Lotus 1-2-3 Release 3.1

Upgrader's Handbook

Contents

How to Use this Handbook

This handbook is intended for users who are upgrading from a previous release of 1-2-3® or are familiar with many of the 1-2-3 features.

The handbook includes the following chapters:

- Chapter 1 orients you to the 1-2-3 Release 3.1 screen and describes the differences between the Release 2 and Release 3.1 working environments.
- Chapter 2 acquaints you with many of the new features in 1-2-3 Release 3.1 through keystroking instructions you can follow using the sample files provided in the 1-2-3 package. The chapter also directs you to the sections in the documentation that tell you more about the new features.
- Chapter 3 provides guidelines for converting files from previous releases for use in 1-2-3 Release 3.1 and for sharing information in Release 3.1 files with other releases. The chapter includes information on converting macros for use in Release 3.1.
- Chapter 4 describes 1-2-3 Release 3.1 features whose performance differs somewhat from corresponding features in 1-2-3 Release 2.

NOTE This handbook uses Release 2 to mean Release 2, Release 2.01, and Release 2.2, unless otherwise noted.

NOTE Before you can use this handbook, you must use the 1-2-3 Release 3.1 Install program, as described in *Setting Up 1-2-3*.

Using the Sample Files

The sample files that accompany Chapter 2 include the following:

- ACCTG.WK3
- CONSOL.WK3
- DATA.WK3
- EXPENSES.WK1
- MFG.WK3
- SALES.WK3
- SHOES.WK3
- SUMMARY.WK3
- TABLES.WK3

These files are located in your 1-2-3 Release 3.1 program directory, because the Install program transfers the files to this directory when you installed 1-2-3.

The instructions in Chapter 2 include instructions for saving the sample files. If you want to use the sample files more than once, make backup copies of the files before you begin Chapter 2 or, when the instructions tell you to save a sample file, save the file using a different name so you can use the original version again.

Chapter 1
The 1-2-3 Release 3.1 Environment

The 1-2-3 Release 3.1 environment is very similar to the Release 2 environment. As you work with Release 3.1, however, you will notice a few differences in the appearance of the worksheet and in the appearance of some indicators and messages. This chapter tells you what differences you can expect to see as you work with Release 3.1.

To find out which commands are new in Release 3.1, see the menu trees at the end of *Quick Reference*. The new Release 3.1 commands are highlighted in the menu trees.

The Release 3.1 Screen

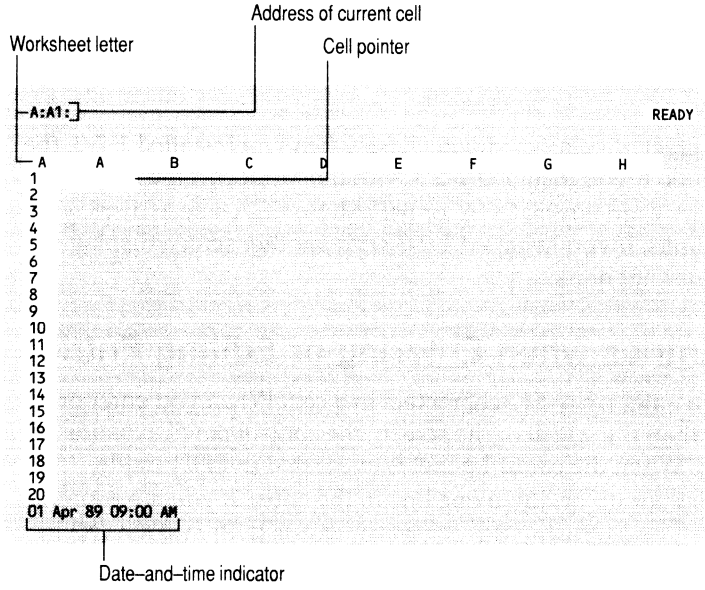

Figure 1-1 The 1-2-3 Release 3.1 screen

The 1-2-3 Release 3.1 worksheet looks very much like the worksheet in previous releases, with the following differences:

- The cell address in the upper left corner of the control panel now includes a **worksheet letter** that shows you which worksheet the current cell is in. 1-2-3 uses a : (colon) to separate the worksheet letter from the rest of the cell address.

In Figure 1-1, for example, the address A:A1 shows that the current cell is cell A1 in worksheet A. Provided your computer has enough memory, you can have up to 256 worksheets in a file — from worksheet A to worksheet IV.

The worksheet letter also appears in the upper left corner of the worksheet frame.

- The worksheet frame now contains highlights that indicate the row and column position of the cell pointer.
- When you read a file into memory, the date-and-time indicator changes to show the name of the current file.

Number of Rows on the Screen

With the exception of Color Graphics Adapter and 64K EGA screen display cards, all the screen display cards you can use with 1-2-3 let you display more than 25 lines. If you installed 1-2-3 with a screen display card that lets you display more than 25 lines and chose to display a number of lines greater than 25, 1-2-3 reduces the size of the text and numbers on your screen so you can see more information at one time.

WAIT Indicator

Depending on the type of screen display card you chose when you installed 1-2-3, the WAIT indicator may not blink. If you installed 1-2-3 with the Monochrome Display Adapter, Hercules® Graphics Card 80x25, CGA, or 64K Mono EGA screen display card, the WAIT indicator blinks. If you installed 1-2-3 with another screen display card, the WAIT indicator does not blink.

Display of Long Entries when Entering or Editing Entries

In 1-2-3 Release 3.1, you can enter up to 512 characters in a cell. When you enter or edit an entry that is longer than the width of the screen, the control panel expands so you can see the entire entry. When the control panel is expanded in EDIT mode, pressing ↑ or ↓ moves the cursor up or down one line in the entry. If you are running a macro, however, pressing ↑ or ↓ or using the macro keywords {UP} or {DOWN} in EDIT mode always completes editing and moves the cell pointer up or down one or more cells.

Graph Axes and Pie Charts

When you view a graph with an x-axis and y-axis in Release 3.1, the tick marks on the x-axis and y-axis appear inside the graph. When you view a graph with an x-axis and y-axis in Release 2, the tick marks on the x-axis and y-axis appear outside the graph. In addition, Release 3.1 displays pie charts differently from Release 2. Using the first value in the data range as a starting point and starting at 3 o'clock, Release 3.1 graphs the values in the range in a counterclockwise direction, in order of their appearance in the range. Release 2 graphs the values in the data range in a clockwise direction starting at 12 o'clock.

Appearance of Numbers, Text, and Graphs

If you installed 1-2-3 with a screen display card that can display a graph in a graph window — for example, the EGA screen display card — the numbers, text, and graphs in your Release 3.1 worksheets look slightly different from the numbers, text, and graphs you see when you work with worksheets in Release 2, because of the new 1-2-3 Release 3.1 screen fonts. If you installed 1-2-3 with a screen display card that cannot display a graph in a graph window — that is, with the Monochrome Display Adapter, Hercules Graphics Card 80x25, CGA, or 64K Mono EGA screen display card — the numbers, text, and graphs in your Release 3.1 worksheets have the same appearance they have in Release 2 worksheets.

Macro Menus

When you run a macro that displays a macro menu and then make a selection from the menu, the menu may not disappear immediately. The presence of the menu on the screen does not interfere with the operation of the macro, however.

CALC Indicators

1-2-3 Release 3.1 displays two different types of CALC indicators. A red CALC indicator (or, for monochrome monitors, a white CALC indicator) appears in the status line when 1-2-3 performs a background recalculation. A blue CALC indicator (or, for monochrome monitors, a white reverse-video CALC indicator) appears if /Worksheet Global Recalc is set to Manual and you change data in the worksheet. A blue CALC indicator reminds you that you may now need to press **CALC (F9)** to update your formulas.

PRT Indicator

1-2-3 Release 3.1 displays a PRT indicator at the bottom of the screen when you are printing on a printer or to a file. The PRT indicator appears when you select /Print [E,F,P] Go and remains on the screen until 1-2-3 finishes printing or you select /Print Cancel.

Background Error Messages

In Release 3.1, you can use the Print commands to start a printing operation and then continue to work with worksheets while 1-2-3 prints. This is called background printing. If the printer develops a problem while it is printing, 1-2-3 displays a background error message, that is, a message that appears on the screen but does not put 1-2-3 in ERROR mode. To clear a background error message from the screen, select /Print Cancel or correct the printer problem and then select /Print Resume. Pressing **ESC** will not clear the error message.

Chapter 2
What's New: 1-2-3 Release 3.1 Features

1-2-3 Release 3.1 provides many new features while retaining the familiar menu structure and ease of use of previous releases. Release 3.1 offers

- New worksheet features, including multiple worksheets in the same file, the ability to see three worksheets at the same time, and cell mapping.
- New file features, including multiple files in memory, file protection, and file compatibility with previous releases of 1-2-3.
- New graph features, including additional graph types, a hot-view graph window, and greater flexibility in graph customization.
- New data features, including the ability to read data from external database tables into 1-2-3, searching for data in multiple input ranges, and enhanced sorting.
- New print features, including background printing, graph printing from within 1-2-3, and merged text and graphs for reports.
- New range features, including search and replace, new formatting options, and other ease-of-use and editing enhancements.
- New macro features, including additional advanced macro commands and macro key names, an unlimited number of macro range names, and keystroke recording to simplify building macros.
- New @functions, additional function keys and pointer-movement keys, new file types and extensions, more flexible use of memory, and network support.

How to Use this Chapter

The first four sections of this chapter include keystroking instructions you can follow using sample files included in your 1-2-3 package. At the end of each section, you can end 1-2-3 or continue to the next section. You should read the sections in sequence, because some of the procedures in later sections assume a knowledge of procedures introduced in earlier sections.

Before you begin this chapter, make sure you have made backup copies of the sample files and read Chapter 1. Chapter 1 describes the parts of the 1-2-3 Release 3.1 screen you need to know about before you begin using Release 3.1 with the sample files. In addition, you need to be familiar with the Data Sort and Data Query commands in

previous releases of 1-2-3 before you use the sample files that accompany the section on the new 1-2-3 Release 3.1 database features.

Starting 1-2-3 and Using the Sample Files

When you install 1-2-3, the Install program automatically transfers the sample files to your 1-2-3 Release 3.1 program directory. To start 1-2-3 and use it with the sample files, make your 1-2-3 Release 3.1 program directory the current directory and then enter 123 at the operating system prompt.

If you copied the sample files to another directory after you installed 1-2-3, start 1-2-3 as described above and then use /File Dir to change the directory to the directory containing the sample files.

Worksheet

This section introduces you to the new 1-2-3 Release 3.1 worksheet features.

Retrieving a Release 2 File

1-2-3 Release 3.1 lets you retrieve and work with files created using other releases of 1-2-3. In this section, you'll retrieve a file that was created using Release 2.

When you retrieve a file created using another release of 1-2-3, 1-2-3 Release 3.1 converts the file to the Release 3.1 file format while the file is in memory. For this reason, it may take longer to retrieve such a file than it does to retrieve a Release 3.1 file, depending on the size of the file.

Select /File Retrieve EXPENSES.WK1

Notice that the indicator in the bottom left corner of the screen (called the **file-and-clock** indicator) now shows the name of the current file, EXPENSES.WK1. Although 1-2-3 reads EXPENSES.WK1 into memory as a Release 3.1 file, 1-2-3 displays the extension .WK1 to remind you that the file was created using Release 2. You then have the option of saving the file as a Release 2 or Release 3.1 file, as you'll see later on.

Introducing Multiple Worksheets

Of the new 1-2-3 Release 3.1 features, one of the most significant is the use of multiple worksheets. The three-dimensional structure of multiple worksheets helps you organize, manage, and consolidate your data. You can have up to 256 worksheets in memory at the same time, provided your computer has enough memory. (See Appendix 4 of *Reference* for information on memory management.)

The following figure shows how you might use multiple worksheets to organize and consolidate sales information for three divisions of a company.

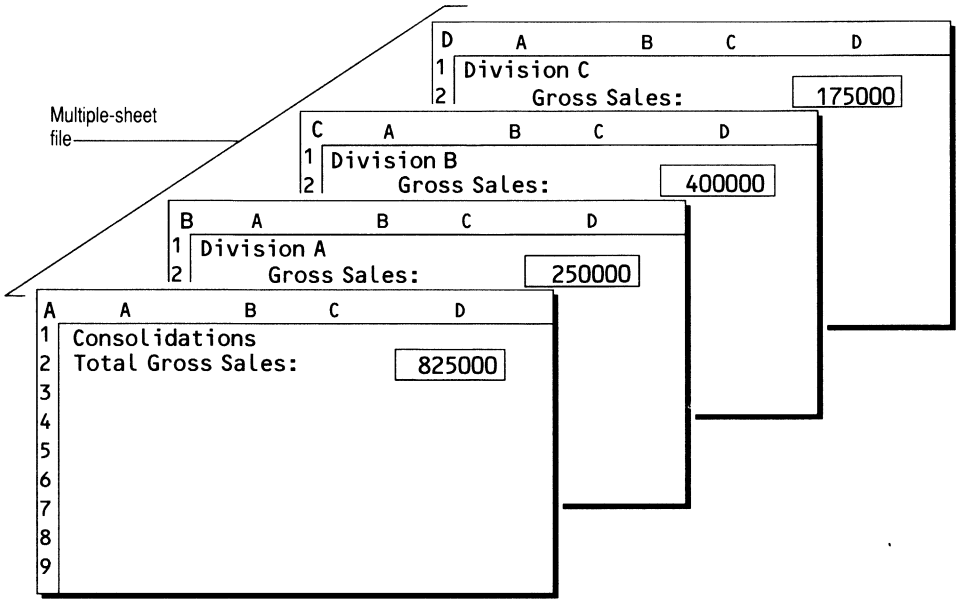

Figure 2-1 A file containing multiple worksheets

Inserting Multiple Worksheets in a File

In Release 3.1, one file can contain multiple worksheets. To add new worksheets to a file, you insert them either before or after the **current worksheet** (the worksheet containing the cell pointer). In this section, you'll insert three new worksheets in EXPENSES.WK1.

Select /Worksheet Insert Sheet After

Enter 3

1-2-3 inserts three worksheets after worksheet A and labels the new worksheets B, C, and D. The first of the three new worksheets, worksheet B, becomes the current worksheet. The cell pointer is in B:A1.

Tips

You can also delete one or more worksheets from a file by using /Worksheet Delete Sheet. If you delete worksheets from EXPENSES.WK1, remember to insert the correct number of new worksheets before you continue in this section.

Moving Between Worksheets

1-2-3 Release 3.1 provides several keys that let you move the cell pointer between worksheets. The following instructions show you how to use these keys to move between worksheets.

Move to worksheet A by pressing **PREV SHEET (CTRL-PGDN)**

Move to worksheet D by pressing **NEXT SHEET (CTRL-PGUP)** three times

Move to worksheet A by pressing **FIRST CELL (CTRL-HOME)**

The following table summarizes the keys you can use to move between worksheets in a multiple-sheet file.

Key	Effect
NEXT SHEET (CTRL-PGUP)	Moves the cell pointer to the next worksheet.
PREV SHEET (CTRL-PGDN)	Moves the cell pointer to the previous worksheet.
FIRST CELL (CTRL-HOME)	Moves the cell pointer to cell A1 in worksheet A, unless worksheet A is hidden, column A in the worksheet is hidden, or titles are set for the worksheet.
LAST CELL (END CTRL-HOME)	Moves the cell pointer to the lower right corner of the file's active area. The active area is a three-dimensional area between worksheet A and the last nonblank worksheet in the file. The first cell in the active area of a file is always A:A1; the last cell is the cell in the same row as the lowest nonblank cell in the file and the same column as the rightmost nonblank cell in the file.
END NEXT SHEET (END CTRL-PGUP)	Moves the cell pointer back through worksheets in a file. The cell pointer stays in the same row and column, but moves back to the next cell that contains data and adjoins a blank cell either in front of or behind it. If none of the cells in this position in the remaining worksheets in the file contain data, the cell pointer moves to the last worksheet in the file.
END PREV SHEET (END CTRL-PGDN)	Moves the cell pointer forward through worksheets in a file. The cell pointer stays in the same row and column, but moves forward to the next cell that contains data and adjoins a blank cell either in front of or behind it. If none of the cells in this position in the preceding worksheets in the file contain data, the cell pointer moves to the first worksheet in the file.

NOTE 1-2-3 remembers which cell you last highlighted in a worksheet and moves the cell pointer to that cell when you move to that worksheet using NEXT SHEET (CTRL-PGUP) or PREV SHEET (CTRL-PGDN). For example, if B:G12 was the last cell you highlighted in worksheet B and the cell pointer is now in worksheet A, pressing NEXT SHEET (CTRL-PGUP) moves the cell pointer to B:G12. When your worksheets are in perspective view and you select /Worksheet Window Sync, however, or if 1-2-3 is in POINT mode or the file containing the cell pointer is in GROUP mode, pressing NEXT SHEET (CTRL-PGUP) or PREV SHEET (CTRL-PGDN) moves the cell pointer to a location that corresponds to the original location of the cell pointer. For example, if the cell pointer is in A:C9 when you press NEXT SHEET (CTRL-PGUP), the cell pointer moves to B:C9. Perspective view is described in the next section; GROUP mode is described later in the chapter.

Viewing Multiple Worksheets

1-2-3 Release 3.1 can display three separate windows on the screen, letting you view and work with multiple worksheets in perspective view. The window containing the cell pointer is called the **current window**.

Move to A:A1 by pressing FIRST CELL (CTRL-HOME)
Select /Worksheet Window Perspective

Tips

To clear windows from the screen, use /Worksheet Window Clear.

Moving Between and Expanding Windows

The following table shows the keys you can use to move between windows and resize windows when 1-2-3 is in perspective view.

Key	Effect
WINDOW (F6)	Moves the cell pointer to the next window.
ZOOM (ALT-F6)	Expands the current window to the full size of the screen or, if the current window is full size, shrinks the window and restores all the windows to the screen.

WINDOW (F6) moves the cell pointer between the three windows currently on the screen. When 1-2-3 is in perspective view and the current file contains more than three worksheets, you must use the keys described in "Moving Between Worksheets" to move a new worksheet into view in the windows.

Move to A:A1 by pressing FIRST CELL (CTRL-HOME)
Move to worksheet C by pressing WINDOW (F6) twice
Move to worksheet D by pressing NEXT SHEET (CTRL-PGUP)
Press ZOOM (ALT-F6) *to restore the perspective view*
Press ZOOM (ALT-F6) again *to restore the three windows to the screen*

Copying Data to a Three-Dimensional Range

A **three-dimensional range** is a range that spans two or more consecutive worksheets in a file. The address of a three-dimensional range includes the worksheet letters of the first and last worksheets in the range. For example, the address A:A1..C:B4 refers to a range that includes cells A1..B4 in worksheets A, B, and C.

In this section, you'll use /Copy to copy the contents of A1..E10 in worksheet A to B:A1..D:E10, a three-dimensional range that spans worksheets B, C, and D. First, however, make sure your worksheets are in perspective view, to make it easier to see what's happening.

Select	/Worksheet Window Perspective, *if necessary, to put your worksheets in perspective view*
Move	to A:A1 by pressing **FIRST CELL (CTRL-HOME)**
Select	/Copy
Specify	A:A1..A:E10 *as the range you want to copy FROM*
Highlight	B:A1..D:A1 *(the range you want to copy TO) as follows:*
	Move to B:A1
	Anchor the cell pointer in B:A1 by pressing . (period)
	Move to D:A1
	Notice that the range address in the control panel is B:A1..D:A1.
Press	**ENTER** *to complete the copy*

Using GROUP Mode

GROUP mode causes all worksheets in a file to take on the worksheet settings of the current worksheet. For example, GROUP mode formats all worksheets in a file using the cell formats of the current worksheet. GROUP mode does not affect the contents of cells.

In this section, you'll turn GROUP mode on to set the widths of all the columns in worksheets B, C, and D to the widths of the corresponding columns in worksheet A.

Move	to A:A1 *to make the settings in worksheet A the current settings*
Select	/Worksheet Global Group Enable
	Column A in each worksheet in the file is now 18 characters wide, because column A in the current worksheet (worksheet A) is 18 characters wide.

You'll work more with GROUP mode later in this chapter.

Turning On the Undo Feature

The undo feature lets you cancel mistakes you make as you work. The feature is initially off; if you want to use it, you must turn it on. You'll use it later in this section, so turn it on now.

Select	/Worksheet Global Default Other Undo Enable
Select	Quit

Tips

If you want 1-2-3 to turn on the undo feature automatically each time you start the program, turn on the undo feature with /Worksheet Global Default Other Undo Enable and then select /Worksheet Global Default Update. Keep in mind that 1-2-3 will use more memory when the undo feature is on.

Searching for and Replacing Text

/Range Search lets you search for — and, as an option, replace — text in labels and/or formulas. A piece of text you search for or use as replacement text is called a **string**.

In this section, you'll use /Range Search to replace all the occurrences of the word Telephone with Phone in the range A:A1..D:A6.

Move	to A:A1
Select	/Range Search
Specify	A:A1..D:A6 *as the range you want to search*
Enter	telephone *as the search string*
	1-2-3 does not distinguish between uppercase and lowercase letters when searching for strings.
Select	Labels Replace
Enter	Phone *as the replacement string for telephone*
Select	All
	1-2-3 replaces the word Telephone with the word Phone each time it finds Telephone in the range you specified.

Using the Undo Feature

When the undo feature is on, UNDO (ALT-F4) cancels the last 1-2-3 operation that changed one or more entries or worksheet settings since the last time 1-2-3 was in READY mode.

Press UNDO (ALT-F4)

Select Yes

1-2-3 restores the worksheet to the state it was in before you selected /Range Search Replace. The word Telephone now reappears in cells A:A6, B:A6, C:A6, and D:A6.

Saving a Release 2 File as a Release 3.1 File

If you insert worksheets in a Release 2 file and want to save the file with the additional worksheets and new Release 3.1 features such as the new @functions, you must save the file as a Release 3.1 file. In this section, you'll save EXPENSES.WK1 as a Release 3.1 file.

Select /File Save

1-2-3 displays the file name EXPENSES.WK1 in the control panel. To save this file as a Release 3.1 file, you must specify the .WK3 extension.

Press BACKSPACE

Enter 3

You now have two copies of the file on your disk: the original Release 2 version (EXPENSES.WK1) and the new Release 3.1 version (EXPENSES.WK3). In addition, note that 1-2-3 now displays EXPENSES.WK3 in the file-and-clock indicator.

Tips

Unless you need to share your Release 2 files with other users of Release 2, save your Release 2 files as Release 3.1 files. 1-2-3 Release 3.1 retrieves Release 3.1 files more quickly than Release 2 files.

For more information on working with Release 2 files in Release 3.1, see Chapter 3.

Retrieving a Release 3.1 File

Next you'll retrieve a Release 3.1 file that is similar to the file you created earlier, but contains more data. The file contains expense information for several departments and an incomplete summary worksheet. Worksheet A contains the summary, and worksheets B, C, and D contain the individual department data.

Select /File Retrieve CONSOL.WK3

Select /Worksheet Window Perspective

Look at the contents of the file using the keys described in "Moving Between Worksheets" earlier in this chapter.

Entering Dates

Using 1-2-3 Release 3.1, you can enter dates more easily than in previous releases. When you enter a date in one of the 1-2-3 Date formats, 1-2-3 automatically converts the entry to a date number. You can then format the cell to display the contents of the cell as a date. You no longer have to use the @DATE function to calculate date numbers.

Move to A:A2

Enter 17-sep

1-2-3 enters the date number for September 17 of the current year in the current cell. (If you do not specify the year, 1-2-3 uses the date used by the clock in your computer to determine the year.)

Next you'll format the cell so that its contents appear as a date.

Select /Range Format Date 1

Specify A:A2..A:A2 *as the range to format*

The date now appears in Date 1 format in the worksheet.

In the following section, you'll use /Data Fill to enter dates in the range A:B3..A:E3. Before you do this, format the range using a Date format (D2).

Select /Range Format Date 2

Specify A:B3..A:E3 *as the range to format*

Using /Data Fill to Enter Dates

/Data Fill now lets you enter a sequential list of dates or times. You'll use /Data Fill to enter a series of dates one month apart in the row above the headings identifying the types of expenses.

Select /Data Fill

Specify A:B3..A:E3 *as the range you want to fill with dates*

Enter 1-jan *as the start value*

This date is in Date 2 (D2) format. For /Data Fill, 1-2-3 recognizes Date formats D1 through D4.

Enter 1m *as the step value*

Enter 1-apr *as the stop value*

1-2-3 enters the date numbers for January 1, February 1, March 1, and April 1 in the range. Because you formatted the range with D2 format, 1-2-3 displays the date numbers as dates.

You can also enter a step value representing days, weeks, quarters, or years if you are filling a range with dates or seconds, minutes, or hours if you are filling a range with times. See /Data Fill in Chapter 2 of *Reference* for more information.

Using NAME (F3) to Enter Formulas

You can enter formulas that refer to cells in different worksheets. In this section, you'll use the @SUM function to total the expenses for all three departments in the summary worksheet (worksheet A). You'll enter the name of the @SUM function in the control panel by choosing it from a list on the screen. Although in this case you know which @function you want to use, the ability to select an @function from the screen is useful when you cannot remember the name of a particular @function.

Move to A:B5

Type @

Press **NAME (F3)** *to display the beginning of a list of all the available @functions in alphabetical order*

Press **NAME (F3)** again *to expand the list of @functions to a full-screen list*

Depending on your hardware and the screen display driver you selected using the Install program, the list may not fit on a single screen.

Select SUM

If SUM does not appear on the screen, use **PGDN** to display the remaining section of the list and then select SUM.

Highlight B:B5..D:B5

Notice that when you move the cell pointer from worksheet C to worksheet D, 1-2-3 displays worksheet D in the top window and replaces worksheet A with worksheet B in the bottom window.

Type)

Press **ENTER**

Now copy the formula from A:B5 to the range A:B5..A:E8.

Move to A:B5

Select /Copy

Specify A:B5..A:B5 *as the range you want to copy FROM*

Specify A:B5..A:E8 *as the range you want to copy TO*

Copying Formulas Across Worksheets

In this section, you'll enter a formula that totals the expenses for January in A:B10 and then copy the formula to the Totals rows in all four worksheets.

Move	to A:B10
Enter	@sum(a:b5..a:b8)
Select	/Copy
Specify	A:B10..A:B10 *as the range you want to copy FROM*
Specify	A:B10..D:E10 *as the range you want to copy TO*

1-2-3 copies the formula in A:B10 to each cell in A:B10..D:E10 and adjusts the cell references accordingly.

Setting the Column Width of a Range of Columns

/Worksheet Column Column-Range changes the width of several adjacent columns at once. Before you use this command, you'll turn on GROUP mode so that the column-width changes you make will affect all the worksheets in the file.

Select	/Worksheet Global Group Enable

Now you'll change the widths of columns B, C, D, and E with /Worksheet Column Column-Range.

Move	to column B in worksheet A, *if necessary*
Select	/Worksheet Column Column-Range Set-Width
Specify	columns B through E *as the columns whose widths you want to change*
Enter	12 *as the column width for each column*

1-2-3 widens columns B, C, D, and E in each worksheet in the file to 12 characters.

Saving a Release 3.1 File

Save the current file using /File Save.

Select	/File Save CONSOL.WK3
Select	Replace
Select	Quit *to end 1-2-3*
Select	Yes

NOTE If you select /Quit and then Yes and you have worksheets you have changed but not saved, 1-2-3 displays another No/Yes menu and asks if you want to end the 1-2-3 session anyway. Select No to cancel the command and then save the worksheets; select Yes to end the session without saving your worksheets.

Additional Worksheet Features

To decrease calculation time, 1-2-3 now recalculates only those cells that are affected by a change in the worksheet. Furthermore, you can continue to work while 1-2-3 recalculates. If you make a change that affects a cell 1-2-3 is currently using in a recalculation, 1-2-3 stops the recalculation and begins the recalculation again.

Using other 1-2-3 Release 3.1 worksheet features, you can do the following:

- Format a cell by typing an entry in the format you want for the cell. To do this, you use a new format called Automatic format. (See /Range Format in Chapter 2 of *Reference*.)
- Add a comment at the end of a formula to record the purpose of the formula. (See "Entering Formulas" in Chapter 1 of *Reference*.)
- Write notes along with range names to keep track of the data each range name represents. (See /Range Name Note in Chapter 2 of *Reference*.)
- Display a worksheet map — an image of the worksheet that displays symbols that indicate whether cells contain labels, numbers, or formulas. (See /Worksheet Window Map in Chapter 2 of *Reference*.)
- Display and print negative numbers in a different color (if you have a color monitor and color printer) or with a brighter intensity (if you have a monochrome monitor). (See /Range Format in Chapter 2 of *Reference*.)
- If you specified two screen display modes when you used Install, you can change display modes by using /Worksheet Window Display. (See /Worksheet Window Display in Chapter 2 of *Reference*.)

File

This section introduces you to the new 1-2-3 Release 3.1 file features and shows you how to do the following:

- Work with more than one file in memory (open a file)
- Move between files
- Link files with formulas
- Save and back up one of several files in memory

Retrieving a File

In this section, you'll work with four files that are used to track and summarize a company's fixed asset records. Three of the files contain information on the company's three departments, Sales, Accounting, and Manufacturing. The fourth file summarizes the data from the three departments.

You'll begin by retrieving the summary file and looking at the two worksheets in the file.

Select /File Retrieve SUMMARY.WK3

Worksheet A contains information on the file.

Move to worksheet B

Worksheet B contains a partially completed summary of the fixed asset records in the other files. You'll complete the summary later.

Opening a File

In addition to having multiple worksheets in a single file, you can have multiple files in memory. A file in memory is called an **active file**. To bring a file into memory without replacing any active files, you use /File Open. This command lets you open a file before or after the **current file** (the file containing the cell pointer).

You'll open the file containing Sales department information after the current file, SUMMARY.WK3.

Select /File Open After SALES.WK3

1-2-3 displays worksheet A of SALES.WK3 on the screen. The indicator in the bottom left corner of the screen changes to SALES.WK3 to show that SALES.WK3 is now the current file.

Select /Worksheet Window Perspective *to view the two files in memory*

1-2-3 displays worksheet B of SUMMARY.WK3 in the bottom window and worksheets A and B of the current file, SALES.WK3, in the top two windows.

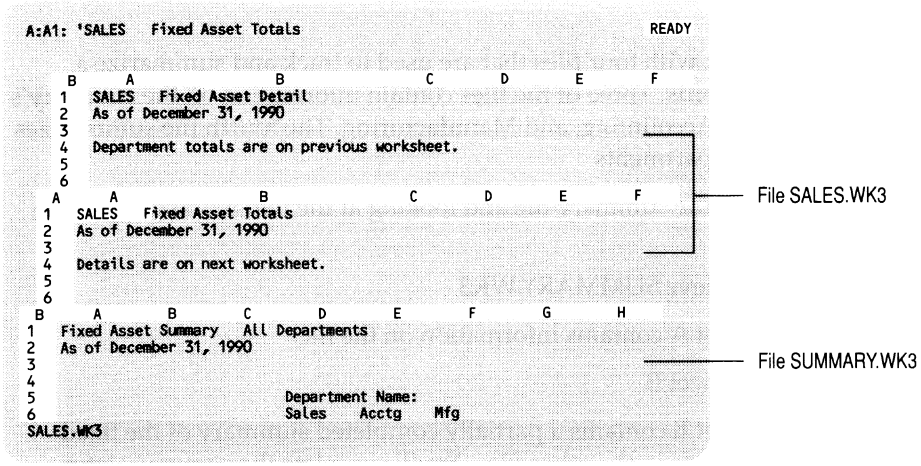

Figure 2-2 Two files in perspective view

When you have more than one active file, you can move from one worksheet to the next using the same keys you use to move between worksheets within a file.

Move to worksheet B of SUMMARY.WK3 *by pressing*
PREV SHEET (CTRL-PGDN)

The indicator in the bottom left corner of the screen changes from SALES.WK3 to SUMMARY.WK3.

Move to worksheet A of SUMMARY.WK3 *by pressing*
PREV SHEET (CTRL-PGDN)

Tips

When you want to work with multiple files in memory, use /File Open instead of /File Retrieve to read the files into memory because /File Retrieve removes the current file from memory.

Moving Between Files

1-2-3 Release 3.1 provides several keys that let you move between active files. Using these keys is a two-step process: first you press **FILE (CTRL-END)**, and then you press another key or key combination.

You'll move from worksheet A of SUMMARY.WK3 to SALES.WK3, the next active file, using **NEXT FILE (CTRL-END CTRL-PGUP)**.

Move to worksheet A of SUMMARY.WK3, *if necessary*
Press **CTRL-END**

The FILE indicator appears in the lower right corner of the screen, indicating that the next pointer-movement key combination will move the cell pointer to a different file.

Press CTRL-PGUP

1-2-3 moves the cell pointer to SALES.WK3, the next file after SUMMARY.WK3.

Similarly, to move to the previous active file, SUMMARY.WK3, you'll use **PREV FILE (CTRL-END CTRL-PGDN)** as follows:

Press CTRL-END

Press CTRL-PGDN

1-2-3 moves the cell pointer to SUMMARY.WK3, the file preceding SALES.WK3.

The following table shows the keys you can use to move between active files. Practice using these keys before you continue with the exercise.

NOTE Remember that you can also use **NEXT SHEET (CTRL-PGUP)** and **PREV SHEET (CTRL-PGDN)** to move the cell pointer to any worksheet in any file in memory.

Key	Effect
NEXT FILE (CTRL-END CTRL-PGUP)	Moves the cell pointer to the cell you last highlighted in the next active file.
PREV FILE (CTRL-END CTRL-PGDN)	Moves the cell pointer to the cell you last highlighted in the previous active file.
LAST FILE (CTRL-END END)	Moves the cell pointer to the cell you last highlighted in the last active file.
FIRST FILE (CTRL-END HOME)	Moves the cell pointer to the cell you last highlighted in the first active file.

Moving Around a File

Before continuing with the exercise, restore the screen to one window and then examine the contents of the Sales department file.

Select /Worksheet Window Clear

Move to worksheet A in SALES.WK3 as follows:

Press **FIRST FILE (CTRL-END HOME)** *to move to the last cell you highlighted in SUMMARY.WK3*

Press **NEXT SHEET (CTRL-PGUP)** once or twice *to move to worksheet A in SALES.WK3*

Press **HOME** to move to A:A1, *if the cell pointer is not already there*

Move to A:C8 to examine the formula

Each formula in A:C8..A:C10 totals the contents of a named range. These range names refer to ranges in worksheet B.

Move to worksheet B of SALES.WK3

This worksheet contains the detailed fixed asset records for the Sales department.

In the next section, you'll open two more files that contain similar types of information. Then later on, you'll create a formula in SUMMARY.WK3 that refers to another cell in one of these files.

Opening Additional Files

Next you'll open two more files behind SALES.WK3.

Move to SALES.WK3, *if necessary*

Select /File Open After ACCTG.WK3

ACCTG.WK3 is now the current file.

Select /File Open After MFG.WK3

MFG.WK3 is now the current file.

Look at the contents of the new files using the pointer-movement keys that move the cell pointer between files and between worksheets. (See "Moving Between Files" in this section and "Moving Between Worksheets" in "Worksheet" for lists of pointer-movement keys.)

Linking Files with Formulas

1-2-3 Release 3.1 lets you create formulas in one file that refer to cells or ranges in another file. The file to which these formulas refer can be active (in memory) or on disk. When you enter a formula in one file that refers to a cell or range in another file, you create a link between the files.

When you retrieve a file that contains a formula referring to another file, you can update the formula with the data in the other file by selecting /File Admin Link-Refresh.

In this section, you'll create a formula in B:D8 in SUMMARY.WK3 that refers to the cell containing the Cost amount for the Sales department.

Select /Worksheet Window Perspective *to put your worksheets in perspective view*

Move to SUMMARY.WK3 by pressing **FIRST FILE (CTRL-END HOME)**

Move to worksheet B by pressing **NEXT SHEET (CTRL-PGUP)**, *if necessary*

Move to B:D8 *(the cell in which you'll create the formula)*

Cells B:E8 and B:F8 contain formulas that refer to the Cost amounts for the Accouting and Manufacturing departments, respectively.

Type + *to begin creating the formula*

Move to worksheet A in SALES.WK3 *by pressing* **NEXT SHEET (CTRL-PGUP)**

The cell pointer moves to cell D8 of worksheet A of SALES.WK3. When you move between worksheets or files in POINT mode, the cell pointer stays in the same cell position as it moves from worksheet to worksheet.

In the control panel, 1-2-3 displays a + (plus sign), the path and file name SALES.WK3 enclosed in << >> (double angle brackets), and the cell address A:D8. For example, if your 1-2-3 Release 3.1 program directory is C:\123R3, 1-2-3 displays +<<C:\123R3\SALES.WK3>>A:D8.

The << >> (double angle brackets) indicate a **file reference**, or file specification. You use a file reference whenever you want to refer to a cell or range in a file that is not the current file.

Move to A:C8 *(the cell containing the total Cost amount)*

Press **ENTER** *to complete the formula*

1-2-3 enters the total Cost amount for the Sales department (3150) in cell B:D8 of SUMMARY.WK3. The formula in B:D8 consists of a + (plus sign), a file reference for SALES.WK3, and the range address A:C8..A:C8. For example, if your 1-2-3 Release 3.1 program directory is C:\123R3, 1-2-3 displays the formula +<<C:\123R3\SALES.WK3>>A:C8..A:C8.

Saving and Backing Up One of Several Files in Memory

When you have more than one active file, /File Save gives you the option of saving all the files at once or saving only the current file. Because you modified only one file — SUMMARY.WK3 — you'll save only that file.

You'll use a /File Save option that saves two copies of the file: a copy that contains the changes you made in the current session, and a copy of the file as it was the last time you saved it (called a **backup copy**).

NOTE If you select /File Save when you have more than one active file, 1-2-3 displays [ALL MODIFIED FILES] in the control panel. If you then press **ENTER**, 1-2-3 automatically saves all the files in memory, using the current name of each file. Because you are saving only one file, you should not press **ENTER** when this text appears in the control panel.

Move to SUMMARY.WK3, *if necessary*

Select /File Save

1-2-3 displays [ALL MODIFIED FILES] at the prompt for the file name.

Press **ESC** *to display the name of the current file, SUMMARY.WK3*

Press **ENTER** *to save SUMMARY.WK3 in the current directory*

Select Backup

1-2-3 saves the modified version of the file in SUMMARY.WK3 and saves the preceding version unchanged in a file called SUMMARY.BAK.

Removing Files from Memory

You can remove, or delete, a file from memory by using /Worksheet Delete File.

You'll use /Worksheet Delete File to remove SUMMARY.WK3 from memory.

Select /Worksheet Delete File

1-2-3 displays a list of all the files currently in memory.

Specify SUMMARY.WK3

1-2-3 removes SUMMARY.WK3 from memory. The file remains on disk, however.

Now you'll remove the remaining files from memory using /Worksheet Erase Yes.

Select /Worksheet Erase Yes Yes

1-2-3 removes the remaining three files from memory and clears the windows from the screen.

Additional File Features

Using other 1-2-3 Release 3.1 file features, you can do the following:

- Prevent changes to data and settings such as cell formats, titles, and column widths. (See /File Admin Seal in Chapter 2 of *Reference*.)
- Create an alphabetical list (or table) of all active files or the files in any directory. For each file in the table, 1-2-3 shows the date and time the file was last modified and the size of the file. (See /File Admin Table in Chapter 2 of *Reference*.)

Graph

This section introduces you to the new 1-2-3 Release 3.1 graph features and shows you how to do the following:

- Create a graph automatically
- Create a graph using /Graph Group
- Create a graph window

Creating a Graph Automatically

1-2-3 Release 3.1 now lets you create graphs by moving the cell pointer to the range that contains the data you want to graph and then pressing **GRAPH (F10)**. This feature is called **automatic graphing**. You'll retrieve a file and then graph the data in the file using automatic graphing.

Select	/File Retrieve SHOES.WK3
	This single-sheet file contains the 1989 monthly sales data for a company that operates a chain of athletic shoe stores.
Move	to A:A7 *or any other cell within the range containing the monthly sales data you are graphing*
Press	**GRAPH (F10)** *to create the graph*
Press	**ESC** *to clear the graph from the screen*

To create an automatic graph, 1-2-3 uses the data surrounding the cell pointer and specifies the graph ranges accordingly. The first (leftmost) column in the area around the cell pointer corresponds to the X range, and the columns immediately to the right of the first column correspond to the A through F data ranges. Because the cell pointer is currently in an area of the worksheet that contains only five adjacent columns of information, the automatic graph of this area has an X range (in column A) and four numeric data ranges. Data range A is in column B, data range B is in column C, data range C is in column D, and data range D is in column E.

NOTE You can set whether 1-2-3 uses columns or rows as data ranges by using /Worksheet Global Default Graph Columnwise or Rowwise or /Graph Group Columnwise or Rowwise.

1-2-3 uses the current graph type for the automatic graph and any other current settings such as the settings for titles.

Creating a Graph Using /Graph Group

/Graph Group lets you specify all the graph data ranges in one step. You can use this command if the data you want to graph is in adjacent rows or columns. You'll use /Graph Group to graph the sales data in columns B, C, and D, leaving out the data in column E.

Move	to A:A7
Select	/Graph Group
Specify	A:A7..A:D18 *as the range you want to graph*
Select	Columnwise *to indicate the data ranges are in columns*
Select	View *to view the graph*
	The data showing the sales for aerobic shoes is not included in the graph, as it was when you created an automatic graph in the previous section.
Press	ESC *to return to the /Graph menu*
Select	Quit *to return 1-2-3 to READY mode*

Creating a Graph Window

You can display a graph and a worksheet on the screen at the same time by creating a graph window. While a graph window is on the screen, you can continue to work in any active file. If you make any changes in the data on which the graph is based or change the appearance of the graph using the Graph commands, 1-2-3 Release 3.1 automatically updates the graph to reflect the changes.

When you create a graph window, 1-2-3 splits the screen vertically at the location of the cell pointer and displays the current graph in the righthand window. You'll create a graph window beginning in column E and then update the graph by making a change in the worksheet.

NOTE Some monitors cannot display a graph in a graph window. If you have such a monitor, the graph window will be blank when you complete the following procedure.

Move	to any cell in column E
Select	/Worksheet Window Graph
	1-2-3 splits the screen beginning in column E, displays the current graph in the righthand window, and leaves the cell pointer in the left window. You cannot move the cell pointer into the graph window.
Move	to A:D17
Enter	80000
	1-2-3 updates the graph in the graph window to reflect the change in the worksheet.

Before you finish this section, you'll create an **area graph** in the graph window. In an area graph, the lines are stacked and the areas between the lines are filled with different colors or hatch patterns.

Select /Graph Options Format Graph Area

Select Quit *three times*

Next, you'll clear the graph window from the sceen.

Select /Worksheet Window Clear *to remove the graph window from the screen*

Additional Graph Features

Using other 1-2-3 Release 3.1 graph features, you can do the following:

- Create graphs using several new graph types. (See "Graph Types" in Chapter 2 of *Reference*.)
- Choose the colors, hatch patterns, fonts, and text sizes for your displayed and printed graphs. (See /Graph Options Advanced Text in Chapter 2 of *Reference*.)
- Make colors and hatch patterns depend on values in the worksheet. For example, you can have 1-2-3 display a bar in red if the value of a cell is above a certain number and in green if the value is below that number. (See /Graph Options Advanced Colors and Hatches in Chapter 2 of *Reference*.)
- Add two lines of explanatory text to the bottom of a graph. (See /Graph Options Titles in Chapter 2 of *Reference*.)
- Create a graph that includes two y-axes. (See /Graph Type in Chapter 2 of *Reference*.)
- Display a graph with a logarithmic scale. (See /Graph Options Scale in Chapter 2 of *Reference*.)
- Save a graph in two different formats: graphic metafile (CGM) or picture file (PIC). This lets you use 1-2-3 graphs with most graphics and word processing programs. (See /Graph Save and /Worksheet Global Default Graph in Chapter 2 of *Reference*.)
- Create a table of all the named graphs in a file. For each graph name in the table, 1-2-3 shows the graph type and the first line of the graph's title. (See /Graph Name Table in Chapter 2 of *Reference*.)

Database

This section introduces you to the new 1-2-3 Release 3.1 database features and shows you how to do the following:

- Sort a database table using extra sort keys
- Perform calculations in an output range by using computed columns and aggregate columns
- Extract data from multiple tables

You should be familiar with /Data Sort and /Data Query before you use the following sections.

Sorting a Database Table Using Extra Sort Keys

1-2-3 Release 3.1 now lets you specify as many as 255 sort keys when you sort information in a worksheet. After you specify the first and second sort keys using /Data Sort Primary-Key and /Data Sort Secondary-Key, you use /Data Sort Extra-Key to specify any additional keys. You'll retrieve a file and then sort the database table in the file using three sort keys.

Select	/File Retrieve DATA.WK3
	The database table in this single-sheet file contains employee information for several departments of a small company. The table is sorted alphabetically by employee name.
Move	to A:A2
Select	/Data Sort Data-Range
Specify	A:A2..A:G30 *as the range you want to sort*
Select	Primary-Key
Specify	the JOB field *as the primary sort key by moving to A:D2 and pressing* **ENTER**
Press	**ENTER** *to specify Descending as the sort order*
Select	Secondary-Key
Specify	the YEARS field *as the secondary sort key by moving to A:E2 and pressing* **ENTER**
Press	**ENTER** *to specify Descending as the sort order*
Select	Extra-Key
	1-2-3 displays a 1 in the control panel to indicate you are specifying the first extra sort key.
Press	**ENTER** *to confirm you want to specify the first extra sort key*
Specify	the SALARY field *as the extra sort key by moving to A:F2 and pressing* **ENTER**

Press ENTER *to specify Descending as the sort order*

Select Go *to sort the records in the database table*

1-2-3 sorts the records in the database table by the contents of the JOB field. 1-2-3 sorts records with the same JOB entry by the contents of YEARS, and records with the same JOB and YEARS entries by the contents of SALARY.

Creating a Computed Column in an Output Range

You can perform calculations with the contents of a database table by setting up an output range that contains formulas in addition to field names. When you select /Data Query Extract, 1-2-3 performs the calculation specified in the formula and enters the results in the column containing the formula. Such a column is called a **computed column**..

To learn about computed columns, you'll work with worksheet A of a file named TABLES.WK3. You'll use the remaining worksheets in the file in the remaining two sections on the new database features.

Select /File Retrieve TABLES.WK3

Worksheet A contains a database table, a criteria range, and an output range, each of which has a range name. The range name of each range appears above the range in the worksheet. For example, CRIT1 is the name of the range in A:E3..A:G4.

Next, in place of the field name RATE in the output range, you'll enter a formula that multiplies the contents of the RATE field by 5%. You can use the field name RATE in the formula, even though you have not defined RATE as a range name.

NOTE The formula will evaluate to ERR because you have not defined RATE as a range name. This does not affect the query, however. To display the formula instead of its result, you'll format the cell with /Range Format Text.

Move to A:G8

Enter +rate*1.05

1-2-3 displays ERR in the cell.

Select /Range Format Text

Specify A:G8..A:G8 *as the range to format*

1-2-3 displays the formula as text in the cell.

Select /Data Query Input

Specify STAFF *as the range containing the records you want to extract to the output range*

Select Criteria

Specify CRIT1 *as the range containing your selection criteria*

Select Output

Specify OUTPUT1 *as the range to which you want to copy the records*

Select Extract

Because the criteria range is blank, 1-2-3 selects all the records in the input range and, for each record, copies the contents of the PERSON and LEVEL fields to the output range. In addition, 1-2-3 multiplies the value in the RATE field of each record by 1.05 and enters the result in the appropriate cell in the third column of the output range.

Select Quit *to return 1-2-3 to READY mode*

NOTE You can use selection criteria in the criteria range when you create a computed or aggregate column in an output range. For example, to calculate the effect of increasing the billing rate for rates over $40, you could enter the criterion '>40 under RATE in the criteria range, erase the records in the output range, and reselect /Data Query Extract. (Notice also that you no longer have to enter a complete formula as a criterion in the criteria range.)

Creating an Aggregate Column in an Output Range

An aggregate column is a type of computed column that calculates a total for a group of related values. You create an aggregate column by entering one of the following @functions in the output range: @AVG, @COUNT, @MAX, @MIN, and @SUM. You'll use an aggregate column containing an @SUM formula to perform calculations with the data in a database table in worksheet B.

Move to worksheet B

This worksheet contains a database table with the range name WEEKLY. The table contains information about the hours each employee worked during the last week of July, 1989. Each record represents the time one person worked for one client during the week.

Move to worksheet C

This worksheet contains a criteria range and an output range. You'll use these ranges to extract information from the database table in worksheet B.

Move to C:C8

Enter @sum(hours)

This formula totals the values in the HOURS field for each employee. The cell has already been formatted with /Range Format Text, so 1-2-3 displays the formula in the cell instead of ERR.

Select /Data Query Reset *to clear the current settings for the input, output, and criteria ranges*

Select Input

Specify WEEKLY *as the range containing the records you want to copy to the output range*

Select Criteria

Specify CRIT2 *as the range containing your selection criteria*

Select Output

Specify OUTPUT2 *as the range to which you want to copy the records*

Select Extract *to extract the records*

1-2-3 calculates the aggregate column based on the fields specified in the output range. Because the field name NAME appears in the output range and the criteria range is blank, 1-2-3 creates one record in the output range for each unique entry in the NAME field of the input range, WEEKLY. In the aggregate column, 1-2-3 enters the sum of all the values in the HOURS field for each employee.

Select Quit *to return 1-2-3 to READY mode*

Extracting Data from Multiple Tables

1-2-3 Release 3.1 lets you perform queries that combine data from two or more tables. In this section, you'll combine data from STAFF and WEEKLY into a single output range so you can work with the combined data to update the company's billing records.

To set up a query that combines data from two or more tables, you create a join formula in the criteria range, create an output range that contains some or all of the field names in each table you want to query, and specify an input range that includes the range names or addresses of each table in the query. (You'll use **NAME (F3)** when you specify tables STAFF and WEEKLY in the input range.)

A **join formula** establishes a relationship between the keys in two database tables. A **key** is a field or set of fields containing information that uniquely identifies each record in a database table. The single-field keys in the tables you want to join are NAME in the WEEKLY table and PERSON in the STAFF table.

Move to worksheet D

This worksheet contains a criteria range (CRIT3) and an output range (OUTPUT3). The output range contains field names from both tables and a formula that multiplies the contents of RATE by the contents of HOURS.

Move to D:B4

Enter +name=person *to create the join formula*

This formula tells 1-2-3 to compare the contents of STAFF and WEEKLY and create a third, new record for each pair of records that contain matching NAME and PERSON entries.

Select Data Query Reset *to clear the current settings for the input, output, and criteria ranges*

Select Input

Specify tables STAFF and WEEKLY *as the input range, as follows:*

- Press **NAME (F3)** twice *to display a full-screen list of range names*
- Specify STAFF
- Press **ENTER** *to complete the specification of the first table*
- Select Input
- Type , *(comma) to indicate you want to specify a second range name*

  The address of the current cell appears following the comma in the control panel.
- Press **NAME (F3)** twice *to display a full-screen list of range names*
- Specify WEEKLY
- Press **ENTER** *to complete the specification of the input range*

Select Criteria

Specify CRIT3

Select Output

Specify OUTPUT3

Select Extract

1-2-3 combines the data from STAFF and WEEKLY in the output range and, using the formula in column F of the output range, multiplies the rates from STAFF by the hours from WEEKLY.

Select Quit *to return 1-2-3 to READY mode*

Select /File Save TABLES.WK3

Select /Quit Yes

Additional Database Features

Using other 1-2-3 Release 3.1 database features, you can do the following:

- Access data in database tables created with a database management program other than 1-2-3, for example, dBASE III®. These database tables are called **external tables**. (See /Data External in Chapter 2 of *Reference*.)
- Modify records you extract from an external table or 1-2-3 database table and return the modified records to the original table. (See /Data Query Modify in Chapter 2 of *Reference*.)

- Use the new advanced macro commands {FORM} and {APPENDBELOW} to create forms that let you enter data directly into your database tables. (See "Advanced Macro Commands" in Chapter 4 of *Reference*.)
- Create a data table that calculates the results of one formula that uses three variables; or calculate the results of one or more formulas that use an unlimited number of variables. (See /Data Table 3 and /Data Table Labeled in Chapter 2 of *Reference*.)

Print

This section introduces you to the new 1-2-3 Release 3.1 print features and explains how to set up your printer for use with Release 3.1. There is no sample file for this section.

With the 1-2-3 Release 3.1 print features, you can do the following:

- Print graphs within 1-2-3 using the Print commands; a separate PrintGraph program is no longer necessary. You can also include graphs in your print range so you can print graphs and text on the same page. (See Chapter 2 of the *Tutorial* and /Print [E,F,P] Range in Chapter 2 of *Reference*.)
- Print text and graphs horizontally on the page, if your printer has this capability. This is called printing in landscape mode. Printing in **landscape mode** allows you to print wider printouts. (See /Print [E,P] Options Advanced Layout Orientation in Chapter 2 of *Reference*.)
- Continue to work in the worksheet while 1-2-3 is printing; you no longer have to wait for 1-2-3 to finish printing. (See "Background Printing" in "Print Commands" in Chapter 2 of *Reference*.)
- Print a sample printout that lists the current print settings, shows a small worksheet using the current settings, and shows the print options available on your printer. If your printer can print graphs, the sample also includes a graph using the current print settings and a chart showing the available graph fonts and sizes. (See /Print [E,F,P] Sample in Chapter 2 of *Reference*.)
- Specify multiple ranges and graphs from the same or different worksheets or files and select Go only once to print all of the ranges and graphs. (See Chapter 2 of the *Tutorial* and /Print [E,F,P] Range in Chapter 2 of *Reference*.)
- Use menu commands to do the following: print compressed, standard, or expanded characters; print compressed or standard pitch (line spacing); and print fonts and colors available on your printer. You no longer need setup strings for these print attributes. (See /Print [E,P] Options Advanced in Chapter 2 of *Reference*.)

- Print worksheet letters, column letters, and row numbers with your print range. (See /Print [E,F,P] Options Borders in Chapter 2 of *Reference*.)
- Name groups of print settings and save them with your files. You can then use named print settings whenever you want without having to respecify each setting individually. (See /Print [E,F,P] Options Name in Chapter 2 of *Reference*.)
- Control the printer while it is printing. You can temporarily suspend printing and resume it later, or you can cancel a print job entirely. You can also queue several print jobs to one printer and assign the print jobs different priorities to control the order in which they print. (See /Print Cancel, /Print Suspend, and /Print Printer Options Advanced Priority in Chapter 2 of *Reference*.)

Setting Up Your Printer for Use with Release 3.1

Before you begin printing using Release 3.1, you need to do the following:

- Set the page length to the correct number of lines per page for your printer
- Print a sample printout to determine your printer's capabilities

Setting Page Length

Use /Print [E,F,P] Options Pg-Length to make sure the page length is set to the correct number of lines for your printer and to change the setting, if necessary. The initial setting for page length is 66 lines per page, the setting for dot matrix printers. If you are using a laser printer, however, you need to change the page length. For example, the HP® LaserJet® requires a setting of 60 lines per page. Consult your printer manual for information on the number of lines per page your printer prints.

If you want to print using landscape mode, you must first change the page length setting and the right margin setting.

To save the default page-length setting for future Release 3.1 work sessions, select /Worksheet Global Default Printer Pg-Length, change the setting, and then select /Worksheet Global Default Update.

NOTE For a list of page-length settings for selected printers, see the table at the end of "Print" in Chapter 5 of *Reference*.

Printing a Sample Printout

In general, it is a good idea to use /Print [E,F,P] Sample Go to print a sample printout before you print your work in Release 3.1. The sample printout shows you exactly what the capabilities of your printer are.

If you want to choose different fonts and colors for your printed text, you must use /Print [E,F,P] Sample Go first to print a sample printout. 1-2-3 identifies each font and color with a number on the sample printout. These numbers correspond to the numbers 1-2-3 displays when you select /Print [E,P] Options Advanced Color or Fonts to choose a different color or font for your printed text. To make a meaningful

color or font selection, you must match the numbers on the menus with the numbers on the sample printout.

Figure 2-3 shows part of a sample printout.

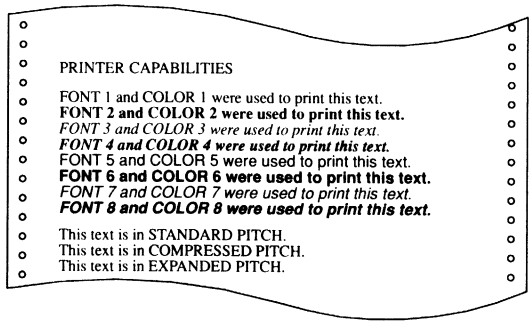

Figure 2-3 Part of a sample printout

Macros

This section introduces you to the new 1-2-3 Release 3.1 macros features.

Recording Keystrokes

With the record feature, 1-2-3 automatically records your keystrokes as you work, so you can easily replay keystrokes or create macros.

See Chapter 5 of the *Tutorial* and "Using the Record Feature for Macros" in Chapter 4 of *Reference*.

Unlimited Macro Names

You can name an unlimited number of macros in a file. Each macro name can be as long as 15 characters.

See "Creating a Macro" in Chapter 4 of *Reference*.

New Advanced Macro Commands and Macro Key Names

1-2-3 Release 3.1 includes new advanced macro commands and new arguments and capabilities for existing advanced macro commands, as follows:

Command	Action
{APPENDBELOW}	Copies data in one range to the bottom of another range. Use this command in conjunction with {FORM} to copy new records from entry forms to database tables.
{APPENDRIGHT}	Copies data in one range to the right of another range.
{BREAK}	During data entry or selection of a 1-2-3 command, returns 1-2-3 to READY mode.
{FORM}	Similar to /Range Input, this command is especially useful in conjunction with {APPENDBELOW} to enter new records in database tables.
{FORMBREAK}	Ends a {FORM} command.
{FRAMEOFF}	Turns off the display of the worksheet frame (worksheet and column letters and row numbers).
{FRAMEON}	Turns on the display of the worksheet frame following a {FRAMEOFF} command.
{GRAPHOFF}	Cancels a {GRAPHON} command.
{GRAPHON}	Displays the current graph or a named graph.
{INDICATE}	Now lets you make the mode indicator as long as the width of the screen.
{PANELOFF}	A new optional argument, clear, clears the control panel and status line.
{SYSTEM}	Sends a command to the operating system and then returns to 1-2-3.

1-2-3 includes the following new macro key names:

Key name	Action
{ADDIN}	Invokes the function key **ADDIN (ALT-F10)**, which displays a menu that lets you use 1-2-3 Release 3.1 add-ins.
{CE}	Clears the information 1-2-3 automatically displays at a prompt, such as the name of a file when you select /File Save.
{FILE}	Turns on the FILE status indicator at the bottom of the screen. Must be used in conjunction with another pointer-movement key to move between active files.
{FIRSTCELL}, {FC}	Moves the cell pointer to cell A:A1 in the current file.
{FIRSTFILE}, {FF}	Moves the cell pointer to the cell you last highlighted in the first active file.

(Continued)

Key name	Action
{HELP}	Lets you use the 1-2-3 Help screens during a macro.
{LASTCELL}, {LC}	Moves the cell pointer to the end of the active area in the current file.
{LASTFILE}, {LF}	Moves the cell pointer to the cell you last highlighted in the last active file.
{NEXTFILE}, {NF}	Moves the cell pointer to the cell you last highlighted in the next active file.
{NEXTSHEET}, {NS}	Moves the cell pointer to the next worksheet.
{PREVFILE}, {PF}	Moves the cell pointer to the cell you last highlighted in the previous active file.
{PREVSHEET}, {PS}	Moves the cell pointer to the previous worksheet.
{U}, {D}, {L}, {R}	Can take the place of {UP}, {DOWN}, {LEFT}, and {RIGHT}.
{ZOOM}	Switches worksheet windows between their original size and full-screen size.

To create 1-2-3 macro applications, see Chapter 5 of the *Tutorial* and Chapter 4 of *Reference*.

@Functions

1-2-3 includes new @functions and new arguments for existing @functions, as follows:

@Function	Action
@CELL and @CELLPOINTER	Each includes the following new arguments: coord, filename, and sheet.
@COORD	Creates an absolute, mixed, or relative reference from values you provide
@DGET	Finds a value or label in a field of a database table, based on certain criteria.
@DQUERY	Sends a command to an external database management program, letting you use functions that are not part of 1-2-3 but are understandable to the external database.
@DSTDS	Calculates the sample standard deviation of values in a field of a database table, based on certain criteria.
@D360	Calculates the number of days between two date numbers, based on a 360-day year with 30 days per month.
@DVARS	Calculates the sample variance of values in a field of a database table, based on certain criteria.
@INDEX	Now includes an additional optional argument.

(Continued)

@Function	Action
@INFO	Reports system information for the current session, such as the number of files in memory or the operating system you are using.
@ISRANGE	Determines whether the specified argument is a defined range name or valid range address.
@SHEETS	Counts the worksheets in a range.
@STDS	Calculates the sample standard deviation of a list of values.
@SUMPRODUCT	Sums the product of corresponding elements in multiple ranges.
@VARS	Calculates the sample variance of a list of values.
@VDB	Calculates depreciation using the double-declining balance method and allows the percentage of straight-line depreciation to be values other than 200%.

See "@Function Descriptions" in Chapter 3 of *Reference*.

Additional Function Keys

1-2-3 has some new function keys as well as enhanced capabilities of other function keys:

Function key	Action
ADDIN (ALT-F10)	Displays a menu that lets you use 1-2-3 Release 3.1 add-ins.
APP1 (ALT-F7), APP2 (ALT-F8), APP3 (ALT-F9)	Starts an available 1-2-3 Release 3.1 add-in assigned to the key.
GOTO (F5)	Now lets you move the cell pointer to a different worksheet in the current file or to a different active file.
NAME (F3)	Now displays a list of @functions or advanced macro commands or key names if you are entering a formula or macro.
RECORD (ALT-F2)	Lets you use the contents of the record buffer or turn STEP mode on or off.
RUN (ALT-F3)	Selects a macro to run.
UNDO (ALT-F4)	Cancels any changes you made to your worksheet since 1-2-3 was last in READY mode.
ZOOM (ALT-F6)	Switches worksheet windows between their original size and full-screen size.

See "1-2-3 Function Keys" in Chapter 1 of *Reference*.

Additional Pointer-Movement Keys

1-2-3 has new pointer-movement keys to help you navigate between worksheets and files:

Key name	Action
END NEXT SHEET (END CTRL-PGUP)	In READY and POINT modes, moves back through multiple worksheets to the next cell that contains data and adjoins a blank cell either in front of or behind it.
END PREV SHEET (END CTRL-PGDN)	In READY and POINT modes, moves forward through multiple worksheets to the next cell that contains data and adjoins a blank cell either in front of or behind it.
FIRST CELL (CTRL-HOME)	In READY and POINT modes, moves to cell A:A1 in the current file.
FIRST FILE (CTRL-END HOME)	In READY and POINT modes, moves to the cell you last highlighted in the first active file.
LAST CELL (END CTRL-HOME)	In READY and POINT modes, moves to the end of the active area in the current file.
LAST FILE (CTRL-END END)	In READY and POINT modes, moves to the cell you last highlighted in the last active file.
NEXT FILE (CTRL-END CTRL-PGUP)	In READY and POINT modes, moves to the cell you last highlighted in the next active file.
NEXT SHEET (CTRL-PGUP)	In READY and POINT modes, moves to the next worksheet. In EDIT mode, completes editing and, if you are using multiple worksheets, moves to the next worksheet.
PREV FILE (CTRL-END CTRL-PGDN)	In READY and POINT modes, moves to the cell you last highlighted in the previous active file.
PREV SHEET (CTRL-PGDN)	In READY and POINT modes, moves to the previous worksheet. In EDIT mode, completes editing and, if you are using multiple worksheets, moves to the previous worksheet.

See "Using Multiple-Sheet Files" and "Working with Multiple Files" in Chapter 1 of *Reference*.

Additional 1-2-3 File Types

1-2-3 has added some new file types:

Extension	File type
.BAK	A backup worksheet file 1-2-3 creates when you use /File Save or /File Xtract.
.CGM	A graphic metafile. You can save graph files in .CGM format if you select Metafile with /Worksheet Global Default Graph.
.ENC	An encoded file 1-2-3 creates when you use /Print Encoded. An encoded file can contain text, graphs, and special formatting characters.
.TMP	A temporary file 1-2-3 creates to complete an operation that requires more memory than is currently available. 1-2-3 deletes .TMP files when you end the program.
.WK3	A Release 3.1 worksheet file.

See "Working with Files" in Chapter 1 of *Reference*.

Networks

1-2-3 now provides increased network support.

Sharing 1-2-3 Data Files

You can share 1-2-3 worksheet files on a network that Lotus supports, making it easier to share data with other 1-2-3 users. All 1-2-3 file features, such as file linking, also apply to files available on a network.

For information on sharing data files, see Appendix 5 of *Reference*.

File Reservations

1-2-3 Release 3.1 has new menu commands that help prevent conflicts when more than one person is working in the same data file on a network. With the File Admin commands, you can restrict access to shared files through file reservations, which allow only one user at a time to save changes to a file. Reservations ensure that users do not inadvertently write over others' changes.

For information about maintaining data integrity in a multi-user environment, see /File Admin Reservation in Chapter 2 of *Reference* and in Appendix 5 of *Reference*.

Password Protection

For network security, you can limit access to a data file by including a password when you save the file.

You can also use a password with /File Admin Seal to protect data or settings in a file. Other users can read the file into memory, but can make changes only to unprotected data. To unseal the file, you must enter the exact password.

To protect files with passwords, see /File Save and /File Xtract in Chapter 2 of *Reference*. For information on password protection of worksheet and reservation settings, see /File Admin Seal in Chapter 2 of *Reference*.

Printing on a Network

If your personal computer is connected to a network printer, you can print on the network printer as well as on your local printer.

See "Printing on a Network" in Appendix 5 of *Reference*.

Chapter 3
Sharing Files with 1-2-3 Release 2 Users

This chapter explains how to

- Convert Release 2 files to Release 3.1 files
- Save Release 3.1 files as Release 2 files
- Convert Release 2 macros to Release 3.1 macros

Converting Release 2 Files to Release 3.1 Files

1-2-3 Release 3.1 lets you read and work with files created in all other releases of 1-2-3. When you work with a file created in Release 2, you can save the file using its original format (the .WK1 format) or convert it to a Release 3.1 file by saving it with the extension .WK3. When you read a Release 1A (.WKS) file into memory, 1-2-3 converts the file to a Release 3.1 (.WK3) file; you must then save the file as a .WK3 or .WK1 file to preserve any changes you make in the file.

You should be aware of the following points as you work with .WK1 or .WKS files in Release 3.1:

- If you intend to work with a .WK1 file in Release 3.1 only, you should save the file as a .WK3 file. 1-2-3 Release 3.1 reads .WK3 files more quickly than it does files with other formats.
- If 1-2-3 displays nonstandard characters on the screen when you read a .WK1 or .WKS file into memory, select /Worksheet Global Default Other International Release-2, change the setting for the character set (LICS or ASCII) that 1-2-3 uses to display .WK1 files in Release 3.1, and read the .WK1 or .WKS file into memory again.
- If a formula in a .WK1 file contains a range name that refers to a single cell, 1-2-3 displays the cell address rather than the range name when you read the file into memory. When you read the file back into Release 2, the range name reappears in the formula.
- If you read a .WKS file into memory, 1-2-3 displays ERROR as the mode indicator and the message 'File and/or extension converted' to inform you that the file has been converted to .WK3 format and has been given a .WK3 extension. The original .WKS file remains unaltered on disk.

- If a file is sealed or contains more than one worksheet, you cannot save it as a .WK1 file.

NOTE 1-2-3 Release 3.1 also lets you read and work with files created in all previous releases of Symphony®. When you read a Symphony file into memory, 1-2-3 converts the file to a .WK3 file. If you do not need to work with the file in Symphony, save the file as a .WK3 file. If you want to work with the file again in Symphony, save the file as a .WK1 file. When you save the file as a .WK1 file, however, some Release 3.1 features may be lost. See the section below for information on what happens when you save a .WK3 file as a .WK1 file.

Upgrading Release 3 files to Release 3.1 Files

To ensure that your 1-2-3 Release 3 worksheet files are completely updated to reflect the capabilities of 1-2-3 Release 3.1, Lotus recommends that you follow this procedure for each .WK3 worksheet file.

1. Retrieve the worksheet file with /File Retrieve.
2. Determine the current recalculation order by selecting /Worksheet Status. Make a note of the recalculation order (for example, Natural, Rowwise or Columnwise), and then press **ENTER**.
3. To ensure that your entire worksheet is recalculated, you need to temporarily change the recalculation order of the worksheet. To do so, select /Worksheet Global Recalc. Then, select a recalculation order other than the one currently selected. For example, if the recalculation order of your worksheet is already Rowwise, select Natural or Columnwise.
4. Press **CALC (F9)**.
5. Change the recalculation order back to the original setting noted in step 2 by selecting /Worksheet Global Recalc and then selecting the original recalculation order.
6. Press **CALC (F9)**.
7. Save your worksheet file with /File Save to save the recalculation results.

Saving Release 3.1 Files as Release 2 Files

In some cases, you may want to provide Release 2 users with data from a .WK3 file. To do this, you can save the .WK3 file as a .WK1 file. If you used new Release 3.1 features while working with the .WK3 file, however, some information may be lost when you save the file as a .WK1 file. The following list describes what will happen when you save a file that contains Release 3.1 features as a .WK1 file.

- Labels that contain more than 240 characters (the limit in Release 2) are truncated after 240 characters. (The character limit includes the label prefix.)
- Formulas that contain more than 240 characters are saved in their entirety. However, if you edit such a formula in Release 2, 1-2-3 truncates the formula after 240 characters.
- New Release 3.1 @functions and existing @functions that have new arguments are treated as add-in @functions, which are saved as @? with a list of arguments (if the original formula had arguments) following the ?. Cells that contain these @functions evaluate to NA. If you read a file that contains these @functions back into Release 3.1, the original @functions are restored.

  NOTE Before you use Release 2.01 to read a .WK1 file that contains new Release 3.1 @functions saved as @?, you must remove from memory any add-in programs you use with Release 2.01. In addition, if you save the file in Release 2.01 and then read the file in Release 3.1, Release 3.1 will no longer evaluate the @functions correctly.
- If the file contains formulas linked to other files, the links are converted to @@("<<filename>>range").

  NOTE If you read a .WK1 worksheet containing a formula in the form @@("<<filename>>range") in Release 2.2, Release 2.2 evaluates the formula correctly. If you read such a worksheet in other releases of 1-2-3 or in Symphony, these programs display ERR as the formula's value.
- Formulas that contain undefined range names evaluate to ERR.
- Range name notes and formula annotations are lost.
- All new Release 3.1 /Data, /Graph, /Print, and /Worksheet settings are lost.
- New formats, such as Automatic or Label, are changed to the default Release 2 formats.

NOTE You can also use the Translate utility to convert a multiple-sheet .WK3 file to .WK1 format. The Translate utility creates a separate .WK1 file for each worksheet in the .WK3 file. See Appendix 1 of *Reference* for more information on the Translate utility.

Saving a Single-Sheet Release 3.1 File as a Release 2 File

To save a single-sheet .WK3 file as a .WK1 file, do the following:

1. Check the list in the previous section to make sure that saving the file as a .WK1 file will not result in the loss of important data.
2. Save the file as a .WK3 file if you do not want to lose information permanently when you save the file as a .WK1 file.

3. Save the .WK3 file as a .WK1 file by using /File Save and including the extension .WK1.

   NOTE If the .WK3 file contains new 1-2-3 Release 3.1 features, 1-2-3 displays ERROR as the mode indicator and the message 'Incompatible worksheet information lost during saving' to inform you that some information was lost when you saved the file.

This procedure creates two copies of the file on disk: the .WK1 version and the .WK3 version.

Saving Information from a Multiple-Sheet Release 3.1 File

Before you can save information from a multiple-sheet .WK3 file as a .WK1 file, you must copy the information you want to save to a single-sheet .WK3 file using one of the methods described in this section. Before you copy information to a single-sheet .WK3 file, however, you should note the following:

- Copying formulas with three-dimensional ranges to a single-sheet file may produce unexpected results. For example, if you copy @SUM(A:A1..D:A5) to a file that contains one worksheet, the copied formula will refer to data in worksheet A only. For this reason, you should use /Range Value to convert these formulas before you use them, as the following procedures indicate.
- Check the list in "Saving Release 3.1 Files as Release 2 Files" to make sure that saving the file as a .WK1 file will not result in the loss of important data.

With the multiple-sheet file in memory, complete one of the following procedures.

NOTE The following procedures assume a familiarity with /Copy, /Range Value, and /File New, Open, Save, and Xtract. If you are not familiar with these commands, you should read about them in Chapter 2 of *Reference* before you begin the procedures.

- To save formulas, data, and range names in a .WK1 file, follow these directions:

  1. If one or more formulas in the section of the file that you want to save refer to other worksheets, use /Range Value to turn those formulas into values in their current locations.
  2. Use /File Xtract Formulas. When you enter the file name, use the extension .WK3 to extract the data to a .WK3 file that contains one worksheet.
  3. Use /File Retrieve or /File Open to read the new .WK3 file into memory.
  4. Use /File Save and name the file using the extension .WK1.

- To save formulas and data but not range names in a .WK1 file, follow these directions:

  1. If one or more formulas in the section of the file that you want to save refer to other worksheets, use /Range Value to turn those formulas into values in their current locations.
  2. Use /File New to create a new single-sheet file in memory. When you enter the file name, use the extension .WK1.
  3. Use /Copy to copy the formulas and data from the multiple-sheet .WK3 file to the new .WK1 file. If you are copying formulas and data in more than one worksheet, you must copy the information one worksheet at a time.
  4. Use /File Save to save the .WK1 file.

- To save just data but not formulas or range names in a .WK1 file, follow these directions:

  1. Use /File New to create a new single-sheet file in memory. When you enter the file name, use the extension .WK1.
  2. Use /Range Value to copy the data from the multiple-sheet .WK3 file to the new .WK1 file. If you are copying data in more than one worksheet, you must copy the information one worksheet at a time.
  3. Use /File Save to save the .WK1 file.

Converting Release 2 Macros to Release 3.1 Macros

Before you use your Release 2 macros in 1-2-3 Release 3.1, you must do the following:

- Read the Release 2 macros into Release 3.1
- Edit the macros, if necessary

Reading Release 2 Macros into Release 3.1

You can run your Release 2 macros in the original .WK1 file in which you created the macros by reading the .WK1 file into memory in Release 3.1 and then running the macros. In addition, you can use your Release 2 macros with .WK3 files. The procedure you follow to read your Release 2 macros into Release 3.1 depends on whether you want to use the macros with only one .WK3 file or with more than one .WK3 file.

NOTE To set up Release 2.2 macros stored in a macro library so you can read them in Release 3.1, use the Macro Library Manager Load command to retrieve the macro library into Release 2.2, select Edit to copy the contents of the macro library to the worksheet, save the worksheet as a .WK1 file, and then retrieve the worksheet in Release 3.1.

Using Release 2 Macros with One File

If you plan to use Release 2 macros with only one Release 3.1 file, you can copy the macros to that file, as follows:

1. Use /File Retrieve or /File Open to read into memory the .WK1 file containing the macros.
2. Use /File Open to read into memory the .WK3 file to which you want to copy the macros or use /File New to create a new .WK3 file in memory.
3. If the .WK3 file does not contain any blank worksheets, use /Worksheet Insert Sheet to insert a blank worksheet in the file.
4. Use /Copy to copy the Release 2 macros to the blank worksheet in the .WK3 file.

   If you copy your macros to a separate worksheet in a .WK3 file, you are less likely to damage the macros when you work with the data in the file, for example, when you insert or delete rows and columns in the data area.
5. Use /Range Name Create to rename the macros.
6. Use /File Save to save the .WK3 file with the Release 2 macros.

Using Release 2 Macros with More Than One File

If you plan to use your Release 2 macros with more than one file, you can copy the macros to a Release 3.1 file that contains only macros (a **macro library**). You can then read the macro library into memory along with the files in which you want to use the macro. See "Sample Macros" in Chapter 4 of *Reference* for more information on creating and using macro libraries.

1. Use /File Retrieve or /File Open to read into memory a .WK1 file containing the macros you want to copy to the .WK3 file (the macro library file).
2. Use /File Open to read into memory the .WK3 file to which you want to copy the macros or use /File New to create a new .WK3 file in memory.
3. Use /Copy to copy the Release 2 macros to the .WK3 file.

   If each macro is no more than a few lines long, you may want to copy all the macros to the same worksheet in the .WK3 file. If a macro is many lines long, you may want to copy it to a separate worksheet in the file. Use /Worksheet Insert Sheet to insert one or more blank worksheets in the .WK3 file.
4. Repeat steps 1 and 3 to read into memory additional .WK1 files containing macros and to copy the macros to the .WK3 file.

5. Use /Range Name Create to rename the macros in the .WK3 file.
6. Use /File Save to save the .WK3 file with the Release 2 macros.

Editing the Macros

The results of a macro containing a cell or range address (called a **reference**) may vary depending on the worksheet or file the cell pointer is in when you run the macro. For example, a macro in worksheet A of file SALES may affect worksheet A when the cell pointer is in worksheet A and worksheet B when the cell pointer is in worksheet B. Similarly, a macro in file A may affect file A when the cell pointer is in file A and file B when the cell pointer is in file B.

If you do not want the results of a macro containing a cell or range reference to change depending on the location of the cell pointer, you can use one of the following types of addresses in the macro:

- An address that includes a worksheet letter, for example, A:A12.
- An address preceded by both a worksheet letter and a file reference, for example, <<SALES>>A:A12. (For more information on file references, see "Working with Multiple Files" in Chapter 1 of *Reference*.)

For example, assume the macro /reA8~ (a macro that erases a single cell) is in worksheet D of EXPENSES, a file that contains four worksheets (worksheets A, B, C, and D). The following table shows how the results of the macro change when you change the cell reference in the macro and/or the location of the cell pointer.

Macro	Location of cell pointer	Result
/reA8~	A:C7 in EXPENSES	Erases cell A8 in worksheet A of file EXPENSES
/reA8~	B:D6 in EXPENSES	Erases cell A8 in worksheet B of file EXPENSES
/reC:A8~	B:D6 in EXPENSES	Erases cell A8 in worksheet C of file EXPENSES
/re<<SALES>>C:A8~	B:D6 in EXPENSES	Erases cell A8 in worksheet C of file SALES (if SALES is in memory)
/reC:A8~	B:D6 in SALES	Erases cell A8 in worksheet C of file SALES

NOTE If a macro contains an advanced macro command that uses an address without a worksheet letter or file reference (for example, {BRANCH A6}), 1-2-3 interprets the address as being in the same worksheet as the macro. If an advanced macro command uses a cell or range reference that does not include a file reference, 1-2-3 interprets the address as being in the same file as the macro.

Adapting the Contents of a Macro

Most Release 2 macros will have the same effect in both Release 3.1 and Release 2. Because Release 3.1 differs from Release 2 in some respects, however, you may have to edit some macros before you can use them in Release 3.1. For example, because Release 3.1 includes new menu commands, you may have to edit macros that use the menu pointer to select commands to ensure that the menu pointer moves to the correct command.

For information on Release 3.1 features that may affect the performance of Release 2 macros, see "Macros" in Chapter 4.

Chapter 4
Compatibility with Other Releases of 1-2-3

Compatibility with files from other releases of 1-2-3 has been of primary importance in designing 1-2-3 Release 3.1. 1-2-3 Release 3.1 automatically reads files from other releases of 1-2-3 and, if your Release 3.1 files do not contain multiple worksheets and are not sealed, you can save 1-2-3 Release 3.1 files as Release 2, 2.01, and 2.2 files (.WK1 files).

1-2-3 Release 3.1 not only contains many new features but also contains some enhancements to previously existing features. In most cases, these enhancements will have no effect on the compatibility with files from other releases of 1-2-3.

The following sections, arranged alphabetically, describe 1-2-3 Release 3.1 features whose performance differs somewhat from corresponding features in 1-2-3 Release 2, 2.01, and 2.2.

NOTE 1-2-3 Release 3.1 does not support Lotus or third-party add-ins designed for other releases of 1-2-3. If you are using an add-in, contact the manufacturer to see if a version is available for 1-2-3 Release 3.1.

Character Sets

1-2-3 Release 3.1 uses the Lotus Multibyte Character Set (LMBCS). 1-2-3 Release 2, 2.01, and 2.2 use the Lotus International Character Set (LICS). Resulting compatibility problems are minimal because 1-2-3 Release 3.1 automatically changes LICS to LMBCS when you read a file from 1-2-3 Release 2, 2.01, or 2.2 into 1-2-3 Release 3.1. When you save a 1-2-3 Release 3.1 file as a .WK1 file, 1-2-3 automatically changes LMBCS to LICS.

NOTE If you created files in 1-2-3 Release 2, 2.01, or 2.2 using the Universal Text Display -ASCII- No LICS driver, 1-2-3 Release 3.1 will display those files correctly if you select /Worksheet Global Default Other International Release-2 ASCII before you read the files into Release 3.1.

In rare instances, the use of LMBCS may cause a few incompatibilities with the results of @CHAR and @CODE functions because some LMBCS characters and codes are different from those in LICS. If this causes a problem for you, use /Range Search to find the @CHAR and @CODE functions in your files and replace the LICS codes or characters with LMBCS codes or characters.

Data

The following section describes changes that affect data operations.

Blank Row in Criteria Range

When using /Data Query, 1-2-3 Release 3.1 ignores blank rows in the criteria range as long as at least one row contains a valid criterion.

Other releases of 1-2-3 copy all the records in the input range to the output range if the criteria range contains a blank row.

/Data Matrix Multiply and Invert

1-2-3 Release 3.1 supports an 80-by-80 cell matrix for /Data Matrix Multiply and /Data Matrix Invert. When using /Data Matrix Multiply to multiply a column of numbers by one cell, the maximum number of entries in the column is 6553.

Other releases of 1-2-3 support a 90-by-90 cell matrix for /Data Matrix Multiply and Invert. When using /Data Matrix Multiply to multiply a column of numbers by a single cell, the maximum number of entries in the column is 8191.

Field Names with Database @Functions

When evaluating database @functions, 1-2-3 Release 3.1 checks to be sure that field names in the input range are labels. If they are not labels, the database @functions evaluate to ERR.

When evaluating database @functions, other releases of 1-2-3 do not check to be sure that field names are labels.

Identical Input and Output Ranges

When using /Data Query in 1-2-3 Release 3.1, the location of the input range cannot be the same as the location of the output range.

Other releases of 1-2-3 allow the location of the input range to be the same as the location of the output range.

Repeated Field in Criteria Range

When using /Data Query, 1-2-3 Release 3.1 lets you use two fields that have the same name in your criteria range. When you put a criterion in each of the fields, 1-2-3 uses both criteria when it searches for records. For instance, if you have two fields named AMOUNT in the criteria range and your criterion in one of those fields is >100 and your criterion in the other field is <1000, 1-2-3 finds all records with amounts greater than 100 and less than 1000.

Other releases of 1-2-3 ignore the second occurrence of a field name in the criteria range.

Error Messages

When 1-2-3 Release 3.1 is in ERROR mode, pressing ESC or ENTER generally returns 1-2-3 to the point in the program at which the error occurred.

When other releases of 1-2-3 are in ERROR mode, pressing ESC or ENTER returns 1-2-3 to READY mode.

Error messages generated from background operations, such as printing, do not put 1-2-3 Release 3.1 in ERROR mode. You can, therefore, continue to work in the worksheet. These error messages remain displayed until you clear the error. (To clear a background print error message, for instance, fix the problem that caused the error and then select /Print Resume or /Print Cancel.)

In other releases of 1-2-3, all error messages put 1-2-3 in ERROR mode.

File

The following sections describe changes that affect file operations.

File Name Syntax

Operating systems vary in the rules they use for the syntax of file names. 1-2-3 follows the same rules as your operating system. See your operating system manual for details.

Saving Files as .WK1 Files

In many cases, you can save a 1-2-3 Release 3.1 file as a .WK1 file by including the extension .WK1 when you name the file with /File Save or /File Xtract. For more information, see "Saving Release 3.1 Files as Release 2 Files" in Chapter 3.

Formulas

The following sections describe changes that affect formulas.

Calculation Precision

1-2-3 Release 3.1 generally calculates and displays values to 18 significant digits.

Other releases of 1-2-3 generally calculate and display values to 15 significant digits.

This increased accuracy could cause some formulas to display different results in 1-2-3 Release 3.1 from the results in other releases. In most cases, these differences will not cause a problem. If you use a logical formula to compare the values in two cells, however, 1-2-3 Release 3.1 may find certain values not equal even though other

releases found the values equal. If this is a problem for you, use @ROUND to reduce the additional precision.

Displaying Long Values

When a cell is not wide enough to display a value, 1-2-3 Release 3.1 always displays a rounded value. For instance, if you enter the value 123.876876 in a cell with a width of 9, 1-2-3 displays 123.8769.

Other releases of 1-2-3 truncate digits if a cell is formatted as General and is not wide enough to display all of the digits. For instance, 1-2-3 Release 2, 2.01, and 2.2 display the value 123.876876 as 123.8768 in a cell formatted as General and with a width of 9.

This change affects only the way 1-2-3 displays values. It does not affect the value 1-2-3 stores for use in calculations.

Distinguishing Dates from Formulas

1-2-3 Release 3.1 has been enhanced to interpret entries that look like valid dates, such as 31-jan and 9/21/89, as dates. 1-2-3 enters the appropriate date numbers, even if JAN is a range name in your file. If you want 1-2-3 to interpret such entries as formulas, precede the entries with a plus sign, such as +9/21/89, or enclose range names in parentheses, such as 31-(jan).

Other releases of 1-2-3 interpret entries that look like valid dates as formulas.

Graph

The following sections describe changes that affect graphs.

Format and Extension for Graph Files

When you use /Graph Save, 1-2-3 Release 3.1 uses graphic metafile as the default file format and .CGM as the default extension on graph file names. You have the option of saving graph files as picture files with the extension .PIC.

Other releases of 1-2-3 use picture file as the default graph file format and use .PIC as the default extension.

Pie Charts

1-2-3 Release 3.1 does not use negative numbers when you create a pie chart. If you want to include these numbers in your pie chart, use @ABS to make the numbers positive or create formulas to copy the positive value of the numbers to another range.

Other releases of 1-2-3 automatically use the absolute value of negative numbers when creating pie charts.

Macros

The following sections describe changes that affect macros.

Macros Affected by Changes in 1-2-3 Menus

New menu commands have been added to 1-2-3 Release 3.1. These commands may affect macros that rely on menu-pointer movement for command selection.

Macros that Print

If you use 1-2-3 Release 3.1 with a print spooler (such as the OS/2 print spooler) or with a network printer, each time you leave the /Print menu, the spooler or network print software advances the paper in the printer to a new page because leaving the /Print menu closes the current print job. If your macro prints several ranges on the same page but leaves the /Print menu between print ranges, alter the macro to select /Print [E,F,P] Hold before leaving the /Print menu. /Print [E,F,P] Hold keeps the print job open, preventing the spooler or network print software from advancing the paper in the printer to a new page.

Other releases of 1-2-3, with the exception of 1-2-3 Networker® and 1-2-3 Release 2.2, do not support print spoolers or networks.

Macros that Read or Save Files

When you use 1-2-3 on a network, because you need a reservation to read or save a file, you may have to alter macros that read or save files. The following conditions could interfere with macro execution if you do not alter your macros:

- If someone else has the reservation for a file you want to read, 1-2-3 displays a prompt asking if you want to read the file without a reservation.
- If you try to save a file when you do not have the reservation, 1-2-3 displays an error message.

Macros that Use {ONERROR}

1-2-3 Release 3.1 uses the same wording for most error messages as in other releases of 1-2-3. Operating system error messages, however, may be different, depending on the operating system and version you are using. Although 1-2-3 Release 3.1 error messages include an additional message telling you to press HELP (F1), when you use {ONERROR} this additional message is not considered part of the error message.

NOTE Although {ONERROR} traps background printer error messages, a printer problem suspends printing. To continue printing, you must fix the printer problem and select /Print Resume. To cancel printing, select /Print Cancel.

The table below lists the error messages that are different in 1-2-3 Release 3.1 from the corresponding messages in 1-2-3 Release 2, 2.01, and 2.2.

1-2-3 Release 3.1	1-2-3 Release 2, 2.01, and 2.2
Cannot invoke operating system	Cannot invoke DOS
Input line too long	Input line too long (240 characters max)
Insufficient memory to invoke operating system	Insufficient memory to invoke DOS
No printer driver loaded	No text printer driver loaded
Printer error — attention required	Printer error
Too many fields	Too many fields (32 max)
Too many X variables	More than 16 X variables

In 1-2-3 Release 3.1, {ONERROR} traps all error messages except the following, most of which are caused by syntax errors: Invalid expression, Invalid range, Invalid string argument, Invalid type, Invalid value, Macro: missing argument, Syntax error in macro key/range, Too many arguments, Unrecognized key/range name.

In other releases of 1-2-3, {ONERROR} traps fewer error messages, primarily those caused by a problem with the printer or a disk drive.

Macros that Use Strings as Arguments

In 1-2-3 Release 3.1, when you use strings as arguments in advanced macro commands, you should enclose the strings in " " (quotation marks) so 1-2-3 does not interpret the strings as cell addresses, range names, or formulas.

1-2-3 Release 3.1 has been enhanced to let you use cell addresses, range names, and string formulas as arguments in advanced macro commands that use strings as arguments, such as {INDICATE} and {GETLABEL}. When you use a cell address or range name with {INDICATE}, for instance, 1-2-3 displays as the mode indicator the entry located in the cell you specified. When you use a string formula with {INDICATE}, 1-2-3 displays the result of the formula as the mode indicator. To display the result of a numeric or logical formula as the mode indicator, you must use @STRING to turn the result into a string. If you try to use a string that looks like a formula, such as FY-89, 1-2-3 displays an error unless you enclose the string in quotation marks.

In 1-2-3 Release 2 and 2.01, you cannot use cell addresses, range names, or formulas as string arguments in advanced macro commands.

Subroutine Names

If your macros include subroutine names that are now key names or advanced macro commands, such as {HELP}, {FILE}, {BREAK}, or {FIRSTCELL}, you will have to change the names of those subroutines.

Turning STEP Mode On and Off

To turn STEP mode on and off in 1-2-3 Release 3.1, press **RECORD (ALT-F2)** and select Step from the Record menu.

To turn STEP mode on and off in other releases, press **STEP (ALT-F2)**.

Using Macros with a Different Screen Display Mode

In 1-2-3 Release 3.1, with most screen displays you can select from more than one screen display mode. The display mode you select can affect macros that use the macro key names {PGUP}, {PGDN}, {BIGLEFT}, or {BIGRIGHT}.

For example, with an Enhanced Graphics Adapter (EGA) in 80x25 display mode, {PGDN} moves the cell pointer down by 20 rows. With an EGA in 80x43 display mode, {PGDN} moves the cell pointer down by 38 rows.

In other releases of 1-2-3, with most screen displays you cannot select from more than one screen display mode. 1-2-3 uses the standard 80x25 display mode.

Print

The following sections describe changes that affect printing.

Compressed Line Spacing and Compressed and Expanded Pitch

1-2-3 Release 3.1 now includes menu commands (/Print [E,P] Options Advanced Layout Line-Spacing and Pitch) that let you specify standard or compressed line spacing, and standard, compressed, or expanded pitch. When you change the line spacing, you do not have to change the page length; 1-2-3 automatically accommodates for the correct number of lines per page. When you change the pitch, you do not have to adjust the margins; 1-2-3 automatically accommodates for the correct number of characters per line.

In other releases of 1-2-3, you use setup strings to compress or expand the line spacing and pitch. You then have to adjust the page length or margins to accommodate for the new line spacing or pitch.

NOTE Setup strings work the same way in 1-2-3 Release 3.1 as in other releases. If you use a setup string to change the line spacing or pitch, you must adjust the page length or margins.

On some printers, using menu commands for some options and setup strings for others could have unexpected results. Because the results depend on your printer, it is a good idea to print a small range with the option combination you specified before printing a large document.

Extra Page Feeds

When you use a print spooler or a network printer, the spooler or network printer advances the paper to the next page after each print job, even if you have not selected

/Print [E,F,P] Page. For details, see "Macros that Print" in "Macros" earlier in this chapter.

Margins

1-2-3 Release 3.1 measures margins in standard-size characters, even when you use compressed or expanded pitch. For instance, when you use compressed pitch and specify a left margin of 4, 1-2-3 leaves a margin that is 4 standard-size characters wide, not 4 compressed characters wide. Measuring margins in standard-size characters makes your margins consistent throughout your printout, even when you use different pitches.

Other releases of 1-2-3 measure margins in the current character pitch. For instance, when you use compressed pitch and specify a left margin of 4, 1-2-3 leaves a left margin that is 4 compressed characters wide.

Proportionally Spaced Fonts

If your printer has the capability, 1-2-3 Release 3.1 supports printing with proportionally spaced fonts. Because the width of proportionally spaced characters (except numbers) is different from the width of standard-size characters, the number of characters that print when you print labels may be different from what you expect. The actual number of characters that 1-2-3 prints depends on the widths of the columns in your print range.

See /Print [E,F,P] Range in Chapter 2 of *Reference* for more information on proportionally spaced fonts.

Other releases of 1-2-3 do not support proportionally spaced fonts.

Ranges and Range Names

The following sections describe changes in the way 1-2-3 works with ranges and range names.

Deleting the First or Last Cell of a Range

In 1-2-3 Release 3.1, when you delete a column, row, or worksheet that contains the first or last cell of a range to which a formula or command refers, the range contracts and the formula or command now refers to the new, smaller range. If a range name was assigned to the range, the range name is now assigned to the new, smaller range.

In other releases of 1-2-3, when you delete a column or row that contains the first or last cell of a range to which a formula refers, the formula evaluates to ERR. If a command referred to the range, the command no longer refers to the range. If a range name was assigned to the range, the range name is no longer assigned to a range.

Range Names in Formulas

In 1-2-3 Release 3.1, when you have more than one range name for the same range, the range names remain independent of each other. Changing the range that one name refers to does not affect the other names. Because of this, 1-2-3 Release 3.1 uses different rules for substituting range names for ranges in formulas than do other releases. The new rules follow:

- When you first create a range name, 1-2-3 Release 3.1 automatically substitutes the range name for the associated range address in existing formulas.
- When you create subsequent formulas that contain the same range address, 1-2-3 Release 3.1 substitutes the range name for the range address only if you press **NAME (F3)** while you are creating or editing the formula.
- 1-2-3 Release 3.1 does not automatically substitute range names for single cell addresses in formulas. If you want 1-2-3 to substitute a range name for a single cell address in a formula, enter the cell address as a range address, such as A1..A1 or !A1, in the formula, or press **NAME (F3)** while you are creating or editing the formula.

In other releases of 1-2-3, when you have more than one range name for the same range, changing the range that one name refers to changes the range that the other names refer to. Also, other releases always substitute range names for associated range addresses in formulas.

In addition, when you use **EDIT (F2)** to edit a formula that contains a range name, 1-2-3 Release 3.1 displays the range name in the formula.

Other releases of 1-2-3 display the range addresses associated with the range names when you press **EDIT (F2)**.

In 1-2-3 Release 3.1, formulas (but not @functions) evaluate to ERR if they include a range name that has more than one cell assigned to it. For instance, if the range name MULTI is assigned to the range A1..A6 and you create the formula +MULTI+7, the formula evaluates to ERR.

In other releases, you cannot use a formula that includes a range name that has more than one cell assigned to it.

Transposing Ranges

When you use /Range Trans in 1-2-3 Release 3.1, 1-2-3 copies the results of formulas rather than the formulas themselves. The values resulting from formulas, therefore, do not change when 1-2-3 transposes ranges that contain formulas.

When you use /Range Transpose in 1-2-3 Release 2 and 2.01, 1-2-3 copies the actual formulas, changing the references in the formulas relative to their new locations. Because the formulas change relatively, the values resulting from the formulas change.

Using Undefined Range Names in Formulas

In 1-2-3 Release 3.1, you can always use a range name in a formula, even if you have not yet assigned the name to a range. The formula, however, evaluates to ERR until you use /Range Name Create or Labels to specify a range address for the name.

In other releases of 1-2-3, you cannot use a range name in a formula unless you already assigned the name to a range. (1-2-3 beeps and enters EDIT mode.)

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