



Introducing Sound

Sound And Light is a new series that will teach you how to get the most from the sound and graphics facilities on your computer

As home computers have developed over the last few years the features provided have become more comprehensive. Games facilities have been of vital importance to the popularity of each new computer and much time and effort has gone into developing sophisticated colour graphics capabilities. Though not so obvious in importance, sound and music-making features have been developed to a similar degree. If you asked successful games writers how important sound routines were in their programs they would probably place them a close third behind the game concept and graphics. Intelligent use of sound effects and music add considerably to the

excitement and entertainment value of all arcade-type games.

In addition to games applications it is possible to further your knowledge of music by using the sound capabilities provided by your home computer. In many cases special music commands are provided in BASIC to enable you to write short programs to play quite complex tunes that even include chords. Some computers also provide ways to change the nature of the sound to make it more pleasing to the ear or approximate the sounds of conventional musical instruments. In all cases the computer keyboard can be configured, by means of a suitable program, to act in a similar manner to a piano keyboard, enabling you to play music in 'real time'.

Even if you have little knowledge of programming it is possible to write short and simple programs that make reasonably sophisticated musical sounds. If you wish to use the sound facilities to their best advantage, most software houses produce comprehensive music programs that enable you to write and play tunes immediately. Whichever approach you take, it is useful to understand how your computer generates, shapes and controls its sound output.

...And Light

Low and High Resolution

Graphics on microcomputers can be divided into two categories: low resolution and high resolution. The difference between low and high resolution is best described by considering how a character (a letter, number or shape) is made up.

If you take a close look at a standard character printed on a television screen you can see that its shape is made up of a group of small squares. These squares are called picture elements, or 'pixels', and every character or shape that appears on the screen is an arrangement of these in a pattern. On most home computers the characters are formed from a square of 64 pixels, grouped into eight rows of eight. The letter 'A' can be made up of a pixel pattern like this:

Each illuminated pixel on the grid can be represented in the computer's memory by a '1' and each dark pixel by a '0'. Eight bits make a byte, so each row of the character grid may be stored in one single location of the computer's memory. Thus it takes eight memory locations to hold a single character.

Graphic displays are sometimes made up of blocks the size of whole, half, or quarter character grids. Graphics designed using these large, simple building blocks are said to be of low resolution. On many home computers it is now possible to design graphic displays that are built up from single pixels. These are high resolution displays. A good way to demonstrate the difference between the two types is to look at a plot of a sine curve, as illustrated, using both kinds of resolution.

BIT PATTERN

0	0	0	1	1	0	0	0
0	0	1	1	1	1	0	0
0	1	1	0	0	1	1	0
0	1	1	1	1	1	1	0
0	1	1	0	0	1	1	0
0	1	1	0	0	1	1	0
0	1	1	0	0	1	1	0
0	0	0	0	0	0	0	0

