



# Uncle Bob's Baby

*The Minimoog in 1985*



Successful though today's technology may be, there'll always be a place for yesterday's — especially if nothing has come along since to replace it. What are the qualities that make Moog's synth for the masses irreplaceable? *Tim Goodyer*



**A rarity** Minimoogs were available with remote keyboards, but you had to order them direct from the States...

The march of technology rarely admits defeat. Occasionally it has a pause for breath, consolidating its position before surging forward once again. But far less common are the moments at which progress is forced to take a backward step. When that happens, it happens because a giant leap forward has sapped so much strength from the march, that a small retrograde movement is the only way things can go – at least for the time being.

The recent march of musical instrument technology throws up a number of excellent examples of this. Hammond could only go backwards after the B3 and C3 organs, Hohner could only do likewise after the Clavinet. Then there was Yamaha, who experienced a mild hiccup after deluging the CS80 polysynth, only to bounce back with a vengeance at a later date; Roland did much the same after the demise of their TR808 drum machine.

Sadly, Moog never really recovered from discontinuing the Minimoog, the instrument that did so much not only to bolster the image of Moog as a company, but also to increase awareness of the music synthesiser as a whole.

Before the Minimoog's introduction, Bob Moog's company concerned itself with producing tailor-made, highly-complex modular synth systems like the Zouktra Moog and the System 55 – huge, unwieldy monsters that were never going to see use by anyone other than the lucky, pioneering few. They were essentially mid-60s designs, but they continued in sporadic production well into the 70s. By that time, however, Moog had turned his attention to producing a simpler, more usable, and more accessible synthesiser – the Minimoog.

Most sources agree the Minimoog was the work of in-house designer Jim Scott, but there's no real consensus on when, precisely, the instrument made its first public appearance. In *The Synthesizer & Electronic Keyboard Handbook*, Dave Crombie reckons it to have been the AES Convention in 1971. A *N Other* magazine put the year of release at 1970, but my money would go on Roy Goudie's recollection of it being the Chicago NAMM show of '69.

But regardless of the exact year of its birth, the Minimoog was a revolution, a synthesiser

for the masses. Now, it's an anachronism. It's monophonic, it has no sound memories, onboard sequencing or arpeggiation facilities, and certainly nothing as comprehensive as MIDI with which to communicate with other music machines. And in the synthesis department, its range of facilities was surpassed by the SCI Pro One (itself now discontinued) and is now taken to the cleaners by the OSCar. But let's not dismiss its electronics out of hand; they're the main reason the Minimoog is still sought-after, why second-hand models are changing hands for surprisingly large sums, and why, as we said at the beginning, nothing is ever likely to replace it completely.

The first, and best-known, of the synth section's attributes is the presence of no less than three analogue oscillators, all of them simultaneously available for audio applications if you didn't mind losing the services of the modulation oscillator. In fact, the latter became sufficiently favoured for its fat sound for some models to be made with a fourth modulation oscillator built in. It was an elegant way to avoid compromise, but chances are you'll pay handsomely for a quad-oscillator Minimoog now – if you can find one at all.

The oscillators were well-endowed with waveform options. Each has triangular, sawtooth, triangular-sawtooth, and three different square waveforms, with reverse sawtooth instead of triangular-sawtooth on Oscillator 3 in the interests of improving modulation. Only one waveform can be selected from each oscillator at any one time, but that choice can be made independently of the other two oscillators, as each is a law unto itself.

The absence of a pulse width modulated waveform might appear at first to be a serious omission, but it isn't. Remember, PWM was a facility initially introduced as a sound-fattening exercise on synths with only a single oscillator (a handicap the Minimoog obviously isn't encumbered with), and in any case, Moog had the situation well in hand by allowing you to mix the different widths of square waves together.

The filter is a 24dB/octave low-pass affair, with three different keyboard-tracking rates. Both the filter and amplifier transients are permanently assigned a separate transient generator laid-out in an attack, decay, sustain configuration. The sustain is the prevailing level whilst the key is held, with the decay taking effect again during the period after key release(!). It's certainly a little different to what you'll find on most other synthesisers, but it's easy to use, and gives excellent results.

Modulation effects may make use of Oscillator 3, which can be switched out of the mixer section and keyboard control and into its 'Lo' (sub-audio) state, for conventional vibrato effects and the like. The modulation waveforms cover most eventualities admirably, and some great effects are easily achieved.

Need some ring modulation effects? Easy, just use Oscillator 3 within the audio range, whilst arranging for the modulation rate to track the keyboard if the keyboard control is switched back in; thus the higher up the keyboard you play, the faster the modulation rate.

Switching is provided to allow a choice of routing to either or both of the oscillator and filter sections, and both pink and white noise ▶

▷ modulation are provided; either one of these can be used on its own or mixed with any of the above effects to modulate the oscillators and/or filter.

The mixer section allows simultaneous mixing of the oscillators, the noise generator and an external sound source, all of which are provided with a mute switch in addition to a level control. There's also a master mute switch, which allows you to set up sounds on headphones without having to unplug the output to prevent your audience getting advance warning of what you are about to inflict upon them.

Now, that might be a long and impressive list of analogue synth features. It doesn't explain why the Minimoog can still be found on so many album credits, and in keyboard players' interviews. Surely anything that could be achieved 15 years ago can be easily recreated now?

It seems not. Even when Moog themselves analysed the sound of the Minimoog and attempted to incorporate its essence into the polyphonic Memorymoog, the results lacked the characteristic warmth of the earlier model. Impressive, perhaps, but cold, distant and featureless by comparison.

How come? Well, early Minimoogs (up to serial number 10175) had rather unstable oscillators, which some claimed added to the warmth and colour of the sound as well as being a sizeable pain in the bum. Personally, though, I'd attribute most of the credit to more general imperfections within the old analogue circuitry.

Then there's the patented Moog filter to consider. In use, it isn't capable of giving the very bright sound Pro One owners will be so familiar with, but instead, it provides an as yet unequalled richness of texture, even using the dual audio oscillator, single LFO arrangement. At its most leisurely, the filter can be made to decay over a ten-second period after key release - an arrangement that demonstrates that richness rather well. The filter also has a very sharp attack (it's stated as being 10ms but it sounds a lot shorter), and it's this coupled with a relatively short inital decay that helps to give the percussive funk or sequence-style bass sounds that ensure its popularity, even in today's much-changed musical climate.

The other significant factor in this area is the filter resonance - or Emphasis, as Moog would have it. With it, the filter can be driven into self-oscillation - a feature regrettably missing from many current synths. It's this, more than anything else, that's enabled Minimoog owners to generate sharp, aggressive dynamics - the sort of thing that'll still cut through a mix even when the lead guitarist is launching into his favourite solo. And with the filter on the edge of self-oscillation lies a family of sounds that sound exciting without appearing incongruous alongside today's sampled and digital sounds.

On the interfacing front, the Minimoog went out of production before MIDI was even thought about, so there's nothing too complex. Instead, the traditional control standard of one volt per octave applies, but with a negative trigger voltage requirement Moog term an S-trigger (switch trigger) that caused inital incompatibility problems as everybody else opted for the new industry-standard V-trigger. With a simple modification or pulse inverter, though, sequencer control is no problem, and the Minimoog

scores here because it permits voltage control over both filter cutoff frequency (1V/octave) and loudness (over a 5V range) via quarter-inch jacks.

But Minimoog owners needn't forget about MIDI altogether. A recently-discovered delight in the E&MM office was the sound of a Minimoog under the control of a DX7 keyboard, complete with key velocity information, courtesy of the Jellinghaus CGX interface converting MIDI information into CV/Gate format for consumption by the Moog. Few instruments of the Minimoog's vintage are able to acquire themselves so well when surrounded by technology of an altogether different era...

The Minimoog, like all commercial success stories, proved to be an influential product. Its layout, and particularly the configuration and positioning of the pitchbend and modulation wheels, set standards that have been widely adopted by designers ever since. By contrast, the rotary and proportional pitch controls advocated by rival company ARP on their Odyssey have fallen into almost total disuse. The pitchbend is derented, but not sprung to return on its release like the one on the DX7, for instance. The resulting arrangement is both comfortable and musical, as many a soloist proved in the Minimoog's heyday. Of course, that form of synth soloing, so beloved of pioneers such as Keith Emerson and Jan Hammer, has fallen foul of pop fashion. Should it ever become popular again, few of today's synths will be capable of matching an old Minimoog.

But I'm leaping ahead of myself. As the Minimoog - and synthesizers in general - grew in popularity, so Moog's designers carefully refined their product, various editions of the instrument being introduced before the final and best-known variant, the Series D, appeared in the late-seventies. There were also a number of custom-fitted, alternative features available, such as multiple - as opposed to single - note triggering, velocity sensitivity, ribbon pitchbend (not as used by Keith Emerson, but in place of the standard wheel) and a remote keyboard. Unfortunately, none of these innovations was available in the UK, except by special order from the States. Again, if you see something like this for sale now, it won't be cheap.

Eventually, though, the Minimoog fell victim to the arrival of cheaper competition (its price had fallen to under £1000, but Moog could not make it any cheaper), and production ceased in 1981, having just exceeded the 13,000 mark. The last 25 were all handbuilt, and finished in walnut with a brass plaque bearing the serial number on the front. The final one - serial number 13,252 - was presented to Bob Moog himself.

The demise of the Minimoog coincided with the introduction of the Moog Source, a monosynth of totally new design and of decidedly more modern configuration. Moog denied it was ever intended as a replacement for the Minimoog, but there are many who believe that was the original idea.

The Source was the first-ever synth to employ digital parameter access. It had programmability, it had sequencing and arpeggiation facilities, it had ultra-modern styling, and it was cheaper than the Minimoog. But it did not sound anything like as good, and consequently, it did not sell nearly as well. The rot had begun to set in. ■

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