When it comes to consumer electronics, we seem to live in a wholly digital world. Yet, in the world of music, analogue electronics is staging a comeback, with products like decades-old synthesisers being reintroduced and recording studios incorporating analogue elements into a previously totally digital process.

The synthesiser is the archetypal electronic instrument and dates back to the 1930s, when they were naturally all analogue and used valves. The first commercial unit is regarded as the Novachord, manufactured by the Hammond company, famous for its organs. It contained more than 160 vacuum tubes, 1000 custom built capacitors, miles of hand soldered wiring and weighed nearly 500lb. More than 1000 were built between 1939 and 1942, when World War II stopped production due to a lack of electronic components.

Radically different sounds

Several other analogue electronic instruments had similarities with modern synthesisers, at least in terms of the radically different sounds they could produce. They were extraordinary devices and had extraordinary names to match – the Ondioline, the Trautonium, the Theremin and the Ondes Martenot. Then there was the Voder, which while not strictly a musical instrument, had an effect on the human voice that has been used successfully in pop music, notably Cher’s hit, Believe.

To an extent, they were curiosities, but several were used in films to create moody, other worldly sounds. Most notably, the Novachord was used in Vera Lynn’s “We’ll Meet Again” and in the film Gone With the Wind.

But it is the resurgence of analogue electronics in today’s digital world that is particularly surprising. In fact, the resurgence started several years ago, with the most famous name in the world of synthesisers – Moog – launching the analogue Minimoog Voyager in 2002. It took the name of the first portable synthesiser, the Minimoog, created around 40 years ago. Since then, several other units have been produced, including a range of ‘Phatty’ models, the most recent being the Sub Phatty.

A name that almost equals Moog’s in the synthesiser world is Korg, based in Tokyo. Korg started again with analogue products a couple of years ago with a small handheld synthesiser called the Monotron, followed since by the MS-20, a classic instrument of the 1970s. It has recently launched another low cost range, the Volca.

“The Monotron was something of a test to see how people would react to analogue products”, says Ian Bradshaw, product manager for Korg Hitche. “It was an incredible success globally and we designed it in such a way that the ‘circuit bending’ community could easily get inside it and modify it. There are certain points on the circuit board that are key to what they want to do. Users make break out boxes so it can be connected to other modular synthesisers, then control them.”

Why the resurgence of analogue? Bradshaw thinks it is possibly the desire to have a physical object to...
almost everyone agrees, is different to digital.

“When you compare our soft synth versions of the MS-20 (that is, digital emulations) they are very accurate. But when you start listening to the sound, it is different. One manufacturer, Doepfer, has done nothing but produce analogue synths (it has recently launched a new version, the Dark Energy II, a monophonic standalone synthesizer with USB and Midi interface). I asked why it never did anything using digital software and the answer was that software does not work as quickly as analogue for certain things, like the way the envelopes respond, and this has been demonstrated.

Another thing is that when you change a parameter on a digital unit, it happens in separate steps – typically 128. With analogue, that range of variation is pretty much infinite.”

Recreating an electronic product – especially an analogue one first made decades ago – raises the question of whether the same components are used.

“Inevitably, there are differences,” Bradshaw says. “The main difference is that the new MS-20 is all surface mount technology. One of the things crucial to the MS-20 sound was the transistors, which are no longer available. Our engineers looked in detail at the behaviour of the original transistors and then found units that behave in pretty much the same way. Also, some original components used materials now banned, like cadmium, so again we had to find replacements that behaved similarly.”

One person steeped in the

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‘sympathetic’ distortion and colouration is leading to the use of analogue signal processing in recording studios.

“This is a particularly interesting development,” Wilson says. “After years of 24bit/96kHz digital signal paths, many musicians, producers and studio engineers have discovered that placing at least some analogue equipment – often 1960s tube based technology – in the recording chain can add some magic that had curiously been lacking.

“For most, the use of analogue compressors or tube preamps is as far as it goes, but studios are increasingly rediscovering the benefits of mastering to analogue tape and even vinyl is making its way back in some circles. Again, it’s all down to subtle, yet musically desirable, distortion and colouration which often interacts with the musician’s playing style.”

Wilson admits digital will win when it comes to repeatability, the convenience of total session recall, lossless editing/duplication, transparency and cost: look inside a synthesiser today, he says, and you will typically find a dsp, a processor and a few passive components. A genuine analogue polyphonic synthesiser features thousands of op amps, comparators, multiplexers and passives, with a price tag ten times larger. An analogue unit may also require component matching, heat soaking and lengthy calibration procedures.

**Demand for analogue is growing**

Even so, the increasing demand for analogue processing in professional recording is clearly being taken seriously.

“Many recording studios and artists are now using at least some analogue technology in their music production,” Wilson asserts. “This is not restricted to electronic music. Many acoustic recording artists and even orchestral music producers are introducing analogue elements to their recording process.

“What is likely to emerge is an increasing number of hybrid solutions that permit certain analogue processing elements to be inserted directly into the digital path, potentially in more interactive and integrated ways than we have seen of late. For example, analogue and even tube gear may be combined with built in codecs and digital front panel control.

“There is now much R&D going into the deep emulation of various tube and analogue processing elements in software and dsp and maybe one day these might displace the use of analogue electronics in modern recordings entirely – but not for now.”

Another company reentering the analogue world is Novation, part of Focusrite Audio Engineering, which made the Bass Station; a famous synthesiser in the 1990s. To celebrate its 21st birthday, it has developed the Bass Station II – an analogue synth made for bass, but also suitable for leads.

“Bass Station II has been completely reworked for the 21st Century, with two filters, two oscillators plus a sub oscillator, patch save and a fully analogue effects section,” says Novation’s Simon Halstead. “Plus there’s a step sequencer, arpeggiator, a two octave (25 note) velocity sensitive keyboard with full sized keys and a powerful modulation section. There’s also MIDI I/O and USB connectivity.”

Halstead attributes much of analogue’s difference from digital to voltage controlled sound generators, processors and modulators, which sound less precise and clinical than virtual analogues/software plug ins and, consequently, more interesting as pleasant imperfections affect the signal.

“That said, modern digital synths are very good at emulating the imperfections that make analogue synths sound good. Some of Novation’s VA synths include features such as ‘VCO drift’, which simulates tuning inconsistencies that emerge as voltage controlled oscillators warm up.”

Another way of combining digital elements with analogue is illustrated by Dave Smith Instruments of San Francisco, which produces the Mopho, a desktop synthesiser module with a 100% analogue signal path but which is controllable via MIDI. It also has a free editor for use with pcs.

No ‘Swiss Army knife’ solutions

Andrew McGowan, an engineer at Dave Smith, sees analogue retaining its niche, despite continuing enhancements to digital synths.

“Digital is still getting cheaper and will continue to improve sonically. It also allows for a degree of flexibility that is not really possible in the analogue realm or, at the very least, would not be cost effective. Digital makes it possible to design ‘Swiss Army knife’ instruments like many of today’s keyboards that do analogue synth emulations, drawbar organ emulations, sample playback, effects processing and whatever else can be crammed into them. The downside of that approach is there’s a homogeneity to the sound and the instruments can be viewed more as playback devices than as musical instruments with a character of their own.

“If consistency and repeatability are the goals, then digital is probably the best way to go. But if character is important, then analogue is hard to beat.”

Andrew McGowan