

ANALOGUE SOLUTIONS

VOSTOK
*Have synthesizer,
will travel.*

By Mike Peake with Geary Yelton

From U.K. manufacturer Analogue Solutions comes the Vostok, a portable modular synthesizer that provides plenty of basic functions for producing and manipulating audio, as well as a few esoteric capabilities. Most notable are its matrix panel for patch programming and its suitcase-like box (see Fig. 1). Both are reminiscent of the classic EMS Synthi A that was highly regarded in the 1970s. Analogue Solutions stresses that the Vostok is not a Synthi A clone but is, rather, a configuration of modern electronics that borrows some of EMS's most practical design ideas.

The Vostok's modules include two analog oscillators, a digital wavetable oscillator, a noise generator, two filters, a voltage-controlled amplifier, two ADSR generators, two LFOs, a mixer, a ring modulator, and an 8-step analog sequencer. A built-in MIDI-to-control-voltage converter interfaces the Vostok with modern sequencers and other MIDI gear. With the exception of the MIDI circuitry and the wavetable oscil-

lator, all the Vostok's circuits are completely analog.

OPEN-AND-SHUT CASE

The Vostok's size and weight make it an ideal carry-on item should you want to travel with it. The case is sturdy enough for everyday use, but you'll need a flight case if you intend to check it with your luggage or toss it into the back of your band's equipment truck for touring.

The Vostok's corners are reinforced with thick plastic, and the case has sturdy metal latches and a removable plastic front cover. Rubber feet on the bottom and back allow you to stand the Vostok upright or lay it on its back. If you already have a small collection of Analogue Solutions modules and you require portability and a power supply, you can also order the case separately.

CONNECT AND CONTROL

The Vostok's 22-by-22-point pin-matrix patch bay is one of the ways you can interconnect the modules (see Fig. 2). The matrix's horizontal axis hosts the audio and control-voltage (CV) sources, and the vertical axis has the destinations; you can connect any source to any destination by placing a pin at their point of intersection. Only 15 patch pins are supplied with the Vostok, and depending on the complexity of your patches, you might use up that supply quickly. The included pins are resistor pins, which allow you to route a source to more than

one destination (as opposed to shorting pins, which offer a more direct link but can cause a drop in signal level when you patch a source to multiple destinations). Additional pins are available from Analogue Solutions.

One noticeable difference between the matrix patch bays on the Vostok and previous synthesizers is that the

Vostok's is buffered. That allows you to patch multiple sources to a single destination without causing an offset in levels or voltages. When a patch pin is removed, the buffer holds the voltage until a new pin is inserted. You can even "play" parameters by partially inserting a pin in a rhythmic manner.

If a particular connection is unavailable on the patch matrix, the Vostok provides 69 1/8-inch jacks for routing audio and control signals with patch cords. These patch points allow you to connect any source to any destination as well as interface with external gear, such as Analogue Solutions' Oberkorn sequencer. Also on the front panel are 52 parameter knobs, 13 indicator LEDs, and a joystick. The joystick, which feels smooth and solid, isn't spring-loaded and therefore remains in position when you release it. Control outputs for its x- and y-axes each have an attenuator knob with a range of $\pm 12V$.

In addition to signals for pitch, gate, and modulation, the Vostok's MIDI-to-CV module emits voltages for Legato and Accent in response to MIDI data. Absent are provisions for Pitch Bend and Aftertouch, which, oddly, the manual suggests is because the Vostok is optimized for sequencing rather than keyboard performance. The Legato function generates a 5V signal whenever the device detects simultaneous notes, and Accent generates a 5V signal whenever MIDI Velocity exceeds a value of 79. A Gate button triggers a 10V signal for as long as it's pressed.

PRODUCE AND PROCESS

The two identical, traditional analog voltage-controlled oscillators (VCOs) each feature a wide-range, continuous pitch control as well as knobs for Portamento, Pulse Width, Sawtooth Level, and Pulse-Wave Level. In addition to control inputs for Pitch Modulation, Pulse-Width Modulation (PWM), and Sync, each oscillator provides audio outputs for the pulse and sawtooth waveforms.

Modulating the frequency of one oscillator with the other appears to use AC coupling, producing more mellow



FIG. 1: Bearing some physical resemblance to the vintage EMS Synthi A, the Analogue Solutions Vostok is a complete modular synthesizer in a suitcase.

results than you might expect. (If you prefer a harder edge, you can route an oscillator to modulate the cutoff frequency of self-oscillating filters.) Either oscillator's frequency can be modulated down to the subaudio range for use as an extra LFO, if one is needed. Thanks to separate Glide controls on each oscillator, you can achieve the once-popular effect of using a touch of portamento on just one oscillator as you play them in pairs; I was pleased to discover that the Vostok made that classic sound possible.

In the patch matrix, the pulse wave from VCO 1 and the sawtooth from VCO 2 are available as audio and modulation sources. You'll need patch cords if you want to use two similar waveforms simultaneously. Likewise, VCO 2's PWM signal must be routed with a patch cord; it doesn't appear in the matrix.

A ring modulator circuit is located on the VCO 1 module. It has just two audio inputs and an audio output, and it's suitable for processing external sources as well as the Vostok's oscillators. Its squelch of the input signals isn't great, but it's fine if your aim is simply nastiness and grunge.

The third oscillator is a horse of a different color or, more specifically, a wider range of colors. VCO 3 is an 8-bit digital wavetable generator that produces 256 waveforms. You can select waveforms manually with the Initial Wave knob or dynamically by means of the Wave CV input and its associated Level control. Using an LFO or envelope generator, you can modulate the wavetable in the manner of the classic PPG Wave synthesizer. An intentionally retro-looking four-digit LED display indicates the pitch by note name and the waveform in hexadecimal notation.

VCO 3's pitch is quantized into semitones and covers a four-octave range centered at a fairly low frequency, making it most suitable for bass tones and sound effects. You can't increase or offset its range with external CV sources. (According to Analogue Solutions, a wavetable oscillator would need to be more complex, and therefore more expensive, to produce higher frequencies.) As an LFO, VCO 3 can produce some wonderfully strange modulation effects. As an audio oscillator, its 8-bit character is edgy enough

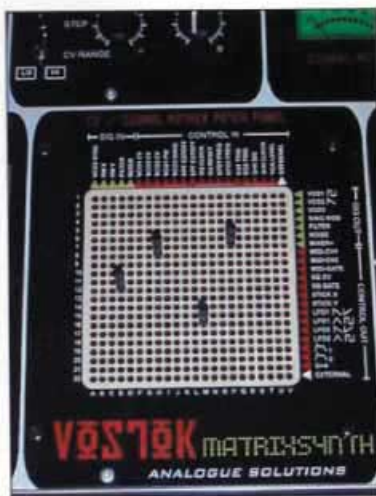


FIG. 2: Inserting pins in the matrix patch bay connects audio and modulation sources to their destinations, minimizing the need to use patch cords.

to produce upper harmonics that high filter-resonance settings can accentuate to create interesting timbral results.

Like another Analogue Solutions product, the Phobos Filtered Coffee, the Vostok's filter section is based on that of the Korg MS-20 analog synthesizer. It consists of a highpass filter in series with a lowpass filter, which can produce a classic variable-width bandpass response. Both 12 dB-per-octave filters have independent cutoff, resonance, and modulation-level controls.

Two resonant filters working together can give rise to some interesting sound-design and processing possibilities. With high resonance settings and no signal input, the self-oscillating filters generate clean sine waves; introducing an audio signal and increasing its level creates a nice intermodulation of the two resonant peaks. At maximum levels, the result is an overdrive that can produce sounds similar to a swept, hard-synced oscillator.

The lowpass filter can self-oscillate across its full range, which goes from about 160 Hz to beyond audibility, but the highpass doesn't sweep below about 160 Hz or self-oscillate beyond 484 Hz. Consequently, the Vostok is incapable of producing very deep bass tones.

Vostok Specifications

Sound Engine	analog subtractive synthesis
Polyphony	1 note (monophonic)
Sound Sources	(2) analog VCOs; (1) digital wavetable VCO; (1) noise generator
Filters	(1) resonant lowpass and (1) resonant highpass in series; 12 dB-per-octave
Amplifier	(1) VCA
Effects Processor	(1) ring modulator
Control Modules	(2) ADSR generators; (2) LFOs; (1) sample and hold; (1) joystick
MIDI-to-CV Converter	MIDI In, Out, Thru; pitch, modulation, gate, accent, and legato CV out
Sequencer	8-step CV and gate
Utility Modules	(1) 6-input, 2-output audio/CV mixer with inverter; (2) 4-way signal-splitter/multiples; (1) VU-type signal meter
Matrix Patch Panel	22x22 patch connections; (15) resistance pins included
Patch Cord Connections	(69) 1/4" minijacks
Power	100-220V; IEC connector
Dimensions	17.32" (W) x 10.78" (H) x 7.40" (D)
Weight	14 lb.

Above those ranges, however, the Vostok is quite capable of snappy filter zaps and harsh filter FM.

MODULATION VARIATIONS

Both envelope generators (EGs) are of the ADSR variety. In addition to a CV-level knob that turns clockwise for positive modulation and counterclockwise for negative modulation, the Vostok has knobs for each of the four stages, a jack for CV input, and a jack for CV output. LEDs indicate that a gate signal has been received, but they don't indicate whether the EG is actually firing. The envelopes can be triggered by LFO square waves as well as by external signals and gates from the MIDI-to-CV converter.

The EGs offer a Repeat function that you enable by setting the sustain level to zero; its rate is determined by the attack and decay times. Repeat can produce harsh amplitude modulation of

the VCA at high rates, as well as pseudo-echo and other interesting mod effects. The only problem is that when Repeat is enabled, the EG's output never reaches zero, which can cause the VCA to pass a bit of signal as long as a gate is present; that's not an issue if you simply play staccato. Nonetheless, the Vostok is definitely more interesting for the Repeat feature's inclusion.

Another pair of control-voltage sources are identical LFOs. Two waveforms are simultaneously available from each LFO. The Levels/Select knob acts as a switch when you pull it, toggling the waveforms from falling sawtooth or triangle to inverted sawtooth or square. In addition to the two LFO outputs, a control input lets you modulate LFO rate with external sources such as sample and hold.

The Noise module contains a classic sample-and-hold circuit with an audio input, an audio output, and a clock input. By sampling the noise generator, it can produce traditional stepped

random signals. A Slew control can smooth the transitions between steps.

The Vostok's 8-step analog sequencer is icing on the proverbial cake. Use it to create repeating melodic patterns or repetitive modulation of filter cutoff and other control parameters. A knob for each step lets you specify a series of control voltages, and the module has outputs for both voltage and gate as well as clock input and throughput jacks. By turning a step's knob all the way counterclockwise, you turn off that stage and prevent its gate from appearing at the sequencer's gate output.

Each clock signal will advance the sequencer by one step. The sequencer's clock source can be a gate from the MIDI-to-CV converter, a square wave from an LFO, or any source that exceeds a 10V threshold. If the sequencer is clocked by an audio oscillator, it can act as a waveform generator that you can play with a keyboard. If it's clocked

by a low-frequency triangle wave, the sequencer will randomly select steps.

MODULAR MOBILITY

The Vostok provides most of the functions you'd hope to find in a modular synth. In fact, it packs so many goodies into a single package that it put me in a tough spot; it was hard to stop playing with it long enough to write this review.

I was pleased with the Vostok's convenient matrix patch panel, its combination of analog and digital oscillators, and its classic MS-20 filter replication. Factor in MIDI and external-signal processing capabilities, and you have an instrument that holds its own against comparably priced modern modular synthesizers.

Mike Peake was a member of the Alexis Andromeda design and realization team and has been a modular-synthesizer enthusiast since 1978. Geary Yelton is associate editor of EM and received his custom modular Oberheim in 1978.