



TOM OBERHEIM SEM

The Return of an Analog Synth Classic

by Mitchell Sigman

PROS

Silky analog sound. Discrete analog circuit design. Unique and flexible filter. Modular-style patch panel has options galore for interfacing with other analog gear.

CONS

You either get the patch panel or MIDI, but not both. No memory to save presets.

INFO

\$899, tomoberheim.com

In 1974, Tom Oberheim released the first Synthesizer Expander Module, or SEM. Players loved this easy-to-use, ballsy-sounding synth, and its unique multimode filter gave it a distinctive sound. The SEM went on to become the basis for some of the world's first polyphonic synths, such as the Oberheim Two-, Four-, and Eight-Voice,

which were essentially multiple SEMs in the same cabinet as a keyboard. Beginning in the late '70s, these gave way to more compact analog polysynths (the Oberheim OB-Xa behind Paul Shaffer on page 28 among them) but analog tone nuts still hunt for original SEMs. Much to their delight, Tom has now reissued it.

THE SIMILARITY STARTS HERE

In contrast to most second comings of great analog synth names, the SEM is almost identical to the original. In fact, the external cosmetics are changed far more than the innards. Tom tells us that just one component was changed from the original design due to lack of availability, and it

doesn't affect the sound. He kept the wedge-shaped beige case, and even the knobs are the same parts as on the originals. Some details *have* changed: two separate tuning knobs work better than the original's touchy concentric arrangement. The biggest difference is the 33-jack patch panel. Since "bringing out" patch points is a common mod on originals, Oberheim took it one more step – a *large* step – providing fantastic flexibility for interfacing with other analog gear. Modular and Moog-fooger maniacs rejoice!

THE VOICE

Oscillators. Two identical oscillators initially give you a five-octave range. The tuning knobs have no detents or marks on the

HANDS-ON

- ① You get 33 patch points on 1/8" mini jacks. The SEM is compatible with all one-volt-per-octave analog synths, transforming the SEM into a powerful synth expander module, hence the name!
- ② Large coarse tuning knobs for each oscillator offer a five-octave range; small pots above fine-tune over a range of about a major third.
- ③ Unique multimode filter operates in lowpass and highpass modes and is continuously variable between modes with a knob – at 12 o'clock it's a notch filter. Slide switch activates bandpass mode.
- ④ These knobs combine the oscillator waveform and mixer functions found in separate sections on other synths: Center is off, left makes the sawtooth louder, right does the same for the pulse wave.
- ⑤ Slide switch bypasses the VCA. Translation: infinite sustain. This also lets users run external audio inputs through the filter without triggering the envelopes – handy.

NEED TO KNOW

What is it? A monophonic analog synthesizer module.

Does it have MIDI? The version reviewed here doesn't. You'll need either a hardware MIDI-to-CV converter, an analog synth with CV outs, or MOTU Volta (reviewed Aug. '09).

Can I save patches? No, but this means knobs are fully analog and not digitally scanned, allowing finer resolution.

Who is it for? Die-hard analog synth heads who crave the warm, big and fuzzy sound that only a true analog synth can provide.

How does it compare to other synths? The SEM offers the purest analog synth experience available short of springing for a modular synth. The oscillators, filters and amps use no digital components.

panel, so pitch-perfect tuning requires a tuner or reference tone. The upcoming MIDI model (see "MIDI and the SEM" at right) will have an A-440Hz reference tone that feeds the SEM's external audio input. On the positive side, the calibration is extremely accurate. On my unit, the coarse tuning knob swept exactly five octaves and

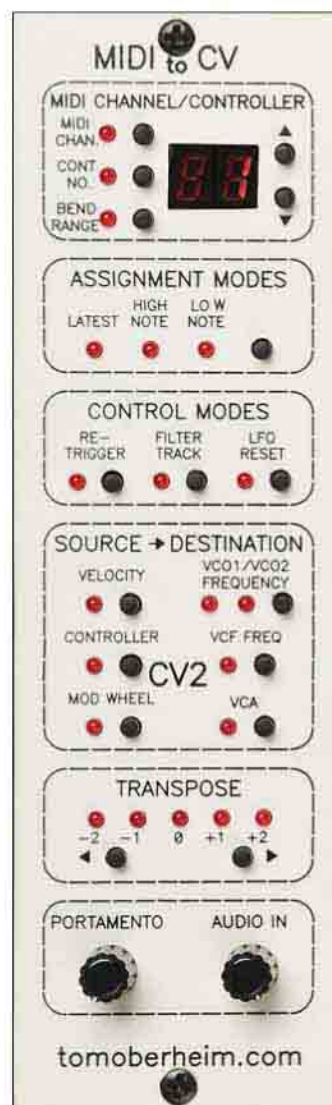
the tuning never drifted. The oscillators have saw and variable pulse/square waves but no triangle or sine. Pulse can be modulated via the LFO or envelopes, and is independent for each oscillator. This can lead to some seriously thick tones! There's also a sync switch for classic sounds a la the Cars and Kraftwerk.

Filter. The filter is the famous two-pole multimode Oberheim type. Due to its shallower cutoff slope, it sounds a bit sharper and brighter than four-pole, Moog-style filters. The SEM can function in lowpass, bandpass, or highpass modes for lots of tonal variety. With the bandpass switch turned off, the SEM's filter is "state variable." That means you can mix between low- and highpass modes with a knob. Moving this guy around while playing makes some great noises – too bad it's not a modulation destination!

Mixing. You may have noticed that the SEM doesn't have oscillator waveform selector switches. Instead, center-detented knobs for each oscillator live in the *filter* section; turn to the left to increase saw volume or to the right for square/pulse. This works fine, but doesn't allow waveform mixing within the same oscillator. There's one more knob for balancing volumes from the two external audio inputs, and this works the same way – there's no mixing of two sources.

Envelopes. There are two simple attack/decay/sustain envelopes. There's no release segment – the decay knob does double duty here, and decay continues whether you hold a key down or not. Whether this bothers you depends on the sound, but let's just say the SEM isn't the go-to synth for elaborate 14-segment envelopes. Envelope 1 is hardwired to the VCA (volume) and can control oscillator 1's pitch as well. Envelope 2 can control the filter or oscillator 2. These are just the "basic" routings – you can reroute the envelopes in numerous ways using the patch panel.

Modulation. There's a sine-wave only LFO with a solitary rate knob. So where do you set the depth, i.e. how intensely the LFO affects a given destination? You do it at the destination: oscillator 1, 2, or the filter. Finally, a VCA on/off switch acts as a



MIDI AND THE SEM

The SEM's extensive control voltage I/O is a boon for serious fans of analog, but what if you want to just wail on it from your MIDI keyboard? Tom Oberheim will soon release the SEM MIDI edition. This replaces the SEM's left-side patch panel with a nicely outfitted MIDI-to-CV converter, and adds rear-panel MIDI jacks. Along with standard note on/off reception, there's an auxiliary CV that you can control with your choice of velocity, mod wheel, or other continuous controllers. The aux CV destinations include oscillator frequency, filter cutoff, and amplitude. The MIDI panel also offers a portamento knob, and expands the SEM's audio input processing with a preamp that lets you process low-level sources such as mics and electric guitars. Also, the MIDI panel works in standalone mode for CV control of external synths.

bypass by disconnecting envelope 1 and setting the VCA to full volume. This is handy for drones or when you're using the filter to process a constant external input such as a music track. All in all, the modulation routings are surprisingly flexible.

Then there's that patch panel! All the audio and control voltage I/O you could want is here. Unlike a full-blown modular system, you don't get a mixer or patching jacks that can "mult" one signal to several destinations, but that said, the patch panel is a boon for anyone with CV/gate-type gear, be it a modular synth, older analogs, or guitar gear with CV I/O. The possibilities are staggering.

IN USE

If you're familiar with analog synths, the SEM should be way easy to get your head around, requiring minimal manual-cracking. (Tom Oberheim tells us a more in-depth version of the currently brief manual is on the way.) Much like a Minimoog, the SEM's simple controls array makes sound creation a joy – the absence of menus and


confusing abbreviations is a breath of fresh air. All the expected analog sounds are on hand: big, aggressive bass, piercing leads, blips and thwips, and those brassy splats that vintage Oberheim synths are famously good at. By using bandpass and combined lowpass/highpass filter modes, all kinds of midrange variations from spitty highpass to mellow horn-like timbres are on tap. Teamed up with my Synthesizers.com modular and MOTU Volta, it sounded like the end of the world – in a good way.

Being a pure analog synth, there's no patch storage whatsoever, but for true analog aficionados, this may not be a big deal. The lack of savable presets does tend to make the SEM more of a "studio" instrument though.

As to sound quality, instead of using tired buzzwords like "fat" and "warm," let's put it this way: Compared to using virtual analog plug-ins, the SEM sounds like the difference between mono and stereo (even though its output *is* mono), or like someone took a dank tarp off your studio monitors. The thing sounds that good.

CONCLUSIONS

Depending on your viewpoint, the SEM represents either a steep price for a monophonic synth with no keyboard, or it's the bargain of the century. It faces obvious competition from Dave Smith's Mopho and its four-voice sibling, the Tetra (reviewed Jan. '10). Both of these are true analog synths and have MIDI and patch storage. But the specs only tell half the story. With their digital encoders and menus, their user interfaces are less immediate than the SEM's. Sound quality is a hotly debated topic in the synth world, but my ears say that out of everything wearing the analog badge today, the SEM's is as analog as it gets.

The SEM's knobs and pots make sound manipulation a whole lot of fun, the patch panel lets you get creative even without any other gear – some pretty crazy cross mod/sync madness is just a patch cord or two away. For my money, the SEM is a winner. Thanks for keeping it real, Tom! 

Keyboards, Synths & Pianos are all we sell, and we do it best:

- Advice from the Pros
- Video demonstrations
- Best prices available

Buy with confidence: Part of America's largest keyboard and piano retailer • No boring static pics and stats, you'll find a real keyboard experience with demos from the Pros. See *why people are raving about their experience with Kittsdirect.com*

We've chosen only the best products from the best names

YAMAHA • ROLAND • KORG & more



- Keyboards
- Synths
- Workstations
- Digital Pianos
- Used Pianos

Over A Quarter Million Sold Since 1912


Expert advice on the best keyboard values, *direct to you!*



'Contact Us' today with any questions!

Get Clearance pricing this month on demo models under 'Pricebreaker Specials'