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THE TIME MACHINE

While Bob Moog was still experimenting with vast 'telephone exchange' modular synths, a British company was producing the world's first mass-market synthesiser. We take an affectionate look back at the EMS VCS3, and examine how well it stands the test of time. *Annabel Scott*

Imagine the typical Japanese design job, and you think of sleek lines, tasteful colour schemes, logical (if sometimes bafflingly complex) control systems, and a general air of professionalism and competence. Imagine the typical British design job – and you've got the VCS3.

That's not to knock the basic design of the old EMS synthesiser. At the time EMS went into production in the UK (sometime in the late sixties), Bob Moog had just launched his modular synthesiser range in the States, and such equipment was impossibly expensive for the British musician. Moog synths were large, unreliable, far from portable and, of course, expensive. Electronic Music Studios (EMS) in the shape of chief designer Dr Peter Zinovieff, aimed for something portable, relatively affordable, and definitely home-grown.

The VCS3 (it stood for Voltage Controlled Studio Model 3) was Zinovieff's attempt to introduce all these factors, and it was massively successful, albeit mainly in the UK (the company's German and American offices never did get their export services together properly). At the same time, the machine introduced a few typical design philosophies which have been cursed for their limitations and missed in their absence ever since.

The first of these was the Pin Board. Like the Moog systems, EMS synths were modular, though on the VCS3 and its briefcase-borne portable version, the Synthi A, the modules available were permanently fixed. But rather than using double-ended cords to patch the modules together, EMS took the inputs and outputs for every module to a matrix of relays which could be shorted together by pushing metal pins into holes in the matrix. With 'sources' down the side and 'destinations' along the top, the pin board provided billions of possible patches in a space much smaller than a reasonable fistful of jack sockets.

Suitcase version *of VCS3 was known as Synthi AKS, had touch-operated keyboard and 256-note sequencer built in*

Some of the facilities linked by the pin matrix were fairly standard, some very unusual. For instance, both the VCS3 and the Synthi A had three oscillators as follows:

OSC1 *1Hz-10kHz Sine/Sawtooth*
OSC2 *1Hz-10kHz Square/Triangle*
OSC3 *0.05-500Hz Square/Triangle*

Due to the wide pitch ranges, any of these could be used as audio or control oscillators, and since the pin board allowed each oscillator to control any of the others (and even itself), the possibilities were almost endless. Pitch was set via a Vernier pot with Coarse and Fine controls, but with very little allowance for conventional musical tuning or octave switching – there wasn't even a 440Hz tuning oscillator.

The VCS3 filter was fairly understandable, with just Resonance (marked 'Response'), Frequency, and Output Level controls. As a simple low-pass filter it wasn't amazingly powerful, though it could be set to resonate and it tracked fairly well if used as a fourth audio source. Jean-Michel Jarre, who swears by his VCS3s (he has six), has long since replaced their filters with Moog circuits.

White Noise – with Colour and Level controls – was also provided on both VCS3 and Synthi A, and this could be used as a control source for random effects. Unusually, a spring-line reverb was also provided, and this could add a great deal of depth to the EMS sounds – though it meant that leaning on the synthesiser while working could lead to the appearance of unwanted clonking noises.

All these effects could be passed through a ring modulator and an envelope shaper of somewhat bizarre design. As well as having Attack and Decay parameters (with the pots' clockwise movement marked 'Slow' in each case), there was a parameter cryptically known as 'On' (better known as 'Hold' on later Korg synths) and another named 'Off' (with the maximum setting known as 'Manual').

Additionally, there was a Level section with Trapezoid and Signal parameters, which allowed several other parameters to be controlled by a DC version of the envelope signal for stereo panning and other effects.

Yes, the VCS3 was a stereo synthesiser, with individual panning and filtering on its output channels, built-in stereo speakers, mic and line inputs with level controls, high and low outputs, and even an auto-trigger facility for the envelope shaper on one of the line inputs. In its own way the VCS3 was pretty accessible, though for some reason, Dr Zinovieff decided not to adopt Bob Moog's one-volt-per-octave standard. A typical EMS standard was around a third of a volt per octave, though as we'll see, the company didn't want its clients to feel constrained even to *think* in octaves.

A couple of major features remain unmentioned, one common to both VCS3 and Synthi A, one packaged only with the latter machine. The first of these is the joystick, which has survived through to the Korg synths of today, but which took on a far more versatile role on the EMS synths.

The joystick's Up-Down and Left-Right movements, each with individual scaling controls, could be set to affect almost any parameter on the synth, from pitch to modulation speed to reverb mix (yes, the reverb mix was voltage-controllable too). Although the EMS joystick has most often been seen in the act of being furiously twiddled by Jarre or Tim Blake for wobbly sound effects, it could in fact be a powerfully expressive performance device – always assuming you were using the synth for anything which could be termed a 'performance'.

That's where we come to the other facility, the keyboard. The VCS3 could be bought with a mechanical keyboard called the DK1, which plugged into a special socket – though on very early models, you had to patch it into the pinboard with a loose wire terminating in a patch pin. But the Synthi A usually came packaged with its own keyboard, the KS (becoming known as the Synthi AKS), which was a capacitative touch-operated two-and-a-half octave model, with a 256-note digital sequencer built in.

EMS advertising *was stylish and daring for early 1973, but couldn't save the London-based company from closure*

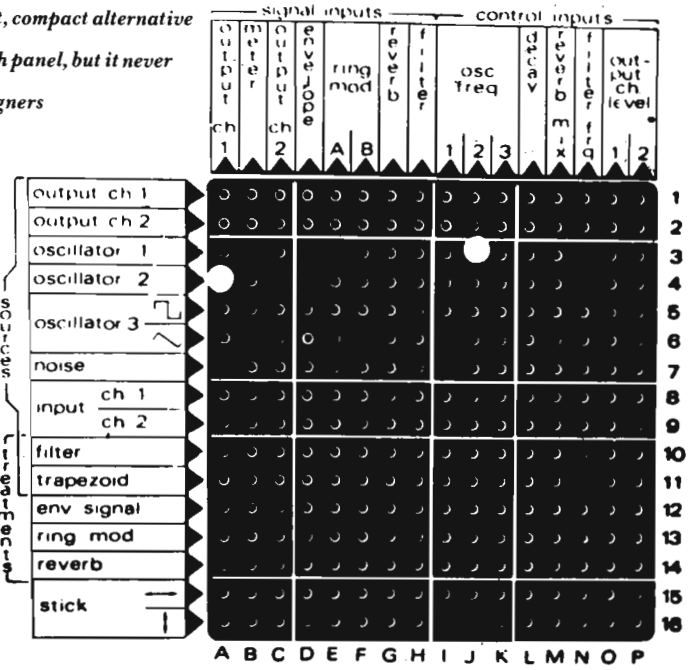
Frequently heard producing rapid flowing sequences (as in 'On The Run' from Pink Floyd's *Dark Side of the Moon*), the KS sequencer was a real-time device which could record as fast as you could play, and stretch your sequences out to 25 minutes at its slowest playback speed. You could transpose sequences up a half-tone or full-tone, a third or a fifth, or play random notes chosen from the sequence using the keyboard. Macrotones and microtones could also be tuned in, and a meter on the synth itself could be set to indicate the length of sequence available by sweeping from left to right in the appropriate time.

Also available on many models of the VCS3 and Synthi A was the Prestopatch socket, a multipin connector beneath the pinboard which allowed you to slot in a plug with the correct connections for a particular sound. It didn't help you with the exact levels of each parameter – you still had to set those up by hand – but it was a useful way of getting over the difficulty of remembering and quickly setting up a patch.

Two major questions remain – what was it like using an EMS synth in those early days, and what good could the machines be now? The answer to the first is pretty simple – not much fun, but a hell of a lot better than what came before. Tape studios began to fade into insignificance as the power of the synthesiser for creating, treating and manipulating sound became evident, and some brave souls even tried to play tunes on the things ('An Electric Storm In Hell' by David Vorhaus' White Noise is a classic example). EMS oscillators tended to stray out of tune even more than Moog's, and there was no standard tuning or tuning aid on the synth in the first place, so a tuning fork was a necessity. The white noise generator took around half-a-minute just to warm up, and the sequencer was eccentric and non-syncable. EMS gear didn't happily link to Moog or any other gear (not that that was unusual in those pre-MIDI days) and the pinboard system was fiddly, if not as clumsy as Moog's patch leads.

But the sound potential was stunning, and that's where we come to today's place for the EMS synths. After their disappearance, synthesisers became more and more ▶

VCS3 pin board *was neat, compact alternative to the programmer's patch panel, but it never caught on with other designers*



► typecast as keyboard instruments, and the standard oscillator-filter-envelope-amplifier patch became fixed on many machines. Result? The variety of new sounds being created was reduced – drastically. Quite simply, the VCS3 and Synthi A have possibilities denied to any other small synth on the market, and to many large ones. You won't find these possibilities on a Jupiter 6, despite its polyphony and MIDI facilities, and you won't find them on a Prophet, either, despite all the wonders of Poly-Modulation. You might find some of them on a DX7 – after all, lots of oscillators (operators) with many patch possibilities (algorithms) are what defined the EMS sound, but somehow, no-one has ever re-created the thrill of a joystick-controlled gun battle or dawn chorus from the VCS3.

Just imagine the possibilities of three oscillators modulating each other in a ring, or sequenced, voltage-controlled panned stereo reverb, or a noise-controlled envelope decay time. The very fact that many *can't* imagine those things, and the fact that it's so easy to predict *exactly* what many new synths will sound like, goes some way to explaining why the VCS3 and Synthi A still change hands for up to £700 on the secondhand market.

You may get a bargain, though, if you find someone who doesn't appreciate the potential of these little monsters – and it's a potential which is, admittedly, more in the effects line than the melodic line (particularly if your model has old and tired oscillators).

Luckily, there are still two companies doing EMS sales, repairs and servicing, along with some mildly wonderful modifications which help take the VCS3 and Synthi A, and thrust them headlong into the 1980s. ■

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