Buchla 200e

Photos: Mark Ewing

Patchable Analogue & Digital Synthesizer • Part 2

We conclude our look at synth pioneer Don Buchla's extraordinary new 200e modular synth.

Gordon Reid

Following on from the first part of this review in last month's *SOS*, this month I'm going to take a deeper look at each of the modules in the review 200e system, hook them together to see what sounds can be obtained, and then try to decide whether the 200e can justify its hefty price tag.

225e MIDI/USB Decoder

As discussed last month, the 225e is the heart of the 200e, converting MIDI information to analogue control signals and then supplying these by patch cable and buss to the dozens of destinations in the synth. The Preset Manager in the 225e is also capable of saving and recalling the values of most (but not all) of the knob and switch values in the system modules with an 'e' in their names. The method is a bit clunky, because you have to 'Remote Enable' the connection in each of the modules whose values are to be saved or loaded, and it's important to know which values are *not* stored, so that you can jot down their values manually. And of course, the 225e has no way of knowing which cables are inserted, so it can't provide a true patch memory system.

If you fancy patching the 200e in a single, unchanging configuration, and using the 210e Control and Signal Router (see page 153) to control a limited number of CV sources and destinations in the same manner as an integrated synth with routing switches, you can get closer to saving and recalling sounds in their entirety, but only by sacrificing the flexibility of patching freely from anywhere to anywhere. Nevertheless, the Preset Manager is a big step forward from no memories at all.

You can name and store up to 30 presets, and select them using the last/next buttons on the panel. You can also step through them by presenting timing pulses to the associated inputs. This could allow sounds to switch themselves to the next (or the previous) patch in a sequence!

The final set of facilities in the 225e is called Global, and handles functions such as formatting memory cards, saving to them and recalling presets from them. Unfortunately, the cards seem to be proprietary. With USB memory so cheap and easily obtained, I am surprised that Buchla didn't adopt this approach.

259e Complex Wave Generator

The four 259e modules in the lower boat are the guts of the 200e, each including a Principal Oscillator and a Modulation Oscillator, or Mod Osc. Let's start with the Principal Oscillator...

In the bottom right of the module, you'll find a coarse tuning knob calibrated from

SOUND ON SOUND

Buchla 200e

pros

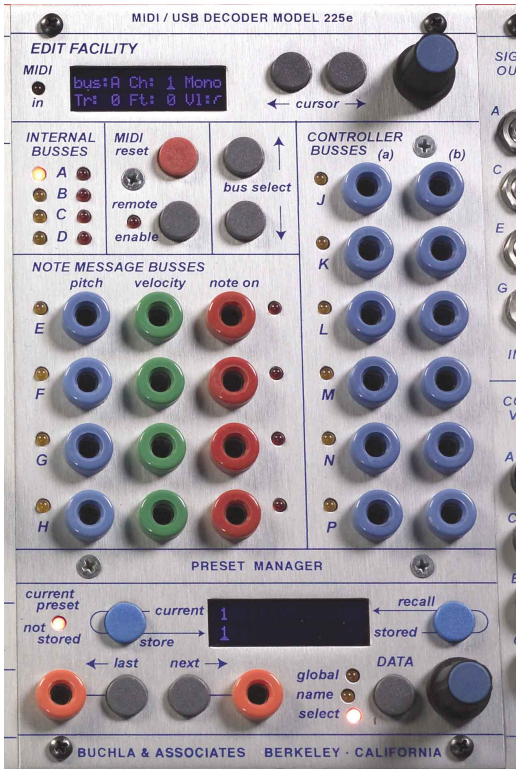
- It has huge potential if you have the time to devote to it.
- It's very stylish — you'll love it or hate it.
- It's incredibly portable for such a 'big' system.
- For many of us, it's an entirely new way to approach analogue synthesis.
- The sound quality is excellent.

cons

- It can be very frustrating.
- It's not compatible with other modular systems.
- There's a steep learning curve.
- The manual's terrible.

summary

The 200e is not a synth that will appeal to everyone. If your objective is to make sounds and play tunes with the minimum of fuss, the 200e is the wrong choice. But if you fancy expanding your horizons into deeply esoteric realms, a Buchla will develop your sonic palette beyond what is possible using more conventional models of synthesis.



27.5Hz (MIDI note A1) to 7040Hz (MIDI note A9), giving it a huge tuning range of eight octaves. This is echoed by the ±4 octave transpose range offered by each of the internal busses, which override the position of the tuning knob if you control the 259e via MIDI.

Beneath the tuning knob, there's a 3.5mm (audio) FM input with an amplitude control knob, plus a CV input with a bi-polar amplitude knob. If you're playing conventional melodies using a MIDI keyboard, you need use these only for effects, because the 200e's internal busses take care of standard pitch control duties and, when controlled by one of these, a 259e tracks very well. The final control in this section is a tiny, unmarked knob for fine-tuning.

Although the only waveform generated by the Principal is a digitally generated sine wave (the first of the waveforms shown in the box on page 154), this is passed down two signal paths ('green' and 'red') with eight waveshaping positions, whereupon it is either passed unmolested to the output (position 1) or warped into more complex shapes (positions 2 to 8). The amount of warp for each position is determined by the Warp knob, and the mix of the green and red channels is determined by the Morph knob. Both of these controls can be modulated by dedicated CV inputs, and the amount of Warp and Morph modulation can be determined independently by the adjoining bi-polar amplitude controls. Setting Morph to one extreme or the other and sweeping Warp (as I did to create the waveforms shown on page 154) demonstrates that the sounds generated by the positions are very different from one another, and very different from the positions in the other channel, with the 'red' timbres typically having the less complex harmonic structures.

When testing the 259e in this fashion, it soon became apparent that it sounds nothing like a conventional analogue oscillator. In stark contrast, it sounds like nothing so much as a wavetable synthesizer being swept though its more esoteric tables. It even generates a significant amount of aliasing if you play the more complex waves at high pitches. This is not surprising. As far as I can gather, the 259e uses waveshaping tables to distort the initial sine wave into all its other waveforms, with the Warp knob controlling the position in the tables.

As you can imagine, the sonic complexity offered by two warpable,

mixable waveforms is immense, but that's far from the whole story, because alongside the Principal, there's the Mod Oscillator. This has a low-frequency range from 0.25Hz to 64Hz, but also offers the same audio range as the Principal; eight octaves from A1 to A9. Like the Principal, this too has FM and CV inputs with amplitude control knobs, and it has a Pitch Track option that connects it to the appropriate buss (A, B, C or D, depending upon which 259e you're adjusting). This means that each 259e module in the system is a true audio-frequency dual-oscillator device. What's more, the Mod Oscillator generates its LFO waveforms — sawtooth, square and triangle waves — in the audio domain, so you could use it (at least in theory) to generate 'analogue' timbres that are hard to obtain from the Principal. However, there's a caveat; the Mod Osc aliases like crazy when used in this way (once again, see the box on page 154 for more on this).

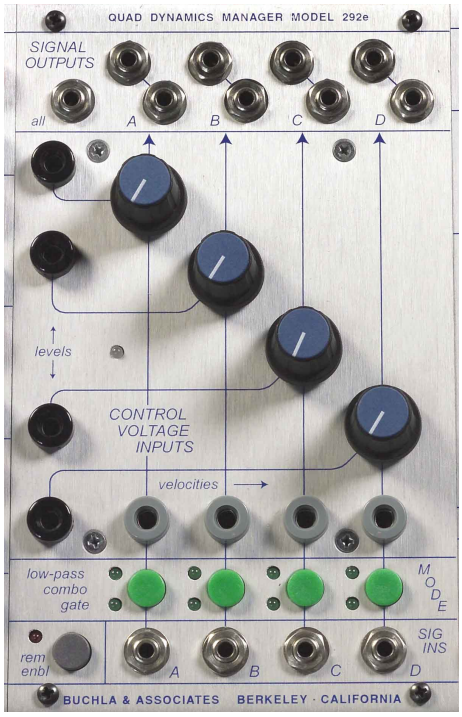
The Mod Osc can be directed internally to any combination of the Principal Oscillator's pitch, Warp and Morph, and can do so in either range, so you can create modulations ranging from gentle vibrato to outlandish screams of harmonic anguish, without a patch cord anywhere in sight. The amount of modulation is determined by the Modulation Index knob, and this can itself be modulated using the associated CV input and bi-polar amplitude control.

The only facility I've yet to mention on the 259e is Sync. At the touch of a button, the Mod Osc can be hard- or soft-sync'ed to MIDI Clock or to the Principal Oscillator. The first of these is useful for reinitialising low-frequency modulation to keep tempo with MIDI-sequenced music. The second allows you to produce those instantly recognisable sync lead and bass patches.

Finally, at the top of the module lie four outputs. These comprise two identical audio outputs for the Principal, plus a CV output and an audio output (which carry the same signal) for the Mod Osc. There's nothing stopping you from taking these outputs and feeding them back to the inputs on the same 259e to generate yet more radical (and usually cacophonous) sounds.

292e Quad Dynamics Manager

The 292e is a combined VCA/VCF module offering four devices called A, B, C and D in deference to their internal connections to the busses of the same names. There are three modes of operation — VCA-only, low-pass VCF only, and combined VCA/VCF — and the response for each device is determined by the CV inputs to the left of the module. Further control is provided by Velocity CV inputs, and the Remote Enable connects this to the MIDI velocity on busses A to D if desired. The only



knob per channel is an Initial Gain control that passes signal unimpeded from input to output.

You'll notice that there aren't any filter Cutoff Frequency and Resonance knobs. This isn't the only way in which the 200e fails to conform to the 'accepted' model of analogue synthesis, as we'll see.

281e Quad Function Generator

Back in 1969, EMS confused UK synthesists by introducing a module that they called a 'Trapezoid'. This was a contour generator that provided Attack, On, Release, and Off

stages or, when cycling, a range of low-frequency waves shaped by the Attack and Release values. The 281e is simply four such trapezoid contour generators.

Shaping a contour is achieved using just two knobs, Attack and Decay (which I would call Release). Both of these can also be adjusted using CVs. Three modes are provided — ASR, AR, and repeating AR, independently selectable for each trapezoid — and the output appears at each generator's blue socket. The red outputs provide timing pulses at the end of each contour or, when cycling, at the end of each cycle.

But this is just the tip of the iceberg. The four contour generators — again called A, B, C and D — are arranged as two pairs that are capable of generating more complex contours. There are two architectures for doing this. Firstly, you can use the logic in the lower right-hand corner to mix the A&B (and C&D) trapezoids to create four-stage ADSR and five-stage AD1D2SR-type curves. It does this by allowing you to create a transient on (say) A, followed by an attenuated sustained section on B. Buchla's system (which he calls an 'Or') then determines the highest voltage at any given moment and presents this to the output (see the top two diagrams on the opposite page). Unfortunately, the attenuation levels for B and D are not stored in a 225e preset, so alas, you cannot store these contours as part of your patches.

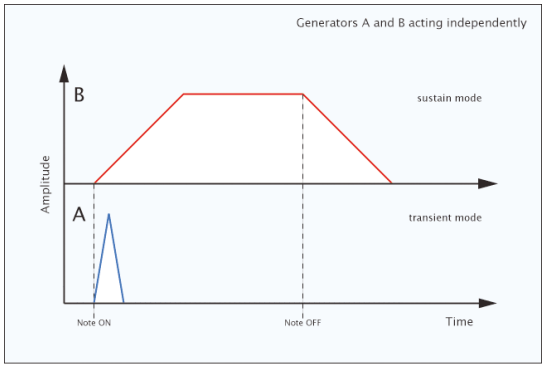
The second method for creating complex contours is called 'Quadrature Mode', and is accessed by pressing the 'A-B' and/or 'C-D' buttons in the lower left of the module. In this mode, the linked pairs operate as follows (using 'A-B' as an example). Firstly, the A buss is triggered, and A enters its Attack phase. When this is completed, A remains at its maximum level, and B begins its Attack. When this is completed, everything is sustained (when in Sustain mode) or A begins its Decay (when in Transient mode) while B maintains its maximum level. B then begins its Decay. At the end of all of this, if A is in Cyclic mode, the entire process repeats *ad infinitum*.

Buchla & Associates describe this algorithm as having the two contour generators 90 degrees out of phase with one another. That's not as daft as it seems; there are four stages, and B lags A by one stage. In the lower two diagrams opposite, you can see what happens in a simple case, and the contour that you obtain if you stack the CV outputs of A and B.

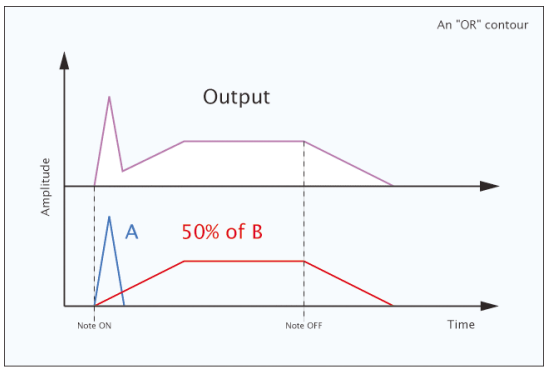
Happily, the straightforward trapezoid contours, quadrature contours and Or contours are available simultaneously (with some logical restrictions), making each 281e enormously flexible once you get your head around what's going on.

The 281e's fastest attack is quoted as

Two 281e contours, one an AR transient, the other an ASR sustain.



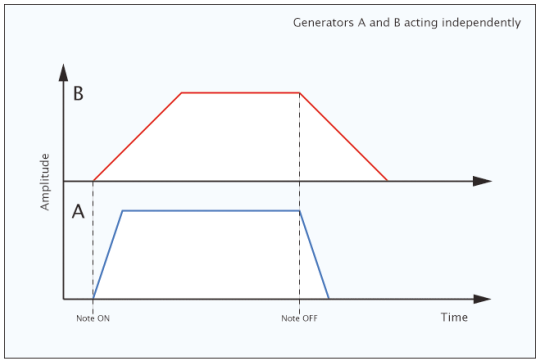
Summing the two contours while attenuating B by 50 percent.



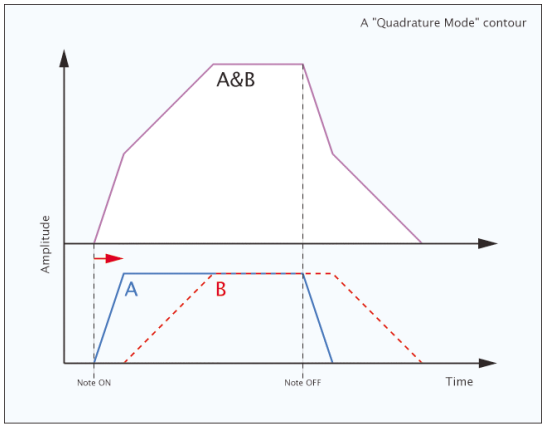
a remarkable 1ms, and my tests verify this. I passed high-frequency noise through a VCA 'blipped' by one of the contour generators in Transient mode, with Attack and Decay set to 0. The VCA was open for a total of around 190 milliseconds, with an almost instantaneous Attack. The Decay took much longer in total — it dropped back to zero in around 15ms, but took another 140ms to settle. I suspect that this profile is generated not by the contour generator, but is the response of the VCA in the 292e. Either way, this was surprising... so I duplicated the test, passing a high-frequency audio wave through one channel of a 292e in VCA-only mode. This verified the earlier result; patches shaped by a 281e and a 292e combine an extremely snappy attack with a much more sluggish release.

291e Triple Morphing Filter

The 259e, 292e and 281e module together provide superlative waveform possibilities and flexible contouring, but very basic filtering, so it's no surprise to find that the 200e has another filter module. As its name suggests, the 291e (shown overleaf) contains three digitally controlled analogue band-pass filters, with control over centre frequency, amplitude and bandwidth, the last two of which imitate the resonance of traditional band-pass filters, but without self-oscillation. You can pass signals independently to the A, B and C filters (not to be confused with the busses of ▶



Two dissimilar 281e ASR contours, A and B.



Summing A and an offset version of B to create a new contour.

the same names) and treat the 291e as three (mostly) separate filters with independent outputs. You can also pass the same signal through all three filters using the All input, using the 291e as a three-band formant filter.

If that description seems straightforward, the reality isn't. Notwithstanding the method of selecting the nodes to edit them, and of keeping track of which filter is doing what to which signal, the 291e is a fiendish module that some are going to love, and others will hate. This is because each filter offers eight snapshots that you can jump between (for sample & hold-type effects) or morph between (for dynamic filtering effects).

Numerous ways of moving between these stages are provided, and the ability to sequence filter parameters is interesting. But if you take a step back and analyse what's happening, the amount of control that you have over each filter — frequency, width, amplitude, and step time — is little more than you can obtain by applying CVs to the centre frequency and resonance of a conventional band-pass filter. Even the various morph modes — one-shot, looping and so on — are nothing more than you can obtain by applying appropriate CVs to the traditional filter.

Perhaps in deference to this, each of the three filters in each 291e has CV inputs plus global modulation inputs (which are, strangely, on 3.5mm sockets) and these CVs can be directed to any combination of frequency modulation, bandwidth modulation and amplitude modulation. You can achieve interesting effects by combining the internal morphing with external control (and, in particular, voltage control of the morphing!) but I'd have to question how musically valid the results are.

I have three more points to make about the 291e. Firstly, the maximum filter frequency is quoted as a little over 4kHz. You can't view this in the same way as a low-pass filter with a maximum cutoff of 4kHz, but it still places constraints on the range of effects that you can obtain. Secondly, the quantisation of the filter frequencies is clearly audible when you control them using the Freq knob, and the only way to fine-tune the filters is to apply static CVs. Thirdly, two aspects of the 291e escape me even now: how to use the 'expand input', and how to adjust the individual stage times for each filter. The manual states that you can do these things, but it doesn't tell you how!

Making a pair of formant filters the primary sound shapers in the 200e is a bold move, and in some areas, it extends the synth's palette far beyond what traditional high-pass and low-pass filters can achieve. But you can't live forever on the esoteric, and sometimes sausages and mash is preferable to the finest gourmet cuisine.

260e Pitch Class Generator

The 260e (shown opposite) is perhaps the oddest module in the 'e' family. It comprises two 'Pitch Class Oscillators' that generate the same pure note (a digitally generated sine wave) in all the octaves of the audible spectrum. You can modulate the pitches of these using standard CV inputs and audio FM inputs, each with its associated Amplitude control. Below these lies an in-line five-band graphic EQ, and the output from this provides the raw material for the mis-named 'Escher's Barber Shoppe'. Mixing two metaphors — the rotating barber's pole that continually spirals upwards but never ascends, and MC Escher's visual paradox of the never-ending staircase — this takes the equalised pitch class signals and generates a number of audio paradoxes from them, the most famous of which is the Shepard Tone. This tone, which sounds like a rising (or falling) pitch that never actually climbs (or descends) has been used on numerous recordings, but it strikes me as strange that anyone would use an expensive module location (and, for that matter, an expensive module) to obtain it.

The Manual

If there's one thing that annoys me about the 200e, it's the manual. At just 22 pages of loose-leaf text, this is — like the synth itself — densely packed, with a surprising amount of information in such a small space. But it offers no help to the novice, and even expert users will have to try to work out what's happening. You don't expect to have to take a voltmeter, oscilloscope or spectrum analyser to your $20,000 synthesizer just to find out how to use it, nor should you have to!

Having said that, the 260e is elegant, and it offers numerous alternatives on the same theme, including continuous glide, chromatic glissando with up to 24 divisions per octave, and variable rate. The only restriction appears to be that you cannot use the FM or pitch CVs simultaneously with the barber pole effect. One other facility deserves mention; when set to either of the quantised modes, pulse outputs fire on each pitch step. You can use these pulses to control other modules (such as contour generators) which can then further modify the basic effects being generated. It's all very flexible. Unfortunately, the review 260e had a fault; it created a thump at the end (or start, depending upon how you look at it) of every cycle, rendering it useless for its intended function.

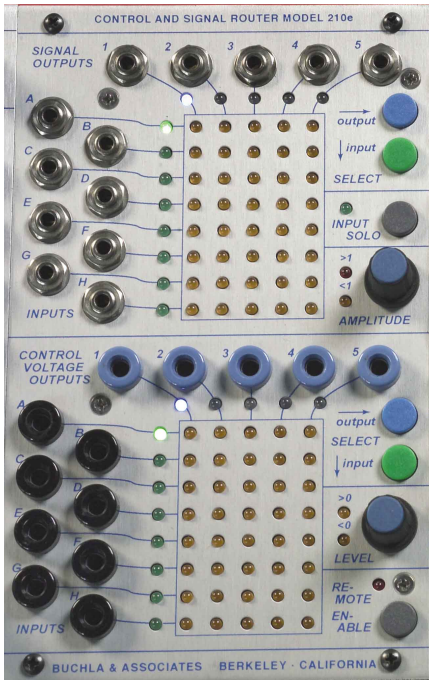
266e Source Of Uncertainty

When I first saw the name of this module, I wondered why a noise generator could not simply be called a noise generator. But the 266e has four noise and sample & hold sections, and far more control than is offered by any conventional noise generator, so its name is justified.

The uppermost section is the simplest, simultaneously offering white, pink and red noise. Below this, the Fluctuating Random Voltages provide two channels (A and B) of unquantised, low-speed fluctuations, with the rate of change of each affected by dedicated knobs and CV inputs.

Next come two channels (C and D) of Quantised Random Voltages. These require pulses to change state, and you can determine the number of states from 2 to 24 as well as the statistical distribution of the randomness obtained. To describe the voltage randomness in the simplest terms, a flat distribution means that all states are equally likely, so extreme voltages are just as likely as small ones. At the other end of the scale, a 'bell' curve means that the likeliness of a state is (roughly speaking) inversely proportional to its deviation from the centre, resulting in a 'tighter' sounding range. The time distribution seems to do a similar thing in the time domain, determining how likely a given state is by considering how long it has been since it last occurred. I should mention that the outputs at C and D are different from one another, even though the parameters controlling them are common.

The fourth and final panel in the 266e is called 'Stored Random Voltages with voltage controlled probability distribution'. This is similar to the Quantised Random Voltages, but the voltages are not quantised, and you can determine the maximum spread of the output voltages, the distribution, and the degree of skew from favouring low voltages to favouring high ones. In short, far from



being a footnote in the 200e family, the 266e is an excellent module that offers far more than you might think.

210e Control & Signal Router

Up to this point, I've said little about patching the 200e, but this is a hugely important aspect of its operation, and the strongest weapon in its armoury is the 210e. This has two, independent sections (audio and CV) and allows you to make up to 80 connections using two 5x8 matrices.

To use the CV section, you connect the CVs that you want to use to the eight inputs on the left of the module. Second, you connect the five outputs to the destinations of your choice. Having done so, you can make a connection between an input and an output (say, #5 input to #3 output) by stepping across and down the matrix and then turning the Level knob once you have reached the desired 'co-ordinate'. Not only is the signal routed as you wish, but you can scale it from minus infinity to unity gain.

You might think this would save on patch spaghetti, but it doesn't. In fact, you need more cables than you would if you patched directly from each source to each destination. However, it allows you to direct one CV to multiple destinations without the dreaded voltage droop that occurs when you stack banana plugs one upon the other. Better still, the routings and levels within the 210e can be stored as part of a 225e Preset so, with a bit of luck and lots of forward planning, you can make all the connections for a particular sound at the touch of a button.

Buchla's marketing blurb states that if you route more than one input CV to a single output, the 210e acts as another logical 'Or', selecting the highest voltage and transmitting this to the destination. But my tests showed that the output was the sum of the scaled inputs, and this is far better, because it allows you to sum CVs without side-effects.

The audio section works in the same way, except that the maximum gain for each connection is +10dB rather than unity. The ▶

fact that you can mix scaled audio signals means that the 210e not only acts as a powerful router, but as an even more powerful 'matrix' mixer. This allows you (for example) to direct one percentage of signal A and another of signal B to output 1, while at the same time directing a third percentage of A and a fourth percentage of signal B to output 2. Excellent stuff!

227e System Interface

The final element in the audio path is the 227e (shown opposite), a mixer and output module that allows you to position your sounds in a quadraphonic soundfield. Each of the four primary channel inputs (1, 2, 3 and 4) can be mixed to the four outputs (A, B, C and D again!), each of which has dual 3.5mm outputs at the top of the module, as well as a quarter-inch output on the back of the boat.

The 227e provides dynamic panning from left to right and front to back, as well as 'Swirl', which rotates the signal clockwise or anticlockwise, and allows you to determine the amount of channel separation so that you can control the amplitude of the effect.

Master volume controls are provided for the front and rear pairs, as are two-channel EQs. These provide a maximum of ±15dB of gain at either extreme, and also allow you to tilt the overall spectral response by up to 12dB in favour of high frequencies, or up to 18dB in favour of low frequencies. A further four inputs (A to D again!) exist in a separate sub-mixer. You can direct these straight to the four primary outputs, whereupon 1 and A are summed, 2 and B are summed, and so on. You can also direct the mixed output to the destination of your choice by patching.

There are two further facilities: a stereo headphone output that allows you to monitor the front or rear pair, and a mic preamp with an XLR input mounted on the rear of the upper boat. This offers three gains — 10dB, 25dB, and 40dB — and in addition to line-level outputs, has an envelope follower that generates a standard CV.

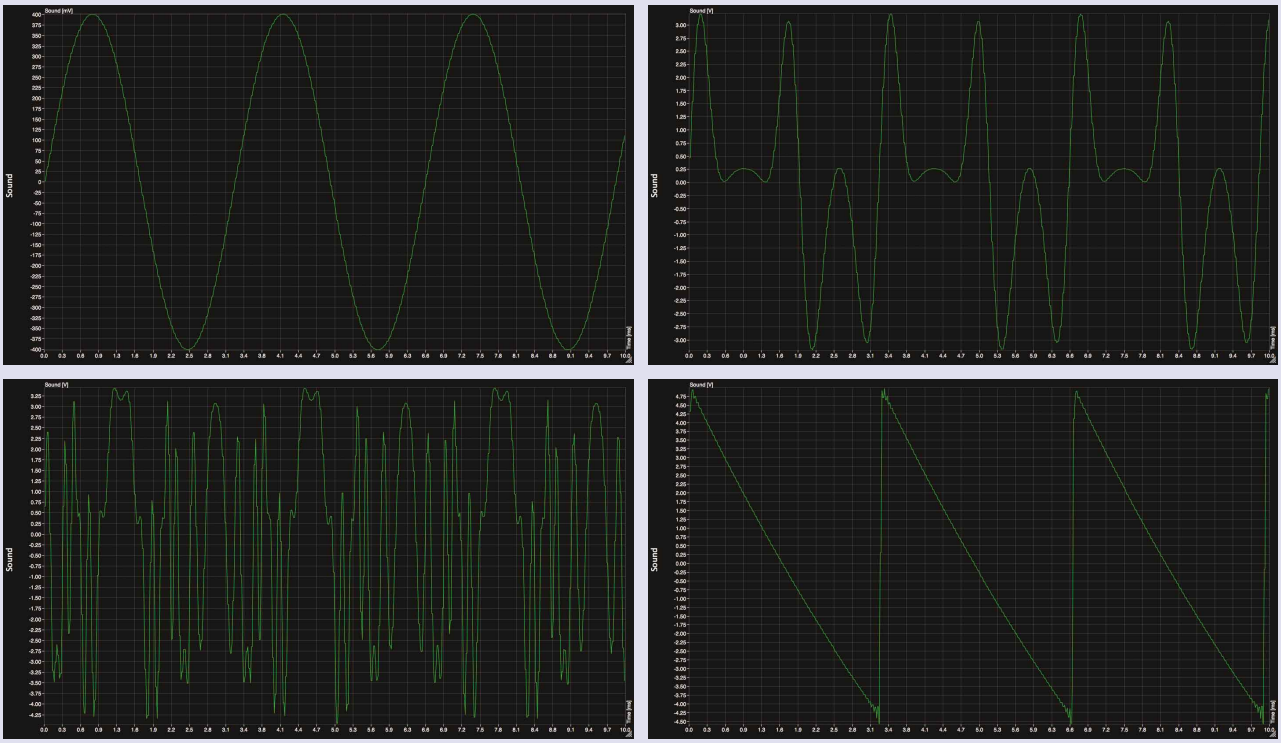
249 (DArF)

Buchla & Associates describe this module (shown overleaf) as 'two multi-segment function generators drawing from a parallel database', which is in itself enough to discourage purchasers. OK, so it's a complex and sophisticated module, but why not call a sequencer a sequencer?

Put more simply, the 249 DArF (Dual Arbitrary Function Generator) provides two rows of 24 steps, each with two programmable pitch CVs and pulse outputs. However, despite the claims that the four CVs generated by the sequencer are internally connected to the four 259e oscillators, I can find no way to make the module in this system drive them without patch cords. This is irritating, because the pitch tracking of a 259e when responding to its CV inputs is less precise than when it's driven by the internal busses. Given the lack of the letter 'e' in the 249 name, I wondered whether a module from the original 1970s Series 200 had been installed by mistake, but there was no 249 back then, only a 248, and it looked nothing like this. It beats me.

Overlooking this, you'll find that programming simple sequences using the centre section of the 249 is relatively straightforward. You can determine the pitches of each pair of CVs, determine the duration of each step, and create loops with a defined number of repetitions. You can ask any step in the sequence to glide from one value to the next, and to jump to any other step, either as an absolute value or relative to

259e Waveforms



The waveforms reproduced in this box give you some idea of how far removed the sound generation in the 200e is from that of an analogue synthesizer. The first (top left) shows the unadulterated sine wave obtained from either the green or red channels of a 259e Principal Oscillator in position 1. The next (top right) shows the output from the green channel, in position 4, with the Warp control set to 0. The considerably different third waveform (bottom left) shows the same output, this time with Warp set to 10. These last two were measured at the same audio frequency, although the perceived octave differed depending upon the strength of the harmonics present at different Warp settings. The final waveform trace (above) shows the sawtooth wave output by the Mod Osc. Though this seems like a perfect sawtooth, the square wave from the Mod Osc is very unlike an ideal square wave; it generates numerous additional enharmonic components, and sounds harsh and metallic as a result.

where you are in the sequence. You can even set a probability of a jump occurring, thus creating quasi-random sequences using the determined notes.

The true complexity of the 249 starts to become apparent when you invoke the Stage Select, Status and Time Scaling panels to each side of the main section, the External Inputs at the bottom, and the more esoteric logic and timing functions. You can do things such as enable steps only when a pulse is present at an appropriate input, or only when the pulse is absent, or use the external CV inputs to determine the pitch and timing, or as multipliers for other pitch and timing values... and so on. Most confusing, perhaps, is the Stage Select, which provides numerous ways to force a sequence to a particular step. Of these, the one I found most intriguing was the X/Y option, which allows you to apply one CV to move a sequence 'vertically' and another CV to move it 'horizontally'. In doing so, you can create all manner of cyclic, discontinuous sequences, some of which appear to be random whilst actually operating to well-defined rules.

If you're wondering what all this is for, I found an interesting use in synthesizing the character of a picked guitar. I set all the notes in the sequence to those of a six-note chord and then used the X/Y inputs to fire the steps in different orders. By moving some of the notes onto different CV rows and outputting them to different oscillators, I could envelope the sounds in interesting ways and recreate the feel of strumming. I then extended the idea by using the output pulse at the end of a given number of repetitions to demand a new preset from the 225e Preset Manager, thus changing chords and the voicing of some or all of the destinations while the sequence was playing. The possibilities were enormous, but I'm not sure whether it was worth it, because the amount of work involved was horrendous.

There's much, much more in the 249, and some users are going to love it. But I fear that it crosses the boundary from musical instrument to educational tool. You may feel differently, but I'm prepared to bet you're not going to sit down in front of the 249 and bash out a quick sequence the first time you use one.

The Sound Of The 200e

If you think that $20,000 is going to buy you the equivalent of five Moog Voyagers (let alone 10 vintage Minimoogs, or 60 second-hand SH101s) you're in for a big disappointment. In fact, it won't buy you the equivalent of one of these, because that's not what Buchla synths do. Patching what you might consider to be a typical analogue lead synth sound on the 200e, a task which would take me a minute or so on a conventional analogue synth, took about an hour, because the 200e simply isn't designed to produce those kind of sounds. This tells you something important; if you want conventional synth sounds, buy a conventional synth!

But on the other hand... when I took the patch cord out of the Mod Osc and stuffed it into the output of the Principle Oscillator alongside it, I immediately obtained gritty, harsh, PPG-esque timbres that would be impossible to obtain from a conventional analogue synth. Adjustment of the wave position and the amount of Warp

generated all manner of excellent sounds, ranging from almost acoustic to almost percussion, to almost analogue, to almost something you've never quite heard before. Now the situation was reversed, and I was obtaining serendipitous sounds that — even if possible — would have taken forever to patch on a conventional modular synth.

While I was doing this, I discovered that I preferred the results if I disconnected the signal passing through the morphing filter, connected another 259e (or two, or three) and experimented instead with dynamic control of the various Warps and Morphs. This made me realise something very important about the underlying philosophy of the 200e. The best way to approach it is to forget the conventional VCO/VCF/VCA model of analogue synthesis, and to start to think in terms of harmonic modulation, waveshaping and mixing, rather than filtering. In the Buchla universe, the absence of resonant low-pass filters is not a problem (any more than it is, say, on a Synclavier II), and we can view the triple filters as powerful effectors rather than fundamental components of the signal path. Casting aside the acquired skills and preconceptions learned over 30 years of programming and playing modular analogue synths isn't easy when you're sitting in front of a modular analogue synth, but once I had accomplished it, the 200e and I finally started to make friends with one another.

Price & Prejudice

It's impossible to review something costing $20,000 without being aware of the huge amount of alternative equipment that this could buy. But is the 200e really *that* expensive? If you carefully consider what it might cost to purchase a modular synth with similar features from elsewhere, as I have done with a number of other modular manufacturers, the Buchla can almost seem cheap. But such comparisons are hard to make, not least because there are so many features in the 200e that have no close equivalents in any other manufacturers' systems. Furthermore, the sound and character of any alternative system will be totally different from that of the Buchla. There's also no sensible way to place a value on the amazing portability and convenience of the 200e, nor on the immediacy of alternatives from Analogue Systems, Doepfer, MOTM, or whomsoever.

Given the feature-count in the 200e, it seems almost impertinent to ask if anything is missing, but it is a valid question. I'm not going to cry out for a classic Moog filter — that simply isn't part of the Buchla model — but the lack of inverters is a pain and, while the 266e is excellent, I think the synth would benefit from at least one genuine Sample & Hold (to be fair, you can force the 249 to act as a S&H, but that's an extremely expensive way to obtain a basic facility).

I feel that the 200e would also benefit hugely from a CV converter that produces precise 1V-per-octave pitch CV inputs and outputs for interfacing with other analogue synths, but since this is not on the horizon, the thing that I would add to the review configuration is another 210e Signal Router. The mixing and patching facilities of the one already installed proved to be very useful and, happily, the 225e will support two of them.

Ultimately though, all this speculation is pointless, because there's nowhere left to squeeze anything in, unless you dispense with existing modules or purchase yet further Buchla boats and modules.

Pricing

As explained last month, there is no set price for the 200e, because it is a modular system. However, interested parties should be aware that the US price for the 200e system reviewed in *SOS* is a shade under 20 thousand dollars — US $19,850, to be precise. UK distributors RL Music do not quote sterling prices for the 200e, and so the exact cost fluctuates with the sterling/dollar exchange rate. A module-specific price list in dollars is available on their clear, detailed web site, www.rlmusic.co.uk. However, these prices do not include UK customs duty, which is payable on the system, nor the cost of transporting any Buchla modules or systems you purchase from California to the UK, nor the UK VAT at 17.5 percent on all of those costs. At the time of going to press (late November 2005), $19,850 is worth about £11,500, but don't forget, that excludes shipping, duty and UK VAT.

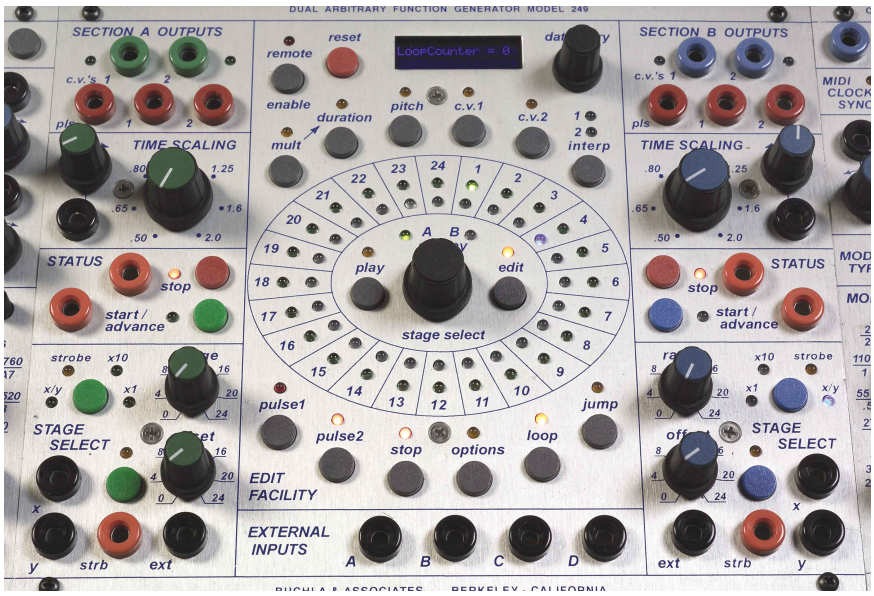
Incidentally, in case we gave anyone the wrong impression last month, the prices quoted for the 201e6 and 201e18 cabinets (700 and 1400 dollars respectively, or about 400 and 800 pounds without shipping, UK duty, or VAT) were the prices for the *empty* cabinets, not for the cabinets filled with modules as in the *SOS* review system.

Conclusions

The 200e is a highly unusual synth, born of one man's creative vision, and his unswerving refusal to embrace commerciality. As such, it commands great respect. But I suspect that that will be irrelevant to some potential owners who will view the 200e as a status symbol or a piece of technological art. Others will see it as an object of ultimate synth lust.

I belong to neither camp, and I'm not afraid to stand up and say that the 200e is not the right instrument for me. I accept that even given the months I've been using it, I've had it for too limited a period to get to grips with it fully, and I know that it's still unfinished in one or two areas, but I find nevertheless that it stands between me and my musical ideas instead of enhancing my creativity. Maybe if I were less deterministic in my sound programming, less conventional in my composing, or if my ideas were triggered by new and interesting sounds, I would feel differently. But however you view the 200e, it's clear that it's a unique proposition: truly one of a kind. It's equally apparent it's going to stir up strong emotions for and against it.

Here's my final thought. If you want the Buchla experience, you need a Buchla, and the only Buchla in production is the 200e. It's as simple as that. SOS



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