



The less expensive portables use dedicated applications programs that are usually loaded into the computer's RAM from cassette. This is a much slower process than loading from bubble memory cartridge or disk drive. The NEC PC-8201A comes with a cassette containing several applications programs. These include a memory calculator, text formatter, investment portfolio manager, and loan evaluator. The memory calculator turns the machine into a calculator that can remember up to 99 entries. The text formatter prepares for printing files that have been entered into the word processor program by specifying margin widths, dividing the text into pages, assigning page numbers and so on. The investment portfolio manager is for use by people who want to evaluate how their stocks and shares are performing. This program analyses a portfolio of up to 50 investments, calculating losses and gains.

As with any other computer, the portable micro can be connected to peripherals such as printers, tape cassette decks, and modems. Apart from the obvious factor of size and weight, the test of a true portable is that it should be battery-powered, have its own display, and carry its word processing and communications programs in ROM.

Machines such as the Apple IIc and Apricot are advertised as portables. But they cannot be used in transit as they have to be plugged into the power supply, connected to a monitor, and have their programs loaded into RAM from disk. Apart from their smaller size and lighter weight, these have more in common with the desk-top micro than the battery-operated hand-held computer.

As well as their main batteries, portable computers are equipped with small nickel cadmium batteries that can provide emergency power. This is essential, as all data would be lost if the batteries failed without this back-up.

Most portables also have a bar code reader interface so that they can be used for stock control. The bar code reader is passed over the code on product packs. This decodes pricing and dating information that can be processed by the computer to give shopkeepers an accurate readout of their stock inventory. Of the machines that we illustrate on these pages, the Tandy Model 100, NEC PC-8201A and the Olivetti M10 are all equipped with bar code readers, but the Casio FP-200 is not. The first three machines are in fact very similar in a number of ways, as they are all manufactured at the same Japanese factory. The significant differences between them are that the Olivetti has a tilting screen, the NEC has less built-in software and the memories of the Tandy and the Olivetti cannot be expanded beyond 32 Kbytes, whereas the NEC can be expanded to 64 Kbytes. The NEC can also use interchangeable 32 Kbyte memory cartridges that retain their data even



**Epson HX-20**

Although it has a small screen, the HX-20 has the advantage of a built-in cassette recorder and tiny printer. A modest word processor is also included



**Casio FP-200**

The Casio is the cheapest of the hand-held computers but lacks the built-in word processor. Instead it offers a kind of spreadsheet.

