

QUICK START / 1.0.0

Welcome to Nodium

Start in five steps

1. Close your DAW and run the installer for your computer. Install the plugin formats you use and the standalone application.
2. Open your DAW, rescan plugins if needed, and add Nodium to an instrument track. Or open the standalone application.
3. Sign in to AudioNode and open My plugins. Copy your personal AN- key, paste it into Nodium and select Activate. Nodium is silent until activated.
4. Choose a factory preset from the menu at the top and play, or start from INIT and build your own sound.
5. Save your own presets and import wavetable WAV files to make the sound your own. Support: hello@audionode.io.

Formats and requirements

macOS 11 or later, Apple Silicon and Intel: AU, VST3 and standalone. Windows 10 or later, x64: VST3 and standalone. Windows also requires Microsoft Edge WebView2 Runtime for the interface. Download it from <https://developer.microsoft.com/microsoft-edge/webview2/> if it is not installed.

Nodium renders its voices at twice the sample rate by default. GLOBAL > Oversampling trades quality against CPU.

OVERVIEW / 1.0.0

Finding your way around

The top bar

The arrows beside the preset name step through presets, and under the name are its author and notes (hover to read long notes, double-click to change them). Click the name to open the preset browser; + adds presets to your library and the disk icon saves your own. The pages: OSC for the oscillators, sub, noise and filters; MIX for levels, routing and Morph; FX for the three effect racks; MATRIX for every modulation connection; ARP for the arpeggiator; GLOBAL for voicing, oversampling, tuning and library tools; and ROUTING for the whole signal flow on one page. Under the logo: the version (and, in a DAW, the Licence button beside it). On the right: CPU load, the ANALOG switch and the output level. ANALOG makes the voices differ from each other as an analogue synth's do (their tuning, drift, filters, envelope timing and level): click it to switch it on (its lamp lights) or off. Off is exact.

Modulators and macros

The strip under every page has a tab for each modulator across its top: AMP ENV (the amplifier's envelope), ENV 2 to 4 and LFO 1 to 10. Click a tab to edit that source in the screen and dials below, or drag it by its grip dots onto any dial to modulate it. The eight macros are on the right.

Keyboard and voicing

The on-screen keyboard has pitch and mod wheels; Z and X change its octave. At the bottom right: the number of voices, POLY, MONO or LEGATO, and glide.

Presets

Choose a factory preset or start from INIT (Init patch in the preset browser): a plain saw on each oscillator, every control at its default, no modulation and no effects. Build from there and save your own. Saving, adding presets and packs, and editing a preset's author and notes: page 3.

PRESETS / 1.0.0

Your presets

The library

Click the preset name to open the browser: packs on the left, then the pack's categories, then its presets. Packs you add are listed there. Your own presets are under My Sounds > User, beside Favourites (star a preset) and Recent. Search looks through names, tags, categories and authors, and the preset under the pointer shows its author and notes under the list.

Saving your own

Select the disk icon and give the preset a name and a category (it is filed in that category's folder). Add a few tags that describe it, such as dark wide evolving; your name as the author, which Nodium remembers for next time; and a description of how it plays and what its macros do. Saving with the name of one of your presets in the same category replaces it.

Author and notes

Under the preset name, the header shows the preset's author and notes; hover over them to read long notes. Double-click either one to change it, then press Enter (Esc cancels). Your own presets are updated in place. Factory and pack presets are never changed: the edit is saved as a new preset of yours with the same name, numbered if you already have one.

Adding presets and packs

To add presets you have downloaded or been sent, click + beside the preset name and choose .nodium files, folders of them, or both. A file joins your own presets under My Sounds > User. A folder becomes a pack of its own, listed after Default, and its sub-folders become its categories unless a preset was saved with one. Nodium copies them into your library, leaves the originals where they are and loads the first one you chose. Files already in your library aren't copied again, and Nodium tells you about any file that isn't a Nodium preset.

Organising

The browser works like a set of folders. My Sounds holds User and folders of your own: + New folder adds one, and + New category adds a category inside it. Drag a preset by its handle onto a folder, a category or Favourites; the places it can go are outlined. Right-click a preset to rename, duplicate, show in Finder or move it to the Trash, and a folder, category or pack to rename it, show it or move it to the Trash. Factory presets can't be changed: dragging one onto a folder, or choosing Copy to My Sounds, saves a copy of yours.

Where presets live

Your presets are ordinary files in Music/Fletcher Audio/Nodium/Presets; your own folders are in its My Sounds folder and packs you add in its Packs folder. Open folder in the browser, or GLOBAL > Open user preset folder, shows them. Copy the Presets folder to take your presets to another computer, or delete a pack's folder to remove the pack. Wavetables and impulse responses you load are saved inside the preset, so a preset always has everything it needs.

SOUND SOURCES / 1.0.0

Oscillators A, B and C

The oscillators

Each oscillator's large display shows its wavetable and where it is playing, and names the table along its foot: the arrows step through the tables and clicking the name opens the list. Two dials sit in the display's corners, WARP on the left and GRANULATE on the right, named on the small screen between them over their menus. On the WAVE tab, the NOTCH box cuts a notch into the waveform: STRENGTH sets how deep (at 100% it's silent there), POSITION moves it from the cycle's start (0%) to its end (100%) and THICKNESS sets how much of the cycle it takes (an eighth by default). Sweep the position or the thickness with an LFO for a moving, pulse-like edge.

Wavetable

384 factory tables in 21 categories, each with Position shown on the screen in the table's own terms (PW 31%, CUTOFF $\times 4.2$, INDEX 3.1, BPM 120): real sources (analogue oscillators and their circuits, filters, phase distortion, FM and the digital coders, drawbar and pipe organs, voices and choirs, the orchestra's strings and winds, pianos and mallets, the Distortion circuits), Nodium's own (oscillators and machines in motion, mathematical patterns, walks from one instrument into another) and tables designed for pads, leads, keys and textures. Or import your own WAV wavetables. A warp, a technique from real instruments with its amount shown in its own terms (a sync ratio, a DCW, an FM index): hard sync and resonance, phase distortion, downsampling, a mirrored cycle, through-zero and exponential FM, phase, amplitude and ring modulation from any oscillator, and the Distortion rack's circuits.

Granulate

Each oscillator granulates its own sound: GRANULATE (the right dial) and the type beside it. Cloud spreads the sound into a dense, drifting wash; Shimmer plays it an octave and a twelfth up, fed back so it climbs; Reverse plays it backwards in swells; Freeze holds the note's first moment and plays grains of it while the note goes on, following its pitch.

GRANULATE mixes the dry sound with the grains, matched in loudness: at 100% you hear only grains, at 0 it's off. On the GRAIN tab, SIZE is each grain's length, DENSITY how many start a second, RANDOM how irregular they are (at 0 evenly timed and all from one place, at 100% at random times from random places) and SPRAY how far back they reach and how wide they spread (dead centre at 0, the whole stereo field at its most); picking a type sets the four to its starting point, and touching the GRANULATE dial opens the tab. Where the grains can't be as long as SIZE asks, its readout shows the length they play in brackets. On the screen each grain is a small glowing particle that rises from the bottom edge to the top, cooling and fading as it climbs: SIZE is how big it is, DENSITY how many there are, RANDOM the sequence they arrive in (in tidy columns at 0, scattered at 100%), and SPRAY how wide they spread (one stream up the middle at 0, the full width at its most); it glows hot while its grain sounds, and Freeze's held grains are white.

GRANULATE dims the wave as the grains come up. Hover a type in its menu to read what it does.

Unison, sub and noise

Each oscillator has up to 16 unison voices with several detune modes and stereo width. SUB adds a sine, triangle, saw, square or pulse wave up to three octaves down. NOISE plays sixteen pitchable noise loops and one-shots.

SHAPING / 1.0.0

Filters, mix, Morph and FX

Two filters

Two stereo filters, in series or in parallel, with drive, keytracking and left and right cutoff spread. Thirty-eight types in seven groups, each a model of its own circuit: Four-Pole, Two-Pole, Resonant, Phase & Delay, Mangle, Clean and EQ. VAR is each type's own extra control, named on the panel, and FDBK its own feedback loop. The display draws the filter's real response. Each source's arrow menu sends it to F1, F2, both, or straight past them. The filter chapter, after this page, shows every type's circuit.

Mix and routing

MIX sets each source's level and pan and sends the filtered sound to the main FX rack or either FX bus. ROUTING shows the whole signal flow, from the oscillators through the filters and racks to the master.

Morph

Morph stores four snapshots of the whole patch and moves between them on an XY pad. Put the pad on macros or modulate it to make a patch travel.

FX racks

Three racks, Main, Bus 1 and Bus 2, each with eight slots for 18 effect modules: ensemble, distortion, flanger, phaser, chorus, delay, compressor, reverb, EQ, filter, frequency shifter, convolution, utility and band splitters. The rack runs left to right, the order the sound goes through it, each effect a faceplate in its own colour; scroll sideways with the mouse wheel or the map in the bar. Each plate's controls are in boxed sections, the main dials large and the rest small. Every plate's screen follows the live sound (the one you click gets the finest analysis); drag a plate by its title strip to move it along the chain, and use + after the last effect to add one. An effect with a mode shows it on a small screen under its main one: step it with the arrows or click the name for the list.

FILTERS / 1.0.0

The filters

Every filter is a circuit

Each of Nodium's 38 filter types is a model of its own. We studied the circuit or design each one comes from and built our own version of it, part by part. Where the real parts saturate (a transistor pair, a diode, an amplifier running out of headroom), ours do too, and every sample is solved so the circuit's own equations hold. That's why they thicken, ring and break up the way hardware does, and why no two sound alike.

Every type has the same four places: an input stage, its core, an output stage and a feedback loop of its own. The pages that follow show each type's circuit and what its controls do.

The seven groups

Four-Pole: four stages in a loop, 24 dB an octave, the classic synth low-passes and a high-pass. Two-Pole: 12 dB an octave, from state-variable, Sallen-Key and diode-bridge circuits, each resonating its own way. Resonant: mostly resonance, formants, combs tuned to the note and twin peaks. Phase & Delay: delays and phase-shift stages mixed with the dry sound. Mangle: circuits that change the signal itself. Clean: exact, uncoloured designs. EQ: equaliser sections with a line amplifier's warmth on DRIVE.

The controls

CUTOFF and RES set the core's frequency and resonance. DRIVE pushes the signal into the circuit's own parts, wherever that circuit overloads: clean at 0, about 1 to 5 dB louder at full. VAR is each type's own extra control; the panel names it (SLOPE, MODE, CHIP...), and picking a type puts it at the type's home, where the type sounds as designed. FDBK is the type's own feedback loop, from -100% to +100%: the sign sets the loop's polarity, and every type's loop is different. KEY tracks the note, SPREAD offsets the left and right cutoffs, MIX blends the dry sound back in and LEVEL sets the output.

The screen

Each filter's screen is measured from the circuit you hear, as it's set. It reads like a measuring instrument: frequency across (100, 1K, 10K), level up the right in dB, 0 dB brighter. The dashed line is the cutoff and the handle sits on the curve there: drag across for CUTOFF and up or down for RES (hold Alt for fine moves; double-click resets both). CUTOFF and RES read along the top. A resonant peak has its true height written beside it, found exactly even when it's too narrow to draw. When the filter rings on its own, a bright line marks the tone and RINGS reads its pitch; the curve is then what the filter does to your sound around that tone. While the filter is modulated the curve moves with it, and where the dials set it stays as a dashed line.

■ FILTERS / 1.0.0

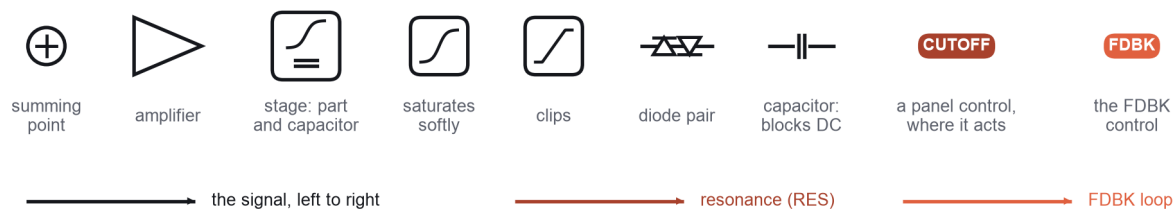
The filters, continued

ANALOG, QUALITY and the FX module

With ANALOG on, each of the eight voice cards builds its filters from slightly different parts (each side of the stereo filter too), so notes differ as they do on a polyphonic analogue synth. QUALITY sets how finely the circuits are solved and the rate they run at; offline renders always use the finest. Every filter ends in a soft ceiling, so nothing comes out louder than +3.5 dBFS. The Filter module in the FX racks plays the same types, but never lets a ring or a loop sustain on its own: an effect falls silent when the sound does.

Reading the diagrams

The signal runs left to right from IN to OUT. Red marks the resonance path and orange the FDBK loop; the coloured tags are the panel's controls, placed at the parts they act on.



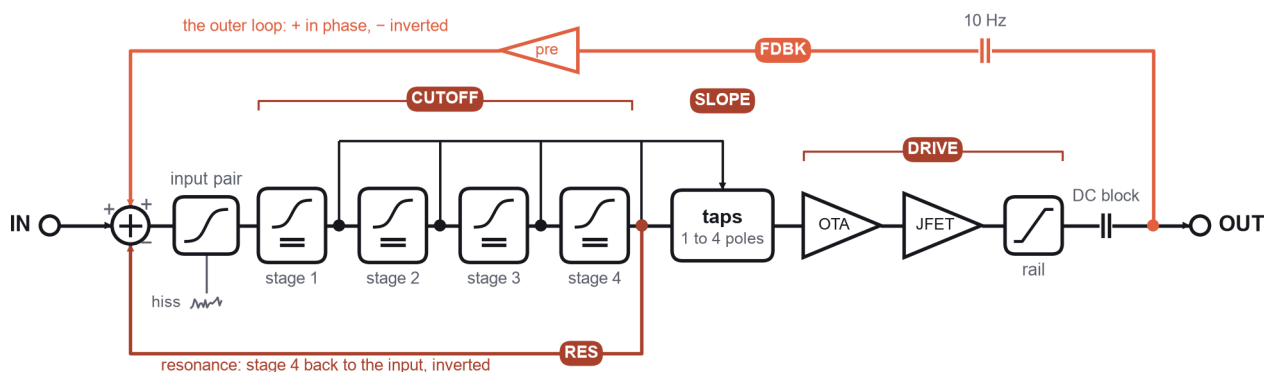
FILTERS / 1.0.0

Four-pole filters

Ladder LP

The transistor ladder: four transistor-pair stages, each charging a capacitor, with the fourth stage's output fed back, inverted, to the input pair. Every pair rounds the sound off, so it's thick and warm. As RES rises the bass thins and a ring grows at the cutoff, singing on its own from about 72%.

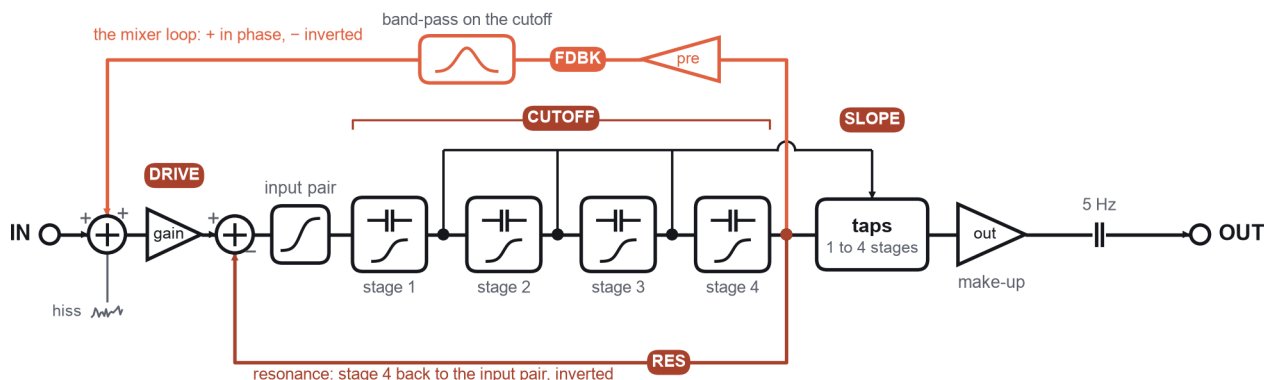
SLOPE (VAR) takes the output from stage 1 to 4: 6 to 24 dB an octave. DRIVE pushes an OTA and a JFET stage after the filter, warm and then snarling. FDBK sends the output back to the input through a preamp that overloads: + adds bass, growl and motorboating, - thins the sound and rings sooner.



Ladder HP

The transistor ladder turned into a high-pass: four stages, each a capacitor in the signal's path that a transistor pair charges. The highs pass straight through; driven hard, the pairs can't keep up with the bass, so its peaks break through, buzzing. RES lifts a peak at the cutoff and thins the top, but never rings.

SLOPE (VAR) takes stage 1 to 4: 6 to 24 dB an octave. DRIVE pushes the input pair before the stages: grit, and the bass breaking through. FDBK is a mixer loop through a band-pass on the cutoff: - rings at the cutoff from about -79%, + screams two octaves up from +88%.

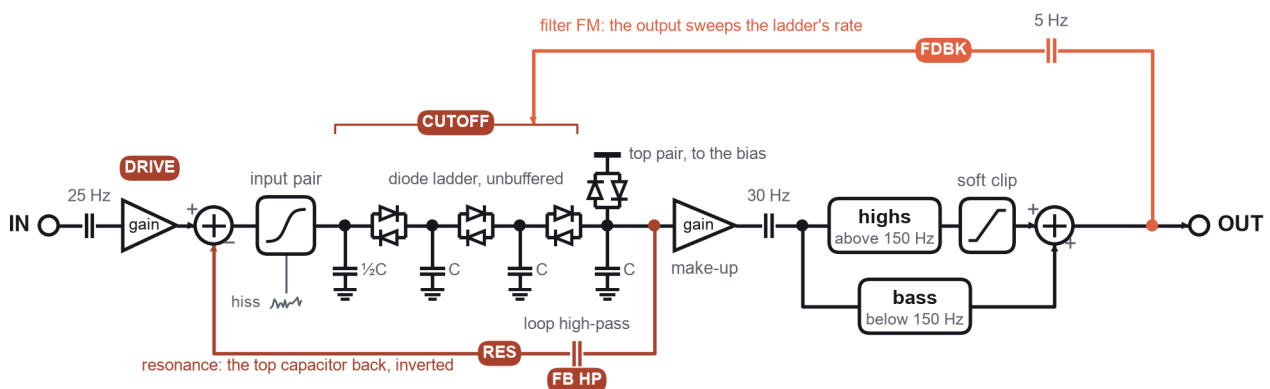


Four-pole filters, continued

Acid Ladder

The diode ladder of the classic acid bass line: four capacitors joined by diode pairs, nothing isolating them, so each stage loads its neighbours. Its roll-off starts early and gently, so it's darker than the other ladders at the same CUTOFF. Its resonance is rubbery, squashing as the note gets louder, and rings only past 80% RES.

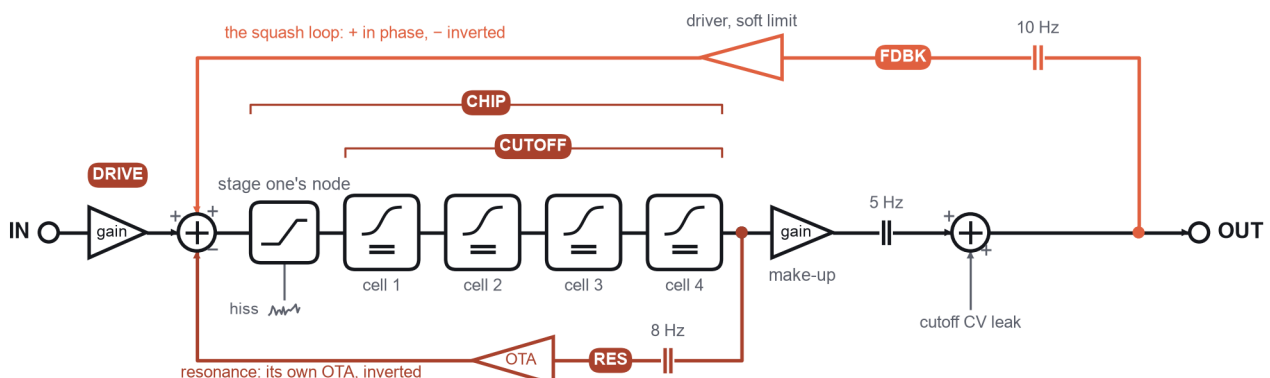
FB HP (VAR) sets the loop's high-pass, 20 to 400 Hz: low holds the resonance on bass notes, high thins it as the cutoff falls. DRIVE pushes the input pair by up to 36 dB: grit, the ring quenched at the note's peaks. FDBK lets the output sweep its own cutoff; - sharpens the edges.



Cascade 24

The integrated four-pole of the classic poly synths: four gain cells, each charging a capacitor, with resonance through its own amplifier. It stays clean until its input overloads, on one side only: loud notes clip unevenly and the ring dips. RES takes the bass and, from about 62%, sings a pure sine.

CHIP (VAR) morphs between the two chip generations: 0% is the earlier, warm and smeared; 100% the later, clean and glassy. DRIVE pushes the input node into its one-sided clip. FDBK loops the output back through that node, so it squashes rather than swells; - adds to the resonance.



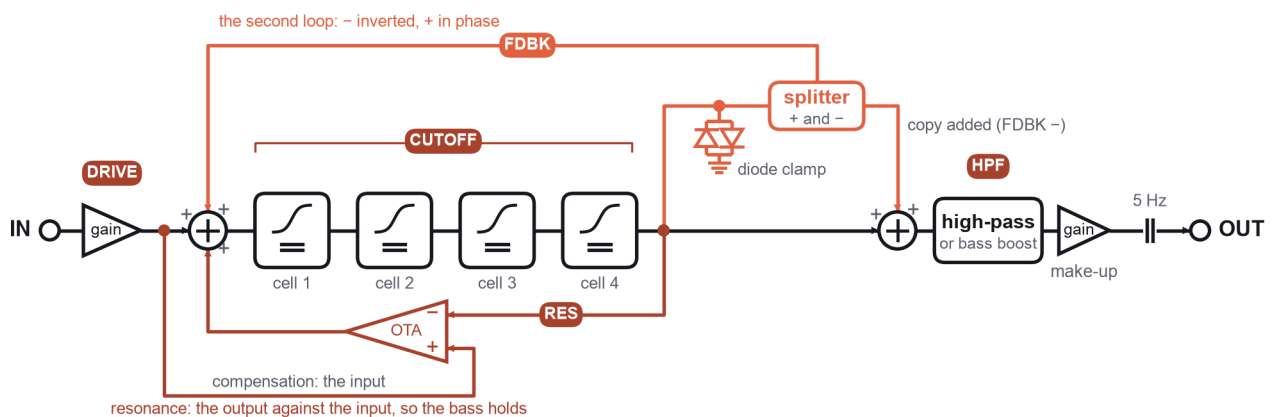
FILTERS / 1.0.0

Four-pole filters, continued

Poly OTA 24

The four-pole chip of the classic 80s polysynths: four amplifier cells, each charging a capacitor, kept clean by heavy attenuation, so they smear only edges and highs. Its resonance amplifier also feeds in more input, so the bass holds as RES rises. From 78% it rings, a sine held 6 dB below full scale.

HPF (VAR) is a gentle filter after the chip: 0% a +6 dB bass boost, 20% flat, 100% a high-pass at 720 Hz. DRIVE smears the cells' edges, then drives the capacitors into their limits. FDBK adds a diode-clamped loop: – a gritty second resonance and bass loss; + bass swells the diodes hold down.



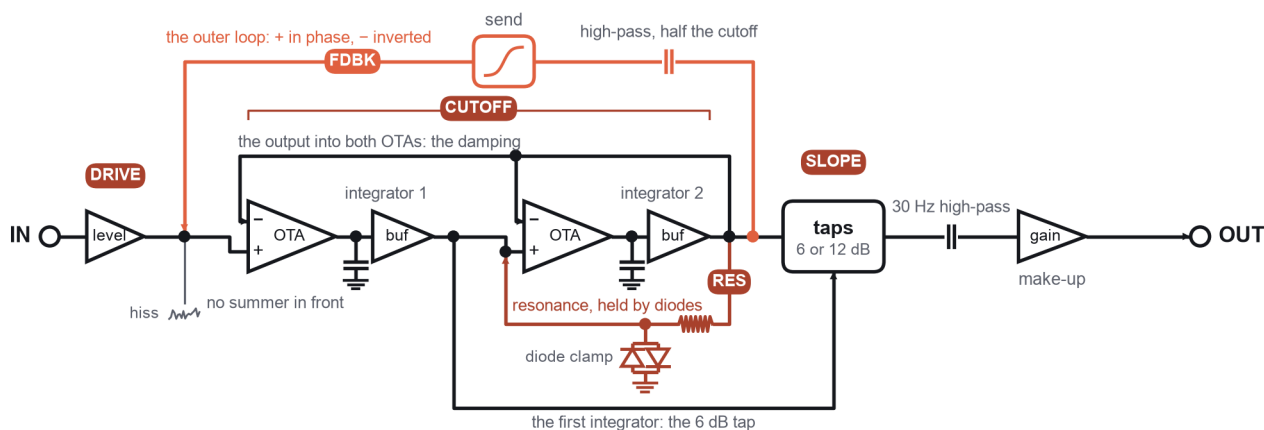
FILTERS / 1.0.0

Two-pole filters

Biquad LP

Two current-driven amplifiers, each charging a capacitor, with no summing amp in front: the input goes straight into the first, which runs hot, so edges and highs fizz even at moderate levels. The output feeds back into both. Resonance keeps the bass; from about 80% it rings, held by a diode pair just under full scale.

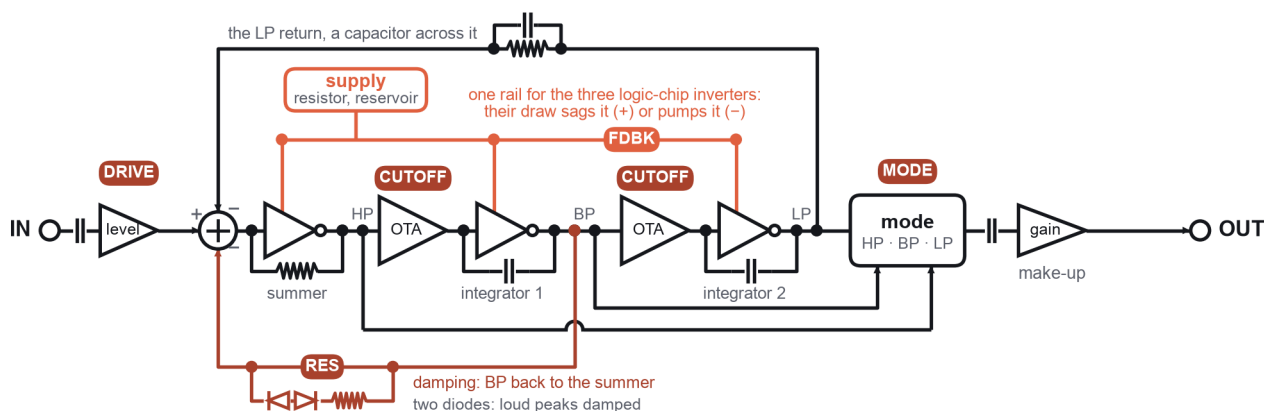
SLOPE (VAR) takes the output from the first stage (6 dB an octave) or the second (12 dB), blended. DRIVE pushes the first amplifier: fizz, then clipping from half way. FDBK sends the output, minus its bass, back in: + swells the band below the cutoff, then screams; – scoops it and tames the peak.



CMOS SVF

A state-variable filter (a summing stage and two integrators in a loop) built from logic-chip inverters instead of op-amps, all three on one supply rail. They have little gain to spare, so it's gritty and lopsided at every level, and gate-like near the rails. Two diodes squash loud peaks; it pings but never rings on its own.

MODE (VAR) sweeps from high-pass (0, the rawest) through band-pass to low-pass (100%, the smoothest), with no notch between. DRIVE runs from –6 to +18 dB: soft grit, then the rails, then a square. FDBK moves the shared rail with the signal: + sags it (grittier), – pumps it (cleaner). The cutoff never moves.



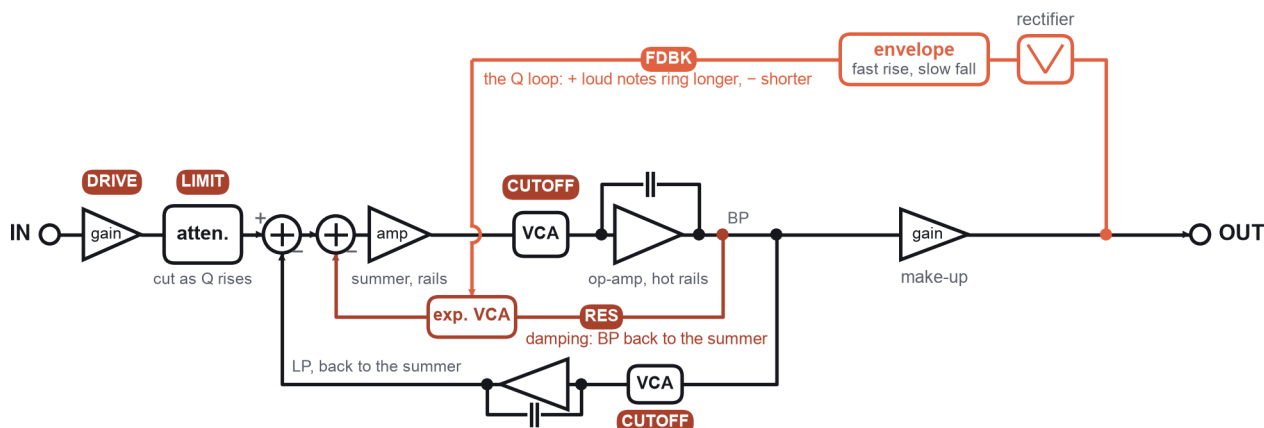
FILTERS / 1.0.0

Two-pole filters, continued

Resonator BP

A resonator: a summing amp and two integrating stages in a loop, taken as a band-pass. RES sets its sharpness exponentially, each tenth doubling it, so at the top a strike rings for seconds at the cutoff, though never on its own. Loud peaks hit the band-pass stage's rails and clip, slightly lopsided; DRIVE pushes them there.

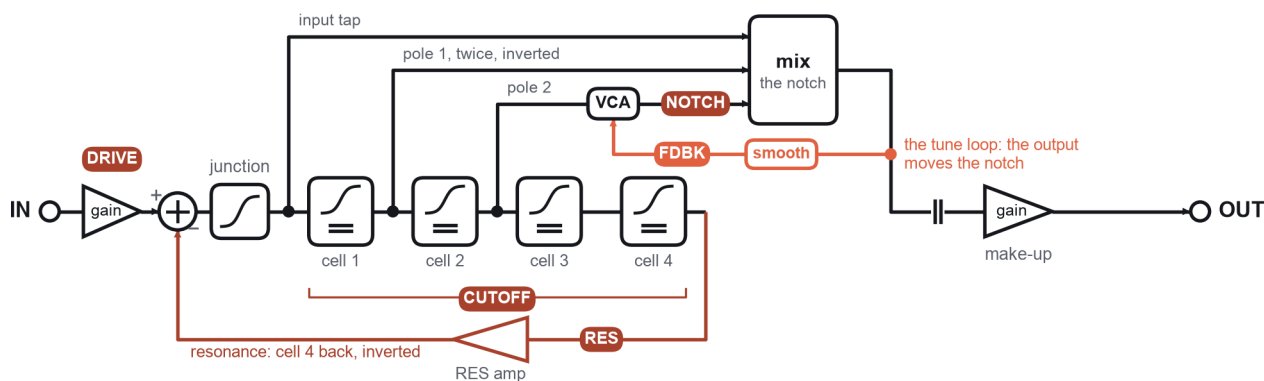
LIMIT (VAR) turns the input down as the resonance sharpens: at 0 the peak climbs 54 dB and overloads; at 100% it stays at 0 dB, a clean ping; 50% keeps the level steady. FDBK puts the output's envelope on the damping: + loud notes ring longer, – shorter.



Pole-Mix Notch

Four gain-cell stages in a resonant loop, the output mixed from the loop's input and its first two stages so they cancel at one frequency: a notch about 40 dB deep, as deep as the parts match. As RES rises the bass thins and a peak climbs into the notch, never ringing on its own.

NOTCH (VAR) moves the notch from two octaves below the cutoff to two above, 50% on it: lower also drops the bass, higher the top. DRIVE squashes the loop's input, squeezing the resonance. FDBK lets the output move the notch with the waveform, + on positive swings, – on negative; pushed, the notch fills, metallic.



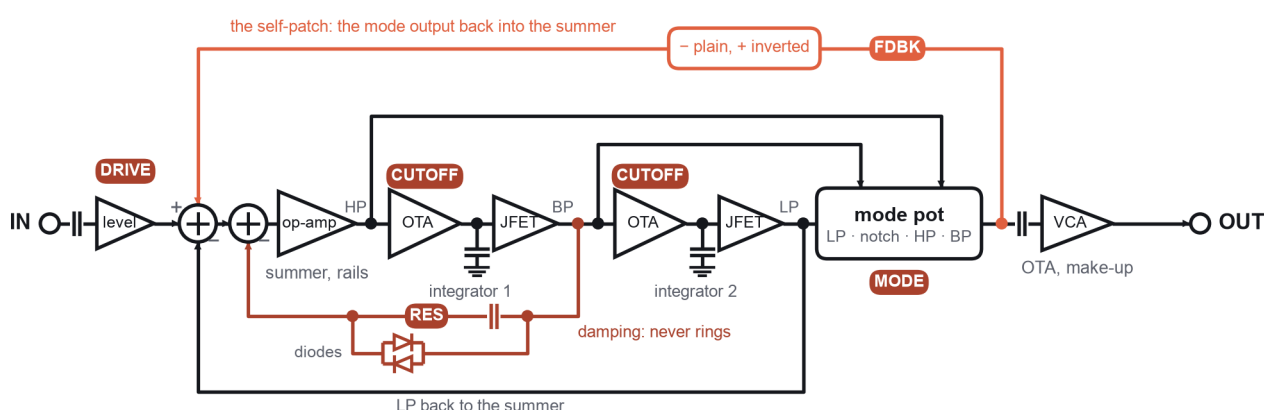
FILTERS / 1.0.0

Two-pole filters, continued

SVF Morph

A classic state-variable filter: an op-amp summer and two gently driven current-controlled integrators, read by transistor buffers. Its resonance is damping that can't go past zero, so it never rings, and diodes soften loud peaks. Smooth and vocal, it keeps its bass: breathy at low RES, with most of the resonance in the top fifth.

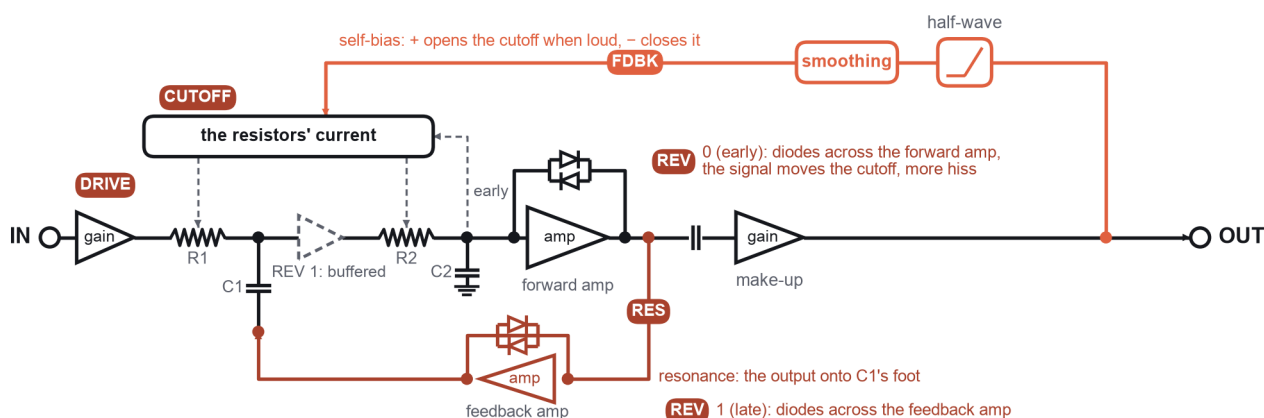
MODE (VAR) turns a pot between the outputs: low-pass at 0, notch at 50%, high-pass at 95%, band-pass at 100%. DRIVE clips edges at the summer and brings the diodes in sooner. FDBK patches the output back in: – lifts the low-pass's peak and narrows the notch; + fills the pass band and softens the resonance.



Sallen-Key LP

A Sallen-Key low-pass: two resistor-capacitor sections, the output fed back onto the first capacitor, so the resonance never thins the bass. From 80% RES it screams, and a diode limiter inside the loop holds the scream: the note and the ring share its headroom, so a big ring ducks the note and a loud note pushes the ring back.

REV (VAR) picks the revision. 0 (early): diodes across the forward amp, so the whole signal grits, with a lopsided, noisier ring. 100% (late): diodes in the feedback; the note stays clean. DRIVE adds up to 20 dB. FDBK moves the cutoff with the output's level: + opens it when loud, – closes it.



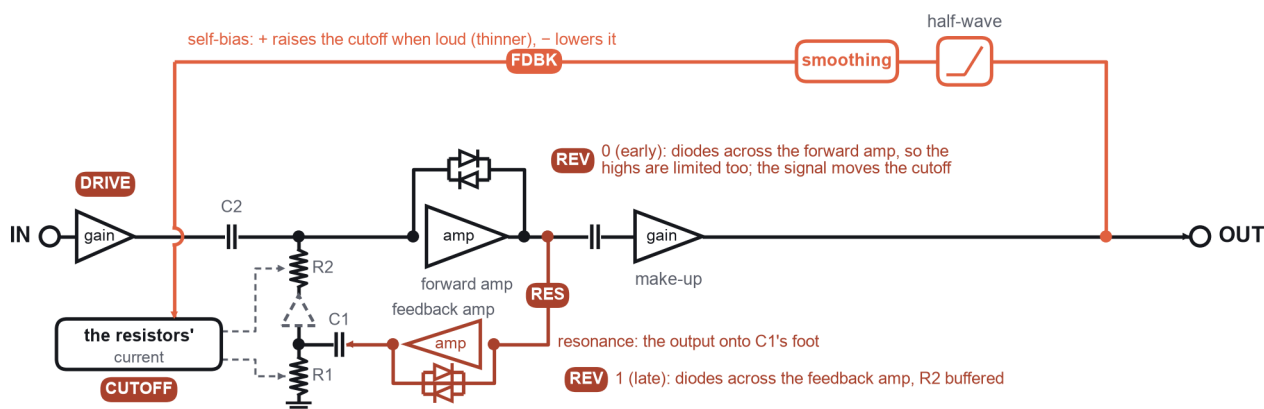
FILTERS / 1.0.0

Two-pole filters, continued

Sallen-Key HP

The Sallen-Key LP's partner, made by feeding the input to the bottom of the second capacitor rather than swapping parts: a resonant hump over a skirt that falls only 6 dB an octave, so plenty of bass leaks under the peak. From 80% RES it rings; diodes in the loop hold the ring, which ducks the passed highs.

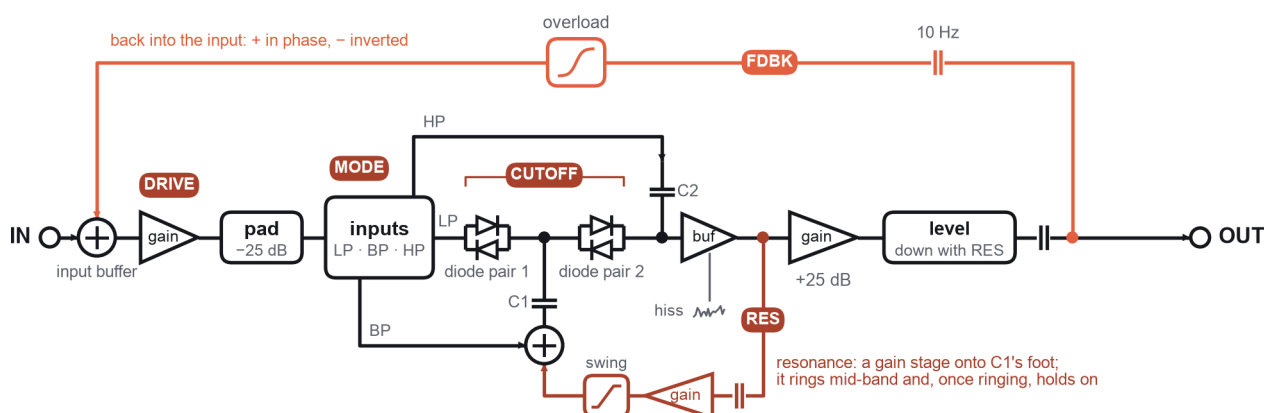
REV (VAR) picks the revision: 0 (early) puts the diodes across the forward amp, limiting the passed highs too, with a lopsided, noisier ring; 100% (late) puts them in the feedback, keeping the highs clean. FDBK moves the cutoff with the output's level: + raises it when loud (thinner), - lowers it (fuller).



Diode Bridge

A two-pole filter whose resistors are diode pairs, so it's dirty from ordinary levels and its cutoff sags as the sound gets louder. A gain stage rings it, mid-band only, from about 81% RES; once ringing it holds on until RES is back near 69%. It keeps its bass, so the level is trimmed as RES rises.

MODE (VAR) picks where the voice goes in, crossfading: the first diode pair (low-pass), the first capacitor (band-pass), the second (high-pass), or LP and HP together (notch). More DRIVE is dirtier, the cutoff sagging. FDBK loops the output in: + swells the bass or moves the ring, - thins it; the top quarter is wild.



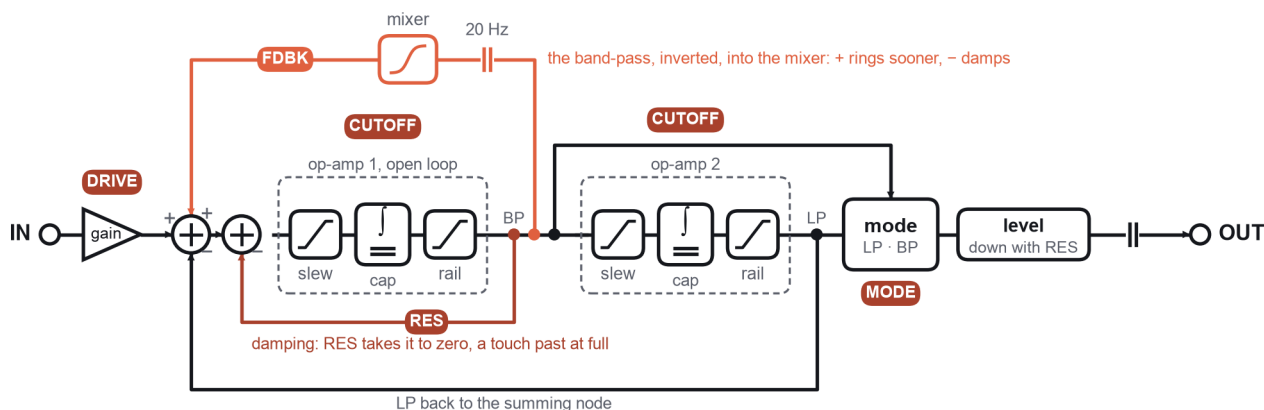
FILTERS / 1.0.0

Two-pole filters, continued

Slew 12

A state-variable filter whose two integrators are slow op-amps run without feedback: their outputs can only move so fast, so it distorts on rate, not level, turning edges into ramps. No diodes hold the ring, only that slewing and the rails: from 67% RES it rings as a lopsided, flattened pulse, going flat at the top of the range.

MODE (VAR) crossfades low-pass (0, 12 dB an octave) to band-pass (100%, 6 dB). DRIVE adds up to 20 dB: edges slew, then the outputs stick on the rails and the ring dies. FDBK feeds the band-pass, inverted, into the mixer: + rings sooner and, pushed, flat on the rails; – damps until the mixer clips.

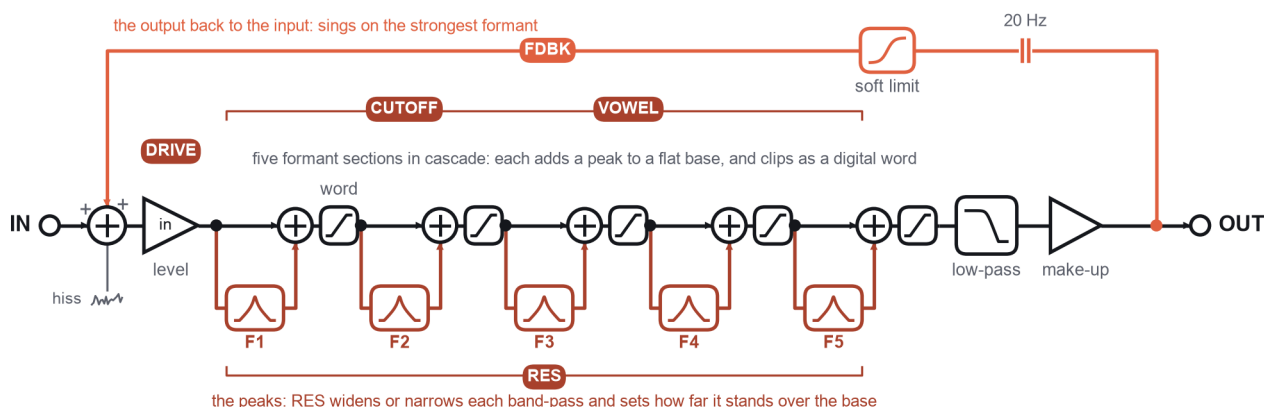


Resonant filters

Vowel

A vocal tract: five formants (the resonant peaks a mouth and throat make), one after another, each a peak added to a flat base, so the highs pass between them. The peaks are measured from real voices. Driven hard, its arithmetic clips: the strongest formant squashes first, then the vowel itself distorts. It never rings.

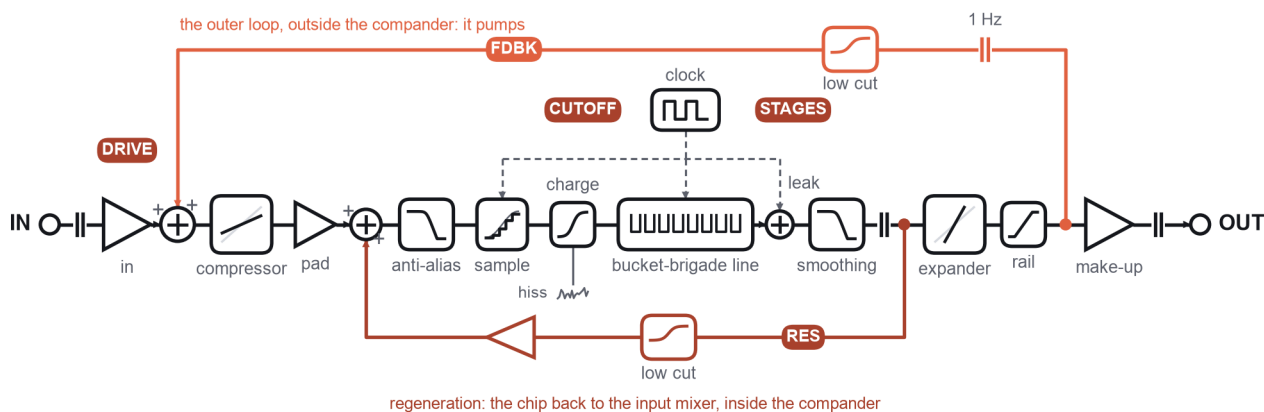
VOWEL (VAR) morphs through eight vowels, heed to who'd. CUTOFF is the tract's size: men, women, children, then a giant or a tiny voice. RES narrows the peaks and lifts the loudest from 8 to 30 dB over the base. FDBK + sings on the strongest formant from about 90%; – flattens it.



Bucket Comb

A bucket-brigade chip (a line of tiny capacitors its clock steps the sound along) played as a comb: peaks at the cutoff and its harmonics. It sits inside a compander that squashes the sound going in and expands it coming out, so the peaks stand out twice as far. Dull, hissy and a little gritty; pushed, it crunches.

STAGES (VAR) is the chip's length: short, the clock whines and grates at low notes; long, more grit and hiss and duller high notes. RES regenerates inside the compander and rings from 80%. FDBK, the outer loop: + rings at the cutoff and ducks under new notes; - rings about an octave lower, hollow.



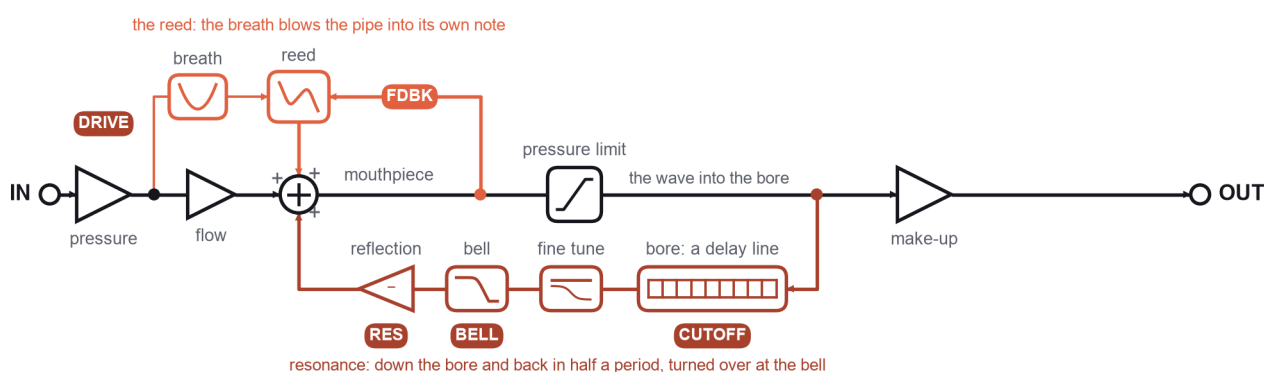
FILTERS / 1.0.0

Resonant filters, continued

Pipe Comb

A digital pipe: a delay line there and back in half a period, turned over at the bell, so it rings at the cutoff and its odd harmonics only, exactly in tune and hollow. A reed at the mouthpiece lets a loud enough input blow it into its own note while it lasts. Its pressure limit rounds loud rings off.

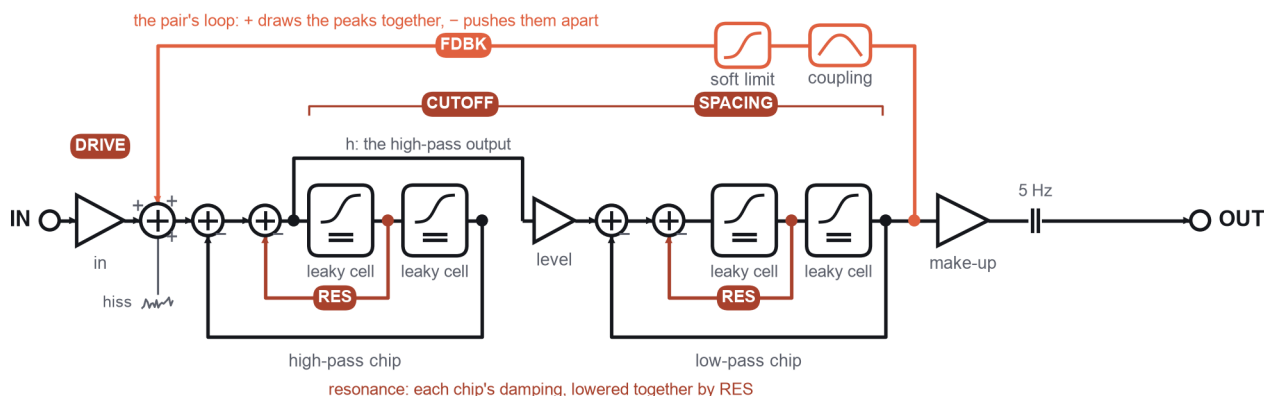
BELL (VAR) sets how fast the highs die: woody to glassy; home 40%. RES is the reflection: from a knock to a ring of seconds. DRIVE is blowing pressure. FDBK is the reed: + blows the pipe into its own note once you play loud enough; - chokes it while the input is loud.



Dual Peak

Two filter chips one after the other, a high-pass into a low-pass: a band with a resonant peak at each edge, or crossed, a thin band. A small leak in each chip keeps low peaks soft and lets high ones grow sharp. Driven, the high-pass chip's peak saturates first and the bass under the band breaks through.

SPACING (VAR) sets the two chips up to 3 octaves apart: open, two peaks; at the middle, one; crossed, a thin band. RES sharpens both peaks, never ringing. FDBK lets the pair ring: + draws the peaks together and rings at the cutoff from 80%; - pushes them apart, ringing on the upper one.



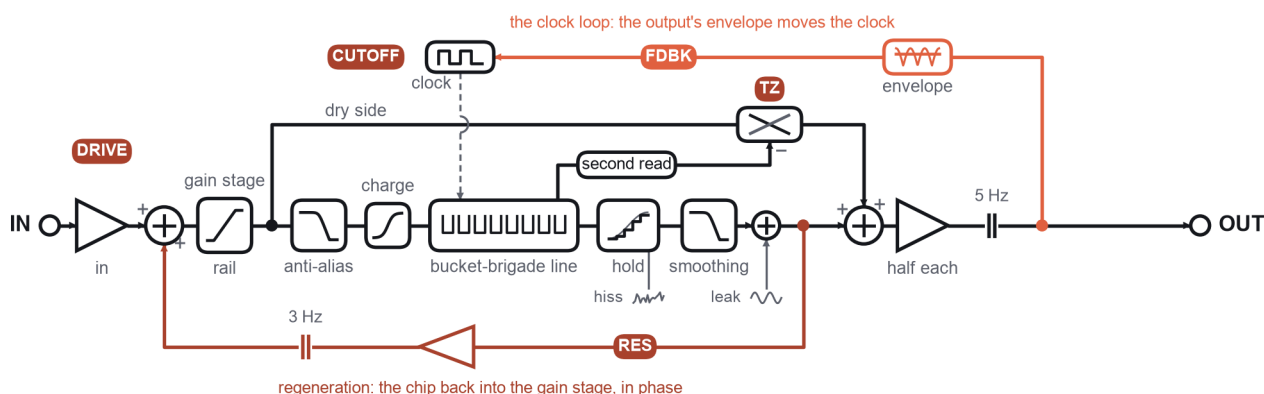
FILTERS / 1.0.0

Phase and delay filters

Flanger

A short bucket-brigade chip (a line of capacitors its clock steps the sound along), half and half with the dry sound: evenly spaced peaks on the cutoff's harmonics, bottomless notches between. It doesn't sweep itself. Glassy up high; below about 80 Hz the slow clock darkens, whines and grates. Pushed, the chip clips and the notches fill.

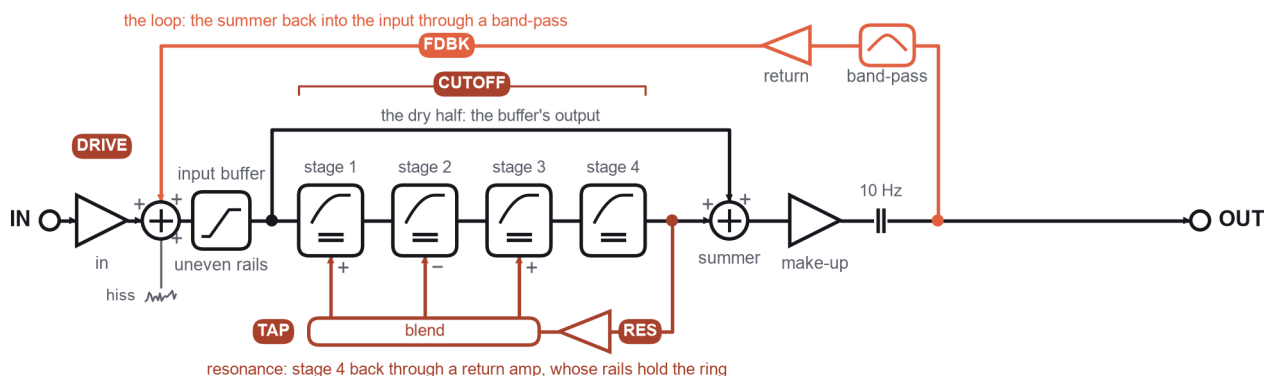
TZ (VAR): turned up, the dry side becomes a second, inverted chip: the comb turns over and a CUTOFF sweep passes through zero. RES narrows the peaks to a ring that never sustains. FDBK moves the clock with the output's level: + the comb falls as a note swells, - rises; up to 1.5 octaves.



Phaser 4

The classic four-stage phaser pedal held still: four transistor allpass stages (each shifts the phase, not the level) mixed with the dry sound, so two notches sit either side of the cutoff. Each transistor bends with the signal, so loud notes fill the notches with warm grit, more at low cutoffs; pushed harder, the input buffer clips unevenly.

TAP (VAR) picks where RES's return lands: stage 1, 2 or 3, blended, putting the peak about an octave below the cutoff, on it, or most of an octave above. RES raises that peak and rings from 80%. FDBK, a loop through a band-pass: + sings at the cutoff, ringing from 90%; - dips it.

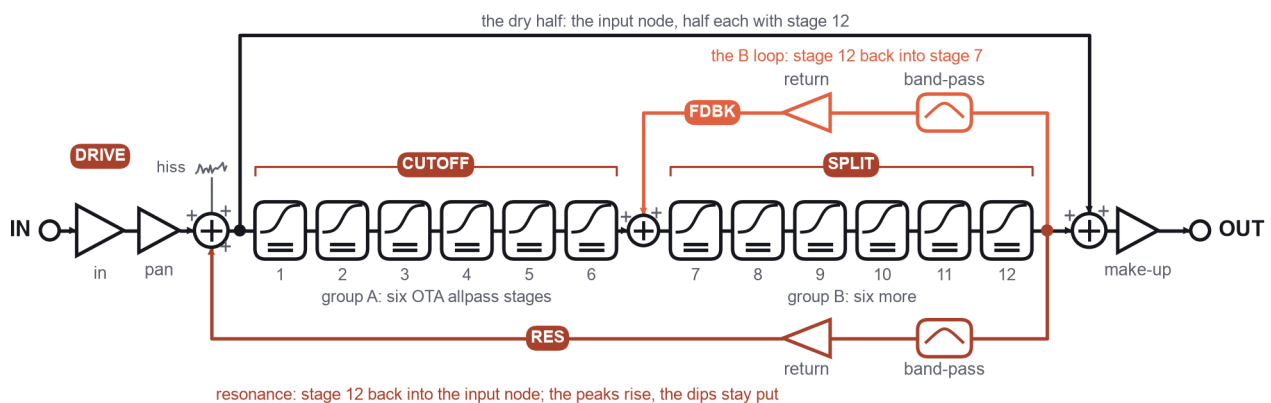


Phase and delay filters, continued

Phaser 12

A twelve-stage phaser held still: twelve allpass stages (each shifts the phase, not the level) in two groups of six, mixed half and half with the dry sound for six dips. Each stage's amplifier runs out of current on loud notes, so the dips sink, then fill in, with a smooth grit.

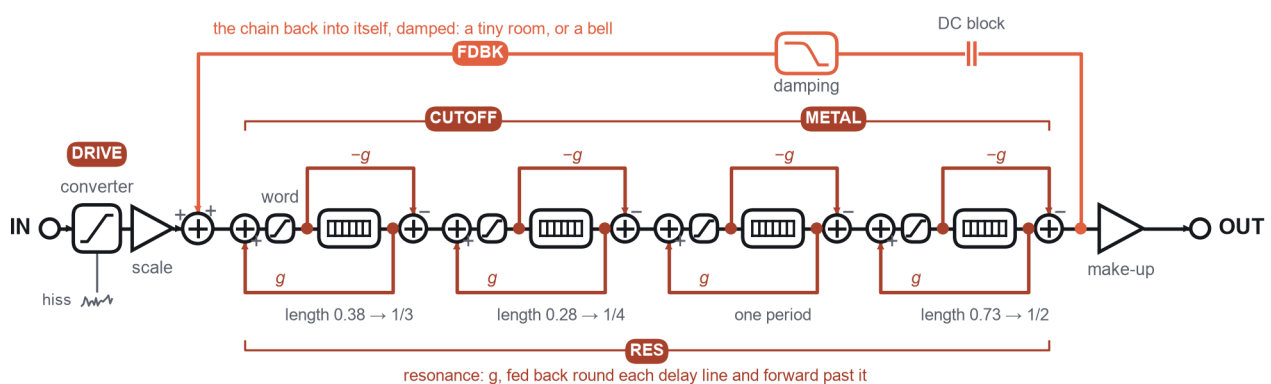
SPLIT (VAR) lifts group B up to 4 octaves above A: from six even dips to two uneven, interleaved sets. RES raises the peaks between the dips, which stay put, and rings on the middle peak from 86%. FDBK adds a second resonance on group B: – peaks at its own frequency, + either side.



Diffuser

The input diffuser of the early studio digital reverbs: four delay lines, each wrapped in feedback and feed-forward so it passes every frequency at full level and only smears the sound in time. The longest line is one period of the cutoff, so the smear buzzes at a playable pitch. Driven, its arithmetic clips and loud echoes flatten.

METAL (VAR): 0 is the classic diffuser's uneven, slowly moving lengths (smooth); 100% sets them to a half, third and quarter of the longest (metallic). RES is the diffusion: plain echoes, then a smear, then a buzz. FDBK feeds the chain back into itself, damped: a tiny room, or a bell when metallic.



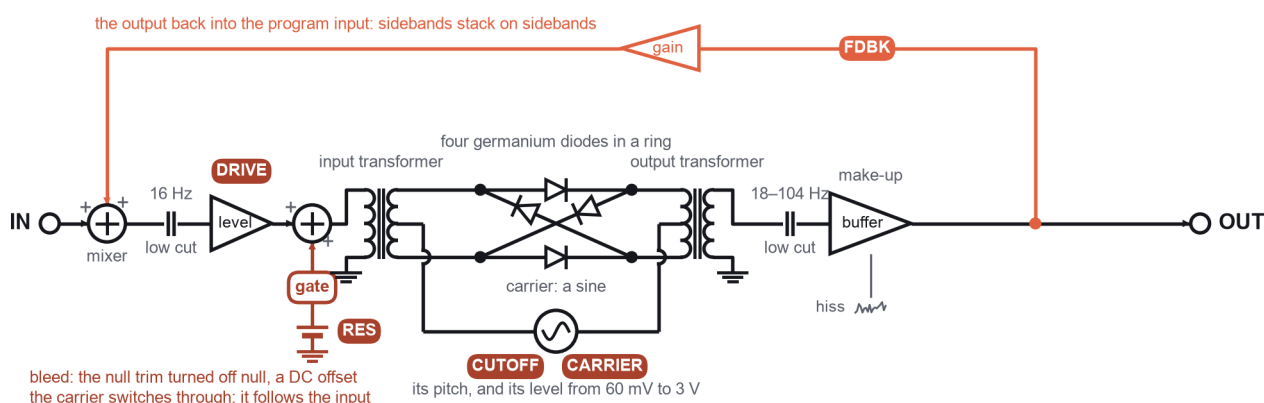
FILTERS / 1.0.0

Mangle filters

Ring Mod

A passive ring modulator: four germanium diodes in a ring between two transformers, switched by an internal sine carrier at the cutoff. The input comes out as the sum and difference of the two pitches, its own pitch gone: metallic and bell-like, out of tune unless KEY locks the carrier. The transformers thin the bass as the carrier drops.

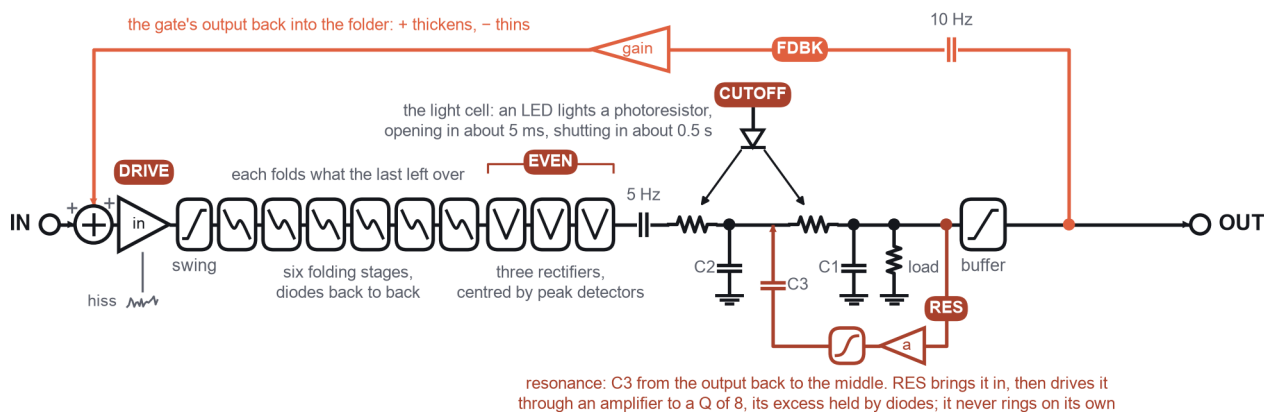
CARRIER (VAR) sets the carrier's level: squashed and thin at 0%, close to a pure multiply near 45%, soft-edged switching at 70% (home), a hard square at 100%. RES is the bleed: the carrier comes through. DRIVE adds intermodulation. FDBK sends the output back in, stacking sidebands at every multiple of the carrier.



Fold

A wavefolder into a low-pass gate. Six diode stages fold the wave back on itself, their folds unevenly spaced, so it grows bright odd harmonics as you push it. The gate is a light cell, an LED lighting a photoresistor: it opens in about 5 ms and shuts over half a second, so an envelope plucks.

DRIVE pushes the wave through the folds, from just under the first to all six. EVEN (VAR) brings in three rectifiers in turn, adding octaves (even harmonics). RES runs from the gate's gentle mode to a resonant peak, never a ring. FDBK feeds the gate's output back into the folder: + thickens, - thins.



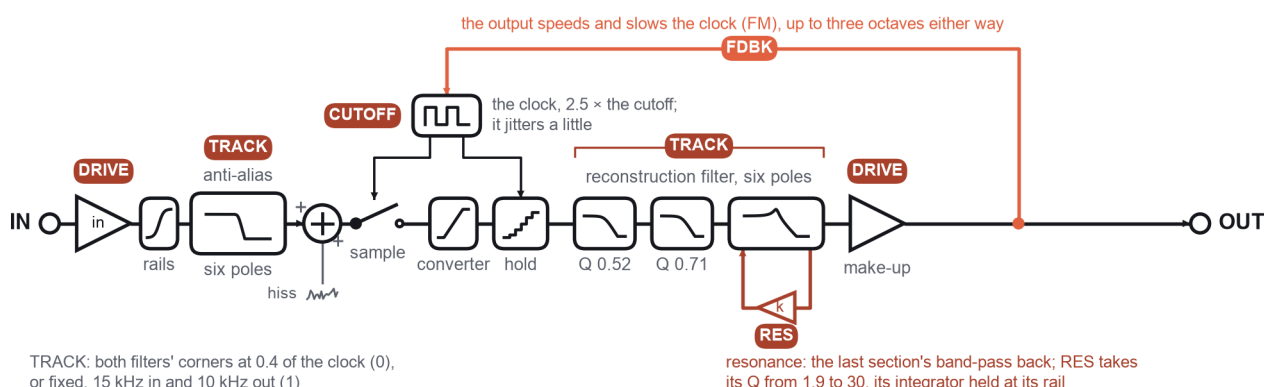
FILTERS / 1.0.0

Mangle filters, continued

Downsample

A sampler voice, live: the input is filtered, sampled by a clock at 2.5 times CUTOFF, held from tick to tick and filtered again. Low clocks turn grainy and metallic, tones folding back down (aliasing) and the held steps' images ringing above; tracking filters keep it dark and smooth. Loud inputs overload the converter, folding at the clock.

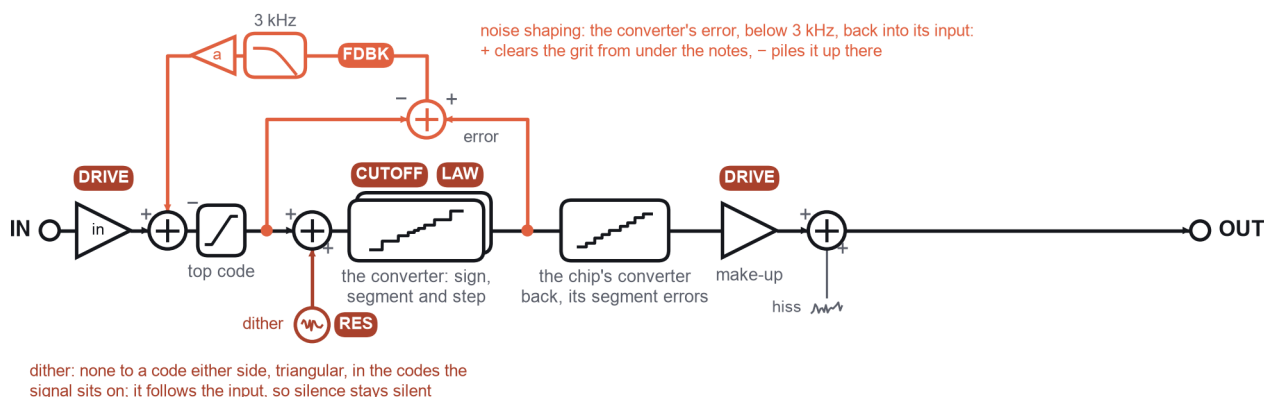
TRACK (VAR): at 0% both filters follow the clock, dark and smooth; at 100% they stay at 15 kHz in and 10 kHz out, letting aliasing and the steps' images through (home 50%). RES peaks the output filter just under half the clock. FDBK lets the output bend the clock's rate: grit, then chaos.



Bitcrush

An early drum machine's 8-bit companding converter: a sign, a segment and a step. Each segment's steps are twice the last's, so the grit rides the note: quiet sounds keep their detail, loud ones turn grainy, and tails fade without gating. CUTOFF sets the word length, 2 to 16 bits; the chip's segment errors add their own roughness.

LAW (VAR) runs from a linear converter that cuts towards zero (0%: tails gate) to the companding chip (100%, home). RES adds dither that follows the input. FDBK shapes the error below 3 kHz: + clears grit from under the notes, - piles it there. DRIVE clips at the top code.



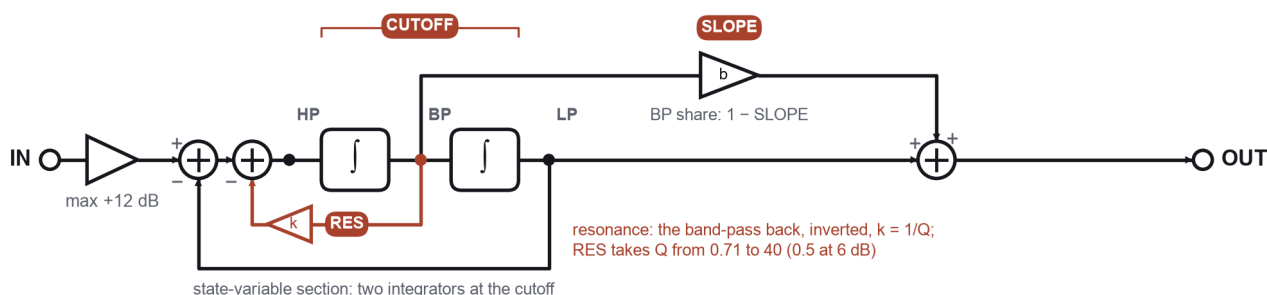
FILTERS / 1.0.0

Clean filters

Clean LP 12

The exact two-pole low-pass: a state-variable filter worked out to the sample, with nothing that saturates, hisses or drifts. Flat to the cutoff, then 12 dB an octave. RES raises a clean peak just under the cutoff that rings and dies away but never sustains; past +12 dB the peak holds and the pass band drops instead.

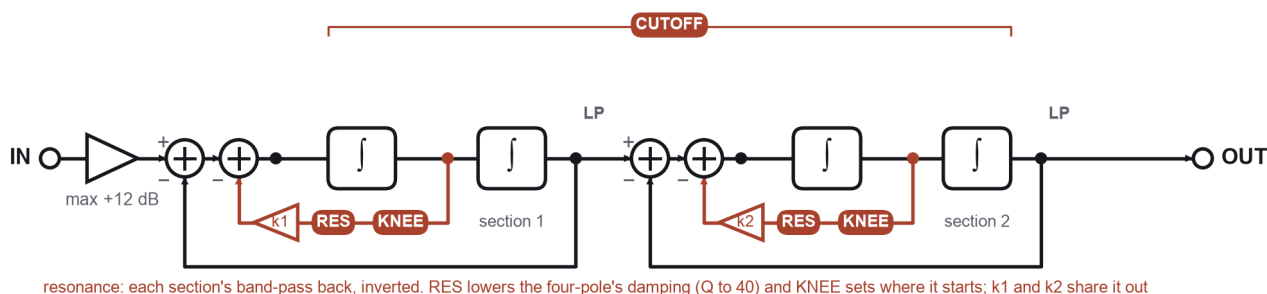
SLOPE (VAR) blends in the band-pass: 12 dB an octave at 100% (home), an exact 6 dB one-pole at 0%, with no bump in between. RES raises the peak to +12 dB, then narrows it while the rest drops. DRIVE does nothing, and FDBK is off.



Clean LP 24

The exact four-pole low-pass: two state-variable sections at the cutoff, sharing out one damping so the pair falls 24 dB an octave with a clean knee. RES gives Clean LP 12's peak at half the width, ringing twice as long, then dying away. Unlike the analogue four-poles it keeps its bass and never self-oscillates.

KNEE (VAR) shapes the bend: a soft crossover knee at 0%, 6 dB down at the cutoff, which sums flat with Clean HP 24 set the same; the flattest knee at 100% (home), 3 dB down. RES raises the peak to +12 dB, then narrows it. DRIVE does nothing, and FDBK is off.

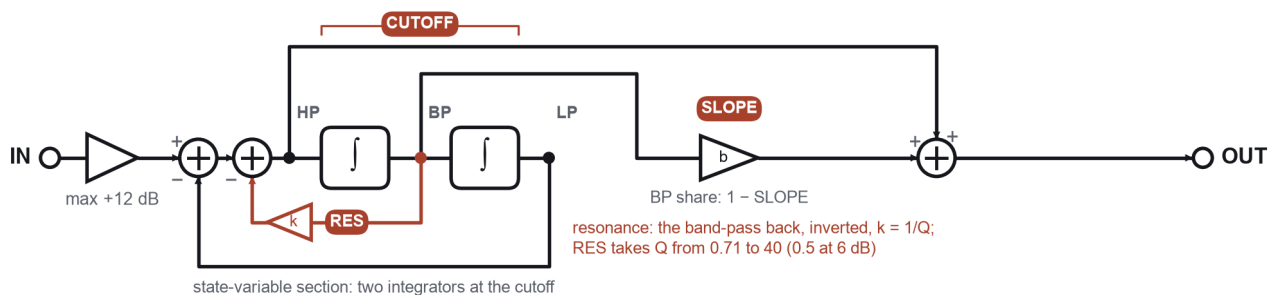


Clean filters, continued

Clean HP 12

The exact two-pole high-pass, Clean LP 12 mirrored: a state-variable filter worked out to the sample, with nothing that saturates or drifts. It cuts 12 dB an octave below the cutoff. RES raises a clean peak just above the cutoff that rings and dies away, never sustaining. The tidy high-pass: no scream, no lost level.

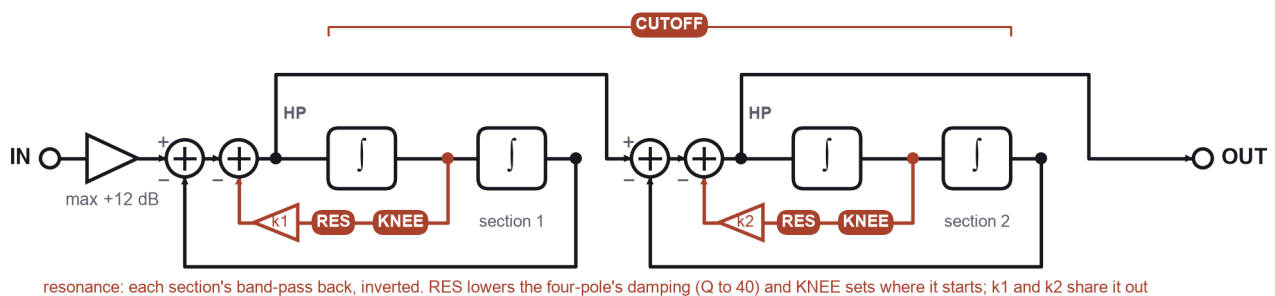
SLOPE (VAR) blends in the band-pass: 12 dB an octave at 100% (home), an exact, gentle 6 dB low cut at 0%, with no bump between. RES raises the peak to +12 dB, then narrows it while the pass band drops. DRIVE does nothing, and FDBK is off.



Clean HP 24

The exact four-pole high-pass, Clean LP 24 mirrored: two state-variable sections at the cutoff, their high-passes in series, falling 24 dB an octave below it. RES gives a peak just above the cutoff, half as wide as Clean HP 12's, which rings and dies away. No bass-side loop and no level loss: the high-pass for tidying a mix.

KNEE (VAR) shapes the bend: a soft crossover knee at 0%, 6 dB down at the cutoff, which sums flat with Clean LP 24 set the same; the flattest knee at 100% (home), 3 dB down. RES raises the peak to +12 dB, then narrows it. DRIVE does nothing, and FDBK is off.



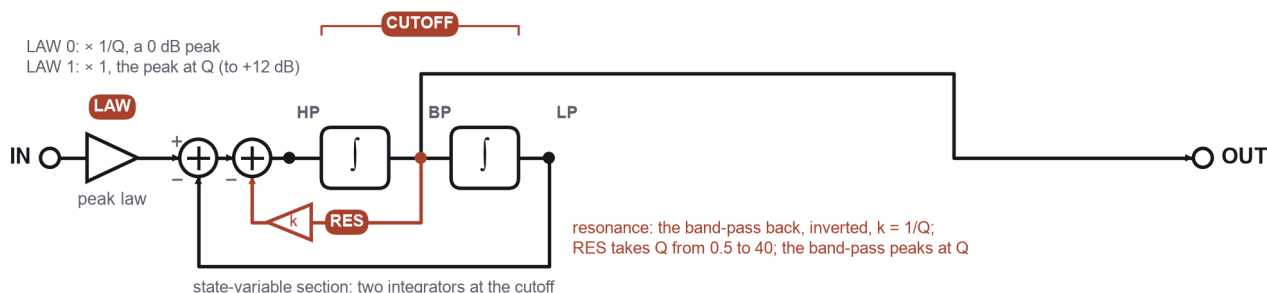
FILTERS / 1.0.0

Clean filters, continued

Clean BP 12

The exact two-pole band-pass: a state-variable filter's band output, one pointed peak exactly on the cutoff at any resonance, falling 6 dB an octave either side. So with KEY at 100% it plays a pitch. RES narrows it from a band two octaves wide to a ringing tone that dies away; the peak never passes +12 dB.

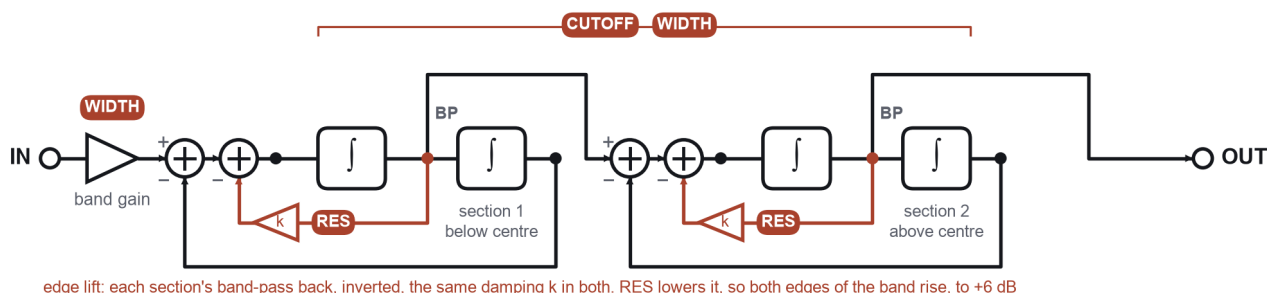
LAW (VAR) sets how RES behaves. At 100% (home) the skirts stay put and the peak rises with RES: a pinging resonator. At 0% the peak stays at 0 dB and the band narrows round it: a focus. Between, the peak rises part of the way. DRIVE does nothing, and FDBK is off.



Clean Band

A flat-topped band rather than a peak: two state-variable band-passes in series, tuned either side of the cutoff, falling 12 dB an octave each side and level across the top. It's the tool for telephone, radio and small-speaker sounds. RES lifts both edges of the band into shoulders while the middle stays at 0 dB.

WIDTH (VAR) sets the band between its -3 dB edges: a third of an octave at 0% to four octaves at 100%, centred on the cutoff (home 50%, just over an octave). RES lifts both edges from flat to +6 dB shoulders. DRIVE does nothing, and FDBK is off.



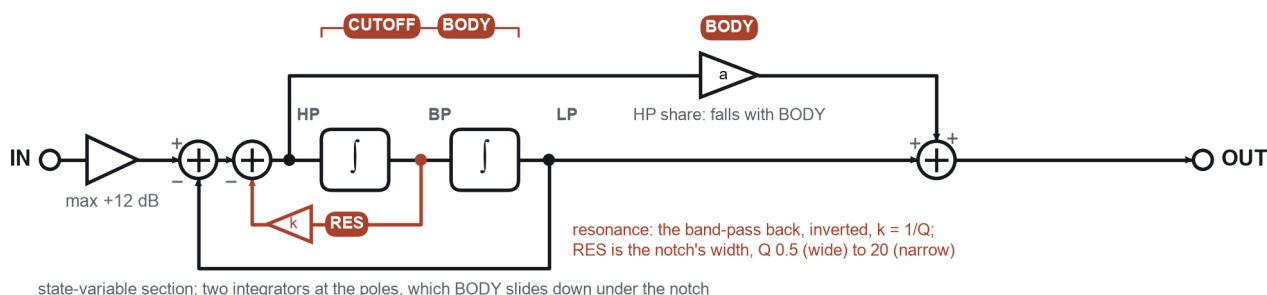
FILTERS / 1.0.0

Clean filters, continued

Clean Notch

An exact notch pinned on the cutoff: a state-variable filter's low-pass plus its high-pass, which cancel completely there, so the cutoff vanishes at every setting. RES only sets the notch's width, from a broad scoop two and a half octaves wide to a surgical tenth of an octave. Nothing saturates; with BODY, a peak grows under the notch.

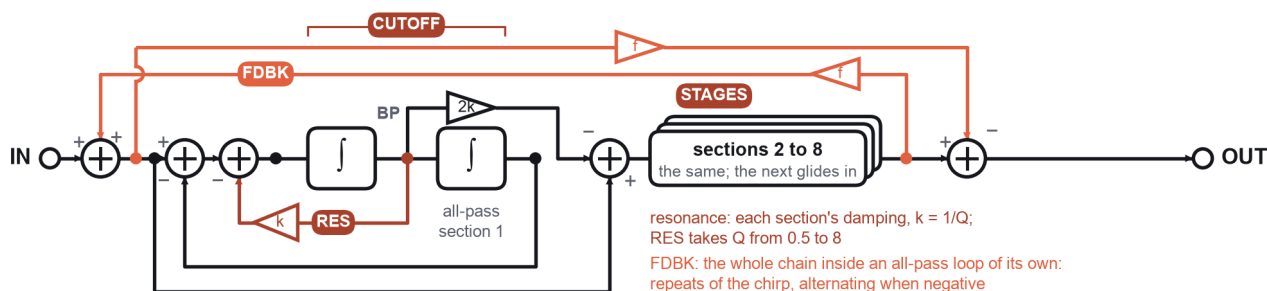
BODY (VAR) slides the poles down to half an octave under the notch: a plain notch at 0% (home); at 100% a low-pass with the notch on top, the highs 6 dB down, and RES growing a peak just under the notch. DRIVE does nothing, and FDBK is off.



Allpass

A chain of one to eight all-pass sections at the cutoff. Every frequency passes at full level, but those near the cutoff come out later, so with several sections a click becomes a pitched chirp and a sound smears like a spring. One section is a phase tool and, with SPREAD, a widener; lower MIX for notches.

STAGES (VAR) sets the sections: one at 0% (home) to eight at 100%, the next gliding in between. RES sharpens each section: a longer, narrower chirp. FDBK feeds the chain's output round it again, still all-pass, so the chirp repeats like a spring, alternating in sign when negative. DRIVE does nothing.



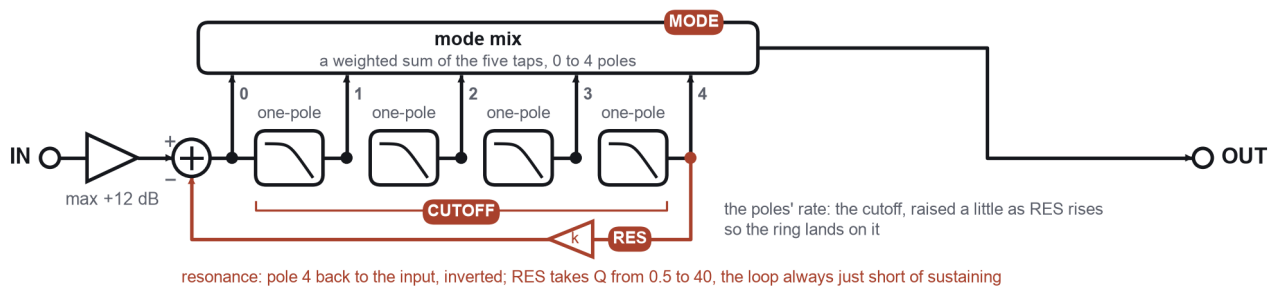
FILTERS / 1.0.0

Clean filters, continued

Clean Morph

One four-pole loop for every mode: four exact one-pole low-passes in a loop, their five taps mixed into eleven responses, as the pole-mixing synths did, but linear and noiseless. The resonance is the same four-pole peak in every mode; it keeps the bass, rings and dies away, and the peak holds at +12 dB.

MODE (VAR) walks the modes: low-pass 24, 18, 12 and 6 dB (0%, home), band-pass (33%), high-pass 6 to 24 dB (to 67%), notch (83%) and a phase shift (100%), each blending into the next. RES raises the shared peak. DRIVE does nothing, and FDBK is off.



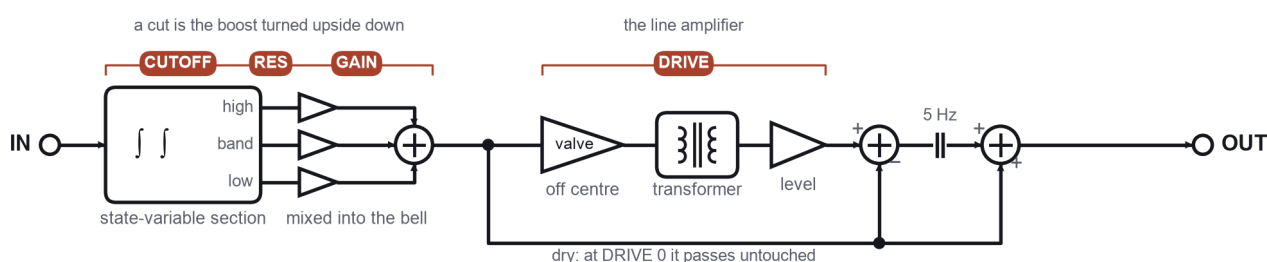
FILTERS / 1.0.0

EQ filters

Bell

The parametric equaliser's bell: one filter section whose outputs are mixed into a lift or dip around the centre. Its width stays the same whatever the gain, and a cut is exactly the boost turned upside down, so the two undo each other. It's exact, clean and never rings on its own.

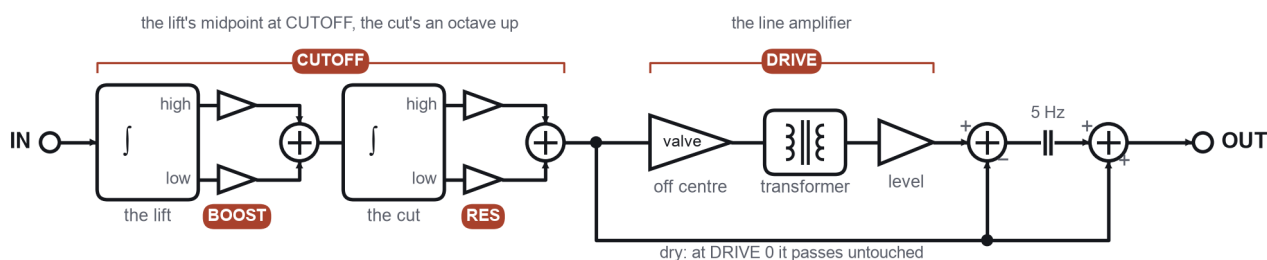
GAIN (VAR) sets the centre's lift or cut, -18 to $+18$ dB, flat at 50%. RES sets the width, from 3.7 octaves to an eighth of an octave. DRIVE runs it through a valve and transformer: clean at 0%, gentle warmth and nearly 3 dB louder at full. FDBK is off for it.



Low Shelf

The passive program equaliser's low end: two gentle shelves in series, a lift with its midpoint (half its gain) at CUTOFF and a cut an octave above. Alone, each tilts the bass broadly; together they give the classic low-end trick, the bottom raised with a dip just above it, adding weight while clearing mud.

BOOST (VAR) lifts the lows up to $+16$ dB; RES cuts up to 18 dB an octave higher. BOOST 75% with RES 50% gives $+3$ dB at the bottom and a dip above. DRIVE adds a valve and transformer: warm, saturating the bass most. FDBK is off for it.



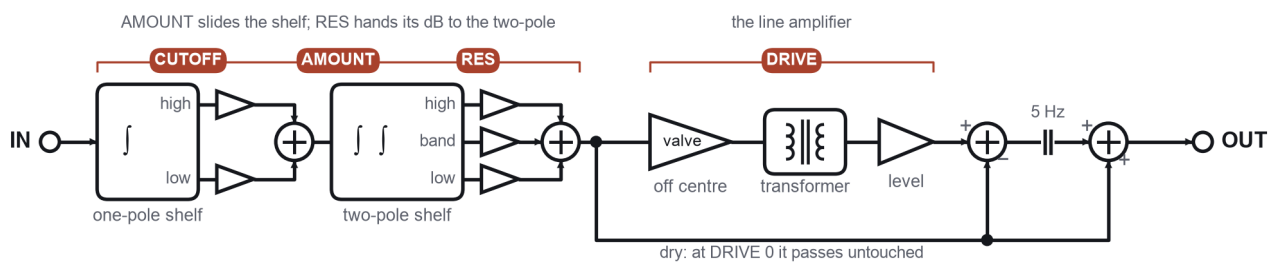
FILTERS / 1.0.0

EQ filters, continued

High Shelf

The tone control's treble: a gentle 18 dB shelf that slides along the frequencies rather than growing. A little AMOUNT tips up only the very top; more brings the turn down towards CUTOFF, and the same goes for a cut. It's smooth and clean; try CUTOFF at 12 kHz for air.

AMOUNT (VAR) cuts below 50% and lifts above, sliding the shelf down to CUTOFF at the ends. RES steepens the turn from 6 to about 18 dB an octave, overshooting by 3 dB at full. DRIVE adds a console line stage, pushed harder and edgier than the other EQs'. FDBK is off for it.



MOVEMENT / 1.0.0

Modulation and the arpeggiator

Envelopes and LFOs

Four envelopes with delay, attack, hold, decay, sustain and release, curves and tempo sync; the first, AMP ENV, is the amplifier. Ten LFOs with drawn shapes, sample and hold, smooth random and Lorenz and Rossler chaos, free or synced from 1/128 to 32 bars.

Drag onto a dial

Drag any envelope, LFO or macro onto a dial to modulate it. A coloured ring appears around the dial; drag the ring to set the depth. If the dial is on a tab that isn't open (an oscillator's TUNE, another page, another LFO's editor, an FX rack), rest the source on that tab while you drag: a bar fills along it in the source's colour and the tab opens. On the FX page, hold it near either end of the rack to scroll the rack that way. MATRIX lists every connection, up to 64, with its curve and amount, and adds sources such as velocity, aftertouch, MPE pressure and slide. Select a source, or point at one in the list, and every dial it drives glows in its colour.

Macros

Each of the eight macros can move many settings at once. Macros are modulation destinations too.

Arpeggiator

Switch it on (top left of the ARP page) and hold notes. MODE picks which held note each step plays: up, down, up/down, down/up, as played, random, all at once (Chord), converging or diverging. The 16-step pattern on the right shapes every mode: switch a step off to rest, and give each its own pitch, octave, gate, velocity and tie. Each step's light flickers as it plays. Rate, octaves, gate, swing, chance, repeats and latch are on the left.

Performance

Up to 32 voices, mono and legato with portamento, MPE (lower zone), sustain pedal, and key and scale quantise.

USER GUIDE / 1.0.0

Activation and support

Activate

Sign in at <https://audionode.io> and open My plugins. Copy your AN- key or download its licence file. Paste the key or import the file in Nodium, then select Activate online. The Licence button opens the screen again: beside SETTINGS in the standalone app, or beside the logo in a DAW.

Your full licence

A full licence has no fixed end date and permits up to three computers. After successful online validation each computer can work offline for up to 30 days. Reconnect before that period ends. If authorisation expires, Nodium goes silent until it can validate again; your projects and presets are kept. Deactivate an old computer through your AudioNode account before activating a fourth.

Beta signups

People who signed up before the public launch receive a full licence. Sign in with the same verified email address to find your key in My plugins. This is a permanent full licence, separate from any expiring beta key.

Downloads and updates

Download the current version from <https://audionode.io/plugins/nodium>. Close your DAW and run the installer again to update. Keep backups of your projects and presets before updating.

Support

Contact hello@audionode.io with your Nodium version, operating system, DAW and a description of the problem. Do not include a full licence key in your initial message.