DOODOV DIGITAL DESIGN

SPLiTFiRE FURIOSO

In-Depth Manual • Complete technical reference

Front panel

Back panel

This manual is a complete technical reference for Splitfire Furioso. Every control, every CV input and output, every mode, every behavior under every state combination — documented with the precision of an instrument datasheet. For first-time use, see the Quick Reference card. For everyday workflow help, see the Operation Manual. This document is what you reach for when you need to know exactly what a knob does under a specific mode combination, or when CV is patched, or under quantize lock.

Audience: producers, patch designers, Combinator builders, anyone driving Furioso with extensive CV.
Conventions: ranges are inclusive. Times are in milliseconds at 48 kHz unless noted. Knob positions are normalized 0..1 (0 = full counter-clockwise, 1 = full clockwise).
Version: documents Furioso v3.2 (CV expansion + recording-swap safety). Earlier versions may lack cv_slices, cv_mod_stutter_rate, and cv_mod_stutter_win.

Contents

1. Introduction and design philosophy

Splitfire Furioso is a compact live sampler Rack Extension for Reason. It is the aggressive sibling of Splitfire Rubato, designed for a fundamentally different use case. Where Rubato is the expressive flagship — large rack footprint, many voices, long buffer, dual playback engines, designed for a single producer working on a single delicate phrase — Furioso inverts every one of those choices. Three voices. Sixteen slices maximum. Roughly four seconds of buffer. Tape-only playback engine. Two rack units. The design thesis is: if we accept hard constraints, what becomes possible?

Answer: stacking. Five Furiosos in a Combinator use less RAM than one Rubato, fit in 10 rack units, and let you decompose a groove into independent rhythmic voices — each with its own slice grid, loop behavior, CV routing, mute state, and character. The Combinator brings them together. The cv_slice_count output wires to Thor sequencers for self-synchronizing polyrhythmic phrases. The cv_gate_rec input fires from a sequencer for evolving sample-mangling that recaptures audio on every bar.

Furioso emphasizes immediacy. Recording is one button press. The waveform updates live during capture. The voice machinery is click-free across all combinations of voice mode, play mode, and loop mode — extensive engineering work has eliminated the gain-step and waveform-discontinuity artifacts that haunt naive sampler implementations. Recording over actively-playing voices (common in CV-driven workflows) is handled by per-voice fade-in machinery that hides the buffer swap. Unforgiving CV abuse produces "controlled mayhem" — loud, surprising, but never harmful — rather than digital noise.

1.1 Position in the Splitfire family

Splitfire Rubato	Full-featured live sampler, 4 RU. "Rubato" = stolen time, expressive timing. Dual engine (Tape + granular Time), 8 voices, 64 slices, up to 25 s sample memory. Flagship of the family.
Splitfire Furioso	Compact aggressive derivative, 2 RU. "Furioso" = furiously, with fury. Tape-only engine, 3 voices, 16 slices, ≈ 4 s sample memory. Built for hosting multiple instances in Combinator patches.

Both devices share the underlying sampler DNA. The voice allocation logic, the click-elimination machinery, the slicing engine, the swap-fade safety mechanism — all of these are common code. Where they diverge is in capacity (voice count, buffer length, slice maximum) and feature set (granular Time engine in Rubato only; mute, retrigger voice mode, input meter in Furioso only).

2. Specifications at a glance

Parameter	Range	Default	Notes
Format	Reason Rack Extension	—	SDK 4.x, Reason 13 compatible.
Rack size	2 RU	—	3770 × 690 px panel.
Sample buffer	≈ 4 s	mono dual-buffer	Stereo, recorded into separate L/R arrays. Length set at compile time.
Voice pool	3	—	Allocated by priority: inactive slot → release-tail voice → oldest active voice.
Slice count	1..16	—	Settable via panel Auto/Manual mode or cv_slices override.
Play engine	Tape-only	—	No granular Time engine (Rubato territory).
CV inputs	20	—	See section 12 for full enumeration.
CV outputs	2	—	cv_slice_count, cv_playhead.
Audio outputs	Stereo main + 3 per-voice	—	Main = mixed/panned/degraded. Per-voice = raw, no pan, no degradation.

Sample rate support	44.1 / 48 / 88.2 / 96 kHz	48 kHz	Internal constants are samples — fade lengths scale with rate.
Channels	Stereo throughout	—	Inputs and outputs.

3. Front panel anatomy

Front panel, left to right

The front panel is organized as a flow from sample-capture through playback. Far left is the sample-shaping zone (slicing, fades). Middle-left is stutter. Center is the live waveform display flanked by START/END pitch-region knobs. Below the display is the channel/record cluster. Right side is playback control. Top right is the voice-parameter cluster (envelope, pan, degradation, volume). Far right is the status display.

3.1 Sample zone

Controls that shape how the sample is sliced and how loops behave. Located in the dark-brick rounded cluster on the far left.

Parameter	Range	Default	Notes
FADE MODE	Manual / Auto	Auto	Manual: XFADE knob sets loop crossfade length directly. Auto: crossfade length is computed from loop region length using an internal formula.
XFADE	0..100% of loop region	50%	Loop crossfade length. Active in Manual fade mode. In Auto mode the knob is read but its effect is influenced by region length.
SLICES (knob)	1..16 (integer)	8	Slice count in Manual mode. Ignored in Auto mode and when cv_slices is patched.
SLICES (button)	Auto / Manual	Auto	Auto = transient-detection slicing using TRANS sensitivity. Manual = equal divisions using the SLICES knob. Both are overridden by cv_slices when patched.
TRANS	0.0..1.0	0.5	Transient sensitivity for Auto mode. Higher = more peaks detected = more slices.

Note When cv_slices is patched on the back panel, the FADE MODE / SLICES auto-manual toggle and the SLICES knob are both functionally bypassed. The cv_slices input value × 16 (rounded) becomes the active slice count and equal-divisions slicing is enforced. The TRANS knob is also bypassed in this state.

3.2 Stutter zone

Stutter is a per-voice effect that captures a chunk of the playback (the "window") and repeats it at a settable rate while engaged. Engaging stutter mid-playback freezes the window at the current position.

Parameter	Range	Default	Notes
SIZE	0..1 → ~10 ms..1 s window	0.5	Stutter window length. Frozen at engage time — adjusting the knob while stuttering does NOT change the active window. Mapped exponentially.
STUT (button)	On / Off	Off	Engage / disengage stutter. Also responsive to back-panel cv_gate_stutter (gate high = stutter engaged).
RATE	0..2× speed	1×	Stutter playback rate. Live — modulating while stutter is engaged sweeps the playback rate, producing pitch-down or pitch-up effects on the held window.

3.3 Channel zone

Voice-mode selector, recording quantize controls, mute, and fixed-mode length. Located between the stutter zone and the record cluster.

Parameter	Range	Default	Notes
MUTE (button)	On / Off	Off	Mutes the device. Display dims, all voices stop emitting output. Also responsive to back-panel cv_mute (rising edge or level > 0.5).
VOICE Q	Poly / Mono / Legato / Retrigger	Poly	Voice mode selector. Detailed in section 6.1.
SIZE	5 bar fractions	1 bar	Recording quantize size. Active in Q rec mode. Five musical fractions mapped to a 5-position switch.
LEN	0..max buffer length	1.0 s	Fixed-mode recording length. Active in FIXED rec mode.

3.4 Record zone

Big red buttons for record, clear, and undo, plus the rec-mode select (HOLD/FIXED/Q) and the IN level meter.

Parameter	Range	Default	Notes
REC (button)	Momentary / Latching	—	Behavior depends on rec mode. HOLD: button-down captures until released. FIXED: button press starts fixed-length capture. Q: button press arms capture; actual record start/end snap to bar boundaries.
CLR (button)	Momentary	—	Clears the sample. Recording state becomes Empty. Display blanks. Also responds to cv_gate_clear rising edge.
UNDO (button)	Momentary	—	Restores the previous sample (one level of undo). Useful after clear or unintended overdub.
HOLD / FIXED / Q	3-way exclusive	HOLD	Three small buttons below the rec-action cluster, under the HOLD label. Exactly one is always active.
IN meter	4 LEDs: green/ green/yellow/r ed	—	Pre-record input level indicator. Red LED lights above 0 dBFS — Reason mixer clips at this point. Watch while feeding signal into the device.

3.5 Waveform display

The amber/orange waveform display sits center-top. It shows the captured sample as an envelope plot with slice boundaries (yellow), playhead position (red), pitch-mode region (between START and END), and live recording activity when capturing.

Parameter	Range	Default	Notes
START (knob)	0..1	0	Start of the pitch-mode region. In Pitch mode, only audio between START and END is played. Green indicator on the display.
END (knob)	0..1	1	End of the pitch-mode region. Red indicator on the display. END must be > START (the device internally enforces this).

Note START and END are only meaningful in Pitch play mode. In Slice mode they have no effect; slice boundaries come from the slicing system (auto/manual/CV).

3.6 Playback zone

Speed, reverse, play mode, loop controls. Located on the right side of the lower row of controls.

Parameter	Range	Default	Notes
SPEED	0..3× (piecewise)	1× at center detent	Playback speed. Piecewise mapping: lower half (0..0.5 knob) maps linearly to 0..1× speed; upper half (0.5..1.0) maps linearly to 1..3× speed. The detent at 0.5 is unity. The 2..3× zone enters audible aliasing — deliberate.
PITCH (button)	Slice / Pitch	Slice	Play-mode select. Detailed in section 6.2.
REV (button)	Forward / Reverse	Forward	Reverse playback. Affects current and subsequent notes. Also responsive to back-panel cv_mod_reverse (toggle or level above 0.5).
LEN	0..1 × region length	1.0	Loop length within the playing slice or pitch region. Reducing pulls the loop end inward; the wrap point is recomputed live.
LOOP (button cluster)	Off / On variants	Off	Loop on/off and behavior variants. Loop Off = one-shot. Loop On = playback wraps from end back to loop-back with crossfade.
MODE (button)	multiple	default	Loop mode behavior variant — affects how the loop-back point is computed and how the crossfade is applied.
PERF (button)	Performance switch	default	Expression/performance feel switch — affects velocity response and envelope behavior across the voice pool.

3.7 Voice parameter cluster (top right)

Envelope, root note, pan, degradation, and volume. Top-right cluster of small knobs.

Parameter	Range	Default	Notes
ROOT	C-2..G8	C3	Root note for slice-mode key mapping. Note that maps to slice 1 (Mono/Legato) or to the first triggered voice (Poly).
PORTA	0..1 → 0..2 s glide	0 (no glide)	Portamento time. Active in Legato and Mono voice modes. Glide between consecutive notes.
ATK	0..1 → 0..2 s attack	0 (instant)	Envelope attack time. Linear ramp from 0 to peak.
REL	0..1 → 0..4 s release	0 (instant)	Envelope release time. Linear ramp from peak to 0 after NoteOff.
PAN	0..1 → spread	0.5 (no spread)	Stereo pan spread across the three voices. 0 = all voices centered. 1 = maximum spread (V1 far left, V2 center, V3 far right). Applies to main outputs only; per-voice outs are unaffected.
DEGR	0..1 → bit/rate degrade	0 (clean)	Bit depth and sample rate degradation. Bottom of knob = clean (16-bit, full rate). Top = 4-bit @ 6 kHz (Akai S900 / SP-12 territory). Applies to main outputs only; per-voice outs bypass degradation.
VOL	0..1 → 0..+6 dB	0.5 (unity)	Output volume, post-degradation. Affects main outputs.

3.8 Status display (far right)

The far-right amber display shows live device state in three regions: a top icon row, a large numeric area, and a bottom icon row.

Top row (left)	M = mute status; loop icon = current loop mode (off/on/variant); transport arrow = transport sync state.
Top row (right)	Numeric: current slice in Slice mode, or pitch/note value in Pitch mode (formatted as e.g. "1.00" for slice 1).
Bottom row	Active slice number (integer); lock icon if quantize lock is engaged; slice-diff indicator (small pixel-block icon) if the currently rendered slice differs from the most recent NoteOn slice.

4. Back panel anatomy

Back panel — 20 CV inputs + 2 CV outputs

The back panel is organized in two horizontal bands. Top band: audio I/O (VOL trim, IN L/R, OUT L/R, per-voice outputs V1/V2/V3, sequencer GATE/NOTE, cv_slice_count output). Bottom band: control CVs (REC, CLR, MUTE gates; START/END mod; SLICES override; PORTA, ATK, REL mods; WIN/STUT/RATE stutter mods (v3.2); REV; SPEED, LEN mods; cv_playhead output).

4.1 Audio I/O

Parameter	Range	Default	Notes
VOL (trim)	0..1 → 0..2× linear	0.5	Input level trim. Applied before recording. Use to compensate for hot or quiet incoming signals.
IN L / IN R	Audio input	—	Stereo audio input. Source for recording. Reads as mono-summed if only IN L is patched.
OUT L / OUT R	Audio output	—	Main stereo mix output. All voices summed, post-pan, post-degradation, post-volume.
OUT V1 / V2 / V3	Audio output	—	Per-voice direct outputs. No pan, no degradation, no main volume scaling. Each output corresponds to a voice slot in the 3-voice pool. Use for parallel processing or routing each voice to its own mixer channel.
GATE / NOTE	CV pair	—	Sequencer pitch + gate pair. Auto-routes from any Reason sequencer device (Matrix, Thor, Dr.OctoRex, Redrum trigger out). Equivalent to MIDI NoteOn/Off.

4.2 Gates and triggers

Parameter	Range	Default	Notes
cv_gate_rec	0..1	—	Rec gate. Rising edge triggers REC (same as button press). Behavior in HOLD mode: gate-high = recording. In FIXED / Q modes: rising edge starts one capture cycle.
cv_gate_clear	0..1	—	Clear gate. Rising edge triggers CLR (same as button press).
cv_mute	0..1	—	Mute control. Two response modes: (a) rising edge toggles mute; (b) level > 0.5 = muted, level ≤ 0.5 = unmuted. The first edge after patching establishes the response mode.
cv_gate_stutter	0..1	—	Stutter engage. Gate high (level > 0.5) = stutter active. Gate low = stutter disengaged. NOT an edge-triggered toggle.

4.3 Slice and key CVs

Parameter	Range	Default	Notes
cv_slice_select	0..1	—	Slice select. Maps 0..1 to slice index 1..N (where N is the current slice count). Overrides keyboard slice mapping in Mono/Legato modes when patched.
cv_slice_offset	0..1, centered 0.5	—	Additive shift to the currently selected slice. ±N/2 slices either side of the keyboard-determined slice. Useful for chromatic offsetting of rhythmic patterns.
cv_slices (v3.2)	0..1 → 1..16	—	Force slice count. When patched, overrides BOTH the Auto and Manual panel modes — slicing becomes equal divisions with N = round(value × 16) slices, clamped 1..16. The TRANS and SLICES knobs are bypassed.
cv_mod_pitch_start	−1..+1, additive	—	Additive modulation to the START knob value. Sum is clamped 0..1.
cv_mod_pitch_end	−1..+1, additive	—	Additive modulation to the END knob value. Sum is clamped 0..1.

4.4 Modulation CVs

Parameter	Range	Default	Notes
cv_mod_speed	−1..+1, additive	—	Additive mod to the SPEED knob. Applied per-batch.
cv_mod_porta	−1..+1, additive	—	Additive mod to PORTA knob.
cv_mod_reverse	0..1	—	Reverse control. Level > 0.5 = reverse playback. Affects new notes and voices started after the CV changes.
cv_mod_attack	−1..+1, additive	—	Additive mod to ATK knob.
cv_mod_release	−1..+1, additive	—	Additive mod to REL knob.
cv_mod_volume	−1..+1, additive	—	Additive mod to VOL knob.
cv_mod_loop_len	−1..+1, additive	—	Additive mod to LEN knob.
cv_mod_stutter_rate (v3.2)	−1..+1, additive	—	Additive mod to stutter RATE. Live — modulates rate during active stutter.
cv_mod_stutter_win (v3.2)	−1..+1, additive	—	Additive mod to stutter SIZE (window). Applied at stutter engage time (matches knob behavior — window is frozen at engage).

4.5 CV outputs

Parameter	Range	Default	Notes
cv_slice_count	0..1	—	Currently active slice count, normalized: 1 slice = 0.0, 16 slices = 1.0, linear in between. Useful for self-syncing patches — wire to a sequencer step count to keep the sequencer aligned with the slicing.
cv_playhead	0..1	—	Primary voice (voice 1) playback position within its region. 0 = region start, 1 = region end. Updates per sample. Useful for syncing other devices to Furioso's current playback position.

5. Recording subsystem

Furioso's recording system captures audio from the IN L / IN R inputs into internal stereo buffers. Maximum length is approximately four seconds. Three distinct recording modes determine how capture starts and stops. Recording while voices are playing engages a separate "live" buffer and finalizes via an atomic swap.

5.1 Record modes

Parameter	Range	Default	Notes
HOLD	while held	—	Recording starts on REC button press (rising edge of cv_gate_rec) and ends on release (falling edge or button up). Maximum capture is the full buffer; recording stops automatically if the buffer fills.
FIXED	fixed length	LEN knob	Pressing REC starts a fixed-length capture defined by the LEN knob. Recording stops automatically at the target length. Useful for repeatable capture lengths (e.g., recording 1-second loops over and over).
Q	quantized	SIZE knob	Quantized recording. Pressing REC arms capture. Actual recording starts at the next transport bar boundary (defined by SIZE) and ends at the next boundary after. The Armed lamp on the panel indicates "waiting for boundary."

5.2 Recording-live (overdub)

When REC is triggered while a sample is loaded AND voices are actively playing, Furioso enters "recording-live" state. The new capture goes into a separate incoming buffer while active voices continue reading the old buffer. When recording finalizes, the new content is copied atomically into the main buffer in a single memcpy, and active voices continue seamlessly via per-voice fade-in machinery that hides the buffer transition.

Without this mechanism, the swap would produce a loud crack: the voice's phase position is preserved across the swap, but the underlying sample value at that phase jumps from old content to new content in one sample — a waveform discontinuity that, multiplied by sustain envelope, can spike output meters into clipping range. The fade-in starts at gain = 0 at the swap instant and ramps to full gain over approximately 10.7 ms, hiding the discontinuity behind near-zero amplitude.

> Note Recording-live works in all three rec modes (HOLD, FIXED, Q). The behavior is identical from the user's perspective: hit REC, capture happens, voices keep playing through the transition.

5.3 Quantize lock

In Q rec mode, between REC press and the actual recording start, Furioso is in an "Armed" state. The lock icon on the status display lights to indicate quantize lock is engaged. Pressing REC again while armed cancels the arm and returns to the previous state.

5.4 Sample storage and undo

Furioso maintains two sample buffers: the active sample (currently playing) and the undo sample (one level back). Every successful StopRecording / Clear operation copies the previous active sample into the undo slot. UNDO restores the undo sample to active. After UNDO, the undo slot is empty until another sample-modifying operation occurs. There is no redo.

6. Playback engine

Three orthogonal mode selectors define how Furioso responds to incoming notes: voice mode (Poly / Mono / Legato / Retrigger), play mode (Slice / Pitch), and loop mode (Off / On with variants). All 4 × 2 × 2+ = 16+ combinations are click-free; the v3.1 click-elimination campaign verified each combination individually before shipping.

6.1 Voice modes

Parameter	Range	Default	Notes
Poly	3 simultaneous voices	—	New notes allocate fresh voice slots. When all three voices are active, the oldest voice is stolen (released and reallocated). Each voice has its own phase, envelope, and degradation state.
Mono	single voice, re-attack	—	New notes reuse the same voice. Envelope re-attacks from current level (audible as a brief attack ramp from sustain back to peak, then back to sustain). Slice mode snaps phase to new slice start; Pitch mode snaps phase to region start. Click-free across all transitions.
Legato	single voice, envelope preserved	—	New notes reuse the same voice. Envelope is NOT retriggered. In Slice mode, phase still snaps to new slice (the old phase is meaningless in the new slice). In Pitch mode, phase is preserved — the voice continues at its current position in the sample.
Retrigger	single voice, hard reset on same-note	—	Identical to Mono for different-note plays. Same-note retriggering hard-resets the voice (Reset()), clearing envelope and phase. Useful for percussive retriggering effects.

6.2 Play modes

Parameter	Range	Default	Notes
Slice	one slice per note	—	Each MIDI note plays one slice. Mapping: ROOT note plays slice 1; ROOT+1 = slice 2; ... ROOT+N-1 = slice N (where N is the slice count). Notes outside this range are ignored. Slice playback ignores START/END knobs.
Pitch	whole sample, pitched	—	The whole sample (region defined by START..END) is played back, pitched relative to ROOT. ROOT = unity pitch; ROOT+12 = one octave up (2× speed); ROOT-12 = one octave down (0.5× speed).

6.3 Loop modes

Parameter	Range	Default	Notes
Off (one-shot)	—	—	Voice plays from region start to region end, then fades out via internal end-fade (~10.7 ms) and deactivates. Release envelope applies if note is released before reaching region end.
On (looping)	—	—	Playback wraps from end back to a loop-back point. Loop-back position is (region start) + (1 − LEN) × (region length). Equal-power crossfade between end and loop-back, length controlled by XFADE (Manual fade mode) or computed from region length (Auto fade mode). Crossfade length is capped at 25% of loop region to keep short loops audible.

6.4 Speed mapping

The SPEED knob uses a piecewise mapping designed to put unity (1×) at the center detent while still offering a full 0..3× range:

Parameter	Range	Default	Notes

Lower half (0..0.5 knob)	0..1× speed (linear)	—	Slow motion. 0 knob = freeze (silent). 0.5 knob = unity.
Center detent (0.5 knob)	1× speed	default	Unity playback. Detent click for tactile feedback.
Upper half (0.5..1.0 knob)	1..3× speed (linear)	—	Fast playback. The 2..3× zone produces audible aliasing — preserved deliberately as part of the Furioso "tape going too fast" character.

6.5 Envelope and portamento

Per-voice envelopes are AR (attack-release) with implicit sustain at unity. NoteOn ramps fEnvAmp from 0 to 1 over the ATK knob time. NoteOff ramps from 1 to 0 over REL time, then deactivates the voice. There is no decay or sustain level parameter — Furioso is optimized for percussive and looped material where the envelope serves shape rather than expression.

Portamento applies in Mono and Legato voice modes between consecutive notes. PORTA knob = 0: no glide. PORTA knob = 1: maximum glide (~2 s). The glide applies to the pitch step value (fStepF), so it works in both Slice and Pitch play modes — in Slice mode it produces a pitch glide across the slice content; in Pitch mode it produces a true note-to-note glide.

7. Slicing

Slicing divides the sample into N regions (1..16). Each slice is independently addressable from the keyboard in Slice play mode or via cv_slice_select. Three mechanisms determine slice boundaries: auto (transient detection), manual (equal divisions), and CV override.

7.1 Auto-slice (transient detection)

When SLICES is set to Auto, the device analyzes the recorded sample for amplitude transients and places slice boundaries at detected peaks. The TRANS knob controls detection sensitivity: higher = more sensitive (more slices), lower = less sensitive (fewer slices).

Parameter	Range	Default	Notes
Window size	128 samples	—	Per-analysis-window RMS scan length. Approximately 2.7 ms @ 48 kHz.
Minimum gap	2400 samples	—	Minimum spacing between detected transients. ~50 ms @ 48 kHz. Prevents over-slicing on rapid transient material.
Noise floor	0.02 (linear)	—	RMS levels below this threshold are ignored. Prevents noise from creating spurious slices.
Maximum slices	16	—	Hard cap. If more transients are detected than the cap, only the strongest are kept.

7.2 Manual slice (equal divisions)

When SLICES is set to Manual, the SLICES knob value determines the slice count N (1..16, integer). Slice boundaries are placed at equal intervals: slice K spans samples [K × L/N, (K+1) × L/N) where L is the sample length.

> Note Manual slice boundaries are snapped to nearest quiet points in the audio (when available within a small window around the equal-division position). This avoids placing boundaries in the middle of transients, which would produce audible clicks at slice edges. The quiet-point snap is suppressed when cv_slices is driving the slicing — see 7.3.

7.3 Slice CV override (v3.2)

When cv_slices is patched, the slice system enters override mode: equal-divisions slicing with N = round(cv_slices_value × 16), clamped to 1..16. This overrides both Auto and Manual panel modes — the panel SLICES button becomes inactive while the cable is plugged.

Quiet-point snapping is intentionally NOT applied to CV-driven slicing. The reasoning: when CV is sweeping slice count in real time (e.g., from an LFO), the user wants the slice grid to update immediately without the ~ms-scale snap-scan overhead. The trade-off is that CV-driven slice edges may land in audio transients rather than quiet points, producing slightly more audible edge clicks than panel-driven slicing. For static CV values this is rarely audible; for fast modulation it's part of the "controlled mayhem" character.

7.4 Slice-select behavior in voice modes

Parameter	Range	Default	Notes
Slice mode + Poly	Per-note slice	—	Each note triggers its mapped slice (ROOT + offset). Up to 3 different slices play simultaneously.
Slice mode + Mono	New slice retriggers	—	Each new note retriggers the voice with the new slice. v3.1f source crossfade hides the slice transition.
Slice mode + Legato	New slice, envelope preserved	—	Phase snaps to new slice start; envelope continues. v3.1g source crossfade hides the transition.

cv_slice_select patched	CV overrides keyboard	—	In Mono/Legato modes, cv_slice_select determines the active slice regardless of which note is held. The keyboard still gates the voice (NoteOn/NoteOff) but doesn't select the slice.

8. Stutter subsystem

Stutter freezes a window of audio at the current playback position and repeats it at a settable rate. Engaging stutter mid-playback captures the current position and length; the stutter "loop" plays from that captured window until stutter is disengaged.

Parameter	Range	Default	Notes
Window position	frozen at engage	—	The current sample position at the moment of stutter engage. Cannot be moved without disengaging and re-engaging.
Window length	frozen at engage, from SIZE knob	—	Set at engage time from SIZE knob + cv_mod_stutter_win. Subsequent changes to SIZE or cv_mod_stutter_win do NOT modify the active window.
Playback rate	live, from RATE knob	1×	Set continuously from RATE knob + cv_mod_stutter_rate. Modulating during active stutter sweeps the rate — produces audible pitch effects on the window.
Engage trigger	STUT button OR cv_gate_stutter > 0.5	—	Either source engages stutter. Gate-low disengages. The button toggles.
Per-voice	each voice has independent stutter state	—	Stutter applies per-voice. Engaging stutter affects all currently active voices.

9. Mute subsystem

Mute is a global per-device cut. When muted, all voices continue running internally (phase advances, envelopes track) but produce zero output. Unmuting restores audible output instantly. Designed for live performance — map MUTE to a foot controller, MIDI button, or touch surface, and toggle channels in and out during a performance.

Parameter	Range	Default	Notes
MUTE button	toggle	unmuted	Front-panel button. Toggles mute state. Display dims when muted.
cv_mute	rising edge OR level threshold	—	Two response modes: edge-toggle (each rising edge toggles state) or level (above 0.5 = muted, below = unmuted). The first edge after patching establishes the mode.

Tip Mute is orthogonal to Combinator Receive Notes. Combinator gating cuts MIDI; Furioso's mute cuts audio. Use Combinator Receive Notes to prevent new note triggers and Furioso's MUTE to cut already-playing tails. The two complement each other for live performance routing.

10. Degradation

The DEGR knob applies bit-depth reduction and sample-rate decimation in a single combined curve. At 0 knob: clean 16-bit / full sample rate. At 1 knob: 4-bit / 6 kHz — Akai S900 / SP-12 territory. Aggressive but musical lo-fi character. Capped intentionally to prevent reaching 0-bit silence; the design thesis is character transformation, not destruction.

Degradation applies ONLY to the main stereo outputs. Per-voice direct outputs (OUT V1/V2/V3) bypass degradation. This is useful when you want a clean parallel route while keeping the main output degraded.

11. Status display readouts

The status display has three logical regions: top icon row, large numeric area, and bottom icon row. Each region reflects a different aspect of the current state.

11.1 Top row (left to right)

M	Mute icon. Lit (amber) when device is muted.
Loop icon	Circular arrows. Dim when loop is off, lit when loop is on. Animates direction with REV state.
Transport arrow	Triangular arrow. Lit when Reason transport is playing. Indicates the device is sync-aware.
Slice numeric	Large number showing current slice index in Slice mode, or pitch value (octave.semitone) in Pitch mode.

11.2 Bottom row (left to right)

Slice integer	Currently triggered slice number (1..N). Useful when slice CV is driving rapid changes — confirms what the device "sees."
Lock icon	Quantize lock indicator. Lit (red) when Q rec mode is armed and waiting for the next bar boundary.
Slice-diff icon	Small pixel-block indicator. Lit when the slice CURRENTLY rendering audio differs from the most recent NoteOn slice — happens during slice-CV retarget transitions.

12. CV input/output reference

Complete enumeration of all 20 CV inputs and 2 CV outputs. All inputs read 0..1 voltage range (Reason standard). Modulation inputs are additive to their corresponding knob and clamped to the knob's native range.

12.1 Inputs (audio + control)

Parameter	Range	Default	Notes
IN L / IN R	audio	—	Stereo audio in for recording. VOL trim applied before capture.
cv_in_gate / cv_in_note	0..1 / pitch	—	Sequencer pair; auto-routes from any Reason sequencer.
cv_gate_rec	0..1	0	Rec gate (rising edge or hold).
cv_gate_clear	0..1	0	Clear gate (rising edge).
cv_mute	0..1	0	Mute (edge or level).
cv_gate_stutter	0..1	0	Stutter engage (level).
cv_slice_select	0..1 → 1..N	0	Slice select (Mono/Legato override).
cv_slice_offset	0..1, ±N/2	0.5	Slice index shift.
cv_slices (v3.2)	0..1 → 1..16	—	Force slice count, overrides Auto/Manual.
cv_mod_pitch_start	−1..+1, add	0	START knob mod.
cv_mod_pitch_end	−1..+1, add	0	END knob mod.
cv_mod_speed	−1..+1, add	0	SPEED knob mod.
cv_mod_porta	−1..+1, add	0	PORTA knob mod.
cv_mod_reverse	0..1	0	Reverse, level > 0.5.

cv_mod_attack	−1..+1, add	0	ATK knob mod.
cv_mod_release	−1..+1, add	0	REL knob mod.
cv_mod_volume	−1..+1, add	0	VOL knob mod.
cv_mod_loop_len	−1..+1, add	0	LEN knob mod.
cv_mod_stutter_rate (v3.2)	−1..+1, add	0	RATE knob mod (live).
cv_mod_stutter_win (v3.2)	−1..+1, add	0	SIZE knob mod (at engage).

12.2 Outputs (audio + control)

Parameter	Range	Default	Notes
OUT L / OUT R	audio	—	Stereo main mix; pan + degradation + volume applied.
OUT V1/V2/V3 (L/R each)	audio	—	Per-voice outputs; no pan, no degradation.
cv_slice_count	0..1	—	(N−1) / 15. 1 slice → 0.0, 16 slices → 1.0.
cv_playhead	0..1	—	Voice 1 position in its region.

13. Pro tips (advanced patterns)

This chapter documents advanced Furioso workflows that go beyond stock single-instance use. These patterns leverage the device's small footprint, fast response, and rich CV I/O to enable musical applications that would be awkward or impossible with a single full-featured sampler. None of these require modifications — they're all stock Furioso behavior, just composed in less obvious ways.

13.1 Multi-instance Combinator decomposition

Five Furioso instances in a Combinator use less RAM than one Rubato, fit in 10 rack units, and let you decompose a groove into independent rhythmic voices. Each instance can have:

Different source audio	Each instance captures a different drum hit, vocal fragment, or synth phrase.
Different slice grids	Independent slice counts, modes, and CV-driven overrides.
Different play modes	Mix Slice and Pitch modes across instances.
Independent CV routing	Each instance has its own back panel — wire CVs differently.
Per-instance mute	Map each instance's MUTE to a separate controller. Drop voices in and out live like a drum mixer.

The Combinator's Receive Notes feature can route different keyboard ranges to different instances. With four octaves and five instances, each instance gets a 9-or-so semitone range — which is exactly enough for a 16-slice grid mapped across one octave per instance.

13.2 Polyrhythmic textures via cv_slices

Load the same source audio into multiple Furioso instances, but drive each instance's cv_slices input with a different modulation signal:

Instance 1	cv_slices = 3/16 (constant) → 3 slices, ternary feel
Instance 2	cv_slices = 4/16 (constant) → 4 slices, binary feel
Instance 3	cv_slices = LFO at slow rate → continuously varying slice count
Instance 4	cv_slices = sequencer driven, alternating 5 and 7

Each instance plays the same source but with a different grid, producing cross-rhythmic patterns from a single audio source. Combine with per-instance pan and slight pitch differences (cv_mod_speed) for additional separation.

13.3 Self-syncing via cv_slice_count

The cv_slice_count output emits 0..1 scaled to (N−1)/15 where N is the current slice count. Wire this output to a Thor sequencer's step count input. The sequencer now has exactly N steps regardless of how the slicing changes. Combine with cv_slices CV driven by an LFO and you have a self-modulating sequence that re-syncs every time the slice grid shifts.

13.4 CV-driven recapture (sample mangling)

cv_gate_rec triggers recording on a rising edge. Wire it to a Matrix or Thor sequencer gate, and the device recaptures audio on every gate. With short rec mode set to HOLD and gate length short enough (a few samples), each cycle captures a small fragment of whatever is at the input.

Combined with self-feedback (route the OUT back into the IN via a Combinator or external mixer), this creates an evolving texture that mangles itself over time. The v3.2 recording-swap safety mechanism handles the constant rapid recaptures without artifacts.

> Caution Self-feedback patches can build amplitude over time. Use the IN meter to monitor levels and trim VOL on the back panel if needed.

13.5 Stutter as continuously modulated texture

Before v3.2, stutter was a binary effect: engaged or not. With cv_mod_stutter_rate and cv_mod_stutter_win, stutter becomes a continuously modulatable texture generator. Patch:

cv_gate_stutter	high (always engaged)
cv_mod_stutter_rate	slow LFO → pitch sweep of the held window
cv_mod_stutter_win	sequencer → window size changes per gate

Result: a self-modulating stutter loop where the rate sweeps continuously and the window snaps to a new size on each sequencer trigger. The audible effect is similar to a granular synth driven by a fixed sample.

13.6 Combinator macro mapping for live performance

In a multi-instance Combinator, map Combinator macros to per-instance Mute, Speed, and Reverse for live performance control:

Macro 1: Drop voices	Map to all instances' MUTE in alternation pattern
Macro 2: Slow down	Map to all instances' SPEED knobs, decreasing
Macro 3: Reverse cascade	Map to instances' REV in sequence
Macro 4: Slice rampup	Map to all instances' cv_slices via Spider CV merger

The result is a live-performance control surface where each macro is a meaningful musical gesture across the entire stack, not just per-device tweaks.

13.7 Recording dynamics tricks

Three workflows that exploit Furioso's recording-live capability:

Layered capture	Capture a phrase, play it back while routing the output back into the input via a Combinator. Hit REC again — the new sample is the original PLUS the played-back result. Layer multiple times for evolving textures.
Beat conform	Set Q rec mode with a 1-bar SIZE. Hit REC. The device captures exactly one bar of audio synced to transport. No tempo manipulation needed.
Granular freeze	Capture a very short sample (~50 ms) in FIXED mode. Load into Pitch mode + Loop On. The "sample" plays as a continuously looped grain pitched by the keyboard. Hold a chord for a frozen drone with internal motion from the original capture.

14. Troubleshooting

Parameter	Range	Default	Notes

No audio output	Check VOL knob, MUTE state, voice mode allocation	—	If MUTE LED is lit, click MUTE button. If VOL is at 0, raise it. If no voices are allocated (all in release tail), play a new note.
Input meter not lighting	Check IN L/R cabling, VOL trim	—	VOL trim on back panel affects the recording level. If signal source is quiet, raise VOL. Verify cables routed to IN L / IN R, not some other socket.
Audible clicks at slice edges	Increase XFADE or TRANS	—	In Manual fade mode, raise XFADE for smoother seams. In Auto slice mode, raise TRANS to detect cleaner edge positions.
Loud crack on REC over playing	v3.2 swap-fade should handle this	—	If running v3.2 or later, the swap-fade is automatic. If using earlier firmware, brief MUTE before/after REC, or use Q mode to align REC with transport beats.
CV input has no effect	Check patching, knob position, mode interaction	—	Additive mods (cv_mod_*) are summed with the knob. If knob is at extreme (0 or 1), the mod may saturate. cv_slices overrides panel slicing only when patched; cv_slice_select overrides only in Mono/Legato modes.
Stutter window won't change	Window is frozen at engage	—	Disengage and re-engage stutter to recapture window at new SIZE. RATE modulates live; SIZE does not.
Slice CV produces clicks	Auto-slice quiet-point snap is bypassed for CV	—	Intentional — see 7.3. For cleaner edges, drive cv_slices with stepped values rather than smooth LFO.
UNDO doesn't restore	One level of undo only	—	After UNDO, the undo slot is empty. UNDO twice will not work. Save patches before destructive operations.

15. Specifications

Parameter	Range	Default	Notes
Format	Reason Rack Extension	—	SDK 4.x.
Reason version	13.x and later	—	—
Sample rate	44.1 / 48 / 88.2 / 96 kHz	48 kHz	Auto-tracks Reason document rate.
Bit depth	32-bit float internal	—	16-bit equivalent for capture.
Sample buffer	≈ 4 s stereo	—	Stored as separate L/R arrays.
Voice pool	3	—	Hard limit.
Slice count	1..16	—	Hard limit.
CV inputs	20	—	See section 12.
CV outputs	2	—	cv_slice_count, cv_playhead.
Audio inputs	Stereo (IN L/R)	—	Single recording source.
Audio outputs	Stereo main + 3 voice (stereo each)	—	8 output channels total.
Latency	Single sample (no internal buffering)	—	—

CPU footprint	~1–2% per active voice	—	Depends on loop_len_rt, degradation, slicing CV activity.
Rack height	2 RU	—	3770 × 690 px panel.
Memory footprint	< 5 MB per instance	—	Roughly 1/6 of Rubato.

Credits

Splitfire Furioso designed and developed by Doodov Digital Design. Derived from the Splitfire Rubato codebase via incremental specialization for the compact-stacking use case. The v3.1 click-elimination campaign and v3.2 recording-swap safety mechanism establish the DSP correctness baseline. Thanks to the testers who provided the unforgiving CV abuse that produced "controlled mayhem" as a verified product property.

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