say, or an unscheduled trip to France — will be on your expected cash surplus (always assuming that you have one). In other words, once the model is built, you can play around with the data and see how the effect of one alteration can be reflected across the spreadsheet as a whole.

BUILDING A MODEL

The first step in building such a model is to write down on a piece of paper a list of all the household expenses that you can think of. The next task is to note the expected monthly figure under each heading. It is here, at the point of calculating or estimating the monthly amount and keying it into the model, that Vu-Calc's strengths become apparent. The expense categories are keyed in one after the other down the first column, and each subsequent column is labelled 'Jan', 'Feb', 'Mar', etc. Vu-Calc requires that all text entries be preceded by a double quotation mark, but this punctuation does not appear on the displayed spreadsheet. The first few rows and columns of our model might therefore look like this:

	1	2	3	4
A		JAN	FEB	MAR
B	Car H/P			
C	Mortgage	150		
D	Rates			

This gives us the basic 'shape' of the model. We now need to input the relevant values, and to do this we use Vu-Calc's REPLICATE command.

Vu-Calc has a limited number of commands, all of which are prefixed with a # sign. (When you type # at a blank cell, the program goes into 'command mode' and waits to be told the command you want to use.) The most useful of these commands is REPLICATE – this is because the most boring part of building a model is the need to key in all the values the model will use. REPLICATE is basically a labour-saving device that allows the same piece of data to be entered into many different cells simultaneously.

A common part of a household expenses/ budget model is the fixed monthly expenses, such as the rates, the mortgage or the rent. If the mortgage is, say, £150 a month, the REPLICATE command would be used to insert £150 in the appropriate 12 cells.

When you invoke the REPLICATE command by typing #R, a prompt line appears at the top of the screen, above the model itself, which reads:

Replicate – Enter the cell to replicate, RETURN for the current cell.

This asks you to specify the cells that are to be copied (notice that you can copy only one cell, not a whole block of cells – this is one of Vu-Calc's more obvious limitations). The cell is specified by its co-ordinates, with the row letter given first, followed by the column number – i.e. C2. Once this has been entered, the prompt line asks you to:

Enter the range over which the data is to be replicated.

A range of cells in Vu-Calc is indicated by specifying the first (or leftmost) cell and the bottom rightmost cell of the range. (Think of the block of cells as a box; you have to tell the program the co-ordinates of the box's top left and bottom right corners.)

In our example, we want to tell the program to put £150 into the range of cells in Row C, from C3 to C13 (the columns labelled 'Feb' to 'Dec'). The format for this is #R,C2,C3:C13. This automatically fills each cell, almost instantly, with the value 150. (The real power of the REPLICATE command comes in copying formulae from cell to cell, but this is a fairly specialised area, since such formulae can either be 'relative' to a particular cell or 'absolute' – a distinction and a topic that we will cover in the next instalment.)

We now work through all our expense headings in the same way. Note that if you decide that in specified months the amount for a particular expense should be greater or less than the standard value, you can simply move the cursor to that cell and enter a new value. This will immediately overwrite the old figure.

In our model, column 14 will be the monthly totals column. There would be little point in using a spreadsheet if you needed to use a calculator to add up each month's expenses, so Vu-Calc can be used to add all values in any row or column. The @ command indicates that you want to add the values contained in a range of cells; this range is specified in the same way as before. So, to total the year's mortgage payments, and to put the result in cell C14, you simply place the cursor at C14 and type @C2:C13. The result – 1800 in this case – is immediately displayed.

We could just as easily have put a formula into cell C14; instead of adding all the values we could have entered C2*12. Vu-Calc would have taken this to be a formula, as the C is not preceded by a quote mark, and would have executed it immediately, giving the result 1800. This illustrates that there is often more than just one way to achieve a particular result.

In the next instalment of the course, we will look at how expenses can 'grow' by fixed percentages, and how relative and absolute cell reference formulae may be replicated.

Spreading It Around

Commodore 64
Busicalc: £45. Cassette/disk by Supersoft, Winchester House, Canning Road, Harrow HA3 7SJ.
Insta-Calc Graphic: £87.50. Cartridge/disk by Dataview Wordcraft Ltd., Radix House, East Street, Colchester CO1 2XB.

BBC Micro
VuCalc: £10. Cassette by Psion Ltd., 2 Huntsworth Mews, Gloucester Place, London NW1 6DD.

Spectrum
VuCalc: £10. Cassette by Psion Ltd.