POLEZERO OWNER'S MANUAL

Polezero plays the sample banks of the Scotts Valley sampler and of the hardware samplers before it, on an engine rebuilt from the way the original behaves. This manual shows how to find and play your banks, how to shape them with the modifiers and effects, how to edit their samples, and how to use the arpeggiator.

Formats VST3 · AU · CLAP · LV2

Systems macOS 11 or later · Windows 10 or later, 64-bit · Linux 64-bit, glibc 2.35 or later

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CHAPTER 0

ABOUT THIS MANUAL

Polezero is a sampler for banks made for the Scotts Valley sampler. *2009: the last software sampler from the Scotts Valley house whose sampling keyboards began in 1981, heir to its hardware samplers.* This manual calls it *the original*, and its maker *the house*.

Polezero does not run the original's code. Its engine was written anew, and each part of it, from the envelopes and filters to the effects and the way loops follow the tempo, was rebuilt from how the original behaves. A preset made for the original therefore plays with the modulation, filters and effects it was programmed with. Banks of the house's fourth-generation samplers, and the older banks of its third generation and its budget line, play on the same engine.

The manual follows the order of the original's reference manual where it fits: how a bank is built, getting started, the presets and their voices, editing samples, beats and loops, and the effects. It describes Polezero's own pages and procedures, though, and the chapters on the browser, the modifiers, the arpeggiator and user presets cover what Polezero adds.

Some topics of the original do not apply. Polezero plays one preset at a time per instance instead of a sixteen-channel multisetup. It has no voice editor for building presets from scratch, and it does not record from an audio input. There are no hardware routings, disk-streaming preferences or copy protection to set up either. What it does edit, it edits in place: samples, loops, regions, slices and effects, with the results saved as user presets or as a new bank.

Conventions

WRITTEN AS	MEANS
Loop…	A button, menu, tab or label in Polezero's window, as it reads on screen.
⌘ L	Keys on the computer keyboard. On Windows and Linux, use CTRL wherever ⌘ appears.
Edit › Fade in	A menu entry: the **Edit** menu, then **Fade in**.
C4	A note, named the way Polezero names it: C4 is MIDI note 60, middle C. The house's sample names often call the same key C3.
0…127	A range of values, from 0 to 127.

The screenshots show Polezero 1.1.0 playing banks from a test library. None of these sounds comes with Polezero. Click any screenshot to open it at full size.

CHAPTER 1

INTRODUCTION

A sampler plays recordings. What makes the original more than a sample player is what happens around them. Each preset can stack many layers, each with its own key and velocity ranges. Filters, envelopes, LFOs and function generators shape each layer. Modulation cords join any of them to almost anything else, and effects follow. Polezero reproduces all of that for the banks you already have.

What Polezero reads

- **The original's banks** (`.exb`), with the sample files they use: the `SamplePool` folder of `.ebl` files beside them, and the library files some commercial banks keep there.
- **Fourth-generation banks** (`.e4b`), loose or straight from images of fourth-generation CD-ROMs and hard disks (`.iso` , `.img` , `.hda`). Each image becomes a library of its own, and its samples play from the image without being copied out.
- **Third-generation banks**, from the house's 1987 third generation and the racks that followed it: from the same disk images or as loose `.e3b` , `.e3x` and `.esi` files.
- **Budget-line banks**, from the house's 1986 budget line (`.em1` , `.em2` , `.eb1` , `.eb2`), including banks spread over several disks.

The original itself never read third-generation and budget-line banks, so Polezero converts those its own way. Appendix A describes every format in detail.

The engine

- Up to 256 voices, each note starting on its exact sample.
- 55 filter types: the classic low-pass, high-pass, band-pass, swept EQ, phaser, flanger and vocal types, five morphing types, and 33 twelfth-order models.
- Three six-stage envelopes, two LFOs, three function generators and two lag processors in every voice, with 36 modulation cords; preset-wide lags, ramps and 16 more cords.
- Polyphonic, solo and release-trigger keyboard modes, assign groups, and presets that play other presets through links.
- Loops and beats that follow the tempo without changing pitch.
- All 20 effect types a bank can use, as the preset's own insert effects and as the bank's aux effects.
- Linear interpolation like the original, or 8-tap high-quality interpolation of our own.

What Polezero adds

- **A library browser** with covers, categories (guessed where a bank has none), favourites, history, search and a filter by bank format.
- **Modifiers**: amp, filter and pitch controls that move every note of a preset, including notes already sounding.

- **Two master effect slots** after the bank's effects, with the same 20 effect types, and an output limiter.
- **A sample editor** with non-destructive loop and region editing, audio tools, beat analysis and slicing.
- **An arpeggiator** with eight modes and a step editor for your own patterns.
- **User presets** that keep the modifiers, the master effects and your edits with a bank preset.
- **Saving** an edited preset into a new bank, and exporting samples as WAV, AIFF or an SFZ multisample.

> **NOTE**
> Polezero comes with no sounds. You play your own banks: point Polezero at the folder that holds them, and it builds the library.

Installing

Polezero runs on macOS 11 or later, on Apple Silicon or Intel, as a VST3, AU or CLAP plugin; on Windows 10 or later, 64-bit, as VST3 or CLAP; and on Linux, 64-bit (x86-64) with glibc 2.35 or later, as in Ubuntu 22.04 and newer, as VST3, CLAP or LV2.

With DDS Hub, Digital Dream Synths' installer, choose Polezero and the formats your DAW uses. Hub downloads them, checks each file and puts it in your plugin folders. On macOS and Linux those are your user's, and no administrator's password is needed. On Windows, Hub asks once who gets the plugins: **All users**, the default, puts them in `C:\Program Files\Common Files\VST3\DDS` and `…\CLAP\DDS`, where every DAW looks, and Windows asks for permission at each install or update; **Only for me** uses your user folders and asks nothing.

By hand, each format comes as a zip holding a single item. Unzip it and move the item into the folder of its format:

SYSTEM	FORMAT	FOLDER (YOURS)
macOS	VST3	`~/Library/Audio/Plug-Ins/VST3`
macOS	AU	`~/Library/Audio/Plug-Ins/Components`
macOS	CLAP	`~/Library/Audio/Plug-Ins/CLAP`
Windows	VST3	`%LOCALAPPDATA%\Programs\Common\VST3`
Windows	CLAP	`%LOCALAPPDATA%\Programs\Common\CLAP`
Linux	VST3, CLAP, LV2	`~/.vst3`, `~/.clap`, `~/.lv2`

- **macOS:** a plugin downloaded with a browser is marked as coming from the internet, and macOS refuses to load it. Remove the mark in Terminal, for example `xattr -dr com.apple.quarantine ~/Library/Audio/Plug-Ins/VST3/Polezero.vst3`. Plugins installed by Hub do not need this.
- **Windows:** some DAWs look only in the system folders (`C:\Program Files\Common Files\VST3` and `…\CLAP`). Add the folder above in your DAW's settings, or use the system folder.

Then let your DAW rescan its plugins. Polezero appears as an instrument from Digital Dream Synths.

Where Polezero keeps its files

Polezero writes nothing into your banks. Its own files live in one data folder, shared by every instance and by the standalone application. From version 1.1.0 it is where every Digital Dream Synths plugin keeps its files:

- macOS: `~/Library/Application Support/Digital Dream Synths/polezero/`
- Windows: `%APPDATA%\Digital Dream Synths\polezero\`
- Linux: `~/.local/share/digital-dream-synths/polezero/` (under `$XDG_DATA_HOME` if you set it)

Polezero 1.0.0 kept it in `~/Library/Application Support/Polezero/`, `%APPDATA%\Polezero\` or `~/.config/Polezero/`. The first start of 1.1.0 or later moves that folder to the new place. A folder it cannot move is copied there instead and stays where it was: delete it once the new one holds your presets. If the new folder is already there, the old one is left alone.

`settings.xml`
The library folder, favourites, history, the MIDI response curves and the browser's view.

`library-cache.xml`
What the browser knows about your banks, so that it does not read them again at every start.

`User Presets/`
Your user presets, one file each, in folders that act as categories (chapter 13).

`Arp Patterns.txt`
Your arpeggiator patterns (chapter 12).

`Edited Samples/`
The audio your edits on the Sample page produced (chapter 9).

`Dragged Samples/`
Samples you dragged out of Polezero (chapter 11).

Sys › **Show data folder** opens it.

CHAPTER 2

HOW A BANK PLAYS

You do not need this chapter to play Polezero, but it explains what the browser lists, what the Edit page's Preset panel counts and what the Sample page shows. The terms are the original's.

From bank to sample

BANK → PRESET → VOICE → ZONE → SAMPLE

Bank

One file. It holds the presets, the list of samples they use, and one or more *multisetups*, the mixer state the original saved with the bank. Polezero plays one preset at a time. From the bank's current multisetup it takes the aux effects, the first channel's volume, pan and controller settings, and the tempo, which it sets when you open the bank.

Preset

What you choose and play. A preset has a name and often a category. It holds its voices and a few settings for all of them: a transpose and a volume, starting values for the sixteen controllers A–P, two lag processors and two ramps, 16 modulation cords of its own, and up to two insert effects, FX A and FX B.

Voice

One layer of the preset. A voice decides *when* it plays through its **windows**: a key range, a velocity range, a range of a realtime controller, and up to five ranges of other controllers, each with optional fades at its edges. Overlapping windows with fades make crossfades. A voice also decides *how* it sounds, through its oscillator, filter, amplifier, envelopes, LFOs, function generators and cords. A 16-voice piano may keep a layer per velocity range; a pad may stack voices tuned apart.

Zone

One sample inside a voice, over its own key and velocity range: a multisample is a voice with a zone for every few keys. A zone sets the sample's original key, tuning, volume and pan, and the *region* of the sample it plays. It also sets the direction: forward, reverse, the whole region looping (forward or in reverse), or one shot.

Sample

The recording, with its sample rate, its loops, and, when it has them, beat markers and a tempo.

Inside a voice

OSCILLATOR → FILTER → AMPLIFIER → FX SENDS

Oscillator

Plays the zone's sample at the note's pitch, with transpose, coarse and fine tuning, glide, a chorus that thickens the voice with detuned copies, a sample start offset, and a key delay. Its keyboard mode makes it

polyphonic, solo with one of eight ways of choosing between held keys, or sound at the release of the key.

Filter

One of 55 types, with frequency and resonance, or no filter. The morphing types move between two filter shapes under modulation. Appendix B lists them all.

Amplifier

Volume, pan, the level of its envelope, and sends to the preset's effects and the bank's aux effects.

Envelopes

Three per voice: one for the amplifier, one for the filter and an auxiliary one. Each has six stages, two of attack, two of decay and two of release, with a level and a time each. Times can follow the tempo.

LFOs

Two per voice: triangle, sine, sawtooth, square and many other shapes, with delay, variation, key sync and tempo divisions.

Function generators

Three per voice: shapes of up to 64 steps, running free or in time with the tempo.

Cords

36 per voice. A cord joins a source, such as velocity, a key position, a wheel, controller A–P, an envelope, an LFO or noise, to a destination, such as pitch, filter frequency, volume, pan, an envelope's times, an LFO's rate, the sample start, the loop or another cord's amount.

Links

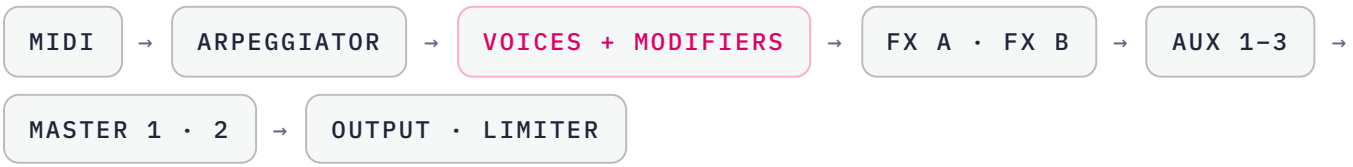
A preset can also play other presets of its bank along with its own voices: a *link*, which has key and velocity windows like a voice. A string ensemble may link a pad, or a split may link a bass below a piano. Polezero plays links as the original does, and the Edit page names the presets a preset links (chapter 6).

Loops that follow the tempo

A sample with beat markers can play in time: when the preset's *Lock to tempo* is on, the zone stretches its slices to the tempo without changing their pitch. Polezero follows the host's tempo or its own (chapter 4), and chapter 10 shows how to give a sample beat markers.

What Polezero puts around the bank

The bank's sound passes through Polezero's own stages, in this order:



The arpeggiator, the modifiers and the master slots are Polezero's. FX A, FX B and the aux effects are the bank's.

CHAPTER 3

GETTING STARTED

This chapter takes you from an empty plug-in to a preset of your own in six steps. Each step points to the chapter that covers it in full.

1 **Point Polezero at your banks.**
Open Polezero in your DAW, or start the standalone application. On the **Browse** page, click the folder icon beside **LIBRARIES** and choose the folder that holds your banks. Every folder inside it becomes a library. Polezero reads the presets' names in the background, and the libraries appear as tiles. See chapter 5.

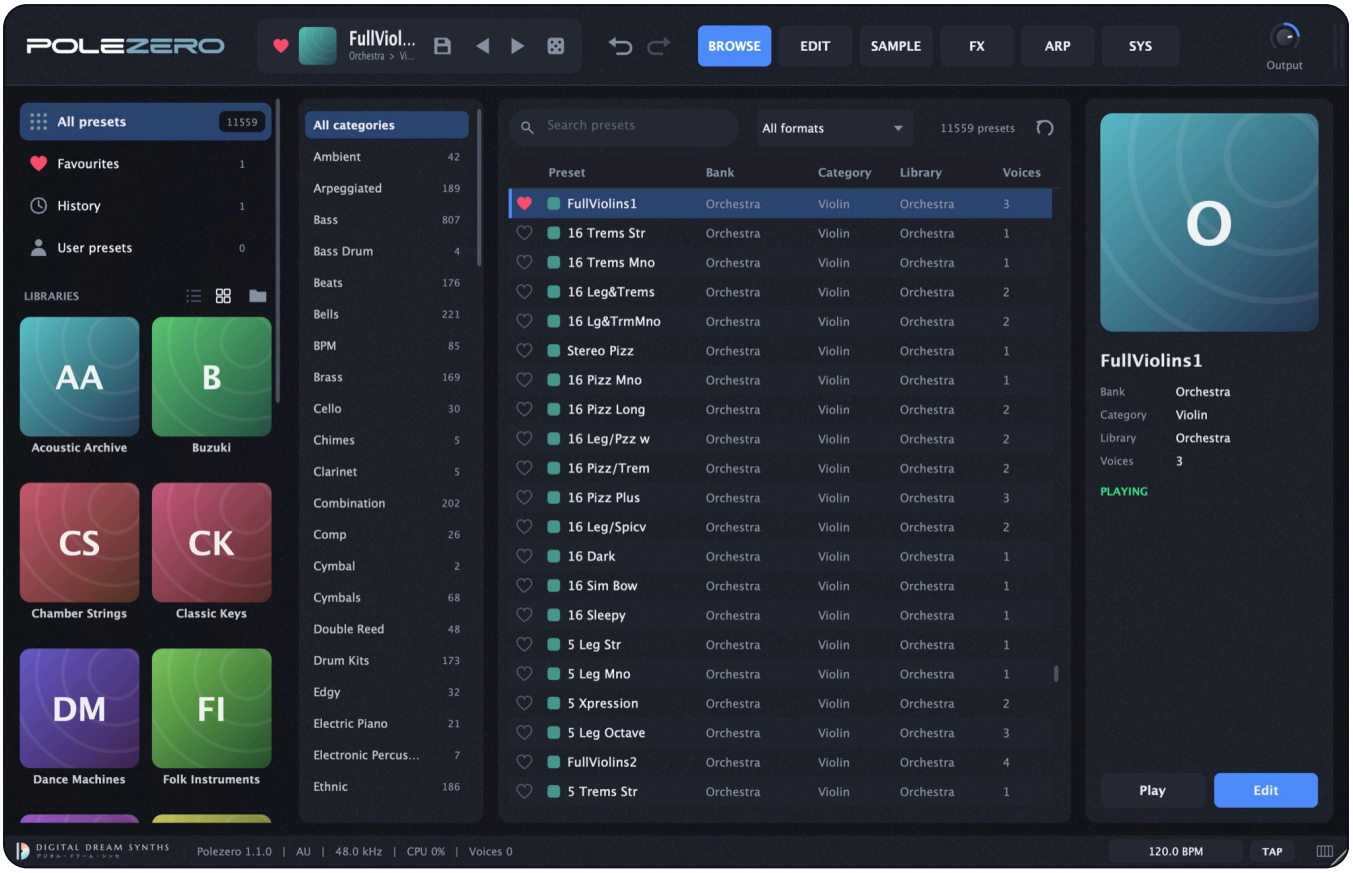
2 **Choose a preset.**
Click a library tile, then a category, then a preset in the list: it loads and plays. The arrow keys step through the list, and every step plays the next preset. The heart beside a preset makes it a favourite.

3 **Play it.**
Play from your MIDI keyboard, or click the keyboard icon at the right end of the bottom bar to show Polezero's own keyboard.

4 **Shape it.**
Click **Edit**. Turn the **Cutoff** of the **Filter modifier** to darken the sound, and the **Release** of the **Amp modifier** to lengthen its tail. The modifiers move every note of the preset, even the ones still sounding. See chapter 6.

5 **Give it space.**
Click **FX**, select **Master 1** and choose **Reverb** from the menu. Drag the decay handle in the picture, or turn the knobs under it. See chapter 7.

6 **Keep it.**
Click the disk icon in the top bar, give your version a name and click **Save**. It appears under **User presets** and plays the bank preset with your settings. See chapter 13.



The **Browse** page over a test library of eighteen libraries and 11,560 presets.

> **TIP**
>
> A double-click on a preset, or RETURN, plays it and opens the Edit page at once.

CHAPTER 4

THE WINDOW

Polezero's window has three parts: the top bar, the page you chose, and the bottom bar. Drag the window's lower right corner to resize it, from 1100 × 700 up to 2560 × 1600 points.

The top bar

The logo

Polezero's.

The playing preset

A box with the preset's heart, the cover of its library (or the colour of its bank), its name, and its path as *library › category › bank*. Click the name to go back to the browser.

The disk icon

Saves a user preset (chapter 13).

Previous, next and the dice

Step to the previous or next preset in the browser's current list, or play a random one from it. The list is whatever the browser shows: a category, a search, your favourites.

Undo and redo

Take back or repeat changes: knob moves, effect changes and every edit on the Sample page. A drag is one step.

The page tabs

Browse, **Edit**, **Sample**, **FX**, **Arp** and **Sys**.

Output

The output level, the same as on the Edit page, and a level meter beside it.

The bottom bar

From the left: the Digital Dream Synths logo, Polezero's version, the plug-in format it runs as, the sample rate, the processor load and the number of voices sounding. At the right are the tempo, **TAP**, and the keyboard icon, which shows or hides an on-screen keyboard under the page.

The on-screen keyboard

Click its keys to play. Notes from it go through the arpeggiator and the velocity curve like notes from MIDI, and keys you play from MIDI light up on it. It stays open from page to page.

Tempo

The engine's tempo-locked loops and tempo-synced LFOs, envelopes and delays, the arpeggiator and the master effects all play at one tempo:

- **In a DAW** that sends its tempo, the host's. The bottom bar shows it, marked *(host)*, and you cannot change it there.
- **Otherwise** Polezero's own, for example in the standalone application. Drag it up or down or turn the mouse wheel over it to change it, with SHIFT in tenths; double-click it to type a value. It goes from 20 to 300 BPM.
- TAP sets it by tapping: from the third tap on, the tempo is the mean of the last four intervals, between 25 and 300 BPM. A pause of two seconds starts over.
- Opening a bank whose multisetup stores a tempo sets Polezero's tempo to it, as the original does. A project you reopen keeps the tempo it was saved with.

CHAPTER 5

THE LIBRARY AND THE BROWSER

Polezero does not ask you to open banks one by one. You choose one folder, the *library folder*, and it lists every preset of every bank below it, by library and category.

How Polezero reads your folders

- Every folder inside the library folder is a **library**, named after the folder.
- Every bank file inside a library, at any depth, belongs to it. The folders between the library and the bank become the bank's **category**: a bank in `Acoustic Archive/Flute/` files its presets under *Flute*, and nested folders give a path such as *Keys / Organs*.
- A bank kept in a folder of its own name (`Grand Piano.exb/Grand Piano.exb`, as many libraries ship) counts as if it lay in the parent folder. Such a folder lying directly in the library folder is a library named after the bank.
- Bank files lying directly in the library folder form one more library, named after the library folder.
- A disk image of the house's samplers anywhere below the library folder is a library of its own, named after the image file. Its folders order its banks like category folders.
- Folders and files whose names begin with a dot are skipped. Symbolic links to folders are followed, once each.

Polezero reads only what it needs to list the presets: names, categories and the number of voices. The samples load when you play a preset.

Covers

A library shows a picture called `cover.png`, `cover.jpg` or `cover.jpeg` from its folder; failing that, the folder's only picture, if it holds just one. For a disk image, a picture of the same name beside it (`Analog Collection.png` for `Analog Collection.iso`) is its cover. A library without one gets a gradient in its own colour, with its initials. The colour comes from the library's name, so it never changes, and every bank of the library gets a shade of it: the small swatch in each preset row.



One library chosen, and its **Flute** category: the category comes from the library's folders. The Category and Library columns hide, since they would repeat the choice.

Categories

A preset's category comes from the first of these that gives one:

1. **The folders** between the library and the bank.
2. **The preset itself**: many banks store a category with each preset.
3. **A guess from the preset's name**, for the many banks that store none:
   - a prefix in the fourth-generation style, three letters and a colon such as `bas:` or `epo:`, names the category directly;
   - otherwise the instrument words of the name decide: *Synth Bass 11* is a Bass, *Space Bass Pad* a Pad, *Orch Hit* a Hit;
   - in a library of several banks, the bank's name is the last resort.

The info panel marks a guessed category as *(guessed)*. Categories that banks spell in different ways (*Synth* and *Synthesizer*, *Drum Kit* and *Kit*, *Bass 1* to *Bass 5*) are shown with one spelling. Nothing is written back to your banks.

A name whose prefix gave its category is shown without it: `apo:Pop Piano` appears as *Pop Piano*, in the browser, the top bar and your DAW's program list. The search still finds the full name.

The browser

The left column

All presets, **Favourites**, **History** (the last 100 presets you played, the newest first) and **User presets**, with their counts. Under them, the libraries; click one to see its presets. The two buttons beside **LIBRARIES** show them as tiles, with their covers, or as a list, a row each with a small cover and the number of presets. Every instance shows the same, and Polezero keeps your choice. The folder icon beside them chooses the library folder.

The categories

The categories of what the left column chose, with their counts. **All categories** lifts the filter.

The list

The presets, with their bank, category, library and number of voices. Click a column's heading to sort by it. The heart in each row marks a favourite.

Search

Type in the field above the list to keep only the presets that match: every word you type must appear in the preset's name, its bank or its category.

The format menu

Appears when your library holds more than one kind of bank: **All formats**, then one entry per kind: **EXB** for `.exb` banks, **4th gen** for fourth-generation banks, **3rd gen** for third-generation banks and **Budget line** for budget-line banks, each with its number of presets. It filters the categories too, and stays chosen from one library to the next.

The count and Reload

The number of presets listed. The round arrow beside it reads every bank again (see below).

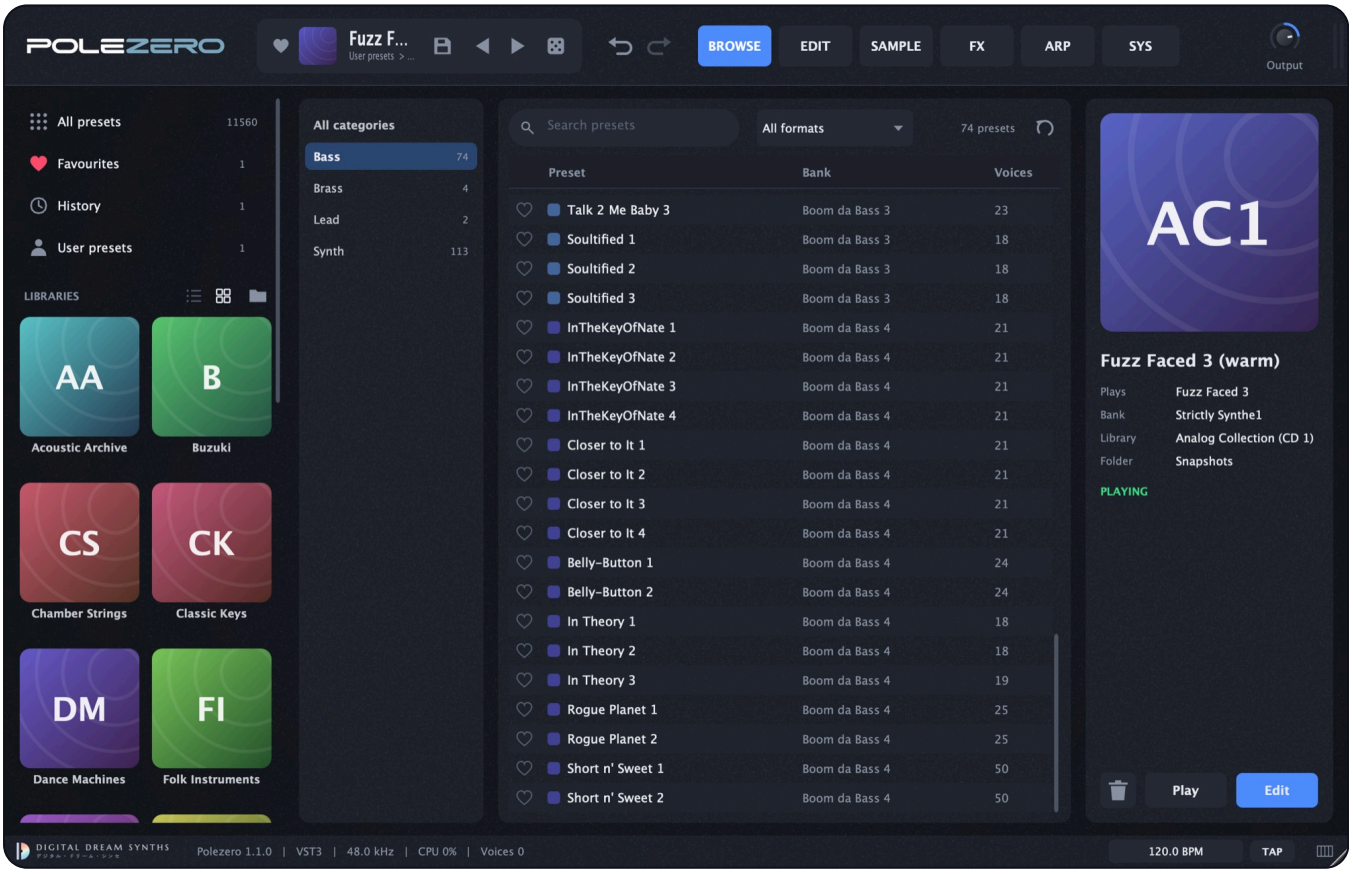
The info panel

The selected preset's cover, name, bank, category, library and voices, with **Play** and **Edit**. **Playing** shows when it is the preset playing.

A click on a preset, or the arrow keys, play it. A double-click or RETURN also opens the Edit page.



The format menu set to **EXB**: across every library, only the presets of `.exb` banks.



A fourth-generation CD-ROM image is a library of its own. Its banks play straight from the image.

Keeping the list up to date

Polezero remembers what it read. At the next start the library shows at once, and Polezero checks the folder in the background: only banks that are new or changed since the last time are read, and the list changes only if something did.

While Polezero runs, it watches the library folder. Copy a bank in, delete one or rename a folder, and the list follows by itself, about a second and a half after the changes stop, so a large copy is read once it ends.

Reload, the round arrow beside the count or the button in **Sys**, forgets what Polezero knew and reads every bank again. The list stays usable meanwhile, and the count shows *Reading* with a percentage.

> **NOTE**
>
> - Presets without voices are left out: they play nothing. They are the credits and revision notes some banks carry (*Design By:*, *Rev B*) and blank defaults. Your DAW's program numbers still count them, as the bank does.
> - Fourth-generation presets whose samples are in a hardware ROM rather than in the bank cannot play, and are left out too.
> - If the library folder is missing, for example on a disk that is not connected, the browser shows no library, and Polezero keeps what it knew for when the folder returns.

Favourites and history

Favourites and history remember presets by their bank's path inside the library folder and their place in the bank. They are shared by every instance of Polezero. If you move the library folder elsewhere and choose it again, they still find their presets.

CHAPTER 6

THE EDIT PAGE

The Edit page is where you shape a preset without programming it. Its **modifiers** are offsets laid over the preset: the preset stays as the bank made it, and the modifiers move it. Below them, the page shows the effect chain, what the preset contains, and the output.



The **Edit** page with a 16-voice grand piano. The Preset panel draws its voices over the keyboard, one row per layer.

How the modifiers work

- They reach every voice through the voice's own modulation inputs, so they also move **notes that are already sounding**: turn the cutoff while you hold a chord and the chord follows.
- Choosing another preset sets the three modules back to neutral, unless a module is **locked**: click the padlock in its header to keep its settings from preset to preset.
- The round arrow in a module's header sets that module back to neutral at any time. A double-click on a knob sets that knob back.
- Every knob is a parameter your DAW can automate, and every move can be undone.
- User presets store the modifiers with the bank preset (chapter 13).

Amp modifier

KNOB	RANGE	WHAT IT DOES
Volume	−48…+12 dB	The preset's level, after the bank's effects and before the master slots.
Pan	left…right	Moves every voice's position in the stereo field.
Attack, Decay, Release	shorter… longer	Scale the times of the amp envelope's attack, decay and release stages, from about 39 times shorter to 39 times longer.
Sustain	lower… higher	Raises or lowers the level the envelope holds while a key is down.

Filter modifier

CONTROL	RANGE	WHAT IT DOES
Type	As preset, No filter, or one of the 55 types	Replaces every voice's filter type, from the next note. The voices keep their own frequency and resonance.
Cutoff	lower…higher	Moves the filter frequency of every voice.
Reso	less…more	Moves the resonance of every voice.
Env	0…200 %	Scales how far the filter envelope moves the cutoff: 0 % removes its effect, 200 % doubles it.
Velocity	−…+	Adds the note's velocity to the cutoff: harder notes play brighter, or darker with a negative amount.
Attack, Decay, Sustain, Release	as on the Amp modifier	The same for the filter envelope.

The **Type** menu sits in the module's header, in three columns: **As preset** and **No filter**, then the classic types, then the morphing types and the 33 twelfth-order models. Appendix B lists them. When you give a voice a morphing type it did not have, it has no morph settings in the bank, so Polezero uses its own:

- **Dual EQ morphs**: two peaks that both boost and move up together.
- **Peak/shelf morph**: a strong peak moving up through the spectrum, with no shelf.
- **Morph designer**: one low-pass section opening from closed to open, the first example of the original's manual.

Each module draws the preset's own envelope (its first voice's) with the modifier applied, on a compressed time axis, with the attack, decay, sustain and release under it.

Pitch modifier

KNOB	RANGE	WHAT IT DOES
Tune	±24 semitones	Transposes every voice.
Fine	±100 cents	Detunes every voice.
Glide	0…max	Adds to the voices' glide time, so legato notes slide into each other.

Effects

The effect chain of the FX page, small: **Preset FX**, **Bank aux (sends)** and **Master**. Click a slot to open it on the FX page (chapter 7).

Preset

The panel draws the preset's voices over a keyboard, one bar per key range; voices whose ranges do not overlap share a row, so a velocity-layered multisample shows as stacked rows. Keys being played light up. Beside it:

- the number of voices and zones;
- the number of samples and their size;
- the range of keys the preset plays;
- the voices' filter type;
- the presets its links play, if any;
- its insert effects.

Output

The **Output** knob sets Polezero's final level, from −24 to +6 dB; it is the same as the knob at the top right of the window. The **Limiter** after it keeps peaks below −0.5 dBFS, with an 80 ms release. It is on by default; switch it off if you prefer to handle peaks in your DAW. User presets do not change these two settings.



A fourth-generation preset that links another, **Fuzz Faced Fade**: the link's range shows as the top bar on the keyboard. Fourth-generation banks have no aux effects, so the aux slots read *not playing*.

CHAPTER 7

EFFECTS

Every effect in Polezero is one of the original's 20 effect types, and they sit in a chain of seven slots. The FX page shows the chain across the top and an editor for the selected slot below it.

SLOT	WHAT IT IS	WHERE IT IS KEPT
FX A, FX B	The preset's own insert effects. Its voices' cords can modulate their parameters.	In the bank preset.
Aux 1–3	The bank's aux effects, fed by each voice's sends.	In the bank's current multisetup.
Master 1, 2	Polezero's own, after the bank's effects and the Amp modifier's volume.	In your project and in user presets.

The output level and the limiter follow (chapter 6).



The **FX** page with **Master 1** selected. The reverb's picture is measured from the effect as it is set: the light lines are single reflections, and the two shades are the high and low bands of the tail.

The chain

Each slot shows its effect's name, or *Empty*, and a power switch that bypasses it. Under the name a slot may read:

- *bypassed*: its power switch is off;
- *edited*: a bank slot you changed from what the bank says;
- *not playing*: no bank is loaded, the bank's effects are switched off in Sys, or the bank sends that aux bus to an output other than the main one. The tooltip says which.

> **NOTE**
> The original could send its aux buses to the outputs of the house's audio interfaces. Polezero plays only the buses routed to the main output, as they were meant for the mix.

Click a slot to open it in the editor. The Edit page shows the same chain; a click there opens the FX page on that slot.

The editor

The effect menu

None, then the 20 effect types. A new effect starts from its default settings and is not bypassed. Changing the type of a playing slot rebuilds the effect; a changed parameter reaches the playing effect at once, without interrupting its tail.

The power switch

Bypasses the slot.

Back to the bank

The round arrow, on a bank slot you edited: forgets your changes to that slot.

Save as new bank…

On bank slots: writes your effect changes into a new copy of the bank (chapter 11).

The picture

What the effect does, measured from the effect as it is set wherever it can be, and redrawn when a setting or the tempo changes. Its handles are parameters you can drag.

The controls

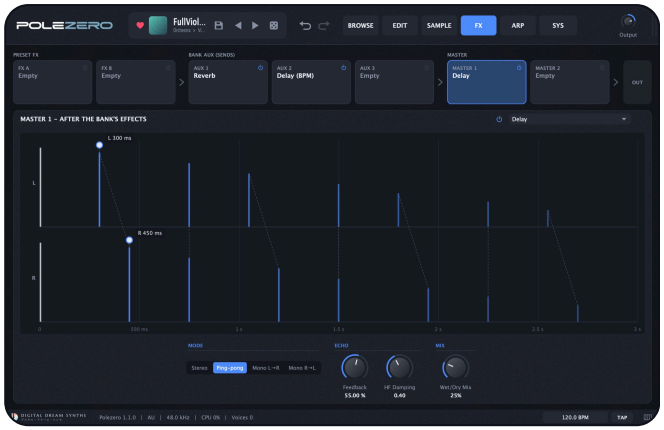
Knobs, button rows and menus under the picture, in labelled groups, with the wet/dry mix last. Values show under the knobs; a double-click sets a knob back to its default. Short menus appear as rows of buttons; the tooltips give their full names.

Dragging a handle changes its parameter, with SHIFT at a tenth of the speed; a double-click sets it back to its default. Some handles move two parameters at once, one sideways and one up and down, and take the mouse wheel for a third. A drag, a menu choice or a click on the power switch is one undo step.

On FX A and FX B, a parameter that the preset's cords modulate shows **+ mod**: it plays away from the value shown, and its tooltip names the source.



EQ – 4 Band. Drag a numbered node sideways for its frequency and up or down for its gain; the wheel sets a peak's bandwidth.



Delay. The echoes of a single click, left above and right below; drag the first echo of each side to set its time.



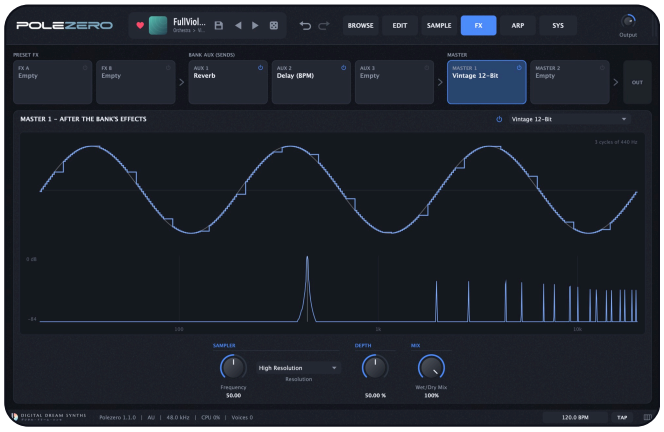
Chorus. Above, the response at the LFO's position, moving at its rate; below, what the LFO does to the delay over two cycles.



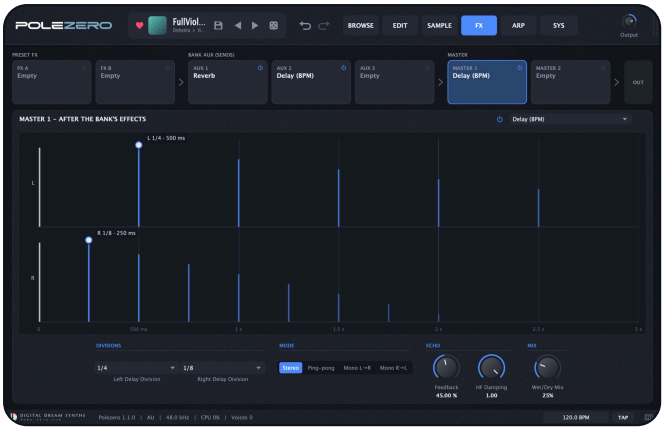
Tube. How a sine comes out: its transfer curve, its harmonics, and the tone controls' response.



Pitch Shifter (mono). The spectrum a 440 Hz tone comes out with; drag the handle to shift it.



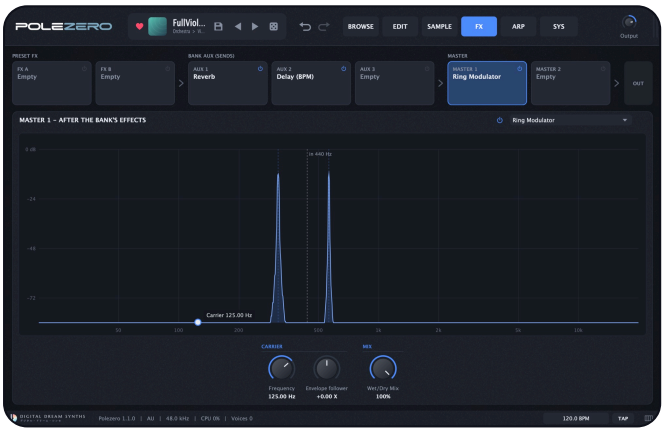
Vintage 12-Bit. A sine in and out, as steps, and the spectrum it comes out with.



Delay (BPM). The quarter notes are drawn under the echoes; the time handles snap to the nearest note value.



Phaser. The notches at the LFO's position, and how the LFO sweeps them.



Ring Modulator. Drag the carrier; the dashed lines show where the sidebands should land.



Early Reflections Reverb. The pattern's reflections, then the tail.

The effect types

Chorus

A stereo chorus: copies of the sound delayed by a few milliseconds and swept by a triangle or sine LFO.

Chorus / Delay (mono)

A chorus whose delay reaches a second, so it also echoes, with a pan the LFO can move.

Delay

A stereo delay of up to two seconds on each side: discrete stereo, or ping-pong in stereo or from one side to the other, with feedback and high-frequency damping.

Delay (BPM)

The same delay with times in note values, from four bars down to a 1/64 note, including triplets and dotted notes.

Delay (mono)

A single delay of up to two seconds, with feedback, damping and pan.

Early Reflections

The first reflections of a space, without a tail: ten patterns (Hall 1–3, Room, Spiral, Multitap, 6 Tap, 12 Tap, 12 Tap Rising, Up & Down), a size and a left/right offset.

Early Reflections Reverb

Those reflections followed by a reverb tail, with their balance, pre-delay, damping and the tail's decay, diffusion, size and stereo mode.

EQ – 1 Band Parametric

One peak or dip from 40 Hz to 16 kHz, −24 to +15 dB.

EQ – 4 Band

A low shelf, two peaks and a high shelf.

Flanger

A short swept delay with feedback, optionally through zero, in or out of phase.

Flanger (BPM)

The same flanger with its sweep in note values.

Growl

A delay whose length the sound itself sets, sample by sample: a level-dependent warp, mostly of even harmonics, after a pre-filter.

Phaser

3, 6, 9 or 12 stages swept by an LFO, with the right channel's sweep 0°, 90° or 180° from the left's.

Pitch Shifter (mono)

Shifts the pitch from three octaves down to two up, with feedback and pan.

Reverb

A stereo reverb with room size, diffusion, decay, early reflections, pre-delay, damping and three stereo modes.

Reverb Lite (mono)

A lighter reverb with pre-delay, decay, diffusion, size, damping and pan.

Ring Modulator

Multiplies the sound by a sine of up to 5 kHz; an envelope follower can move the frequency with the input's level.

Vintage 12-Bit

Holds and quantizes the signal like early sampling drum machines: a frequency, a depth and a resolution from 1 to 12 bits. The original named it after the house's own sampling drum machine.

Tube

Tube saturation with gain, output level, presence, compression and bias.

Twin (mono)

A two-stage guitar amplifier: volume, treble, mid, bass, second-stage gain, presence, master volume, compression and pan.

Appendix B lists every parameter with its range.

Bank slots and master slots

Changes to FX A, FX B and the aux slots are **edits of the playing preset**, like the edits of the Sample page:

- they are dropped when you choose another preset;
- your project and your user presets keep them;
- **Save as new bank…** writes them into a new bank: FX A and B into the preset, the aux effects into the bank's multisetup. A bypassed FX A or B is left out of the new bank, since a preset has no bypass of its own.

The master slots belong to Polezero, not to the bank. They stay as they are when you change presets, and your project and user presets keep them. Use them for what you want on every preset: a room, an EQ, a delay in time with the song.

> **TIP**
> To hear a preset without the bank's effects, switch off **Bank effects** in **Sys**. The master slots keep playing.

Automation

Each of the seven slots has thirteen parameters for your DAW, in a group of its own: *Bypass* and twelve parameters, the most any effect type has. Their names follow the effect in the slot (*Master 1 Decay*, *FX A Wet/Dry Mix*). When a slot's effect type changes, Polezero tells the DAW, which reads the names again; a parameter the new type lacks keeps a plain name such as *Master 2 Param 9* and does nothing. Automation plays on the audio thread, so offline bounces are exact, and the FX page shows the values as they move. The effect type itself is not automatable.

CHAPTER 8

THE SAMPLE PAGE

The Sample page opens the playing preset down to its samples. It lists every zone, draws the selected zone's sample, and lets you change where the zone starts, ends and loops while you play. These changes are *edits* laid over the bank: the bank and its sample files stay as they are. Chapter 9 continues with changes to the audio itself.



The **Sample** page. Zone V1 of *FullViolins1* is selected: a stereo violin sample at 32 kHz whose loop plays on after the key is released.

The zones

The list on the left shows every zone of the preset, by voice (*V1*, *V2*...): the sample's name, the zone's key and velocity ranges and its original key. Click one to show its sample. An orange dot marks a zone you edited. Links are not listed: they have no samples of their own.

With ⌘-click or SHIFT-click you select several zones at once, for the batch processing of chapter 9.

The waveform

The selected zone's sample, one lane per channel, with a ruler in seconds. Drawn over it:

- **Region** and **End**: the part of the sample the zone plays. What lies outside is dimmed.

- **Start**, the green handle at the bottom: the voice's sample start offset, counted from the region start.
- **Loop** and **Loop end**, with the loop shaded. A sample with several loops shows them all, the first one stronger.
- **Beat markers**, dashed, numbered at the start of each bar; **note markers**, small orange ticks at the top (chapter 10).
- A **playhead** for every voice playing this sample, so you see where the loop takes it. Zones that stretch to the tempo have none.

Under the waveform, the facts: sample rate, channels, length, the loop and whether it plays in the release; the zone's ranges, original key, tuning, volume, pan and region; and the voice's number of zones and sample start.

Zooming and moving

- The mouse wheel or a pinch zooms around the pointer.
- A horizontal scroll, or ALT-drag, moves along the sample.
- A double-click, or Show all, shows the whole sample.
- Show loop shows the first loop with a quarter of its length around it.



`Show loop`: the loop and its surroundings, close enough to place its points on the waveform.

Moving the markers

Point at a marker: the pointer turns into a left-right arrow. Drag the **Region** and **End** lines, the **Loop** and **Loop end** lines, or the green **Start** handle. The change plays at once, even on notes that are sounding: their playheads stay inside the new loop and region. The start applies from the next note, and zones that stretch to the tempo take changes from the next note.

The **snap** menu, left of the channel menu, decides where a dragged marker lands:

Zero crossings
The nearest point where any channel crosses zero, so the loop or cut does not click. The default.

Markers
The nearest marker within 8 pixels: region, start, loop, beat and note markers, and the sample's other loops.

No snap
Exactly where you let go.

Edit › **Points…** types the region, the start and the first loop to the sample, as one change.

The loop

The loop button switches the sample's loop on (**Loop on**) and off (**Loop off**). A sample without a loop shows **Add loop**, which adds one over the last quarter of the region. The **Loop…** menu holds the rest:

Loop in release
The loop goes on after the key is released, while the release fades it out. Off, the sample plays on past the loop end once the key is up.

Lock the loop length
Dragging one loop marker takes the other along, so the loop keeps its length while you move it.

Select the loop ⌘ L
Selects the loop's frames, for the Edit and Process menus.

Autocorrelate the loop start
Moves the loop start, within a quarter of the loop's length, to where the wave around it best matches the wave around the loop end: the smoothest join it can find. Doing it again finds the same point.

Loop processing…
Compression, crossfade and truncation of the loop (chapter 9).

Make a loop from the selection ⌘ ⇧ L**, and Loops**
Several loops per sample (chapter 10).

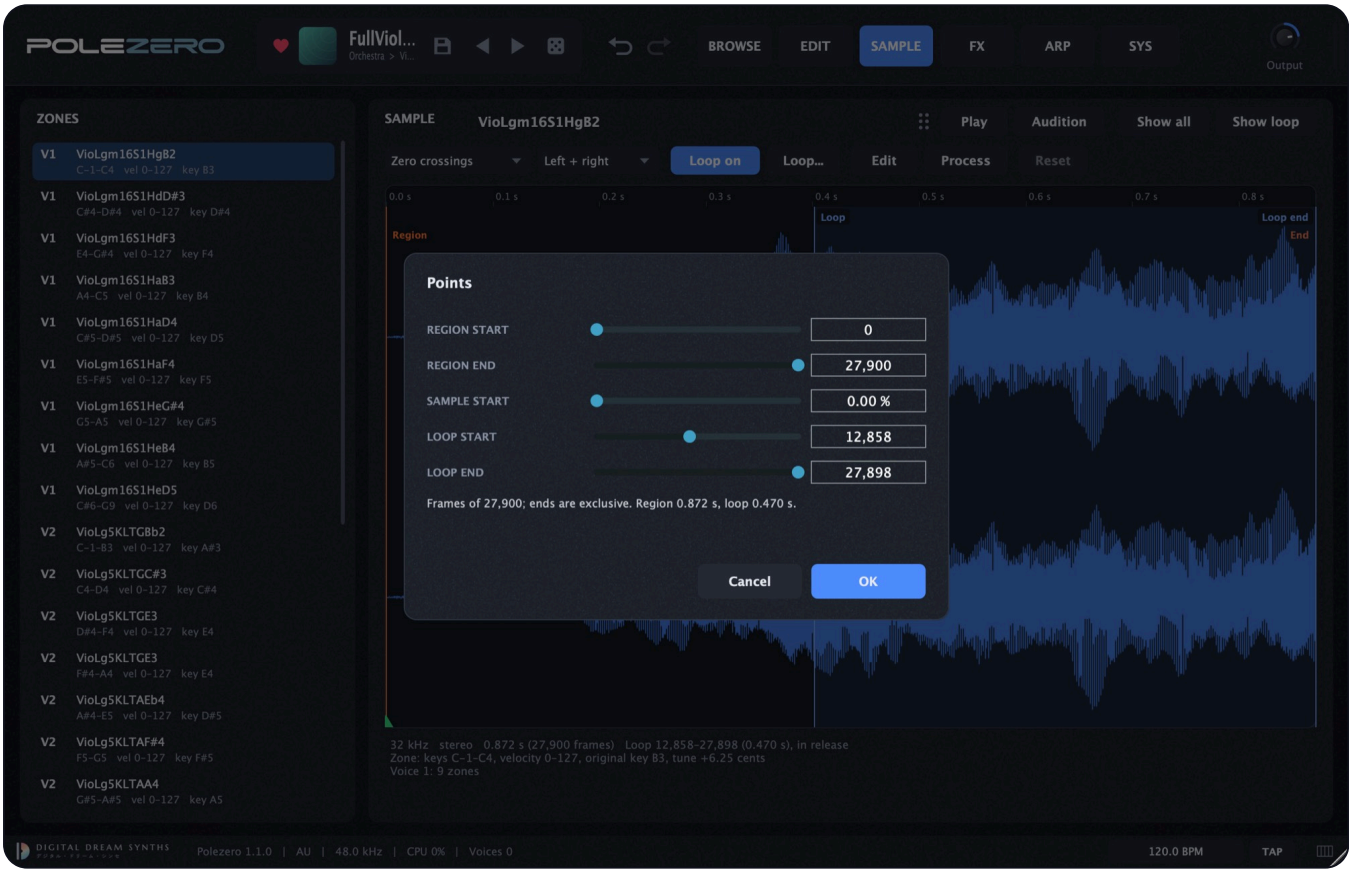
Note markers, Shift the beats, Clear the beat markers
For beat-analysed samples (chapter 10).

Reset takes the zone, its voice and its sample back to the bank's own points and audio.

> **NOTE**
>
> Zones that loop their whole region, in either direction, or play one shot do not use the sample's loop: the page says so and its buttons are off. In reverse, the start counts from the region's end.

Where the edits live

- With the preset you made them on. Choosing another preset drops them, so save a user preset first if you want to keep them.
- Your project keeps them, and a user preset saved after them stores them and brings them back.
- **Save as a new bank…** makes them part of a new bank (chapter 11).
- Every drag, switch, autocorrelation or reset is one undo step.



`Edit › Points…`: the region, the start and the first loop, typed to the frame.

CHAPTER 9

EDITING AUDIO

The **Edit** and **Process** menus change the sample's audio. Each change writes a new sample file into the data folder's `Edited Samples/`, and the zone plays that file instead of the bank's. Your bank and its sample files are never touched. Every command is one undo step, and undo brings back the previous file.

Selecting

- Drag across the waveform, away from the markers, to select. The ends snap like markers do.
- A click places the cursor, where a paste goes.
- ESC clears the selection.
- Without a selection, the Process tools work on the whole sample.

The Edit menu

ENTRY	KEYS	WHAT IT DOES
Cut, Copy, Paste	⌘ X, C, V	As in any editor. A paste over a selection replaces it.
Paste...	⌘ ⇧ V	Insert with a crossfade, or mix the clipboard in with equal-power or linear crossfades (below).
Delete	⌫	Removes the selection.
Select all, Select the loop	⌘ A, L	
Points...		Types the region, start and loop (chapter 8).
Region Xplode...		Slices the sample onto keys (chapter 10).
Crop to the selection		Keeps only the selection.
Silence		Replaces the selection with silence.
Fade in, Fade out		A smooth fade over the selection.
Export..., Replace..., Edit in the system's audio editor		See chapter 11.
Save as a new bank...		See chapter 11.
Back to the bank's sample		Drops the audio edits of this sample.

Cuts and pastes take the loops and beat markers along with the audio, and the regions of every zone that plays the sample move with it.

The Process menu

Each tool opens a dialog that remembers the values you used last. **Preview** plays the result without changing the sample: on the selection, else on the first 15 seconds. Long tools run in the background; the page reads *Processing…* meanwhile. For stereo samples, the channel menu beside the snap menu (**Left + right**, **Left only**, **Right only**) limits Fade, Adjust gain, Normalize and Reverse to one side.

Fade…

From a start gain to an end gain, each from silence to +24 dB, in a straight line or along one of three curves that leave the start gain ever faster: a fade-in rises early, a fade-out falls early.

Adjust gain…

From silence to +96 dB, or a normalization instead, optionally of each channel to its own peak.

Normalize to 0 dB, Remove DC offset, Reverse

At once, without a dialog.

Bit reduction…

From 16 bits down to 1.

Sample rate convert…

Resamples to a new rate from 8 to 100 kHz, keeping the pitch. A calculator shows the new length and the length of one cycle at a given key, for single-cycle loops.

Pitch shift…

Up to an octave either way, in cents, three ways: *nudge the sample rate* (only the rate changes; lossless), *high-quality resampling* (the audio becomes shorter when higher), or *constant time* (the length stays).

Time compression…

From 50 to 200 % of the length, keeping the pitch, with a tempo calculator. Its twelve algorithms, named as in the original, trade smoothness for precision: *deep* and *bass* use long grains for low material, *high* and *tight* short ones for percussive material, and the *smooth* variants overlap more. Appendix B lists them.

Transform multiply with the clipboard…

Convolves the selection with the clipboard: copy an impulse response or any sound, select, and the selection takes on its character. An intensity mixes the result in.

Xtractor…

For stereo samples: picks out what sits at one place in the stereo field, within a focus width and between two cut frequencies, and raises, lowers or pitch-shifts it, leaving the rest. Use it to pull out or remove a centred voice or instrument. *Sweep* moves the position across the selection to find it.

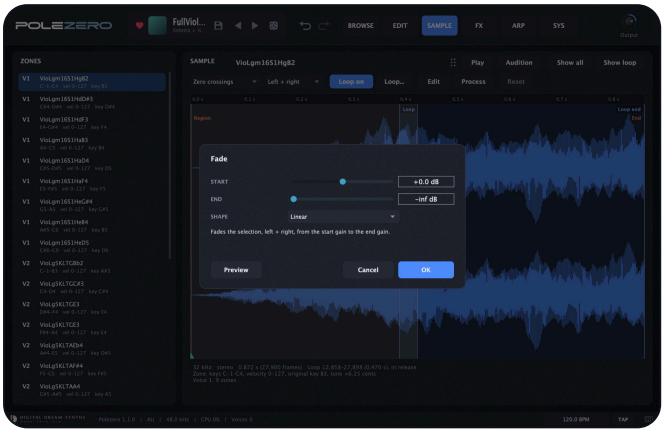
Beat analysis… ⌘ B

See chapter 10.

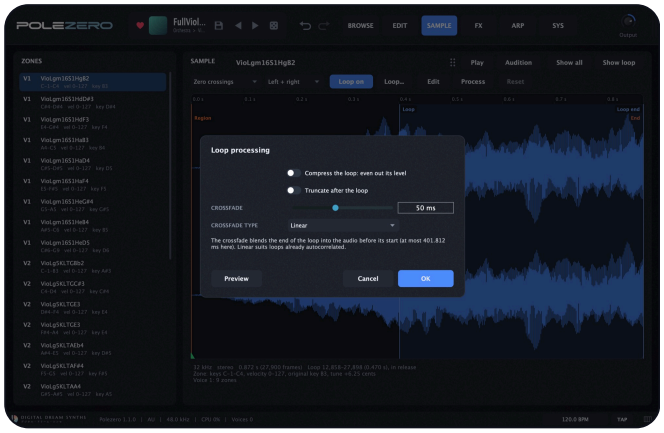
Swap left and right, Convert to mono…, Convert to stereo

Mono takes a mix from the left only to the right only; stereo copies the channel.

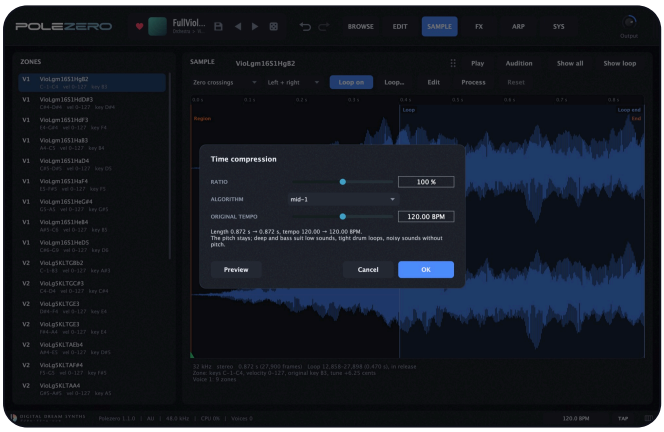
Paste… offers *Insert*, which overlaps the clipboard's ends with the audio around the cursor over the crossfade length, and *Equal power mix* or *Linear mix*, which add the clipboard from the cursor at a share you choose, faded in and out at its ends. At 100 % a mix replaces the audio.



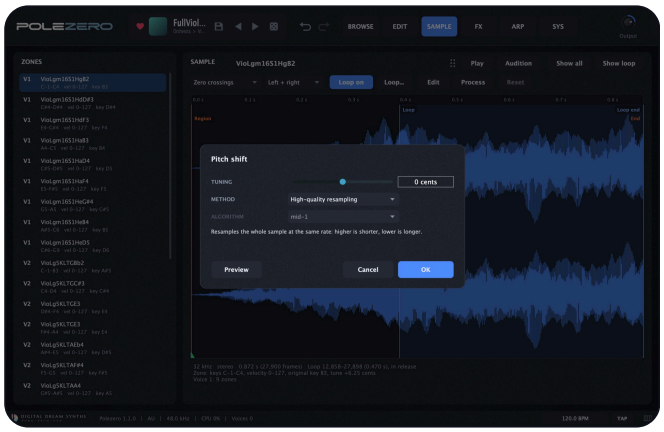
Fade… over a selection.



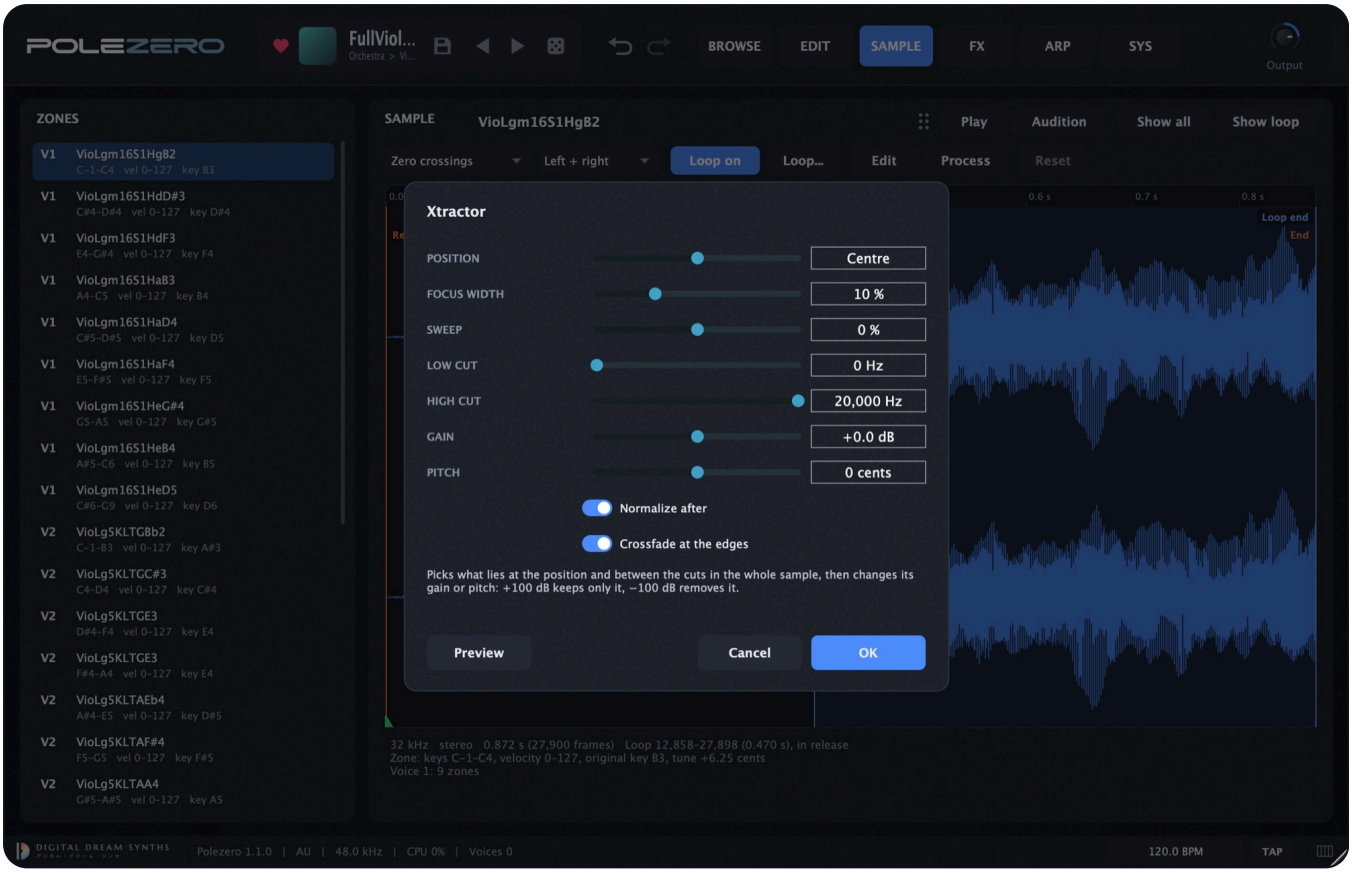
Loop processing…: compress, crossfade, truncate.



Time compression… with its tempo calculator.



Pitch shift… and its three methods.



`Xtractor…`: a place in the stereo field, its width and frequency range, and what to do with it.

Loop processing

Three operations on the first loop, in this order:

1. **Compress the loop**: evens out the level inside the loop, so it enters and repeats at the same loudness. Loops shorter than 120 ms are left alone.
2. **Crossfade**: fades the loop's last frames into the frames before its start, linear or equal power, over the length you choose (as far as the loop and the audio before it allow). A crossfade hides the join of a loop that will not close cleanly.
3. **Truncate after the loop**: drops the audio after the loop end, which a looping zone never plays.

Batch processing

Select several zones in the list (⌘-click, SHIFT-click) and the Process menu says how many samples it will work on. Adjust gain, Normalize, Remove DC, Reverse, Bit reduction, Sample rate convert, Pitch shift, Time compression, Transform multiply, Beat analysis, Swap and the mono and stereo conversions then work on every selected sample, as one undo step. A tool that does not fit a sample (swapping the sides of a mono one) leaves it alone.

Listening

Play SPACE

Plays the selection, or else the whole sample, once at its own pitch and through its loop. Again stops it. The sample plays on its own, without the preset's filter, envelopes or effects and without the master slots.

Audition

While it is on, notes from MIDI and from the on-screen keyboard play the sample instead of the preset, one at a time, with C4 at the sample's own pitch. A held key stays in the loop. A new key goes on from where the last one was released, so you can step through a long sample; with a selection, every key starts at its start. It switches off when you leave the page.

The edited files

Edited audio is stored exactly: audio that was only cut and pasted stays 16-bit, a bit reduction is stored as 16-bit, and everything else as 32-bit float, so edits add no rounding. Old versions stay on disk for undo and for projects that use them. **Sys** › **Edited samples** shows how much space they take and moves the ones nothing uses to the Trash (chapter 14).

CHAPTER 10

LOOPS, BEATS AND SLICES

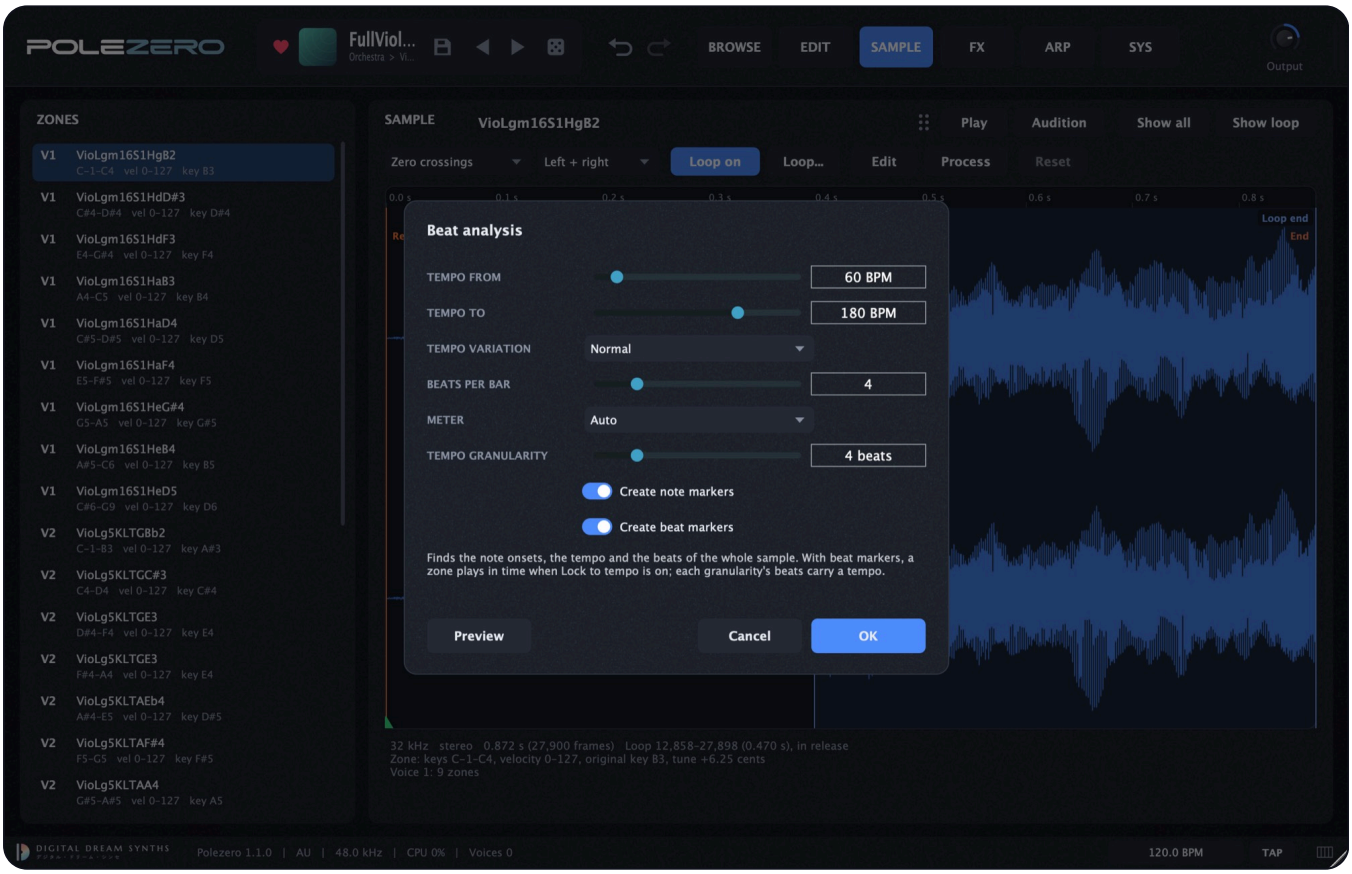
A drum loop or a rhythmic phrase plays in time with the song only if Polezero knows where its beats are. This chapter covers beat analysis, which finds them, the samples' multiple loops, and Region Xplode, which cuts a sample into slices across the keyboard.

Playing in time

A sample with beat markers and a tempo plays at the song's tempo, without changing pitch, when its preset's *Lock to tempo* is on. Each beat's slice is stretched or squeezed to fit. **Sys** › **Lock to tempo** overrides the presets: **as the preset says**, **always** or **never**.

Beat analysis

Process › **Beat analysis…** (⌘ B) finds the note onsets, the tempo and the beats of the whole sample, and writes them into a new file of the sample.



Beat analysis…, with the original's settings.

Tempo from, Tempo to

The range the tempo lies in, between 40 and 240 BPM. A narrow range avoids half or double tempo.

Tempo variation

Constant for a machine-made loop, *Normal* for most playing, *Fast* for a performance that speeds up and slows down.

Beats per bar, Meter

The bar's length, and whether its beats divide in two (*Duple*), in three (*Triple*), or as the analysis finds (*Auto*).

Tempo granularity

How often a beat marker carries a tempo of its own: every beat, every bar... Fewer tempos give a steadier stretch.

Create note markers, Create beat markers

What to keep. Beat markers make the sample play in time; note markers are for slicing.

Afterwards the beat markers show dashed on the waveform, numbered at each bar. If the analysis put the beat a little early or late, **Loop…** › **Shift the beats a quarter beat left** or **right** moves them all; **Clear the beat markers** removes them. Note markers show as orange ticks at the top; **Loop…** › **Note markers** sets how sensitive they are, from showing every onset to only the strongest. Note markers are not saved with the sample.

> **NOTE**
> Polezero's beat analysis is its own algorithm. It follows the original's settings, not its results.

Several loops

A sample can have more than one loop. **Loop…** › **Make a loop from the selection** (⌘ ⇧ L) adds one. **Loop…** › **Loops** lists them in order, to select or delete each. The first is the one the waveform edits; a preset's cords can make voices jump between the others while they play, the original's Loop Select.

Region Xplode

Edit › **Region Xplode…** cuts the shown zone's sample at its note markers and gives every slice a key of its own, so a drum loop becomes a kit you can play or re-sequence:

1. **Find the notes.**
   Run **Beat analysis…** with **Create note markers** on, and set **Note markers** so that the ticks fall where you want cuts.
2. **Choose the range.**
   Select part of the sample to slice only that; without a selection, the zone's region is sliced.
3. **Choose the keys.**
   White keys or *Chromatic*, from a starting key (C4 by default). Slices past the top key are left out.

4 **Decide about the voice.**
By default the slices take the voice's place; *Keep the voice* leaves it and adds the slices after the last voice, as the original did.

5 **Export a MIDI file**
if you want one: a note per slice at its time, at the tempo you give, ready to drag into your DAW to play the loop back from its slices.

Each slice is a copy of the voice that plays one slice of the sample, at the sample's own pitch, on its own key. A slicing is an edit like the others: one undo step, kept in your project and user presets, and saved by **Save as a new bank…**. A slice cannot be sliced again.

CHAPTER 11

SAVING AND EXPORTING

Your edits live with the playing preset until you keep them. A user preset keeps them alongside the bank. This chapter covers the other ways: a new bank, and audio files for other programs.

Save as a new bank

Edit › **Save as a new bank…**, or the button on the FX page, saves the bank under a new name, by default *<bank> edited.exb* beside the bank, with this preset's edits made part of it: regions, sample starts, loops, edited audio, slices, and the effect changes of the FX page.

- Every other preset of the bank stays as it was. A sample they share with the edited preset keeps playing unchanged for them, and the edited preset gets its own copy.
- The other samples are copied under the new bank's name. On an APFS disk the copies are clones that take no extra space.
- When it is done, the new bank plays at the same preset, with no edits left over, and the page says how many samples it wrote and copied.
- If the new bank lies in your library folder, the browser lists it at once.

The new bank is an ordinary `.exb` bank, as the original saved them. It is offered for `.exb` banks only.

Export as WAV or AIFF

Edit › **Export as WAV or AIFF…** writes the shown sample, with your edits, at its own sample rate: 16-bit when the audio is 16-bit, 24-bit otherwise. A WAV file carries its loops and the zone's original key in its sampler chunk, which most samplers read.

Export all samples, with an SFZ

Edit › **Export all samples as WAV, with an SFZ…** exports the whole preset as a multisample for other samplers: every sample, edits included, into a new folder named after the preset, together with an `.sfz` file that maps them as the zones do.

- Each voice becomes a group, with its amp envelope; each zone a region with its key and velocity ranges, root key, tuning, volume, pan, start, end, direction and loop.
- Filters, LFOs, cords, the other envelopes, links and muted zones are left out: SFZ cannot carry the whole voice.
- Each WAV is named after its sample, with its root key added when the name lacks it, and carries its loops and its key and velocity ranges.

The folder opens in the Finder when it is done.

Drag out

The grip left of **Play** drags the shown sample, exported as above, into the Finder, your DAW or another sampler.

Replace with an audio file

Edit › **Replace with an audio file…** puts a WAV, AIFF, FLAC, Ogg or any file the system reads in place of the zone's sample, as an edit you can undo. A WAV's loops become the sample's loops; the regions keep their place in proportion.

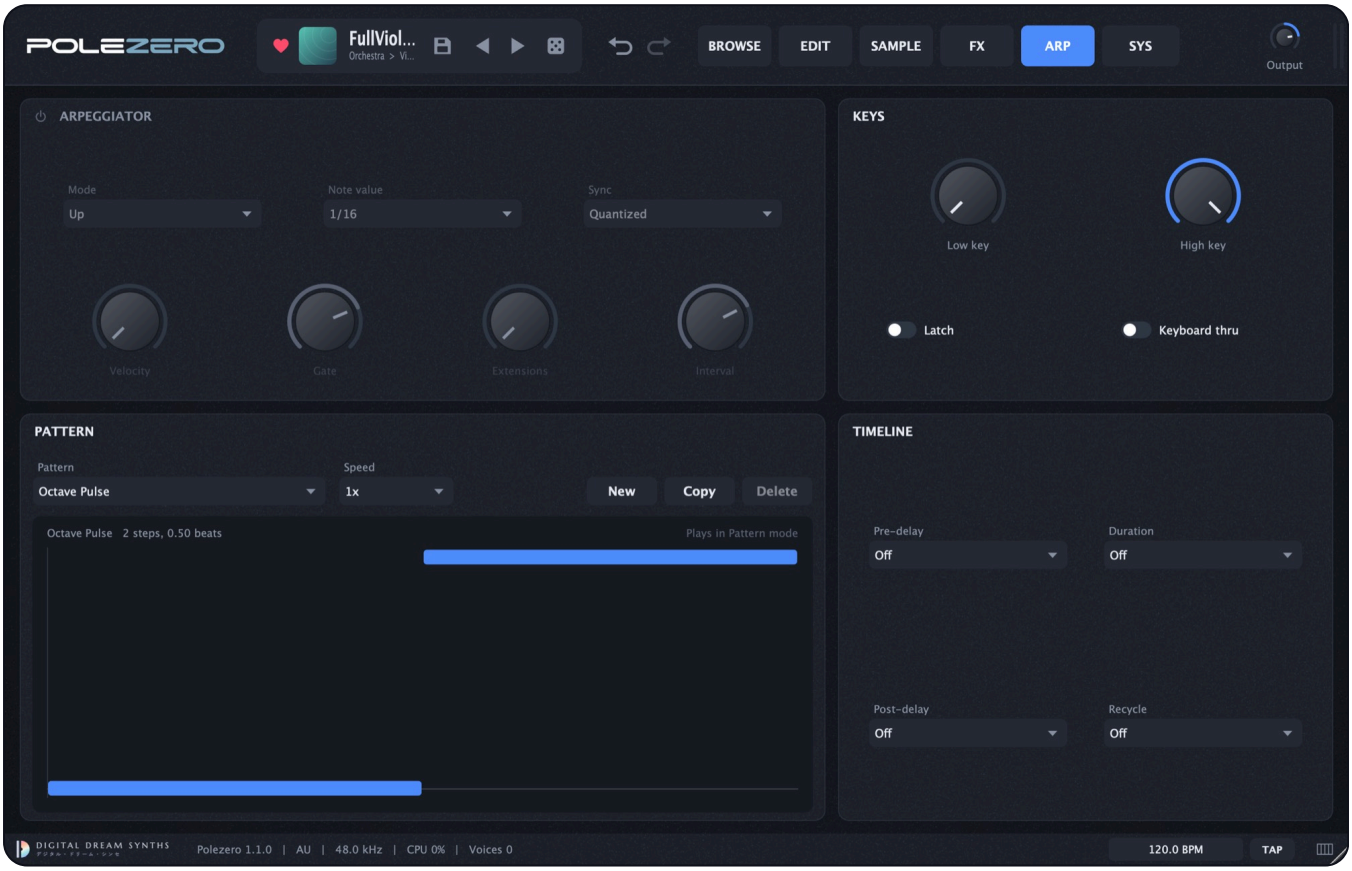
Edit in another application

Edit › **Edit in the system's audio editor** opens the sample in the application your system uses for WAV files. Each time you save it there, Polezero takes it back as an edit, as long as the Sample page shows that sample.

CHAPTER 12

THE ARPEGGIATOR

The original had no arpeggiator, but the house's sound modules of the same years did, and many banks were made for them: their *arp:* presets. Polezero's arpeggiator is built on the parameters and behaviour of those modules, with patterns of our own. It sits before the engine, so it plays any preset, and the on-screen keyboard goes through it too.



The **Arp** page: the arpeggiator, its keys, the pattern and the timeline.

Arpeggiator

The power switch in the module's header turns it on. Then hold a chord.

MODE	PLAYS THE HELD KEYS
Up, Down	From the lowest to the highest, or the reverse.
Up/Down	Up and back down, without repeating the top and bottom notes: C E G E C E G E...
Fwd Assign, Bkwd Assign	In the order you pressed them, or the reverse.
Fwd/Bkwd	In the order you pressed them and back.

MODE	PLAYS THE HELD KEYS
Random	One at random at each step.
Pattern	Through a pattern (below), all held keys at once.

Note value

The length of a step, from 1/32 to two whole notes, including triplets and dotted values: 19 in all. Not used in Pattern mode, where each step has its own.

Sync

Key: the first note sounds when you press the key. *Quantized*: it waits for the next step of the grid, so the arpeggio lands in time.

Velocity

As played, or a fixed velocity from 1 to 127.

Gate

How much of each step the note sounds, from 1 to 100 %. At 100 % notes join without gaps.

Extensions and Interval

The arpeggio plays the held keys, then again transposed by the interval, and again, as many times as the extension count, then starts over. With E, C, G pressed in that order, Fwd Assign, an interval of 12 and two extensions play E C G, an octave higher, then two octaves higher.

Keys

Low key, High key

Only keys inside this range arpeggiate; keys outside it play as usual, so you can play a bass line under an arpeggio.

Latch

Keys stay in the arpeggio after you release them. Press a key again to take it out. Turning Latch off releases them all.

Keyboard thru

The held keys also sound as ordinary notes, under the arpeggio.

Timeline

By default the arpeggio runs for as long as you hold the keys. The timeline can give it a shape in time, from the first key:

PRE-DELAY → DURATION → POST-DELAY → RECYCLE

Pre-delay

How long the held keys play as ordinary notes before the arpeggio starts.

Duration

How long the arpeggio then runs. After it, the keys sound as ordinary notes again.

Post-delay

How long they sound so before a recycle.

Recycle

Off: once the duration ends, the arpeggiator waits until you release every key. *On*: after the post-delay, the timeline starts again from the pre-delay. *On, no pre-delay*: it starts again from the duration.

All four use the note values, or are off.

Patterns

In Pattern mode every held key plays the pattern at once, so a chord plays it in harmony. A pattern has up to 32 steps, each with:

- **a key**: an offset from −48 to +48 semitones from each held key; or *tie*, which extends the step before; or *rest*; or *skip*, which leaves the step out;
- **a velocity**: as played, or 1–127;
- **a length**: one of the 19 note values;
- **a repeat count**: 1 to 32 plays of the step.

The **Speed** menu plays the whole pattern at ¼, ½, 1, 2 or 4 times its speed. The **Pattern** menu lists Polezero's 44 patterns, then your own, numbered by their slot. Polezero's patterns show read-only, with time across, the key offset up and the velocity as brightness; your own open in the step editor.

- **New** makes a one-step pattern in the first free slot of your own.
- **Copy** copies the selected pattern there, to change it.
- **Delete** empties the selected slot of your own; click it twice within three seconds.



A pattern of your own in the **step editor**: a copy of *Acid Line* with a few changes.

The step editor

One column per step, plus one at the end to add a step. Changes play at once and are saved a second later; there is nothing to store.

LANE	CLICK AND DRAG	DOUBLE-CLICK	WHEEL
Key	Sets the offset; drag across steps to draw	Offset 0	±1 semitone
Vel	Sets the velocity; drag across steps to draw	As played (*P*)	±4
Length	A menu of the note values		Next value
Repeat	Drag up or down	1	±1

A right-click on a step makes it a note, a tie or a rest, and inserts, duplicates or deletes steps. The header holds the pattern's name, which you can type over, and its number of steps with – and + to remove or add the last one.

Your patterns have 100 slots, shared by every instance of Polezero, in the data folder's `Arp Patterns.txt`. The file is plain text, one pattern per line, and you can edit it by hand:

```
[3] Bounce = 0:1/8 +12@100:1/16 rest:1/16 +7x2 tie
```

That reads: slot 3, named *Bounce*; a step at the held key, an eighth note long; one an octave up at velocity 100, a sixteenth; a sixteenth rest; a fifth up, played twice; and a tie. A step is an offset, `tie`, `rest` or `skip`, then optionally `@velocity`, `:length` (default 1/16) and `xrepeats`.

Clock

The arpeggiator counts in 24 steps per quarter note. While your DAW plays, it follows the song position, and a starting transport restarts a running arpeggio from its first step at the next grid point. Otherwise it runs at the tempo from when Polezero starts. All its settings are parameters your DAW can automate, and choosing a preset does not change them.

CHAPTER 13

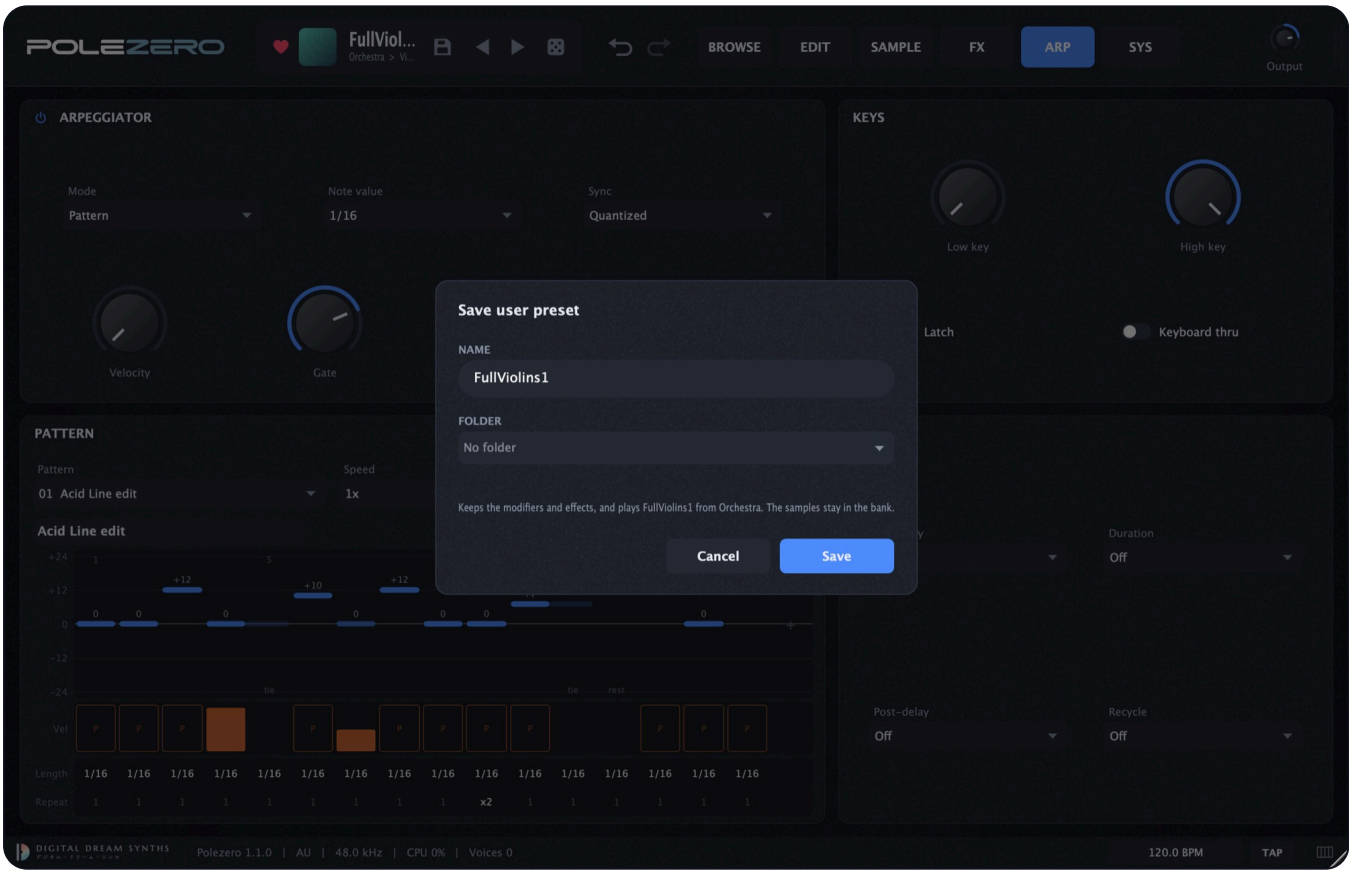
USER PRESETS

Banks hold the sound. The modifiers, the master effects and the arpeggiator are Polezero's, so a bank preset cannot keep them. A **user preset** does: it names a bank preset and stores Polezero's settings with it.

What a user preset stores

- The bank preset: its bank's path in the library folder and on disk, and the preset's place and name in the bank.
- Every parameter: modifiers, arpeggiator and effect settings. The output level and the limiter are left as you set them.
- The master slots. A user preset saved with empty master slots empties them when it loads.
- Your edits of the bank preset: regions, loops, edited audio, slices and the changes to its effects.

It stores no samples and no copy of the bank: it is a small text file.



The disk icon in the top bar opens **Save user preset**.

Saving

1. **Click the disk icon** in the top bar.

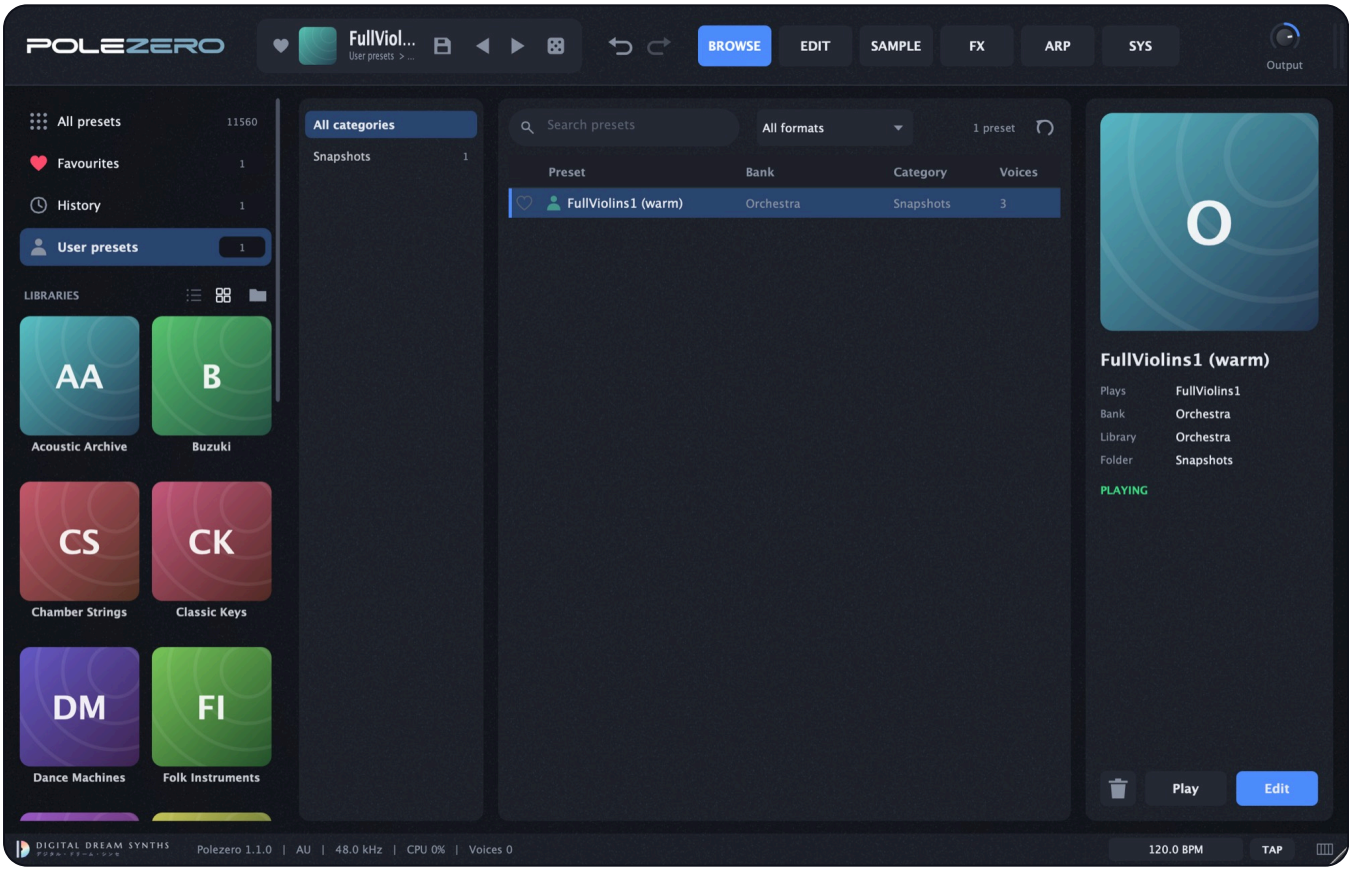
2 **Name it.**
The playing preset's name is proposed.

3 **Choose a folder**
, or type a new one. A folder is a category in the browser; *Keys / Organs* makes a folder in a folder.

4 **Click Save.**
If a user preset of that name exists in that folder, the button reads **Replace**. The new user preset is the one playing.

Loading

Choose a user preset like any other: in **User presets** in the browser, or in **All presets**, **Favourites** and **History**, where a person icon marks it. It sets every parameter it stores, and those it lacks to their defaults; locked modifier modules keep their values. It stays the playing preset until you choose another or your DAW selects a program.



The **User presets** library. The info panel shows the bank preset a user preset plays, and a button that moves it to the Trash.

Files

Each user preset is a file, `<name>.preset`, in the data folder's `User Presets/`, in its folder. Rename a file in the Finder and you rename the preset. To share user presets, give someone the files: they play as long as the other person has the same banks.

Finding the bank again

If banks move, Polezero looks for each user preset's bank preset in this order:

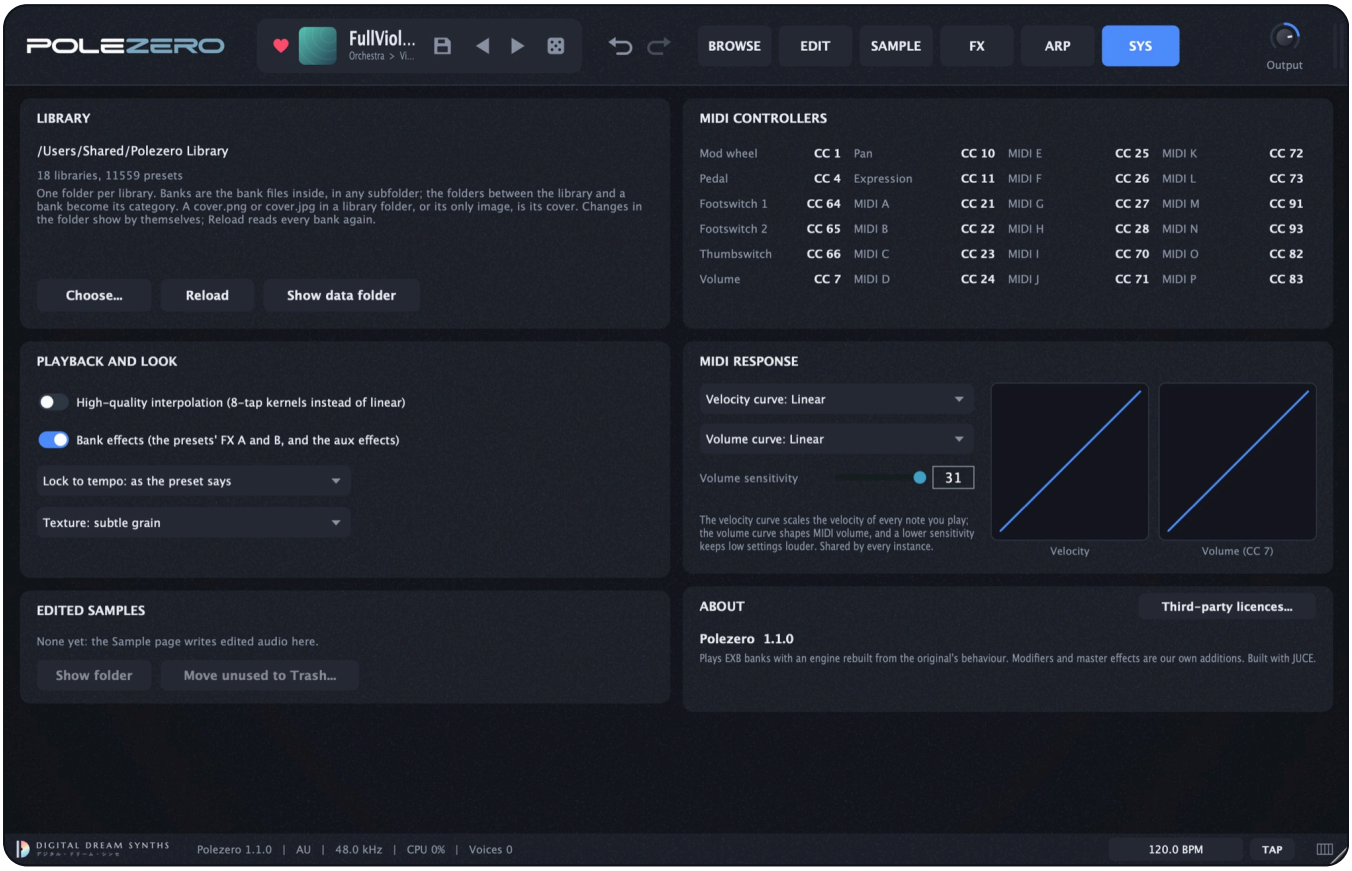
1. the same bank and preset name, at the same place if it can;
2. the same bank and place, when the preset was renamed;
3. the full path saved with it, for banks outside the library folder;
4. a bank of the same file name elsewhere in the library folder, with the same preset name.

A user preset whose bank cannot be found stays listed and says so, but cannot play.

CHAPTER 14

SYSTEM SETTINGS

The **Sys** page holds what is not part of a preset.



The `Sys` page.

Library

The library folder, how many libraries and presets it holds, and three buttons: **Choose…** another folder, **Reload** every bank (chapter 5), and **Show data folder**.

Playback and look

High-quality interpolation

Plays samples through 8-tap interpolation of our own instead of the original's linear interpolation: cleaner when a sample is transposed far up, at some more processor time.

Bank effects

Switches the bank's own effects, FX A and B and the aux effects, on or off together, to hear a preset dry. The master slots are not affected.

Lock to tempo

As the preset says, *always* or *never* (chapter 10).

Texture

The film grain on Polezero's backgrounds: off, subtle or strong.

MIDI controllers

The control change numbers Polezero listens to, with the original's default assignments: the modulation wheel, pedal, footswitches, volume, pan and expression, and the sixteen controllers *MIDI A* to *MIDI P* that presets use as their knobs. Appendix B repeats the list.

MIDI response

Velocity curve

Linear or one of 23 curves, drawn beside the menu. It reshapes the velocity of every note you play, the on-screen keyboard's too, before the arpeggiator. Choose a curve that lifts low velocities if your keyboard plays too softly, or one that holds them back if it plays too loud.

Volume curve, Volume sensitivity

How MIDI volume (control change 7) becomes loudness: *Linear*, *Inverse Square* or *Logarithmic*, and a sensitivity from 0 to 31. A lower sensitivity keeps low volume settings louder.

These settings are shared by every instance and the standalone application, and are not saved in projects.

Edited samples

How many edited sample files the data folder holds and how much space they take, **Show folder**, and **Move unused to Trash…**. A file counts as unused when no instance has played it since Polezero started and no user preset names it.

> CAREFUL
>
> A project saved with edits and closed now would play the bank's own samples once its edited files are gone. Empty the Trash only when you are sure no project needs them.

About

Polezero's version, and **Third-party licences…**, which shows the software in Polezero that is not ours, with its licences in full (Appendix D).

CHAPTER 15

POLEZERO IN YOUR STUDIO

Parameters for your DAW

Polezero's parameters come in groups, which DAWs show as folders: *Amp*, *Filter*, *Pitch*, *Arpeggiator*, *Output*, then one for each effect slot from *FX A* to *Master 2*. Each name also stands on its own in a flat list: *Pitch Tune*, *Output Level*, *FX A Bypass*. Not automatable: the choice of preset (use program changes), the effect type of a slot, the Sys settings, the tempo and the Sample page's edits.

Programs

Polezero offers the 128 MIDI program numbers to your DAW: program *n* plays preset *n* of the playing bank, counting from 0 or 1 as your DAW does, with the preset's name. Presets left out of the browser, such as credits, still count, so the numbers match the bank's. A program change from MIDI does the same.

MIDI

- Polezero plays one part and ignores MIDI channels.
- Control changes reach the presets through the controller map of Sys: a preset made to open its filter with *MIDI A* responds to control change 21.
- The pitch wheel bends each voice by its own range, as the bank sets it.
- A note-on with velocity 0 is a note-off.

Latency and timing

Polezero starts every note on its exact sample. To do that, it runs 128 samples behind its input (2.9 ms at 44.1 kHz), and reports this latency to your DAW, which compensates for it.

What a project saves

Your DAW's project keeps, for each instance: the bank and preset, the user preset playing, every parameter, the modifier locks, the Sample page's edits, the master slots, the interpolation and tempo-lock settings, Polezero's own tempo, and the browser's view (page, library, category, search, sorting and window size). It keeps no samples: the project needs your banks where they were.

Several instances

Every instance plays its own preset with its own settings. The library, favourites, history, user presets, arpeggiator patterns, MIDI response and edited samples are shared, so a favourite marked in one instance shows in all of them.

The standalone application

The standalone application plays Polezero without a DAW. Its **Options** button chooses the audio output and MIDI inputs. Without a host it plays at its own tempo, set in the bottom bar.

Memory and processor

- When a bank opens, all of its samples load into memory, so choosing another preset of the same bank is immediate. Polezero keeps them as 32-bit values, about twice the size of 16-bit sample files: a large bank needs memory to match. The Edit page shows the size of the playing preset's samples on disk.
- The bottom bar shows the processor load and the voices sounding. Long releases, many layers and high-quality interpolation cost the most.

APPENDIX A

BANK FORMATS IN DETAIL

The original's banks

- **Files:** `.exb`, often in a folder of the same name.
- **Samples:** kept in the bank, or in a `SamplePool` folder beside it (or one level up) as `.ebl` files named after the bank. Some commercial libraries keep their samples in one large library file in that folder; Polezero reads it when it lies with the bank.
- **What plays:** everything chapter 2 describes, with the bank's multisetup for the aux effects, first-channel settings and tempo.
- **Saving:** Save as a new bank… writes a new `.exb` bank.
- A sample file that cannot be found leaves its zones silent; the rest of the preset plays.

Fourth-generation banks and disk images

- **Files:** `.e4b` banks, loose or inside images of fourth-generation CD-ROMs and hard disks (`.iso`, `.img`, `.hda`), recognized by their contents rather than their names.
- **In the browser:** each image is a library; its folders order its banks, and give them a category when they name one (*SFX*, *Plucked Strings*); the presets' names decide otherwise. Inside Polezero, a bank in an image has a path like `Analog Collection.iso/Strictly Synthe/Strictly Synthe1.e4b`, with `#` for a `/` in a name.
- **Samples** play straight from the image; nothing is copied.
- **Conversion:** as the original's own import of these banks, with one difference. The original adds a bend of its own to every imported voice, which doubles the pitch-bend range of many presets. Polezero bends as the fourth-generation hardware did.
- **Left out:** presets whose samples are in the sound ROM some fourth-generation models carried, credit presets, and the hardware's own effect settings, which the original did not play either.
- Saving as a new bank is not offered.

Third-generation banks

- **Files:** banks inside the same disk images as fourth-generation banks, or loose `.e3b`, `.e3x` and `.esi` files.
- **Conversion:** Polezero's own, since the original did not read these banks. It maps each preset's primary and secondary layers, velocity ranges, envelopes, LFO, filter and velocity routings to voices. The crossfade options between layers are not read yet: both layers play within their velocity ranges.
- Label banks that only name a disk's sections play nothing and are left out. Saving as a new bank is not offered.

Budget-line banks

- **Files:** `.em1`, `.em2`, `.eb1` and `.eb2`. A bank spread over several disks (`BANK01.EM2`, `BANK02.EM2`) is listed once, by its first disk, and finds the others beside it.
- **Conversion:** Polezero's own, for the same reason.
- Floppy and hard-disk images of the budget line are not read yet, only its bank files. Saving as a new bank is not offered.

Where Polezero differs from the original

Polezero aims to play banks as the original did. Where it does not, it is by choice:

- **Lost velocity switches.** The house's own conversions of some older libraries kept both layers of their velocity-switched presets but lost the switch, so the original plays both layers at once. Polezero gives the switch back to presets whose name says they switch (*XSwtch*, *VelSwitch*, *VSW*) and whose voices form two layers without velocity ranges: the first layer plays below velocity 64, the second from 64. This affects the velocity-switched presets of a few older libraries.
- **Presets without voices** are left out of the browser.
- **Aux buses** routed to the outputs of the house's audio interfaces do not play.
- **Our own designs:** the filters' responses are fitted to measurements of the original, the high-quality interpolation, the velocity and volume curves and some reverb reflection patterns are our own work, made to match.
- **Not yet supported:** alternative tuning tables (two presets in our test library use one).

APPENDIX B

REFERENCE TABLES

Filter types

The 55 types of the Filter modifier's menu, as the presets also use them.

Classic

- 2-pole low-pass
- 4-pole low-pass
- 6-pole low-pass
- 2-pole high-pass
- 4-pole high-pass
- 2-pole band-pass
- 4-pole band-pass
- Contrary band-pass
- Swept EQ, 1 octave
- Swept EQ, 2 to 1 octave
- Swept EQ, 3 to 1 octave
- Phaser 1
- Phaser 2
- Bat phaser
- Flanger lite
- Vocal Ah-Ay-Ee
- Vocal Oo-Ah

Morphing

- Dual EQ morph
- Dual EQ + low-pass morph
- Dual EQ morph + expression
- Peak/shelf morph
- Morph designer

Twelfth-order models

- Ace of Bass
- MegaSweepz
- Early Rizer
- Millennium
- Meaty Gizmo
- Klub Klassik
- BassBox 303
- Fuzzi Face
- Dead Ringer
- TB or Not TB
- Ooh to Eee
- Boland Bass
- Multi Q Vox
- Talking Hedz
- Zoom Peaks
- DJ Alkaline
- Bass Tracer
- Rogue Hertz
- Razor Blades
- Radio Craze
- Eeh to Aah
- Ubu Orator
- Deep Bouche
- Freak Shifta
- Cruz Pusher
- Angelz Hairz
- Dream Weava
- Acid Ravage

- Bass-O-Matic
- Lucifer's Q
- Tooth Comb
- Ear Bender
- Klang Kling

Effect parameters

The parameters of the 20 effect types, in the order your DAW lists them as *Param 1* to *Param 12*.

EFFECT	PARAMETERS
Chorus	Wet/Dry Mix 0…100 %; Initial Delay 10…50 ms; Modulation Depth 0…100 %; Modulation Rate 0…15 Hz; Feedback −99…99 %; LFO Waveform Triangle · Sine
Chorus / Delay (mono)	Wet/Dry Mix 0…100 %; Initial Delay 10…1000 ms; Modulation Depth 0…100 %; Modulation Rate 0…15 Hz; Feedback −99…99 %; Pan −100…100 %; LFO → Pan 0…100 %
Delay	Wet/Dry Mix 0…100 %; Left Delay 0…2000 ms; Right Delay 0…2000 ms; Mode Discrete stereo · Ping Pong, stereo · Ping Pong, mono, L→R · Ping Pong, mono, R→L; Feedback 0…99.9 %; HF Damping 0…1
Delay (BPM)	Wet/Dry Mix 0…100 %; Left Delay Division 4/1 … 1/64 dotted, 21 values; Right Delay Division 4/1 … 1/64 dotted, 21 values; Mode Discrete stereo · Ping Pong, stereo · Ping Pong, mono, L→R · Ping Pong, mono, R→L; Feedback 0…99.9 %; HF Damping 0…1
Delay (mono)	Wet/Dry Mix 0…100 %; Delay Time 0…1999 ms; Feedback 0…99.9 %; HF Damping 0…1; Pan −100…100 %
Early Reflections	Wet/Dry Mix 0…100 %; Mode Hall 1 … Up & Down, 10 values; Room Size 0…1; L/R Offset −50…50 %
Early Reflections Reverb	Wet/Dry Mix 0…100 %; Pre-Delay 0…200 ms; Early Reflections Mode Hall 1 … Up & Down, 10 values; ER Room Size 0…1; ER L/R Spread −50…50 %; ER / Tail Balance 0…100 %; HF Damping 0…1; LF Damping 0…1; Tail Decay 0…0.95; Tail Diffusion 0.15…0.85; Tail Room Size 0.2…1; Tail Stereo Mode Independent · Figure Eight · Matrix
EQ - 1 Band Parametric	Wet/Dry Mix 0…100 %; Gain −24…15 dB; Frequency 40…16000 Hz; Bandwidth 0.01…2 octaves
EQ - 4 Band	Wet/Dry Mix 0…100 %; High Gain −24…15 dB; High Frequency 4000…16000 Hz; HiMid Gain −24…15 dB; HiMid Frequency 1000…8000 Hz; HiMid Bandwidth 0.01…2 octaves; LoMid Gain −24…15 dB; LoMid Frequency 200…3000 Hz; LoMid Bandwidth 0.01…2 octaves; Low Gain −24…15 dB; Low Frequency 40…800 Hz
Flanger	Wet/Dry Mix 0…100 %; Initial Delay 0…4 ms; Depth 0…100 %; Rate 0…20 Hz; Feedback −99…99 %; Through Zero Off · On · On (out of phase)

EFFECT	PARAMETERS
Flanger (BPM)	Wet/Dry Mix 0…100 %; Initial Delay 0…4 ms; Depth 0…100 %; LFO Note Division 4/1 … 1/64 dotted, 21 values; Feedback –99…99 %; Through Zero Off · On · On (out of phase)
Growl	Wet/Dry Mix 0…100 %; Initial 0…15 ms; Depth 0…100 %; Color –99…99 %; Pre-Filter 0…1
Phaser	Wet/Dry Mix 0…100 %; Depth 0…100 %; Rate 0…20 Hz; Feedback –99…99 %; Stages 3 · 6 · 9 · 12; LFO L/R Phase 0 degrees · 90 degrees · 180 degrees
Pitch Shifter (mono)	Wet/Dry Mix 0…100 %; Pitch Shift –36…24 semitones; Feedback 0…90 %; Pan –100…100 %
Reverb	Wet/Dry Mix 0…100 %; Decay 0…0.95; Diffusion 0.15…0.85; Room Size 0.2…1; Early Reflections 0…100 %; Pre-Delay 1…200 ms; HF Damping 0…1; LF Damping 0…1; Stereo Mode Independent · Figure Eight · Matrix
Reverb Lite (mono)	Wet/Dry Mix 0…100 %; Pre Delay 10…200 ms; Decay 0…0.95; Diffusion 0.15…0.8; Room Size 0.2…1; HF Damping 0…1; Pan –100…100 %
Ring Modulator	Wet/Dry Mix 0…100 %; Frequency 0…5000 Hz; Envelope follower –10…10 ×
Vintage 12-Bit	Wet/Dry Mix 0…100 %; Frequency 0…100; Depth 0…100 %; Resolution 1 bit … High Resolution, 11 values
Tube	Wet/Dry Mix 0…100 %; Gain 0.25…50; Output Level 0…1; Presence 0…1; Compression 0…1; Bias 0…1
Twin (mono)	Wet/Dry Mix 0…100 %; Volume 0…10; Treble 0…10; Mid 0…10; Bass 0…10; 2nd Stage Gain 0…10; Presence 0…10; Master Volume 0…10; Pan –100…100 %; Compression 0…1

MIDI controllers

CONTROLLER	CONTROL CHANGE	CONTROLLER	CONTROL CHANGE
Modulation wheel	1	MIDI A–D	21, 22, 23, 24
Pedal	4	MIDI E–H	25, 26, 27, 28
Volume	7	MIDI I–L	70, 71, 72, 73
Pan	10	MIDI M, N	91, 93
Expression	11	MIDI O, P	82, 83

CONTROLLER	CONTROL CHANGE	CONTROLLER	CONTROL CHANGE
Footswitch 1, 2	64, 65	Thumbswitch	66

Note values

The arpeggiator's note values, step lengths and timeline times, from the shortest: 1/32, 1/16 triplet, 1/32 dotted, 1/16, 1/8 triplet, 1/16 dotted, 1/8, 1/4 triplet, 1/8 dotted, 1/4, 1/2 triplet, 1/4 dotted, 1/2, whole triplet, 1/2 dotted, whole, two-whole triplet, whole dotted, two wholes.

Time compression algorithms

ALGORITHM	GRAIN	SEARCH	OVERLAP	SUITS
deep	100 ms	25 ms	2	Mostly bass, down to 20 Hz
bass	80 ms	20 ms	2	Mostly bass
mid-1	50 ms	15 ms	2	Average material
mid-2	40 ms	12 ms	2	Average material, higher mids
high	25 ms	8 ms	2	Material with strong highs
tight	20 ms	5 ms	2	Keeping time: drum loops
broad	60 ms	15 ms	2	Low bass with important highs
broad-smooth	60 ms	15 ms	4	Lows and highs, smoother
difficult	45 ms	10 ms	4	Inharmonic or broadband material
noisy	35 ms	3 ms	4	Unpitched material, sound effects
tight-smooth	20 ms	5 ms	4	Rhythmic material, small changes
x-smooth	30 ms	8 ms	4	Rhythmic material, small changes

Keyboard shortcuts

WHERE	KEYS	DOES
Browse	↑ ↓	Play the previous or next preset
Browse	RETURN	Open the Edit page

WHERE	KEYS	DOES
Sample	SPACE	Play or stop the sample
Sample	⌘ X, C, V	Cut, copy, paste
Sample	⌘ ⇧ V	Paste...
Sample	⌘ A	Select all
Sample	⌘ L	Select the loop
Sample	⌘ ⇧ L	Make a loop from the selection
Sample	⌘ B	Beat analysis...
Sample	⌫	Delete the selection
Sample	ESC	Clear the selection
Knobs	double-click	Back to the default
Knobs, handles	SHIFT -drag	Finer steps

APPENDIX C

TROUBLESHOOTING

Studio One lists Polezero but does not load it (Windows)

Polezero has changed folder, for example when DDS Hub moved it to the folder for all users, and Studio One still remembers the old one. In Studio One's Plug-In Manager, choose **Remove Plug-In Settings**, confirm and restart Studio One; updating the plug-in list is not enough. Studio One then scans all your plugins again, which takes a few minutes; your favourites and folders stay. If another plugin stalls the scan, **Skip** leaves that plugin out until the next full scan.

The browser is empty

- Choose the library folder: the folder icon beside **LIBRARIES**, or **Sys** › **Choose…**.
- If the folder is on an external disk, connect it: the libraries come back by themselves.
- A first reading of a large library takes a moment; the count shows its progress.

A bank I copied in does not show

Wait for the copy to finish: the list follows a second and a half after the folder settles. If it still does not show, click **Reload**.

No sound

- Check that your DAW sends MIDI to Polezero's track.
- Check the **Output** knob and the Amp modifier's **Volume**.
- If the arpeggiator is on, check its key range and Latch, and that the chosen pattern is not an empty slot of your own.
- On the Sample page, **Audition** sends your notes to the sample instead of the preset.

Some notes are silent

A sample file of the bank is missing: its zones stay silent. Keep the `SamplePool` folder with the bank, and library files where the bank expects them.

A user preset cannot play

Its bank is not where it was, and Polezero could not find it elsewhere in the library folder. Put the bank back, or into the library folder.

My sample edits are gone

Edits belong to the preset they were made on and are dropped when you choose another preset. Save a user preset to keep them, or **Save as a new bank…**.

An old project plays the bank's own samples instead of my edits

Its edited sample files were moved to the Trash from **Sys** › **Edited samples**. Put them back from the Trash into `Edited Samples/` in the data folder.

An effect slot reads “not playing”

The bank's effects are off in Sys, the slot's aux bus goes to a hardware output, or the bank has no aux effects. The tooltip says which.

The loop buttons are greyed out

The zone loops its whole region or plays one shot, so it does not use the sample's loop.

A loop does not follow the tempo

The sample needs beat markers (**Beat analysis…**), and the preset's Lock to tempo must be on, or **Sys** › **Lock to tempo** set to *always*.

The processor load is high

Switch off high-quality interpolation, shorten releases with the Amp modifier, or raise your DAW's buffer size.

APPENDIX D

THIRD-PARTY SOFTWARE

Polezero is built with the JUCE framework (JUCE 9.0.4, © Raw Material Software Limited), used under the JUCE 9 licence. It also contains the open-source software below, each under its own licence. The last column names the plugin formats that contain it.

This software is based in part on the work of the Independent JPEG Group.

SOFTWARE	VERSION	LICENCE	FORMATS
zlib	1.3.2	Zlib	All
HarfBuzz	14.2.1	MIT-Modern-Variant	All
SheenBidi	2.9.0	Apache-2.0	All
LunaSVG	3.5.0	MIT	All
PlutoVG	1.3.2	MIT	All
libpng	1.6.58	libpng-2.0	All
IJG libjpeg	10.0	IJG	All
libwebp	1.6.0	BSD-3-Clause	All
FLAC	1.5.0	BSD-3-Clause	All
libogg	1.3.6	BSD-3-Clause	All
libvorbis	1.3.7	BSD-3-Clause	All
Opus	1.6.1	BSD-3-Clause	All
opusfile	0.12-59-g6dfd29e	BSD-3-Clause	All
libopusenc	0.3	BSD-3-Clause	All
VST3 SDK	3.8.0	MIT	VST3
AudioUnitSDK	1.1.0	Apache-2.0	AU (macOS)
LV2	1.18.0	ISC	LV2 (Linux)
clap-juce-extensions	commit 7adee3a	MIT	All
CLAP	1.2.7	MIT	CLAP
clap-helpers		MIT	CLAP

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Polezero is made by Digital Dream Synths. The instrument that inspired this plugin is not named in this manual: its name is a trademark of its owner. Digital Dream Synths is not affiliated with, endorsed or sponsored by any instrument maker. None of the original's sounds come with Polezero.

This manual follows the order of the original's reference manual where it fits, but it is written for Polezero, from Polezero's own behaviour. Like the plugins, it was written with the help of AI. Polezero 1.1.0 (beta), October 2026.