

references as variables and the formulae as simple algebraic expressions using these variables, constants and the arithmetical operators. Some examples of such formulae are:—

B1*1.03
D12*(B2 + 1.5)/C1
D7—C7

A formula can refer to one particular box or it may be repeated along a row, down a column, or across a block. To achieve this, the $\#$ Repeat command is used (see below under commands).

Formulae are always applied relatively. For example, in the Repeat command, if the current formula is being applied to a sequence of boxes along a row then the column references in the formula are always incremented as the formula is applied sequentially along the row. For example, if the formula "1.03*A1" in the box A2 was repeated along the row A then the formula in box A3 would be "1.03*A2" and the formula in box A4 would be "1.03*A3", etc. The same relative concept is applied down a column or over a block where the row letters in the formula are incremented sequentially.

If, in a formula, you wish to refer to an absolute box reference which does not alter when repeated, the box reference in the formula should be prefixed with the character "\$". Thus, for the above example, the formula "1.03*\$A1" when applied to the row A would always refer to the contents of box A1 only.

COMMANDS

A variety of commands exist in VU-CALC for loading, saving and printing files, for editing etc. These commands are entered by typing " $\#$ " in the empty input line followed by the first character of the particular command.

$\#$ B

Blank

Blanks the current box.

$\#$ C Calculate
Forces a recalculation of the whole table and is sometimes required when a formula is changed.

$\#$ E Edit
Allows the formula referred to by the current box to be replaced by a new formula.

$\#$ F, c, f, j Format
Format specifies the representation of a number in a column, as defined by the three parameters c, f, j. The first parameter c must be a one or two digit number or the letter "A". If c is a number, the formatting will apply to that column only, while "A" will apply the format to All the table.

The parameter f specifies the type of formatting required. If an l is entered, integer format will be used. If \$ is entered, a real number with two decimal points will be used. G specifies a general format. The third parameter, j, must be L or R for left or right justified.

$\#$ G, rc Go
Move the cursor immediately to the box rc.

$\#$ L Load
Will clear the screen, ask for a file name and load that file.

$\#$ P Print
Will cause a copy of the screen to be output to the printer.

$\#$ Q Quit
Will allow the user to clear the worksheet or exit from the program.

$\#$ R, rc, f:l Repeat
This will cause the contents of the box rc to be reproduced across the range specified. Most importantly, it will repeat the formula in the box rc over the other boxes within the range specified.

The first parameter, rc, is a box reference, for example B3, which specifies the box whose contents or formula is to be repeated.

The box can be repeated along a row, down a column or over a rectangular block of boxes. This is defined by the parameter range which has the form f:l where f and l are box references, for example A3:B5. f is the top left-hand box of the block and l is the bottom right-hand box of the block. In the example, the box at rcc would be repeated over the boxes A3, A4, A5, B3, B4 and B5, in the range, the box f must always be to the left, and, or above the box l.

$\#$ S Save
Clears the screen and asks the user for a file name. The data on the table will be saved to cassette.

$\#$ T, r or c, r or c Transfer
This command transfers a row or column defined by the first parameter to another row or column defined by the second parameter. A row cannot be copied to a column and vice-versa.

SUM FACILITY

Part of a row, a column, or a rectangular block of boxes may be added automatically through the sum facility. Summing is performed as a formula. Position the cursor at the cell where you wish to place the result of the summation. Enter a formula of the form

&f:l

and press the enter key. The sign "&" means sum and the formula means "sum the boxes from the first box f to the last box l".

f:l is the rectangular "range" of boxes over which the summation is to be performed where f is the top left-hand box of the rectangle. For example:

&A2:B4
will sum the boxes A2 + A3 + A4 + B2 + B3 + B4.