

The Age Of Portables

As computers become more sophisticated they can be squeezed into smaller packages, so that truly portable micros are now possible



No Executive Toy

Portable computers such as the Epson HX-20, with up to 32 Kbytes of memory built-in peripherals and a wide range of software, have greatly increased the amount of information available to a business executive, no matter where he may be. Each microcassette can hold up to 230 Kbytes (perhaps 40,000 words, equivalent to a powerful database), while standard word processing and spreadsheet software allows work to be done almost anywhere — even in a taxi cab!

Development of the portable micro as we know it today has come from two directions. One has been the augmentation of the pocket calculator, as in the Sharp PC1251 and the Casio FX700P. The other has been an evolutionary process of miniaturisation, which has resulted in such machines as the Tandy TRS80 Model 100 Personal Computer and the Epson HX-20 (see page 169).

These advances were a result of the development of more densely packed chips, allowing a great deal more information to be contained in the same physical space.

With the advent of the single-chip micro-processor in 1972 it became theoretically possible to build an entire computer into a box no bigger than a cigarette packet. However, the size of the display and the prime means of access — the keyboard — imposed practical limitations on this miniaturisation.

Pocket calculators did indeed become smaller, and today digital watches are available that double as calculators, requiring use of a matchstick or a purpose-built stylus to operate the 'keys'. But it is difficult enough to perform a simple arithmetical operation on these and even the most enthusiastic would shrink from entering a 50-line program in

BASIC. So personal computers are unlikely to become as small as a wristwatch. But they have become calculator-sized.

Once pocket calculators became programmable, albeit in their own programming notation, it was only a short step to the incorporation of a high level programming language, and the obvious choice was BASIC. At about the same time manufacturers started to use 'non-volatile' RAM — a type of memory that, by retaining a small electrical charge, doesn't lose its contents when the power is turned off — and a more comprehensive character generator, to allow for alphabetic characters to be displayed in addition to numerals.

Reasonably priced devices such as the Sharp and Casio pocket computers, which have a range of BASIC commands comparable to home computers and similar memory capacities, are fast taking over the programmable calculator market. Packaged to fit comfortably into a pocket — even a shirt pocket — some offer the possibility of being directly interfaced to both a printer and a cassette recorder. Doubtless, a built-in communications facility will follow if there is sufficient demand, allowing the transfer of information over telephone lines. The Casio range, especially, is attractive to scientists and engineers, as it retains the wide range of mathematical and scientific functions that made that company's calculators desirable.

Other models are available with a built-in printer and, complete with cassette interface, cost around £125. Sharp's PC1251 is similarly priced for a similar specification.

The next major step is represented by the 'lap-held' models such as Epson's HX-20, the Tandy 100 and the NEC 8220. These micros offer a full implementation of BASIC (in all cases Microsoft), 16 to 64K bytes of usable RAM, an inbuilt liquid crystal display (LCD) of a reasonable size (20 × 4 characters on the Epson, 40 × 8 on the other two) and the ability to connect to a wide range of industry-standard peripherals.

Indeed, couple them to a regular monitor (you may need to buy a special interface) and you have a micro comparable in capacity and performance to a conventional home computer at the same reasonable price. The essential difference lies in the fact that these machines rely on their own internal power supply, thus allowing absolute portability.

The Epson, for example, has built-in nickel

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