Simple Sounds

Sound generation on the Sinclair Spectrum

The Spectrum is rapidly becoming the most popular home computer. It features excellent colour graphics facilities and useful memory options at a low price. Unfortunately, some facilities have been sacrificed in order to keep the price down. Most complaints concern the keyboard and the use of a non-standard BASIC, but it can be argued that its minimal sound capabilities are its weakest feature. The Spectrum provides the barest essentials for sound generation and produces unrewarding 'music' from a single 'pulse'-type oscillator. It is possible to control the duration of a note and its pitch, but there is no way to alter the tone of a note or change its envelope (see page 276). Another handicap is the standard output, which is through a very small internal piezo-electric speaker that makes the sound of a harsh 'beep'. However, Sinclair have provided alternative signal outputs from the 'mic' or 'ear' cassette ports, suitable for external amplification via a hi-fi system, but because of the lack of sound quality this is a dubious benefit. The Spectrum's sound capabilities do have the advantage of the simplicity of the associated BASIC commands of BEEP and PAUSE, which enable the user to understand the principles of computer-generated sound more easily. And the machine does have a very impressive frequency range of 10 octaves.

Before any sound can be produced on the Spectrum, it is first necessary to either connect it to a hi-fi or make the internal 'beeper' audible by entering the following direct command before RUNning a sound program:

POKE 23609,100

This also increases the volume of the 'click' feedback that occurs as a key is pressed on the keyboard.

Sound Control

To instruct the computer to output a particular note the BEEP command is used like this:

BEEP d,n

where 'd' represents the duration of a note, and 'n' represents the pitch of the note. The duration value can be set between 0.00125 and 10 seconds; and the pitch is expressed as the number of semitones from middle C (given a value of 0) in the range from −60 to 69. For example, the following statement plays the note 'A' at 440Hz, which is nine semitones from middle C, for a duration of half a second:

BEEP .5,9

To play a whole string of notes with an accurately timed space between each one, we can use the PAUSE command:

PAUSE ms

Primary Pictures

The graphics capabilities of the Commodore Vic-20

Like Commodore's other home computers, the Commodore 64 and the PET, the Vic-20 is a well-constructed machine, but its makers do not give much away in the machine's BASIC instruction set. No special graphics commands are available to the Vic-20 user, who has to have either a very good knowledge of the machine's internal workings or buy one of the accessories designed to make graphics programming easier. However, Commodore provide an extensive set of special characters that can, with a little ingenuity, be put together to produce interesting results.

Sixteen colours are available on the Vic-20 and each character square can contain four colours. The screen display is made up of 23 rows and 22 columns of eight by eight pixel character cells, but characters can also be displayed in a 16 by 8 rectangular format. High resolution graphics are possible on the standard Vic-20 but this is rather difficult for the average user to program.

Low Resolution Capabilities

Upper and lower case alphabetic characters are available, as well as more than 60 special PET graphics characters. Two small squares are marked on the front of many of the Vic-20's keys each displaying a particular pattern. In addition to half- and quarter-character squares there are playing card symbols, chequerboard designs,