Tray bon

Stephen Wells turns his mind to SendKeys and creating a macro to specify which printer tray to use, sets his sights on a clay pigeon problem, and presents a macro that looks for links.

I'm a simple country boy with a basic Canon BJ-10e bubble jet printer, so I've never been faced with reader Tony Wolfe's problem.

"Is it possible, using Excel macros, to instruct a spreadsheet to be printed from a specific printer tray (upper or lower)?" he asks. "This problem has been bugging me for some time and I'd be grateful for an answer; even to know that it can't be done. I have succeeded by using SendKey statements but this is clumsy and doesn't always work. I use Excel v7, but would also like the macro to run on v5. The printer at the office is an HP LaserJet 5M and the one at home is an HP LaserJet IIID. Again, I'd like the macro to be able to cope with both, though I understand some small variation in the macros might be required."

Well, I turned to the brainiest Californian guru I know, but he said he would use the SendKeys command himself, so I wasn't able to help Tony. But it did get me looking in the Microsoft Knowledge Base to learn more about SendKeys, and I found two articles about changing the paper source on Hewlett-Packard printers to the lower tray.

One (Q69614) talks about using the SEND.KEYS() macro function, in Excel 2 to 5, to change the HP LaserJet IIP; and the other (Q105878) using the SendKeys command, in Excel 5 and higher, to change the HP LaserJet 4/4M.

The idea of SendKeys is to send keystrokes to Excel as if they were typed on the keyboard. This only works with Windows, not Excel for the Mac. A macro might look like Fig 1.

The Wait statement is to let things catch up. Here, it is set for one second, but some system environments might need longer. Then the printer is defined. After that, the SendKeys statement mirrors what you would enter using keyboard shortcuts. You would first choose

Fig 1 SendKeys macro

```
Sub HP4_Paper_Source()
        Application.Wait Now + Timevalue("00:00:01")
        Application.ActivePrinter = "HP LaserJet 4/4M on LPT1:"
        SendKeys "%(f)(p)(r)%(s)%(s){pgup}{down}{down}
        {down}{down}~~~"
   End Sub
```

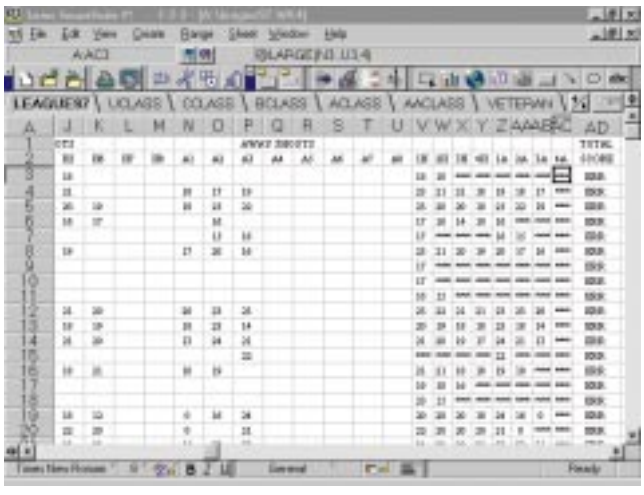

Fig 2 The @LARGE function has a limitation: If the main argument is larger than the number of values in the range, you get an ERR message

```
Alt+F(ile),P(rint),(P)r(operties)
```

In SetKeys, % (percent) represents the Alt key. You use {pgup} for the PageUp key and {down} for the down arrow. A ~ (tilde) is used for the Enter key. Three consecutive ones are needed here to accept defaults.

Obviously, before you write such a macro you would go through the required keyboard shortcuts manually and write down what is required. All the keys can be duplicated in a SendKeys command using either the displayed character or a code like {home}, {end}, {tab}, {left} and {right}. To use the Shift key, you precede the character or code with a + (plus sign), and for the Ctrl key you use a ^ (caret).

Potted pigeons

The one time I saw clay-pigeon shooting was off the stern of a cruise ship sailing out of Acapulco… But you're not interested in my luxury vacations in exotic locations. We're here to discuss the problem of Ian Greig, secretary and treasurer of the Cleveland Sporting Clay league.

"I receive the score sheets from four shoots each week," he writes, "and work out the leaders in each class. The league position is obtained from the top four home shoots and the top four away shoots, as you can see from the attached spreadsheet made on Lotus 1-2-3 v5." Fig 2 displays it in Lotus 97.

p284 ➢

Questions & Answers on XLS

Q I would like my formulas *not* to change when I move them to another area of my worksheet.

A By default, spreadsheets use relative formulas, meaning they will change appropriately when you move them. Sometimes you want to freeze them and then they are called absolute: it might be to refer to a VAT rate which you always keep in cell B5.

In Excel, you make a formula absolute by adding dollar signs. If you enter =$B$5 in another cell it will always show the value in cell B5, no matter where you move it. The fastest way of adding the dollar signs is to put the cursor on the cell reference in the Formula Bar and press the function key, F4.

Q I sorted a list and my field names have disappeared.

A Choose Data, Sort, "My list has Header row" *not* "My list has No header row". Additionally, do not select the whole range of your list; just click in one cell before you sort. Excel recognises the header row by looking for a change of formatting so it's a good idea to make your field names, or column headings, bold or of a different colour.

Q How can I sort a list of month names or days of the week?

A Choose Data, Sort, Options. Then in the "First key sort order" box you can choose either the full names or abbreviations of the months or days.

Q I wish I could stop Excel printing "Sheet 1" at the foot of my single worksheets.

A You can. Choose File, Page Setup, Header/Footer and select "None" from the drop-down list. You will find many other optional headers and footers here which might include your name and the date.

Q How can I control the number of worksheets with which each new workbook opens?

A Choose, Tools, Options, General, "Sheets in new workbook". In Excel 97 you can also control in Options General the number of entries in the Recently Used Files list at the foot of the File menu.

Q Sometimes a grand total at the end of a column of totals does not equal that at the end of a row of totals. They should be the same.

A Choose, Tools, Options, Calculation, Worksheet options, "Precision as displayed". It is best to do this when you first set up the worksheet, not when the results look odd. If, later on, you wanted to go back to calculating with full precision on that sheet, you couldn't do it. The original underlying values cannot be restored.

Q I miss some of the formulas that I used to use in Lotus 1-2-3.

A Although it is not documented, you often find that you can enter a 1-2-3 function and it will work in Excel! Additionally, the functions with an A at the end (such as AVERAGEA and MAXA) are included to be compatible with Lotus 1-2-3. You could also choose Tools, Options, Transition, "Sheet options" and "Transition navigation keys".

Q How can I add all the values in one column without looking to see the first and last cell?

A If the column were E, then in a cell in another column you can enter =SUM(E:E). You cannot enter that in the same column or you will get a circular reference. So choose any cell in column E and press Ctrl+ down arrow. This will take you to the last occupied cell. Drop down to the blank cell below that and click the SUM tool, marked Σ. Excel will automatically mark the range. Press Enter.

Q How can I convert degrees Fahrenheit to Celsius?

A You can convert an enormous number of different things with the versatile CONVERT() function.

The arguments are: =CONVERT (number,from_unit,to_unit). It could be Watt-hours to BTUs, statute or nautical miles to meters, cups to teaspoons and so on. To convert 720∞F use

```
=CONVERT(72,"F","C")
```

The answer is 22.2 recurring.

Q How can I jump to the next occupied cell in a column or a row?

A Press Ctrl+arrow in the required direction.

Q How can I jump to the very last cell in the area of the worksheet which I've used?

A Press Ctrl+End. To go to the start, usually cell A1, press Ctrl+Home.

Q CONVERT is not listed among my available functions.

A Choose Tools, Add-Ins, and check the Analysis ToolPak box. You can also shorten the loading time when you next start Excel by deselecting here all those Add-Ins that you are unlikely to need.

Q The text in some of my labels in column A is cut off.

A Either your column is not sufficiently wide, or the font size is too big. To make the column width fit the contents, double-click the boundary between columns A and B in the column heading.

To reduce the font size, choose View, Toolbars, Formatting. You can either select a smaller font size from the drop-down list or type a smaller number into the Font Size box.

Alternatively, you could choose Format, Cells, Alignment, and check the "Shrink to fit" box.

Q With Excel 95 there was an Office Shortcut Bar. I do not have it in Excel 97.

A Well, actually, this is not an Excel feature but an Office feature, although it can be an easy route to starting Excel.

In Office 95 it was installed by default. In Office 97 it isn't. Nevertheless, you can easily install it. Insert your Office 97 CD-ROM. Go to Control Panel and then Add/Remove Components. I like this bar although I have it in the shape of a box.

Q How do I add a button to the Office Shortcut Bar which opens a favourite workbook such as my expenses?

A Easy: open the workbook, choose File, Save As and select the directory C:\Program files\Microsoft Office\Office\Shortcut Bar\Office.

"These are collected by the formula @LARGE(range,n). However, if a shoot is not attended, there is no score to enter and this results in an ERR in the scores column. I can't place a 0 in this cell, as this is used when a shoot is attended and either no clays were hit or the shooter has thrown the scorecard away (probably in disgust). This problem resolves itself when a shooter has attended and scored at four home and four aways.

"The ERR affects a further formula I need to work out the shooter's class for next season. This is calculated from the total score from all eight home shoots and all eight away shoots, multiplied by four and divided by the number of shoots attended."

Well, the first thing to do is examine how the @LARGE function works. What it does is find the nth largest value in the specified range. You might have a series of scores in the range N3 to U3 and want to find the fourth highest. In another cell you would enter @LARGE(N3…U3,4). The function's limitation is obviously that if n is larger than the number of values in the range, you get an ERR message. So if you have entered only two or three results to date, you're up the proverbial: there won't be a fourth highest.

There are several ways around this problem, but the simplest is to have zeros in the empty cells but not display them. To insert all the zeros in one swift move before any results are entered, highlight the range you will use. Enter zero, then press Ctrl+Enter. To stop the zeros being displayed, press Alt+Enter and under Sheet Properties, deselect "Display zeros as", in the formatting dialog box. When no clays are hit and you need to enter and display a zero in the cell, use a capital O. It won't affect the calculation.

Missing links

Last month, I wrote about a reader's problem with linked formulas: I suggested he might be able to replace them with values. I have since discovered a helpful macro, in the Microsoft Knowledge Base, that rifles through a workbook looking for links: when it finds one, it stops and asks if you want to change it to a value.

It will work with Excel 5.0, 5.0c, Excel for Mac 5.0, Excel for Windows NT 5.0, Excel for Win95 7.0, and Excel 97. As Excel users can suffer from missing links for a variety of reasons, I'm putting this macro on our cover-mounted CD this month. It's in the Word file LinkMacro.txt. Just read the notes, then copy and paste the macro into a new module sheet.

DDE quirk

Speaking of links, the new Lotus 1-2-3 97 does a lot of good things but it doesn't support Dynamic Data Exchange (DDE). If you open a 1-2-3 Release 5 file that uses @DDELINK, 1-2-3 97 changes @DDELINK to @DATALINK. If you re-save the file as a .WK4 file, then @DDELINK will be saved. If links no longer update in 1-2-3 97, make sure the application that is the source of the data supports OLE linking.

Other Lotus 1-2-3 97 quirks

Lotus 1-2-3 95 was adapted to run under Windows 95 but it was still a 16-bit program. Lotus 1-2-3 97 is a full 32-bit program but can throw up some little compatibility problems.

For example, Lotus warns that trying to embed 1-2-3 workbooks in Microsoft Word 97 will cause unpredictable results. And if you create a file that you plan to share with users of previous releases of 1-2-3, you must save the file in .WK* format. Also, the file name must be eight characters or less.

Make sure that file references in this file refer to .WK* files only. For example, if you create a formula that refers to another file, the file being referenced must be in .WK* format. Otherwise, the file reference will not work in previous versions of 1-2-3.

Another quirk is that you can't use the Undo facility in scripts or macros. Bringing forward query tables has to be done carefully. When you open a file that contains a query table from 1-2-3 Release 4 or 5 for Windows in 1-2-3 97, the query table is converted to a range with data query properties. To work with the range as a data query table, you must use LotusScript or macro commands.

If you use the {SELECT} macro or the .SELECT method in LotusScript to select the data query table, you can then use macro commands or scripts to perform database commands on the data query table, such as refreshing and sorting.

Quick looks at new books — *net.savvy Office 97*

It has long been a pet theory of mine that the familiar big four applications of office suites — word processor, spreadsheet, database and presentation package — will eventually be combined in one piece of software. With the growth of web page creation, using HTML code to combine output from these four sources, my prediction is now approaching reality.

net.savvy Office 97 is a well-illustrated, well-indexed 382-page book by Greg Harvey, which guides you through saving form and survey results in Excel workbooks, building a customer support system, creating hyperlinks to interrelate all your documents, and adding interactivity to web pages with ActiveX controls.

The book comes with a CD-ROM which holds sample files from the book's examples, a number of templates and useful software including Internet Explorer 3.1, ActiveX Control Pad, and PowerPoint Animation Player. There are viewers for Microsoft Office Applications, the ScriptActive plug-in for Netscape Navigator and an Adobe Acrobat viewer, as well as shortcuts to web sites, including one for updates to the book.

I've never understood why authors who go to so much trouble in every other respect can't run a spellchecker through their examples. But apart from that irritation, this work is a fact-packed source of information for those who need to publish data from, or download data into, Excel 97 forms and pivot tables.

Publisher Que Corporation
Price £27.99 with CD-ROM
Supplier Computer Manuals (see "PCW Contacts" box).

PCW Contacts

Stephen Wells welcomes problems or solutions relating to spreadsheets. Write to him at the usual *PCW* address or email
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Computer Manuals 0121 706 6000;
www.compman.co.uk

Thinking **links**

Stephen Wells puts on his thinking cap and helps a reader with links. Sherlock finds the solution to a problem in Excel where all files open automatically. It's elementary, dear readers.

I'm always pleased to hear from a reader who previously contacted me over a year before. It suggests that they received satisfaction and have remained a regular reader of this column since. Cedric Roberts has written a long query, but the gist of it is that he had masses of CA-SuperCalc 5.5 worksheets which he has imported into Excel. He was "heartened to find that all formulae transferred" but has had trouble with links between the original SuperCalc sheets not being recognised. He also had a number of graph sheets which referred to the worksheets.

I suggested he transfer all outstanding values to a spare sheet in his new workbook, then track down the links and redirect them. Ideally, all links should be within one workbook. On the edit menu, click Links. In the Source list, click the Links to reconnect. To select multiple links to the same source file, hold down Ctrl and click each linked object. Click Change Source. In the Change Links dialog box, locate the source file for the selected links.

In some cases, it may be possible to replace links with values. If this is feasible, you select the appropriate cells, choose Copy, then Paste Special, Paste Values.

When moving or copying sheets between workbooks, if you are to maintain links between charts and their data on worksheets, it's important in Excel to follow the preferred procedure. Open both the workbook which is to provide the sheets and the one which is to receive them. Switch to the workbook that has the sheets to be moved or copied, and select the sheets. (Hold down Ctrl and click on the sheet tabs.)

Then choose Edit, Move or Copy Sheet. In the To book box, click the workbook which is to receive the sheets. In the Before sheet box, click the sheet before which you want to insert the moved or copied sheets. To copy the sheets instead of move them, select the Create a copy check box. All this takes much less time than it takes to describe and it's the best method to use to maintain links.

I communicated all this to Cedric and he wrote back that all his links now work. For users of very large workbooks, I should add the following caution. If you're short on memory and have large workbooks, it can be appropriate to split a file into two or more linked files. Simple external links using absolute references, e.g.

```
=1996_Income!$F$120)
```

can reduce the amount of memory used by the workbook.

Not now, if you don't mind

Another interesting question came from Val Wallace on the Isle of Man: "*I'm having a strange problem with Excel 95 that I'm sure has a simple answer. When I open Excel, it opens all previous documents that I have had opened. Very annoying and time consuming. I hope you can help.*"

I replied that these files were opening automatically because somebody has intended it to happen; or maybe Val had saved her files in the wrong directory. I suggested the best way to approach the problem is to ask what you would do if you

Microsoft Excel 97 Developer's Handbook

If you have Eric Wells' *Developing Excel 95 Solutions*, this book may appear to be a reprint of it, at first glance. Although the new volume has 200 fewer pages, much is identical. But the version of Visual Basic for Applications supplied with Excel 97 is obviously only an upgrade, so that's fair enough. And you may not have the earlier book.

The earlier edition had the sample files on a floppy. The same files (and the 200 missing pages) are now on a bizarrely organised CD-ROM. The book says, Run D:\SETUP.EXE. Do that, and you get an error message. The file is actually in the Samples directory. This setup only copies the samples to your hard drive. To read the important new appendix which details the development features added in Excel 97, you can either open the undocumented file, Appendix\Zappg.htm in Microsoft Explorer, or find the same text incorporated in the book's Introduction. Grrrr!

These irritations aside, Steve Harshbarger's update of Eric Wells' book is a well-written, properly indexed bible for the specialised application developer. It is not for VBA beginners. But if you know at least one programming language, you will be able to use a treasure trove of expertly crafted forms, PivotTables, tabbed dialogue boxes, web queries, an intranet home page and other database interfaces created for four fictional companies: a regional airline, a bicycle marketing company, a cycle manufacturer, and a regional conglommerate.

It is particularly informative in its explanations of ActiveX technology, so that you can develop custom Excel VBA solutions that use the 97 versions of Access, PowerPoint, Word and Outlook.

If you need to create commercial data analysis applications based on Excel 97, this book with CD (and VAT on that) is good value at £37.49. It is available from Computer Manuals (see the "PCW Contacts" box, page XXX).

p272 ➢

wanted to have your previous files open automatically. Here are four ways:

1. Open the workbooks you want as a group. Size and position the windows as you want them to appear each time. Choose File, Save Workspace. Give the workspace file a name. Save this file in the \Office\XLSTART directory.

2. Specify an alternate startup folder. Choose Tools, Options, General tab and enter the path to the alternate startup folder in the location box. Excel will attempt to open every file in the alternate startup folder when you start Excel.

3. To open a single workbook automatically when you start Excel, open Windows Explorer and move the icon of the workbook into the XLSTART folder. Or create a shortcut to its current location in the XLSTART folder.

4. Add startup switches. Locate the icon you use to open Excel. Right-click and choose Properties. This will show a path like `C:\Program Files\Microsoft Office\Office\EXCEL.EXE`

You can add switches to the end of this path which will open specific workbooks, or will specify the working folder.

The only other likely option is that a macro is opening files when Excel starts. You can always ensure that macros don't run when Excel opens by holding down the Shift key when you click on your usual icon to start it. However, if you start Microsoft Excel from the Office Shortcut Bar, click the Microsoft Excel button on the Office Shortcut Bar first and immediately hold down Shift while Microsoft Excel starts.

Later, Val let me know what had happened: *"Thanks for your prompt reply. The second solution sorted out my problem. I wasn't aware that this occurred when an alternate startup folder was specified."* Elementary, my dear Wallace.

Translations and temps

Ross Coad emailed: *"I want to send my spreadsheets and formulas to a colleague in New York. I am on Windows 3.1 with Works 3.0. He is on Excel 5.0. He says that he cannot cope with my output. As we both use Microsoft, is there no way of him using an associate or something? His Word for Windows 2.0 text comes across beautifully. I do hope you can help and give us a way around this apparent problem."*

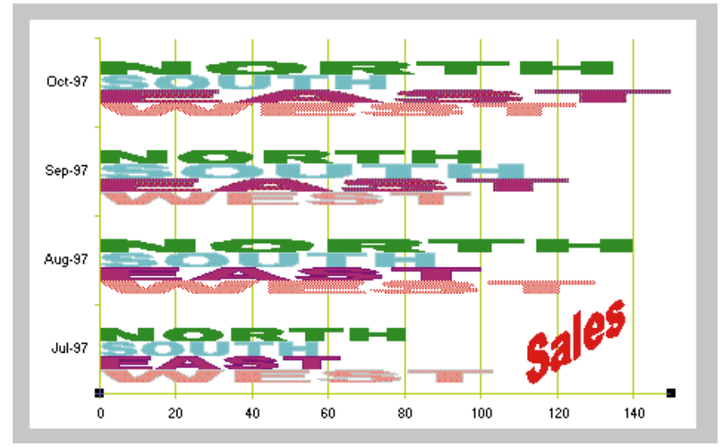


Fig 2 **Excel 97 makes it easy to use WordArt or AutoShapes to create an individually designed bar chart**

The Works: How to get Excel 5.0 to accept output from Win3.1/ Works 3.0 (*see below*)

It is really irritating when the various Microsoft product groups ignore each other's files. Excel goes to so much trouble to be compatible with Lotus 1-2-3 and often ignores its own Works.

I had many spreadsheet files made in Works 2.0. Later, I found Excel 95 wouldn't import them, although it would import Works 3.0 files. But I found that Word 95 would recognise them so I imported them into that, and then into Excel 95.

Oddly, Excel 97 will import both Works 2.0 and Works 3.0 files. One way that always works is to save your Works 3.0 file as text, or comma separated values (CSV). But first have a look at all the save options in Works 3.0. You might find a 1-2-3 option that an Excel 5 user could import. Let me know what you end up doing.

Ross replied: *"I have taken your advice and gone through the "save as" options many times. Although there is a Lotus 1-2-3 facility, I cannot pull it out when I want to as an attachment. However, I have discovered an Excel 4.0 and 5.0 facility. This seems to work. Ditto there is a Word 2.0 that works.*

"One minor irritation is that I seem to be cluttering up my disk with a number of files labelled .tmp — these are only recoverable by choosing an associate. Can I delete them? Do I risk upsetting anything by clearing the .tmps? Another point: when I work on a sheet and save as Excel 5.0, does it also save as Works, or do I have to save the new work in both formats manually?"

Strictly speaking, if you close everything down properly at the end of a session, all temp files should disappear. But it happens to all of us that we accumulate a lot of them. I just let a couple of days go by (so the date of the files is non-current) and delete them.

As to saves: if you save in Excel 5.0 (or any other format) Excel only saves the one version. But you can save in as many formats as you like and keep various versions.

```
Sub Auto_Open()
    If Worksheets("Sheet1").Range("A1") = "" Then
        Worksheets("Sheet1").Range("A1") = Int(Now())
        Worksheets("Sheet1").Range("A1").NumberFormat = "d/m/yy"
    End If
End Sub
```

Fig 1 **Add this macro to a template and it will put today's date on a new worksheet, but the date won't change when you reopen the worksheet on another day**

EXCELlent little formulas

Two-faced If you've upgraded to Excel 97 and need to provide files to people who haven't, you can choose File, Save As and click Microsoft Excel 97 & 5.0/95 Workbook *.xls. This is a clever format, as you won't lose any Excel 97 features, and Excel 5 and 95 users can open the workbook and work with it, within the parameters of their version.

New default To automatically save all workbooks in the above multiple-version format, choose Tools, Options, Transition tab, and click Microsoft Excel 97 & 5.0/95 Workbook *.xls in the Save Excel files As box. Obviously, you can use this option to specify any available file format for the default.

Memory trick 1 Formulas require more memory than constants. If it's feasible to change any, select the range, use Copy and then choose Edit, Paste Special, Values. This converts any formulas in the range to their values.

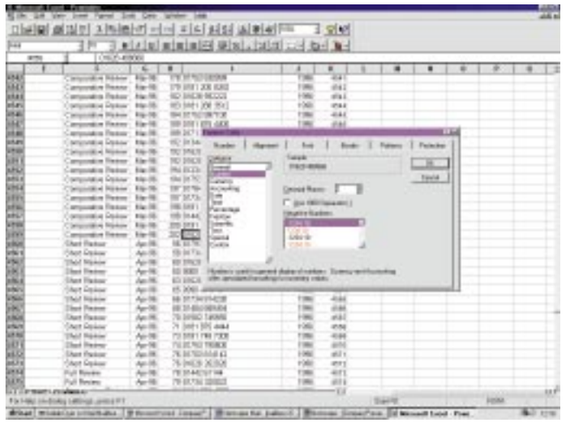
Memory trick 2 Press Ctrl+End to go to the last active cell on your worksheet. If it is way past the last cell you're actually using, delete the unused rows and columns. Save the worksheet. Close and reopen it. Smaller worksheets use less memory.

Memory trick 3 You can consolidate repetitive formulas by replacing them with array formulas. Supposing the range H4:H9 provides the answers (products) after multiplying F4*G4 down to F9*G9. Instead of having individual formulas, select the range H4:H9 and enter in the formula bar {=F4:F9*G4:G9}. Use Ctrl+Shift+Enter and Excel will add the curly brackets to indicate it's an array formula. This may look like a more complicated formula in each cell, but it actually saves memory.

File names The formula below will display the name of the current worksheet in Excel 4 or less, and the name of the workbook and the active sheet in Excel 5 or higher.

Again, it is entered as an array. As it is confusingly complicated, I've included it in the file Figaro.xls on the cover CD-ROM. This file is in the multi-version format mentioned above.

```
{=RIGHT(CELL("filename"),LEN(CELL("filename"))-MAX
(IF(NOT(ISERR(SEARCH("\",CELL("filename"),ROW(1:255)))),
SEARCH("\",CELL("filename"),ROW(1:255)))))}.
```



Excel: A formula for every occasion

Improved wizard

To enable you to create a web page which contains cell ranges and charts from an Excel worksheet, Excel 97 includes an add-in called the Internet Assistant wizard. Inevitably there are going to be application developers who want a facility for programming such a conversion. A later version of the wizard offers this ability and I've included it on the cover CD-ROM this month: you can find it in the Hands On Spreadsheets section.

Click on the file **html.exe** and it will install the new version correctly.

Keeping track

Siddharth Jhunjhunwala emails from India: *"I'm using Excel 97. For sending quotations I use a template where I have used the TODAY() function to automate date generation every day. The problem is that whenever I create a worksheet from this template, the date is copied as a function. Hence the date changes every day, and I cannot keep track of the quotations sent."*

The flippant answer is, don't use the TODAY() function in such a template. But I made two suggestions. One is to select the cell holding that function and press F2, then F9, then Enter. (You can also change the contents of a cell from a formula to a value by using the shortcut in Memory trick 1; see the "EXCELlent little formulas" box-out, above.) The fastest solution is to leave this cell blank in the template and press Ctrl+; (semicolon) in the current quotation. This inserts the current date as a value.

Time to look for a solution from halfway around the world in the other direction. I emailed the problem to Hands On regular, Shane Devenshire, in California. He came straight back with the macro listed in Fig 1. Just open the appropriate template. Press Alt+F8 to create a new macro. Call it Auto_Open. Press Enter, then type in the listing. Substitute the cell of your choice for A1, and the preferred formatting of the date. Save the template. Any worksheet made from the template will include the current date; but the date won't change when this file is reopened.

Fancy graphs

As each new version of Excel comes along, it gets progressively easier to produce more imaginative presentation solutions. In recent versions, for instance, it's been fairly easy to insert a graphic into the bars of a chart. Excel 97 makes it easy to design your own shape for the bars: hearts, diamonds, squiggles or whatever. You just click on AutoShapes on the Drawing toolbar, then choose a shape. You draw the shape somewhere on your worksheet, click on it and copy it to the clipboard. Then you click on a data series in the chart and click Paste.

A variation of this which I like is to use WordArt in the same way. Fig 2 shows that instead of having a bar with a label or legend box, the bar can be letters which spell the series' name. Once you've drawn the WordArt objects on your worksheet, and copied and pasted them onto the relevant series, you can go back and make changes. Any editing of the words, or reformatting of the fonts or colours in the WordArt objects, is automatically reflected in the bars on the chart.

WordArt can also be used to pop a fancy-looking title on the chart, as I have done here with "Sales". You must forgive the artistic limitations of my humble effort, but it gives you the idea.

PCW Contacts

Stephen Wells welcomes problems or solutions relating to spreadsheets. Write to him at the usual *PCW* address or email spreadsheets@pcw.co.uk

Computer Manuals 0121 706 6000; www.compman.co.uk

Changing the sheets

You can sleep easy in your bed tonight: Stephen Wells tackles a problem of file usage when changing from 1-2-3 to Excel 5. Plus, an overview of 1-2-3's new Version Manager.

Years after people retire, it often happens that they still mull over problems they should have left at the office. But I hadn't heard of anyone still fretting over spreadsheets until I received a letter from John Gudge in Banbury.

"Please find enclosed a disk with two Lotus 1-2-3 Version 2.0 files. Using Dailprod.WK1 with its customised menu I was able to construct a daily production database. At the end of each month I could collate the month's production using M-prod.WK1, save it to a PRN file and edit and print in WordPerfect.

"Since having changed to Excel 5, although I am able to use the files in 1-2-3 mode, I have been unable to construct files in Excel format to do the same job. The sticking point is the 'data\unique' extraction. In Excel it appears to extract only one entry of each named product, while in 1-2-3 I can collate the whole month's production, even if there are eight to ten entries. As I have now retired, the whole exercise is academic, but it is nevertheless driving me mad."

The two files John sent are very sophisticated. They lock out the regular menus and offer their own. The macros are fine but their script is entered in columns to the right of the ranges which have the databases. Although Excel recognises 1-2-3 file formats, it will only run macros which contain menu commands, @ functions, keywords and advanced macro commands that are supported by 1-2-3 Release 2.01.

Excel doesn't support references to 1-2-3 add-in programs, so remove any keystrokes or command names that attach, start or use an add-in. Also, when you run a 1-2-3 macro in Excel, the macro cannot end in a menu, such as keystrokes /pp.

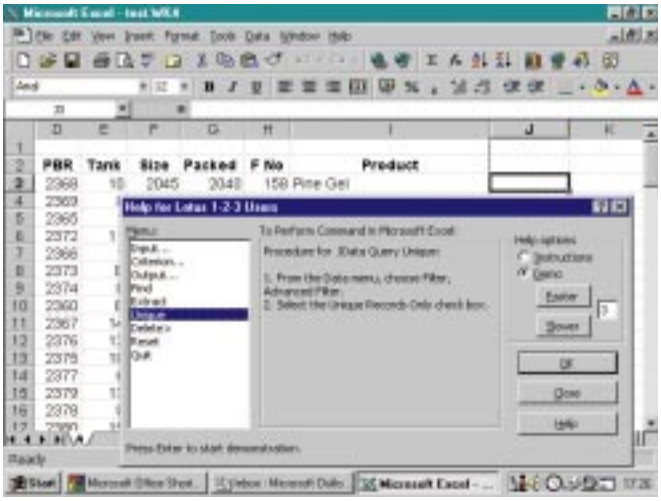


Fig 1 Help is at hand in Excel for Lotus 1-2-3 users. Here it suggests an Excel alternative for Data, Query, Unique

If John wanted to run the files without the macros there are a number of options. First, Excel will open and save a 1-2-3 file, so although you won't be running 1-2-3, in many aspects the effect can be the same. Second, if you choose "Lotus 1-2-3 Help" on Excel's Help menu, you can look up procedures to substitute. Excel 97 offers instructions and even demos (Fig 1). In this case it says the equivalent of "Data, Query, Unique" is the Advanced Filter with the "Unique Records Only" box checked.

Third, you can enter a formula using 1-2-3 entry methods. On the Excel Tools menu, choose Options, Transition. Now Excel will apply names for ranges as you enter references to ranges in formulas. In addition, if a function does not require arguments, you can type @ followed by the Lotus 1-2-3 function name, and the function is then converted to its Microsoft Excel equivalent.

Interestingly, Lotus 1-2-3 97 saves files in a format with the extension 123 and Excel 97 doesn't recognise it. So if you want to pass some 1-2-3 97 files to an Excel user you have to save them in a .WK* format, which may lose some features. Doubtless the next version of Excel will rectify this.

Dressing up

I have been receiving more questions lately about dressing up readers' own applications. If you have Excel 97, you might enjoy including your own versions of the Office Assistant. On this month's *PCW* CD-ROM you'll find a file from the Microsoft Excel Technical Support group called office.xla. It's very easy to use.

Copy the file to the directory, C:\Program Files\Microsoft Office\Office\Library. In Excel 97 choose Tools, Add-Ins, Office Assistant Animation Explorer, OK. You can see the dialog box in Fig 2. I happen to have dragged the regular Office Assistant into it so that I could see examples of each option in action. The tabs offer you a wide choice: assistants of all kinds under "Choose Assistant", one-off actions under "Short Animations" and continuously running elaborate animations under "Infinite Animations". Under the tab "Sample Code" you'll find the brief listings to copy into your own code.

Perhaps surprisingly, these commands do a lot. To achieve one of the long

p244 ➢

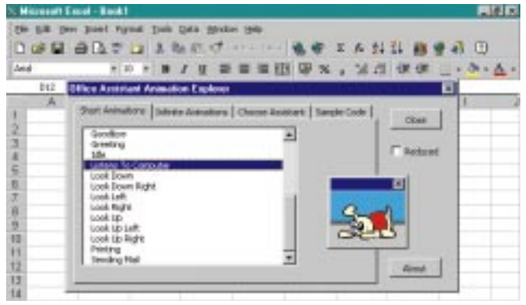


Fig 2 You can liven up your own Excel 97 application by picking new Office Assistants and giving them new jobs

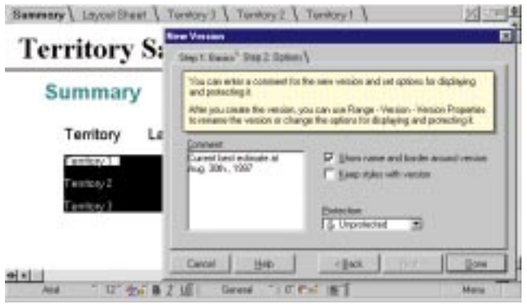


Fig 3 The Version Manager in Lotus 1-2-3 97 has been redesigned, with new features and more elaborate dialog boxes

Quick looks at new books

■ **The Essential Excel 97 Book**
Ever since Microsoft changed from providing traditional documentation to its *Getting Results* series there has been an opening for manuals in a format with which experienced users are comfortable. They'll like this book. Although it bills itself as a "Get-It-Done Tutorial" and the art director has sprinkled the volume with thousands of halftone pics of open diaries and PCs (representing notes and tips) this book works its way through every option on every Excel 97 menu, all the dialog boxes and all the tool buttons, too. There are two types of Contents list: a fully detailed index and a glossary and comprehensive functions list.

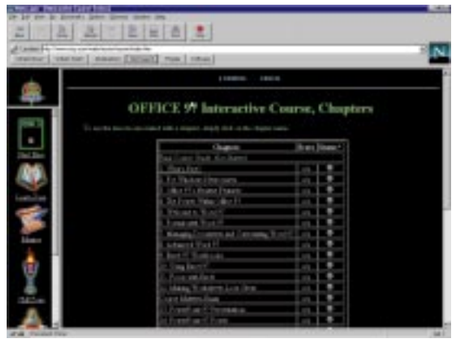
These days, many books on software take you only so far and then end lamely: "For more information, look up online Help." This 600-page book doesn't need to do that. Also, it is full of good advice like not trying to use Excel as a relational database when it can only ever produce a flat-file type. It clarifies what happens in SetUp and you select various Excel components. It details all the Excel Add-Ins. There is an excellent chapter on the incorporation of graphics, and it has the best explanations I've seen of all the strange chart types available in Excel and for what they are best suited.

The only criticism of this book is that the author uses worse analogies than I, writing "Excel is a tool like a briefcase…", and that formatting numbers can be compared to "…ancient theatre productions where costumes were used to help you tell the good guys from the bad guys." Otherwise, it is excellent value at £22.99.

■ **Office 97 Interactive Course**
Is this the way of the future for books? *Office 97 Interactive Course* is available from book shops but is also published on the internet (*see illustration*). The first advantage is that you can log on to www.waite.com/ezone and preview the first chapter. But then, having bought the book and registered by entering a requested keyword from a specified page, you can see the rest of the book and take the course. Having answered multiple-choice questions on each chapter, you are not only given a score but you can take mid-term and final exams. (If you want to cheat, the answers are in an appendix in the book.) Once you've successfully passed you can download an impressive certificate of completion — isn't that just the cutest thing?

More importantly, you can question a "Mentor" who is standing by to assist you. And you can view the Mentor's FAQ (Frequently Asked Questions). Included in the 464-page book's price of £36.50 is your quota of ten questions. But stick to the course material or you'll get no reply and lose one answer from your allotment.

Of the 24 chapters, there are four which are devoted to Excel 97; these cover all the basics well. The book is well illustrated and contains tips, notes and warnings. But the value of this work is really in getting the most out of combining this application with others in the suite, including Word and PowerPoint but particularly the database, Access, Office 97 Binder, and Outlook, the scheduling, diary, and mailing program.



● *Both books are available from Computer Manuals (see the PCW Contacts box, opposite).*

animations, all you need is:

```
Sub OfficeAssistantExample()
Assistant.Animation =
msoAnimationGetArtsy
End Sub
```

Just supposing

I promised to return to Lotus 1-2-3 97 and do so here to look at the new, improved Version Manager. If you want to try out various projections on a worksheet, you could save different versions of the same file and keep scribbled notes on your desk. But this can take up a lot of disk space and creates a lot of duplication.

Version Manager stores different sets of data for the same named range. You might have different managers' monthly estimates for the same sales forecast, for instance. Those 12 figures would change but the formulas for the rest of the worksheet would stay the same (although obviously the results would change). Each Version can have its own name. Storage space is minimal because each Version only stores the changes.

This has been a valuable feature in previous releases of 1-2-3 but it is more elaborate in the 1-2-3 97 interpretation, with redesigned dialog boxes. Fig 3 shows the options section of the box for creating new Versions.

The Version's range can contain anything you can enter in a cell: values, formulas, labels, functions and even macros. The range can have up to 2,000 cells. You can have several Version ranges set up on one worksheet and you can treat any selection of the different named ranges as a Group. Once you have found what might be the optimum solution to a problem, you can save it. You don't have to create a new file to do this, you just save a new Version and check a box in the Basics section entitled "Use Current Data".

The equivalent feature in Excel is Scenario Manager. But even in Excel 97 you can't retain formulas in different Scenarios: they will change to values. And you can only have up to 32 cells in the specified Scenario range.

To boldly go

David Michael of Oxford writes: "*I have created an Excel 95 spreadsheet listing the call charges for various telephone companies. I have a column giving countries, then columns for BT, Mercury, Energis, ACC and other telcos. Now, what I want is to make the lowest rate appear in bold. I have tried and tried but cannot find a simple way of doing this without resorting to writing a macro. Can you help?*"

I replied that the blunt answer is that David can't do what he wants to do within the parameters defined, which are (a) using Excel 95, (b) not using a macro, and (c) changing the formatting according to conditions in other cells. If he would relax one of these rules then these solutions would help, respectively:

(a) David could trade up to Excel 97 which allows Conditional Formatting, as I've described in an earlier column. The latest version of Excel offers a Conditional format dialog box and he could enter:

```
=IF(B2=MIN($B$2:$E$2),1)
```

where B2 to E2 is the range of call charges and "TRUE" or "1" means format in bold. Excel 95 only allows conditions in the same cell, like go bold if the number in the cell is >100.

(b) He could use the macro which I have included on our cover-mounted CD-ROM in the ChangeColour.XLS file and revise it as necessary. This will work with Excel 5 and above.

(c) I would suggest his simplest solution might be not to change the winning price to bold but to add another column (on the same, or a new sheet) and use a formula like this:

```
=LOOKUP(MIN(Spain),Spain,Company)
```

This assumes that "Company" is the header row of column labels which give the telephone company names, and "Spain" is the name of the range of charges for that country. If you don't want to use names but use column F to hold the MIN(B2:E2) formula, then it would look like this:

```
=LOOKUP(F2,B2:E2,B1:E1)
```

Either way, what happens here is that in the new "Winner" column, the name of the company with the lowest charge would be displayed. I have tried all these solutions and they work for me.

EXCELlent little formulas

■ **Two into one** A worksheet which holds a list can often have a field which, for sorting purposes, may need to be split into two. Say column A holds a name which you want to split into a first name in column B and a surname in column C. Cell A2 might contain John Brown. In B2 enter

```
=LEFT(A2,(FIND(" ",A2,1)-1))
```

In C2 enter

```
=MID(A2,FIND(" ",A2,1)+1,LEN(A2))
```

This puts John into B2 and Brown into C2.

■ **Not the average** If you would like to omit the larger numbers in a range when you calculate an average, use

```
{=AVERAGE(IF(A1:A100<1000,A1:A100)}
```

when the range is A1 to A100 and you want entries of less than 1,000. Enter as an array by using Ctrl+Shift+Enter. Excel itself inserts the curly brackets.

■ **Be selective** Similarly, using the same parameters, you can count the number of entries of less than 1,000 with

```
{=SUM(IF(A1:A100<1000,1))}
```

What this does is return a 1 when the result is true, and then adds up the 1s.

■ **Top address** You can find the cell address of the cell containing the highest value in a range named TEST with

```
=ADDRESS(MATCH(MAX(TEST),TEST,0)
+ROW(TEST)-1,COLUMN(TEST)).
```

Substitute MIN for MAX to find the address of the smallest value in the range.

■ **Number of labels** You can count the number of labels in a range named TEST with

```
=COUNTA(TEST)-COUNT(TEST)
```

■ **Add everything** If you wish to add up all the values in a range, name the top left cell, FIRST and the bottom right cell, LAST and use

```
=SUM(FIRST:LAST)
```

(As an example: if every cell in the block A1 to F10 contained 1 then the answer would be 60.)

■ **Gate estimate** To roughly estimate attendance of a future event use

```
=FORECAST(7,E2:E7,{1,2,3,4,5,6})
```

when cells E2 to E7 give the six previous gate figures. Note that the FORECAST function can take an array as an argument but you enter it with Enter, not Ctrl+Shift+Enter. In this case, you enter the curly brackets.

Half an answer

Valroy Vinyard emailed: "*I'm using Excel 7 and have come across a problem with the location of the VBAEN.HLP file. While developing a macro I got 'Run-time error 424' but when I clicked 'Help' I received the Windows Help message: 'Cannot find the Shared VBAen.HLP file. Do you want to try to find this file yourself?'. I clicked 'Yes', but it just repeated the 'Cannot find…' line, followed by a message concerning re-installation. It does not give me the opportunity to specify the location of the file.*

"*I have searched help files, Excel menus etc to find where the location of this file can be altered, but to no avail. Can you help, please?*"

I replied that I had experienced the same thing with Excel 8. What I did was minimise Excel and use Windows 95 Find to track down the VBAen.HLP file, and then double-clicked on it. The Help file opened and I looked up my original question. In my case, this seemed to teach Excel where to find this Help file and I had no further problem.

Valroy replied: "*Thanks for your prompt response. I've tried your suggestion and can now open the file as a Help file OK but unfortunately it didn't cure the problem of finding it from Excel.*"

Assuming Valroy is not on a network and has run SetUp again and reinstalled all the appropriate components, this is puzzling. Maybe it's an error in the Registry? Path problems can be caused when upgrading from one version to the next, and also when components are shared between applications, like Excel and Word. If any reader can suggest a solution, I'll pass it on.

PCW Contacts

Stephen Wells welcomes problems or solutions relating to spreadsheets. Write to him at the usual *PCW* address or email spreadsheets@pcw.co.uk

Computer Manuals 0121 706 6000; www.compman.co.uk

Times tables

Time is money for a businessman — Stephen Wells tackles the 40-hour week timesheet. There's lots more on using Lotus 1-2-3 97 and Excel 97, plus a few quick tips for 2000.

Here's an interesting query from a reader who has his own interpretation of the 40-hour week, and who has wandered off into the realms of negative time.

Andrew Fielder writes: "*I've been a reader of your column for many a year and have lost count of the number of tips I've been able to adapt for my own use. Now I have a little problem of my own: I want to run a simple timesheet for my staff.*

"*I would like to total the times as entered and see whether, in each week, more or less than 40 hours have been worked. This would then be passed forward to the next week, so that a running total could be kept to see whether an employee is ahead of, or behind, his contracted hours. The trouble is, I cannot find a way of getting Excel 5 to calculate minus time values.*"

Part of Andrew's timesheet design is shown in Fig 1. It shows the end of Week 3 and all of Week 4 for a fictional Carol. In Week 3, Carol has worked 38 hours and 45 minutes. This means she's an hour and a quarter under her required 40 hours. Worse. from Weeks 1 and 2 a further two hours have been carried forward, so the poor love is going to have to put in an extra three and a quarter hours in Week 4. However, she comes out square by the end of Week 4.

Fig 1 (left) Carrying forward an employee's unworked hours. Time can be added and subtracted with the right formatting

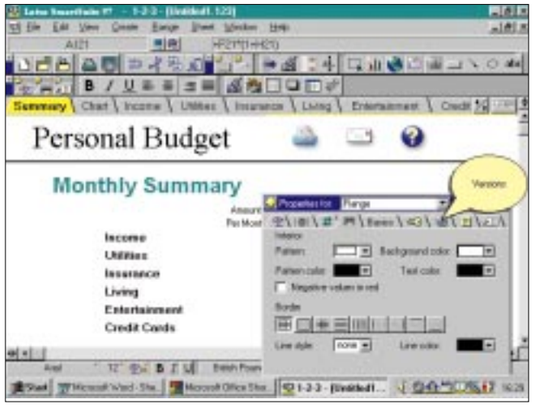


Fig 2 (below) A SmartMaster, the new Infobox, and Bubble Help, displayed by hovering the mouse: all in Lotus 1-2-3 97

It's none of my business if Andrew keeps Carol slaving away until 7 o'clock in the evening. My role is to suggest that hours carried forward are just numbers, not time. You'll find the worksheet on our cover-mounted CD this month, in the file Timesht.xls. The solution I suggested uses the functions HOUR(F54) in cell G54 and MINUTE(F58) in H58.

These formulas are replicated as needed, in columns G and H. The numbers are totalled in G61 and H61. Cell I61 has the formula

```
=H61+G61*60
```

In other words, we've now totalled the minutes Carol worked in Week 4.

In cell F62 we insert the formula

```
=(I61-$I$14)/60
```

Cell I14 just carries the number 2,400 which is 40hrs x 60mins. Cell F63 has =F48, which is the number of unworked hours carried forward from Week 3.

The formatting is straightforward. Everything that is time (as in the block D54 to F61) has the custom elapsed time format of [h]:mm. Cells in the groups like F62 to F64 are in the Number format, with two decimals. Columns G, H and I are just in the General format.

To emphasise that the numbers in rows 46 to 48, and 62 to 64, are hours and decimal fractions of hours (not minutes), I've emphasised the word and the numbers in green.

Tips for the year 2000

- Lotus 1-2-3 97 offers you an option. Choose File, User Setup, 1-2-3 Preferences and you can check a box to "Interpret entry of years 00-49 as 21st century".
- Excel 97 assumes by default that if you enter two digits for the year in the range 00-29, that you mean the 21st century. Two-digit year entries in the range 30-99 are assumed to be this century.
- With both spreadsheets, you can override these settings simply by entering a four-digit year. Excel 97 accepts dates entered with four digit years up to 31st December 9999; and Lotus 1-2-3 97 accepts dates up to 31st December 2099.

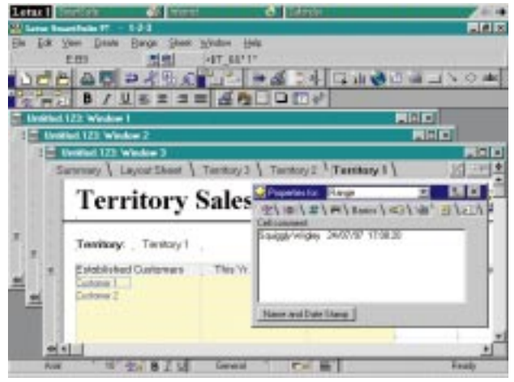


Fig 3 Another SmartMaster, and just visible are the new Formula Markers and the Outlining feature. Cell Comments and Multiple Windows are also shown

1, 2, 3 jump

At the top of the list of things I like about the latest version of Lotus 1-2-3 is that it has been rewritten with 32-bit architecture. Loading 1-2-3 Release 5, which was the 16-bit version that came with SmartSuite 96, seemed to slow down Windows 95 for any 32-bit applications loaded after it, in the same session.

Lotus has dropped the term Release and the new model is called "Lotus 1-2-3 97 Edition". (Microsoft, on the other hand, sometimes refers to "Excel 97" and at other times calls it "Excel Version 8.0".) It appears also to be the senior application in SmartSuite 97. In SmartSuite 96, features like the Infobox were added to other applications but now they're available in 1-2-3. Other features would appear to be have been added to remain competitive with Excel.

The Infobox is a sort of multi-function floating toolbar box with groups of options divided between tabs (Fig 2). This screenshot also shows the Personal Budget SmartMaster, one of a number of new, well-designed templates provided for the most common spreadsheet applications. It also illustrates Bubble Help: hover the mouse over an icon or dialog box tab and up pops a description.

More new features are illustrated in Fig 3. You can create several windows in the same file to facilitate viewing and analysis of worksheets. Outlining has been added, as in Excel. Plus or minus signs appear to the left for demoting rows (and it's not shown here, but can appear above, for demoting columns). This means you might show the detail of sales to all customers, and then create an outline so that only totals by county or by region are shown. Across columns you might have a year's figures, which open out to show the figures for quarters and then open out to show the detail for each month.

Also in Fig 3, you should just be able to see some dots in the corners of some cells. These Formula Markers (optional) indicate which cells have formulas in them. There are new Cell Comments, too. These are indicated by a marker and can be read and edited in the Infobox.

One feature about which Lotus seems proud, but about which I can't get excited, is AutoTotal. You type the word Total (or Totals) in a cell to the left of the range where you want to create the totals for columns, or above the range to sum rows. So, the label goes where it logically would be.

You can have up to ten blank rows above the Total label when you sum columns, and up to ten blank columns to the left of the Total label when you sum rows. But frankly, I find it quicker to sweep the mouse along a row and instantly select the cells where I want totals and then click the Sum tool. I rarely use the uninformative label, "Total". I always put "Total Assets", or whatever it is. Often it is conventional to use another term, like Gross Sales or Net Profit.

One feature which I do find helpful is the Quick Demo. These use sample files to show how various procedures are carried out. You watch the mouse arrow select ranges and tools and you can read pop-up explanations: there are five on subjects related to entering, editing and calculating data, one about the Infobox, two on copying and moving data, and three on naming sheets and ranges. In addition, there are five on sizing and hiding columns and rows, four on re-ordering and outlining data, three on creating and displaying versions and version groups, and two on graphic objects (including maps).

If you are a Lotus Notes user with Notes 4.1 or higher, you can create a TeamConsolidate database which lets you distribute workbook sheets in a Lotus Notes

Quick look at a new book

Using 1-2-3 97 for Windows

This 984-page tome from Que Corp might have been better entitled "The Complete Lotus 1-2-3 Encyclopedia". Although it covers the latest features introduced in 1-2-3 97, and any of the illustrations which show a complete screen show Lotus SmartSuite 97 in the top line, this book is much more than a manual for the new version of 1-2-3.

All the basic features of 1-2-3 are thoroughly covered and there is a fully-detailed Function Dictionary. But then there is a whole series of excellent articles by a range of well-known spreadsheet experts like Shane Devenshire who has a been a long-term contributor of tips to this column. He has written chapters on using 1-2-3 for querying databases and advanced data management.

Sue Plumley provides chapters on linking 1-2-3 with other SmartSuite applications, using 1-2-3 with Lotus Notes, and building complex charts and mapping data. Joyce Nielsen, author of a score of computer books, tells you how to write your first macro. Stan Donerty explains programming with the latest version of LotusScript.

There is a helpful index of common problems, an upgrader's guide and a massive regular index. It makes sense not to confine the book to Lotus 1-2-3 97 features: someone buying the latest version may not be familiar with 1-2-3 at all so will be glad to find everything they need in one place. But one could almost recommend this book also to 1-2-3 users who haven't yet upgraded.

I have been fed up lately with the price increases of computer books but I really think this one is worth its £36.99. It is available from Computer Manuals (see "PCW Contacts", below).

p264

database to obtain data or modifications from other users. After they have made changes, you can consolidate these sheets into your workbook.

If you were using 1-2-3 to track expenses on a project involving several departments, you could create a workbook containing a sheet for each department. You distribute the sheets using Lotus Notes. The others make their updates and additions and then you can consolidate the changes into the original workbook.

Storing the workbook in a Notes database makes the information available to everyone (even those at different locations) and can help you track changes over time. A TeamConsolidate template comes with 1-2-3 97 and is installed in the Notes data directory. You can use all the TeamConsolidate features without altering the forms and views of a TeamConsolidate database, yet still customise the forms and views of the template in 1-2-3 to tailor it for your needs. For example, you might want to change the user interface to make it easy to distribute workbook documents to the same set of users each month. The forms of the TeamConsolidate database contain scripts created using the LotusScript language. I expect I'll return to 1-2-3 97 next month.

EXCELlent little formulas

■ **Once is enough** One of the most frequent needs of those who maintain lists on spreadsheets is to check for duplicated items: they might be names, product numbers or prices. Excel 97 offers a simpler way of doing it, using the conditional formatting feature. The first instance will not be affected but the other instances will be highlighted.

Let us say the items are in column A and you want the duplicates to appear in red. Select a range like A2:A50. Choose Format, Conditional formatting, Formula Is. In the next box insert:

```
=ISNUMBER(MATCH(A2,OFFSET($A$1,0,0,ROW(A2)-1,1),0))
Select Format, Colour, Red, OK.
```

■ **Validation** To reassure a user that they have entered a valid number (it might be a product or account number) you can also use conditional formatting to check the entry against a list of acceptable numbers. If the entry cell is B3 and the authorised numbers are in the range F6:F11, then select cell B1 and choose Format, Conditional formatting, Formula Is and insert:

```
=ISERROR(MATCH(B3,$F$6:$F$11,0))
```

Then select the format to be used for unacceptable entries. It might be white bold type on a red background.

■ **Versatility** If you are unsure of the version of Excel which will be running with a macro you have written, you can have it checked automatically. Where xlObj is the name of the Excel object in question, you can use the following line of code:

```
ExcelVersion = Val(xlObj.Application.Version)
```

The value that is returned will be: 5, if Excel 5.0 is running; 7, if Excel 7 for Windows 95; or 8 if Excel 97. Now you can use "If" statements to carry on from there, as with:

```
If ExcelVersion = 8 Then
```

Creating add-Ins in Excel 97

An add-in is just another kind of workbook. It can contain worksheets, charts, VBA macros and functions. But when open, it should not be visible on the screen and you shouldn't be able to unhide it by clicking Unhide on the Window menu. Until Excel 97 it was unnecessary to protect the contents of an add-in file, but now it is, if you don't want others to view or edit the sheets and VB modules in it. Here's the procedure:

1. Activate the Excel 97 workbook you want to convert to an add-in file.
2. Choose Tools, Macro, Visual Basic editor.
3. In the Project Explorer window click the entry <Project name> <File name> where the former is the name of the project and the latter is the name of the workbook to convert.
4. Choose Tools, <Project name> Properties. Click the Protection Tab.
5. Check the "Lock project for viewing" check box. Type a password in the appropriate box.
6. Repeat this in the "Confirm password" box. Click OK.
7. Click "Close and Return to Excel" on the File menu. Choose File, Properties, Summary.
8. In the title field, enter your name for the new add-in. (This will later appear in the Add-Ins dialog box.) If you want to have text that describes your add-in, enter it in the Comments field. Click OK to close the Properties dialog box.
9. Choose File, Save As. Choose "Excel Add-In" in the Save As Type box.
10. Change the file name if you wish. Click Save. At this point Excel creates the add-in. Choose File, Close.

Attaching toolbars in Excel 97

Something else that has changed in Excel 97 is that you can now attach custom toolbars to a workbook so that they are available to any user of the workbook:

1. Choose View, Toolbars, Customise. Click Attach.
2. In the list of Custom Toolbars, select a toolbar that you want to attach to the active workbook, and click Copy. Repeat this step for each toolbar you want to attach to the workbook.
3. Click OK, and then click Close. But you must save the workbook in the "Microsoft Excel Workbook(*.xls)" file format. If you save the workbook in the "Microsoft Excel 5.0/95 Workbook(*.xls)" file format, the chances are the toolbar(s) will not be attached.

The web toolbar in Excel 97

It is immediately apparent to a new user that Excel 97 is orientated towards saving worksheets as web pages and retrieving data from the internet. What might not be realised as quickly is that some of the related features can make life easier without connection to the internet. Excel 97 is integrated with the Active Web searching technology. This can allow users to instantaneously retrieve Office or HTML documents anywhere on a corporate network.

Active Web Search is similar to any of the popular internet search engines. Excel 97 has a Web Toolbar that appears whenever a document containing a hyperlink is opened, or can be displayed by choosing View, Toolbars. It is similar to the Microsoft Internet Explorer toolbar. You click on the Search tool and fill in a search form and then find the file for which you are looking, whether the server is on a network or an intranet.

PCW Contacts

Stephen Wells welcomes problems or solutions relating to spreadsheets. Write to him at the usual *PCW* address or email spreadsheets@pcw.co.uk.

Computer Manuals 0121 706 6000; www.compman.co.uk

Scouting out a solution

Dyb-dyb-dyb, dob-dob-dob… Stephen Wells presents an unusual spreadsheet for planning Scouting hikes. And, he does his best with a useful guide to helpful web URLs.

Having gained much from my stint as Patrol Leader of the Woodpeckers, years ago, I was delighted to receive an unusual spreadsheet from Mike Foster, who is the treasurer of his local Venture Scouting unit in Staffordshire. (Venture Scouts are the over-16's.)

This spreadsheet isn't for figuring out which scouts are behind with their subs, it's for route-planning when preparing walks — I love these unusual Hands On applications!

I've loaded the spreadsheet into Lotus 1-2-3 R5, as you will see from Fig 1, although Mike wrote it in Release 4. It calculates the average compass bearing in both true and magnetic, and also works out the length of time that each part of the walk should take.

"*The time formula assumes a walking speed of 4Km/h,*" writes Mike, "*and adds an extra half hour for every 300m climbed, one minute for every 10m, though you can change this. It then calculates the figures for hours and minutes, converts them to strings and joins them with a colon ':'. In calculating the minutes, I have added a '0' to the front of the string and then taken the right two characters in order that '4' will become '04' but '14' would stay as '14'.*

"*The bearing formulas use the magnetic offset (westerly) given in B1. I have used three spare columns in calculating these values as the formulas would otherwise exceed the 512-character limit imposed by 1-2-3 Release 4. Columns K, L and M, therefore, give the distance travelled east, the distance travelled north and the angle of the direction of travel from the N/S line respectively. These can either be hidden or just not printed, depending on preference.*

"*The bearing formula then calculates which direction this is in, and from that the bearing. It then tests to see if you are travelling N,S,E or W and adds letters instead; a touch more friendly than numbers. The magnetic bearing is then calculated from the true bearing and given in column F.*

"*The formulas rely on you being west of the Greenwich meridian and in the northern hemisphere, but it is easy enough to compensate if this is not the case. All that needs doing is for you to change the sign of the offending result in either K or L: that is, make the answer from K negative if you are east of Greenwich, or make the answer from L negative if you are in the southern hemisphere.*"

Mike's example is for a short training hike for the Queen's Scout Award, in the White Peak area, starting a few miles out of Ashbourne, Derbyshire. A typical formula in the Mag Bearing column is:

```
@IF(E3="N",360-A:$B$1,@IF(E3="E",
90-A:$B$1,
@IF(E3="S",180-A:$B$1,
@IF(E3="W",270-A:$B$1,
@IF((E3-A:$B$1)=0,"N",@IF((E3-
A:$B$1)=90,"E",
@IF((E3-A:$B$1)=180,"S",
@IF((E3-A:$B$1)=270,"W",
(E3-A:$B$1)))))))))
```

The basic formula used in the Time column is:

```
@STRING(@INT(((G4/$D$1)+(H4/
$F$1))),0)&":"&@RIGHT("0"&@STRING
((60*((G/$D$1)+(H4/$F$1)))-60*(@INT
((G4/$D$1)+(H4/$F$1))),0),2)
```

Lotus 1-2-3 Release 5 - [WALK.WK4]

File Edit View Style Tools Range Window Help

	A	B	C	D	E	F	G	H
1	Magnetic Deviation (W)	5						
2	From		To		True Bearing	Mag Bearing	Distance	Height Gai
3	Car Park by Ilam	147 508	Dale End	147 595	N	355	11	1
4	Dale End	147 595	Footpath	145 599	333	328	0.5	
5	Footpath	145 599	Heathcote	147 602	34	29	0.25	
6	Heathcote	147 602	Junction	146 606	346	341	0.25	
7	Junction	146 606	Tissington Trail	148 609	34	29	0.75	
8	Tissington Trail	148 609	Path	142 639	349	344	4.5	
9	Path	142 639	A515	144 642	34	29	0.5	
10	A515	144 642	C-Road	148 649	30	25	0.5	
11	C-Road	148 649	Monyash	150 655	18	13	1.5	
12	TOTAL						19.75	
13		Camp at:	Rowson House Farm (155 664)					
14								
15								
16								
17	Monyash	150 665	Path	148 649	187	182	2	1
18	Path	148 649	A515	144 642	210	205	0.5	
19	A515	144 642	T. Trail	142 639	214	209	0.5	
20	T. Trail	142 639	Vincent House	137 632	216	211	1	
21	Vincent House	137 632	Pilsbury	116 635	278	273	2	
22	Pilsbury	116 635	Road	115 625	186	181	1	
23	Road	115 625	Path	117 623	135	130	1	
24	Path	117 623	Junction	121 609	164	159	1.5	
25	Junction	121 609	Newfield	114 605	240	235	1	
26	Newfield	114 605	Path	108 606	279	274	0.5	
27	Path	108 606	Ford	098 596	225	220	1.5	
28	Ford	098 596	River - Westside Mill	101 589	157	152	1	
29	River - Westside Mill	101 589	Bend	099 556	183	178	5	
30	Bend	099 556	Wetton	108 554	103	98	1	

Fig 1 An application designed for route planning. It calculates where you should be if you don't get lost

Where to find what URLooking for

■ **Baarns Publishing**, Mission Hills, California, is a team (now including the well-known author, Rob Bovey) dedicated to producing productivity enhancements for Microsoft Office Professional products. Baarns offers: a range of Excel books by post; and Excel business, financial, statistical, and home and personal add-ins you can download. There is also an Excel FAQ (Frequently Asked Questions) section. There are shortcuts to the External Microsoft Newsgroup site, the Excel section on the Microsoft web site, and the Excel Knowledge Base. www.baarns.com

■ **Computer Manuals On-line Bookstore** is a well-established on-line bookshop run from Sparkhill, Birmingham. You'll find illustrations of covers of new books on spreadsheets and reviews, interviews with authors, resource kits, a search function to find subjects of interest among the volumes available, and an ordering service. www.compman.co.uk

■ **Easter Eggs:** a huge collection (basket?) of Easter Eggs submitted by volunteers is offered by David Nagy-Farkas at Washington University. Everything, from games to pocket calculators, are included (also, see *Walkenberg,* below). http://weber.u.washington.edu/~davidnf/egg.html

■ **Excel Monthly Magazine:** older issues are called "Excel Pages" when you print them out but, strangely, they are called "Tips & Tricks" on the web site. At time of writing the monthly issues available are from August '95 to July '96. www.microsoft.com/excel/work_tips.htm
The most recent issues of Excel Pages magazine, listed as "Tips & Tricks" on-line (though you need Word 97 or its viewer, to read them) are at www.microsoft.com/msexcelsupport/content/tips/xlpages.htm

■ **Facts about Lotus 1-2-3 97** for Windows 95 and NT, and links to other Lotus product and service pages, can be found at www.lotus.com/123/214e.htm

■ **Marchcom** specialises offers a comprehensive on-line service called CAROL (Company Annual Reports On Line). There are separate sections for UK and continental companies. You start by selecting a group like banks, chemical, media or transportation companies, and the available firms in that category are listed. You can download any report, such as a Balance Sheet or P&L Statement. Excel 97 will open an HTML page and display it, properly formatted on a new worksheet, complete with corporate name on the sheet tab. www.carol.co.uk

■ **Microsoft's main page** for Excel tech support, consulting services and pre-sales information. www.microsoft.com/msexcelsupport/

■ **Microsoft's "Work with Excel"** page offers Excel patches, fixes, drivers, utilities, virus information, tutorials and links to third-party web sites. www.microsoft.com/msexcel/fs_xl.htm

■ **Microsoft Excel Knowledge Base** contains articles about Excel and particularly its occasional shortcomings. The best way to use this service is to first download the file "index.txt" then use Find to search for the particular subject in which you are interested. Say you want to add labels to data markers in an x-y chart. You might search for "labels" and eventually find "Q161513: Macro to Add Labels to Points in an XY (Scatter) Chart". You can note the reference number, then go back on-line and select directory q161, then directory 5, then the file 13.txt, and download it. ftp://ftp.microsoft.com/deskapps/excel/kb/

■ **Rick's Software Development Center** has a TalkShop, Bulletin Board and Information Center about Excel. Rick Dill worked for Microsoft for 11 years, teaching programming, and lives in Redmond, Washington. http://forums.msn.com/SOFTWAREDEVELOPMENT/category2/forum3/01c2f3.asp

■ **J. Walkenberg Associates** is a San Diego consulting firm, run by John Walkenberg in La Jolla, California. His page offers lots of add-ins for Excel, Lotus 1-2-3 and Quattro Pro together with tips and shortcuts and details of his own books. There is also lots of fun stuff like the "Easter Eggs" I mentioned on page 282. www.j-walk.com/ss/

■ **Webzone** is a Midlands public access web server which runs an on-line conference for some 200 web designers. If you are uploading spreadsheets to your own page, some of their code could be very useful. There are generic scripts you can download for operations like adding page counters to your page, or guest books for accepting responses. www.Webzone1.co.uk/www/demo/index.htm#html

Carlton Communications is one of many UK companies which make their financial results available on the CAROL web site

where D1 is walking speed in Km/h and F1 is the number of meters climbed, which cause one hour to be added to your time.

Thanks to Mike for his contribution and he certainly deserves a book token. His spreadsheet is on our cover-mounted CD-ROM this month.

Page break poser

Steven England, of Devon, emails:
"*I have test results, on an Excel spreadsheet, for students at the college where I work. The spreadsheet is set up to percentile the marks for a whole year-group, which is split into sets. My query is, how can I get Excel to automatically put in a page break after each set, so that each set's results are printed on separate sheets? I put in the page breaks manually, but this is irritating, particularly when people leave or join the college, because the page breaks are then in the wrong places and I have to start from scratch, removing the old page breaks and entering new ones.*"

Steven didn't say which version of Excel he was using, but in my reply I suggested he could start a new worksheet for each set and keep all the worksheets in one workbook. If he wished to write a macro, then in Excel 4 he could use the PAGE.SETUP macro function.

In Excel 97, the following sets a page break above row 25 on Sheet1:

```
Worksheets("Sheet1").Rows(25).
PageBreak = xlPageBreakManual
```

And this example sets a manual page break to the left of column J on Sheet1:

```
Worksheets("Sheet1").Columns("J").
PageBreak = xlPageBreakManual
```

If the set range varies, the range can be given a Name. Any changes in the range will be allowed for by the Name.

Now they tell me!

Last month, a reader was asking for a way to add labels automatically to an x-y scatter chart, as you can in Lotus 1-2-3. In other words, the x numbers were in one column of his worksheet, the y numbers in another, and the labels in a third.

Having found no immediate solution to this, I asked a friendly spreadsheet adviser and he knocked up a short macro (which earned him a book token). He also told me about Rob Bovey's utility which does the same thing.

All this bother, yet Microsoft offers three different solutions, none of which are mentioned in the help files. First, if you wander down the right paths from the Microsoft home page you can get to the Power Utility Pak, which is actually published by John Walkenberg. Then, if you patiently trawl through the Excel Knowledge

p282 ➢

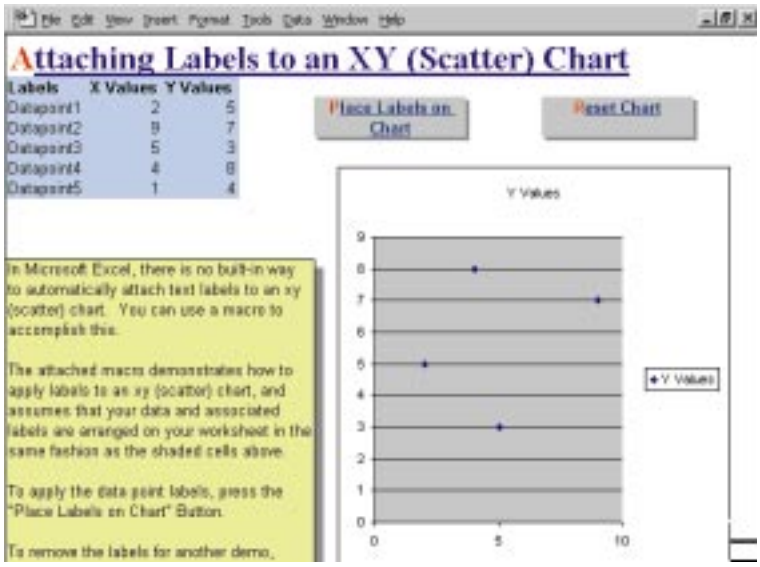


Fig 2
A macro for attaching data labels which is included in the Excel file, Sample.xls. It is included with Excel 95 and 97

Base you find a comprehensive document, complete with listing for a suitable macro, which I've included on the *PCW* CD-ROM.

Finally, in an issue of the on-line Excel Pages magazine (in an article which had nothing to do with this subject at all), I found a reference to a Sample.xls file, from the Office suite which contains a similar macro (Fig 2). And it is already on my hard disk! More embarrassing still, I had mentioned this file in my February column and then forgotten all about it.

Belated convert

I found myself with a list of items in one column of a worksheet the other day, and wanted to see if it contained any duplicates of items in a column of another sheet.

I knew very well that there is a way of comparing two columns — I recalled writing about it, but couldn't remember the procedure. Time to try out the *PCW* CD-ROM. I slipped the latest one in the drive and the main menu appeared. I clicked Hands On Spreadsheets. Acrobat loaded. I clicked the button with the binoculars and a page, then entered "compare two columns" in the Search box, with only the Proximity option checked. Acrobat immediately went to the file for Hands On Spreadsheets, Dec '96, with the chosen words highlighted.

It was one of those helpful tips contributed by Shane Devenshire. Terrific. It still tickles me when something new actually works.

Dates and figs

I've been sitting for far too long on an interesting letter about date formats, from Ian Galpin of Poole. I've mentioned before that as I never issue more than one invoice a day, I create my invoice numbers by reversing the date of the invoice; so, one raised on 30/9/97 would be numbered 970930. Most of the software on Ian's PC reflects his interest in astronomy and he tells me that astronomers use an International Date Format of the year first in four digits, then the month in two digits (padded zero if necessary) and the day in two digits (likewise).

Although this conveniently gets around the topical Year 2000 computer problem, the original intent was to avoid other variances. As he says, 02/04/96 would be 2nd April in the UK and 4th February in the US. Because astronomy is an international science, observations are passed around the world. (Apparently, astronomers also use a common time-zone, but that matters less here.) Another argument for the year-month-day format is that it is consistent with the "largest first" format for time, which is Hours:Minutes:Seconds.

For his DOS software he has COUNTRY=088, instead of 044 in his Config.Sys file, but he warns of Code Page potential problems. In Windows' Control Panel, Regional Settings, you can specify a year-month-day format. And of course in a spreadsheet, it's simple.

With 1-2-3 you can use Style Number Format or Style Worksheet Defaults to specify date formats in a specific worksheet, or use Tools User Set-up International to specify long or short International Date formats by default. In Excel you simply enter any Custom format you like.

Life's little oddities

One of the delights of sharing other users' knowledge via the internet is stumbling across little oddities. I think of these as the Keith Chegwins of spreadsheeting. One of these I found via John Walkenberg's web page (*see "Where to find what URLooking for", page 281*). I had been aware that it is possible to display a list of the developers of such software, if you know a series of non-intuitive steps. These displays are sometimes called "Easter Eggs" (more because of Fabergé than Cadbury).

- To display Excel's 97's Easter Egg: open a new workbook. Press F5. Enter X97:L97 and press Enter. Press Tab. Press Ctrl+Shift and click the Chart Wizard button on the toolbar. Then use the mouse to move around. I found the credits hard to read but the colour and animation is dramatic.
- If you have Excel 95: open a new workbook. Scroll down and select row 95. Press Tab. Choose the Help / About Microsoft Excel command. Press Ctrl+Shift and click the Tech Support button. You'll be greeted with a new non-Excel window. Explore the window using the arrow keys.
- To see the Excel 5 Easter Egg: choose the View / Toolbars command. Click the Customise button. Scroll down the Categories list and choose the Custom category. Drag the second button (with a deck of cards image) to any visible toolbar. Click Cancel if you are asked for a macro. Click Close to close the Customise dialogue box. Press Ctrl+Shift+Alt, and then click the new toolbar button.

On the *PCW* CD-ROM

- In the Software Library, Hands On, Spreadsheets section this month are examples of some the material about spreadsheets available on the internet (see also, "Where to find what URLooking for", page 281).
- The file "labels.txt" is the MS Knowledge Base document, Q161513, which includes the code for a macro to add labels to data markers in an x-y chart.
- An example of the Knowledge Base index is in "index.txt", although you should go on-line to see the most recent listing of documents.
- Mike Foster's spreadsheet for planning walks is in the file "walk.wk4". It is in Lotus 1-2-3 R4 format and will import into Excel.

PCW Contacts

Stephen Wells welcomes problems or solutions relating to spreadsheets. Write to him at the usual *PCW* address or email spreadsheets@pcw.co.uk.

The need for speed

Stephen Wells looks at a new twist on the common problem of achieving raw performance with Excel and how to optimise spreadsheets. And help is at hand for oil men and pilots.

An extreme example of a common problem arrived this month by email from John Ferguson.

"*I need to supply an actuarial team with raw performance on Excel. I could ask them to rewrite their spreadsheets in a better fashion (I am sure their spreadsheets are inefficient) but it would be difficult to persuade them to do this. The spreadsheets are about 7Mb in size. Loading takes 30 minutes on a Pentium P75 with 32Mb memory, Windows 3.11 and Excel 5.0c. Changing to NT 3.51 and Excel for NT does not speed up the load or recalc time. I can either supply them with increasingly higher-spec PCs or an alternative system. I could let them use Visual Basic 5, but I do not expect to see any great improvement with this because they expect to take their VBA Excel macros directly to Visual Basic. Essentially, the spreadsheets test profitability.*"

I have to assume these spreadsheets take 30 minutes to load from an intranet, not a disk. But my reply zeroed in on some key points: developments in Excel and VBA, inefficiency of design, and use of macros.

The calculation engine in Excel 95 was rewritten and is much faster than Excel 5, and the same engine is used in Excel 97. VBA Version 5, which comes with Office 97, is faster than the Excel 4 macro language and earlier versions of VBA.

For one thing, the Visual Basic for Applications object library is no longer a standalone file. It is integrated into the dynamic-link library (DLL). And there are many other efficiencies: for example, in Excel 5, the Names collection is accessed through the Workbook object. Excel 95/7 provides a new Names collection for the Worksheet object as well. I suspect the root problem for John is one of available expertise. A DTP package does not an art director make, nor Excel an application developer. Optimisation of an Excel spreadsheet starts with better formatting, then more use of Excel functions before macros and then more efficient macros.

Here are some examples. Say cell E1 displays the date of the first day of next month in a normal date format of d/m/yy. In cell D1 you want to show the name of that day. It's not uncommon to use a LOOKUP table. You could have the numbers of the days of the week, 1 to 7, in the range F2 to F8, and the names in G2 to G8. So, in D1, you could have the array formula

```
{=LOOKUP(WEEKDAY(E1),F2:G8)}
```

You use Ctrl+Shift+Enter and Excel adds the curly brackets. WEEKDAY provides the number of the day of the week and the LOOKUP function provides the name from the table. But it is far more efficient of space and memory, and you display the same result, if you simply enter =E1 in cell D1 and custom format the cell as dddd.

Moving back to cell E1: many users would create a function to find the first day of next month like this —

```
Function FirstOfNextMonth()
 FirstOfNextMonth = _
  DateSerial(Year(Now), Month(Now)
 + 1, 1)
End Function
```

Then they would write a macro to display it in the cell, like this:

```
Private Sub Sheet1()
Range("E1").Value =
FirstOfNextMonth()
End Sub
```

Again, it would be more efficient to simply enter in cell E1:

```
=DATE(YEAR(TODAY()),MONTH(TODAY())+
1,1)
```

Obviously there are going to be times when an application needs macros. Microsoft itself makes a number of suggestions for speeding up Visual Basic for Excel. These tips can also save memory.

The first is to streamline any code produced by the macro recorder which is a wonderful device for beginners because it automatically produces code. But it is there for convenience rather than economy. It blindly duplicates the keystrokes you make, but it's not psychic. For one thing, it can't tell which options you've changed in a dialog box so it sets all of them. You might change FontStyle to Italic, but the macro recorder will list every formatting variation, with all the others individually set to False. You can shorten what might be a 13-line macro to one line by eliminating the unnecessary instructions.

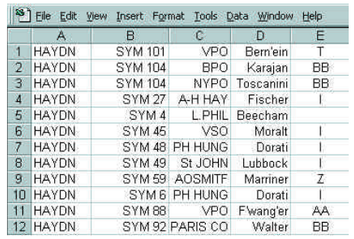
Also, following your keystrokes, the macro rdecorder will activate or select objects before it specifies any action. Again, if you edit the resulting code you can remove all the Select method calls and use a With statement instead.

When you write your own code, it's important to remember that every dot, or full stop, you use is an OLE call for a method or property. Reduce the number of dots and you expedite the code. You can do this not only through With statements, but by setting an object variable or using a For Each…Next loop. Another good tip is to use Excel functions within a macro. Functions that can take a range as an argument, like SUM, MATCH and LOOKUP, are faster than VBA code equivalents.

Getting sorted

In the post this month arrived a letter from G Eames, of Ramsbottom, which I suspect is more about formatting than sorting.

"*Can you please help? The problem is sorting. Using Excel, when preceded by a word, numbers are treated as separate digits so 100 is placed before 4, and so on. I have enclosed a listing to illustrate the effect.*" (Fig 1)



	A	B	C	D	E
1	HAYDN	SYM 101	VPO	Bern'ein	T
2	HAYDN	SYM 104	BPO	Karajan	BB
3	HAYDN	SYM 104	NYPO	Toscanini	BB
4	HAYDN	SYM 27	A-H HAY	Fischer	I
5	HAYDN	SYM 4	L.PHIL	Beecham	
6	HAYDN	SYM 45	VSO	Moralt	I
7	HAYDN	SYM 48	PH HUNG	Dorati	I
8	HAYDN	SYM 49	St JOHN	Lubbock	I
9	HAYDN	SYM 59	AOSMITF	Marriner	Z
10	HAYDN	SYM 6	PH HUNG	Dorati	I
11	HAYDN	SYM 88	VPO	F'wang'er	AA
12	HAYDN	SYM 92	PARIS CO	Walter	BB

Fig 1 How can you sort on column B which has a mix of text and numbers? Format as a number and include the text in a custom format

There are ways around this. You could put the SYM, which I presume is short for symphony, in a separate column from the numbers. But I think you may prefer the idea of formatting this range of cells with the custom format, "SYM" 0. All you enter are the numbers but they will display preceded by a SYM. Then you can sort the whole block, based on Column B, and it will descend from SYM 4 correctly to SYM 104. If, later in the listing, you need, say, CON, for concerto, you just change the formatting for that range of cells.

As this looks like a music collection, you might be interested in the Music Collection Database template which comes with Microsoft Access 95 and 97. Excel is fine for small databases but Access is better designed for the job. Incidentally, until the latest version, Excel displayed dates alphabetically rather than numerically. The new Excel 97 helps solve sorting and formatting by displaying dates as numbers rather than text. When dates are sorted in ascending or descending order, they are listed in appropriate chronological order. It doesn't matter whether the dates are formatted as 6/9/97 or September-97.

Flying high

Here's that old problem again of subtracting times. Ron Whytock emailed me from Singapore, *en route* to Manchester.

"*I run quite a large spreadsheet in Excel 7 for my flying logbook. I need to be able to subtract two times (24-hour clock), one from one another.*"

Fig 2: A macro for changing data point labels on an Excel chart

```
 Sub addlabels()
'assumes labels are in range A2 to A28
'select the appropriate worksheet first
Set LabelRange = Range("a2:a28")
With ActiveSheet.ChartObjects(1).Chart.SeriesCollection(1)
    .ApplyDataLabels
    For i = 1 To .Points.Count
        .DataLabels(i).Text = "=" & LabelRange.Cells(i).Address _
            (ReferenceStyle:=xlR1C1, external:=True)
    Next
End With
End Sub
```

Regardless of the format used, Excel stores any date as a serial number and it stores any time as a decimal fraction. For instance, 23/6/97 22:20 is stored as 35604.93.

The way that a time or date is displayed on a worksheet depends on the format applied to the cell. When you type a date or time that Excel recognises, the cell's format changes from the General number format to a built-in date or time format. By default, dates and times are right-aligned in a cell. If Excel cannot recognise the date or time format, the date or time is entered as text, which is left-aligned in the cell. Options you can select in the Regional Settings of Control Panel determine the default format for the date and time, and the characters used as date and time separators. To type a date and time in the same cell, separate the date and time with a space.

Excel separates date elements with a slash (/) and time elements with a colon (:). By default, Excel bases the time on the 24-hour clock. If you type 3:00 instead of 3:00PM, the time is stored as 3:00AM. To type a time based on the 12-hour clock, type a space followed by A or P after the time.

To see the underlying serial number which is stored, select the cell, choose Format, Cells, Number tab, General. Times and dates can be added, subtracted, and included in other calculations. To use a date or time in a formula, enter the date or time as text enclosed in quotation marks.

So when I replied to Ron, I suggested that he simply enter the correct date and time when he went on duty, and again when he went off duty, then in a third cell subtract one from the other. So A1 might display 23/6/97 22:20 and B1, 24/6/97 03:25. C1 would have the formula B1 — A1. It would be formatted as h:mm and the result here would display correctly as 5:05.

Easing into oil

The problem posed by oil consultant Gordon Smith seemed simple enough:

"*We use Excel 7 to analyse data for a number of different wells and we want to chart rock porosity against the amplitude of permeability.*

"*Say we have an X Y data chart made from porosity values listed in column B and the amplitude in column C. What causes a problem is that having created the chart we want to label the points, not with the porosity or amplitude but with the equivalent well names, listed in column A. Typically this would be an alphanumeric field looking like 30/17b-A21Z. How can you easily add this information to the chart? At the moment, we edit each label manually and, faced with 30 or so wells, this is a problem. Is there an easier way?*"

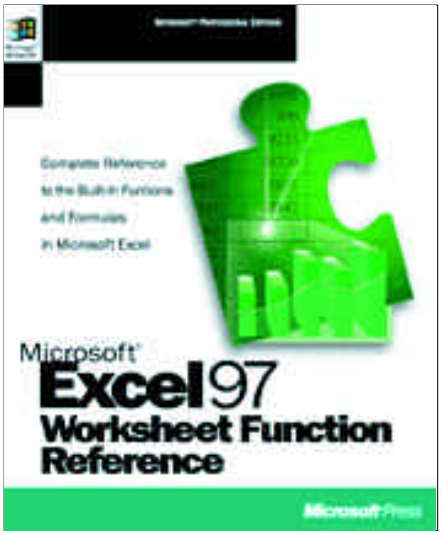
Gordon attached a sample Excel file for me to play with. He also said that when his office used Lotus 1-2-3 there had been no problem. So first I imported the file into 1-2-3 Version 5 and, sure enough, there is a dialog box for specifying the range of the worksheet to refer to for the data point labels. Then I opened the file in the feature-packed Excel 97 and, to my surprise, there is no equivalent. You can format data labels every which way from Sunday but to change them you have to do it one label at a time.

"I must be doing something wrong," I thought. Time to consult my friendly guru, Michael Rickard. As usual, he's rescued my rashers. First of all he knocked up the short VBA macro (Fig 2) which worked for me in Gordon's worksheet, first time. But he also

p268 ➢

Quick looks at new books

Microsoft Excel 97 Worksheet Function Reference



With version 4.0 of Excel you get a two-volume User's Guide and a separate 580-page Function Reference book. For version 8.0, or Excel 97, the book has shrunk to 308 pages and it now costs £22.99. What's missing?

Well, the Excel 4 macro language functions became redundant, replaced by the properties in VBA v5.0 which comes with Office 97. And, the short lists of related functions which appeared after each function have been dropped. Related to INT, for instance, is CEILING, FLOOR, MOD, MROUND, ROUND and TRUNC. These prompts were useful because they often suggested other ways of doing things. However, the other four main sections for each worksheet function (definition, syntax, remarks and examples) are still there. All the most recently added functions are included, too. All the worksheet functions are grouped by category at the front of the new book, as before, but the previous list of changed functions has been dropped. As has the book's index.

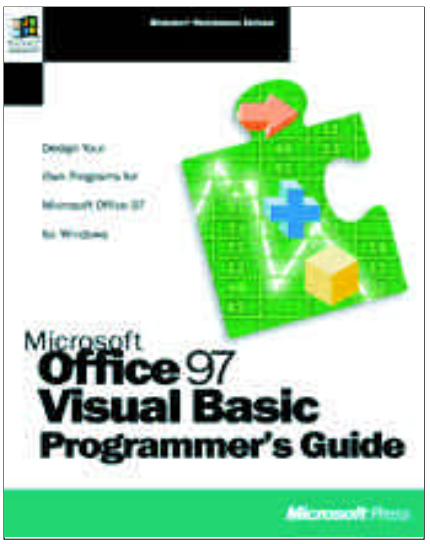
Of course, if you don't have the Excel 4 version on your shelf and you like to sit down with a book instead of working through the on-line function list and help files, this up-to-date version of the *Excel Function Reference* book will be right for you.

Microsoft Office 97 Visual Basic Programmer's Guide

With no visible module sheets and a bewildering multi-window opening screen, experienced and neophyte programmers alike may be initially confused by the Visual Basic Editor in Excel 97. This book is an excellent introduction. It clearly describes, with a mass of examples, how to write, edit, store, run, optimise and debug VBA code. Right at the front there is a detailed illustration, with call-outs, of all the Editor windows and associated boxes and toolbars, which gets you off to a good start.

With VBA Version 5, Microsoft has reduced the differences between VBA for Excel, Word, PowerPoint and Access so the programming environment is now all integrated, including Outlook (the information management program) and Office Assistant (an advanced help system). The sections on creating custom commands, menus, dialog boxes, messages, and buttons, as well as the online help, apply to all these applications. But there are also chapters on the specific objects required in each application. The Excel section details the Workbook and Range objects and their properties as well as support for event-driven programming.

There is everything from programming basics to dealing with the drawing layer, ActiveX Controls and developing applications for the internet and the World Wide Web. A comprehensive appendix details how VBA 5 differs from the Excel 4 macro language.



This book, priced at £32.49, is a first-class introduction to VBA 5 for anyone developing Office 97 under Windows 95, Windows NT or for the Macintosh.

Both these books are published by Microsoft Press and are in the *Microsoft Professional Editions* series. They are available from Computer Manuals (see the "PCW Contacts" panel, below).

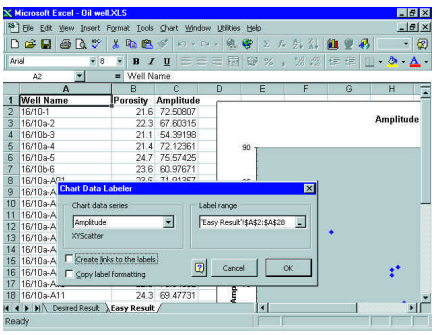


Fig 3 The Chart Data Labeller utility in the registered version of John Walkenbach's Power Utility Pak for Excel 97

recommended Rob Bovey's equivalent utility, a Rolls-Royce job with frills and full documentation. You'll find the Excel 97 version of this on our *PCW* CD-ROM, in the packed file, label_97.exe. If you want versions designed for Excel 5 and 95, download them from www.baarns.com/. There is a comparable utility in the registered version of John Walkenbach's Power Utility Pak 97 (Fig 3). The shareware, unregistered version is at www.j-walk.com/ss/pup97.htm. I've put an earlier version of this Pak, which works with Excel 95, on our CD-ROM. Although this version doesn't include the labelling utility, it offers 21 general-purpose utilities, 23 new worksheet functions, and enhanced shortcut menus.

On the *PCW* CD-ROM

1. In the Software Library, Hands On Spreadsheets section this month is John Walkenbach's Power Utility Pak 2.0a. Click on the file xlpowr2a.exe to unpack it in the directory of your choice.
2. Many loans allow for the early prepayment of the principal at any time. This results in savings of interest and a shorter loan period. Roy Murphy's file, prepay.xls, for Excel 4 and above, is a worksheet which examines the effect on the loan of paying different amounts in each period.
3. The Excel 97 version of Rob Bovey's XY Chart Labeller is in file label_97.exe. Click to unpack. Email addresses for John, Roy and Rob are included in the respective files.

PCW Contacts

Stephen Wells welcomes problems or solutions relating to spreadsheets. Write to him at the usual *PCW* address or email spreadsheets@pcw.co.uk

Computer Manuals 0121 706 6000; www.compman.co.uk

A balanced approach

Stephen Wells explains how spreadsheets can be used to create a model for businesses to balance liquidity with profitability. Plus, how to stay sane when moving from 1-2-3 to Excel.

To an accountant, Working Capital is simply defined as a business's current assets minus its current liabilities (current, usually meaning consumed or payable within a year). To a businessman, it is the fuel of the enterprise. Sufficient working capital ensures that a company can pay its creditors, hold adequate stocks and allow debtors reasonable time for payment. The amount required will depend not only on the size of the business, but also the type of industry it is in. But all businesses need to manage their working capital and balance liquidity (the speed of converting into cash) with profitability (the return on idle funds).

Generally speaking, longer-term financial instruments will usually pay a higher rate of return than shorter-term ones. But the responsible manager can't tie up funds for six months when they are needed in 30 days. A spreadsheet can be of help here to create a useful model.

I emphasise that the example shown here is *only* a model and not intended to be incorporated into a company's financial statements. It is concerned only with the cash portion of working capital. This is money which a company might typically roll over in Treasury Reserve accounts, pooled with others to qualify for deposit minimums.

Fig 1 shows the layout. The total interest expected to be earned in the half-year is in cell F5. The current yields of the planned short-term financial instruments are in B3:B5. The starting cash is in B8. After the month-labelling row 7, the six columns B through G show the position at the start of each month; in this case, July through December. Column H shows the position at the end of the last month of the period.

The starting cash is entered in B8. The rest of row 8 shows the cash position at the end of the previous month and the start of the current one, so =B15 is entered in C8, =C15 in D8, and so on.

The initial anticipated investments in one-month, three-month and six-month instruments are entered in B11:B13. Row 14 shows the estimated cash needs of the business for each month. In many months (hopefully!) the business will generate more than its cash needs, and those amounts are entered as negative figures (as in Aug, Sep and Dec).

Row 15 shows the ending cash. C9 is entered in cell =B11 because the one-month deposit has now matured and is thus available if needed. However, it is turned over or immediately reinvested and entered in C11. At the beginning of October, as recorded in E9, both a one-month and a three-month deposit mature; and at the end of December, H9, all three types of deposit mature.

Row 10 shows the interest earned. So

```
=B11*$B$3
```

is entered in C10, and

```
=D11*$B$3+B12*$B$4
```

in E10, and

```
=G11*$B$3+E12*$B$4+B13*$B$5
```

in H10.

Cell F5 shows the total of this interest:

```
=SUM(B10:H10)
```

At this point, you could fiddle around with the investments to see if you could

p282 ➢

Fig 1 (Right) **A worksheet for modelling potential short-term investments to maximise returns on the cash portion of Working Capital**

Microsoft Excel - WC Mngmnt.xls

File Edit View Insert Format Tools Data Window Help

	A	B	C	D	E	F	G	H
2		Yield	Annual % Rate					
3	1-month Inst.	0.6%	7			Interest earned		
4	3-month Inst.	2.0%	8					
5	6-month Inst.	4.5%	9			£1,525		
6								
7	Month:	July	August	September	October	November	December	Ending
8	Starting Cash:	£ 150,000	£ 90,000	£ 100,146	£ 120,292	£ 40,538	£ 25,683	£ 40,829
9	Matured Inst.		25,000	25,000	30,000	25,000	25,000	40,000
10	Interest:		146	146	246	146	146	696
11	1-month Inst.	25,000	25,000	25,000	25,000	25,000	25,000	
12	3-month Inst.	5,000			5,000			
13	6-month Inst.	10,000						
14	Cash needs:	20,000	-10,000	-20,000	80,000	15,000	-15,000	30,000
15	End Cash:	£ 90,000	£100,146	£ 120,292	£ 40,538	£ 25,683	£ 40,829	£ 51,525

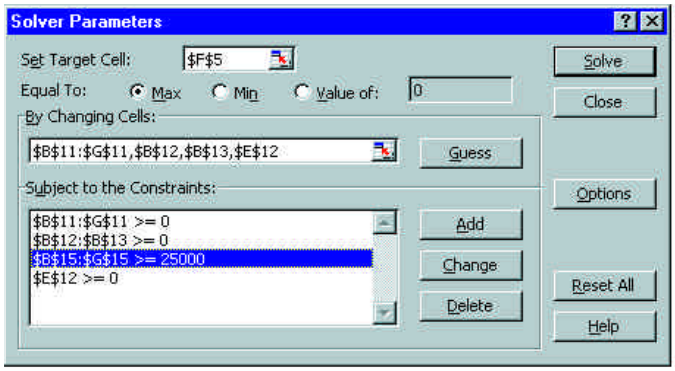


Fig 2 (Left) **Establishing the parameters for Solver to follow: the target cell, the cells which can be changed, and the constraints**

improve on the return. But both Excel and Lotus 1-2-3 offer a Solver tool which rapidly tries out hundreds of options for you.

In a dialog box (Fig 2) you set the Target Cell, in this case F5, and enter the cells which can be changed, here B11:G11,B13,B13,E12.

You can also establish some rules, which both Excel and 1-2-3 call Constraints. Here we've stated that all investments must be greater than, or equal to, zero. Also, it is management policy that the month-end cash balance after all transactions must always be at least £25,000.

If we now run this example using those constraints (Fig 4), Solver says we can earn £3,548 (more than a 130 percent increase) and still satisfy the same cash needs by increasing the six-month investment, not reinvesting the three-month investment in October and not making a one-month deposit in July and November. Who says computers aren't intelligent?

Staying sane

Even though statistically, Excel is currently the leading seller among spreadsheets, it can occasionally confuse people who have been used to Lotus 1-2-3. Take the simple matter of calculating compound growth. Let us say you bought a product for £416.90 in 1989 but the identical product is sold today for £583.66. You want to calculate the average percentage increase of the price each year. We'll enter the £416.90 in C1, £583.66 in C2 and 1997-1989 (or 8) in C3.

Lotus 1-2-3 offers the @RATE function with the arguments: Future Value, Present Value, Term. As far as an investment is concerned, logically £416.90 is the Present Value and £583.66 is the Future Value. So we enter @RATE(C2,C1,C3) in cell B1. The correct answer is displayed: an annual growth rate of 4.3 percent.

Excel also has a RATE function but its arguments are different. They are: NPER, representing the total number of payment periods for a loan or annuity; PMT is the payment made each period ; PV for Present Value; FV for the Future Value; and Type, with a logical value depending on whether the payment is made at the beginning or end of each period.

If you enter the three elements which are known, Excel just returns a #NUM! error. You can enter the 1-2-3 formula, @RATE, and Excel will recognise it, but you'll still get a #NUM! error.

EXCELlent little formulas

■ **Counting occurrences** If the range A1:A100 contains surnames, you can count the number of times that the surname in cell A10 appears in the total range A1:A100 with this formula:

```
=COUNTIF(A1:A100,A10)
```

■ **Counting coincidences** Using the same worksheet, now add the names of sports in the range B1:B100. You can count the number of rows in which the same particular surname occurs with the same sport by using

```
SUM(IF(A1:A$100="Smithson",IF(B1:B100="Cricket",1,0)))
```

Enter as an array, using Ctrl+Shift+Enter.

■ **Conditional additions** As above, but add figures for costs in the range C1:C100. You can total the costs for the rows in which the same particular surname occurs with the same sport. Also enter as an array.

```
=SUM(IF(A1:A100="Smithson",IF(B100:B100="Cricket",C100:C100)))
```

■ **Joining text** If the surname in A1 is Jones and the sport in B1 is hockey, in another cell you can display Jones plays hockey with this formula:

```
=A1&" plays "&B1
```

■ **Joining dates** You can convert a date to text and join it with other text. If the date in cell D17 is 31/8/97 (that is, in the format dd/m/yy) you can display it in another cell as Fixture date: 31/8/97 using this formula:

```
="Fixture date: "&TEXT(D17,"dd/m/yy")
```

■ **Taking a discount** If there is an amount in cell C30 and you want to show this amount less 15 percent in another cell, you can use this formula:

```
=C30*(1-15%)
```

Make sure that this cell is formatted as a decimal or currency, though, not as a percentage.

Fortunately, Excel will calculate it the 1-2-3 way if you choose Tools, Options, Transition and, under Sheet Options, select the Transition formula entry check box. Click OK. Now it's just as though you were using 1-2-3 and you can enter the @RATE function with its three Lotus arguments.

Excel will change it to =RATE(C3,,-C1,C2). You'll note that Excel is inserting a minus sign before the Present Value, which is enough to confuse anyone.

If your organisation has moved from 1-2-3 to Excel and you can't find a particular Lotus function that you are used to, it's worth trying this feature. But don't forget to clear the Transition formula entry check box when you're done.

Happy events

In days of yore, you would run a macro manually by pressing a hotkey, like Ctrl+Z, or selecting it from a menu list of macros, or by clicking a custom-made button. But VBA in Microsoft Excel 5.0 offered the opportunity to have events trigger a macro.

There were (and still are) properties like OnEntry. As soon as a user enters data on a worksheet, then a macro can run. Another property is OnUndo which triggers a macro if the Undo command is selected. I particularly like OnTime which can automatically run a message that it's time to go to lunch at 12.50.

In all there were 14 of these events in Excel 5. Another was added in Excel 95, the OnSave event. It doesn't work if a workbook is saved by a program but is triggered when the user selects the Save or SaveAs commands from the File menu. OnSave might run a macro which simply states that the file has been saved.

Now Excel 97 has added 62 new events, many of which are very sophisticated. Among those available for use with charts, for instance, is MouseDown which occurs when the user presses the mouse button, and MouseUp when he or she releases it. The syntax includes a number of parts so that you can specify whether we're talking about the left button, right button, or middle button if you've got one. You can also specify if the macro runs with a simple press or when SHIFT, CTRL, SHIFT + CTRL, ALT, ALT + SHIFT, ALT + CTRL, or ALT + SHIFT + CTRL are pressed. Whether anyone would remember which of those variations is needed to run the macro is another matter. Maybe it will remain your little secret that you have to press the right button with ALT+CTRL?

Some of the new events are more refined versions of earlier ones. For example, there was a DoubleClick property which runs macro when the user points to an object and then clicks a mouse button twice. Now there is also the BeforeDoubleClick event which occurs when an embedded chart or worksheet is double-clicked, before the default double-click action. It could be used for overriding the default double-click behaviour in a specific instance, like someone wanting to change an element of a chart.

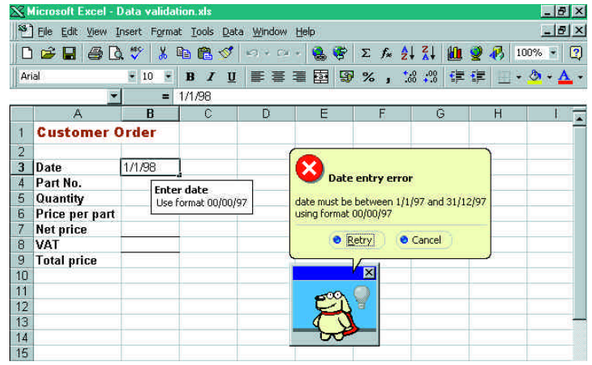


Fig 3 Excel 97 offers automatic data validation. It's easy to create parameters which must be followed and error messages if they aren't Optional, if you have space...

Data entry control

Excel 97 also offers an easy way to ensure that anyone entering data onto a worksheet follows your rules. Perhaps it would be more diplomatic to say you can be helpful in communicating what is expected. They still have the option of clicking in a list and choosing Data, Form, and an entry form will automatically be created.

Alternatively, you can set up the sheet as in Fig 3 so that a message such as Enter date Use format 00/00/97 automatically appears when a data entry cell is selected. If the user enters something which is not within the defined parameters, they are prevented from going further and an error message appears either as a regular error message box, or within the Office Assistant if it is active (again, as in Fig 3).

This is arranged using a new option, Validation, on the Data menu. You have many options from which to choose. The error message can be Stop, Warning, or Information. You write your own message box title and error message. It is also an option whether a title and input message is displayed when a cell is selected.

If you ever have to design a template for any kind of data entry, whether for expenses, invoices, patient reports, ticket sales, you name it, you will find this built-in, easy-to-use feature can save hours of programming time.

Care to share?

With every new version of Excel, it becomes easier to share workbooks with other people on a network. The only limitation is that if a shared workbook were created in Excel 97, you can only make changes to it with Excel 97. But that's not unreasonable. Beyond that, the whole business of sharing is remarkably easy and there is little to be learnt. The intention is that the features be used without instruction from a systems administrator. The typical uses are for budgeting, forecasting, record keeping and project tracking.

Changes can be made in three ways. The first is that a workbook is made available on a network and different people can open it, make changes, and close it. The second is that the file can stay open on a network and several people can make changes simultaneously. The third is that a copy of the workbook can be sent to someone outside the internal network, modified, and the changes merged with the original workbook, together with a revision history.

To get started, all you do is open a workbook, then on the Tools menu choose Share Workbook and click the Edit tab. This is where you choose whether to allow more than one user at a time. Then, you save the workbook on a network location where the users can gain access to it.

Also on the Tools menu, you can select Track Changes, then Accept or Reject changes, and then the When, Who, and Where changes can be made. The When might be "since a certain date". The Who might be "Everyone" or certain specified personnel. The Where indicates the ranges of the workbook which allow changes.

Under Tools, Track Changes, Highlight Changes, you can specify whether changes are visible on the screen, as a cell tip (when you hover the mouse over a cell), or listed on a separate worksheet, or both.

You can see who made a change, the date and time they made it and what they did (for instance, changed a numerical or text entry, or a formula). Cell borders can even be colour-coded corresponding to the person who made the changes.

Operating order

To help myself remember the order in which operators take precedence in Excel, I have devised the mnemonic, EMDAS, standing for Exponentiation, Multiplication and Division, Addition and Subtraction.

Lotus 1-2-3 can work differently in some respects but not for the following cases, which give the same results in both spreadsheets:

```
2^2*2+2/2-2  =   7.0
2^2/2+2*2-2  =   4.0
2/2^2-2+2*2  =   2.5
2+2/2^2*2-2  =   1.0
2+2/2-2^2*2  =  -5.0
```

On the PCW CD-ROM

■ In the Software Library, Hands On, Spreadsheets section there are two worksheets which are templates for financial analysis. Example.xls is for retail, wholesale or manufacturing companies (which carry stock) and Service .xls is for service companies (which don't). They can be used with Excel 4 and above, and Lotus1-2-3 versions for Windows 3.1 and above.

■ Requests are again coming in for the templates which accompanied my series on financial analysis (Sept '94-Jan '96). I assume that people have been reading these articles on the various compilation CD-ROMs which have been issued. To satisfy demand I've included the templates on the CD-ROM, but you will have to assemble the back issues containing the explanatory articles if you need them (see "PCW Contacts", below).

PCW Contacts

Stephen Wells welcomes input on all spreadsheet matters. Write to him at *PCW*, or email spreadsheets@pcw.vnu.co.uk

Back issues of *PCW*: phone 01483 733870

Linking up

Excel 97 offers a number of ways in which to exchange information between a workbook and a web page; Stephen Wells explains how. Plus, Excel 97's hyperlink capabilities.

A worksheet which is specially designed to accept data from a particular web page is called a Web Query. To run one, you choose Data, Get External Data, Run Web Query, then select the particular Query you wish to run from the Run Query dialog box. Excel 97 includes four of them, as I mentioned last month, but one of these is "Get More Web Queries". At present, if you run that when connected to its source, you can download an active sheet with 36 more Queries.

If you have your own web page, it's easy to add a range of a worksheets:

1. Open the page with your usual browser.
2. Choose View, Source, so you can see the HTML code.
3. Where you want the new worksheet data to appear, insert a blank line and then `<--##Table##-->`
4. Save this edited file.
5. Open your worksheet in Excel and select the range you want to add to the web page.
6. Choose File, Save as HTML (Hypertext Mark-up Language). This starts the Internet Assistant Wizard (Fig 1) and you follow a few simple steps. These include browsing to select the .html file you've prepared for accepting the data. When you've finished, the range will appear on the web page.

You also use this Wizard to prepare a worksheet as a web page. It works much better now than when I previewed it last October. If you just accept all the defaults, the Wizard selects enough of the first range of your worksheet to fill a web page, then it creates a new HTML-coded page complete with header, footer and table. This can be opened in Microsoft Explorer or your other favourite browser.

Fig 1 (right) It is easy to save a range of your worksheet as an HTML-coded web page, automatically, using the Internet Asst. Wizard

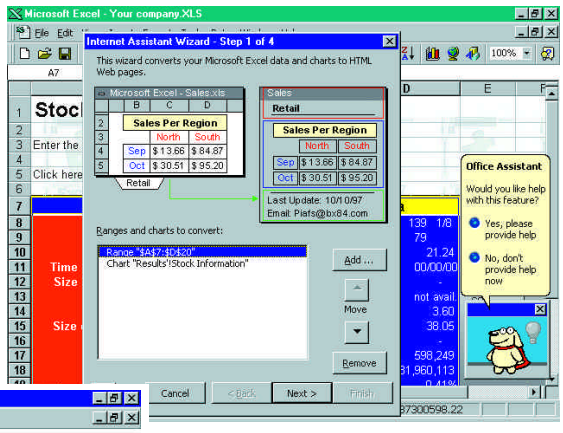
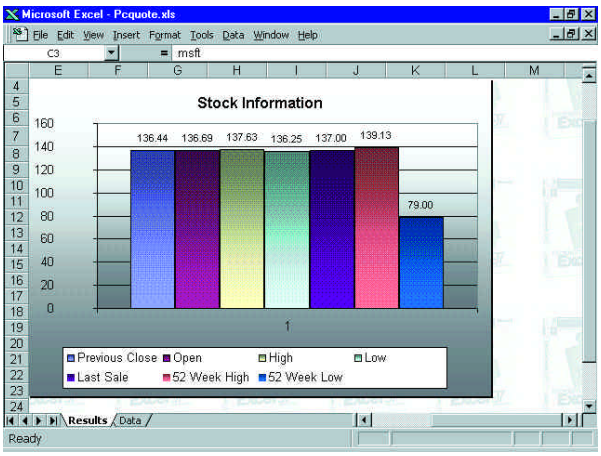


Fig 2 (below) The Excel 97 Web Connectivity Kit includes a template for converting downloaded data into charts



Excel 97 also makes it easy to add an Excel form to your web site which can be used for collecting information for a database. This might be for taking orders from users, or requests for information, or just recording comments. You first create the form in Excel with cells where users will enter their data. Then choose Tools, Wizard, Web Form to open the Web Form Wizard which asks you to select those cells on your worksheet that you wish to have the user fill in, and the labels you wish to give them. It then automatically produces a new .xls file and companion .idc, .htx, and .mdb files. You supply these four files to the web page administrator and you can open the new .xls file, which looks like your original, with a Submit Info button added. This Wizard works best with Microsoft Access 97 and Microsoft Explorer 3.

On this month's cover-mounted CD I've included the complete Excel 97 Web Connectivity Kit. It's the definitive guide to developing sophisticated web sites for Excel users. It also helps you to create special pages on Excel worksheets that will automatically elicit information from company intranets or specific internet web sites. You can learn how to pull daily sales, stock or financial reports from a company intranet server straight onto a worksheet. The Excel 97 Web Connectivity Kit includes an example of converting downloaded data into charts (Fig 2).

Meanwhile, back in the office…

The hyperlink capability of Excel 97 can also be used to improve links with files on an office network, or on your own disks: hard,

p282 ➢

or mounted floppy. If you just want a hyperlink from one Excel worksheet to another without the use of a formula, the easiest way is to select the worksheet data in the destination workbook and then use the right mouse button to drag the information to the worksheet cell that contains the text, button or graphic for the hyperlink. When you release the right mouse button, click Create Hyperlink Here on the shortcut menu (Fig 4).

It's also easy to create a hyperlink between a worksheet and a Word document or a PowerPoint slide. Say you have the text, SEE REPORT, in a cell and the report referred to is a Word document. Just select the cell and then click the Insert hyperlink button on the standard Excel 95 toolbar (or press Ctrl+K). This opens a dialog box where you can browse to find the Word file. Click OK and that's all there is to it. The words SEE REPORT are now an automatic link which opens the Word file when you click them.

As you were

Last month I was saying that Excel 97 allows you to use row and column labels as references, assuming that you've checked the "Accept labels in formulas" box under Tools, Options, Calculation.

I mentioned that in the beta version I tried, this feature easily got confused when one of my labels was "Current Assets" and another was "Current". I also said that if the column heading was a formula, like =B1-1, instead of 1995, then I received an error message even though the sheet displayed

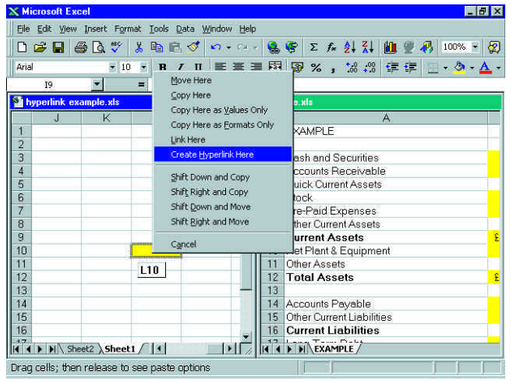


Fig 4 You can create direct hyperlinks simply by dragging a cell from one Excel 97 worksheet to another and right-clicking

1995. I've since received the final version (if there ever is a *final* version) and can report that both of these minor problems have been corrected.

VBA changes

The Excel 97 Visual Basic object model has extensive changes to support new and improved features in Visual Basic for Applications in Office 97. Many objects, properties and methods have been replaced. To provide backward compatibility, most of the replaced components have been hidden rather than removed. They don't show up with the object browser although the existing code that uses the hidden components still works. When you write new code you should use the new objects, properties and methods.

The first thing to get used to is that macros are not displayed on module sheets any more although they are still stored with the workbook. To create or edit a macro you choose Tools, Macro, Visual Basic Editor (or press Alt+F11) and three windows open (Fig 3). Visual Basic now features a single, consistent editing environment for Office programs similar to working in standalone Visual Basic 5.0. Each Excel workbook has a project associated with it. There is an improved code editor, a hierarchical object browser, a multipane debugger, a Properties Window and a Project Explorer to help you view and organise the code and objects in your project.

If you open a workbook created in earlier versions of Excel, Excel 97 preserves macro and dialog sheets and converts module sheets into modules in the workbook's Visual Basic project.

You can run and edit Excel 4.0 macros and Excel 5.0 and 7.0 dialog sheets. To view them, just choose Tools, Macros (or press Alt+F8). You can even add new macro or dialog sheets by right-clicking a sheet tab and then clicking Insert on the shortcut menu. However, it is recommended that you create new macros and dialog boxes in the Visual Basic Editor.

The three largest areas of change in Excel 97 Visual Basic are Shapes, UserForms and Command Bars.

Shapes are drawing objects. The Shape Object is for formatting or modifying a single shape. The Shapes Collection is for modifying all the Shape objects on a specified sheet, such as AutoShape, freeform or OLE objects. The ShapeRange Collection is for modifying a group of Shape objects which you specify.

A UserForm Object is a window or dialog box that makes up part of a custom application's user interface. The UserForms Collection is a collection whose elements represent each loaded UserForm in an application. The UserForms collection has a Count property (which specifies the number of elements in the collection), an Item property (to specify a specific collection member), and an Add method (for placing a new UserForm element in the collection).

CommandBar Objects in Office 97 control the toolbars, menu bars, and shortcut menus in a workbook. Not only can you create and modify custom toolbars, menu bars and shortcut menus for a tailor-made Visual Basic application, but you can also modify any of Excel's own built-in toolbars and menu bar. You can present the features of your application as individual buttons on toolbars or as groups of command names on menus. Because toolbars and menus are both considered to be command bars, you use the same kind of controls for both.

Having installed Office 97, you can find much of the information you need about these changes in the vbaxl8.hlp file. Some useful snippets are in the file xlread8.txt.

Office 97 includes an MS Query Add-In to convert external data ranges which are in Excel 97 format to Excel 5 for Windows 95 format. This is not so much for making Excel 97 data available to version 5/95 users, as for allowing Excel 97 users to run macros created in Excel 5.

EXCELlent changes in Excel 97

- The Chart command on the Insert menu now starts the Chart Wizard. On step four of the Chart Wizard, you can specify whether the chart is inserted as an embedded object on a worksheet or on its own chart sheet.
- The Office Assistant has replaced the TipWizard from versions 5.0 and 95, and includes Answer Wizard IntelliSense technology from version 95. When you need Help, just click the Office Assistant button and ask the Assistant a question in your own words. When a yellow light bulb appears in the Assistant, a program tip is available: click the light bulb to see the tip.
- Cell notes are now called comments. Use the Comment command on the Insert menu to create a comment. You can view comments in the same way that you used to view notes: by resting the pointer over a cell that has a comment indicator (this is a red triangle in version 97) in the upper right-hand corner of the cell.
- The Info Window feature is no longer available in Excel 97. To locate cells that provide data to formulas, use the Auditing toolbar.
- The Shared List command has gone from the File menu. In Excel 97 you can use shared workbooks to create and edit formulae, change formatting, create and change charts, and even add sheets. To share a workbook, click Share Workbook on the Tools menu.
- Sound notes have also been dropped from Excel 97.
- To start the PivotTable Wizard, choose the PivotTable Report command on the Data menu.
- The View Manager command has disappeared from the View menu. Use the Custom Views command on the View menu to save a custom view of a workbook. Custom views have been integrated into Excel 97 and this command no longer requires an add-in program.

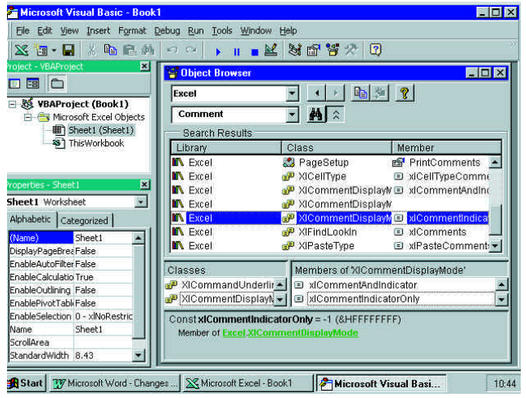


Fig 3 The new Visual Basic editing environment is the same in every Office 97 application and it's all graphically orientated

Right on the button

I recently received a fax from Jeff Forrest, who is working in Paris for a company that has internal email only. Jeff offers the tip that if you run out of suitable button designs for your macros in Excel, you can borrow one from Word.

If you have MS Office 95 or 97, start Excel and Word. If you choose View, Toolbars, Customise, Commands, All Commands in Word, you're offered a wide choice of button designs, any one of which can be dragged onto any toolbar (temporarily).

Right-click on this button and choose Copy Button Image. Drag the button off the toolbar to dispose of it, then switch to Excel. Whenever the Toolbars Customise dialog box is open, the same shortcut menu is available in Excel, so now you can right-click on the button which starts your macro and choose Paste Button Image. This new button will be stored in the Normal.dot template and will stay on the toolbar until you wish to remove it.

On the *PCW* CD-ROM

If you have Excel 97 and Word 97 installed on your computer, you can use the Excel 97 Web Connectivity Kit described here. From the cover CD, copy the self-extracting zip file, WEBCNKIT.EXE, into the folder of your choice on your hard disk and double-click on the icon to expand the files. Follow the instructions in WebCnKit.doc to use the various sample files. Descriptions of the files are in this document's appendix.

A case in point

In his correspondence, Jeff also included a macro for changing the case of selected text. I entered and checked his module and it worked fine, but as I had covered that subject extensively (in my January column), I wasn't going to mention it.

But then I received an email from Andy Male: "I read with interest your article on changing the case of text within Excel. I'm using Excel 5.0 and have successfully created a macro button that will change the case of a single cell. I am trying to amend the macro so that I can change the case of a single cell, or a selected range, but despite hours of effort I have failed. The macro I'm using for the single cell is:

```
Sub titlecasecell()
    ActiveCell.Value = Application.
Proper(ActiveCell)
End Sub"
```

So all of a sudden, Jeff's macro became immediately useful. He had written:

```
Sub MakeProper()
Dim myCell As Object
For Each myCell In Selection
If Left(myCell.Formula, 1) <> "="
Then
myCell.Value = Application.Proper
(myCell.Value)
End If
Next myCell
End Sub
```

I sent this to Andy, who replied: "Thanks for your help — that cracked the problem. I guess it's simple when you know how!" I hope they both see this so that Andy knows where the solution came from and Jeff knows that he did a good deed.

Keyboard conundrum

Roy Small emailed me with an interesting dilemma. "I have a persistent keyboard problem with Excel 7.0 and Word 7.0 . When I type a repeating comma (,,,,,,,) I get repeating (.....) full stops. It only happens in these two applications and I have tried reinstalling twice, but to no avail. In the Turnpike editor and in Wordpad there is no problem. My system is an Escom P60 with 16Mb and Win95. Word 5 and Excel 5 did not have this problem. All the country settings are correct.

"I am loathe to delve into the registry unless I know what I'm looking for. I would appreciate a pointer in the right direction if you are aware of this problem."

I replied: "If you're getting correct results with other software, then it can't be a keyboard mapping problem.

"You might check all the AutoCorrect and AutoText options. If anyone else has used your PC, they might have changed something, either consciously or inadvertently. Also (and this is something that often frustrates me) languages are set in every template. You can't just set English (British) once. It can turn back to English (US) or, perhaps in your case, Swedish or something, in different templates.

"If it's any comfort, it's not a bug in Excel 7 or Word 7 as nobody else has had the problem as far as I know."

He responded: "Brilliant, Stephen. I can't thank you enough. It was indeed the AutoCorrect setting. I don't understand why or how it ever got set that way because only I use this machine and I have never found that setting dialog before. Changing the setting in Word also affects Excel."

PCW Contact

Stephen Wells welcomes input on all spreadsheet matters. Write to him at *PCW*, or email spreadsheets@pcw.vnu.co.uk

The place to be

This column must be well-read by Microsoft employees because many of your past spreadsheet gripes have been dealt with in the new Excel 97, as Stephen Wells explains.

Coincidence? I don't think so. It's obvious that readers of this column are typical of the Excel users to whom Microsoft claims it listens. Just look at the number of features in Excel 97 that solve problems which have been highlighted in this column in the past.

For instance, last month (*PCW*, Feb) a doctor was asking for ways to immediately draw attention to certain medical conditions on a worksheet: Excel 97 now has a Conditional Formatting dialogue box which offers many more options than previously available. In the example in Fig 1, patients' weights are shown in column A. Column B highlights their condition. The cell formula is

```
=IF(A9>14,"OVERWEIGHT",IF(A9<10,
"UNDERWEIGHT",A9))
```

In this simple scenario, anyone over 14 stone is considered overweight, anyone under ten stone is deemed underweight, and between those extremes their weight is simply repeated in column B.

The Format menu offers a new option, Conditional Formatting. You can enter up to three options. So, if you include a cell condition that doesn't meet any of these set criteria, you have (in effect) four options. Each can start with a choice of "Cell Value Is" or "Formula Is". The first depends on the value or formula in the formatted cell. The second allows you to set the formatting, dependent on data or conditions other than in the selected cell. It might be today's date or a total at the foot of the worksheet.

In Fig 1 there are two "Formula Is" conditions. Condition 1 is

```
IF(B9="OVERWEIGHT",A9)
```

and Condition 2 is

```
IF(B9="UNDERWEIGHT",A9)
```

The format set for Condition 1 is a bold font, in red, with a pale yellow cell background. For Condition 2, it is a regular font, in green, with a pale blue background.

Allowing functions to be used to determine formatting will be a popular feature in a wide variety of applications. The content of a cell which is, say, more than 30 percent of the total of a row or column, can be highlighted. If you wanted any even whole number in the range E2:E80 to be purple, you could conditionally format E2 as follows:

```
=MOD(E2,2)=0
```

and then paste that format into the rest of the range. The format formula will be changed appropriately by the Paste tool. To see which cells on your worksheet have Conditional formatting, choose Edit, Go To, Special, Conditional formats.

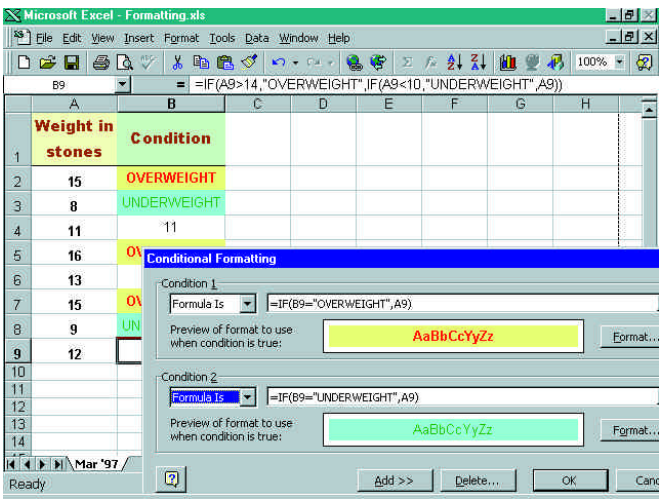


Fig 1 Excel 97 expands the options for conditional formatting. It can control font style, underlining, borders, shading and patterns

A smarter chart

Two other recent requests were for better ways to chart stock and commodity prices (*PCW*, Feb). These investors had to make hundreds of plots and needed a better method of specifying dates along the x-axis. Now Excel 97 comes to the rescue. Previous versions allowed for 4,000 points per data series and a maximum of 32,000 points for all series in one chart. These specs have now been increased to 32,000 for a 2D chart and 256,000 points for the whole chart. And, there is a new option for specifying that an axis refers to dates.

In fact, it has never been easier to make and adjust charts. I must confess that in the past I used to get confused by all the nomenclature of chart objects. Now it's a doddle. Not only does the Chart Wizard now have tabs, but also a small preview window displays changes as you make them (Fig 2).

Whether you decide on a High-Low-Close stock chart, with or without the day's sales volume, or an Open-High-Low-Close chart, with or without volume, the new Step 1 dialogue box of the Wizard can show an example using your data. You can also print your worksheet data in a grid at the foot of the chart.

Additionally, Excel 97 offers more chart types in versions for black and white printers as well as some fancy ones for screen display, slides, or colour printers. There are now bubble, pie of pie, and bar of pie charts, and there are pyramid, cone and cylinder shapes for 3D bar and column

p292 ➢

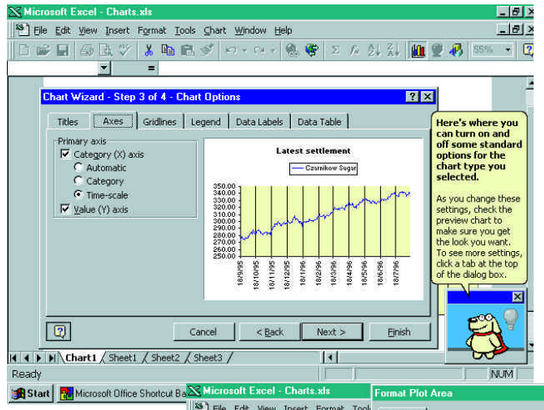
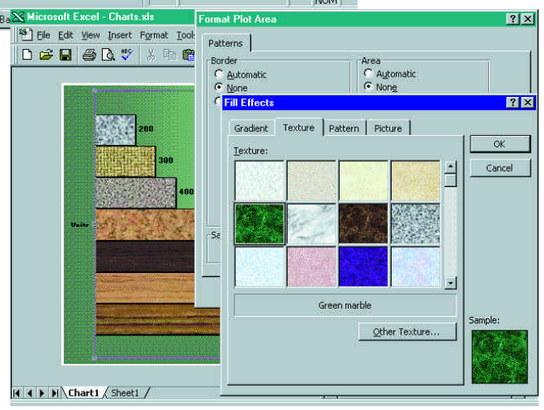


Fig 2 (left) The new Chart Wizard is so easy to use. A canine Office 97 Assistant can be an Excel-user's best friend

Fig 3 (below) Fancier charts for slides, colour printers or your web page. Your bars or background can now be wood, marble, or a picture



charts, as well.

The opportunities for designing custom charts are greatly expanded. If you want to have a green marble effect on the background, or a graduated mahogany effect on your bars, you can. Just choose the Fill Effects dialogue box (Fig 3).

Good intentions

Ever since Dan Bricklin and Bob Franckston designed the first spreadsheet for the Apple II, we have all become used to entering cell references. We might type in cell B5: =B3+B4. With Excel 97, Microsoft allows you to return to the terminology of the accountant's ledger sheet. If the labels in A3, A4 and A5 are Cash and Securities, Accounts Receivable and Quick Current Assets, then in B5 you can actually enter =Cash and Securities+Accounts Receivable. These are called natural-language formulas. No, Excel doesn't automatically create names here. It just lets you use row and column labels as references. This assumes that you've checked the "Accept labels in formulas" box under Tools, Options, Calculation.

The problem is you can't paste labels in to create a formula. You have to type them in, which can take forever. Personally, I create formulas just by typing an "equals" sign and then pointing to the cells to use.

I also found, in the beta version I tried, that this feature easily got confused. My worksheet included a list of ratios, one of which was named Current. I wanted to add Net Plant & Equipment to Current Assets to produce Total Assets. When I tried to type in Current Assets, Excel used the Current result instead. The workaround was to lengthen the first label to Current Ratios.

Also, in columns headed with years, I could refer in a distant cell to Net Sales 1996. But if the column heading was a formula, like =B1-1, instead of 1995, then I received an error message even though the sheet displayed 1995. One solution here is to create the column headings with AutoFill. Select the first or last cell in the range you want to fill and enter the starting value for the series. If you hold down the right mouse button as you drag the fill handle over the range, to the right or left, you're offered a wide range of options on the shortcut menu.

Incidentally, if you've got Excel 2.1, 3.0, 4.0 or 5.0 worksheets that you want to try out under Excel 97, it will not only load them, but you can also save them again in the original format. These saved files won't include a lot of Excel 97 features but at least it means you can still run them with the more familiar version. Excel 97 will save in lots of other formats, too.

Some features in Excel 97 are there because they've been introduced to all Office 97 applications. One of these is more animation. If you like Lotus SmartSuite's way of dropping down menus you can choose Tools, Customise, Slide. Alternatively, you can check Unfold and the menus swoop down and out to the right. No swooshing noises, though, as with Lotus.

Common Outlook

Another common Office 97 feature is that the Journal in Outlook can record your daily activity. If you wish, it will record when you first opened a workbook, subsequent activity and the total time you have spent on it. This has a number of uses. Some professionals will use it for billing time to clients. If you're looking for an Excel file that you know you worked on last Friday, go to that day in the Journal and there is a path to the file.

Some new features have been brought across from Word and extended. Excel's AutoCorrect for text has a lot of built-in corrections, for instance "anual" is automatically changed to "annual", and you can add your own frequent mistakes and replacements. The extension is that if you enter a formula incorrectly (forgetting a bracket, for instance) Excel will now offer to correct it for you. Another addition from Word is multiple levels of Undo, and there is also a drop-down list of recent actions so you can choose which to undo.

Some features are replacements. The Function Wizard (with the Fx button) has been superseded by the Formula Palette. Click the new = button. The box to the left, which normally shows the current cell reference or Names, now offers a drop-down list of functions. Click on one and a dialogue box appears which displays the name of the function, each of its arguments, a description of the function and each argument, the current result of the function, and the current result of the entire formula.

The new Fx button on the Standard toolbar works like Shift+F3 and is used for pasting functions.

There are new features for improving worksheet presentation. One is that you can run column heading labels at any angle. Another is that you can merge cells. You may not want to centre a heading across the whole worksheet but, say, across columns B through F in one row. You select the cells, then right-click and choose Format cells, Alignment, Merge Cells and this group of cells is treated as one. Yet another new feature is easier printing. On the View menu, there is a new Page Break Preview command. I love this: it shows your whole sheet with the default printing page breaks; you can drag them where you want, so you can easily set the page breaks to logical places in your work; and if it's more important to you to get everything on one page, Excel 97 will automatically scale everything down to fit.

Some new features are things which just needed fixing. Before, if you gave a Pivot Table fancy formatting in Excel 7, for instance, you lost it when you rearranged the data to another view. But now your formatting is retained and you can include calculated fields as well. (Incidentally, although Microsoft is calling this Excel 97, the version number, under Properties, is Excel 8.)

Some existing functions have been supplemented with a new version. Included in its calculations are cells which contain text or the values TRUE and FALSE. These include MINA, MAXA, VARA and VARPA.

I've never been one for overly-large single worksheets but Microsoft says a lot of its customers want them bigger than ever; so Excel 97 increases the maximum number of rows from 16,384 to 65,536. This will be good news for Excel database users, of course.

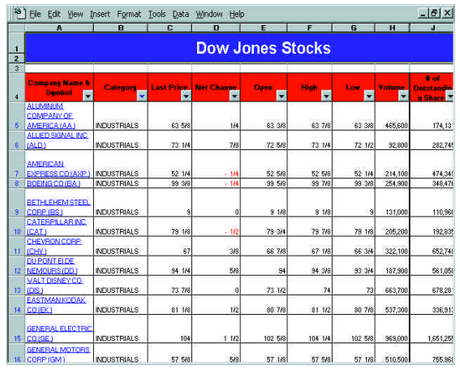


Fig 4 If you have room, Office 97 offers Web Query forms which enable you to quickly download data from the internet to your Excel 97 worksheet

A feature which I expect to use a lot is data validation. You can easily specify the type of data allowed in a cell and have a custom message displayed if a user tries to enter anything else. You could restrict the entry to a date, for instance, or a number below a certain amount. The Auditing toolbar has an additional helpful Circle Invalid Data button, too, which helps you find invalid data.

On the web

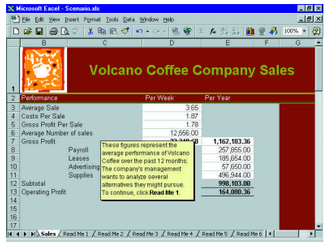
The most dramatic changes to Excel in this new version are the ways you can link beyond your own workbooks. You can create hyperlinks which jump to other Office files on your system, your network, your organisation's intranet or the internet.

Excel 97 offers so many features in this area that I'll expand on them in next month's column, but here's one example. You can easily run queries to retrieve data available on the web. Microsoft Office 97 provides several sample Web Queries that you can run. I was amazed at how easy it is to access this information. I put the cursor on a new worksheet and clicked successively: Data, Get External Data and Run Web Query. This presented four pre-written Web Query files which are included with Office 97. I chose "Dow Jones Stocks by PC Quote, Inc".

One more click on the Connect button in Internet Explorer, which starts in the background automatically, then my worksheet was loaded with ten columns of data about each of the Dow Jones industrial stocks (see Fig 4; prices are current except for a legally-required 20-minute delay behind the New York stock exchange, US Eastern time). The Query form even has AutoFilter set, so that you can drop down an alternative list of transportation or utilities stocks; or you could filter out all but the top ten in terms of sales volume or Net Change for the day. When Microsoft localises this feature, we'll be able to access London's FTSE 100 just as easily.

Scenario Manager on CD

Scenario Manager is a powerful Excel tool for analysing complicated problems. A Scenario is a named combination of up to 34 variable cells. The built-in tool enables you to consolidate multiple "what-if?" models in one spreadsheet, and switch between the Scenarios to see the impact of various assumptions on your model.



On this month's cover-mounted CD, go to Software, Hands On, Spreadsheets, and you'll find Scenario.exe. Copy it to a disk, then open Excel (v5 or higher) and minimise it. In File Manager or Explorer, double-click on Scenario.exe. It will maximise Excel and offer an interactive demonstration of Excel's built-in Scenario Manager. The example provided is for the owner of a small coffee shop who wants to analyse various business scenarios.

EXCELlent shortcuts in Excel 97

- If you double-click a cell which contains a formula, any cell references in the formula change to different colours. The cells referred to are highlighted on the worksheet in those same colours. This new feature is called the Range Finder. To include more or fewer cells in a range reference, use the drag-handle in the lower-right corner of the border to select more or fewer cells. The formula will change correspondingly. (If you can't make a cell active for editing by double-clicking on it, choose Tools, Options, Edit tab and select the first Settings check box, "Edit directly in cell".)
- If you double-click the border of a selected cell, you can move automatically to the corresponding edge of a block of data. Click the top of the cell to go to the top of the block and so on. This is similar to Ctrl + arrow key.
- It's easy to list all your Outlook or Schedule + contacts on a worksheet. Open Outlook. Choose File, Import and Export, and click Export. In the Import Export Wizard, select the Contacts folder and the file type MS Excel. Name a new workbook, or browse existing workbooks and add a worksheet to one of them. You can either map the fields between the Outlook list and worksheet columns yourself, or the Wizard will do it.
- You can create hyperlinks without using your modem. Choose any cell on your worksheet. Click on the Insert Hyperlink button on the Standard toolbar and then browse for a file. This will make a link to that file. The default display in the cell is the file name but you can change it to something else or use a picture instead. The file might be a text scrap on your Desktop, or in any Office application.

PCW Contact

Stephen Wells welcomes input on all spreadsheet matters. Write to him at *PCW*, or email spreadsheets@pcw.vnu.co.uk

Trading places

Stephen Wells shares his stock of spreadsheet knowledge to help you chart your investments

Paulo Freitas Tavares (MD), emails: "*I have a small problem. It extends for dozens of sheets and many parameters but let us suppose it is only one sheet and one parameter.*

"In column B I have weeks; in C I have weights of patients; in column J I have 'alerts' for a quick visualisation if something goes wrong. Suppose that the criteria for 'going wrong' is losing or gaining more than 10 percent weight in one week. The aim is to get the word ALERT in red or the word OK, in blue, in column J — I can't make Excel 7 do it."

As regular readers know, I am not a big fan of unnecessary macros and always try to find a built-in Excel solution before using them. In this case, Dr Tavares may be able to take advantage of the extraordinary flexibility of Excel's Custom Number format.

In Excel 4, you can enter the following as a Custom Number format:

```
[>1000] [Blue] #,##0; [<-1000][Red]
#,##0;[Green] #,##0
```

Excel assumes that the first section is for positive numbers, the second for negative ones, and the third is anything else. You can't write IF statements, but you can use a condition value symbol. So in this example, any entry in the cell greater than 1,000 is displayed in blue, less than -1,000 turns red, and anything else is green.

Interestingly, you can enter the same custom format in Excel 7 but it will automatically shuffle the description around to:

```
[Blue][>1000] #,##0;[Red][<-1000]
(#,##0);[Green] #,##0
```

In this example I've added parentheses, so numbers less than -1000 have brackets as well as being in red.

You can also make text appear even though you have entered a number, or the cell contains a formula which produces a number. Let's say the cell A9 contains the simple formula:

```
=C9-C10
```

We can format A9 with this Custom Number format:

```
[Blue][>14]"OK";[Red][<10]"ALERT";
"Other"
```

If the answer to C9-C10 is 15, the acronym "OK" will display in blue; for 8, it will display "ALERT" in red; for 11, it will display "Other" in black.

Previously, I said that the second section of the Custom Number format is for negative numbers. But there is an exception, as in this example. When the first section is conditional (as it is here because it only applies to numbers bigger than 14) then the second section formats other numbers, whether positive or negative. Here the second section ([Red][<10]"ALERT";) is also conditional. So then the third section applies. In this case, if the number in the cell is between ten and 14, then the word "Other" prints, using the default formatting for the cell. The only problem here is that Dr Tavares says that there are many parameters in his actual workbook. Other readers may also like to have Excel automatically change the font of a warning word, or the background colour of its cell.

So, for those who need it, I'm providing a macro in VBA for Excel on the cover CD in the workbook file, ChangeColour.xls. See also Fig 1 (page 272). In this instance, the word to be emphasised is decided on the worksheet by an IF function, like this one:

```
=IF(C15<10,"ALERT",IF(C15>=14,"OK",
"Other"))
```

There is a button on the worksheet which runs a macro called Changing( ). This specifies a range, although you could use a Name, and the macro runs through that range looking for words which the IF statement has entered. With a macro, you can have as many keywords to look for as you like. It then uses the IF THEN WITH statement to abbreviate font references.

The ColorIndex statement refers to the standard Excel palette box. If you count colours from left to right, and top to bottom, you'll find that 2 is white, 3 is red, 5 is blue and 27 is an off-yellow. So looking at the listing, you'll see the word OK will appear in white on blue and the word ALERT will be red on off-yellow.

ALERT is in Arial Black Bold Italic. OK is in Roman (not italic). You have to include the instruction

```
Italic.False
```

for the word OK because after the macro has run, the font will be set to italic by the instruction,

```
.FontStyle = "Bold Italic"
```

for the `word ALERT.`

EXCELlent shortcuts and longshots

1. Worksheets saved in the MSOFFICE\TEMPLATES folder will behave like an XLT file and open as a copy, without having to be saved as a template file.
2. Many useful macros, which you can copy into your workbooks, can be found in the SAMPLES.XLS file located in the MSOFFICE\EXCEL\EXAMPLES folder. They include error trappers and default resetters.
3. You can copy colour palettes between workbooks: open the workbook with the colour palette you want. Switch to the workbook to which you want to copy the colour palette. Choose Tools, Options, Colour tab. In the Copy Colours From box, select the workbook that contains the colour palette you want to copy.
4. Right-click the mouse on the AutoSum feature in the Excel Status bar. Change Sum to Average, Count, Count numbers, or find the Max or Min of a selected range of cells.

p272 ➢

Up and down the City road

Chris Pack emails: "*I often need to chart market prices, which involves a long series. Daily prices over two or more years can be some 500 plots. It would be nice to label the months along the x axis but calendar months are not evenly spaced and this seems to make them difficult for Excel to display. I have set a column for these labels, but with so many plots Excel appears to be reserving space for the blanks.*" Chris then described all the tricks he's tried, and ended "*…The whole hit-and-miss process seems so time-consuming. I feel sure there must be a simpler way of formatting such X axis labels. Any suggestions?*"

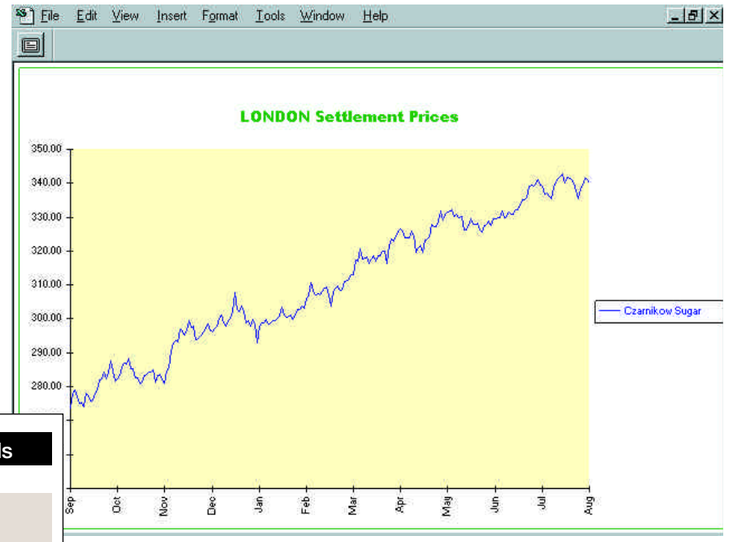


Fig 2 You can format the labelling for axes of an Excel chart on the data source worksheet

Fig 1 Macro — a few colourful words

```
Function Changing( )
 Dim Cell As Range
   Worksheets("Test Sheet").Select
 For Each Cell In Range("D2:D16")
  If Cell.Value = "OK" Then
   With Cell.Font
 .Name = "Arial Black"
  .Bold = True
   .Italic = False
 .Size = 10
  .ColorIndex = 2
 Cell.Interior.ColorIndex = 5
   End With
    End If
 If Cell.Value = "ALERT" Then
  With Cell.Font
   .Name = "Arial Black"
     .Size = 10
  .FontStyle = "Bold Italic"
   .ColorIndex = 3
 Cell.Interior.ColorIndex = 27
     End With
      End If
  Next
End Function
```

Fig 1 A macro, started with the button, changes the font and background colours for key words

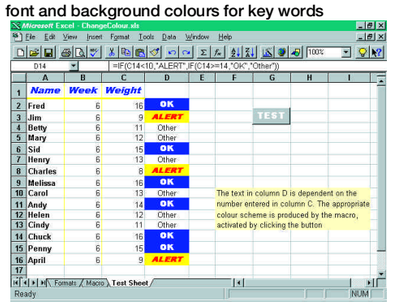


Fig 2 shows a part of one of these charts. It covers just under a year with 233 quoted prices from 18th September 1995 to the following 15th August. Column A just has a list of dates. The adjacent column has the relevant prices. In the worksheet Chris sent me, he had an extra column between the dates and the prices where he had entered the names of the months.

I returned Chris's workbook with an alternative worksheet and chart. First, I eliminated the extra column. Column A still has all the dates but I used the Custom date format mmm. Column B has all the prices. I let the chart wizard make a new chart. Then I opened the Format Axis dialogue box, for the x axis. In the Scale section of this box you can choose individually the "No. of categories between Tick-Marks" and the "No. of categories between Tick-Mark labels". I experimented with different numbers until there was just one label and one tick mark for each month (as in Fig 2). The number happened to be 21, which is probably the average number of trading days each month. I accepted the defaults for the other four options in this useful box . So now, as required, the x axis is labelled only with the name of each month.

Playing footsie

In my October issue column last year, I encouraged readers to write to me with their experiences of downloading information into spreadsheets and how they used spreadsheets to aid with investments. So I was glad to conduct the above exchange with Chris, as well as to receive an email from Keith Bladon, who downloads share prices via a Teletext card and a package called Updata Teleshares. He uses Excel to analyse the FTSE 100 index. He looks at a 201-day centred average of the FTSE within a channel plus and minus 150.

Investors who use technical analysis, agreeing with Shakespeare that past is prologue, look at historical results. This is opposed to fundamental analysts who keep abreast of things like new products and management changes. Within these two major approaches are multitudes of different theories, often based on the expectations of various cycles.

Keith is a 201-day man. His 1,700-row datasheet records the FTSE for every trading day from 1st January, 1990 to 28th August, 1996. Additional columns make calculations based on percentages and other statistical changes. Another sheet in the workbook file he attached for me has a graph of these results. And then there is a long VBA macro.

His problem is: "*When I want to look at different periods of time, adjusting the graph's normal facilities is time consuming.*" After entering a start and end date, the macro finds the correct cell references and then amends the graph properties.

Keith's question is: "*Because I am using Active-Sheet, the display jumps to the various parts of the graph. I have tried to access the graph's properties without using Active.Properties but have been unable to do this. Is there a way?*"

The objects in Excel spread out much like a tree, going from the trunk to the boughs, to the branches, to the twigs. There is an established hierarchy of the 128 programmable data objects in Excel 5 and the 162 objects in Excel 7. You tie them together using Visual Basic for Applications (VBA), Excel's programming language. A full hierarchical path might read like this:

```
Application.Workbooks(1).Worksheets
(1).Range("A1").Value = 1
```

It is not always necessary to detail the entire object path when setting a property, or calling a method, on a particular object. It depends on the context. To start with, Application refers to Excel, so if you're in Excel you don't need to reference the Application object. But although defaults can often obviate entering any step in a macro, Excel can't get from here to there without traversing the steps between.

However, you don't have to watch all the changes taking place to the objects in your chart, one by one. Do you recall how, in the old days, we used to avoid seeing DOS batch files running on the screen by using ECHO OFF and ECHO ON? There is an equivalent command in VBA. Near the top of your macro just insert:

```
Application.ScreenUpdating = False
```

Your macro will run but the results won't display until it's finished and then they will all show at once.

Inspired by Keith's efforts, I wrote the small Excel 7 application, "Bulls 'n' Bears", which is on this month's cover-mounted CD. But it deploys little VBA. The eight charts it includes were made using Excel's charting wizard.

On our cover CD-ROM…

- A small stock-charting application which will run under Excel 7 or above. It displays charts of FTSE 100 closing daily prices for seven years.
- A shareware program, downloaded from the Excel web page, called Portfolio. The file, Portfo.xlw, will run under Excel 4 or above. A description is in the file Manual.rtf. The program is designed to help you keep track of daily stock quotes that you have downloaded in CSV, WKS or DOS TXT formats. It includes a simple graphing facility. Everything is US-orientated so you would have to adapt it for UK use.
- The macro illustrated in Fig 1, and examples of elaborate Custom Number formats, are in the file ChangeColour.xls.

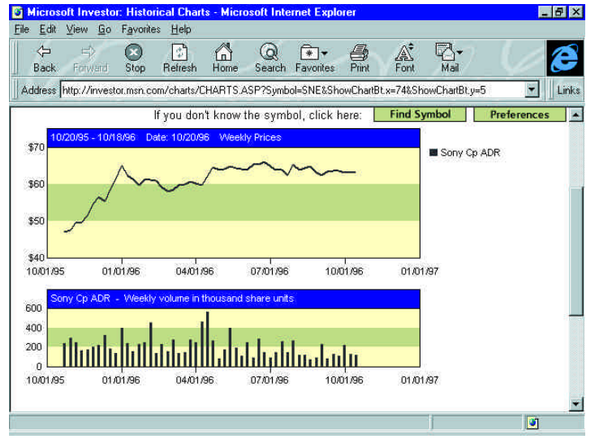


Fig 3 Using Microsoft Investor 2.0, you can download historical data on any listed US stock

Inspired by Keith's efforts, I wrote the small Excel 7 application, "Bulls 'n' Bears", which is on this month's cover-mounted CD. But it deploys little VBA. The eight charts it includes were made using Excel's charting wizard.

Something in the City

Probably the best news for those interested in the stock market is that Microsoft is in the process of localising Microsoft Investor 2.0 for the UK market. You can view this comprehensive product at www.investor.msn.com. It includes a number of related tools.

The Portfolio Manager helps users to create and track multiple stock portfolios. It recognises stock splits and multiple purchase dates and tracks commissions. You can change columns with right-click menus, or double-click columns to "AutoFit" them, just like in Excel. It offers automatic notification when there is news on any stock in your portfolio.

For those into technical analysis, Investor 2.0 supplies historical charts, for any time period, on every listed stock. They can be overlaid with market indices or compared with other securities and downloaded (Fig 3). The product also provides business and financial news from MSNBC, PR Newswire and Business Wire for fundamental analysts.

The Market Summary feature provides up-to-the-minute information on the leading US and foreign markets and currency rates and displays top-ten lists with the market's best and worst performers. Users can look up prices for specific securities by ticker symbol, company name or fund name.

Although Microsoft stresses the integration of Investor 2.0 with Microsoft Money, much of the data can be just as easily imported into Excel. Roll on the day when Investor 2.0 shows the FTSE 100 and other UK listed stocks.

I think we should be told

You may recall the discussion in past columns about calculating the years and fully-completed calendar months between any two dates. It appeared to be easier to find the required solution in Lotus 1-2-3, using the @DATEDIF function, as Excel doesn't offer an equivalent.

But now comes an email from Paul Bloomfield who points out that although it's not listed in the Function Wizard, nor mentioned in the documentation, Excel will indeed accept and correctly use a DATEDIF function — I tried it and he's right. The only possible reason I can think of for this is that Excel is always keen to be able to import 1-2-3 files and so makes allowances.

PCW Contacts

Stephen Wells welcomes comments on spreadsheets, and solutions to be shared, at **spreadsheets@pcw.vnu.co.uk**

Updata Teleshares from Updata Software, Updata House, Old York Road, London SW18 1TG. Phone **0181 874 4747**; email **Sales@updtsoft.demon.co.uk**

Microsoft Investor 2.0: www.investor.msn.com

Taking the **register**

Stephen Wells dips into the Registry to remove troublesome messages. Plus, adding background graphics to a worksheet, and problems with bins and cases.

These days, many Excel 7 add-ins have their own uninstall program. But when you start Excel after deleting an add-in, you may see a warning notice that such-and-such a file cannot be found.

If you right-click on the Start button and choose Explore, you'll find a program called Regedit.exe in the C:\Windows directory. If you can't find it, click the Name column and it will list the files in alphabetical order. Double-click Regedit to start it. Under the displayed MyComputer root directory you'll see several sub-directories starting with HKEY. You want HKEY_CURRENT_USER. Click on this to expand it, then successively expand Software; Microsoft; Excel; 7.0; Microsoft Excel. You are now six levels down from MyComputer. Go down to the sections with names starting with OPEN. If you double-click the first one it should read:

```
C:\MSOFFICE\EXCEL\LIBRARY\ANALYSIS
 \ATPVBAEN.XLA
```

Go down to the last OPEN item. It may be OPEN4 or OPEN5. Click that and you'll probably see an entry like:

```
/F C:\MSOFFICE\EXCEL\
 LIBRARY\Program.xla
```

The F switch simply tells Excel to add custom functions among the Insert, Functions menu items. An R switch would open the file as read only. If Program.xla is actually the name of the add-in you're trying to get rid of, just delete OPEN4 or OPEN5 entirely. Close Regedit. You won't have to restart Windows for the change to take effect. Just start Excel and the troublesome message will be removed.

This procedure is much like removing an entry to an .INI (initialisation) file. Applications, like Excel 7, which only run under Windows 95, don't use .INI files. Everything they need to know is stored in the Registry.

Obviously, Windows 95 can run 16-bit software, like Lotus 1-2-3 Release 5 for Windows. What happens is that when Windows 95 is booted, it examines the WIN.INI, SYSTEM.INI and any additional .INI files, like 123R5.INI, to see if any unique device drivers need to be loaded. Then it moves on and takes its orders from the Registry, which could be defined as a database of everything Windows needs to know.

Look under User and you'll probably see your name. Font sets the default font which might be Times New Roman 10 or Ariel 10. Pos shows the co-ordinates, top, left, width and height of the opening position of the Excel application window. If Basics reads 0, the tutorial runs when Excel is started. If it reads 1, then the tutorial does not run. It's set at 0 when Excel is installed and changes to 1 after the first use.

The Options section offers numbers in hexadecimal and decimal. Choose decimal and it probably reads 87. This is the sum of the following values: 1 to show scroll bars, 2 to show the formula bar, 4 to show the status bar, 16 to use A1-style cell references (rather than Row 1 Column 1), and 64 enables DDE (Dynamic Data Exchange).

But I only pass on these additional details because they're interesting: the average user is well-advised to stay out of the Registry. Generally speaking, it's best to make everyday changes by choosing options in an application, or using Control Panel, as Microsoft recommends.

By design

It's always my little asides which get me into trouble. In a recent column I wrote that you can dress up your displayed worksheets by choosing Format, Sheet Background and selecting a graphic file. I should have left it there, but I slipped in the parenthetical thought that you could print sheets with a background if you have a colour printer. Wrong.

I didn't try it until Peter King emailed that only his worksheet would print. No background. Belatedly, I found Article Q134212 of 28/8/96, entitled "Can't Print Background Graphic Included on Worksheet" in the Microsoft Knowledge Base. It states: "Although you can add a background graphic to a worksheet, this graphic will not be visible when you view your document in print preview or when you print it. The information in this article applies to Excel for Windows 95, version 7.0." And it goes on: "This behaviour is by design of Microsoft Excel, because printing a background is extremely slow on most standard printers."

Time to call on Michael Rickard, an Excel guru at a leading West Coast university who has bailed me out before. He came back with a workaround. His instructions were in shorthand, so I'll spell out the steps I took to make it work.

Let's say you want to print the range A1 to H16 in OLDFILE over Microsoft's familiar Clouds bitmap:

- First make the Camera tool visible. (It's probably on the Utility toolbar.)
- Open OLDFILE.
- Now open a new worksheet. Select the empty range, A1:H16.

p292 ➢

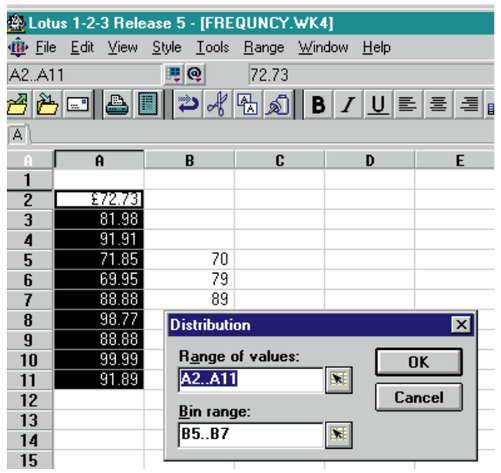
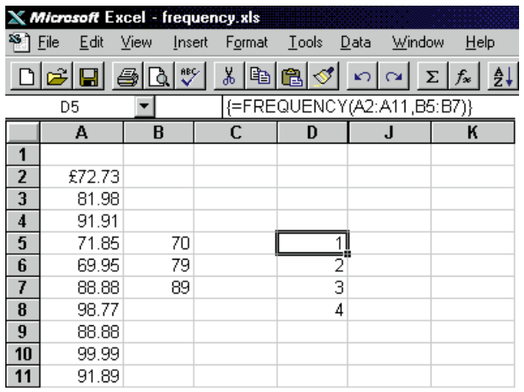


Fig 1 (left) **Dividing the distribution of a data array into bins is easy in Lotus 1-2-3, using menu items**

Fig 2 (below) **Excel has a FREQUENCY function for arranging distribution, which takes a bit of getting used to**



	A	B	C	D	J	K
1						
2	£72.73					
3	81.98					
4	91.91					
5	71.85	70		1		
6	69.95	79		2		
7	88.88	89		3		
8	98.77			4		
9	88.88					
10	99.99					
11	91.89					

● Now choose Tools, Options, View, No Gridlines. Then cell A1, Insert, Picture, Windows Directory, Clouds.bmp.
● Save this file as NEWFILE. (This is the equivalent of a background picture.)
● Choose Window menu, OLDFILE. Select A1:H16. Click the Camera tool.
● Choose Window, NEWFILE, cell A1. (This pastes a linked picture of your data on top of the clouds image.) Drag this object the last little bit into the top left corner of the sheet.
● Right click and choose Format Object on the shortcut menu, then select No Border, No Fill. Click OK.

That's it. You can now view the combined image under Print Preview and print out a hard copy. I must send Michael a long overdue book token.

Binning it

I've got so used to all this column's enquiries arriving by email that it was almost a shock to receive a nice, old-fashioned, typed letter from Alistair P Campbell of West Sussex: "*I think I have found a bug in Excel for Windows 95. When the Frequency function is selected to display the distribution of a data array, the only result is in the first bin. The remaining bins remain blank. I am using a new Dell Dimension XPS P166s and Dell agrees that there appears to be a bug. Your opinion would be welcome. I use frequency distributions a lot, and am having to revert to my older Lotus 1-2-3 spreadsheet to provide results for this function.*"

I've discussed before how some 1-2-3 functions differ from Excel. What we have here is a very easy-to-use menu item in 1-2-3 being replaced by a function in Excel, which takes a bit of getting used to.

Let's say that in the range A2 to A11 you have ten prices. They are in no particular order and there might be duplicates, but they are all below £100. The objective is to see how many prices fall in the ranges £0 to £70, and £70.01 to £79, £79.01 to £89, and £89.01 to £100.

In either 1-2-3 or Excel, you indicate these groups — or bins, as both spreadsheets call them — by simply entering 70, 79, and 89. For this example, we'll enter those numbers in B5 to B7.

In Lotus 1-2-3 Version 5, as shown in Fig 1, you don't have to select any particular cell. You just choose Range, Analyse, Distribution, and a dialogue box invites you to enter, or select with the mouse, the range of values (here, A2 to A11) and the bin range (here, B5 to B7). Then as soon as you click OK, 1-2-3 automatically puts the answers into the column next to the bin array — easy.

Excel's methodology would confuse anyone until they had become familiar with the full procedure. What you have to do, if you have four bins, is to select any four successive blank cells in any one column. I selected D5 to D8.

Click in the formula bar, then the fx (function) button. Select the Frequency function. This opens a similar dialogue box to the Lotus one.

Again you enter, or select with the mouse, the range of values (A2 to A11 again) and the bin range (B5 to B7). But when you click OK, you find yourself back in the formula bar at the end of the new formula.

Now you have to press Ctrl+Shift+Enter. Only then will you get the right answers, as shown in Fig 2. As this is an array, you don't enter the curly brackets which appear around the formula; you just press, all together, the three keys mentioned.

I sent a demo of this on a disk to Alistair. He graciously replied: "*Success! I'm beginning to appreciate Excel more and more. Thank you for your help.*" Good. Another satisfied reader!

On the case

John Young, of the UAE, asks: "*Could you advise if there is an easy way to change the characters in Excel from lower case to upper case on multiple cells, on a spreadsheet? The format menu for fonts does not have the case change as an option. I have found this problem in both Excel 4 and 5, and it can arise when different people have input data to a spreadsheet using a different case (upper or lower). To ensure uniform presentation, I find that it is necessary to adjust each cell and that there is no quick method.*"

John doesn't specify which version of Excel he is currently using, nor whether he wants to end up with all lower case or all capitals, so I'll discuss a couple of approaches.

One solution for versions 4, 5 or 7 is to use the LOWER, UPPER or PROPER functions. They don't reformat text but will redisplay it in another cell in lower case, capitals, or by capitalising the first letter of each word respectively. All three functions ignore characters which are not letters. An example is often the best way of clarifying usage:

If cell A5 holds the phrase *There are 2 Brown foxes*. In any cell, =LOWER(A5) would display, *there are 2 brown foxes*; =UPPER(A5) would display, *THERE ARE 2 BROWN FOXES*; and =PROPER(A5) would display, *There Are 2 Brown Foxes*.

The only way I know to change the actual text in place (that is, not repeat it in another cell) is to run a macro. But if you're going to do that, you may as well enter the text, initially in a dialogue box. Then it can be translated before it's used. To broaden the interest for other readers, let's say the text to be entered is a special password.

The regular way of protecting an Excel file with a password is via File, Save As, Options. But suppose you have prepared your own application and want to use a password to protect a part of it. If it's for internal company use, you could make it easier to remember the password by letting the staff member enter it in upper or lower case. You could even give them the first letter as a prompt.

As a gateway, the starting point could be to create a button, which can be done automatically from the Drawing toolbar. You can then assign a macro to it. In other words, the user clicks the button and the macro runs. If the macro is written in VBA, you can use two of its standard functions, Lcase and InputBox. See Fig 3 for the listing.

The password I've used is "mchenry", but because the user-defined GetTheWord function incorporates Lcase, it can be entered as McHenry, or MCHENRY, or any other case combination. The InputBox function takes a number of arguments, but here I've used the first three and let the defaults be used for the remainder. The prompt in the input box asks "What is your password?", and the title of the box is Password. The third argument here is, M. This means that when the box appears, the first letter (here, M as a capital) is displayed at the start of the password entry line.

If the user enters Matthew or MacHenry, or makes some other mistake, they receive the message "Sorry. Wrong Password". When the user clicks the OK button in this message box, the workbook is minimised in this macro to symbolise no entry.

If the correct password is entered, the user sees the greeting, "Welcome to this application", and can continue.

The button and the macro are in the Excel 7 file, Passes.xls, in the Hands On Spreadsheets section of our cover-mounted CD this month.

Fig 3 Assigning a macro

```
Sub Entering()
        Dim TheWord As String
    TheWord = GetTheWord
    If TheWord = "mchenry" Then
        MsgBox "Welcome to this application."
        Else MsgBox "Sorry. Wrong password."
        ActiveWindow.WindowState = xlMinimized
        End If
End Sub

Function GetTheWord()
    GetTheWord = LCase(InputBox("What is your
                 password?", "Password", "M"))
   End Function
```

Dear Santa...

Obviously you read *PCW* or you wouldn't see all these notes in the Hands On section, so look in the Spreadsheets section of our CD-ROM for pressie hints. Click on Excel 97 demo.exe and you'll see how the coming version of Excel can include hyperlinks to import data from web pages and send mail.

Yes, I'd like a beta copy of Office 97. It will have a new, improved Excel as well as updated versions of Word, Access and PowerPoint. It will also include the web authoring and management application, FrontPage (which I've raved about before), and Publisher, the easy-to-use DTP package. In Excel, the AutoCorrect feature (which irritates me but is beloved by many, I'm sure) will be even more intelligent: popping brackets in formulas if you forget them, for instance.

Microsoft's gone internet bonkers, so the latest Office will be supplemented by a wide range of animations, audio files, clip-art, fonts, help files and templates downloadable free from the MSOffice web site.

After a year, I've still never totally mastered Exchange and Schedule+, so I will welcome the new program, Outlook, which will replace both of them. Maybe the new Office Assistant animated wizards will make things clearer for me, too.

In the same section of our CD, have a look also at the files 123p1.pdf and 123p2.pdf, which run under Acrobat. These will remind you that I'm dying to see the new 32-bit Lotus 1-2-3 97. It, too, will feature shortcuts to the internet, as well as automated demonstrations of common tasks, enhanced printing facilities, new autototalling, and an easier way to create dialogue boxes.

The third present is not for me, but the people who write manufacturers' service contracts: a good pocket dictionary. My current PC came with a one-year free Next Business Day Repair Service Warranty, on-site at their discretion. Or, you could buy two- or three-year warranties. When the year was over, I wanted to pay for an annual renewal, but they've since dropped the one- and two-year options. I was told I could only buy a three-year warranty, which, amazingly, starts from date of purchase. So by purchasing that, I lost my first free year. They also have a Lifetime Return to Factory Warranty; but lifetime isn't defined in the way you or I would. And the right is retained to send parts and tell you, over the phone, how to replace them. They are entitled to offer any services they like, but I wish they wouldn't redefine simple words like "three", "lifetime" and "return".

On the *PCW* CD-ROM

The *Hands On Spreadsheets* section has a short animated file, Excel 97 demo.exe, which previews the availability of hyperlinks in the forthcoming Excel 97. The files 123p1.pdf and 123p2.pdf are Acrobat files which give some details of the anticipated 32-bit Lotus 1-2-3 97, designed to run under Windows 95 and Windows NT. The Excel 7 file, Passes.xls, has the macro shown on these pages as Fig 3 and a button for running it.

PCW Contacts

Stephen Wells welcomes comments on spreadsheets, and solutions to be shared, via *PCW* at the usual address or at **Stephen_Wells@msn.com.**
Files can be attached with MAPI-compliant software. The UUE program, XferPro, works. It can be downloaded from the CompuServe Internet Resource Forum.

Fair and square

The complicated task of allocating work shift and holiday rosters that are fair to all can be eased by using a spreadsheet. Stephen Wells shows how.

Andy Christou works for one of the largest companies in the country. At least, it was until it was denationalised and thousands of people were made redundant. But that's an interpolated comment of mine.

Andy's problem is as follows: "*We used to work a normal five-day, 40-hour week. To improve service to our customers it was decided to extend the working day but at no cost. The method chosen was to only work for nine out of the ten business days in a fortnight so that at the end of two weeks each person had still put in only 80 hours. This was christened the 'nine-day fortnight'.*

"In order that Mondays and Fridays were shared fairly, we had a 'rolling day off' pattern: if you had a Monday off, your next day off would be two weeks and a day away, i.e. Tuesday. This created another problem because after nine periods of having a day off, you ended up with the Friday of one fortnight being next to the Monday of the next fortnight which was not acceptable to our managers.

"The final method was as follows: if the last day off was a Monday, then the next day off would be Tuesday fortnight, i.e. 15 days away; if the day off was Tuesday, the next day off would be Wednesday fortnight, i.e. 15 days away; if the day off was Wednesday, the next day off would be Thursday week, i.e. eight days away; if the day off was Thursday, the next day off would be Friday fortnight, i.e. 15 days away; and if the day off was Friday, the next would be Monday fortnight, that is 17 days away.

"My problem is, given a starting point of 1st January 1996, how do I implement the above so that a worksheet calculates the next day off due and then marks the relevant cell with 'SDO'?

"I realise that I have to carry out a test to see what the day of the week is and then move the cursor along as appropriate and mark the cell. All the initial days would be entered manually."

I asked Andy to lay out a dummy worksheet to illustrate what he hopes to achieve. The starting corner of Andy's worksheet is shown in Fig. 1.

File Edit View Insert Format Tools Data Window Help

Andy's SDO Ticksheet

	WEEK	W/C 30/12/95							W/C 6/1/96							W/C
25	Day	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun
26	Date	30	31	01	02	03	04	05	06	07	08	09	10	11	12	13	14
27																	
28	DILIP			SDO													
29	JAY				SDO												
30	TREVOR					SDO								SDO			
31	BRIAN						SDO										
32	FRED							SDO									
33	JOHN										SDO						
34	ANDY											SDO					
35	TONY												SDO				
36	JIM													SDO			
37	PAUL														SDO		
38	PETER			SDO													

Fig 1 **The first two weeks (starting 30/12/95) of part of a schedule for employees' special days off**

Wrong number

You may recall from an earlier column that a reader emailed me to inquire whether I was the same Stephen Wells who wrote for *New Musical Express*. Now I've received a wedding invitation from someone who's seen my name here. Not that I know the couple… nor do I have a partner called Quiana. What I'm hoping for is third time lucky: it would be very nice if a solicitor were looking for a Stephen Wells who is a major legatee.

In the Navy

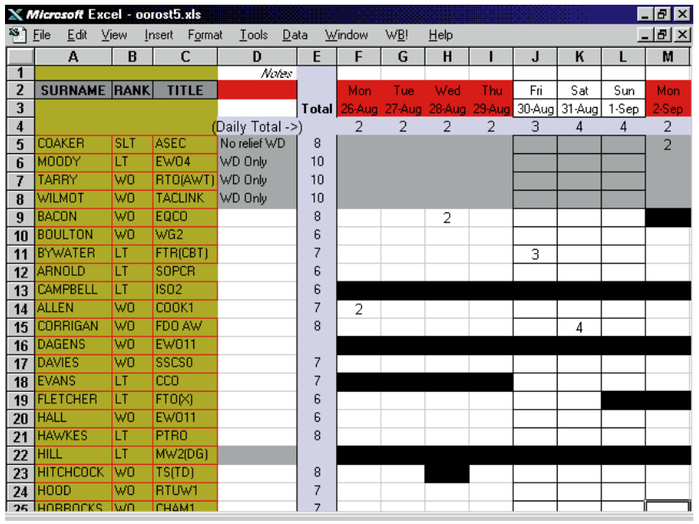
Another staff-scheduling problem is posed by Malcolm Campbell: "*I work at a large Naval establishment where we use lieutenants, sub-lieutenants and warrant officers as duty personnel. I organise a work roster in three month blocks, for out-of-hours managerial duty cover for every day of the week (including weekday*

evenings, weekends and national holidays) for 30-35 managers.

"We don't get extra pay or time off for these duties and we have to sleep on site, so you can imagine how unpopular this duty is! I come up against the human factor: people are away travelling; some people wish to do extra WDs (work days) to get WEs (weekends) off; others can't do particular days due to outside commitments; some are away travelling so much in previous periods that they are granted a reduced number of duties this period, and so on.

"In an effort to be fair to all, I try to spread the load, i.e. give everyone the same number of WDs and WEs. This is fantastically difficult and I revert to graph paper, eraser and pencil. It would seem logical to assign a weighting to each type of day, say two for a WD, three for a Friday and four for a WE or national holiday. Ideally, the spreadsheet would work out an average score and then try many permutations to get everyone's score as close as possible to each other (for the ones on full duties only)."

I asked Malcolm to supply a dummy worksheet and he provided Fig 2. Both Andy and Malcolm are in very different situations but from a spreadsheet point-of-view, their problems have a common thread. What they're both trying to do is prepare a holiday schedule with many variables and a number of constraints.


Microsoft Excel - oorost5.xls

File Edit View Insert Format Tools Data Window WB! Help

	A	B	C	D	E	F	G	H	I	J	K	L	M
1				Notes									
2	SURNAME	RANK	TITLE			Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon
3					Total	26-Aug	27-Aug	28-Aug	29-Aug	30-Aug	31-Aug	1-Sep	2-Sep
4				(Daily Total ->)		2	2	2	2	3	4	4	2
5	COAKER	SLT	ASEC	No relief WD	8								2
6	MOODY	LT	EWO4	WD Only	10								
7	TARRY	WO	RTO(AWT)	WD Only	10								
8	WILMOT	WO	TACLINK	WD Only	10								
9	BACON	WO	EQCO		8			2					
10	BOULTON	WO	WG2		6								
11	BYWATER	LT	FTR(CBT)		7					3			
12	ARNOLD	LT	SOPCR		6								
13	CAMPBELL	LT	ISO2		6								
14	ALLEN	WO	COOK1		7	2							
15	CORRIGAN	WO	FDO AW		8						4		
16	DAGENS	WO	EWO11										
17	DAVIES	WO	SSCS0		7								
18	EVANS	LT	CCO		7								
19	FLETCHER	LT	FTO(X)		6								
20	HALL	WO	EWO11		6								
21	HAWKES	LT	PTRO		8								
22	HILL	LT	MW2(DG)										
23	HITCHCOCK	WO	TS(TD)		8								
24	HOOD	WO	RTUW1		7								
25	HORROCKS	WO	CHAM1		7								

Fig 2 The start of a holiday schedule for Navy managers. It's based on many ifs, ands, and buts

EXCELlibrary

I'm currently looking for a source for review copies of new books on spreadsheets and related subjects. Until then I will adopt the strategy of Neil Negandhi who maintains The Unofficial Microsoft Excel Page. (It's called unofficial but you reach it via a link from Microsoft's Excel web page.) Neil lists current books which have been recommended by his readers, viewers, hits or whatever a web page receiver is called.

- At the top of his list is *Excel for Windows 95 Bible* by John Walkenbach, published by IDG Books Worldwide, ISBN: 1-56884-495-6. It has 990 pages and includes a CD-ROM ($39.95 in the US), which translates to £37.49 here (incl. VAT).
- He also lists two books by Conrad Carlberg, and published by Que: *Managing Data with Excel*, ISBN: 0-7897-0382-3 and *Business Analysis with Excel*, ISBN: 0-7897-0385-8.
- Among his recommendations for VBA beginners is one I bought and use myself: *Developing Excel 95 Solutions* by Eric Wells (no relation), published by Microsoft Press, ISBN: 1-55615-893-9, 864 pages. It includes a 3.5in disk and costs £37.49 here.
- I must look out for another of his suggestions because it's only $9.95 in the US. It's called *Microsoft Excel Visual Basic Macros Made Easy*, by Bob Flanagan, but he gives no other details.

We know what's best

Malcolm had posted his problem to several newsgroups and a chap called Euan in New Zealand said that such preferred assignment schedule riddles are technically known as linear optimising problems. He raved about an Excel add-in called What'sBest! — I love these worldwide conversations, and to think I remember the time when you had to make a booking to talk to relatives overseas at busy times!

What'sBest! (Fig 3) is a well-established product which I hadn't used it before so I tracked down the US publisher and UK distributor and was sent the professional version of What'sBest! Release 2.1. This release supports Excel 3, 4, and 5 (and Lotus 1-2-3 Release 4 and 5) running in Windows 3.x, Windows 95, or Windows NT. Excel 7 is supported only on Windows 95. The product is also available for Quatro Pro and Symphony.

Delivered on two 3.5in disks, What'sBest! is easy to install and use. There is an excellent, well-indexed 256-page manual with a good tutorial. There are lots of sample worksheets covering everything from bond portfolio optimisation to hogfeed mixes and truck loading. There are three staff-scheduling templates included.

This spreadsheet add-in can solve both linear and non-linear optimisation problems and can be restricted to whole units so you don't schedule 3.29 persons or 4.9 days.

You start in the way I always recommend: set up a worksheet with the answers missing, then go through the three steps called ABCs. A is for Adjustable Cells, B stands for Best, and C is for Constraints. The Adjustable Cells are those where you would enter your guesses if you were trying to solve your problem manually. In some industries they are called decision variables. These are the cells with which What'sBest! can play about, to come up with the solution. The Best is the goal of your solution. It might be to maximise or minimise an adjustable cell. No Best is needed when goal-seeking.

The Constraints are the limitations. A Constraint might be: that the number of employees scheduled for each day must be at least equal to the staffing needs for that day; or that preference for days off is ranked by seniority; or that nobody can work more than five consecutive days.

The number of variables and constraints which What'sBest! can handle depends on the version. The bottom-of-the-line personal version can handle 400 variables and 200 constraints. It needs only 640K of memory under DOS, or 4Mb under Windows. The middle-level professional version copes with 4,000 variables, and 2,000 constraints and needs 8Mb of memory under Windows. The high-end extended version copes with 32,000 variables and 16,000 constraints and needs 32Mb of memory under Windows. What'sBest! writes it's own formulas but you can program it and write your own if you prefer. You can also use macros written in Excel 4 or 1-2-3-macro languages or Visual Basic to execute any of its commands. Simple folk like me can start by selecting one of the sample files and modifying it to fit. What'sBest! can also be used by experienced programmers to build a fancy application.

- If you would like to suggest alternative ways of solving Andy's or Malcolm's problem, do let me know. An elegant solution (emailed as an attached file or sent on a disk) that works straight away for me, could win you a book token.

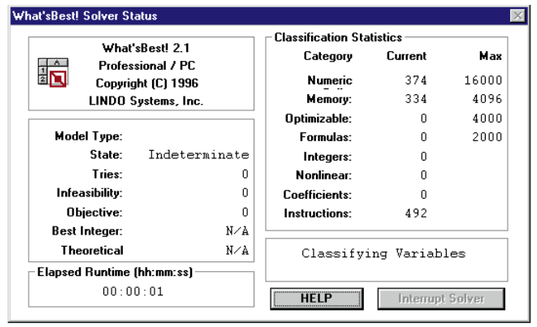
Shortcuts follow-up

In the *EXCELlent Shortcuts* section of my September issue column, I mentioned that the F4 key will change a cell reference from relative to absolute. But reader Chris Vivian expands on this by pointing out that F4 actually toggles and will cycle through relative column and absolute row, absolute column and relative row, and so on.

Chris additionally reminds us that you can check how Excel utilises all the function keys by choosing Help, Topics, Index and then entering Shortcut. Then choose built-in keyboard shortcuts. This offers eight categories of shortcuts.

The last option is Function Keys. This not only shows what the function keys do by themselves, but also in combination with the Shift, Ctrl, Ctrl+Shift and Alt+Shift keys. For example, F1 is Help but Alt+Shift+F1 inserts a new worksheet. F3, F6 and F12 each offer four different functions if you can remember the combinations.

Also in the September issue, I described how to make a pick list in Excel 7. One reader, Kelvin Syrett, asked how he could construct one in Excel 4, so I drew his attention to the Dialogue Editor which comes as an accessory with Excel 4. A list box is one of the many features you can create with this editor. To find out how it is done, see Chapter 8 of Book 2 of the *Excel 4 User's Guide*.


What'sBest! Solver Status

What'sBest! 2.1
Professional / PC
Copyright (C) 1996
LINDO Systems, Inc.

Model Type:
State: Indeterminate
Tries: 0
Infeasibility: 0
Objective: 0
Best Integer: N/A
Theoretical N/A

Elapsed Runtime (hh:mm:ss)
00:00:01

Classification Statistics

Category	Current	Max
Numeric:	374	16000
Memory:	334	4096
Optimizable:	0	4000
Formulas:	0	2000
Integers:	0	
Nonlinear:	0	
Coefficients:	0	
Instructions:	492	

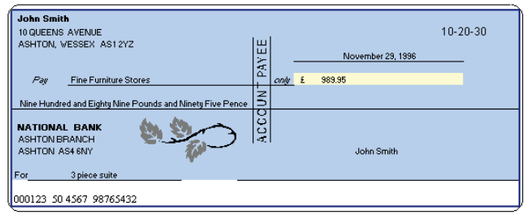
Classifying Variables

HELP Interrupt Solver

Fig 3 What's Best! offers this continually updated report of what's going on while it calculates

On the CD

This month, in the *Hands On Spreadsheets* section of our cover-mounted CD, there is a worksheet template for printing cheques. The clever stuff in it, which automatically writes the amount in words after you've entered it in figures, was written by veteran contributor Shane Devenshire of Walnut Creek, California. I had to anglicise much of his design for the cheque, though. Although I lived in the US for many years, I'd forgotten how much their banking conventions differ. They don't just spell cheque differently and use dollar signs, the wording and reference number arrangements are not the same. It is easy to substitute your own personal and bank details in this template, so you can print custom-designed cheques. I've provided the file in two formats: CHEQUE.xls and CHEQUE.wk4. The 1-2-3 file doesn't have the drawing objects which are in the Excel version but all the formulas work.


John Smith
10 QUEENS AVENUE
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10-20-30
November 28, 1996
Pay Fine Furniture Stores
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Nine Hundred and Eighty Nine Pounds and Ninety Five Pence
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NATIONAL BANK
ASHTON BRANCH
ASHTON AS4 6NY
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For 3 piece suite
000123 50 4567 98765432

EXCELlent shortcuts and longshots

1. UNDERCOVER To hide data in cells, select the cells. Choose Format, Cells, Number. In the Category box, click Custom. In the Type box, enter three semicolons (;;;). The data contained in the cells will appear in the formula bar, or in a cell if you press F2 and edit within the cell. The data in the cell will not be printed.
2. GETTING A DATE To find a date in a range of dates that's closest to a specified date, you can use this formula:

```
{=IF(ISNA(VLOOKUP(Date-
MIN(ABS(Table-Date)),
Table,1,0)),VLOOKUP(Date+MIN(ABS(
Table-Date)),Table,1,0),
VLOOKUP(Date-MIN(ABS(Table-
Date)),Table,1,0))}
```

It assumes that the range of dates has been named Table and the cell containing the specified date is named Date. The curly brackets are not entered. This is an array formula and the brackets will appear when you press Ctrl+Shift+Enter.

3. WHO'S THERE? It is easy to compare two columns of text and find matches and mismatches. Say you have a list of names in the range, A9 to A14, and another in C9 to C14. In cell D9 put:

```
{=IF(OR(A9=$C$9:$C$14),A9,"")}
```

Again, this is entered as an array formula. Then copy this formula down to D14. Column D will then show any names which appear both in columns A and C. In cell E9 enter another array formula:

```
{=IF(AND(A9<>$C$9:$C$14),A9,"")}
```

Copy this down to E14. Column E will then display any names in column A which are not in column C. Finally, in F9 the array formula is:

```
{=IF(AND(C9<>$A$9:$A$14),C9,"")}
```

Copy this down to F14. Column F will then display any names which appear in column C but not in column A.

(Tips 2 and 3 are courtesy of Shane Devenshire.)

•PCW Contacts

Stephen Wells welcomes comments on spreadsheets, and solutions to be shared, via *PCW* at the usual address or **Stephen_Wells@msn.com.**
Excel files can be attached with MAPI-compliant software.

What's Best! from **Eastern Software 01206 44456; www.ip7.co.uk/eastern; email eastern@cix.compulink.co.uk**
(Personal version £295, professional version £995, extended version £3,995 (all prices exclude postage and VAT).

Two **sheets** to the wind

Hello sailor! Our very own old seadog, Stephen Wells, navigates the choppy waters of a reader's sailing handicaps. That old pension problem welcomed him back to dry land.

It is a pet theory of mine that 12-year-olds are more at home with computers than 42-year-olds because they like simple answers: yes and no, right and wrong, black and white. I often find that spreadsheeters write VBA macros when a spreadsheet's functions will do the job faster, or struggle with functions when the problem can be solved by formatting.

Take weekend sailor Michael Samuelson of the Isle of Wight. Seldom known to get his sheets in a twist when tacking across to Cherbourg, Excel 4 gave him mal de mer when he tried to calculate sailing handicaps.

I've dressed up his worksheet a bit using Excel 7 (Fig 1), but it illustrates his problem and the solution. What he wants to do is subtract a Start Time from a Finish Time and get an Elapsed Time. And then multiply that by a Time Correction Factor and produce a Corrected Time.

Mike was trying to separately multiply the hours, minutes and seconds and getting nowhere. Let go of the tiller and trust Excel, I said, when I tracked him down at his sailing club. Just format every column that has Time in the heading in a time format, and format the correction factor column in a number format. Then make a simple subtraction for the Elapsed Time and a multiplication for the Corrected Time. In Fig 1, the formats and entries are spelled out in rows eight and nine. Another happy buoy.

Fair set the wind for Excel, which sailed the calm waters of Elapsed Time and Corrected Time

Microsoft Excel - Sailing.xls

File Edit View Insert Format Tools Data Window Help

	A	B	C	D	E	F	G
1							
2							
3		Boat Name	Start Time	Finish Time	Elapsed Time	Correction Factor	Corrected Time
4							
5		Flyspray	14:10:10	16:13:14	2:03:04	1.046	2:08:44
6							
7							

Fig 1 If you get the formatting right, Excel will calculate elapsed periods of time and correct them with factors

That pension problem

In the August column I reported the long, complicated IF statement formulas that pensions consultant Richard Jones is using in Excel 5 to define the number of years and calendar months between two dates. The complicating factor is that his company only wishes complete months to be counted. I asked readers for more simple solutions and received many responses. I checked all of those which were actually shorter, and not wrapped in pages of explanatory notes. If a solution produced the same answers as Richard, I deemed it successful. The example periods and Richard's answers are shown in Fig 2.

	A	B	C	D
1	START DATE	END DATE	YEARS	MONTHS
2	1-Mar-82	20-May-96	14	2
3	1-Sep-23	1-Jan-97	73	4
4	6-Jan-35	13-Apr-96	61	3
5	30-Sep-46	7-Jan-96	49	3
6	1-Sep-49	1-Jul-99	49	10

Fig 2 The test start and end dates, and the required answers to the pension periods problem

The neatest and most simple solution came from Paul Carter, headteacher of Frithville Primary School, Boston, Lincolnshire. He easily earns a book-token prize (which he's giving to his school) because his formulas were easy to enter and worked first time, and his email of explanation was so brief I can quote it in its entirety: "I use these formulae to calculate chronological ages for comparing test results for the children I teach. The first gives whole years and the second gives completed months."

```
@INT(@DATEDIF((A2),(B2),"m")/12)
@MOD(@DATEDIF((A2),(B2),"m"),12)
```

Ironically, this doesn't help Richard Jones, who uses Excel 5. I can't find any equivalent to the @DATEDIF function in Excel.

As I obviously couldn't specify that Excel had to be used, and many other contest-ants apart from Mr Carter provided Lotus 1-2-3 solutions, I'm going to call *that* the 1-2-3 prize and award a second book token to the best of the many Excel solutions.

That came from Bill Bridge. Whether he knew it or not, he created an Excel function that replaces the @DATEDIF function.

Note how similar the formulas used in the years and months cells are to Mr Carter's:

```
=INT(elapsedMonths(StartDate,
EndDate)/12)
=MOD(elapsedMonths(StartDate,
EndDate),12)
```

The block of cells used for entering Start Dates are named StartDate. The block of cells used for entering End Dates are named EndDate. The formatting for the years and months columns is just General.

The listing for the created function is shown in Fig 3. I know what I said at the beginning about VBA macros, but they have their place and this is one of them.

Bill created the module in Excel 5 under Windows 3.11 but he sent it as part of a workbook file attached to his email, and it opened for me with Excel 7 under Windows 95. I am most grateful to all the readers who sent in other solutions and ask you not to be discouraged — all your contributions are appreciated.

```
Function elapsedMonths(fromDate As Date, toDate As Date)
    Do While toDate >= DateSerial
(Year(fromDate), Month(fromDate) + elapsedMonths, Day(fromDate))
  elapsedMonths = elapsedMonths + 1 Loop
  elapsedMonths = elapsedMonths - 1End Function
```

Fig 3 The VBA module listing to create the elapsedMonths function used for calculating periods

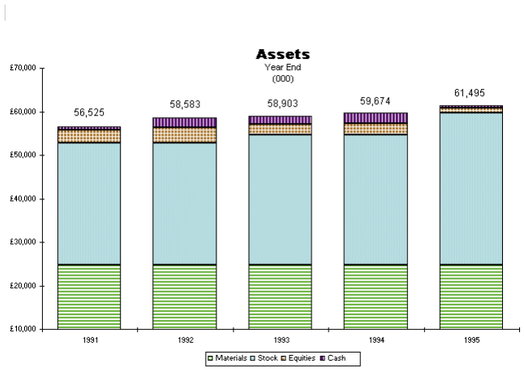

Fig 4 You can add totals to the top of stacked columns of data by creating a dummy series

	1991	1992	1993	1994	1995
Materials	24,750	24,750	24,750	24,750	24,750
Stock	28,000	28,000	30,000	30,000	35,000
Equities	3,022	3,558	2,306	2,524	1,006
Cash	753	2,275	1,847	2,401	739
	56,525	58,583	58,903	59,674	61,495

Fig 5 The data used to create the chart in Fig 4. Totals have been added to each column

Just a dummy

Here's a neat trick for adding totals to a stacked column chart in Excel as in Fig 4.

Add a totalling row to your data table, Fig 5. Select this complete block, including labels and totals. Then choose Insert, Chart, As New Sheet. In Step 2 of the displayed Chart Wizard select Column, then Type 3. Accept the defaults in Step 4 and add a title in Step 5.

Right click on the top data series. Choose Format Data Series, Data Labels, Show Value. Your totals will appear, but your columns are twice the height they should be. Choose Patterns, Border, None, and Area None. This will conceal the extra dummy data series.

Right click on the Y-axis, choose Format Axis, Scale and pick appropriate Maximum, Major and Minor unit values (instead of the default, Auto). If your new totals disappear, choose View, Sized with Window. They'll reappear above the chart title. Drag them down into position.

Finally, format the placement of the legend, if you wish, and add a clarifying subtitle. Make any improvements you like to the width, colour or pattern of the columns by selecting Format Data Series on the shortcut menu.

I've used Excel 7 here, but with slightly different menu options, you can accomplish this in versions 4 and 5 too. Once you're

p272 ➢

familiar with the method, you can produce the result in less than a minute.

Accounting for inflation

I recently had to create a small database of household valuables for insurance purposes. This takes a certain amount of guesstimating for current value, but a small spreadsheet helped (Fig 6).

I've added notes to show the formulas and formatting used in Column B. The average rate of applicable inflation varies by type of item. The formula in cell B10 will work with depreciation as well as inflation, so you can enter a negative inflation rate in B4. You need this with computer hardware! Subject to judgement and advice you might use three percent inflation for some classes of books and furniture. This worksheet doesn't substitute for expertise: it just saves a lot of individual entries on a calculator.

Excel offers functions for calculating depreciation. DDB returns the depreciation of an asset for a specified period using the double-declining balance method. You can calculate the straight-line depreciation of an asset for one period with SLN. SYD uses the sum-of-years' digits method.

Lotus 1-2-3 offers these three functions plus DB which uses the fixed-declining balance method of calculating depreciation. But I've spent my money so wisely that, apart from PCs and printers, clothes and lawnmowers, everything I've bought has gone up in value not down.

Growth of investments

Suppose you are offered a choice of investments. They might be in property or savings accounts. You know how much you have to invest, and how much you expect to receive from each investment at the end of differing periods. What you need is a consistent method of estimating your return. In some industries this is called the average growth rate. In others, it's the annual yield rate or the average rate of return.

The variables can be defined as FV for future value, PV for present value, N for the number of investment periods (meaning the number of times the yield is added to the capital and compounded, or carried forward) and P for periods (or how many Ns there are in a year).

To clarify that, I'll give some examples. If you invested £1,000, stood to collect £10,000 after 10 years, and the investment was compounded annually, then

```
FV=£10,000; PV=£1,000; N=10; and P=1
```

If you invested £1,000, were promised £5,000 after 5 years, and the investment was compounded monthly, then

```
FV=£5,000; PV=£2,000; N=60; and P=12
```

Leaving aside factors like risk or patience, which would be the most rewarding investment? Well, the first example would need an annual yield rate of 25.89 percent, and the second 20.11 percent.

The formula is =((FV/PV)^(1/N))^P-1. If you might use it a lot, it's easy to create a function. In Excel 7, just right-click on a tab in your workbook and choose Insert, Module. Enter the brief listing in Fig 7.

When you need it in your worksheet, put an equals sign in the selected cell (which has been formatted as percentage), click the fx button, and the Function Wizard will offer you the new function under the User Defined category.

You can call the new function anything you wish, but don't call it GROWTH like I did. I couldn't understand why the formula worked but the function didn't. I emailed Michael Rickard, a friendly occasional VBA adviser, who pointed out that Excel already has a GROWTH function (for fitting exponential curves). Microsoft should include a trap so that Excel tells you when you've picked the name of an existing function.

Covering myself

Back issues of this column are now included on the cover CD. Starting this month, worksheets which include macros and formulas are there too. Under Resources, look for the Excel 7 files: Sailing.xls, Periods.xls, Assets.xls, Inflation.xls, Growth.xls; and the Lotus 1-2-3 file, Periods in 1-2-3 V5.WK4.

EXCELlent shortcuts and longshots

DISPLAYING MULTIPLE SHEETS To view more than one sheet of your workbook at a time, click the tab of the first sheet to view, choose Window, New Window. Then Window, Arrange. Select Tiled, and check the Windows Of Active Workbook option; OK. The title bars will show the name of your workbook and a number, based on the number of open windows. If tabs were visible before, they will still be visible, so you can change sheets in each window.
FINDING FILES Excel 7, like all Windows 95 applications, offers sophisticated search facilities. Say you know you have a file called Expenses 95 somewhere but can't find it. Choose File, Open, Advanced. Delete the default search criteria. In the Look-in box choose C: D: or A:. In the Property box choose File name. In the Condition box choose Includes. In the Value box enter Expenses. Check the Search subfolders box. All files with Expenses in the name will now be listed. You could also narrow the search by a date or choose from many other search options.

A	B		
		ENTER	FORMAT
2 Purchase Price		£72.50	Currency
3 Purchase Date		22/6/65	d/m/yy
4 Ave. inflation per yr. (%)		3	Number
	FORMULA		RESULT
6 Today	=TODAY()	2/10/96	d/m/yy
7 Purchase Year	=C3	1965	yyyy
8 This Year	=C6	1996	yyyy
9 Years Old	=YEAR(C8)-YEAR(C7)	31	Number
10 Value Price	=C2*(1+C4/100)^C9	£181.26	Currency

Fig 6 A simple worksheet for calculating present estimated values for insurance coverage

```
Function AYR(FV, PV, N, P AsInteger)
AYR = ((FV / PV) ^ (1 / N)) ^ P - 1 End Function
```

Fig 7 The VBA module listing to create the AYR (Annual Yield Rate) function used for comparing investments

PCW Contacts

Stephen Wells welcomes comments on spreadsheets and solutions to be shared, via *PCW* Editorial at the usual address or at **Stephen_Wells@msn.com**.

Files can be attached if you're on MSN or Demon.