Sprite Dimensions

Sprite graphics are available on only four of the popular home microcomputers, the Commodore 64, Sord M5, TI99/4A and the Atari range.

The 16 colours normally available are increased to 256 on the Atari because each colour comes in 16 degrees of 'luminosity'.

In games it is often useful to know when two sprites come into contact — for example when two spaceships crash — and for this a 'collision detection facility' is provided.

The 3-D effect is created by placing each sprite on a different plane; the more planes in a system the better. The maximum size of each sprite is expressed in pixels. Sprites can be made to expand or contract and can be moved about the screen.

To simplify the process of building up sprites special software 'utility packages' are available

MICROCOMPUTER	NUMBER OF COLOURS	COLLISION DETECTION	PLANES	SPRITE SIZE	SOFTWARE
Commodore 64	16	Yes	8	24 × 21	Yes
Atari 800	256	Yes	16	16 × 16	Yes
Texas TI 99/4A	16	Yes	28	32 × 32	Yes
Sord M5	16	Yes	32	8 × 8	No

grid of squares to the maximum size, and make the required shape by filling in the appropriate blocks. You will already be aware that computers work using only 1s and 0s (see page 28). The black squares should be represented as 1s, and the white squares as 0s.

The computer handles most information in the form of bytes (a collection of eight bits). The computer's manual will show how the whole grid of dots making up a sprite needs to be broken up into groups of eight. Each byte in turn needs to be converted into a single decimal number, ranging from 0 to a maximum of 255, before it can be used in a BASIC program. This is done by multiplying the leftmost binary digit (bit) by 128, the next one by 64, and so on. The results are then added together.

The resulting collection of decimal numbers completely define the design of the sprite. These numbers are placed into memory locations using a BASIC program; the exact procedure varies with each machine. The computer then needs to be instructed as to where in memory it can find the specifications for each of the sprites required.

Everything else can now be achieved using simple commands to specify the current position of each sprite on the screen, change its colour, expand or contract it, and detect when two or more sprites overlap.

Software packages, called 'utilities', are available for most machines with sprites. These make the process of creating the image less tedious. They show the grid on the screen in large scale, and allow the image to be drawn simply by moving the flashing cursor around the grid. All the arithmetic is handled automatically, and the results are then placed in the appropriate bytes. Finally the grid disappears and the sprite itself appears on the screen for manipulation.

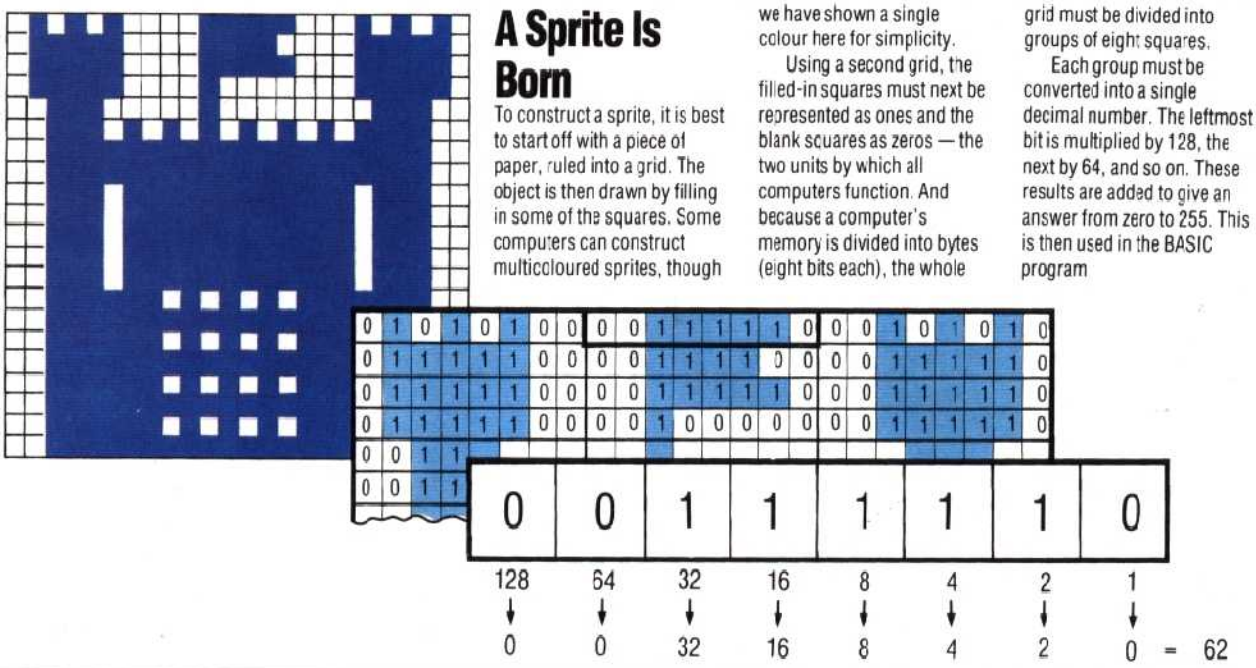
Sprites have revolutionised home computer graphics by providing a simple and efficient method of producing fast-moving and colourful displays.

A Sprite Is Born

To construct a sprite, it is best to start off with a piece of paper, ruled into a grid. The object is then drawn by filling in some of the squares. Some computers can construct multicoloured sprites, though we have shown a single colour here for simplicity.

Using a second grid, the filled-in squares must next be represented as ones and the blank squares as zeros — the two units by which all computers function. And because a computer's memory is divided into bytes (eight bits each), the whole grid must be divided into groups of eight squares.

Each group must be converted into a single decimal number. The leftmost bit is multiplied by 128, the next by 64, and so on. These results are added to give an answer from zero to 255. This is then used in the BASIC program



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