

SYNTH SEDUCTION

Volta M1

Ladder Synthesizer · Rack Extension for Reason



Operation Manual

Version 1.4 · English

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1. Introduction

Volta M1 is a three-oscillator subtractive synthesizer in the tradition of the classic American ladder-filter monosynths, extended with the tools a modern producer expects: polyphony, a modulation matrix, an arpeggiator and step sequencer, unison and a built-in effects chain.

The front panel is laid out exactly like the signal path. The upper 4U section is the instrument itself, read from left to right: Controllers, Oscillator Bank, Mixer, Modifiers (filter and envelopes) and Modulation / Output. The lower 3U section holds the performance and studio extras: Arpeggiator / Sequencer, Mod Matrix, Unison and Effects.

1.1 Key features

- **Three oscillators with continuous wave morphing.** OSC 1 and OSC 2 sweep smoothly from triangle through saw and square to narrow pulse. OSC 3 adds a wavefolder at the bottom of its range and can also run as a sub-audio LFO.
- **Sub oscillator with a wave knob.** One or two octaves below OSC 1, with a morph from square through saw and triangle to pulse.
- **Cross-modulation (X-MOD).** Ring modulation of OSC 1 $\times$ OSC 2, audio-rate FM from OSC 3 to OSC 1 and OSC 2, analog pitch drift, and an OSC 3 keyboard on/off switch.
- **White / pink noise and a feedback loop.** The noise has its own TONE filter and a DECAY envelope for breathy or percussive attacks. The feedback loop routes the output back into the mixer for that classic overdriven “patch-cable” growl.
- **Multimode ladder filter.** It offers 8 modes (24/12/6 dB low pass, 12/24 dB band pass, 12/24 dB high pass and notch), with Drive, self-oscillating Emphasis, RES BASS bass compensation and audio-rate Filter FM from OSC 1.
- **Two ADSR contours with Loop.** Each envelope can cycle while a key is held, which turns it into a key-synced modulator.
- **Modulation.** There is a global LFO (triangle, square, sample & hold; free or tempo-synced), a MOD MIX blend between LFO/OSC 3 and noise, and a 6-slot modulation matrix with 14 sources and 18 destinations.
- **Voicing.** Mono, Legato and 32-voice Poly modes, plus Unison with 2 or 4 detuned, stereo-spread voices.
- **Arpeggiator and 16-step sequencer.** Each step has pitch, gate, accent and glide. Swing and gate length are adjustable, the direction can be forward, backward, ping-pong or random, and the clock locks to the Reason song position. 50 built-in sequencer presets load a complete pattern with one click. The RUN button starts a pattern without holding a key, and after a song loop or a locator jump the pattern snaps back to the bar grid.
- **Effects.** A nine-slot effects chain: Distortion (6 types), Bitcrush, a 3-band EQ with low cut, Compressor, Chorus, Phaser (4–12 stages), Delay (12 types, tempo sync in note values), Reverb (16 types) and a look-ahead Limiter. Each effect has its own on/off lamp and keeps its own settings.
- **CV integration.** There are 11 CV inputs and 5 CV outputs on the rear panel, including the arpeggiator/sequencer note and gate.

2. Getting Started

2.1 Creating a Volta M1

1. In Reason, choose Create > Instrument Devices > Synth Seduction > Volta M1 Ladder Synthesizer. You can also drag the device in from the Browser.
2. Reason creates the device together with a Mix Channel and a sequencer track, and the track is armed for MIDI input.
3. Play your MIDI keyboard (or the On-screen Piano Keys). The NOTE lamp in the header lights up with every note.

The device loads the Init patch: a plain sawtooth on OSC 1 through the fully open filter, with all other sources, the matrix, the sequencer and all effects switched off. It is a clean starting point for your own sounds. Ctrl/Cmd-click any control to return it to its Init value.

2.2 Patches

Use the patch display and the browse buttons in the device header to load and save patches, exactly as with any Reason instrument. Every panel control is stored in the patch, including the full 16-step sequence, the arpeggiator/sequencer RUN state and all six matrix slots. Loading a patch therefore also switches the sequencer on or off as stored.

2.3 Factory sound bank

Volta M1 comes with 454 factory patches plus Init. Open the patch browser (the folder button in the device header) and choose the Volta M1 home folder. The root folder holds ten showcase patches; the rest is sorted into eleven folders:

Folder	Patches	Contents
(root)	10	Showcase patches: one of each kind
Acids	40	303-style acid lines: squelch, slides, stutters and accents
Bass	46	Mono basses, from Moog-style plucks to Reese, neuro and distorted 808
Lead	52	Solo leads plus the Trance, Hardstyle, Chords and Mainstage Lead series (1–5 each)
Pad	65	Pads and evolving textures; Mod Wheel opens the filter
Keys	21	Piano-, organ-, clav- and bell-like keys
Pluck	44	Short plucked and percussive sounds
Percussion	50	Synth drums: kicks, snares, claps, closed and open hats (10 of each kind)
Textures	35	Evolving textures, noise beds and ambient soundscapes
Brass & Strings	21	Brass stabs, swells and string machines

Folder	Patches	Contents
Arp & Seq	50	Twenty arpeggiator and thirty sequencer patches; RUN switches on when loaded
FX & Drones	20	Sound effects and drones

TIP All factory patches are level-matched, so you can browse them without riding the volume. In every pad the Mod Wheel opens the filter; in most leads it adds vibrato or brightness. Patches in Arp & Seq start the sequencer when loaded: hold a key (SEQ) or a chord (ARP) to hear them.

2.4 A first sound in one minute

1. Set VOICE to MONO and turn GLIDE to about 3.
2. In the MIXER, switch on OSC 2 with its lamp and raise its level. Set OSC 2 FINE slightly off-center for a slow beating detune.
3. Set the filter to 4P LP, put CUTOFF around 3 and EMPHASIS around 6, and raise CONTOUR AMT to about 7.
4. Shorten the FILTER CONTOUR: Attack 0, Decay 3, Sustain 2. Play low notes and you have a classic ladder bass.

TIP If the bass loses weight at high Emphasis settings, turn up RES BASS. It restores the low end that a ladder filter naturally thins out when it resonates.

3. Signal Flow

The audio path of every voice runs as follows:

OSC 1 · OSC 2 · OSC 3 · SUB · NOISE · RING 1×2 → MIXER (+ FEEDBACK) → LADDER FILTER → VCA
→ UNISON PAN → FX CHAIN (DIST · CRUSH · EQ · COMP · CHORUS · PHASER · DELAY · REVERB ·
LIMITER) → VOLUME

- **Oscillators.** All three oscillators and the sub are band-limited (anti-aliased) and follow the keyboard, glide and pitch modulation together. The SUB is derived from OSC 1, so it always stays phase-locked to it.
- **Mixer.** Each source has a level knob and an on/off lamp. FEEDBACK sends a saturated copy of the voice output back into the mixer.
- **Filter.** The cutoff is the sum of the CUTOFF knob, keyboard tracking, the filter contour (scaled by CONTOUR AMT), MOD MIX, velocity, sequencer accent, the matrix and the Cutoff CV input.
- **VCA.** The amplifier is driven by the LOUDNESS CONTOUR, scaled by velocity and accent.
- **Effects and volume.** The effects process the summed stereo signal. VOLUME is the final output level. Just before the effects, a DC-blocking filter removes any offset so the output stays centered.

4. The Front Panel

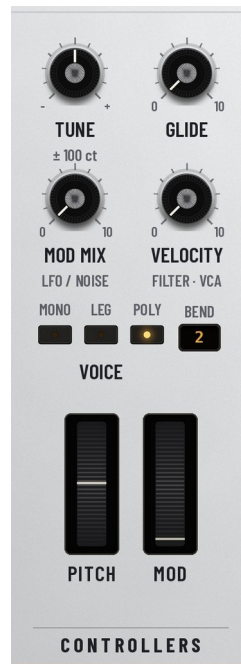


Volta M1 front panel (7U). The upper section is the synthesizer; the lower section holds the sequencer, matrix, unison and effects.

Hold Shift while dragging a knob for fine adjustment, and Ctrl/Cmd-click a control to reset it to its default (the default values are the Init patch). The panel header holds the device name tape, the patch browser, the Volta logo and the NOTE lamp.

Many knobs have a value ring: a colored arc that grows from the minimum to the current position, so you can read settings at a glance. On bipolar knobs (TUNE, SEMI, FINE) the arc grows left or right from 12 o'clock and disappears at the center. The arcs are orange in the synthesizer sections, blue in the X-MOD row and the sequencer.

4.1 Controllers



Control	Range / values	What it does
TUNE	±100 cents	Master fine tuning of the whole instrument. It is added to Reason's global master tune.
GLIDE	0 – 5 s	Portamento time. The glide is constant-time and exponential, like an analog lag circuit. In MONO it glides on every note, in LEGATO only on overlapping notes, and in POLY each new voice glides from the previous note.
MOD MIX	LFO ↔ Noise	Blends the modulation signal used by MOD AMOUNT between the selected source (LFO or OSC 3, see SOURCE) and smoothed noise. Fully clockwise gives random, nervous modulation.
VELOCITY	0 – 10	How much key velocity affects the sound. At 0 every note plays at full brightness and level. At higher settings soft notes become darker (the filter closes by up to 3 octaves) and quieter.
VOICE	Mono · Leg · Poly	MONO retriggers the envelopes on every note (last-note priority). LEGATO retriggers only after all keys are released, so overlapping notes slur. POLY gives 32 voices, or 16 / 8 notes with Unison 2 / 4.
BEND	1 – 12 semitones	Pitch-wheel range. Click the display and drag up or down.
PITCH / MOD	wheels	The performance wheels. They mirror your keyboard's wheels and can be automated. The Mod Wheel is also a matrix source.

4.2 Oscillator Bank



The small symbols around the WAVE knobs show the waveform at that knob position: triangle, sawtooth, square, narrow pulse and, on OSC 3, the folded wave.

OSC 1

Control	Range / values	What it does
RANGE	32' 16' 8' 4' 2'	Octave footage. 8' is concert pitch; each step is one octave.
WAVEFORM	TRI · SAW · SQR · PULSE	Continuous morph: triangle → sawtooth → square → narrowing pulse. Every position in between is usable and the knob can be modulated.
FILTER FM	On / Off	OSC 1 modulates the filter cutoff at audio rate. This gives metallic, aggressive tones, especially with resonance.

OSC 2

Control	Range / values	What it does
RANGE	32' – 2'	Octave footage.
SEMI	–12 ... +12	Semitone offset, for intervals such as fifths (+7) or octaves (±12).
FINE	±50 cents	Fine detune against OSC 1. Small offsets give the typical slow beating of analog oscillators.
WAVEFORM	TRI · SAW · SQR	Continuous morph from triangle through sawtooth to square.

Control	Range / values	What it does
SYNC	On / Off	Hard-syncs OSC 2 to OSC 1. Raise SEMI, or modulate OSC 2 pitch, for classic sync sweeps.

OSC 3

Control	Range / values	What it does
RANGE	LO, 32' – 2'	Octave footage. LO is three octaves below 8', which is a growling sub-audio range. In LFO mode, RANGE sets the base LFO rate (LO = 0.125 Hz up to 2' = 4 Hz).
SEMI / FINE	±12 st / ±50 ct	Pitch offset. In LFO mode they scale the rate.
WAVEFORM	FOLD · TRI · SAW · PW	The first quarter of the knob is the wavefolder: fully left is maximum folding, which gives bright, vocal harmonics, and the folding fades out toward triangle at about 2.5. From there the wave morphs to saw, square and an ever-narrower pulse (PW).
MODE	Audio / LFO	AUDIO is a third sound source. LFO slows OSC 3 down so it can be used as a second modulator (SOURCE switch, matrix source “OSC 3”). In LFO mode OSC 3 still reaches the mixer, as on the classic instruments. Switch its mixer lamp off unless you want the slow wave in the audio path.

SUB and NOISE

Control	Range / values	What it does
OCTAVE	–1 / –2	The sub oscillator plays one or two octaves below OSC 1.
SUB WAVE	SQR · SAW · TRI · PULSE	Continuous wave morph for the sub. Square gives the classic hollow sub; triangle gives a pure, round low end.
COLOR	White / Pink	Noise color. Pink noise is darker and better for wind and breath; white noise is brighter and better for percussive transients.
TONE	dark – bright	Filter for the noise. At the center the noise is unfiltered; turning left closes a low-pass down to about 300 Hz, turning right opens a high-pass up to about 6.4 kHz for thin, hissing noise.
DECAY	10 ms – 3 s / sustained	The noise fades out after every new note, which gives a breath or “chiff” at the start of the sound. Fully clockwise (the default) the noise is sustained.

NOTE The noise level itself is set in the MIXER (NOISE knob and lamp). TONE and DECAY only shape the noise.

X-MOD (cross-modulation)

The blue X-MOD row creates interactions between the oscillators. All controls are off (or neutral) by default, so older patches sound unchanged.

Control	Range / values	What it does
RING 1×2	0 – 10	Level of the ring modulator: OSC 1 multiplied by OSC 2, added to the mixer. It works even when the OSC 1 and OSC 2 mixer channels are off. Try OSC 2 SEMI at +7 or +19 for bells and metallic tones.
FM 3>1	0 – 10	OSC 3 modulates the pitch of OSC 1. With OSC 3 in LFO mode this is vibrato or trills; in AUDIO mode it is classic FM with bright, metallic sidebands.
FM 3>2	0 – 10	The same for OSC 2. Combined with SYNC it produces evolving sync-sweep sounds.
DRIFT	0 – 10	Slow random pitch movement, separately for each oscillator of each voice (up to about ±25 cents). Small amounts add analog life and width; large amounts sound like an unstable vintage instrument.
OSC 3 KBD	On / Off	When off, OSC 3 ignores the keyboard and stays on a fixed pitch (set with RANGE, SEMI and FINE). Useful when OSC 3 is a modulator for FM, or as a drone.

4.3 Mixer



Each source (OSC 1, OSC 2, OSC 3, SUB, NOISE) has a level knob and a lamp button below it. The lamp switches the channel on or off without losing the level setting. The level knobs have an audio-taper curve.

Control	Range / values	What it does
OSC 1 / 2 / 3	0 – 10	Oscillator levels. OSC 3 needs MODE set to AUDIO.

Control	Range / values	What it does
SUB	0 – 10	Sub-oscillator level.
NOISE	0 – 10	Noise level (white or pink, see COLOR).
FEEDBACK	0 – 10	Sends the soft-clipped voice output back into the mixer input. Low settings thicken the sound; high settings give heavy, compressed overdrive that interacts with the filter resonance.

NOTE Pushing several sources to full level drives the filter input harder. This is intentional: ladder filters sound best slightly overdriven. Use VOLUME, not the mixer, to set the final output level.

4.4 Modifiers: Filter and Contours



Filter · Multimode Ladder

Control	Range / values	What it does
CUTOFF	20 Hz – 20 kHz	Filter cutoff frequency on an exponential scale.
EMPHASIS	0 – 10	Resonance. Above about 9 the filter self-oscillates and produces a sine tone at the cutoff frequency, which tracks the keyboard when KBD TRACK is FULL.
DRIVE	0 – 10	Input gain into the ladder's saturating stages. It adds warmth and harmonics and changes how the resonance behaves.
CONTOUR AMT	0 – 10	How much the FILTER CONTOUR opens the cutoff (up to 6 octaves).

Control	Range / values	What it does
RES BASS	0 – 10	Bass compensation. A ladder filter loses low end as resonance rises; RES BASS feeds the bass back in. At 0 you hear the classic thin, squelchy resonance; higher settings keep the bottom end solid.
FILTER MODE	8 modes	4P LP (24 dB) is the classic ladder. 2P LP (12 dB) and 1P LP (6 dB) are gentler. 2P BP and 4P BP are band pass (narrow and nasal). 2P HP and 4P HP are high pass. NOTCH is a band-reject filter for phaser-like sweeps.
KBD TRACK	Off · 1/3 · 2/3 · Full	How much the cutoff follows the played note. FULL tracks 1:1, so the filter opens one octave per keyboard octave.

Filter Contour and Loudness Contour

Both contours are ADSR envelopes. The FILTER CONTOUR modulates the cutoff (depth set by CONTOUR AMT); the LOUDNESS CONTOUR drives the VCA.

Control	Range / values	What it does
ATTACK	1 ms – 10 s	Time to rise to the peak after a key is pressed.
DECAY	1 ms – 10 s	Time to fall from the peak to the sustain level.
SUSTAIN	0 – 10	Level held while the key is down.
RELEASE	1 ms – 10 s	Time to fall to zero after the key is released.
LOOP	On / Off	When on, the contour repeats its attack and decay cycle for as long as the key is held. This makes it a key-synced, tempo-free modulator, useful for pulsing filters and tremolo-like loudness effects. Use low Sustain settings for the clearest effect.

4.5 Modulation and Output



Control	Range / values	What it does
RATE	0.05 – 40 Hz / 4 bars – 1/32	LFO speed. The lamp next to the knob blinks at the LFO rate. With SYNC set to TEMPO the knob selects note values: 4 bars, 2 bars, 1 bar, 1/2, 1/4, 1/4T, 1/8, 1/8T, 1/16, 1/32. When the song is playing, the synced LFO is locked to the song position.
SHAPE	TRI · SQR · S&H	LFO waveform: triangle, square, or sample & hold (a new random value each cycle).
SYNC	Free / Tempo	Free-running rate in Hz, or locked to the Reason tempo.
SOURCE	LFO / OSC 3	The modulation source for MOD AMOUNT. OSC 3 as source gives audio-rate FM when OSC 3 is in AUDIO mode, or a second LFO in LFO mode.
TO PITCH	0 – 10	Modulation amount to the oscillators' pitch, up to ± 12 semitones. The curve is fine at the start, for subtle vibrato.
TO FILTER	0 – 10	Modulation amount to the filter cutoff (up to ± 4 octaves).
VOLUME	$-\infty$... +9 dB	Master output level. 7 on the scale equals 0 dB. Volume can also be controlled by the Volume CV input.

TIP The Mod Wheel does not add modulation by itself: route it in the Mod Matrix. For example, Mod Wheel → Mod>Pitch brings in LFO vibrato through TO PITCH, and Mod Wheel → Cutoff opens the filter. Many factory patches already do this.

4.6 Arpeggiator and Step Sequencer



Control	Range / values	What it does
RUN	On / Off	Switches the arpeggiator or sequencer on.
Button with LED below RUN	On / Off	Starts the arpeggiator or sequencer without holding a key (Remote name: Arp/Seq Run). In ARP mode it plays the last key you played; in SEQ mode the sequence plays right away, regardless of KEYS. Only works while RUN is on.
MODE	ARP / SEQ	Arpeggiator (plays the held keys) or 16-step sequencer (plays the programmed steps).
RATE	1/4, 1/8, 1/8T, 1/16, 1/16T, 1/32	Step length in note values, always following the Reason tempo.
GATE	0 – 10	Note length as a percentage of the step. Steps with GLIDE hold through into the next step (legato slide).
SWING	0 – 10	Delays every second step by up to half a step, for shuffle grooves.
DIRECTION	UP · DN · U/D · RND	Note order in ARP mode, step order in SEQ mode: forward, backward, ping-pong or random.
OCT	1 – 4	Arpeggiator octave range (ARP mode only).
STEPS	1 – 16	Number of active sequencer steps (SEQ mode).

Control	Range / values	What it does
KEYS	On / Off	Key transpose. When ON in SEQ mode, the sequence runs while a key is held and is transposed by the key (C3 plays the sequence as written). When OFF, the sequence runs on its own whenever the Reason transport plays, or while the Run CV input is high.

Step rows

- **Step LEDs** show the current step.
- **PITCH faders** set each step's note offset, ± 24 semitones from the root (C3, or the held key with KEYS). A blue bar runs from 0 to the fader, so transposed steps are easy to spot.
- **GATE buttons** switch a step on or off. Off steps are rests.
- **ACCENT buttons** play the step louder and brighter: the filter opens by about 0.6 octave, resonance rises slightly and the level goes up by about 35%. Accent is also a matrix source ("Seq Accent").
- **GLIDE buttons** make the step slide into its pitch from the previous one without retriggering the envelopes. If the GLIDE knob is at 0, a fixed 50 ms slide is used, which gives the classic acid-bass behavior.

Pattern presets

The PATTERN row below the steps holds INIT plus 50 sequencer presets (PRESET 1 – PRESET 50). INIT is a flat pattern: all 16 steps on, pitch 0, no accents or glides. Click the display to open a list of all presets and choose one, just like a patch browser. The left and right arrow buttons next to it step to the previous or next preset; the list wraps around.

A preset sets all 16 steps (pitch, gate, accent, glide) together with RATE, GATE, SWING, STEPS and DIRECTION, and switches MODE to SEQ. The faders and buttons move to the new values, so you can edit the pattern straight away. Loading a preset can be undone with Edit > Undo, and the pattern is saved with the patch like every other setting. The Init patch uses the INIT pattern.

The presets are grouped in fives: acid lines, bass lines, Berlin-school sequences, arpeggios, gate rhythms, melodies, odd-length (polyrhythmic) patterns, swing grooves, dark patterns, and experimental patterns that use the DIRECTION and glide.

Timing

When the Reason transport is playing, the arpeggiator and sequencer lock to the song position, so patterns stay in sync wherever you start playback. After a song loop or a locator jump they release the sounding note and return to the bar grid at the new position. When the transport is stopped, they run freely at the current tempo, starting as soon as you press a key (or switch on the RUN button). The Reset CV input restarts the sequence at step 1.

TIP Keyboard notes go to the arpeggiator in ARP mode and set the transposition in SEQ mode with KEYS on. With KEYS off in SEQ mode, the keyboard plays the synth normally on top of the running sequence.

4.7 Mod Matrix



Six identical slots each connect a SOURCE to a DESTINATION with a bipolar AMOUNT knob (center = 0, left = negative, right = positive). Click a display to choose from the list. Several slots may target the same destination; their amounts add up.

Source	Description
Off	No modulation.
Velocity	Note-on velocity (0 ... 1).
Aftertouch	Channel pressure.
Mod Wheel	Modulation wheel (plus Mod Wheel CV).
Pitch Bend	Pitch wheel, bipolar.
LFO	The global LFO, bipolar.
OSC 3	OSC 3 output (audio or LFO mode).
Filter Env	Filter contour of the voice.
Amp Env	Loudness contour of the voice.
Key Track	Note number, centered on C3 (MIDI note 60).
Seq Accent	1 on accented sequencer steps.
CV 1 / CV 2	Rear-panel Matrix CV inputs.
Random	A new random value for every note.

Destination	Description
Pitch	All oscillators (± 12 semitones at full amount).
OSC2 Pitch / OSC3 Pitch	One oscillator only. Great with SYNC.
OSC1/2/3 Wave	Waveform morph position (PWM-style movement).
Sub Wave	Sub wave morph.
Noise Lvl	Noise level in the mixer.
Cutoff	Filter cutoff (± 5 octaves).
Emphasis	Filter resonance.
Drive	Filter drive.
Res Bass	Resonance bass compensation.
LFO Rate	Global LFO speed (global sources only: wheels, aftertouch, CV).
Amp	Voice level (tremolo, velocity curves).
Contour	Filter contour amount.
Mod>Pitch / Mod>Filter	The MOD AMOUNT knobs, e.g. Mod Wheel $\rightarrow$ Mod>Pitch for vibrato on demand.

INIT PATCH All six slots are Off in the Init patch, so the wheels and aftertouch do nothing until you route them.

4.8 Unison



Control	Range / values	What it does
VOICES	1 · 2 · 4	Number of stacked voices per note. Unison uses voices from the 32-voice pool: with 4 unison voices, POLY mode plays 8 notes and with 2 it plays 16.

Control	Range / values	What it does
DETUNE	0 – 50 cents	Total pitch spread between the stacked voices.
SPREAD	0 – 10	Stereo spread of the stacked voices.

4.9 Effects



The effects section is a chain of nine effects. The signal passes through them in the order of the FX CHAIN list, from top to bottom: Distortion → Bitcrush → EQ → Compressor → Chorus → Phaser → Delay → Reverb → Limiter.

- **Lamp** (left of each name): switches that effect on or off. Any number of effects can run at the same time.
- **Name button**: shows that effect's controls on the right. Selecting an effect does not switch it on; each effect keeps its settings whether it is shown or not.
- **Display**: shows the effect name and, depending on the effect, a TYPE list (click it to choose), the EQ low cut, the delay time and SYNC button, or a gain-reduction meter (GR, 2 dB per segment).



The nine effect pages (Delay shown with SYNC on).

Distortion

Control	Range / values	What it does
TYPE	Overdrive, Tube, Fuzz, Hard Clip, Fold, Rectify	Shaper character. Tube and Overdrive are warm, Fuzz is square and buzzy, Hard Clip is harsh, Fold adds bright wavefolding, Rectify adds an octave-up grit.
DRIVE	0 – +40 dB	Input gain into the shaper. The output is compensated, so higher drive mainly changes the character.
TONE	dark – bright	Low-pass filter after the shaper.
BIAS	-/+	Shifts the signal before the shaper for asymmetric (even-harmonic) distortion.
LOW CUT	20 Hz – 20 kHz	High-pass before the shaper; raise it to keep the low end clean and tight.
OUTPUT / MIX	±12 dB / 0 – 100 %	Output level and dry/wet balance.

Bitcrush

Control	Range / values	What it does
BITS	1 – 16 bit	Bit depth. Lower values add grainy quantization noise.

Control	Range / values	What it does
RATE	200 Hz – 48 kHz	Sample rate of the decimator. Low settings give metallic aliasing.
DRIVE	0 – 10	Saturation before the crusher.
TONE / MIX	dark – bright / 0 – 100 %	Smoothing filter after the crusher and dry/wet balance.

EQ

Control	Range / values	What it does
LOW CUT	Off · 30 Hz · 80 Hz	High-pass filter (12 dB/oct) on the display. 80 Hz cleans up pads and leads in a busy mix; 30 Hz only removes rumble.
LOW / FREQ	±15 dB / 30 – 600 Hz	Low shelf: boost or cut everything below the frequency.
MID / FREQ	±15 dB / 200 Hz – 8 kHz	Bell (peak) band for presence, nasal tones or scooping the middle.
HIGH / FREQ	±15 dB / 1.5 – 16 kHz	High shelf: air and brightness, or taming harsh highs.

The gain knobs are at 0 dB in the center. Because the EQ sits before the compressor, the compressor reacts to the equalized sound, and the delay and reverb receive the cleaned-up signal.

Compressor

Control	Range / values	What it does
THRESH	–40 – 0 dB	Level above which compression starts (soft knee).
RATIO	1:1 – 20:1	Amount of compression above the threshold.
ATTACK / RELEASE	0.1 – 100 ms / 10 – 1000 ms	How fast the compressor reacts and lets go.
MAKEUP	0 – +24 dB	Gain after compression.
MIX	0 – 100 %	Blend with the uncompressed signal (parallel compression).

Chorus

Control	Range / values	What it does
RATE / DEPTH	0.1 – 5 Hz / 0 – 10	Speed and depth of the ensemble modulation.
WIDTH	0 – 10	Stereo width: at 0 both sides move together, at 10 in opposite directions.
MIX	0 – 100 %	Dry/wet balance.

Phaser

Control	Range / values	What it does
TYPE	4, 6, 8, 12 stages	More stages give more notches and a deeper, more complex sweep.
RATE / DEPTH	0.1 – 5 Hz / 0 – 10	Sweep speed and range.
RESO	0 – 10	Feedback: emphasizes the peaks between the notches.
WIDTH	0 – 10	Phase offset between left and right for a moving stereo image.
MIX	0 – 100 %	Dry/wet balance; at 100 % the notches are deepest.

Delay

Control	Range / values	What it does
TYPE	12 types (see below)	Delay character.
TIME	10 ms – 2 s / 1/32 – 2/1	Delay time. With SYNC off it is a smooth knob in milliseconds. With SYNC on, a stepped knob takes its place with 16 note values: 1/32, 1/16T, 1/16, 1/8T, 3/32, 1/8, 1/4T, 3/16, 1/4, 1/2T, 3/8, 1/2, 3/4, 1/1, 3/2 and 2/1 (up to 4 s). Both knobs keep their own setting, and the display and tooltip show the current value.
SYNC	On / Off	Button on the display: note values locked to the Reason tempo, or free time in ms. The DELAY button in the FX CHAIN always opens the page in the current mode.
REPEATS	0 – 10	Feedback: number of repeats.
TONE	dark – bright	Filtering of the repeats.
MOD	0 – 10	Depends on the type, see the table below.
WIDTH	0 – 10	Cross-feedback between left and right (at 10 the echoes ping-pong).
MIX	0 – 100 %	Level of the echoes.

Delay type	Character	MOD controls
Analog	Bucket-brigade style: repeats get darker and slightly dirty.	Depth of a slow wow
Tape	Tape echo with wow and flutter and tape saturation; time changes glide.	Wow / flutter and saturation
Digital	Clean, full-bandwidth repeats.	Gentle chorus-like modulation
Ping-Pong	Repeats bounce between left and right; WIDTH sets how far.	–

Delay type	Character	MOD controls
Dual L/R	Different times left and right.	Right/left time ratio: 1/2, 2/3, 3/4, 3/2
Multi-Tap	Rhythmic taps before the main echo.	Level of the extra taps
Slapback	One short echo; TIME covers 40 – 180 ms (set SYNC off to adjust it).	–
Reverse	The echoes play backwards.	–
Lo-Fi	Low sample rate and bit depth on the repeats.	Amount of degradation
Diffuse	Every repeat smears a little more, until it turns into reverb.	Diffusion
Pitch Up	Each repeat is shifted one octave up (shimmer echo).	Share of the shifted signal
Ducking	Echoes duck while you play and swell up in the gaps.	Ducking depth

Reverb

Control	Range / values	What it does
TYPE	16 types	Spring, Ambience, Small Room, Dense Room, Chamber, Studio, Plate Short, Plate Long, Fat Plate, Hall, Dense Hall, Large Hall, Big Cave, Deep Space, Gated, Shimmer. Spring is a dispersive spring tank; Gated cuts the tail when you stop playing; Shimmer adds an octave-up halo to the tail.
SIZE	0 – 10	Room size.
DECAY	0.2 – 20 s	Reverb time (scaled per type).
DAMP	0 – 10	High-frequency damping: higher is darker.
PRE-DLY	0 – 200 ms	Gap between the dry sound and the reverb.
WIDTH	0 – 10	Stereo width of the reverb.
MIX	0 – 100 %	Reverb level.

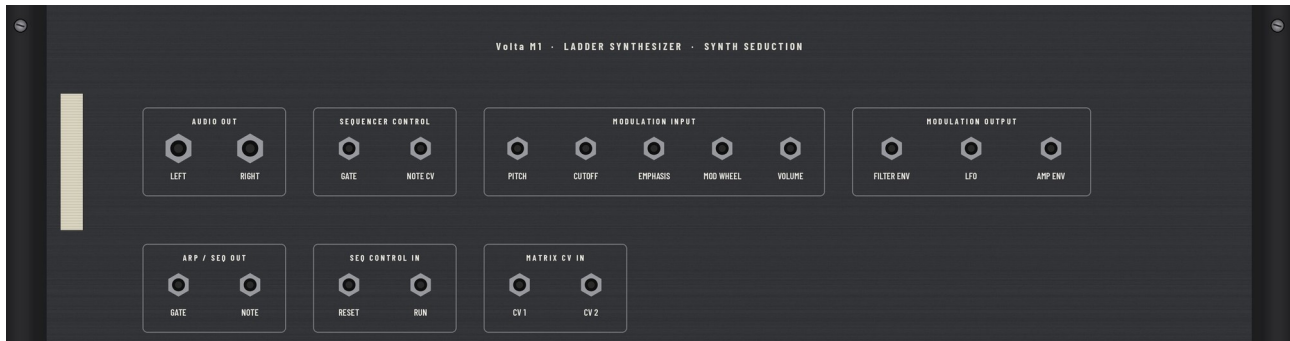
Limiter

Control	Range / values	What it does
INPUT	0 – +18 dB	Gain into the limiter. Push it to make the sound louder and denser.
CEILING	–12 – 0 dB	Maximum level at the limiter output. VOLUME comes after the limiter.
RELEASE	1 – 1000 ms	How fast the gain recovers. Short is loud and punchy, long is smooth.

TIP Switching an effect off fades it out smoothly. Delay and Reverb are cleared when they are switched off, so they always start fresh when switched on again.

5. The Rear Panel

Press Tab in Reason to flip the rack around.



Volta M1 rear panel

Group	Connector	Function
Audio Out	Left, Right	Stereo main output. It is connected to a Mix Channel automatically.
Sequencer Control	Gate, Note CV	Play Volta M1 from a CV sequencer such as the Matrix Pattern Sequencer. These inputs are auto-routed when you create a Matrix under the device.
Modulation Input	Pitch	Pitch CV for all oscillators. A full-scale CV equals ± 12 semitones.
	Cutoff	Filter cutoff CV (± 5 octaves at full scale).
	Emphasis	Filter resonance CV.
	Mod Wheel	Added to the Mod Wheel, so it also drives every matrix slot that uses the Mod Wheel.
	Volume	Output level CV (0 = silent ... 2 $\times$ level).
Modulation Output	Filter Env, LFO, Amp Env	CV outputs of the filter contour, the global LFO and the loudness contour (of the most recently played voice). Use them to modulate other devices.
Arp / Seq Out	Gate, Note	Gate and note CV of the arpeggiator/sequencer. Connect them to another synth's Sequencer Control inputs to let Volta M1's patterns play a second instrument.
Seq Control In	Reset, Run	RESET restarts the sequence at step 1 on a rising edge. RUN starts the sequencer (SEQ mode, KEYS off) while the CV is high, even when the Reason transport is stopped.
Matrix CV In	CV 1, CV 2	Free CV inputs that appear as sources "CV 1" and "CV 2" in the Mod Matrix.

6. Performance, Automation and Remote

6.1 Performance controls

- **Pitch bend** uses the BEND range of 1–12 semitones.
- **Mod Wheel and Aftertouch** are available as matrix sources. The Init patch leaves them unassigned; many factory patches use them.
- **Sustain pedal** holds notes in all voice modes and also holds the notes feeding the arpeggiator.
- **Velocity** is scaled by the VELOCITY knob and is also a matrix source.

6.2 Automation

Every front-panel control can be automated in the Reason sequencer: Alt-click (Option-click on Mac) a control, or record its movement. Performance controllers (wheels, aftertouch, sustain) are recorded with the notes.

6.3 Remote control and MIDI

All parameters have Remote names, so they can be mapped to hardware controllers with Remote Override (right-click a control > Edit Remote Override Mapping). Parameters are listed in Remote and automation menus by group: Controllers, Oscillators, Mixer, Filter, Contours, Modulation, Arp/Seq, Mod Matrix, Unison and Effects.

NOTE Volta M1 has no fixed MIDI CC map. Reason reserves a number of CC numbers for its own use, so use Remote Override to assign knobs on your controller.

7. Sound Design Recipes

Fat mono bass

Set VOICE to MONO. Use OSC 1 saw, and OSC 2 saw at 16' with FINE slightly detuned. Turn SUB to 6. Set the filter to 4P LP with CUTOFF at 2.5, EMPHASIS at 4, CONTOUR AMT at 6 and RES BASS at 7. For the Filter Contour use A 0, D 3, S 1. Add FEEDBACK at 2 for grit.

Acid line

Turn RUN on in SEQ mode at RATE 1/16 with KEYS on. Use OSC 1 square with the mixer playing OSC 1 only. Set the filter to 4P LP with CUTOFF at 2, EMPHASIS at 8, CONTOUR AMT at 7, Filter Contour Decay at 2.5 and RES BASS at 2. Program a few ACCENT and GLIDE steps, then hold a key.

Sync lead

Set VOICE to LEGATO and GLIDE to 2. Turn OSC 2 SYNC on with SEMI at +7. In the matrix, route Filter Env → OSC2 Pitch with an amount around +0.4. Use 2P LP with CUTOFF at 5 and EMPHASIS at 3. Switch DELAY on (type Analog, SYNC on, TIME 1/8) with MIX at 3.

Wide poly pad

Set VOICE to POLY with UNISON at 2, DETUNE at 4 and SPREAD at 8. Set both oscillators to triangle/saw. Use 2P LP with CUTOFF at 4 and KBD TRACK at 2/3. Set the Loudness Contour to A 6, D 5, S 8, R 7. Switch CHORUS on with DEPTH at 6, and REVERB on (type Hall) with MIX at 3.

Wavefolded pluck

Use OSC 3 in AUDIO mode only, with WAVEFORM turned left into FOLD. In the matrix, route Filter Env → OSC3 Wave with an amount of -0.6. Set the Loudness Contour to A 0, D 3, S 0, R 3 and the filter to 1P LP, wide open.

Ring-mod bell

Mixer: switch OSC 1 and OSC 2 off. In X-MOD, set RING 1×2 to 7. Set OSC 2 SEMI to +7 and FINE slightly off-center; use triangle waves on both oscillators. Set the Loudness Contour to A 0, D 6, S 0, R 6 and switch REVERB on (type Plate Long).

Breathy flute

Use OSC 1 triangle and raise NOISE in the mixer to about 4. Set COLOR to Pink, TONE slightly right and DECAY to about 3, so the breath fades as the note settles. Set the filter to 2P LP with CUTOFF around 5, add DRIFT at 2 and a slow Loudness Contour attack.

Self-oscillating filter as a sine voice

Switch all mixer channels off. Set EMPHASIS to 10, KBD TRACK to FULL and CUTOFF to about 5. The filter itself now plays a pure tone that follows the keyboard.

8. Specifications

Item	Value
Device type	Instrument, Rack Extension for Reason
Rack height	7U (the front panel can be folded)
Polyphony	32 voices; Mono and Legato modes; Unison 1/2/4
Oscillators	3 morphing VCOs + sub oscillator + white/pink noise with tone and decay; ring mod, FM 3>1 / 3>2, analog drift
Filter	Zero-delay-feedback ladder, 8 modes, self-oscillating, Drive, RES BASS, audio-rate FM
Envelopes	2 × ADSR (1 ms – 10 s) with Loop
LFO	Triangle, square, S&H; 0.05 – 40 Hz or tempo-synced (4 bars – 1/32)
Mod matrix	6 slots, 14 sources, 18 destinations
Arp / Seq	Arpeggiator (4 directions, 1–4 octaves); 16-step sequencer with pitch, gate, accent and glide, 4 directions, 50 pattern presets; swing; song-locked
Effects	9-slot chain: Distortion (6 types), Bitcrush, 3-band EQ with low cut, Compressor, Chorus, Phaser (4–12 stages), Delay (12 types, tempo sync), Reverb (16 types), Limiter
CV	11 inputs, 5 outputs
Sample rates	44.1, 48, 88.2, 96 and 192 kHz
Patches	Standard Reason .repatch; 454 factory patches in 11 folders plus Init

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