worksheet, several Kbytes of usable memory may be devoured by empty cells. For this reason, it is often preferable to place macros at the left-hand edge of the worksheet, in columns A, B, and C, for example. If all of the formulae in the worksheet are written to work from left to right, the macro regions will remain untouched.

We will build our naming macro in column A. If the number of keystrokes becomes too large to fit neatly into a single cell, the macro can be contained on subsequent rows in the same column. Pointing the cursor at cell A1, we type the keystrokes needed:

VBNC

At this point, 1-2-3 waits to accept the chosen name from the keyboard. A pause is inserted by typing a question mark enclosed in brackets, (?). 1-2-3 will wait until the user presses Return to proceed with the macro. The bracket format is used consistently whenever an action is desired that cannot be indicated by a specific key. Included are cursor movements, which are shown by typing a direction word in brackets. Carriage returns are indicated by a tilde, Thus the macro continues:

*/ BIN C (?) (right) (right) (right) (right)

We have now entered all the keystrokes we need to name a region. This is the body of our macro.

The next step is to name the region with the label

of a key, such as N, for name. Unfortunately, we are faced with a vicious circle here. We must type out all the keystrokes we have just entered in our range-naming macro because we haven't yet named and stored our macro! We place the cursor in cell A1 and type:

1/ R N C \ N Return Return

The character \land is used to indicate that the ALT key must be pressed — so \land N, the name of our macro, means ALT N to 1-2-3. Now that the region has been named, pressing ALT and N together will automatically activate the sequence of keystrokes stored. From this point on, naming a region can be accomplished by typing:

ALT-N NAME Return

 a large improvement on the original process. This example, while useful, is a minimal sample of the potential of keyboard macros. There is

essentially no limit to the number of keystrokes or the number or type of operations that can be automated with macros.

The principle of keyboard macros makes it possible for the user to customise applications software almost as one would write a BASIC or PASCAL program. Although Lotus's 1-2-3 program is expensive and is limited at present to business systems, the concept of macros will almost certainly filter down to software on home micros.



Lotus Command Cluster

Lotus has several levels of menus, as shown here. These commands are built in. Others can be user-defined via keyboard macros