



## Computer-Controlled Devices

Computers can easily be used to control devices in the 'real' world. The application usually quoted is the control of a home central heating system — this is quite possible, although hardly worth the effort as a perfectly effective time-switch is fitted to such systems anyway. Much more fun are the various wheeled vehicles that may be controlled by the computer. The Valiant Turtle is a wheeled vehicle that looks slightly like a turtle and which can produce the graphics used by the LOGO language. This can be fitted to the Spectrum, Commodore 64 and BBC Micro, and uses an infrared beam to communicate with the computer. The BBC Buggy is a similar type of device, but is linked to the computer by trailing wires. It can also be used to draw lines, and is fitted with sensors.

Our picture shows both the Valiant Turtle and the BBC Buggy.

## Printer/Plotters

For anyone who uses a home computer for program development or for word processing, a printer soon becomes a vital acquisition. Most printers are either dot matrix or daisywheel in format. Dot matrix types use a grid of small dots to build up each letter, allowing graphics to be printed, and are fast in operation but produce a poorer print quality than the daisywheel, which is basically a computer-controlled typewriter.

An alternative system is the small printer/plotter that is marketed for the Tandy, Atari, Commodore and Oric computers. This uses paper that is just over four inches in width, and is fitted with four small ballpoint pens to allow multi-coloured text or graphics to be produced. The text is 'drawn' in the same way as the graphics, and a full set of characters is programmed into the device. A further alternative is provided by the Epson P40 thermal printer, which uses a column of heating elements to burn an impression on special paper. This is extremely cheap, yet gives a reasonable quality of print and runs on rechargeable batteries. Again, the paper used is fairly narrow, but the P40 can produce an 80-column printout if the condensed mode is used.

Shown here are the printer/plotter (in its Tandy/Radio Shack guise) and the Epson P40 thermal printer.



## Joysticks

The first peripheral that a home computer owner buys is usually a joystick. Many computers are fitted with suitable interfaces, and some of the newer machines have joysticks supplied as standard. The most common joysticks use the nine-pin 'D'-connectors first adopted by Commodore and Atari micros, and since followed by many independent companies. BBC joysticks are decidedly non-standard, so the choice here is more limited, and Commodore has inexplicably ignored its own standard on its Plus/4 and 16 micros, restricting buyers of these machines to the new Commodore-designed joysticks.

Sinclair has recently marketed the Interface Two, a joystick interface and ROM cartridge port for the Spectrum. Until this was produced, no 'official' joystick interface had been provided for this machine, and the *de facto* standard has been the Kempston interface, the specifications of which have been adopted by many other companies. Unfortunately, the two are incompatible and many best-selling games will work quite happily with the Kempston interface but will not work at all with the Interface Two, so Kempston has now produced an interface that is compatible with software written for both Interface Two and the old Kempston format. One possible alternative is to buy a 'programmable' interface, which allows the user to run any software, whether or not it was originally designed for joystick use. This works by using the joystick to mimic the action of the keyboard and is probably the best buy for any Spectrum owner who has a large software collection.

Of the many joysticks on the market, the most unusual is the new Cheetah RAT (see also pages 590-591). This has no cable to link it to the computer, but uses an infrared beam to send and receive signals. As yet, this is available only for the Spectrum. The Amstrad system is also somewhat unusual. The Amstrad micro has a single joystick socket, but a second joystick may be connected to the first, enabling two-player games to be run.

Our joystick photograph shows (from left to right): the Amstrad joystick, the Cheetah RAT, the Kempston PRO 5000, and (front) the Kempston interface for the ZX Spectrum.

## Monitors

Most home computers are used — initially at least — with an ordinary television set as the display screen. This often poses problems, as other members of the household may want to watch television while the computer owner is playing Pacman, and, anyway, the picture quality is often poor. The answer is to use a monitor, which provides a better quality picture. The user must ensure that the correct monitor is bought, as there are two main standards — RGB and composite video (see page 29). Composite video monitors are used with Atari and Commodore micros, while the BBC, Oric/Atmos and Sinclair QL machines require the RGB format, which provides the best picture quality of all. Some micros rely on the television speaker to produce sound, so these will require monitors with built-in speakers. Several television manufacturers now produce sets that are fitted with monitor interfaces; these are ideal purchases if the user requires both a television set and a high-quality display. Shown here is the Microvitec Cub.

