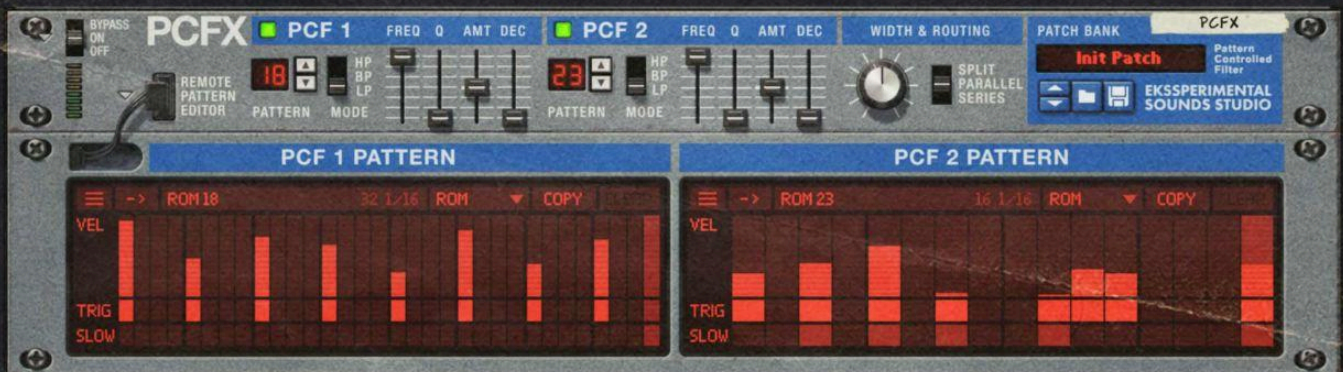


PCFX

Pattern
Controlled
Filter



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Introduction

PCFX is two pattern-controlled filters (PCFs) in one Reason Rack Extension, modelled on the classic PCF. Each PCF is a resonant filter whose cutoff is moved by a step pattern: every step fires an envelope that opens the filter and lets it decay again, so the pattern plays the filter like a rhythm. The classic PCF was a single mono filter with 55 fixed patterns. PCFX builds on that idea and those 55 patterns, and adds:

- 2 PCFs, routed in Series, Parallel or Split, with a stereo SKEW control
- LP, BP and HP modes, 12 or 24 dB/oct, with the 24 dB mode becoming a tuned resonator at high Q
- Bipolar Amount, so a pattern can sweep the cutoff down as well as up
- 32 editable User patterns per PCF, plus two generators: Euclid and Turing
- per-step velocity, trigger and slow/slide, and a Note mode that plays the cutoff like a keyboard
- an Attack control for click-free hits, and CV in and out on the back panel

PCFX is an insert effect with no dry/wet control. The Tips section explains why and what to use instead.

Quick start

The default patch plays straight away: PCF 1 is a lowpass on ROM pattern 05, PCF 2 a lowpass on pattern 08, in Series.

1. Insert PCFX on a drum loop, bass line or pad.
2. Press Play in Reason. The patterns follow the song position, so nothing moves while the transport is stopped (unless that pattern's CLOCK IN is patched).
3. Step through ROM patterns with each PCF's pattern up/down buttons.
4. Set the base cutoff with **FREQ** and the depth of the pattern with **AMT**. At AMT 0 % the pattern does nothing and the PCF is a fixed filter.
5. Use **DEC** for the feel: low for short, pumping hits, high for smooth sweeps. Near the top, the envelope barely decays, turning the pattern into a stepped sample-and-hold effect.
6. Add **Q** for a more pronounced, vocal sweep.
7. Open the Remote Pattern Editor with the fold arrow to see and edit the pattern.



Front panel

The 1U front panel has PCF 1 and PCF 2 side by side, each with the same controls, plus a shared Routing section. Everything deeper lives in the Remote Pattern Editor below it.

Per PCF

Control	What it does
ON	Switches the PCF on or off.
PATTERN	Shows the pattern number in the current bank and steps it. ROM runs 00–54, the other banks 01–32.
MODE	LP, BP or HP. The slope (12 or 24 dB/oct) is set on the SETUP page.
FREQ	The base cutoff.
Q	Resonance, 0–100 %. Raising Q does not drop the volume, and a loud resonant peak is soft-limited instead of clipping. In 24 dB mode the top of the range turns the filter into a pinged resonator (see SETUP).
AMT	How far each step moves the cutoff, from –100 % to +100 %. Positive opens the filter above FREQ, negative closes it below FREQ. At 0 % the pattern has no effect in VEL TO ENV; in VEL TO NOTE the notes still move the cutoff.
DEC	The envelope decay after each step. At the top the envelope holds its level until the next step, which gives a stepped sample-and-hold sound.

Routing and Skew

ROUTING chooses Series, Parallel or Split. **SKEW** is a bipolar knob with a centre detent, and it does something different in each routing (see the table below). At **SKEW 0**, **Series** and **Parallel** use the same cutoff on the left and right channels, so the sound stays centred. **Split** is always stereo: **PCF 1** is on the left and **PCF 2** on the right.

Routing	Signal path	What SKEW does
Series	PCF 1 feeds PCF 2.	Turned CW, PCF 1's cutoff goes lower on the left and higher on the right, and PCF 2's goes higher on the left and lower on the right. Turned CCW, the sides swap. Up to one octave per side at 100 %.
Parallel	Both PCFs filter the input, and their outputs are summed.	Pans the PCFs apart: turned CW, PCF 1 moves left and PCF 2 right, and at 100 % they are hard left and right. Turned CCW, the sides swap. With one PCF off, SKEW has no effect.
Split	PCF 1 is always on the left, PCF 2 always on the right, even at SKEW 0. A FREQ fader only changes its own side.	Cross-modulation: each PCF's envelope also moves the other PCF's cutoff, in both directions at once. Turned CW, it is inverted: when one PCF opens, the other closes. Turned CCW, it is not: when one PCF opens, the other opens too. The further you turn, the stronger the effect.

Split with one PCF off. The remaining PCF filters both sides in stereo, and SKEW offsets its cutoff higher on one side and lower on the other: right raises the right side, left raises the left side. At SKEW 0 this sounds the same as Parallel with that PCF off.



Remote Pattern Editor

Open the Remote Pattern Editor with the fold arrow to show one editor screen per PCF. Pattern 1 always plays PCF 1 and pattern 2 always plays PCF 2.

Header row

Field	What it does
≡ (menu)	Opens and closes the SETUP page.
Direction	- > (forward), < - (reverse), <-> (pendulum: back and forth, without repeating the end steps) or RND (a random step on every step, seeded, so the same song position always plays the same step). Works on every bank.
LENGTH	1–32 steps. Drag the field, or click ▲ ▼ for one step. On ROM, LENGTH and RATE are fixed to the pattern's own.
RATE	The length of one step, from 16/1 to 1/64. When the lane's CLOCK IN jack is patched, it reads EXT SYNC and each clock pulse advances one step.
Source ▼	Picks the bank: ROM, USER, EUCLID or TURING.
COPY / PASTE	See Copy, Paste and Clear.
CLEAR	Empties the selected User pattern, or resets EUCLID and TURING to their defaults. Dimmed on ROM.



STEPS page

- **Bars (VEL):** bar height is the velocity of the step's trigger. The velocity decides how far the hit opens the filter, scaled by the AMT fader. Click or drag to paint; cmd-drag to erase. More draw modes (the keys can go down before or during a drag): Shift holds the level you were at; Alt paints random levels in a band around the pointer; Shift+Alt paints in 16 fixed levels; Shift+Cmd draws a straight line from where you clicked; Cmd+Alt draws a smooth curve from where you clicked; Shift+Cmd+Alt draws a line in 16 fixed levels.
- **TRIG:** whether the step fires the envelope. A step without TRIG lets the previous hit keep decaying. A step with TRIG always retriggers the envelope. If its velocity is 0, the envelope is retrigged at zero, which cuts off the previous hit. Click to toggle a step and drag to paint more; cmd-drag clears; Alt-drag sets steps at random, and moving the pointer up or down from where you clicked raises or lowers the chance (50 % at the click). The SLOW / SLIDE row works the same way.
- **SLOW / SLIDE:** a tick box per step. The row changes its name and function with the Vel to mode. In VEL TO ENV it is SLOW: the step gets a slow attack, like the original PCF's soft-attack steps. In VEL TO NOTE it is SLIDE: a SLIDE step right after a note is a tie, so the envelope is not retrigged and the pitch glides to the step over the Slow / Slide time. A SLIDE step after a rest plays as a normal hit.
-

The grid adapts to 8, 16 or 32 columns and groups the steps in fours. The playhead lights the column that is playing.

Timing

Patterns are locked to the song position, as in the original PCF, rather than restarting when

you change patterns. For example, if you switch to a 12-step pattern at bar 9, it starts at the step it would have reached if it had been playing since the beginning of the song. Pattern changes take effect immediately. When the transport stops, no new steps fire, the playhead goes out and the envelope decays. A pattern on its own CLOCK IN keeps running.

Pattern banks

Only **USER** can be edited step by step. The other banks are sources you play or copy from, and they are read-only for different reasons: ROM is fixed, and the generators store settings, not steps.

Bank	Slots	What it holds
ROM	00–54	The 55 classic PCF patterns, fixed.
USER	01–32 per PCF	Your own step patterns, saved with the song or patch.
EUCLID	01–32 per PCF	Euclidean rhythm generator settings.
TURING	01–32 per PCF	Turing-machine style random looping generator settings.

ROM

The classic patterns are grouped by character:

Patterns	Character
00–05	Even rhythms, no dynamics
06–11	Simple rhythms, no dynamics
12–17	Simple sweeps with slow dynamics; try a long DEC
18–21	Complex, random-like sweeps
22–33	Complex rhythms with dynamics and varied attacks
34–45	32nd-note patterns
46–54	Mixed variations, added in ReBirth 2.0: 46, 47 and 52 are 32nd-note, 53 is an 8th-note pattern, the rest are 16th-note

All patterns are 16th-note unless the table says otherwise. Many have unusual lengths (3, 5, 7, 9, 10, 11, 12, 19, 27, 28, 29 and 30 steps), so they drift against the bar.

USER

Your own step patterns, saved with the song or patch.

Generative

EUCLID



Spreads a number of hits as evenly as possible over **LENGTH** steps. **Trigs** sets the hit count, **Shift** rotates the pattern, **Chance** is the probability that a hit plays, **Slide** sets the share of hits marked **SLOW/SLIDE** (in **VEL TO ENV** they get a slow attack; in **VEL TO NOTE** they can tie, see below), and **Vel** picks a velocity shape over the loop: FLAT, FALL, RISE, ARCH or RND. SEED (on SETUP) picks which hits are marked, the random velocities and the Chance rolls, so the same seed always gives the same pattern. In **VEL TO NOTE** two Slide hits on consecutive steps tie; a Slide hit after a plain hit is a new note.

TURING



A looping random generator with three rings: **VEL** (velocity), **TRIG** and **SLOW/SLIDE**. Each ring has a lock; at 100 % the loop repeats exactly every time, at 0 % everything is rewritten. **LOW** and **HIGH** set the window new VEL values land in, **DENSITY** sets how often trigs fire, and **AMOUNT** sets how many steps are marked **SLOW/SLIDE**. In **VEL TO NOTE**, **SLIDE** keeps the note going: a **SLIDE** step with a trig ties to a note held by **SLIDE** and glides to the new pitch, and a **SLIDE** step without a trig holds that note for one more step.

Copy, Paste and Clear

COPY works in every bank and always ends in **USER**, the only bank a pattern can be pasted into.

1. Pick the pattern you want in any bank and click **COPY**. The pattern goes into memory, the view switches to **USER** and the button now reads **PASTE**.
2. Pick a User slot and click **PASTE**. The pattern is written there, memory is cleared and the button goes back to **COPY**.

From **ROM**, **COPY** takes the factory pattern. From a generator, **COPY** freezes the pattern currently being generated. For **EUCLID**, all generated hits are copied; **Chance** is not applied to the copied pattern. Either way you end up with a User pattern you can edit step by step.

- **PASTE outside USER** is dimmed. Hover over it and it reads **GO TO USER**; click it to switch to **USER**, then click **PASTE** (If you want to paste on a different pattern slot, first change to the location where you want to paste.). The pattern stays in memory until you paste or cancel it.
- **Cancel a copy**: cmd-click **PASTE**. Memory is cleared and the button returns to **COPY**.
- **Between PCFs**: memory is shared, so you can copy on PCF 1 and paste into a PCF 2 User slot.
- **CLEAR** empties the selected User pattern. On **EUCLID** and **TURING** it resets the generator to its defaults. **LENGTH**, **RATE**, **Direction** and **Seed** are always kept. It is dimmed on **ROM** and while **PASTE** reads **GO TO USER**.

The copied pattern is not saved with the song or patch.

SETUP page [≡]



Setting	Range	What it does
Slow / Slide	1–1000 ms	ENV: the attack time of steps marked Slow. NOTE: the glide time of tied Slide steps.
Attack	OFF, 0.1–10 ms	ENV: how fast hits without a Slow mark open the filter. NOTE: how fast each note of the 24 dB resonance fades in; the envelope then opens instantly. OFF is the original instant attack.
Seed	0–63 (EUCLID), 0–255 (TURING)	Picks the random choices EUCLID and TURING make. In TURING each slot has its own seed; cmd-click resets it to the slot number. The same seed always gives the same result.
Filter	12 or 24 dB/oct	The filter slope.
Ping	Off, –47 to 0 dB	24 dB only: the level of the resonance each step sets off when Q is near the top (see below).
Vel to	ENV or NOTE	What a step's velocity controls

Setting	Range	What it does
		(see below).
Gate	1–100 %	NOTE only: the note length as a share of the step, on the TRIG jack and for the 24 dB resonance. Steps with SLIDE always get 100 %.
Root / Scale / Range	note, scale, Off or 1–6 oct	NOTE only: the keyboard velocities are mapped onto. Shift-click the Root arrows to move an octave.

Vel to ENV and NOTE

- **ENV** (default, as the original): velocity sets how far the envelope opens the filter, and **AMT** sets the overall depth. The row under **TRIG** is **SLOW**: steps marked Slow get the slow attack.
- **NOTE**: velocity becomes a pitch within **ROOT**, **SCALE** and **RANGE**, and the cutoff jumps to that note. **FREQ** sets the reference: at 440 Hz the notes are in tune. The envelope still fires at a level set by **AMT**, independent of velocity; for clean pitches, set AMT to 0 %. The row under **TRIG** is **SLIDE**: a **SLIDE** step right after a note ties and glides to its pitch over the Slide time (**EUCLID** and **TURING** have their own rules, see Generative). Gate sets the note length.

Playing melodies with the 24 dB resonance

In **24 dB mode**, with Q above 85 %, the filter becomes a tuned resonator. Each step can ping the filter, and **Q** controls how long the resonance lasts, from about 0.1 s up to 4 s at maximum. The resonance always fades out, so PCFX becomes silent when nothing is playing. For melodies played on the resonance, use:

- **VEL TO NOTE**
- **FREQ** set to 440 Hz or another A (see the fader magnets). If **FREQ** is set to a C instead, the notes stay in tune with each other but sound a minor third above **ROOT**.
- **AMT** at 0 %
- **24 dB mode**
- **Q** near maximum
- **Ping at any level (not Off)**

With **VEL TO NOTE**, the resonance follows the notes like a synth voice: velocity sets the pitch, and every note pings at the full Ping level. **Attack** controls how quickly each note fades in.

A **SLIDE** (tied note) glides to its new pitch and tops up the existing resonance without restarting the envelope. The top-up takes the Attack time, with a minimum of 3 ms.

A **SLIDE** step without a trig, right after a step with **SLIDE**, keeps the gate open in **TURING**, so the filter continues to resonate and decays at the rate set by Q. In the other banks it does nothing.

Gate at 100 % gives the longest notes. The resonance holds until the next step, where a new note pings it again; a rest lets it fade out. On the **TRIG** jack the gate ends 3 ms before the next step, so the next note is retriggered cleanly. Shorter settings give shorter, more staccato notes. For legato, use **SLIDE**.

With **Ping Off**, the filter's resonance is not triggered by the sequencer and instead responds to the input audio. In **VEL TO NOTE** the gate still fades this resonance out at rests and at the end of each note.

Mouse and keyboard

The **FREQ** and **AMT** faders have their own drag behaviour:

FREQ fader

- **Shift-drag**: fine control (1/10 speed).
- **Shift+Cmd-drag**: magnets on every C (32.7 Hz to 16.7 kHz) and every A (27.5 Hz to 14.1 kHz), so you can land on an exact note.
- **Click the track** to jump there. **Cmd-click** resets to the maximum.

AMT fader

- **Zero dead zone**: like Reason's zero-snap knobs, a wide dead zone at 0 % makes it easy to land exactly on no modulation. A drag into or through 0 % holds there for about a full fader length of mouse travel before it moves on.
- **Starting at 0 %**: the drag leaves the dead zone at once and follows the mouse 1:1.
- **Click the track** anywhere to jump there and keep dragging. A click near the centre lands exactly on 0 %.
- **Shift-drag** for fine control (1/10 speed). You can press or release Shift mid-drag; the fader carries on from where it is.
- **Cmd-click** resets to 0 %.

Editor fields

- **Drag** a value field, or click its ▲▼ arrows for one step. Hold an arrow to repeat. Shift-drag for fine control (1/10 speed); you can press or release Shift mid-drag.
- **Shift-click an arrow** to step in musical amounts.
- **Cmd-click** a field to reset it to its default.
- **Menus** (source, Direction, Vel, Filter) open with a click on the field.

Automation

Alt-click a control to open its automation lane. The contents of User and generator slots can't be automated; automate the slot number instead.

Back panel



Besides the stereo audio inputs and outputs, each PCF has its own CV section, plus one shared SKEW CV input.

Group	Jack	Direction	What it carries
FREQ IN	CV + trim knob	in	Offset cutoff.
PATTERN	MOD	out	ENV: the pattern's envelope, scaled by AMT. NOTE: the note pitch CV.
PATTERN	TRIG	out	ENV: a trig each time a step fires. NOTE: a gate, tied on SLIDE, length set by Gate.
SYNC / CLOCK	OUT	out	A pulse on every step.
SYNC / CLOCK	IN	in	One pulse = one step. RATE then reads EXT SYNC.
SYNC / CLOCK	RESET	in	Restarts that pattern when its CLOCK IN is patched. On the song clock it has no effect.
SKEW CV	CV + trim knob	in	Offsets SKEW.

Each pattern has its own clock input, so one **PCF** can follow an external clock while the other follows the song. The internal clock can also be tapped from the clock out - clock pulses out are about 3 ms long at 44.1 and 48 kHz, and shorter at higher sample rates.

Tips and FAQ

Why is there no dry/wet knob? Dry/wet suits a reverb or delay, but not a filter. Mixing the dry signal back in mostly cancels the filtering, and around the cutoff it smears the phase. For a blend, put PCFX on a parallel channel or a pre-fader send, which also gives you more control.

The hits click with AMT high and DEC low. The filter then opens within a single sample, and a change that fast clicks. Open **SETUP** and raise **ATTACK**: OFF is the original instant attack, and 0.5–1 ms keeps the punch but removes the click. In **VEL TO NOTE** Attack fades the 24 dB resonance in instead, and **AMT** at 0 % gives the cleanest melodies. In **VEL TO ENV**, steps marked Slow soften individual hits the same way.

The pattern does nothing. Check that the PCF is on, the transport is running (or, with **CLOCK IN** patched, that clock pulses arrive), **AMT** isn't at 0 %, and **FREQ** isn't fully open with a positive **AMT**.

SKEW sounds weak in Series. In Series, **SKEW** moves PCF 1's cutoff one way and PCF 2's the other way on each side, so when both **FREQs** match, each side passes through the same two cutoffs in a different order. When both PCFs are set alike, the two sides sound much the same and the stereo effect is small. The more the PCFs differ in **FREQ**, **MODE**, **AMT**, **DEC** or pattern, the wider the sound. Series can also go quiet or silent: PCF 1 feeds PCF 2, so their pass bands must overlap. An HP on one PCF set above an LP on the other, or a BP far from the other PCF's band, leaves little or nothing through. Bring the **FREQ** faders closer together, or use Parallel.

The button says PASTE instead of COPY. There's a pattern waiting in memory, and paste only works in **USER**. Go to **USER** and click **PASTE**, or cmd-click **PASTE** to cancel.



Thank you!

Ekssperimental Sounds Studio is a one man project driven by the passion for experimental electronic sounds, new and old synthesizers and music gear. As a Reason user since 2001 it truly is a dream come true to finally be able to create my own synthesizers and effects for the Reason rack.

Thanks to all of you who buy my products I can continue to learn and develop more fun and inspiring devices for our beloved rack.

I hope you will enjoy PCFX!

Cheers,

Erik Söderberg 2026