
MICROGRONE

Bytebeat Synthesizer + Effects Processor

Operation Manual

Firmware v0.10

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OVERVIEW

Microgrone is a Eurorack synthesizer module that runs a 16-program bytebeat engine, with three voltage-controlled equation parameters, variable sample rate, an 8-waveform LFO, and an analog VCF. Last effect is a digital effects processor derived from the Alesis Midiverb, offering three selectable algorithms via a toggle switch.

The result is a self-contained noise instrument that generates complex, evolving textures from pure mathematics, shapes them through analog filtering, and immerses them in digital space - all in a compact Eurorack format.

CONTROLS REFERENCE

Bytebeat Engine

Control	Function	Notes
A0	Parameter A	Equation variable. Range varies per program.
A1	Parameter B	Equation variable. Range varies per program.
A2	Parameter C	Equation variable. Range varies per program.
S RATE	Sample Rate	256 Hz to 16384 Hz. Controls bytebeat playback speed.
UP	Program Up	Short press: next program.
DN	Program Down	Short press: previous program.
LEDs 1-2-4-8	Program Display	Binary display of current program number (1-16).

Analog VCF

Control	Function	Notes
CUTOFF	Filter Cutoff	Sets the cutoff frequency of the low-pass filter.
REZ	Resonance	Adjusts filter resonance / emphasis at cutoff.

LFO Modulator

Control	Function	Notes
SPEED	LFO Rate	0.05 Hz to 5 Hz. Modulates VCF cutoff.
DEPTH	LFO Depth	Amount of LFO modulation applied to the filter.
WAVE	LFO Waveform	8 shapes: Ramp Up, Ramp Down, Pulse, Triangle, Sine, Sweep, Random Levels (S&H;), Random Slopes.

LED (center)	LFO Indicator	Pulses with the LFO rate and shape.
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Digital Effects (Core 1)

Control	Function	Notes
EFX	Effect Select	ON-OFF-ON toggle switch. Up: Reverse Regen. Center: Delay. Down: XL Dark Reverb.
SAMP R	Effect Sample Rate	Controls the clock rate of the effects engine. Lower = darker, grainier.
BLEND	Dry / Wet Mix	Blends between the dry bytebeat signal and the wet effect output.

Patch Points

Jack	Function	Notes
PITCH	CV Input	Voltage control input for pitch / parameter modulation.
F IN	Filter Input	External audio input to the VCF and effects chain.
OUT	Audio Output	Main audio output.

EFFECTS IN DETAIL

Toggle UP: Reverse Regen (Program 47)

A dense, shimmering reverb with reversed diffusion taps that create an ethereal, backwards-swelling character. The regenerative feedback network builds lush, evolving textures. Ideal for ambient drones and otherworldly pads.

Toggle CENTER: Delay (Program 97)

A clean digital delay with 50% feedback. The delay time is fixed by the buffer structure but the SAMP R knob effectively pitch-shifts the delay, creating tape-like warping effects at extreme settings. Useful for rhythmic echoes and lo-fi dub textures.

Toggle DOWN: XL Dark Reverb (Program 50)

A massive 20-second reverb tail with dark, filtered character. The all-pass and comb filter network is tuned for deep, cavernous spaces. Excellent for creating vast, evolving soundscapes from even the simplest bytebeat programs.

QUICK START

1. Connect the module to your Eurorack power supply (standard 16-pin header). Patch the OUT jack to your mixer or audio interface.
2. Set S RATE to noon, A0/A1/A2 to various positions. You should hear sound immediately from Program 1. The four LEDs show the current program in binary.
3. Press UP/DN to scroll through the 16 bytebeat programs. Each program is a unique mathematical equation that generates audio from pure computation. The three knobs (A0, A1, A2) modify different parameters within each equation.
4. Turn CUTOFF and REZ to shape the raw bytebeat through the analog filter. Adjust SPEED, DEPTH, and WAVE to add cyclic modulation via the LFO.
5. Flip the EFX toggle to add reverb or delay. Adjust SAMP R for lo-fi degradation and BLEND for wet/dry balance.
6. Long-press UP to activate the internal sequencer, which randomizes the time counter for glitchy, evolving patterns.
7. Long-press DN, then turn A0 to control time direction and speed (-7 to +7). Negative values play the bytebeat in reverse.

SPECIFICATIONS

Parameter	Value
Format	Eurorack, 3U
Width	10 HP
Depth	25 mm
Power	+12V / -12V, standard Eurorack 10-pin
LFO Waveforms	8 (Ramp Up/Down, Pulse, Tri, Sine, Sweep, S&H, Random Slopes)
LFO Rate	0.05 Hz - 5 Hz
Effects	3 (Reverse Regen, Delay, XL Dark Reverb)
Effects Buffer	16384 samples (32 KB)
Filter	Analog VCF