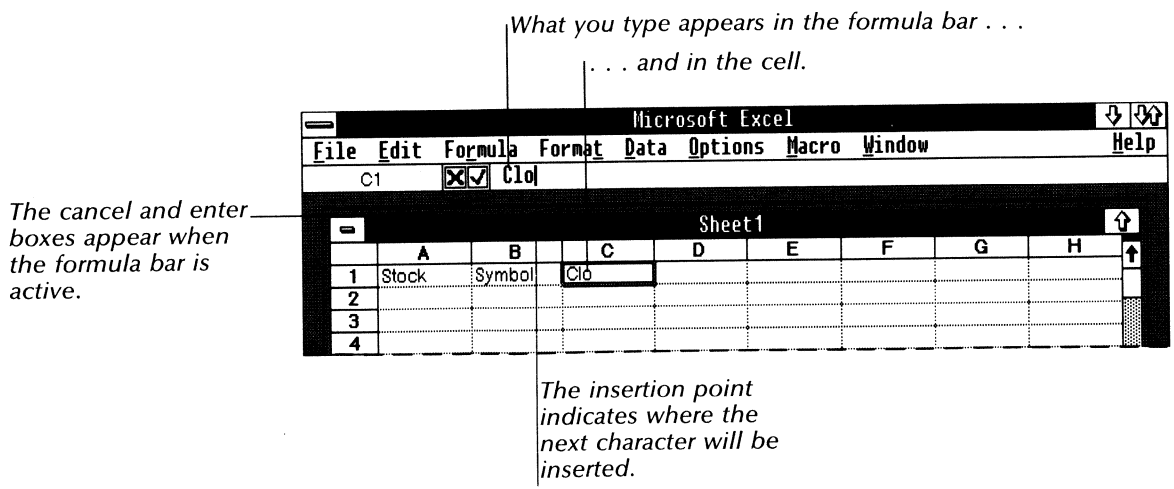
Creating a New Worksheet

Microsoft Excel automatically creates a new worksheet whenever you start the application. During a work session, you can create additional new worksheets.

1. Choose File New.
2. Select Worksheet.
3. Choose the OK button.

Entering Data in a Cell

In Microsoft Excel you use the formula bar for all data entry and editing. To enter data in a worksheet, you first select a cell to make it the active cell. Then you type the data for the active cell in the formula bar, as shown here:



If you press ENTER or click the enter box with the mouse, Microsoft Excel enters the data in the cell. If you press ESCAPE or click the cancel box, the data is cleared from the formula bar and the cell.

The formula bar is inactive whenever the enter and cancel boxes are not displayed — for example, when you first open a new worksheet or select cells before choosing a command. If you start typing or editing cell data, the formula bar becomes active.

To enter data in a cell:

1. Press the UP, DOWN, LEFT, or RIGHT keys to move to and select the cell you want for the active cell.

   With the mouse, click the cell you want.

2. Type the data in the formula bar.

   Press BACKSPACE to erase characters if you need to make corrections.

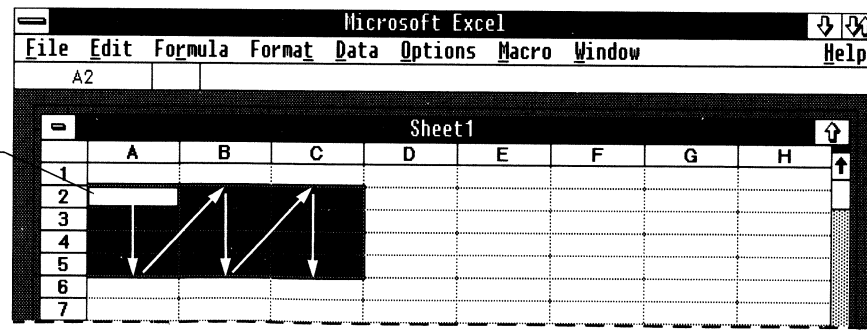
3. Press ENTER.

   With the mouse, click the enter box.

Note All but a few commands on menus are grayed when the formula bar is active. Grayed commands are not available until you complete the entry in the formula bar. If you want to work in the worksheet rather than the formula bar and notice that most commands are grayed, make sure the formula bar is not active.

Entering Data in a Range

When entering data into several adjacent cells, you can speed up data entry by first selecting those cells as a range. You can then make several entries, one after the other, in successive cells in the range.



Type the data for each cell and press ENTER or click the enter box to continue moving through the selection, as shown here.

Once you have selected a range, you can use the keys in the following table to move within the selection and still keep the cells selected (using DIRECTION keys will undo the selection).

To	Press
Move down one cell in the selection	ENTER
Move up one cell in the selection	SHIFT + ENTER
Move right one cell	TAB
Move left one cell in the selection	SHIFT + TAB

These procedures and techniques also apply to multiple selections. In addition, you can use CONTROL + TAB to move to the next area in a multiple selection and CONTROL + SHIFT + TAB to move to the previous area. For more information on multiple selections, see **Selection**.

To select a range of cells and enter data:

1. Press the UP, DOWN, LEFT, or RIGHT keys to move to the first cell you want to select.

   With the mouse, point to the cell you want.

2. Hold down SHIFT and press individual DIRECTION keys, extending the selection to include the cells you want.

   With the mouse, drag through the cells you want.

3. In the formula bar, type the data for the first cell.

   Press BACKSPACE to erase characters if you need to make corrections.

4. Press ENTER to enter the data and move to the next cell in the selection.

   With the mouse, click the enter box.

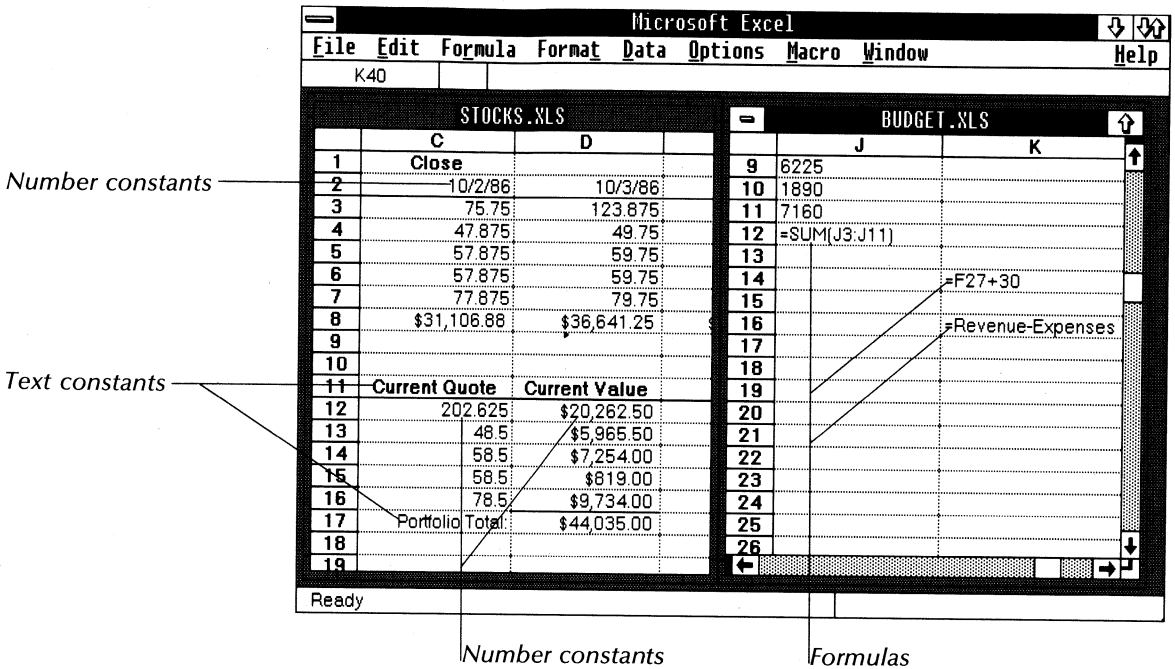
For information on additional data entry and editing techniques, see "Modes in Microsoft Excel," later in this topic.

Types of Data

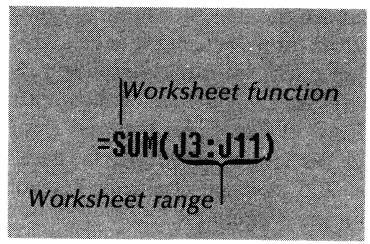
You can enter two basic types of data in a worksheet:

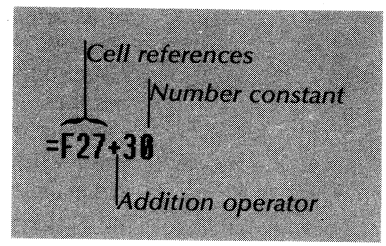
- **Constant value** — can be text, a number (including a date or time), a logical value, or an error value.
- **Formula** — a sequence of values, cell references, names, functions, or operators that produces a new value from existing values.

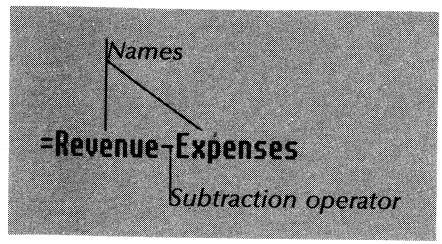
The following illustration shows examples of these types of data in two different worksheets. The worksheet on the right is set up to display formulas in the cells:



Here's a close-up of the formulas in the preceding illustration to show the types of data you can include in a formula:







For more information on displaying formulas or values in a worksheet, see **Display options**.

Guidelines for Entering Data

This section summarizes procedures and guidelines for entering constants (numbers, text, logical values, and error values) and formulas in a worksheet. For detailed information on procedures related to the types of data discussed here, refer to the topics listed at the end of this section.

- **Numbers.** To enter a number as a constant, just type the number. You can enter a number in three basic formats: integer, decimal, and scientific. Microsoft Excel also accepts several other formats for constants. For example, to indicate a negative number, enter a minus sign before the number or enclose it in parentheses. You can enter a comma in a number constant, a dollar sign ($) before it, or a percent sign (%) after it. You can also enter a number in a built-in date or time format.

  To enter a number in a formula, just type the number (the formula should begin with an equal sign — see "Formulas," below). In a formula, you cannot use parentheses to indicate a negative number, a comma to separate thousands, or a dollar sign ($) preceding the number. If you type a percent sign (%) after a number, Microsoft Excel interprets it as the percentage operator and stores it as part of the formula. In a formula, you cannot enter numbers in date or time formats directly. However, in most formulas you can enter a date or time as text enclosed in double quotation marks, and Microsoft Excel will convert it to the corresponding number when calculating the formula. For example, the result of the formula ="12/31/88"-"11/30/88" is 31, the number of days between the two dates.

- **Text.** To enter text as a constant, just type the text. To enter text as part of a formula, enclose the text in double quotation marks. Text constants and text included in formulas cannot exceed 255 characters. Microsoft Excel interprets as a text constant anything it doesn't recognize as a number, logical value, error value, or formula. If you need to enter a text constant that Microsoft Excel interprets as a number, logical value, or error value, enter the text as a formula instead. For example, you cannot enter the number *205* as a text constant, but you can achieve the same effect by entering the formula ="*205*"

- **Logical values and error values.** To enter a logical value or an error value as a constant or as part of a formula, just type the value. The valid logical values are TRUE and FALSE. The valid error values are #N/A, #VALUE!, #REF!, #NULL!, #DIV/0!, #NUM!, and #NAME!. You can type logical and error values in either upper- or lowercase.
- **Formulas.** To enter a formula, start by typing an equal sign (=) and then type the desired sequence of values, cell references, operators, functions, or names. After typing an equal sign, operator, comma, or left parenthesis, you can insert a cell or range reference by using the DIRECTION keys or the mouse to point to a cell or range (see "Modes in Microsoft Excel," later in this topic). You can also include functions and names in the formula bar with the Formula Paste Name and the Formula Paste Function commands.
- **Undoing mistakes in the formula bar.** If you make a mistake while typing in the formula bar you can erase the incorrect characters using the BACKSPACE key. You can also press F2 or click in the formula bar with the mouse to enter Edit mode and perform more extensive editing (see "Modes in Microsoft Excel," later in this topic).
- **Commands you can use in the formula bar.** You can use only the following commands when the formula bar is active: the Edit Cut, Edit Copy, Edit Paste, and Edit Clear commands; the Formula Paste Function, Formula Reference, Formula Goto, and Formula Paste Name (if you have defined names) commands; the Window Arrange All and Window Activate Window commands; and the commands in the Control menus for the application and the document.
- **Formatting cells as you type.** If you enter a number using a built-in format into a cell that has the General format (the default format), Microsoft Excel assigns the format you type to that cell. For example, if you type a date using a built-in date format, Microsoft Excel automatically assigns that date format to the cell.
- **Numeric entries that exceed column width.** If a number value is too long to display in a cell that has the General format (the default), Microsoft Excel stores the value as you enter it, but displays the number in scientific notation. For example, 250,000,000 would be displayed as 2.5E+08. If the number in exponential notation is still too long, or if the cell has any format other than General, Microsoft Excel displays a series of number signs (####). You can adjust the column width to fully display the number.

- **Text, logical value, and error value entries that exceed column width.** If a text value exceeds the column width of a cell, Microsoft Excel stores the text as you enter it and overlaps the display of the text into the cells to the right until it encounters a cell that is not empty. For a logical or error value that exceeds the column width of the cell, Microsoft Excel stores the value, but displays a series of number signs (####). You can adjust column widths to fully display long entries.
- **Calculation and values stored versus display formats.** Microsoft Excel calculates on the basis of the underlying stored values in cells, not their display formats. The built-in or custom number formats you apply with the Format Number command change the appearance of the displayed value of a cell but don't affect its formula or stored value. Microsoft Excel calculates on the basis of displayed values only when you specify Precision As Displayed through the Options Calculation command.

For information on	See this topic
Entering text, numbers, dates, times	Text Number Date Time
Error values; logical values	Error value Logical value
Entering formulas	Formula
Calculation options, including using Precision As Displayed; operators and order of operations	Calculation Operator
Formula bar techniques, including Edit mode, Point mode, and clearing data from the formula bar	Formula bar
Duplicating a series of characters in the formula bar with the Edit Copy and Edit Paste commands	Copying data and formats
Pasting a function into a formula with the Formula Paste Function command	Function

For information on	See this topic
Pasting a name into a formula with the Formula Paste Name command	Names
Changing a reference to relative, absolute, or mixed reference format with the Formula Reference command	References

Modes in Microsoft Excel

Microsoft Excel can be in one of several modes, depending on its current activity. For example, when you first start Microsoft Excel, the program is in Ready mode, waiting for you to select cells, enter data, or choose commands. The formula bar is not active, and the status bar at the bottom of the screen displays "Ready."

In addition to Ready mode, Microsoft Excel has three other modes — Enter, Point, and Edit — used for entering and editing data. You can use Microsoft Excel without learning about these modes. However, understanding them allows you to use the other convenient data entry and editing features built into the worksheet and formula bar.

The following descriptions outline the three data entry and editing modes and how you can use them with either the keyboard or mouse.

Note

The term "movement-selection keys" refers to keys such as the DIRECTION keys (UP, DOWN, LEFT, RIGHT) or the HOME key, and their related key sequences such as CONTROL + DIRECTION and SHIFT + HOME. This section describes the operation of the movement-selection keys as a group in each of the modes. For a table detailing how specific movement-selection keys work in each mode, see the next section in this topic, "Moving and Selecting with the Keyboard."

Enter mode — the basic data entry mode for the active cell. In Enter mode, the formula bar is active, and movement-selection keys operate on worksheet cells. The status bar displays "Enter." Use Enter mode this way:

- To turn on Enter mode, just start typing data for the active cell, and Microsoft Excel automatically activates the formula bar in this mode.
- To erase mistakes, use BACKSPACE. To cancel the entry, press ESCAPE.
- To complete a cell entry, press ENTER or click the enter box with the mouse. If only a single cell is selected, you can press a DIRECTION key to move as you complete the entry.

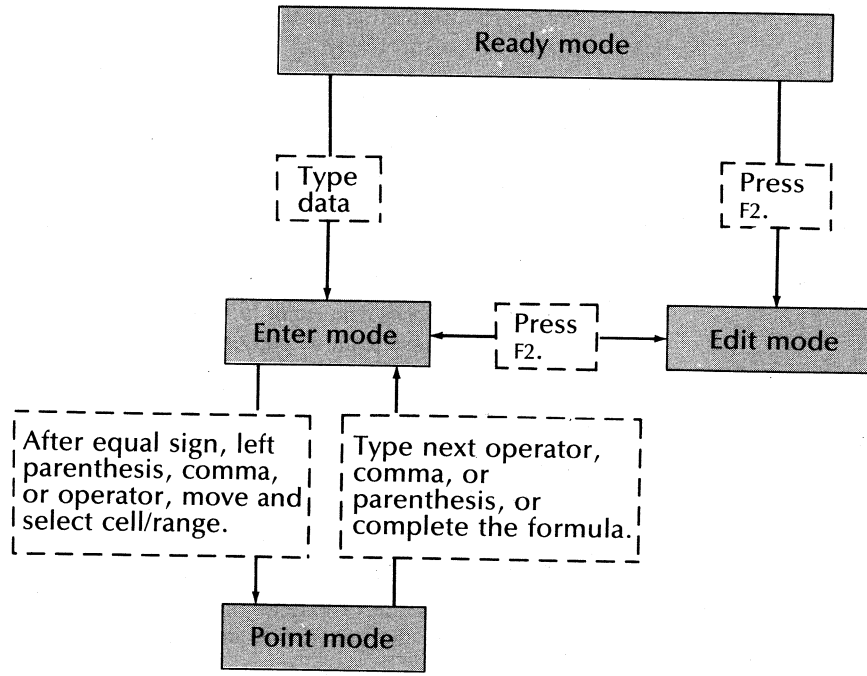
Point mode — a mode that simplifies entering cell and range references in a formula in the active cell. You can use Point mode only if you are first in Enter mode and only when entering a formula. In Point mode, the formula bar is active, and movement-selection keys operate on worksheet cells. The status bar displays "Point." Use Point mode this way:

- First make sure you are in Enter mode.
- The insertion point must immediately follow an equal sign, a left parenthesis, a comma, or an operator (for example, +, −, *, or /).
- To select a cell or range whose reference you want to insert in your formula, press a movement-selection key or key sequence; with the mouse, click a cell or drag through a range. The cell or range you select is surrounded by a dotted line called the marquee. The reference to the cell or range appears in the formula bar.
- After you insert the reference in the formula, type the next operator, comma, or parenthesis, or complete the formula by pressing ENTER or clicking the enter box.

Edit mode — a mode used for editing the contents of the active cell in the formula bar. In Edit mode, the formula bar is active, and movement-selection keys operate on characters in the formula bar. You can turn on Edit mode from either Enter and Ready mode. In Edit mode, the status bar displays "Edit." Use Edit mode this way:

- From Ready or Enter mode, press F2 to turn on Edit mode. With the mouse, click in the formula bar.
- Press movement-selection keys to edit. With the mouse, click where you want the insertion point.
- To switch to Enter mode before completing the entry, press F2 again.
- To complete a cell entry from Edit mode, press ENTER, or click the enter box with the mouse.

The following illustration shows how the modes are related and what basic actions put each mode into effect:



To return to Ready mode from Enter, Edit or Point mode, press ENTER *or* ESCAPE.

Microsoft Excel also displays status bar messages during the following special operations:

- Copy
- Cut
- Find
- Move
- Size
- Split
- Recording
- Calculate
- Circular
- Help

For copy and cut operations, movement-selection keys operate as in Ready mode. For other operations, the keys have different uses. For more information on status bar messages, see **Status bar**.

For more information on the formula bar and status bar, see **Formula bar** and **Status bar** respectively.

Moving and Selecting with the Keyboard

Microsoft Excel has a complete set of keys for moving and selecting in a worksheet. Many keys perform parallel actions in a worksheet and in the formula bar:

- In the worksheet, you can use the keys to move around the worksheet and select the cells you want to work with when choosing a command or performing tasks such as copying or moving cells and data.
- In the formula bar, use the keys to move and select formula bar characters and edit cell entries by choosing editing commands or their corresponding shortcut keys: Edit Cut (SHIFT+DELETE), Edit Copy (CONTROL+INSERT), Edit Paste (SHIFT+INSERT), and Edit Clear (DELETE). Or, once you've started a formula, use the movement-selection keys with Point mode to insert cell and range references in the formula.

Note If you select a cell or extend a selection while in Point mode, the selection is surrounded by the dotted marquee instead of being highlighted in reverse-black.

The following table lists keys and key sequences for moving and selecting. The keys operate on worksheet cells or on formula bar characters, depending on the current mode (for an explanation of the modes, see the preceding section in this topic, "Modes in Microsoft Excel").

Press	In worksheet (Ready, Enter, Point modes)	In formula bar (Edit mode)
DIRECTION key (UP, DOWN, LEFT, RIGHT)	Moves one cell up, down, left, right	Moves one character up, down, left, right
SHIFT + DIRECTION key	Extends selection one cell	Extends selection one character (LEFT/RIGHT keys) or one line (UP/DOWN keys if formula bar entry exceeds one line)
CONTROL + DIRECTION key	Moves by one block of data left, right, up, down	Moves one word left, right, up, down
CONTROL + SHIFT + DIRECTION key	Extends selection by one block of data left, right, up, down	Extends selection one word (LEFT/RIGHT keys) or one line (UP/DOWN keys if formula bar entry exceeds one line)
HOME	Moves to start of row	Moves to start of line
SHIFT + HOME	Extends selection to start of row	Extends selection to start of line
CONTROL + HOME	Moves to start of worksheet	Moves to start of formula bar data
CONTROL + SHIFT + HOME	Extends selection to start of worksheet	Extends selection to start of formula bar data

Press	In worksheet (Ready or Enter mode)	In formula bar (Edit mode)
END	Moves to end of row (last occupied column of worksheet)	Moves to end of line
SHIFT + END	Extends selection to end of row (last occupied column of worksheet)	Extends selection to end of line
CONTROL + END	Moves to end of worksheet	Moves to end of formula bar data
CONTROL + SHIFT + END	Extends selection to end of worksheet	Extends selection to end of formula bar data
PAGE UP	Moves up one windowful	—
SHIFT + PAGE UP	Extends selection up one windowful	—
PAGE DOWN	Moves down one windowful	—
SHIFT + PAGE DOWN	Extends selection down one windowful	—
CONTROL + PAGE UP	Moves left one windowful	—
CONTROL + SHIFT + PAGE UP	Extends selection left one windowful	—
CONTROL + PAGE DOWN	Moves right one windowful	—
CONTROL + SHIFT + PAGE DOWN	Extends selection right one windowful	—
CONTROL + SHIFT + SPACEBAR	Selects entire worksheet	—

Tips

You can also extend a selection by turning on the Extend key, instead of holding down SHIFT in combination with other keys. To turn on the Extend key, press F8. Then press a movement key or key sequence (for example, a DIRECTION key or CONTROL+HOME). For example, to extend the selection one cell to the right, press F8, release the key, and then press the RIGHT key. When the Extend key is turned on, the right side of the status bar displays "EXT". To turn off the Extend key, press F8 again.

To move within the worksheet and keep a cell or range selected, you can scroll the worksheet window. To scroll with the keyboard, first press SCROLL LOCK and release the key. Then press a movement key: for example, the LEFT or RIGHT keys scroll by column, and the UP or DOWN keys scroll by row. When SCROLL LOCK is turned on, the right side of the status bar displays "SCRL". To turn off SCROLL LOCK, press the SCROLL LOCK key again. For more information on scrolling a worksheet window, see **Keyboard**.

For more information on shortcut keys for commands and on additional keys for moving and selecting, see **Keyboard**.

Moving and Selecting with the Mouse

You can use a mouse instead of, or in combination with, your keyboard to move and select in Microsoft Excel. Like the keyboard, the mouse also performs parallel actions in a worksheet and in the formula bar:

- In the worksheet, use the mouse to move around the sheet and select the cells you want to work with when choosing a command or performing tasks such as copying or moving cells and data. To select, you either click a single cell or drag through a range of cells.
- In the formula bar, click with the mouse where you want the insertion point or drag through characters to select them. Clicking in the formula bar turns on Edit mode. You can then edit a cell entry by choosing editing commands or their corresponding shortcut keys: Edit Cut (SHIFT+DELETE), Edit Copy (CONTROL+INSERT), Edit Paste (SHIFT+INSERT), and Edit Clear (DELETE). Or, once you've started a formula and are in Enter mode, you can easily insert a cell or range reference in the formula with Point mode. (For an explanation of the Enter, Point, and Edit modes, see "Modes in Microsoft Excel," earlier in this topic.)

Note

If you select a cell or extend a selection while in Point mode, the selection is surrounded by the dotted marquee instead of being highlighted in reverse-black.

The following table lists mouse procedures for moving and selecting in a worksheet:

To	Do this
Select a single cell	Click the cell you want.
Select a range	Drag through the cells you want.
Select one row or column	Click the row or column heading.
Select many rows or columns	Drag in the row or column headings.
Select the entire worksheet	Click the rectangle below the Control menu icon.
Make a multiple selection	Drag through the first selection, then hold down the CONTROL key as you drag through each additional selection.
Select in the formula bar	Click where you want the insertion point or drag through a series of characters.

For more information on mouse procedures, see **Mouse**.

Tip

To move within the worksheet and keep a cell or range selected, you can scroll the worksheet window. To scroll with the mouse, you use the vertical and horizontal scroll bars. For example, to scroll by row, click the arrow at either end of the vertical scroll bar; to scroll by column, click the horizontal scroll bar arrow. For more information on scrolling a worksheet window, see **Mouse**.

Getting Help

Microsoft Help is an online reference tool you can use with Microsoft Excel. Help provides information on Microsoft Excel commands, worksheet functions, concepts, basic tasks, and error messages. Help is displayed in its own window. You can work on your documents with the Help window open for convenient, quick reference.

To get general help with worksheets	To get help on a specific dialog box or message	To get help on a command
1 Choose Help Index. The Help window displays the Help index. 2 Select the index category you want and press ENTER to display the topics in that category. 3 Browse through the index. 4 Choose the Help topic you want.	Press F1 while the dialog box or message is displayed. Microsoft Help displays the Help topic for that dialog box or message.	1 Press SHIFT+F1. 2 Choose the command you want. Microsoft Help displays the Help topic for that command.

The Help menu includes other commands that let you quickly access various learning and information tools:

- **Help Keyboard command** — an online keyboard template.
- **Help Tutorial command** — starts online lessons in basic skills.
- **Help Feature Guide command** — starts an online overview/guided practice with the unique and high-powered features of Microsoft Excel.
- **Help Lotus 123 and Help Multiplan commands** — introduce you to the Microsoft Excel equivalents of Lotus 1-2-3 or Microsoft Multiplan commands.
- **Help About command** — provides information on the version of Microsoft Excel you're using and on the amount of memory available.

For complete information on using Microsoft Help, see **Help**.

Putting the Worksheet to Work

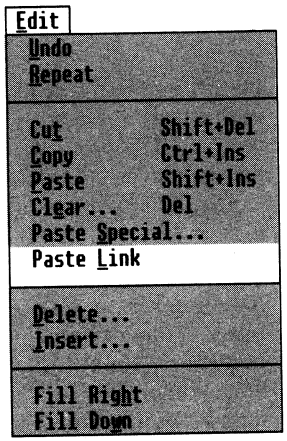
Microsoft Excel offers special capabilities related to worksheets to help put the worksheet to work for you — with tools to build accuracy and efficiency into your models. Follow the guidelines and tips here for designing a worksheet. Each discusses an appropriate Microsoft Excel tool you can use to design an effective model:

- **Sketch out a visual overview of the model — the print preview option.** Before you enter data, think about how you want to use the worksheet. Map out your model on the screen by entering just column and row titles. Then use the print preview option, which shows a reduced version of the document, to check overall structure and logic. See **Printing a document**.
- **Clarify the structure of the model — the names feature.** Use the Formula Define Name command to define names for cells, ranges, and formulas. Use the Formula Apply Names command to substitute those names in formulas. For example, the formula =F6−D6, is more clearly expressed with names this way: =Assets−Liabilities. Use names to make verifying references much easier. See **Names**.
- **Simplify and shorten formulas to reduce errors — built-in worksheet functions.** Use built-in worksheet functions to streamline many worksheet computations. For example, the formula =D12+D13+D14+D15+D16, when expressed with a function, looks this way: =SUM (D12:D16). For an overview of worksheet functions, see **Function**. For complete information on functions, see *Microsoft Excel Functions and Macros*, a separate manual included in your Microsoft Excel package.
- **Streamline and add power to large, complex models — the linking feature.** You link documents with a formula in one that refers to a value in the other. The link enables Microsoft Excel to update the value when it changes. Linking simplifies data consolidation and allows you to break down a large model into compact, interdependent worksheets that are easier to use. Use linking to design versatile models for multiple users or to design modules according to the way you use them — for example, daily or monthly. See **Linking documents**.

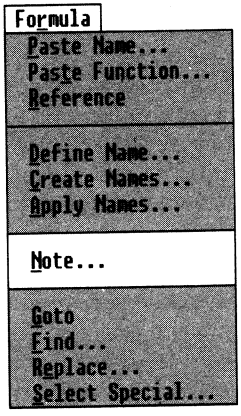
- **Document the model — cell notes and Info window.** Use the built-in cell notes feature to document assumptions and data sources, indicate acceptable tolerances, and flag discrepancies within your worksheet model. Notes can serve as reminders for you and as orientation (especially when used with the Info window) for others using the model. See **Notes** and **Info window**.
- **Test the model — auditing tools.** Auditing tools include methods for examining relationships between cells, resolving circular references, and locating error values. If you're building a large model, use these tools on a "rapid prototype": enter small amounts of data for each part of the model, and test it with the auditing tools to see if the model is correctly designed. See **Auditing worksheet models** and **Info window**.
- **Examine the model visually — charts.** Visualizing data in the form of a chart is another way to analyze a model and show relationships in the data. Plotting worksheet data is as easy as selecting the cells and choosing a single command. You can view charts and worksheets together on the screen — a convenient feature for quick analysis. See **Chart**.
- **Guard against accidental or unauthorized changes — protection options.** The protection options include limiting access to documents with passwords, locking or hiding cells, and locking the window layout of a worksheet. See **Protecting or hiding data**.
- **Automate frequently performed tasks — macros and the macro recorder.** A macro is a set of instructions you create for Microsoft Excel to follow. You can then use just a keystroke or two to carry out the macro. Use macros to automate tasks you routinely repeat, such as creating a monthly summary. Microsoft Excel will even enter the macro instructions for you with the built-in macro recorder. See **Macro** for a general overview of macros. See *Microsoft Excel Functions and Macros* for complete information.
- **Try these other tools in your model — arrays, data tables, databases.** If you need specialized formulas that occupy ranges and return multiple results, use arrays. As shortcuts for your "what-ifs," create one- or two-input data tables. Set up a database on a worksheet, and use Data menu commands to perform all standard database operations, or use a data form to easily enter and view individual data records. See **Array**, **Data table**, and **Database**.

Editing a Worksheet

Editing a worksheet includes not only revising the cell contents, but also making changes in the structure or organization of a worksheet. The main commands for editing a worksheet are on these two menus (Full menus shown):



- The Edit menu commands control standard editing procedures such as moving, copying, inserting, and deleting data.



- The Formula menu commands simplify creating and editing complex formulas and control procedures for naming cells and ranges, finding cells and data, or searching and replacing information.

For a description of each Edit and Formula menu command, see the corresponding command topic.

Guide to Worksheet Editing Topics

The following table lists the editing procedures you can use for Microsoft Excel worksheets. For complete information about a procedure, refer to the topic listed in the table.

Tip | For a quick-reference survey of editing procedures with brief summaries of procedures rather than step-by-step procedures, see **Editing a document**.

For information on	See this topic
Editing in the formula bar	
Editing a cell entry, pasting a cell reference, clearing data from the formula bar	Formula bar
Pasting a function into a formula	Function
Pasting a name into a formula	Names
Duplicating a series of characters in the formula bar	Copying data and formats
Changing the selected reference to relative, absolute, or mixed reference format	References
Replacing the currently displayed formula with its calculated value	Calculation
Copying and moving	
Copying data and formats to another part of the worksheet or to a different worksheet	Copying data and formats
Moving data and formats to another part of the worksheet or to a different worksheet	Moving data on a worksheet
Finding cells and replacing data quickly	
Finding a specific cell, finding specific references or values, searching and replacing data	Finding cells and data quickly
Using the Info window to find specific data about cells	Info window

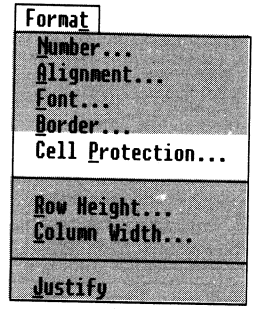
For information on	See this topic
Editing rows and columns	
Inserting rows and columns	Inserting blank cells
Deleting rows and columns	Deleting and clearing data
Dividing a column of long text and number entries into multiple columns	Values
Deleting and clearing data and formats	
Clearing data or formats from cells; deleting cells and closing up space	Deleting and clearing data
Display options that simplify editing	
Sizing and moving a document window	Windows
Opening multiple windows into a worksheet, splitting a worksheet window into panes, freezing row and column titles	Display options

Formatting a Worksheet

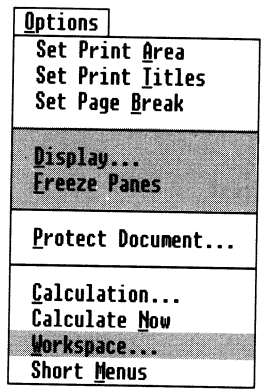
Formatting a worksheet includes changing the appearance of the worksheet data and enhancing the overall design of the document. You can format a worksheet without affecting formulas or values in cells; when you change a cell's format, its value does not change. Microsoft Excel displays the cell's value in the new format.

Microsoft Excel gives you numerous formatting options for displaying and printing out worksheets. For example, you can create custom formats for numbers and text for specialized needs. Or, you can add borders and shading to emphasize key areas.

The main worksheet formatting commands are on these menus (Full menus shown):



- The Format menu commands shown tinted here control the formats of specific cells and ranges.



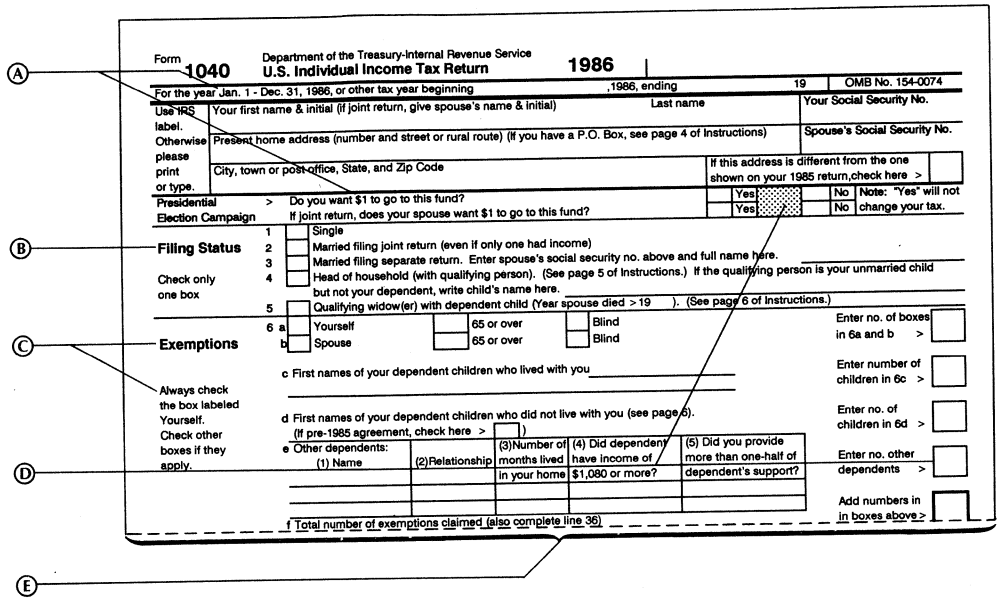
- The Options menu commands shown tinted here control document-wide display format settings.

For a description of each Format and Options menu command, see the corresponding command topic.

Guide to Worksheet Formatting Topics

The following illustration shows examples of general worksheet formatting options. The accompanying table lists the formatting options you can use and the topics you should refer to for complete procedural information about each option.

Tip | For an illustrated, quick-reference survey of formatting options with brief summaries of procedures rather than step-by-step procedures, see **Formatting a document**.



For information on	See this topic
A Standard and custom formats for numbers and text	
Using number, text, or currency formats, including color formats for display	Number
Using date and time formats	Date Time
Displaying formulas or values; hiding or displaying zero values	Display options

For information on	See this topic
B Alignment formats	
Aligning text and numbers in cells	Alignment
Filling a cell or range with a repeated character or series of characters	Alignment
Justifying a paragraph of explanatory text to fit a column	Alignment
C Font formats	
Applying fonts to a worksheet; changing worksheet fonts	Font
Adjusting column widths or row heights	Column Row
D Border and shading formats	
Adding borders or shading to a cell or range	Borders and shading
E Print formats	
Formatting headers and footers	Headers and footers
Setting up page layout	Printing a document
F Row and column heading formats (Example shows row/column headings hidden)	
Hiding or displaying column and row headings on the screen display or when you print	Display options Printing a document
Using R1C1 reference style for rows and columns	References
G Gridline formats (Example shows gridlines hidden)	
Hiding or displaying gridlines on the screen display or when you print	Display options Printing a document

Saving and Printing a Worksheet

This section covers basic procedures for saving and printing worksheets. For complete information and additional options for saving and printing worksheets, see **Saving and closing a document** and **Printing a document**.

Saving a New Worksheet

You save each worksheet as a separate document.

1. With the worksheet window active, choose File Save As.

   The dialog box displays a default name in the text box.

2. In the text box, type a document name (*TAX*, for example).

   Your document name automatically replaces the default when you start typing. Unless you type a different file extension, Microsoft Excel automatically adds the extension .XLS to the document name.

   If you want to save the worksheet to a different directory than the one specified in the dialog box, type the full pathname preceding the document name (for example, *C:\TABLES\TAX.XLS*).

3. Choose the OK button.

Once you've named the worksheet, you can use the File Save command whenever you want to save changes to it again. To rename the worksheet, save it with the File Save As command.

For more information on opening documents you've saved, see **Opening a document**. For more information on directories, see **Directories**.

Printing a Worksheet

Before you print:

- Choose a printer, if necessary. If you specified more than one printer in Setup, or if you want to use a different printer, use the File Printer Setup command to choose a printer. If you are printing in Microsoft Excel for the first time, choose the Setup button in the Printer Setup dialog box to set up initial printer settings.

- Preview the worksheet. The Preview option in the File Print command shows a reduced version of how the printed worksheet will look. You can select and view at larger-scale any detail on the previewed page and make necessary page layout adjustments.

To print a worksheet:

1. With the worksheet window active, choose File Print.
2. Choose the OK button.

For more information on printing on previewing a worksheet, see **Printing a document**.

Related Information

Reference

For information on	**See**
Chart, database, and window basics	Chart Database Windows
Editing and formatting on a worksheet	Editing a document Formatting a document
Using commands and dialog boxes	Command, menu, and dialog box

Tutorial

Worksheets

Feature Guide

Basic Mechanics, "Worksheet Formatting"

Workspace file

A **workspace file** lists the names of documents you have open in the workspace when the workspace file is saved. Saving the layout of your workspace in a workspace file is useful if you work with a particular set of documents for certain tasks. If you save the documents as a workspace file, you can reopen all of them together by opening one workspace file. A workspace file usually has the filename extension .XLW.

This topic explains:

- Saving a workspace file
- Ways to work with workspace files

In addition to saving a list of all documents that are open, a workspace file includes:

- Position and size of all windows used for the open documents.
- Options selected in the Options Workspace dialog box.
- The preferred chart type.
- Global calculation settings (Automatic/Manual and Iteration).
- Menu style (full or short menus).
- Info window settings.

Important

A workspace file is really a list of documents — not the documents themselves. If you have not saved the documents on your disk, you will not be able to reopen them, even though they were open when you saved the workspace file. Do not delete a separate document file that you have saved in a workspace file.

Also, you can open any document you've saved in a workspace file separately. Any changes you make to the document or to its document window size and position will be reflected the next time you open the document as part of the workspace file.

Saving a Workspace File (Full Menus)

1. Choose File Save Workspace.
2. In the text box, type a name for the workspace file. Unless you type a different extension, Microsoft Excel will add the extension .XLW.
3. Choose the OK button.

   Microsoft Excel displays a series of messages asking if you want to save changes made to the open documents. To save the changes, choose the Yes button. To cancel the changes, choose the No button. To cancel the command, choose the Cancel button.

You open a workspace file the same way you open regular document files, using the File Open command. For information on opening documents, see **Opening a document**.

Ways to Work with Workspace Files

Workspace files offer convenient ways to start a Microsoft Excel work session:

- **Set up several work scenarios.** Microsoft Excel remembers the arrangement of the workspace when you create a workspace file. You might find it handy to set up several workspace files to accommodate each arrangement of windows and documents you use to begin a session. For example, you might set up one workspace file for BUDGET.XLW and another for SALES.XLW. When you want to work with a particular set of documents and windows, you open the appropriate workspace file.
- **Modify your start-up file.** You can set up Microsoft Excel so that it opens a certain workspace file or document file every time you start the program. To do this, you enter the appropriate information in your WIN.INI file, a special file that stores start-up settings for Microsoft Excel. For more information, see **Default settings**.
- **Use autoexecs.** You can also use an "autoexec," a special type of start-up macro, to automatically open a workspace file whenever you open a certain worksheet or macro sheet.

Related Information

Reference

For information on	See
Procedures for saving documents	Saving and closing a document
Startup procedures	Starting Microsoft Excel
Ending a work session	Quitting Microsoft Excel

Sampler

Consolidating Reports

Feature Guide

Basic Mechanics, "Saving, Workspace"

Clipboard

You use Clipboard to hold data being copied or moved. You can move or copy data from one worksheet to another or from one application to another. For example, you can copy data from another application and paste it into a Microsoft Excel worksheet. Or you might copy a picture of a Microsoft Excel chart and paste it into a report you are creating in Microsoft Windows Write.

This topic explains:

- Displaying Clipboard
- Cutting, copying, and pasting
- Quitting Clipboard

Displaying Clipboard

Clipboard is always available when you are running Microsoft Excel. You can display Clipboard and view its contents whenever you want.

To display Clipboard:

1. Choose Control Run for the Microsoft Excel window (ALT, SPACEBAR, U).
2. Select Clipboard.
3. Choose the OK button.

The Clipboard window appears. If Clipboard is empty, a blank window is displayed.

Cutting, Copying, and Pasting

To put data on the Clipboard, use the application's Cut or Copy command. To insert data from the Clipboard into an application, use the application's Paste command. Most applications require that you first select the data you want to cut or copy. For information on selecting in Microsoft Excel, see **Keyboard**. For information on selecting in another application, see the user's guide for that application.

Though your application may have different names for the Cut, Copy, and Paste commands, the commands should operate in this way:

- The Cut and Copy commands put the selected data on the Clipboard.
- The Paste command copies data from the Clipboard into a selected area in the application. If the application contains an insertion point, the data from the Clipboard appears to the left of the insertion point. If the application contains a selection, the data from the Clipboard replaces the selection. You can paste the same data from the Clipboard as many times as you want.

Note Some standard applications have commands similar to Cut, Copy, and Paste but don't use Clipboard to transfer data.

Generally, formatting is not stored on the Clipboard. However, this can vary from application to application.

Quitting Clipboard

▣ With the Clipboard window active, choose Control Close (ALT, SPACEBAR, C).

Although Clipboard is no longer displayed in a window, it continues to be available while you work.

Control Panel

You use Control Panel to adjust system settings such as the date and time, printer assignments, and colors of parts of the windows. Control Panel lets you adjust these settings quickly and easily without running the Setup program again.

Many of the changes you make in Control Panel are reflected in the WIN.INI file. Although the WIN.INI file can be altered in a word processing program like Microsoft Word, you should probably avoid changing the WIN.INI file directly unless you are an advanced user, since you may inadvertently change settings that should not be changed.

Note You need to run the Setup program again if you want to add or change graphics cards or change the resolution of the graphics card you have already set up. You cannot use Control Panel to make these changes in your system configuration. For more information on running the Setup program, see *Getting Started and Quick Reference*, a separate manual included in your Microsoft Excel package.

This topic explains:

- Starting and quitting Control Panel
  - Starting Control Panel
  - Quitting Control Panel
- Date, time, insertion point blink, and double-click
  - Changing the time
  - Changing the date
  - Changing the insertion point blink rate
  - Changing the mouse double-click rate
- Adding and removing printers
  - Adding a printer
  - Removing a printer
- Adding and removing fonts
  - Adding a font
  - Removing a font
  - Choosing a font
- Configuring your system
  - Connecting printers
  - Setting up printers
  - Setting up a communications port
- Changing screen colors
- Changing window border width
- Turning off the warning beep
- Changing mouse options
- Country settings
  - Changing settings
  - Creating new settings

Starting and Quitting Control Panel

Starting Control Panel

1. Choose Control Run for the Microsoft Excel application window (ALT, SPACEBAR, U).
2. Select Control Panel.
3. Choose the OK button.

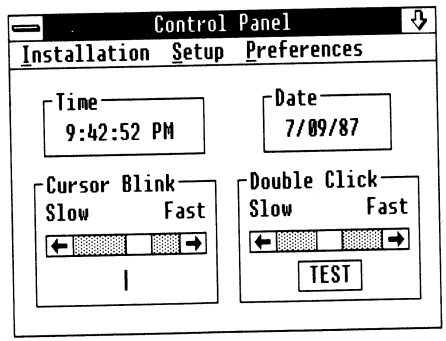
Quitting Control Panel

When you are done adjusting the various system settings, quit Control Panel:

- Choose Control Close for the Control Panel window (ALT, SPACEBAR, C).

Date, Time, Insertion Point Blink, and Double-click

When you start Control Panel, it creates a window containing four sections: Time, Date, Cursor Blink, and Double-click.



Changing the Time

You can use Control Panel to change the system time. The time you set from Control Panel is reflected in functions such as TIME that rely on the system time.

To change the time with the keyboard:

1. Press TAB to move to the Time section.
2. Use the RIGHT or LEFT key to select the part of the time (hours, minutes, or seconds) you want to change.

3 To increase the number, press the UP key.
To decrease the number, press the DOWN key.
4 Press ENTER.



To change the time with the mouse:

1 Click the part of the time (hours, minutes, or seconds) you want to change.
2 To increase the number, click the up scroll arrow.
To decrease the number, click the down scroll arrow.
3 Click anywhere outside the Time section.

Changing the Date

Some functions, like DATE, rely on the system date. You change the date the same way that you change the time.



To change the date with the keyboard:

1 Press TAB to move to the Date section.
2 Use the RIGHT or LEFT key to select the part of the date (month, day, or year) that you want to change.
3 To increase the number, press the UP key.
To decrease the number, press the DOWN key.
4 Press ENTER.



To change the date with the mouse:

1 Click the part of the date (month, day, or year) you want to change.
2 To increase the number, click the up scroll arrow.
To decrease the number, click the down scroll arrow.
3 Click outside the Date section.

Changing the Insertion Point Blink Rate

When you are editing in the formula bar or a text box in a dialog box, the insertion point blinks. The Cursor Blink rate controls how fast the insertion point blinks.



To change the blink rate with the keyboard:

1 Press TAB to move to the Cursor Blink section.
2 Press the RIGHT or LEFT key to scroll to the setting you want.
A sample blinking insertion point shows the current blink rate.



To change the blink rate with the mouse:

▣ In the Cursor Blink section, click the right or left scroll arrow, or drag the scroll box.

Changing the Mouse Double-click Rate

When you double-click the mouse button, Microsoft Excel interprets your action by how quickly one click follows the other.

To change the mouse double-click rate:

▣ In the Double-click section, click the right or left scroll arrow, or drag the scroll box.

You can test the new setting by double-clicking the Test button. The button color inverts if Microsoft Excel interprets your action as a double-click.

Adding and Removing Printers

When you first set up Microsoft Excel, you select the printer you'll use with your system. To change this selection, use the Add New Printer and Delete Printer commands on the Installation menu.

Adding a Printer

1. Choose Installation Add New Printer.
2. When asked, insert the disk that contains the printer-driver files you want to install. The printer drivers supplied with Microsoft Excel are on the Utilities disk.
3. Choose the OK button.

   A dialog box appears listing the printer-driver files available on the disk.
4. In the list box, select the printer you want to add.

   The name of the corresponding printer-driver file appears in the Printer File box at the right.

5 Choose the Add button.

A dialog box appears prompting you to enter the drive or directory you want to copy the printer-driver file to. Your Windows directory appears in the text box.

6 If you want to change the drive or directory the printer driver file will be copied to, type the drive or directory you want in the text box. (The directory must already exist.)

If you do not specify a drive or directory, the file is copied to your Windows directory.

7 Choose the Yes button.

Whenever you add a new printer to your system, you must let Microsoft Excel know which port the printer is connected to. For information on connecting to the correct port, see "Configuring Your System," later in this section.

Removing a Printer

1 Choose Installation Delete Printer.

A dialog box appears listing the printers you have set up.

2 In the list box, select the name of the printer you want to remove.

The name of the corresponding printer driver file appears in the Printer File box.

3 Choose the Delete button.

4 A dialog box appears displaying the location of the printer-driver file. If necessary, type an alternate location for the file in the text box.

5 Choose the Yes button.

Note | If other printers use the printer-driver file that appears in the Delete Printer dialog box, that printer-driver file will not be deleted from the named directory; it will still be available to the other printers.

Adding and Removing Fonts

The Setup program installs fonts automatically, based on your choices of graphics adapter and printer(s). You can override the automatic settings by adding or deleting fonts with Control Panel. If you add a dot-matrix printer, you may want to add a font for that printer.

Adding a Font

1. Choose Installation Add New Font.
2. When asked, insert the disk containing the font you want to install and choose the OK button. The fonts supplied with Microsoft Excel are on the Fonts disk.

   A dialog box appears listing the fonts available on the disk. For more information on the various sets of fonts, see "Choosing a Font," later in this topic.
3. In the list box, select the name of the font you want to add.

   The name of the corresponding font file appears in the Font File box to the right.
4. Choose the Add button.

   A dialog box appears prompting you to enter the drive or directory you want to copy the font file to. Your Windows directory appears in the text box.
5. If you want to change the drive or directory the font will be copied to, type the drive or directory in the text box. (The directory must already exist.)

   If you do not specify a drive or directory, the file is copied to your Windows directory.
6. Choose the Yes button.

Removing a Font

1. Choose the Installation Delete Font command.

   A dialog box appears listing the fonts you have set up.
2. In the list box, select the name of the font you want to remove.

   The name of the corresponding font file appears in the Font File box.
3. Choose the Delete button.
4. A dialog box displays the location of the font file. If necessary, type an alternate location for the font file in the text box.
5. Choose the Yes button.

Choosing a Font

Microsoft Excel provides two types of fonts: raster fonts and stroke (also known as vector) fonts. Raster fonts generally are used only for devices such as dot-matrix printers or the screen. They are available only in fixed sizes. Raster fonts look better and can be drawn more quickly than stroke fonts on raster devices. Stroke fonts typically are used if your output is going to a plotter.

When you choose the Add New Font or Delete Font command from the Installation menu, you are prompted to insert the disk containing fonts or to specify where the font files are located. You then see a list of the available fonts. The listing includes the font names, font sizes, and the set numbers.

Note | Because applications handle fonts differently, some applications may not list all available fonts.

Raster and Stroke Fonts

The font set number indicates the kind of devices that the font is designed to be used with. Six sets of fonts are included on the Fonts disk:

Set #1. Contains stroke fonts that can be used for screen, printer, or plotter devices of any resolution.

Set #2. Contains raster fonts designed for screen resolution of 640 × 200. For example, if you are using the IBM Color Graphics Adapter or a compatible adapter, you would select from this set.

Set #3. Contains raster fonts designed for screen resolution of 640 × 350. For example, if you are using the Hercules Graphics Card or the IBM Enhanced Graphics Adapter, you would select from this set. These fonts are also used by the C. Itoh 8510 (Portrait mode) printer.

Set #4. Contains raster fonts designed for printers in 60 dpi (dots per inch) resolution, including the following:

- Okidata 92, 93, 192, and 193 standard models (portrait mode)
- Okidata 92, 93, 192, and 193 standard and IBM-compatible models (landscape mode)
- Epson MX-80, FX-80, and compatible models (landscape mode)
- IBM Graphics (landscape mode)
- IBM Proprinter (landscape mode)
- Star Micronics SG-10 (landscape mode)

Set #5. Contains raster fonts designed for printers in 120 dpi resolution, including the following:

- Epson MX-80, FX-80, and compatible models (portrait mode)
- IBM Graphics (portrait mode)
- IBM Proprinter (portrait mode)
- Okidata 92, 93, 192, and 193 IBM-compatible models (portrait mode)
- Star Micronics (portrait mode)

Set #6. Contains raster fonts designed primarily for screen resolution of 640 × 480.

Font Names

Fonts have names that represent their different characteristics. Included on your Fonts disk are the following fonts:

Font	Description
Helv (raster)	Proportional font (characters have varying widths) without serifs ("sans serif")
Courier (raster)	Fixed-width font (characters have uniform widths) with serifs
Tms Rmn (raster)	Proportional font with serifs
Roman (stroke)	Proportional font with serifs
Modern (stroke)	Proportional font without serifs
Script (stroke)	Proportional font of slanted characters formed from nearly continuous curved lines

The following fonts are not included on the Fonts disk, but you may see them in some applications; these fonts cannot be added or deleted:

Font	Description
System (raster)	Fixed-width default font designed for menus and dialog boxes
Terminal (raster)	Fixed-width font that is the same as the font your computer displays in DOS

Device Fonts

In addition to the previously described fonts, an application may list device fonts. These are the fonts that are provided by the device. For example, on print-wheel printers, font names correspond to wheel names. These fonts cannot be added or deleted with Control Panel, but they may be listed when the output device is selected. Since there may not be a corresponding raster font for the screen, Microsoft Excel will usually substitute a screen font from the same class.

Configuring Your System

You use commands from the Setup menu to change printer port assignments, set the system default printer and specify its output modes, and set up serial communications ports.

Connecting Printers

Microsoft Excel needs to know which port your printer is connected to. You use the Connections command to assign or change the port for your printer(s). For example, if you decide to move your printer from port LPT1 to port LPT2, you need to use Control Panel to change the printer connections setting.

To change printer connections:

1. Choose Setup Connections.

   A dialog box appears displaying a list of printers and a list of ports.

2. In the Printer list box, select the name of the printer you want to change.

   The current port assignment for the selected printer is selected in the Connection list box to the right.

3. In the Connection list box, select the desired port.

4. Choose the OK button.

Setting Up Printers

You use the Setup Printer command to specify the system default printer and set its output modes. You also use it to set a certain amount of time for printing problems to be corrected before Microsoft Excel sends you a message about the problem.

The system default printer is the printer normally used by Microsoft Excel. Printer output modes are printer-specific settings such as portrait (normal page orientation), landscape (horizontal page orientation), or color for plotters. These options vary from printer to printer. If you have several printers installed, you can use the Setup Printer command to let Microsoft Excel know which printer you want to use.

The two Printer Timeouts settings let you adjust the amount of time Microsoft Excel waits before sending you messages about printer problems.

The Device Not Selected setting controls the amount of time Microsoft Excel waits before notifying you that a printer is not ready to print. The default setting is 15 seconds.

The Transmission Retry setting controls the amount of time Microsoft Excel waits for output characters to be received by a printer before notifying you that it cannot print to the device. The default setting is 45 seconds.

To select a system default printer or change printer output modes:

1. Choose Setup Printer.

   A dialog box appears listing all available printers and their port connections.

2. To select a default printer, move to the Default Printer list box and select the name of the printer that you want as the default.

3. Choose the OK button.

   Another dialog box appears containing the default mode settings for your printer.

4. If necessary, change the settings.

5. Choose the OK button.

To change the amount of time Microsoft Excel waits before sending you messages about printing problems:

1. Choose Setup Printer.

   A dialog box appears.

2. To change the Device Not Selected setting, type the number of seconds you want Microsoft Excel to wait before sending you a message that the printer is not ready.

3. To change the Transmission Retry setting, type the number of seconds you want Microsoft Excel to wait before sending you a message that it cannot print.

4. Choose the OK button.

   A dialog box appears showing the default settings for your printer.

5. If necessary, change the settings.

6. Choose the OK button.

Setting Up a Communications Port

If you are setting up a communications device or serial printer, you need to set up a serial communications port. To do this, you use the Setup Communications Port command.

Note | If you are setting up a serial printer, check your printer's manual to make sure that the port settings you select are correct.

To choose a communications port:

1. Choose Setup Communications Port.

   A dialog box appears displaying the available serial ports and their port settings.

2. Choose a port.

   The dialog box settings change to reflect the current settings for that port.

3. Change the appropriate options to meet the needs of your hardware.

4. Choose the OK button.

Changing Screen Colors

Use the Preferences Screen Colors command to adjust the text and background colors on your screen. The Preferences Screen Colors command also lets you adjust the shades of gray on the screen. You can specify hue, brightness, and amount of color for the following areas of your screen:

- Screen background
- Application workspace
- Window background
- Window text
- Menu bar
- Menu text
- Active (selected) title bar
- Inactive (unselected) title bar
- Title bar text
- Active border
- Inactive border
- Window frame (the border that surrounds each window)
- Scroll bars

To change screen colors:

1. Choose Preferences Screen Colors.
2. In the list box, select the part of the screen or window for which you want to change the color.
3. Press TAB to move to the Hue scroll box.

   Use the RIGHT or LEFT key to change settings in small increments. To move across the scroll bar more quickly, use the PAGE UP or PAGE DOWN key. If you are using the mouse, you can click the scroll arrows or drag the scroll box.
4. Press TAB to move to the Bright scroll box.

   Use the RIGHT or LEFT key to change settings in small increments. To move across the scroll bar more quickly, use the PAGE UP or PAGE DOWN key. If you are using the mouse, you can click the scroll arrows or drag the scroll box.

   If the Bright scroll box is at the extreme left of the scroll bar, the color is black. If the scroll box is at the extreme right, the color is white.
5. Press TAB to move to the Color scroll box.

   Use the RIGHT or LEFT key to change settings in small increments. To move across the scroll bar more quickly, use the PAGE UP or PAGE DOWN key. If you are using the mouse, you can click the scroll arrows or drag the scroll box.

   Scroll to the right for a more vibrant, intense color. Scroll to the left for less intensity.

   If the Color scroll box is at the extreme left of the scroll bar, adjustments to the Hue and Bright scroll bars will result only in black and white and shades of gray.
6. When you have adjusted the screen colors to your satisfaction, choose the OK button.

   If you change your mind and want to return to the previous settings, choose the Reset button. This restores the original settings but does not close the dialog box.

   To cancel the new settings and close the dialog box, choose the Cancel button.

Changing the Window Border Width

The Preferences Border Width command lets you change the width of the border around a window. You cannot change the width of a fixed-size window, such as the Control Panel window.

To change window border width:

1. Choose Preferences Border Width.

   The Border Width text box shows the current width of the border.
2. To change the border width, type a new number.

   The larger the number, the wider the border.
3. Choose the OK button.

Turning Off the Warning Beep

When you are using Microsoft Excel, your computer sometimes beeps. For example, this occurs if you press the wrong key. You can turn off the beep with the Preferences Warning Beep command.

You can tell if the Warning Beep feature is in effect by looking at the Preferences menu. When the feature is active, a checkmark appears next to the Warning Beep command.

To turn the warning beep on or off:

- Choose Preferences Warning Beep.

Changing Mouse Options

The Preferences Mouse command lets you change which mouse button you press and adjust how fast the mouse pointer moves on the screen.

Microsoft Excel generally uses only the left mouse button. You can switch from the left mouse button to the right mouse button, and vice versa. With the Mouse Acceleration setting, you can increase or decrease the speed at which the pointer moves on the screen.

To adjust your mouse settings:

1. Choose Preferences Mouse.
2. To reverse mouse buttons, turn on the Swap Left/Right Mouse Buttons check box.
3. To change the speed at which the mouse pointer moves across the screen, select the acceleration rate you want.
4. Choose the OK button.

Once you have set these options, they remain set until you change them.

Country Settings

With the Preferences Country Settings command you can make changes to the following:

- Country
- Time format (12- or 24-hour)
- Trailing characters (A.M., P.M., etc.)
- Time-separator symbol
- Date format (month-day-year, year-month-day, etc.)
- Date-separator symbol
- Number-separator symbols
- Number of significant decimal digits
- List-separator symbol
- Leading zero
- Currency symbol
- Currency prefix or suffix

Changing Settings

To change country settings:

1. Choose Preferences Country Settings.
2. In the list box, select the appropriate country name.
   All of the other country settings automatically change to correspond to the country you select.
3. If you want, adjust any of the specific fields.
   If you decide that you don't want the changes you have made, choose the Reset button, which returns you to the settings you had when you chose the command.
4. Choose the OK button.

Creating New Settings

If the country name you want is not shown in the list box, you can create your own country settings.

To create a new country setting:

1. In the list box, select Other Country.
   The settings displayed are for your current country setting.
2. Change any of the settings you want.

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Microsoft Excel Update

Please note the following changes to the Microsoft Excel manuals. There are two parts to this Update; the first is for *Reference* and the second is for *Functions and Macros*. Please put each part of this Update into the appropriate manual.

Reference

This part of the Update contains changes to *Reference*.

Page 48: Printing a Chart
Page 288: Draft Quality

Most plotters print charts better when you use Draft Quality. If you are printing a chart on a plotter, turn on Draft Quality in the File Print dialog box when you print.

Pages 148 and 638: Sorting Data

The order in which text is sorted should be shown this way:

space	!	”	#	$	%	&	’	(	)	*	+	,	-	.	/	0	1
2	3	4	5	6	7	8	9	:	;	<	=	>	?	A	B	C	D	E
F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
Y	Z	@	[	\	]	^	_	‘	{	|	}	~	¢	¥	±			

Page 226: Edit Copy Picture command

The Edit Copy Picture command places a picture of the screen on the Clipboard. This picture is in the Microsoft Windows metafile format, and can be pasted from the Clipboard into most applications.

If the application into which you want to paste a picture does not accept the normal picture format, you can try pasting a bitmap. However, bitmaps tend to be rather large and can cause you to run out of memory. Also, bitmaps may not always print properly, especially on color plotters.

To copy a bitmap onto the Clipboard, hold down SHIFT when you choose the OK button in the Edit Copy Picture dialog box.

Page 235: Edit Paste Link command

You cannot paste into a multiple selection with Edit Paste Link.

Page 271: Chart Specifications

The maximum number of data points per series is listed as 2,045. It should be 2,000.

Page 274: Exchanging Data

Page 274 includes a list of Clipboard formats that Microsoft Excel supports. When you choose Edit Copy Picture, the picture is copied onto the Clipboard in the Microsoft Windows metafile format (CF_METAFILEPICT). A bitmap format (CF_BITMAP) is copied only if you hold down SHIFT when you choose the OK button in the Edit Copy Picture dialog box.

When you use the regular Edit Copy command, Microsoft Excel makes all relevant formats available. The application receiving the data determines which format is used to transfer the data.

Page 282: File Open command

Microsoft Excel opens files in CSV format, but only if the file has the .CSV filename extension. For best results, make sure that a file in CSV file format has the .CSV extension.

Page 306: Changing the Worksheet Font Set
Page 314: Printer Fonts
Pages 734–736: Choosing a Font

For best results on an HP LaserJet, make sure it is set to print at 300 DPI.

If the LaserJet is set to print at less than 300 DPI resolution, it treats stroke fonts such as Roman, Modern, and Script as screen fonts rather than printer fonts. This means that stroke fonts appear in the Format Font dialog box only if the Printer Fonts option is turned off. Also, the LaserJet substitutes its default font for the stroke fonts when you print a worksheet with stroke fonts. If you print a chart with stroke fonts, the fonts will print, but may not appear as they should.

To change the resolution used by your LaserJet:

1. Choose the Printer Setup command.
2. In the Printer list box, select HP Laserjet.
3. Choose the Setup button.
4. In the dialog box that appears, set the Graphics Resolution to 300 DPI.
5. Choose the OK button for both dialog boxes.

Page 485: Opening a Lotus 1-2-3 Worksheet

If the Lotus 1-2-3 worksheet you open has charts associated with it, Microsoft Excel asks you if you want to re-create the charts as Microsoft Excel charts. Choose the OK button to re-create the charts, or Cancel to open the worksheet without the charts.

Pages 491 and 496: Macro Translation Assistant

If you want to translate medium or large 1-2-3 macros, the Macro Translation Assistant requires expanded memory in addition to the 640K memory required to run Microsoft Excel. For information on expanded memory, see page 509, "Using Extra Memory."

Page 504: Macro Set Recorder command

If the first cell in the recorder range is not blank, Microsoft Excel displays a message that the record range is full, and does not set the recorder range.

If the selection is a single, non-blank cell, Microsoft Excel finds the last non-blank cell in the column, and starts recording in the blank cell below it. If the last non-blank cell contains a RETURN function, the RETURN is overwritten.

Page 509: Using Extra Memory

The top of page 509 lists two ways to take advantage of extra memory. A third way is to use a disk caching program. A disk caching program, SMARTDRV.SYS, is included with Microsoft Excel. For more information on SMARTDRV.SYS, run Setup and see the Special Information section.

Page 532: Multiplan Number Formats

The manual refers to the Commas command; it should refer to the "commas" field in the Format Options command. Microsoft Excel formats will all have commas if the "commas" field of the Format Options command in Multiplan is set to Yes.

Page 543: How Names are Applied

If the example worksheet shown on page 541 is used, and the Formula Apply Names command is used without changing the dialog box options, the order of the names that replace each reference would be reversed. Instead of January Balance, February Deposits, and February Withdrawals, the formulas on page 543 would have Balance January, Deposits February, and Withdrawals February.

To produce formulas with names in the order shown in the example on page 543, you would change the Name Order option in the dialog box from Row Column to Column Row.

Page 600: Printing a Document

In addition to directly printing a document, you can print to a file, then later print that file using the MS-DOS copy command.

Before you can print to a file, you need to set up the file as a printer.

To set up a file as a printer:

1. In your WIN.INI file, add a line to the [ports] section specifying the name of the file followed by an equal sign.

   For example, you would add the line *c:\print.prn=* to print to the file PRINT.PRN in the root directory of drive C. For more information on the WIN.INI file, see page 201, "Changing Defaults in the Startup File."

2. Quit and restart Microsoft Excel.

   If you are using Microsoft Excel with Microsoft Windows version 2.0 or higher, also quit and restart Microsoft Windows.

3. Use the Control Panel to connect a printer to the file.

   See page 737, "Connecting Printers." In step 3 of that procedure, the desired port would be the file you specified in the WIN.INI file.

Once the file is set up as a printer, you can select it as your current printer with the File Printer Setup command. You can then print to the file as you normally would, with the File Print command.

For more information on choosing a printer and printing, see "Printing a Document" in *Microsoft Excel Reference*.

Note Every time you print to the file, its previous contents are cleared. To save the file contents, rename the file using the MS-DOS RENAME command (or the Microsoft Windows File Rename command if you are using Microsoft Windows version 2.0 or higher) before printing to the file again.

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Part No. 01187

Microsoft Excel Update

This part of the Update contains changes to *Functions and Macros*.

Functions and Macros

Page 12: Translating Data Types

If a number is supposed to be an integer, the fractional part is deleted, just as in the TRUNC function (not the INT function).

Page 17: Commas

The third sentence in the first paragraph is missing the word "list." It should say:

"For example, for a function that takes three arguments, if you enter (,arg2,arg3) as the argument list, Microsoft Excel ..."

Page 35: CHOOSE

The second example is missing a closing parenthesis. It should be:

SUM(A1:CHOOSE(3,A10,A20,A30))

Page 62: INDIRECT

The example at the top of this page assumes that your workspace is set to display R1C1-style references. If your workspace is displaying A1-style references, you can get the same result by using:

INT(INDIRECT(A1,TRUE))

Pages 67 and 73: LINEST and LOGEST

These functions return an array in the form $\{m_n,m_{n-1},\ldots,m_1,b\}$. The manual shows these values in reversed order.

Page 71: LINEST

The first example on the page is missing a closing parenthesis. It should be:

SUM(LINEST(B2:B7)*{9,1})

Page 73: LOGEST

The equation for the exponential curve should be:

$(b*(m_1\hat{}x_1)*(m_2\hat{}x_2)*\ldots)$

Page 153: Starting Subroutine Macros

In the command macro example, the formula in cell A6 should be:

=FORMULA("=AVERAGE(RC[-5]:RC[-1])")

Page 168: Using References

In the last paragraph on this page, the second to last sentence should be:

"The formula =SELECT("R[8]C[-3]"), for example,..."

Page 175: What Actions Are Recorded?

In the second bulleted list on this page, the third item should be:

"Changing the current drive or directory in the dialog box of the File Open command is recorded as a DIRECTORY macro function, as well as an OPEN macro function."

Page 177: Using Arguments

Function macros can take only 13 arguments, not 14.

Pages 201–202: Example

The example works as is, but to use custom help topics and status bar command help messages, the references in the ADD.MENU and ADD.COMMAND macro functions should be to the ranges C11:G16 and C12:G16.

Pages 204, 206, and 210: Custom Dialog Boxes

In cell G19 of the example shown, the reference should be given in R1C1 style instead of A1 style (that is, R5C9:R20C9 instead of I5:I20).

Page 208: Custom Dialog Boxes

The lowest number that you can enter in an integer box is -32765, not -32768.

Page 218: Custom Dialog Box Example

The linked list box in the macro sheet at the top of the page should include the entry "Pants." To correct the example, enter *Pants* in cell J1 and change the reference in cell G11 to:

DIALOG.XLM!R1C10:R10C10

Page 232: Command Equivalent Functions

The File Close All command does have an equivalent macro function: CLOSE.ALL.

Page 252: ARGUMENT

Function macros can take only 13 arguments, not 14.

Page 257: CANCEL.KEY

The second argument, *macro_ref*, should be shown in italics. It is optional.

Page 277: FILE.CLOSE

This function takes one optional argument, *save_logical*. See the CLOSE macro function for a description of the argument *save_logical*.

Page 279: FONT

The macro function FONT should be inserted on this page:

FONT(name,size)

FONT?(*name,size*)

Note

This macro function is included for compatibility with macros written with Microsoft Excel for the Apple Macintosh.

If you want to change a font, you will typically use the REPLACE.FONT function.

Equivalent to the Options Font command in Microsoft Excel for the Apple Macintosh. Sets all four fonts of a document to the font named *name* with point size *size*.

Page 282: FORMAT.LEGEND

This function also has a dialog box form:

FORMAT.LEGEND?(*position_num*)

Page 283: FORMAT.TEXT

This function also has a dialog box form:

FORMAT.TEXT?(*x_align,y_align,vert_text,auto_text,auto_size, show_key,show_value*)

Page 286: FORMULA

The example under "If the active document is a chart:" should be:

=FORMULA("=SERIES(""Chart Title"",,{1,2,3},1)")

Page 286: FORMULA.FIND

This macro function has a fifth argument, *direction*, which is optional. Set *direction* equal to 1 for Next and 2 for Previous. If *direction* is omitted it is assumed to be 1.

Page 296: GET.DEF

The first argument, *def_text*, is required and should not be shown in italics.

Also, the second sentence should say "gives the reference" instead of "give the reference."

Page 301: GET.WINDOW

GET.WINDOW accepts another value for *type_of_info*. If *type_of_info* is 17, GET.WINDOW returns the active pane number, where 1 is the top left pane, 2 is the top right pane, 3 is the bottom left pane, and 4 is the bottom right pane. See the ACTIVATE macro function for more information on pane numbers.

Page 304: HELP

Help_ref must be given in the form of text. For example, to display the help topic numbered 101 in the file HELP.TXT, use the following function:

=HELP("HELP.TXT!101")

Page 308: INPUT

The example at the top of the page should include the *default* argument, between *"title"* and *x_pos*.

Page 322: OPEN

The syntax of the OPEN and OPEN? functions should be:

OPEN(file_text,*update_links*,*read_only*)

OPEN?(*file_text*,*update_links*,*read_only*)

When you are opening a file in WKS or WK1 format, use the *update_links* argument to specify whether or not Microsoft Excel should generate charts from any graphs attached to the WKS or WK1 file. If *update_links* is 0, charts are not created. If *update_links* is 2, charts are created.

Page 329: PASTE.SPECIAL

The third form of PASTE.SPECIAL (bottom half of page 329) applies if you have copied from a chart and are pasting into a chart.

Page 330-331: PATTERNS

The form of PATTERNS that applies if the current selection is a chart, plot area, legend, text label, area, or bar has one additional argument: *invert*. The correct syntax is:

PATTERNS(b_auto,b_style,b_color,b_wt,shadow,
a_auto,a_pattern,a_fore,a_back,invert,APPLY)

Invert corresponds to the Invert if Negative check box. This argument is ignored unless the current selection is a bar.

Page 345: SAVE.AS

If you set *type_num* equal to 0 and omit all other arguments — that is, SAVE.AS(,0) — SAVE.AS marks the active file as saved but does not write it to disk. This can be useful if you want to close a document without saving changes, and don't want Microsoft Excel to display a message asking if you want to save changes.

Page 363: Subroutines

Function macros can take only 13 arguments, not 14.

Page 370: WORKSPACE

The arguments *formula* and *status* are reversed. The correct syntax is:

WORKSPACE(fixed,decimals,r1c1,scroll,status,formula,menu,remote)

WORKSPACE?(*fixed,decimals,r1c1,scroll,status,formula,menu,remote*)

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