



by a special chip in the computer called the GTIA chip. 'Players' are objects created from pixels. Once the shape of a player has been determined, the values of each pixel are POKEd into an area of memory called a 'shape table'. You can create as many as four players, each with an associated missile component. The player is assigned one or more colours, and is manipulated on the screen by changing the values in the shape table. Though Atari's Player-Missile graphics are not easy to use, they provide some remarkable screen displays.

The new Atari machines have 11 graphics modes, and up to 256 colours (actually 16 colours, each with 16 different shades); because of the amount of memory required for screen display, however, the number of colours that can be shown varies according to the resolution of the screen. The higher the resolution, the fewer the colours that can be displayed. The maximum graphics resolution on the 600XL and 800XL is 320 by 192 pixels.

Atari's sound features are also controlled by a specially designed chip. There are four independent voices, each of which has a range of 3½ octaves. The voices can be controlled through the SOUND command in BASIC, or by POKing values into the memory registers that produce the various tones. Tones can be adjusted for oscillation, pitch, distortion and volume. When the voices are controlled with SOUND, only one voice can be started at a time. This means that harmonising requires you to turn on each voice separately, and there is a noticeable delay. This problem can be overcome by using machine code routines, or using POKE in place of SOUND.

The Atari 400 and 800 have no language built in; you have to use a separate cartridge. The 600XL and 800XL have Atari BASIC built in. This is not the best BASIC, lacking in many of the features that make BBC BASIC and others so good. For instance, there is no CIRCLE command, no PRINT@ or PRINT USING feature, no automatic line numbering or renumbering, and no provision for integer variables. However, Microsoft BASIC and Extended BASIC are available in ROM cartridge.



Atari 1027 Printer

This printer has a print head similar to the golfball used in some typewriters. It gives a print-out as good as most electric typewriters, but is rather slow in operation.

There are two other Atari printers, one using ballpoint pens to draw letters and lines in four colours, and a dot matrix printer that gives a poorer quality print-out but is fast. These are the only printers that can be used directly with the XL machines because of the lack of a standard printer interface.



Cartridge Port

The XL range has a single slot for ROM cartridges

Graphics Chips

Two custom-built chips, known as ANTIC and GTIA, provide the Atari's spectacular display abilities.

RAM

A number of chips comprise the 16K of RAM



Ball And Stick

The Atari offers two main ways of controlling games. The conventional method is with a joystick and the Atari joystick (shown right) has become something of an industry standard. The Atari trackball (left) gives control through a ball that spins in its mount

To accompany the new line of computers, Atari has redesigned the existing peripherals and added to the number of options available for expansion. Perhaps the most useful peripheral is an expansion box, which plugs into the Expander. The expansion box provides eight expansion slots, which can hold interface cards for several peripherals, two RS232 serial ports and a parallel bus. Atari also has a CP/M module with a Z80 microprocessor, the CP/M 2.2 operating system, and switchable 40/80 column display.

Atari have scored high marks with the 600XL and 800XL in design, quality of construction, and features. They also have the advantage of a huge library of software on cartridge, cassette, and disk that has grown up over the last few years. These two new machines from Atari should prove a very attractive buy for home computer enthusiasts.