

visual indications of what these new sounds were like in performance. In some cases, musicians were playing from music sheets that looked rather like a graphic designer's doodle-sheet. This problem — how to instruct music performance, what language to use, and how to visualise accurately the result — is one that still exists with digital music systems in the 1980s.

As the 1960s progressed, the pop musicians of the burgeoning youth culture began to spend more time in recording studios, and also started to experiment with electronic music. The classic example is that of the Beatles, who found in George Martin not only an expert recording engineer, but a musician who had kept a professional ear to developments in the classical field. He encouraged the Beatles to use the whole studio as a musical instrument, and before long they were using tape collage techniques and incorporating synthesised sound.

Some musicians made their names by using particular sound processing units. A guitarist like Jimmy Page modelled his playing style on that of black American musicians of the 1940s, but by using a series of distortion controls, produced a sound immediately identifiable as that of Led Zeppelin. This, coupled with Jimi Hendrix's use of feedback howl and rapid sweep filters (by now known as 'wah-wah pedals'), established Heavy Metal music.

By the 1970s, the various sound-generating and sound-processing units, which had been available since the 1950s, were incorporating transistor design. They became smaller, more portable, and as a result, less confined to a studio. Guitarists could play live using an assortment of effects pedals. Soon afterwards, organists and piano players had access to affordable synthesisers they could take on stage.

Typically, these synthesisers would include a set of tunable oscillators, envelope shapers (to create the attack, sustain and decay characteristics of the sound), variable filters, ring modulators (which could split signals up into new frequencies), and noise generators. Just as Jimi Hendrix had been a model for guitarists, Brian Eno became one for synthesiser players, chiefly because of his links with the 'new music' of the classical avant-garde.

At the same time, recording studio equipment became more sophisticated, as musicians looked to the studio to provide something in the production process that they could not create on stage. The mixing desk, now designed to channel successive recordings onto 16 or 24 tracks of tape, was still too large to carry around, and many of the processing units required time to set up. In America and Britain, a new breed of producers emerged. They had often started out as engineers, and had a deeper familiarity with the equipment than the musicians who paid them to provide 'the right sound'.

In Jamaica, engineers started to use the mixing desk as an instrument in itself. Completed songs,



Ace Producer

Producer of the British band Culture Club, Steve Levine is most renowned for his ability to combine electronic music and human voices to produce 'seamless' (well-meshed) pop. Levine was one of the first producers in the UK to make use of the Linn drum, a programmable drum synthesiser, and has recently developed digital recording techniques to a fine art. Levine has made extensive use of synthesisers and other digital music equipment in his recent single, 'Believin'', co-written with Boy George.

recorded on multi-track tape, would be stripped back to their individual rhythm tracks. The original vocal or instrumental contributions would then be used as raw material to drop in or out of the mix in a style heavily dependent on reverberation and signal delay units; this was the style known as 'dub'.

The advent of digital synthesisers brought the possibility of encoding non-electronic sounds. This process is known as 'sampling'. Drum machines like the Linn became sought-after studio items and very soon became part of stage performance. In the mid-1980s, sampling and manipulation of sound has become the 'state of the art', and well-equipped studios and stage set-ups generally contain more items of digital equipment than analogue instruments. Successful groups like Culture Club combine their own musical skills in songwriting with the digital production techniques of producers like Steve Levine, who uses instruments and processing units worth tens of thousands of pounds.

The necessity for an interface that could link up one instrument to another, or which could expand the capabilities of a synthesiser by adding the operating system and memory of a microcomputer, brought musical instrument manufacturers together. They came up with the first MIDI specification in April 1983 and, since then, few companies have dared to announce a new synthesiser that is not MIDI-compatible. In the next instalment in this series, we will look in more detail at the background and development of the MIDI.