



**Clever Keyboard**

The IBM Personal Computer keyboard is claimed as being the best available on any microcomputer. The Advance keyboard closely mimics IBM design but some keys are repositioned and the Advance, rather strangely, has two Return keys

this amount is more than enough for most applications.

The Advance is well supplied with sockets and interfaces. These include a 'mains out' socket that allows a television or monitor to be run from the computer's power supply; a socket enabling a television to be used as a display; 'comp sync' and RGB outlets for either composite video or RGB (red, green, blue) monitors; a standard Centronics interface for connection of a parallel printer; two joystick ports; and a five-pin DIN socket for tape recorder use. If the upgrade is fitted, an RS232 socket is available for connection of a serial printer or modem. All interfaces take IBM-style leads.

In text mode, the Advance displays either 25 lines of 40 characters or an IBM-like 80 x 25 screen; the latter is barely readable unless a monitor is used. The bottom line of the screen normally displays function key labels, but these may be turned off and the full screen made available. In this mode, 16 colours (either steady or flashing) can be used. The medium resolution screen supports four colours, with a graphics display of 320 x 200 pixels or text in 40 x 25 format. The high resolution mode gives a black and white display of 640 x 200 pixels or 80 x 25 text. Seven full 40 x 25 screens may be stored in RAM and recalled instantly — very handy for menus, help pages, etc. In 80-column mode, four screens may be stored and recalled. Despite the large number of available colours, there are some annoying restrictions placed on their use. In text mode the background is limited to one of eight colours, although foreground and border may use any of the full set. When using the medium resolution mode, things become a little more complicated. Although four colours may be displayed, these may not be chosen from the full range; instead one of two set groups (or 'palettes') must be selected.

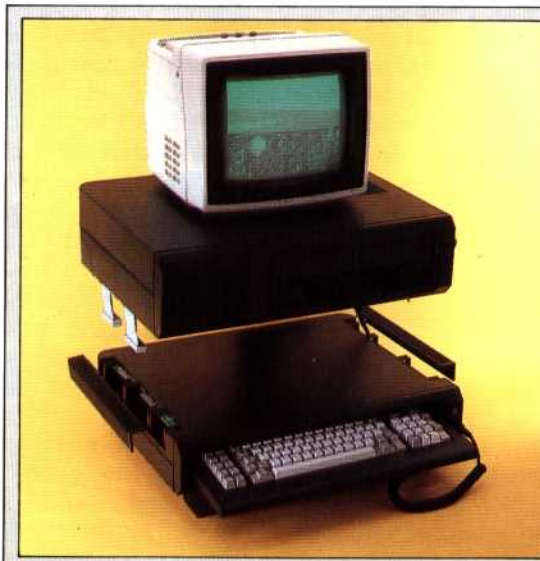
Graphics commands on the 86a are limited to PSET (which sets the colour of an individual screen pixel) and LINE (a fast line-drawing command that also gives boxes). More useful commands like CIRCLE, PAINT (for filling any on-screen shape with colour), DRAW (which allows any shape to be defined and drawn) and GET and PUT (enabling

areas of the graphics screen to be copied into arrays, then returned to the display in different colours or sizes) are supplied only on the 86b's Disk BASIC. This is a pity, as the one thing a home computer owner is likely to require is a full set of graphics commands. The Advance character set includes the normal ASCII range, together with mathematical symbols and block graphics featuring playing card suits, music notes, Greek letters and even one of those hideous smiling faces that you often see on badges and stickers. User-defined characters may also be created.

The rest of the Advance BASIC is almost beyond reproach. Although lacking some of the 'structured' facilities of BBC BASIC, it is fast and very easy to use. Useful features include automatic line numbering and renumbering, PRINT USING, which allows easy formatting of screen displays, and the SWAP command that allows the values of two variables to be exchanged. Sound facilities are good, if not startling, but again the Disk BASIC is required for the full set of commands. Cassette operation is straightforward — BASIC and machine code programs are loaded with a simple LOAD command, and programs will run automatically after loading if the letter 'R' is appended to the instruction.

One of the most impressive features of the Advance is the excellent screen editor. By using the Num Lock key to set up the numeric keypad as cursor controls, the user may move the cursor freely about the screen, making corrections and insertions at any point.

All in all, the Advance does seem to live up to its promise of providing a home computer that may be upgraded to full business status. Undoubtedly the facilities offered by the 86b's more comprehensive Disk BASIC are considerably superior to those on the cheaper machine, but the 86a can certainly bear comparison with any home micro currently available. The BASIC may not be up to BBC standard, but the Advance's superb keyboard and huge memory make it a more attractive proposition at the same price.



**Advance To IBM**

The Advance's main attraction is that it may be bought as a home computer and then upgraded to full business specification.

The expanded system is almost totally IBM-compatible; our picture shows the Advance running Microsoft's Flight Simulator, which is regarded as the ultimate test of compatibility. The expansion box costs £1,100 and fits on top of the 86a's main unit. It should be fitted by a dealer — W. H. Smith markets the computer in the U.K.

**Centronics Printer Interface**

**RGB Output**

A high quality colour monitor can also be used

**Composite Video Output**

This enables a monochrome or colour monitor to be used

**TV Modulator And Output**

To allow an ordinary TV set to be used

**Ferranti ULA Chips**

The cost of the computer is kept down by combining many circuits into nine specially designed ULA (uncommitted logic array) chips