

Studio Electronics Boomstars | £769

Studio Electronics have expanded their synth module range to five distinct units, but which should you choose? **Bruce Aisher** ponders his choice

INCLUDES AUDIO

WHAT IS IT?
A range of dual VCO analogue synth modules, each with a different filter board installed

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- HIGHLIGHTS**
- 1 The range of programmability is extensive
 - 2 No menus, screens or sub-functions
 - 3 The filters – all of them are great in their own way

While the number of boutique instrument and processing companies seems to be increasing at an exponential rate, there are others that had faith in the power of analogue circuitry even at the height of the '80s digital boom-time. Studio Electronics initially gained recognition in the synth world for their rack-

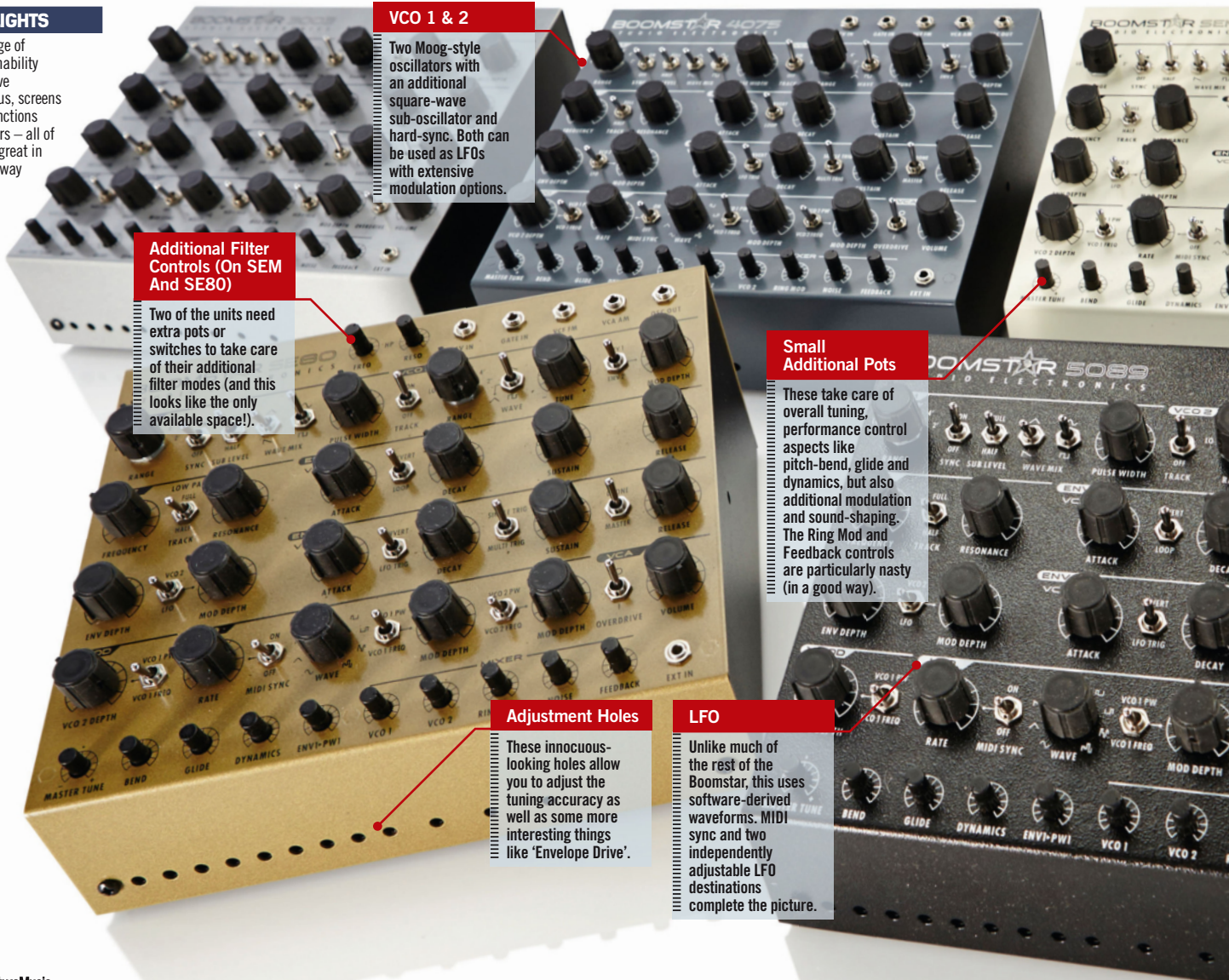
mountable Midimoog. In fact, it was predominantly a Moog product, as the synthesis section was taken from old Minimoog keyboards and placed inside a new box with SE-designed MIDI boards. Inevitably, the supply of real Minimoogs for dissection dried-up – and Moog objected to the name – so SE explored the possibility of building their own synth circuitry. This resulted in the

Midimini, with later iterations being 100% newly-minted synths, but with a definite old-school heritage.

This new-found enthusiasm for synth design resulted in the 'Analog Tone Chameleon' ATC-1 – a twin-VCO digitally-controlled monophonic analogue synth with a range of additional switchable filter cartridges (covering the Minimoog, Roland TB-303, ARP 2600 and Oberheim SEM designs). Later came the SE-1, which once again referenced the Minimoog, but this time with both Moog and Oberheim-style filters.

Sonic boom

This interest in filter design points fairly and squarely at some of the design decisions made when coming up with the Boomstar range on review here. All five Boomstar synths are effectively the same in specification-terms apart from the filter section. In broad terms we are looking at analogue, MIDI (or CV/Gate) controlled, twin-VCO, dual-envelope, single LFO synths laden with over 30



VCO 1 & 2
Two Moog-style oscillators with an additional square-wave sub-oscillator and hard-sync. Both can be used as LFOs with extensive modulation options.

Additional Filter Controls (On SEM And SE80)
Two of the units need extra pots or switches to take care of their additional filter modes (and this looks like the only available space!).

Small Additional Pots
These take care of overall tuning, performance control aspects like pitch-bend, glide and dynamics, but also additional modulation and sound-shaping. The Ring Mod and Feedback controls are particularly nasty (in a good way).

Adjustment Holes
These innocuous-looking holes allow you to adjust the tuning accuracy as well as some more interesting things like 'Envelope Drive'.

LFO
Unlike much of the rest of the Boomstar, this uses software-derived waveforms. MIDI sync and two independently adjustable LFO destinations complete the picture.

knobs, 18 switches – and without an LED or LCD display in sight. However, this doesn't say much about any possible design nuances or interesting features – of which there are many – so it pays to look a little deeper.

According to SE, the two oscillators are based around the same design they have been using since their earlier

option (that causes the oscillator in question to revert to a sub-sonic LFO role) – more on this later.

VCO 1 has four available wave shapes selected from two switches, meaning that triangle or sawtooth waves can be mixed with a sine or square. Pulse Width (PW) of the square wave can be adjusted manually for this

its base frequency. When engaged, any outward changes to the frequency of VCO 2 will result in timbral differences rather than difference in perceived pitch. We'll put this into practice shortly.

VCO 2 has three independent wave shapes selectable from one switch – sine is dropped here. A Tune control

allows this oscillator to be detuned in relation to VCO 1. The range extends from subtle detuning to greater than semi-tone spans. My only

issue here was the sensitivity of the control around the centre mark, where finer control over the inter-oscillator beat frequency would have been much more welcome. When testing the Boomstars I also noticed that some of them exhibited a noticeable drift in tuning across the full frequency range, with notes getting steadily sharper when moving through the octaves via the Range control. Once warmed-up the issue was less marked, and this looks

The 3003 references Roland's classic TB-303. It's squelchy while maintaining a solid bass-end

Minimoog clone. However, the Boomstars have a design that utilises temperature compensating resistors on transistor array ICs to keep tuning stable (rather than discrete transistors). This similarity to the Moog is carried through to the VCA section as well.

Each VCO has six switchable frequency ranges including a 'LO'

oscillator, though both oscillators can create the classic, fat and warm tones of PWM (Pulse Width Modulation) via the LFO modulation section.

VCO 1 also plays host to a third square wave sub-oscillator (one octave below the first). Unlike the main VCOs there's no independent volume control (but it can be switched from full to half volume – and off). A Sync switch locks VCO 2's wave shape start point to that of VCO 1, essentially fixing



CV/Gate connectivity
Besides the rear-panel audio and MIDI sockets, you get CV/Gate inputs as well as access to VCF and VCA levels. OSC OUT takes the pure oscillator signal (pre-VCA and VCF).

Pot Head



On your first glance there may appear to be a few things missing from the main panel, but nearly all of these apparent omissions are addressed by the (knob-less and admittedly rather stiff) small potentiometers along the bottom of the front panel.

The Mixer section allows you to independently mix the levels of each oscillator, with higher settings leading to

'brown-out', where waveforms begin to distort in shape.

Here you'll also find Ring Mod and Noise. Ring Modulation creates sum and difference outputs of the OSC 1 and 2 frequencies. Sine wave inputs can produce bell-like tones, whilst more complex waveforms lead to more atonal timbres.

The Feedback control sets the level of positive feedback (from output to

input), taking the synth from smooth to completely insane with the flick of a wrist.

In this section you also get one additional modulation option with the ability to control the Pulse Width of OSC 1 from ENV 1.

Finally, Master tune does what it says – with a range of +/- 7 semitones. Though I would rather have swapped the wide range for greater accuracy.

SPECS

Steel chassis with 31 pots, 2 rotary switches, 18 toggle switches

Audio circuitry: all discrete circuitry, with the exception of the software LFO

Hand matched transistors in filter and amplifier
Ins/Outs: CV in, Gate in, Filter frequency modulation in, Amplifier modulation in, Oscillator out, External signal in, MIDI In, MIDI Out, 1/4" Audio out, DC power input

Filter options

5089: classic Moog 24dB ladder

4075: classic ARP 2600

SEM: classic Oberheim 12dB SEM (full function with LP to HP mix control)

3003: classic Roland TB-303

SE80: classic Yamaha CS-80

Dimensions

52 x 92 x 221mm

like it could be easily corrected with a little tweaking of the calibration pots accessible through small holes in the front panel. However, without a suitable screwdriver to hand, I resisted the urge to prod, poke and twist.

In place of manual PW adjustment, VCO 2 gets a dedicated modulation control that allows either of the two envelopes to control its frequency. This works a treat when Sync is engaged allowing you to create classic metallic sync-sweeps with ease.

Frequency tracking can be turned off for VCO 2 – good for when creating un-pitched effects or when using it as another LFO.

Resonant peak

Next on the panel we have the filter section. Although the filters vary

between modules (see *Filter Design* below) – and some offer additional controls elsewhere on the top panel – they all share similar functionality when it comes to the basics. There are two dials for Frequency cutoff and Resonance, and three selectable keyboard tracking ranges (scaling cutoff as you move up the keyboard). The response, and ultimate sound, of both cutoff and resonance, varies massively – as you would expect – when moving between the different filter types of each unit. For example, the ‘SEM’ exhibits little drop in level as resonance is increased, but does not proceed into self-oscillation at higher settings. However, the ARP-based 4075 drops in level quite early on in the resonance control’s range and then starts to squeal at around 3 o’clock.

An envelope depth control determines the range over which the cutoff will be modulated by Envelope 1 (this is hardwired to the VCF). An additional Mod Depth control allows cutoff to be controlled by the main LFO or VCO 2. VCO 2 acts as an additional LFO when its Range is set to ‘LO’ and frequency tracking is disengaged, but allows for more gnarly modulation possibilities at audio-range settings.

Pushing the envelope

Both envelope generators on the Boomstars are of the four-stage ADSR variety. ENV 1 is hard-wired to filter cutoff, though as we’ve seen already, it can also be routed to control the pitch of OSC 2 – and there’s a pot for using it to vary the pulse width of OSC 1’s square wave. Both envelopes feature an Invert switch for reversing their polarity (so Attack, for example, starts off at maximum). Loop mode is an interesting option, where the Attack and Decay portions of the envelope repeat. This turns ENV 1 into a form of customisable LFO. This is a much loved feature on my Koma RH-301, and it is great to see it implemented here – the kind of small detail that makes these SE units more interesting than much of the competition.

The second envelope generator is routed to the VCA – to control the loudness contour – but again has some extra features up its sleeve. As well as being started with each note (with legato and retrigger modes), ENV 2 can be triggered by the LFO or opened continuously in Drone mode. I used this to audition all five units simultaneously,

Filter Design

The 5089 has a cloned Moog 24dB/octave ladder filter. As with the oscillators, an integrated circuit replaces some of the discrete transistors of the original. It’s smooth at lower resonance settings, but can be nasty (on purpose) if required.

The 4075 takes its queue from the ARP 2600 (and Mk II/III ARP Odyssey), and though broadly similar in terms of raw specification to the Moog (self-oscillating 24dB/oct) – in fact ARP’s

filter designs did at times cause certain potential legal problems – it perhaps has a more aggressive edge.

For those with an acidic yearning, the 3003 references Roland’s TB-303. The diode ladder design of the original has a well-known tonal footprint that the Boomstar captures well – it’s squelchy, whilst maintaining a solid bass-end.

The SEM (à la Oberheim) is a gentle

12dB/octave filter, but is multimode. These additional high-pass, band-pass and notch modes are accessed from a pot/switch combo above the Pulse Width control.

The SE80 features perhaps the most flexible filter configuration, with the low-pass filter joined by a matching resonant high-pass in the style of Yamaha’s very expensive and very heavy CS-80. Like the 3003, this also sounds great with Overdrive enabled.





and with a result that ended up sounding like a '70s Italian horror movie – brilliant!

How low can you go

The LFO on the Boomstars is software generated, which makes for a wide

range of connections on the rear. CV/Gate connectivity is included in the form of five 3.5mm jacks, although it would have been good to have external access to some of the LFO parameters and the VCOs independently. The audio input is a nice bonus.

comparison to the other boxes. The low and high-pass filters in series are capable of generating weird vocal-like tones and, when resonance is pushed up and overdrive with feedback is engaged, it sounds positively nasty. At the same time it is capable of very

gentle leads and sweeps. For an all-round Moog alternative, the 4075 is also a good bet. This isn't to say that the others are bad – they're all great.

The SE80 is capable of the widest range of tones, from weird and vocal-like to positively nasty

range of possible wave shapes and full MIDI clock sync. The two Mod Depth controls (one for each oscillator) can be routed to modulate the Pulse Width or Frequency of the VCOs.

There's another neat modulation possibility found in the X MOD section, where it is possible to use the frequency of VCO 2 to modulate the Pulse Width or Frequency of VCO 2 – great for clangorous FM tones and unusual textures.

The VCA itself has one important control, Overdrive, which does exactly what you expect, and allows you to push the synth into more saturated territory. It works a treat with the 3003 when looking for that 'acidic' drive.

The synths' remaining sound-shaping controls are accessed via a row of small knobs at the bottom of the front panel, with MIDI and audio

In terms of MIDI, SE keep things very simple, but this does mean that CC control of parameters is sparse, though you can control volume, vibrato (via the mod wheel) and filter cutoff (from aftertouch).

Conclusion

There are a few aspects of the design that could be improved – external PSU, no power switch, lack of clear knob markings or accurate pot control – but for the most part these are aesthetic or ergonomic rather than sonic. The sound is hard to fault.

So now for the big question – if you could choose only one, which would it be? My gut instinct would be to go for the Yamaha CS-80 flavoured SE80, if only because its filter configuration is relatively uncommon. It is also capable of a potentially wider range of tones in

All told, these Studio Electronics boxes offer enough modulation and processing options to give many other current analogues a run for their money and should be on your 'must-try' list if you're considering monophonic analogues new or old. **FM**

FutureMusic VERDICT

BUILD	■■■■■■■■■■■□
VALUE	■■■■■■■■■■■□
EASE OF USE	■■■■■■■■■■■□
VERSATILITY	■■■■■■■■■■■□
RESULTS	■■■■■■■■■■■□

Any of these Boomstars would make a fine addition to any synthesist's armoury.

ALTERNATIVES



Moog Minitaur

£379
The cheapest way to acquire the true Moog sound, and a unit that includes 'that' classic filter.
www.moogmusic.com



Analogue Solutions Nyborg-12

£720
A modern recreation of Oberheim's original SEM module with additional features like a sub-oscillator plus MIDI and CV/Gate interfacing.
www.analoguesolutions.com



Korg ARP Odyssey

£749
If you hanker for the ARP sound, then Korg's revival may well satisfy your yearning – and it comes with three generations of the Odyssey filter including the 4075.
www.arpsynth.com