His Master's Voice

Computers are already an established part of the professional music scene. Now small music synthesisers are being built into many home computers too

Computers are both fun and serious. And they are not just for processing information or playing games. They can be used as musical instruments too — you could say for serious fun. The process of making music artificially is called music synthesis.

Computers can also be used to liven up the teaching of music and work out considerably cheaper than professional tutors. In a forthcoming issue, we'll be explaining how you can make such music on your home computer, but for the moment we'll concentrate on how the professionals do it. This is important, because most of the ideas that start out on professional synthesisers end up as standard on domestic models, or even home computers.

Automatic musical instruments have always been popular and they have a lot in common with computers. The pianola, a sort of automatic piano to be found in the drawing rooms of wealthy Victorians, was operated by means of a roll of punched paper, and musical boxes featured a metal drum or disk with 'teeth' that played a tune on a metal comb.

Even the old crank-handled street organs were in a sense programmable, since the tunes they played could be changed. Nevertheless, this did not commend them to Charles Babbage, one of computing's founding fathers, who wanted to have the organ grinders banned from playing in the street. Their response was to play directly underneath his window.

Nowadays it is the Musicians Union that is trying to ban programmable musical devices — in May 1982, the Central London Branch voted to forbid their use at recording sessions and live performances. Their obvious worry is that because such devices can imitate many different instruments, several at a time, musicians will become redundant.

Electronic synthesisers have been available for many years but the introduction of digital techniques has opened up a whole new area. Instead of having to fiddle with knobs and press buttons to produce every single sound, it is now possible to record any sound (from a conventional instrument to the bursting of a balloon), analyse it by computer into its constituent parts and replay it at any pitch.

Digitised sound is something like a newsprint photograph — if you look very closely at the page, you can see that the whole picture is made up of many small separate dots, whereas the original (analogue) photograph had tones that shade continuously into each other. In the same way, ordinary analogue sound can be broken up into a sequence of digits. This technique is known as sampling.

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One Man Band
Synthesiser players like Klaus Schultz, (shown here) are increasingly using the tremendous power of their microprocessor-based instruments to produce live, on stage, the sort of varied sound that 20 years ago would have required a whole orchestra

Such systems are expensive — the Fairlight and Synclavier are probably the best-known and most sophisticated models — but as they can reproduce the sounds of a number of musical instruments, they can work out cheaper than hiring individual musicians.

With computers becoming cheaper, and the cost of memory falling, digital machines are gaining in popularity — though it will be a long while before the analogue synthesisers disappear altogether. The latter use a technique known as 'subtractive synthesis' — which can be thought of as comparable to the way a sculptor carves his statue from a block of marble. You start with a basic sound created electronically and then pass