Introducing Ensoniq ESQ-1 by Cherry Audio



Ensoniq® ESQ-1 by Cherry Audio is a virtual instrument synthesizer that brings back the spirit and sounds of the Ensoniq ESQ-1 polyphonic synthesizer with the utmost accuracy. The plug-in includes the original 32 waveforms, licensed from Creative Technology, to precisely recreate the 1986 ESQ-1 in software, enhanced with modern features to make it accessible to today's musicians and producers.

A Different Kind of 1980s Classic

In the mid-1980s, synthesizers were changing fast. Analog polysynths were giving way to sleek digital machines, FM synthesis was everywhere, and musicians were suddenly being promised the future in glowing displays and membrane buttons. Into this brave new world came the **Ensoniq ESQ-1**, a synth that didn’t quite fit this new futuristic vision.

A Digital Wave Synthesizer with an Analog Soul

The original ESQ-1 was a digital wave synthesizer with an analog soul, meaning that its oscillators were digitally stored waveforms rather than traditional analog circuits. Each of its 8 voices featured three Digital Wave Oscillators, drawing from 32 sampled and synthetic waveforms, which were then shaped by analog filtering (from the renowned CEM 3379 IC by Curtis Electromusic), four DCAs, four envelopes, three LFOs, amplitude modulation, oscillator sync, and a surprisingly deep modulation system.

It was also more than just a synth. The original hardware included a powerful eight-track MIDI sequencer, giving musicians a way to build complete musical ideas inside the instrument itself. Ensoniq described it as “two powerful devices” in one: an eight-voice, poly-timbral Digital Synthesizer and a flexible eight-track MIDI Sequencer.

What made the ESQ-1 special was the way it combined different worlds. Its digital oscillators could produce crisp, harmonically rich, unmistakably 1980s waveforms, but those waves didn’t just stay cold and shiny.

They passed through a warm, characterful signal path that gave the instrument weight and a personality all its own. It could sound glassy, moody, brassy, metallic, lush, strange, or darkly cinematic.

The Cult Favorite That Never Wore Out Its Welcome

The ESQ-1 also arrived at an odd point in synth history. It wasn't as famous as the Yamaha DX7, Roland D-50, or Korg M1. It didn't become a single-sound cultural monument to a time and place in musical history. In other words, there's no single cliché ESQ-1 preset haunting wedding receptions, documentaries, or sound design nostalgia packages. Instead, the ESQ-1 became something more interesting: a workhorse cult favorite with deep programming, a loyal following, and a sound that is still interesting because it was never overused.

Faithfully Revived After Four Decades

Just in time for its 40th Anniversary, the **Ensoniq ESQ-1 by Cherry Audio** virtual synthesizer brings every bit of the original's character back with unusual care. It isn't just a loose tribute to a vintage instrument with a familiar-looking faceplate. Cherry Audio worked directly with Creative Technology, the current owner of the Ensoniq intellectual property, to obtain official licensing for the original 32 ESQ-1 waveforms for this release. This is a critical part of the equation because these waveforms are the heart, soul, and raw material of the ESQ-1's sound, and here they reemerge as part of a modern virtual instrument built for today's musicians, producers, and sound designers.

Cherry Audio's version also supports importing original ESQ-1 SysEx patches, allowing decades of user-created sounds and legacy patch libraries to find new life in software. For anyone with old ESQ-1 sounds, cartridge memories, or downloaded patch collections lurking on a drive somewhere, this is more than a convenience. It's a small but miraculous act of synthesizer archaeology.

Classic Character, Modern Possibilities

At the same time, this uniquely inspiring synth is not limited to the sounds of the 80s. Cherry Audio's ESQ-1 expands the original concept with two fully independent layers with flexible Whole, Layer, and Split performance modes, a modern modulation matrix, macro controls, a Motion panel with arpeggiator and sequencer tools, per-layer and global effects chains, and support for polyphonic aftertouch and MIDI Polyphonic Expression (MPE).

The result is an instrument that keeps the ESQ-1's sonic heart intact while giving it the kind of immediacy and expression that modern software enables.

Where to Begin

If you're new to the ESQ-1, the basic idea is simple: start with three digital wave oscillators, sculpt them with filter and amplifier stages, then animate the result with envelopes, LFOs, modulation, motion sequencing, and effects.

If you already know the original hardware, you'll find the familiar architecture here, but with a lot more room to stretch out. The ESQ-1 was powerful, but it asked you to do much of your programming through a letterbox display, soft buttons, and a data slider. Cherry Audio's ESQ-1 brings the power directly to the surface, allowing you to view settings across a handful of pages and access a more comprehensive picture of its signal path.

Cherry Audio's ESQ-1 authentically captures the unique essence of this powerful instrument for the first time, enhancing it to meet the expectations of 21st-century musicians. Like the original, this virtual instrument skillfully combines digital and analog expressiveness in a way that is slightly unconventional, yet far more capable than its often-overlooked reputation suggests.

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Understanding the Different Views

Cherry Audio's Ensoniq ESQ-1 gives you a lot of synthesis power, but the basic idea is easy to grasp. Choose a preset, play the keyboard, select the layer or page you want to work with, then start shaping the sound to make it your own. Easy stuff, and a perfect way to dip into the considerable depths this synth offers.

As explained earlier, the synth is organized around three main views: **Keyboard**, **Motion**, and **Effects**. These are selected from the view buttons on the lower left side of the interface. Each view focuses on a different part of the instrument.



The Three Main Views

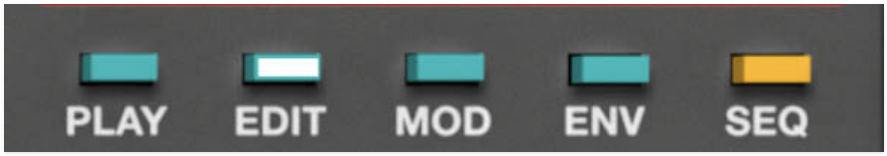
The **Keyboard** view is the main performance and sound-design page. This is where you'll find the core synth engine, including the layer controls, macro sliders, modulation display, oscillators, filter, ENV 4 controls, performance controls, and on-screen keyboard. If you want to play, edit, shape, or understand the basic sound of a patch, start here.

The **Motion** view contains the arpeggiator and sequencer tools. This is where ESQ-1 becomes more than a playable synth and starts becoming a source of rhythmic patterns, evolving phrases, animated movement, and controlled musical mischief.

The **Effects** view provides access to the full effects section. ESQ-1 includes separate effects chains for **Layer 1** and **Layer 2**, plus a **Global** effects chain that processes both layers together. This lets you treat each layer differently, then use shared global effects to pull everything into the same sonic room.

The Five Keyboard View Modes

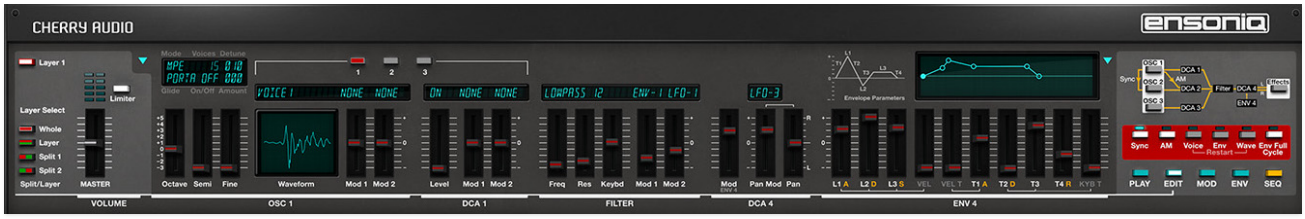
The **Keyboard** view also includes five mode buttons on the upper-right side of the panel: **Play**, **Edit**, **Mod**, **Env**, and **Seq**. These buttons change the main control area of the Keyboard view, allowing you to access different parts of the instrument without leaving the main page.



This is Cherry Audio's modern take on one of the original ESQ-1's defining ideas. The hardware ESQ-1 used page-driven programming, where different front-panel buttons called up different parameter pages on the display. Cherry Audio's version keeps that spirit, but makes it much more visual and immediate.



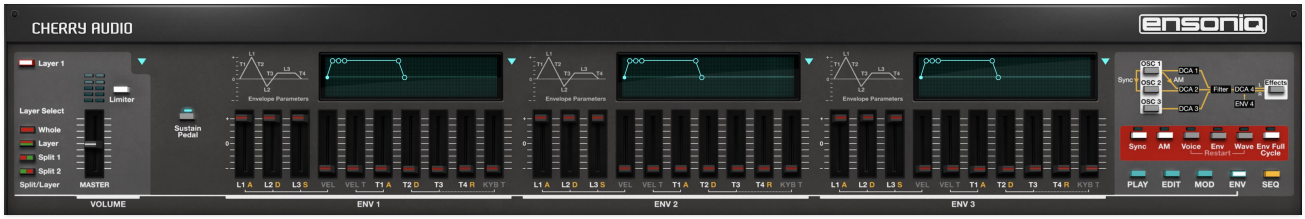
Play mode shows the main performance and quick-edit controls, including the layer section, macros, modulation display, oscillator waveform controls, filter controls, ENV 4 quick controls, and the signal-flow display.



Edit mode provides deeper access to voice and synthesis controls, including oscillator tuning, waveform, DCA, filter, amplifier, glide, and related sound-shaping parameters.



Mod mode displays the LFO and modulation controls, including LFO 1, LFO 2, and LFO 3.



Env mode displays the envelope controls, including the detailed editing controls for ENV 1, ENV 2, and ENV 3.



Seq mode displays the arpeggiator and sequencer controls, including pattern, playback, macro motion, step programming, timing, and transport controls.

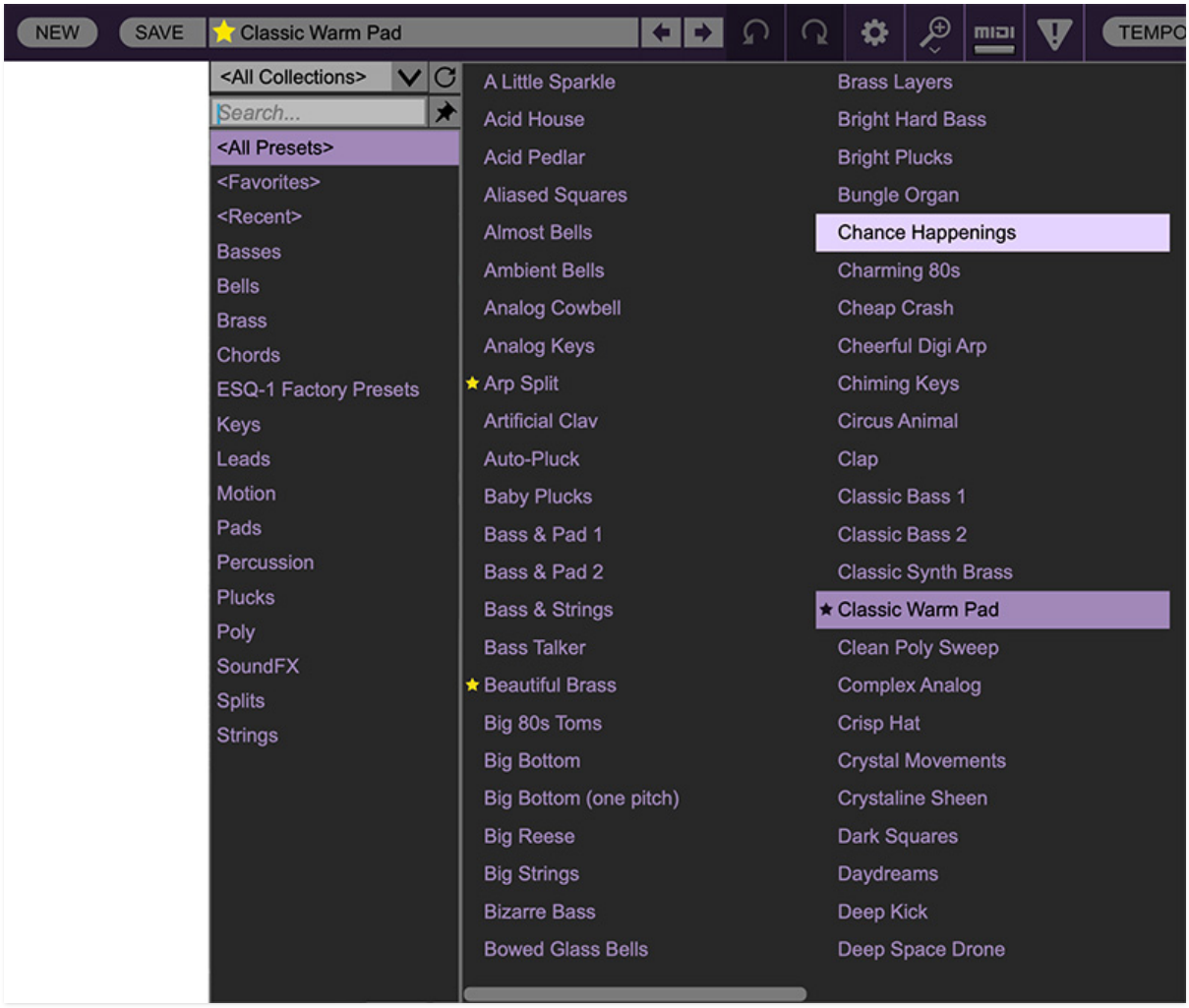
You don’t need to master all five modes immediately. Start in **Play** mode, get comfortable selecting layers and browsing presets, then explore the other modes as you begin editing sounds in more detail.

Playing Presets

The fastest way to begin is by loading a preset from the Preset Browser and playing a few notes. Presets are useful not only as finished sounds, but also as starting points for your own patches.

As you browse, pay attention to whether a sound uses one layer, two stacked layers, or a split keyboard layout. ESQ-1’s two-layer design means a preset may be doing more than it first appears. A pad might

have a soft digital choir on one layer and a darker filtered wave on the other. A bass might occupy the lower keyboard while a lead sits above it.



Understanding Layers

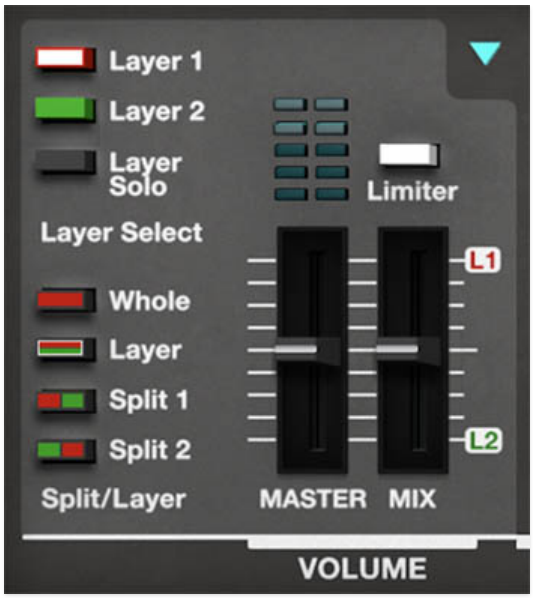
ESQ-1 has two fully independent synth layers: **Layer 1** and **Layer 2**. Each layer can have its own sound, settings, modulation, sequencer behavior, and effects.

The layers are color coded to make it clear which layer is being viewed or edited. **Layer 1** has its controls shown in red, and **Layer 2** has its controls shown in green.

Layer 2 becomes available for editing when **Layer** mode is enabled in the **Split/Layer** section of the Volume panel. In **Whole** mode, ESQ-1 operates as a single-layer sound, and only the currently active layer is shown for editing. When you select **Layer**, the interface expands to show both **Layer 1** and **Layer 2**, along with the **Mix** slider, which balances the two layers.

This is an important distinction. **Whole** mode is ideal when you want to work on one focused sound across the full keyboard. **Layer** mode activates the two-layer structure, allowing both layers to be edited and played together across the keyboard. From there, you can also use **Split 1** or **Split 2** to place the two layers in different keyboard ranges.

When editing a layered or split preset, make sure you've selected the layer you want to adjust. If you move a control and don't hear the expected change, check whether **Layer 1** or **Layer 2** is selected, and confirm that the appropriate Split/Layer mode is active. You may simply be editing the other layer, or working in Whole mode when you meant to build a two-layer sound.



Whole, Layer, Split 1, and Split 2

The **Volume** section lets you choose how Layer 1 and Layer 2 are used across the keyboard.

Whole plays the selected layer across the full keyboard. Use this when you want a single-layer sound or when you want to focus on editing one layer at a time.

Layer stacks Layer 1 and Layer 2 across the full keyboard. This is ideal for big pads, complex hybrid sounds, doubled basses, wide leads, and any patch that benefits from two independent sounds playing together.

Split 1 places Layer 1 on the lower part of the keyboard and Layer 2 on the upper part. This is useful for classic performance setups such as bass on the left hand and lead, pad, or keys on the right.

Split 2 reverses that arrangement, placing Layer 2 on the lower part of the keyboard and Layer 1 on the upper part.

In Layer and Split modes, the keyboard range controls above the on-screen keyboard let you adjust how the layers are assigned across the keyboard. This makes it easy to create performance-ready sounds without opening a separate setup page.

Using Layer Solo

Layer Solo lets you hear only the currently selected layer. This is especially useful when editing layered sounds. For example, if a preset uses a bright digital attack on Layer 1 and a warm pad body on Layer 2, soloing each layer lets you hear exactly what each one contributes. You can adjust the oscillator levels, filter, envelopes, modulation, and effects for one layer without the other one clouding the patch.

Master Level, Layer Mix, and Limiter

The **Master** slider controls the overall output level of the instrument.

When **Layer** mode is enabled, the **Mix** slider balances the level relationship between **Layer 1** and **Layer 2**. Move it toward **L1** to emphasize Layer 1, or toward **L2** to emphasize Layer 2. In layered and split sounds, this is one of the quickest ways to rebalance a patch without changing the individual programming of either layer.

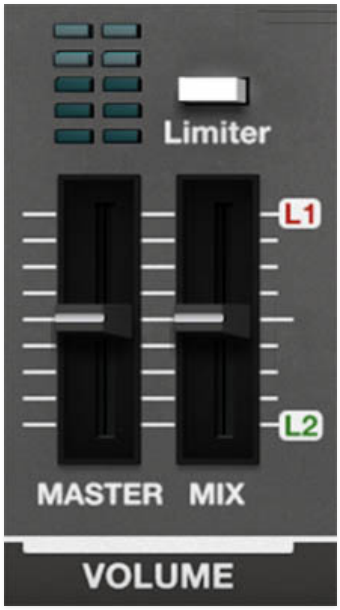
For example, if you've created a layered sound with a bright plucked attack on one layer and a darker sustained body on the other, the Mix slider lets you decide which Layer you want to emphasize (if at all).

The **Limiter** button helps keep the instrument's output under control, especially when you're using layered sounds, high resonance, stacked voices, long releases, Motion features, or effects that add gain. This can

be particularly useful on ESQ-1 because a single preset can contain two independent layers, each with its own oscillators, modulation, sequencing behavior, and effects. It doesn't take much for a big layered patch to become, as audio engineers put it, "enthusiastic."

Musically, the Limiter is useful when you want to preserve a bold, energetic sound without sudden peaks jumping out too aggressively. It can help tame sharp attacks, resonant filter peaks, dense layered pads, or sequences with strong accents. For sound design, it lets you push the instrument harder while keeping the final output more manageable.

As always, use your ears. If a patch feels dynamic and controlled without the Limiter, you may not need it. If a sound is exciting but producing sudden level spikes, turn the Limiter on and adjust the Master level as needed.



The Basic Signal Path

At the heart of ESQ-1 is a classic hybrid signal path. Each voice begins with three Digital Wave Oscillators: **OSC 1**, **OSC 2**, and **OSC 3**. These oscillators provide the raw tone, using the original ESQ-1 digital waveforms as their source.

Each oscillator then passes through its own DCA, or digitally controlled amplifier: **DCA 1**, **DCA 2**, and **DCA 3**. These stages control the level of each oscillator before the signals are combined and sent into the filter.

From there, the sound passes through the **Filter**, which shapes the brightness and harmonic character of the combined oscillator signal. After the filter, the sound passes through **DCA 4**, the final amplifier stage. **ENV 4** is closely associated with DCA 4 and is typically used to shape the overall volume contour of the sound.

Finally, the signal passes into the effects section, where Layer 1 and Layer 2 can each have their own effects chain before being processed by the Global effects chain.

In plain English: choose waves, balance them, filter them, shape their volume, animate everything, then add effects. That's the ESQ-1 recipe. The rest is experimentation that often turns into something uniquely interesting and expressive.

Editing a Sound

A good way to begin editing is to start with a preset that's close to what you want, then make small changes.

Try this:

- Select a preset.
- Choose **Whole** mode if you want to focus on one layer.
- Use **Layer Solo** if the preset has two layers and you want to hear one at a time.
- Use the **Play**, **Edit**, **Mod**, **Env**, and **Seq** buttons to move between different control areas in the Keyboard view.
- Adjust oscillator levels to change the balance of the raw sound.
- Use the filter controls to make the sound brighter, darker, softer, sharper, or more animated.
- Adjust **ENV 4** to change the overall shape of the sound.
- Use the macro sliders to make broad musical changes.
- Visit the **Effects** view to add polish, space, width, or movement.
- Once you understand which layer you're editing, which mode you're viewing, and how the signal flows, ESQ-1 becomes much easier to explore.

A Useful First Experiment

- Load a layered preset, then turn on **Layer Solo** and listen to Layer 1 by itself.
- Switch to Layer 2 and listen again. Notice how each layer contributes something different: attack, body, motion, brightness, weight, atmosphere, or texture.
- Then turn Layer Solo off and adjust the **Mix** slider. This gives you a quick feel for how ESQ-1 builds larger sounds from two independent layers.
- Next, stay in the **Keyboard** view and try switching between **Play**, **Edit**, **Mod**, **Env**, and **Seq**. Notice how the main panel changes to reveal different parts of the instrument. This is a useful habit to build early, because many of ESQ-1's deeper controls live behind these mode buttons.
- Finally, open the **Effects** view and look at the red, green, and gray tabs. The red tab contains effects for Layer 1, the green tab contains effects for Layer 2, and the gray tab contains Global effects that process both layers together. This three-chain structure is a big part of what makes Cherry Audio's ESQ-1 flexible, especially for layered and split sounds.

Where to Go Next

Once you're comfortable loading presets, selecting layers, switching between the Keyboard, Motion, and Effects views, and using the Play, Edit, Mod, Env, and Seq modes, the rest of the instrument becomes much easier to understand.

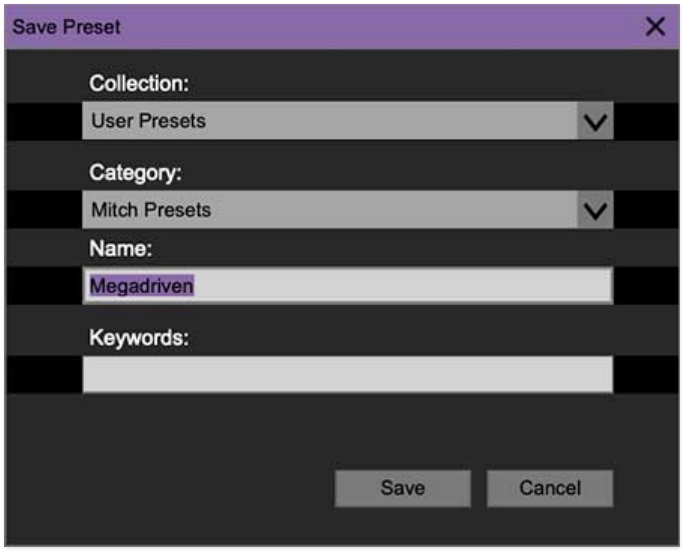
The next chapters explain the toolbar and preset system, then take a closer look at the Keyboard view and the ESQ-1 voice architecture. From there, we'll dig into the oscillators, filter, envelopes, modulation, Motion tools, and effects.

Top Toolbar and Preset Browser

Before we dig into the specifics of the synth, let's talk about some of the stuff that you'll be using every time you fire up this or any other Cherry Audio instrument plug-in: the Toolbar and Preset Browesr.

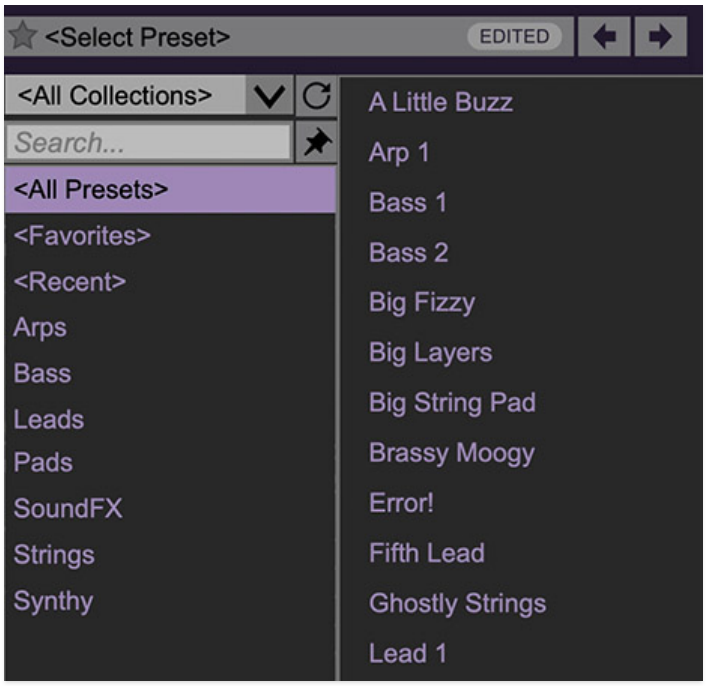
The purple strip at the top of the interface is where you'll load, save, and create sound presets. It also contains utility functions such as undo/redo, UI zoom and *Focus* controls, under-the-hood settings, and more. Let's go over them:

New - Opens a new blank patch preset. If an unsaved patch is currently open or you've modified an existing saved patch, a dialog asks if you'd like to save the patch in its current state. This greatly reduces the possibility of losing an edited unsaved patch.



Save- Use this to save patches. There are a couple of levels of hierarchy:

- **Collection**- This is the top level of organization, and contains entire "sets" of presets. The ESQ-1 *Presets* are the main included collection. We also include a *User Presets Collection* for storing your own presets, but you're free to create your own collections. To create a new collections, click in the *Collection* text field (where it says *User Presets* above) and type a name. User-created sounds can be freely saved to any collection; we like to keep 'em separated for organizational purposes.
- **Categories**- Within each *Collection* are a number of sound categories. As with collections, you're free to create as many categories as you like. To create a category, click in the *Category* text field of the *Save* dialog window and type a new category name.
- **Patch**- A patch is an individual sound. To save a patch, simply type the name in the *Name* field and click *Save*.
- **Keywords**- You can add descriptive words such as "bass," "lead," "spaceship," etc., to patches to make them appear when terms are typed in the *Search* field. Use commas to separate multiple keyword entries.



Browsing Patches- Patches can be browsed by clicking the <*Select Preset*> field. To select a preset collection, click in the area that says <*All Collections*> or on the downward-facing arrow next to it.

Clicking on the left-side categories narrows down which patches are displayed.

- **<All Presets>** will show presets from all collections and categories.
- **<Recent>** displays recently used presets.
- **Refresh** - This is the circular arrow button to the right of the downward arrow; clicking this checks the Cherry Audio server for new or updated presets.



Pin - Clicking the push-pin icon locks the patch selection list open, allowing fast and easy browsing and auditioning of patches. Click the icon again to disable pin mode. when in pin mode, the up and down arrow keys can be used to select patches.

Preset Step Back/Forward horizontal arrows- These step to the previous or next preset. macOS [⌘+left/right arrow key] or Windows [CTRL+left/right arrow key] will navigate through presets back and forth in the currently selected collection/category.

Undo/Redo circular arrows- These undo or redo the last action. It remembers many steps, so if you really mucked something up, keep on clickin'.

Settings - This is where user preferences for user interface, audio interfaces, user account, and more are configured. See the **Settings** section for full information.

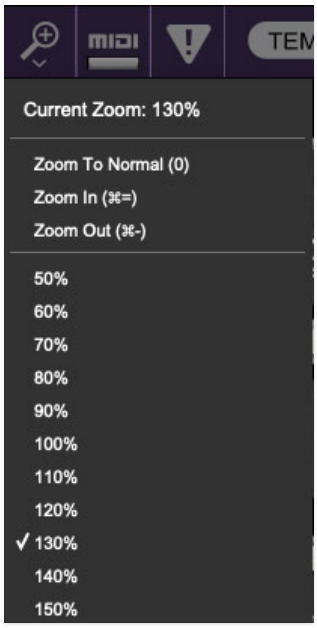
Importing Presets with drag-and-drop

Presets can be imported individually or *en masse* (as a single compressed ZIP file) simply by dragging and dropping from the desktop anywhere on the user interface.

If a single .*preset file is dragged and dropped, the sound is immediately loaded and the standard Save Preset dialog appears; this lets you save the sound to the instrument's preset browser. Note that you don't

have to save the sound to preset browser; if you just want to hear and play the sound, click the Cancel button in the Save Preset dialog - the sound will still be loaded.

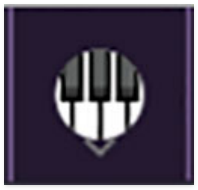
Compressed zip files containing multiple sounds can also be drag and dropped onto the UI. This works the same as with single sounds, but instead of the Save Preset dialog, you'll see the Import Preset Collection dialog. The presets will be added as a new collection and available in the categories for which they were tagged.



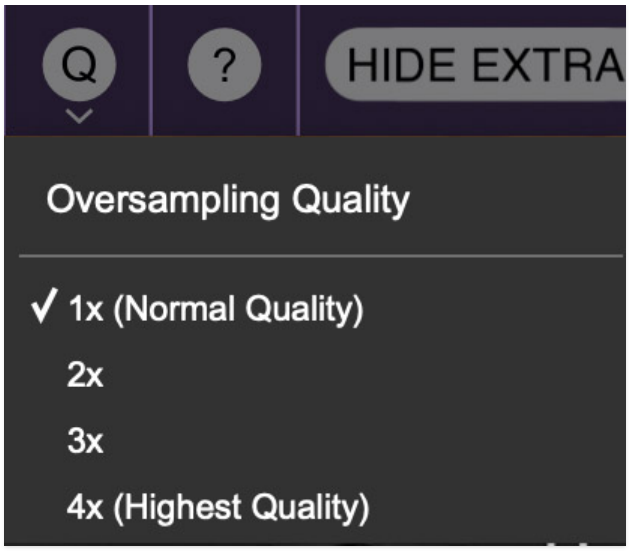
Zoom Magnifying Glass- Click to resize the interface. Selecting *100%* returns the user interface to native size.

MIDI Tab - Opens the MIDI controllers tab for configuring internal and hardware MIDI controls. See the **MIDI Controllers Setup and MIDI Tab** section for full information.

! (MIDI Panic) - Click to send an all-notes-off message in case of, "why won't this thing stop making noise?!?" stuck-note incidents.



QWERTY Musical Typing Keyboard- Opens an onscreen keyboard allowing a standard QWERTY computer keyboard to be used for playing music notes. For more information, see **QWERTY Musical Typing Keyboard (MTK)** section.



Q (Oversampling Quality) - The Q button sets ESQ-1's internal oversampling rate; the higher the setting, the better audio fidelity will be, with the caveat that more computer processing power will be required.

Internal processing can be set to *1x* (same rate as the current sample rate of the host DAW or in the *Settings>Audio/MIDI* window for the standalone version) or to *2x*, *3x*, or *4x* the current sample rate. The sample rate is downsampled at the instrument output stage to match the current host sample rate.

For example, if the current DAW/instrument sample rate setting is 48 kHz, and oversampling is set to 2x, ESQ-1's internal processing runs at 96 kHz, and is then reduced back to 48kHz at the output stage.

If the current DAW/instrument sample rate setting is 192 kHz and oversampling is set to 4x, ESQ-1's internal processing will run at 768 kHz, and you will very briefly hear the most mind-blowing synthesizer sound quality ever experienced by mankind before your computer explodes instantaneously in a fiery, white-hot supernova blaze (or not).



? (Help) - Clicking this launches your web browser and opens this help document. (Confusing circular logic thing there, amirightpeople?)

Hide/Show Extras - This hides the lower "tray" of the user interface that contains the keyboard and its associated controls, and the expanded effects panel. It's handy for people who are working on laptops with overlapping windows and/or very small monitors. However, this will also hide ESQ-1's pitch and modulation wheels panel.

Focus Button

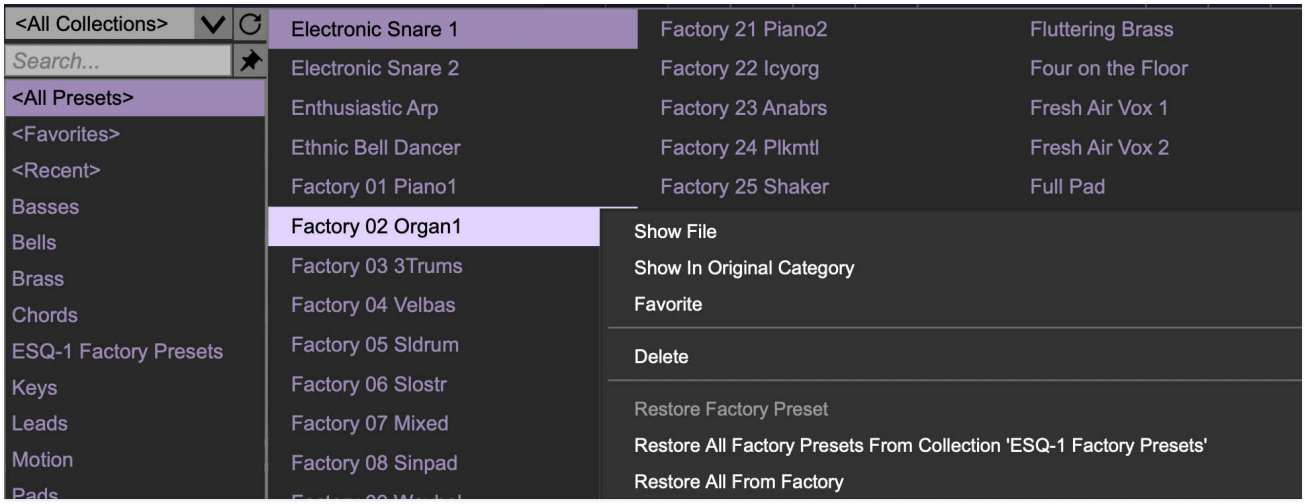


If you're using a laptop, the user interface can potentially be hard to see. With this in mind, the *Focus* button conveniently blows up ESQ-1's view to roughly twice its normal size within the current window size. Unlike the *Zoom* "magnifying glass" function, *Focus* doesn't affect the current window size. By default, the patch panel section fills the current window, but the view can be scrolled vertically and horizontally with a mouse wheel, track pad, or Apple Mighty Mouse finger-scrolling. Or if you're the last person on earth still using a single-button mouse, scroll bars will appear at the window edges when in *Focus* mode.

Using *Focus* mode couldn't be easier - just click the *Focus* button the top menu bar. To return to standard view, click *Reset*.

ESQ-1 logo - Clicking this displays “about” information, and shows the version number and current registered user ID.

Preset List Right-Click Functions



Show File - This displays the selected preset in the Mac or Windows folder containing it. This is useful for backing up or sending a preset file to another user.

Show In Original Category - Selects the preset within its category, i.e. the category will highlight in the left preset menu. The *Show In Original Category* command only displays if the preset was selected within the *<All Presets>*, *<Favorites>*, or *<Recent>* categories.

Favorites - Favorited presets will show in when the *<Favorites>* category is selected. A star will display next to the preset name. Right-click on the preset and reselect *Favorite* to un-favorite it. (Or just ghost it if you don't do the confrontation thing.)

Delete - Deletes the selected preset.

Restore Factory Preset - If one of the factory (i.e. not user) patches is edited and saved, selecting this command restores the patch to its unaltered "factory" setting. This menu will be grayed-out for user bank patches.

Restore All Factory Presets From 'ESQ-1 Presets' - If any patches from the "factory" ESQ-1 bank are edited and saved, selecting this command restores *all* of them to their unaltered "factory" setting.

Restore All From Factory - If any patches from the "factory" banks are edited and saved, selecting this command restores *all* of them to their unaltered "factory" setting. At the time of writing, the ESQ-1 bank mentioned above is the only factory bank, so this function and the *Restore All Factory Presets*

Voice Architecture

How ESQ-1 Makes Sound

The ESQ-1's architecture is a big part of why it remains so interesting. It isn't simply an analog synth with digital oscillators, and it isn't simply a digital synth with an analog-style filter. It's a hybrid instrument where digital waves provide the raw character, DCA stages shape the oscillator mix, the filter focuses the tone, and envelopes and modulation bring the sound to life.

Cherry Audio's version expands that original structure with two independent layers, multiple filter modes, a modern Mod Matrix, Macro controls, Motion tools, MPE support, and per-layer/global effects. The result is still recognizably ESQ-1, but with a much wider modern workflow.

The Basic Signal Path

Each ESQ-1 voice begins with three **Digital Wave Oscillators**: **OSC 1, OSC 2,** and **OSC 3.**

Each oscillator plays one of the original ESQ-1 digital waveforms, then passes through its own DCA before entering the filter:

OSC 1 → DCA 1
OSC 2 → DCA 2
OSC 3 → DCA 3

These three DCA stages control the individual oscillator levels before the signals are combined. From there, the mixed oscillator signal passes through:

Filter → DCA 4 → Effects

That's the core architecture. The oscillators provide the raw digital tone. DCA 1, DCA 2, and DCA 3 determine how much of each oscillator reaches the filter. The filter shapes the combined tone. DCA 4 controls the final voice level. ENV 4 is closely tied to DCA 4 and is typically used as the main volume envelope.

Why the DCA Stages Matter

The ESQ-1's DCA structure is more important than it may first appear. DCA 1, DCA 2, and DCA 3 are not simply volume controls after the sound is finished. They shape the oscillator mix **before** the filter.

That means the harmonic material entering the filter can change over time. One oscillator can provide the body of the sound, another can add a bright attack, and another can fade in as a texture. When those DCA levels are modulated, the sound evolves from the inside, before the filter even begins shaping it.

Tip: Think of DCA 1, DCA 2, and DCA 3 as a programmable oscillator mixer. The filter doesn't have to process a static blend. It can receive a changing mixture of digital waves.

The Filter and Final Amplifier

After the three oscillator signals are combined, they pass through the **Filter**. The filter shapes the brightness, focus, and harmonic balance of the sound. One of the most acclaimed features of the original ESQ-1 was its 4-pole 24 dB/octave resonant low-pass analog filter, which was built using the renowned CEM 3379 chip by Curtis Electromusic.

Cherry Audio's ESQ-1 expands the original concept with four filter modes: **Lowpass 12**, **Lowpass 24**, **Highpass**, and **Bandpass**.

After the filter, the signal reaches **DCA 4**, the final amplifier stage. This is where the complete filtered voice gets its final loudness shape. ENV 4 is closely associated with DCA 4, making it central to whether a sound behaves like a pluck, pad, bass, lead, swell, or sustained texture.

Tip: DCA 1, DCA 2, and DCA 3 control the oscillator ingredients. DCA 4 controls the finished voice.

Modulation Gives the Architecture Behavior

The signal path explains where the sound travels. Modulation explains how it moves.

A modulation source, such as an envelope, LFO, velocity, pressure, Macro, pedal, sequencer source, or MPE gesture, can be routed to a destination such as oscillator pitch, oscillator level, filter cutoff, amplifier level, effects parameters, or other available targets.

This is where the ESQ-1 becomes more than a fixed signal path. The oscillators can change pitch. The DCA levels can shift over time. The filter can open, close, pulse, or respond to velocity. A Macro can control the depth of a modulation routing. MPE gestures can add per-note expression when used with a compatible controller.

Tip: The architecture gives ESQ-1 its sound path. Modulation gives it behavior.

Two Complete Layers

Cherry Audio's ESQ-1 makes this architecture even more powerful by giving each preset two fully independent layers: **Layer 1** and **Layer 2**. Each layer has its own ESQ-1-style synth engine, including oscillators, DCAs, filter, envelopes, modulation, voice behavior, Motion settings, and effects. The layers can be used as one focused sound, stacked together in **Layer** mode, or split across the keyboard using **Split 1** or **Split 2**.

This means a preset can behave like one instrument, two layered instruments, or a split performance setup. One layer might provide a warm pad while the other adds a bright digital attack. One layer might hold a sustained texture while the other runs a sequence. One layer might use a lowpass filter for body while the other uses highpass or bandpass for air, edge, or vocal-like color.

Tip: When a patch sounds complex, solo each layer. You'll often discover that one layer provides the body while the other adds motion, attack, width, or atmosphere.

Effects Routing

After the synth engine, ESQ-1's sound reaches the effects section. Cherry Audio's ESQ-1 includes separate effects chains for **Layer 1** and **Layer 2**, plus a **Global** effects chain that processes both layers together. The routing is:

Layer 1 synth engine → Layer 1 effects → Global effects
Layer 2 synth engine → Layer 2 effects → Global effects

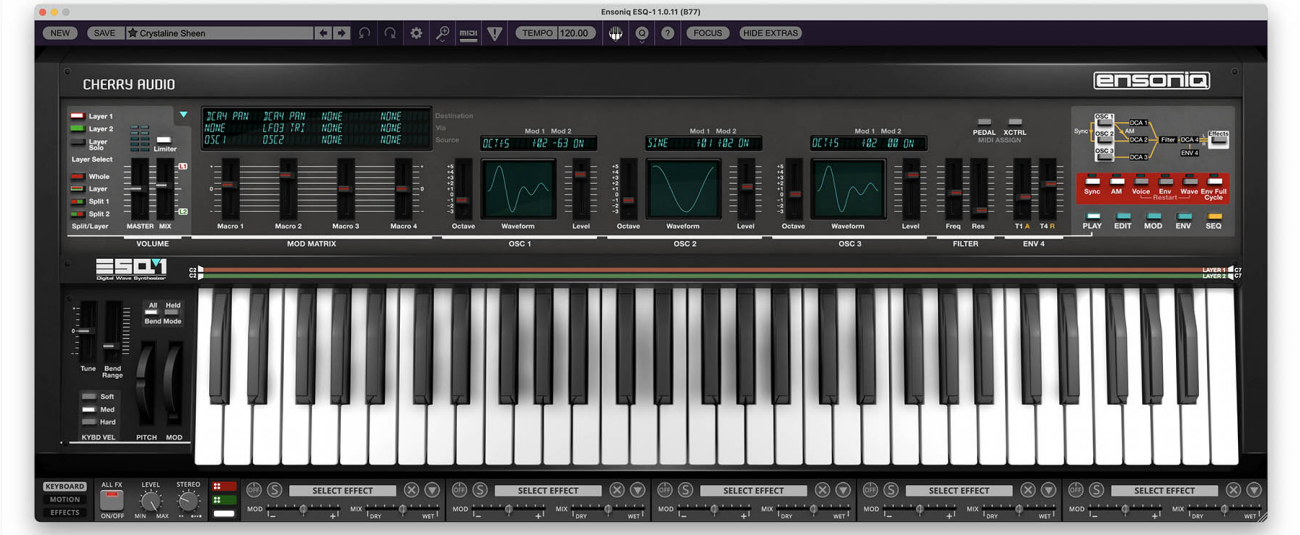
This lets each layer have its own processing while still sharing final effects for glue, space, and polish. For example, Layer 1 might use chorus and delay for a wide digital pad, while Layer 2 uses distortion or compression for a more focused attack. Both layers can then pass through the same Global reverb to place them in a shared space.

The Big Picture

Once you understand the ESQ-1 architecture, the instrument becomes much easier to program:

- Choose the raw digital waveforms with **OSC 1**, **OSC 2**, and **OSC 3**.
- Set their pre-filter levels with **DCA 1**, **DCA 2**, and **DCA 3**.
- Shape the combined tone with the **Filter**.
- Use **DCA 4** and **ENV 4** to define the final volume shape.
- Use envelopes, LFOs, Macros, Motion, and MPE to add movement and expression.
- Use layers and effects to build larger, more polished sounds.

The ESQ-1 isn't complicated for the sake of being complicated. It simply gives you several meaningful places to shape the sound: at the waveform, oscillator level, filter, amplifier, modulation, layer, and effects stages. Follow the signal path, and the instrument starts to make sense very quickly.



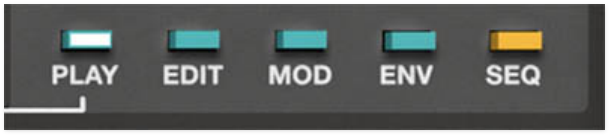
Keyboard View and Main Panel Modes

The Main Programming View

The **Keyboard** view is the main working area of Ensoniq ESQ-1. This is where you'll spend most of your time playing sounds, selecting layers, editing core synthesis parameters, adjusting macros, checking modulation assignments, and getting a clear sense of how a preset is built.



At first glance, the Keyboard view looks like a front panel, but it's more than a single static control surface. The center of the panel changes depending on which mode is selected: **Play**, **Edit**, **Mod**, **Env**, or **Seq**. These five mode buttons appear on the upper-right side of the panel and let you move between different groups of controls without leaving the Keyboard view.



This is Cherry Audio's modern version of one of the original ESQ-1's defining ideas. The hardware ESQ-1 was built around page-driven programming, with different buttons calling up different parameter pages on its display. Cherry Audio keeps that same "organized by function" approach, but presents it in a more visual, immediate way. Instead of peering into a small display and pushing soft buttons, you get large, clearly labeled controls that make the instrument much easier to explore.

A Quick Tour of the Keyboard View

The Keyboard view brings several important areas together when the Panel Mode is set to **Play**:

The **Volume** section lets you select Layer 1 or Layer 2, choose Whole, Layer, Split 1, or Split 2 mode, solo the selected layer, adjust the Master level, balance the two layers with the Mix slider, and enable the Limiter when needed.

The **Macro** sliders control the modulation amount for modulation slots 1–4. They provide quick, hands-on control over the depth of the modulation routings shown in the Mod Matrix. When Macro Motion is enabled in the Sequencer, these modulation amounts can also be sequenced step by step, creating rhythmic or evolving changes in the sound.

The **Mod Matrix** display is where you create and edit the four main modulation routings. Click the appropriate field to choose the **Source**, **Destination**, and **Via** settings for each slot. Modulation is essential when you want to make a preset move, shift, or responds expressively to velocity, pressure, macros, sequencer modulation, or MPE control.

The **Oscillator**, **Filter**, and **ENV 4** areas provide direct access to the most immediate sound-shaping controls, especially in Play mode.

The **signal-flow display** on the upper-right side of the panel shows the basic architecture of the instrument: the three oscillators feed their individual DCA stages, then pass through the filter, DCA 4, and effects. In Edit mode, this display also works as a selector for choosing the oscillator/DCA section you want to edit.

The on-screen keyboard lets you play notes, view split and layer ranges, and audition sounds without an external controller.

Together, these areas make the Keyboard view a practical home base. You can play, edit, inspect, perform, and troubleshoot a sound from one place.

The Five Main Panel Modes

The **Play**, **Edit**, **Mod**, **Env**, and **Seq** buttons change the main control area of the Keyboard view. Each mode focuses on a different part of the instrument.

You don’t need to learn all five at once. A good starting workflow is to use **Play** mode for quick editing and performance, **Edit** mode for deeper sound shaping, **Mod** mode when you want movement, **Env** mode when you want to sculpt how a sound evolves over time, and **Seq** mode when you want patterns, arpeggiation, or rhythmic motion.

Think of them as five different workbenches. It's the same synth, but with different tools laid out in front of you.

Play Mode

Play mode is the main performance and quick-edit view. It gives you fast access to the controls you’re most likely to reach for while browsing presets, playing parts, or making broad sound adjustments.

In Play mode, you’ll find the layer controls, macro sliders, modulation display, oscillator waveform controls, filter controls, ENV 4 quick controls, and the signal-flow display. This makes Play mode the best place to begin with any preset.



Use Play mode when you want to:

- Browse and audition sounds.
- Check whether a preset uses one layer, two layers, or a split keyboard layout.
- Adjust the broad character of a sound.
- Change oscillator waveforms or levels quickly.
- Brighten or darken the sound with the filter.
- Shape the overall amplitude behavior with ENV 4 quick controls.
- Use macros for expressive changes.

The beauty of Play mode is that it gives you enough control to make meaningful changes without forcing you to examine every internal parameter in the synth.

Edit Mode

Edit mode gives you deeper access to the core synthesis engine. This is where the ESQ-1's architecture becomes more visible: oscillators, DCA stages, filter behavior, amplifier controls, glide, voice-related settings, and other detailed sound-shaping parameters.



This mode is especially useful when you want to understand how a sound is built.

The ESQ-1 voice structure is unusual enough that Edit mode deserves a little attention. Each of the three oscillators has its own DCA before the filter:

OSC 1 feeds **DCA 1**.

OSC 2 feeds **DCA 2**.

OSC 3 feeds **DCA 3**.

These DCA stages control how much of each oscillator enters the filter. They're not the final volume control for the whole sound. They're more like individual level gates for each oscillator before the combined signal reaches the filter.

After the filter, the signal passes through **DCA 4**, the final amplifier stage. **ENV 4** is closely associated with DCA 4 and is typically used as the main volume envelope for the sound.

This distinction matters. If you're adjusting DCA 1, DCA 2, or DCA 3, you're shaping the balance and behavior of the individual oscillators before the filter. If you're adjusting DCA 4 or ENV 4, you're shaping the final output level of the complete filtered voice.

Use Edit mode when you want to:

- Fine-tune oscillator behavior.
- Balance the oscillators before the filter.
- Work with DCA 1, DCA 2, and DCA 3.
- Adjust the filter in more detail.
- Shape the final amplifier behavior with DCA 4 and ENV 4.
- Work with glide or other deeper voice controls.

Mod Mode

Mod mode is where you work with ESQ-1's LFOs and modulation behavior. The original ESQ-1 was known for having a flexible modulation system, and Cherry Audio's version continues that idea with a modern visual layout.



In Mod mode, you'll find **LFO 1**, **LFO 2**, and **LFO 3**. Each LFO can generate repeating movement that can be routed to destinations such as oscillator pitch, oscillator level, filter cutoff, amplifier level, panning, effects parameters, and other modulation targets, depending on the available routing.

The ESQ-1 LFOs are more flexible than simple rate and depth LFOs. Each LFO includes controls such as **L1**, **Delay**, and **L2**, which shape how the LFO's intensity changes over time after a note is played.

L1 sets the starting LFO level.

Delay controls how the LFO level moves from L1 toward L2.

L2 sets the final LFO level after that transition.

This means an LFO can fade in, fade out, stay constant, begin strongly and settle down, or grow more intense as a note is held. It's excellent for delayed vibrato, evolving filter motion, animated pads, tremolo effects, and pitch movement that behaves more musically than a simple on/off pitch variation.

Mod mode also includes the **Human** option for the LFOs. On the original ESQ-1, Human introduced variation into the LFO frequency, making the modulation feel less rigid and mechanical. In musical terms, it helps movement feel a little more alive, especially on vibrato, filter motion, and slow evolving textures.

Use Mod mode when you want to:

- Create vibrato, tremolo, or filter movement.
- Add slow animation to pads and textures.
- Make pitch or filter modulation fade in after a note begins.
- Use LFO movement that feels less perfectly mechanical.
- Build more expressive, evolving sounds.

Env Mode

Env mode displays the detailed envelope controls. Envelopes shape how a sound changes over time, and the ESQ-1 gives you multiple envelopes to work with.



On a basic synthesizer, an envelope might simply control volume. On ESQ-1, envelopes can be used much more creatively. They can shape oscillator pitch, oscillator levels, filter cutoff, amplitude, and other destinations through the modulation system.

In Env mode, you'll find detailed controls for **ENV 1**, **ENV 2**, and **ENV 3**, along with graphical displays that show each envelope's shape. **ENV 4** is closely tied to the final amplifier stage, DCA 4, and is also accessible through the Play and Edit mode controls for quick shaping of the sound's overall volume behavior.

Use Env mode when you want to:

- Shape how a sound attacks, decays, sustains, or releases.
- Create plucked, swelling, fading, or evolving sounds.
- Use envelopes for pitch movement.
- Animate filter cutoff over time.
- Create percussive attacks, slow pads, brass-like swells, or strange transitional effects.
- Fine-tune ENV 1, ENV 2, and ENV 3 in detail.

The envelopes are one of the reasons ESQ-1 can sound so animated. A static waveform becomes much more interesting when it changes over time, and ESQ-1 gives you several ways to make that happen.

Seq Mode

Seq mode brings arpeggiator and sequencer controls into the Keyboard view. This mode is related to the larger Motion view, but it gives you quick access to sequence and arpeggiator functions while you're still working from the main Keyboard page.



The original ESQ-1 was notable for combining a deep synth engine with a powerful onboard sequencer. Cherry Audio's version continues the idea of the ESQ-1 as an instrument for motion, rhythm, and pattern-based creativity, while using a modern interface designed for software production.

In Seq mode, you'll find controls for arpeggiator behavior, sequencing, patterns, macro motion, step programming, timing, sync, and transport-style functions. These controls let ESQ-1 generate repeating note patterns, rhythmic movement, evolving sequences, and performance gestures that can bring a sound to life.

Use Seq mode when you want to:

- Create arpeggiated patterns.
- Build rhythmic sequences.
- Add motion to macros or other musical parameters.
- Work with step-based programming.
- Sync movement to tempo.
- Turn a static patch into something that plays back with rhythmic personality.

Macros and the Mod Matrix Display

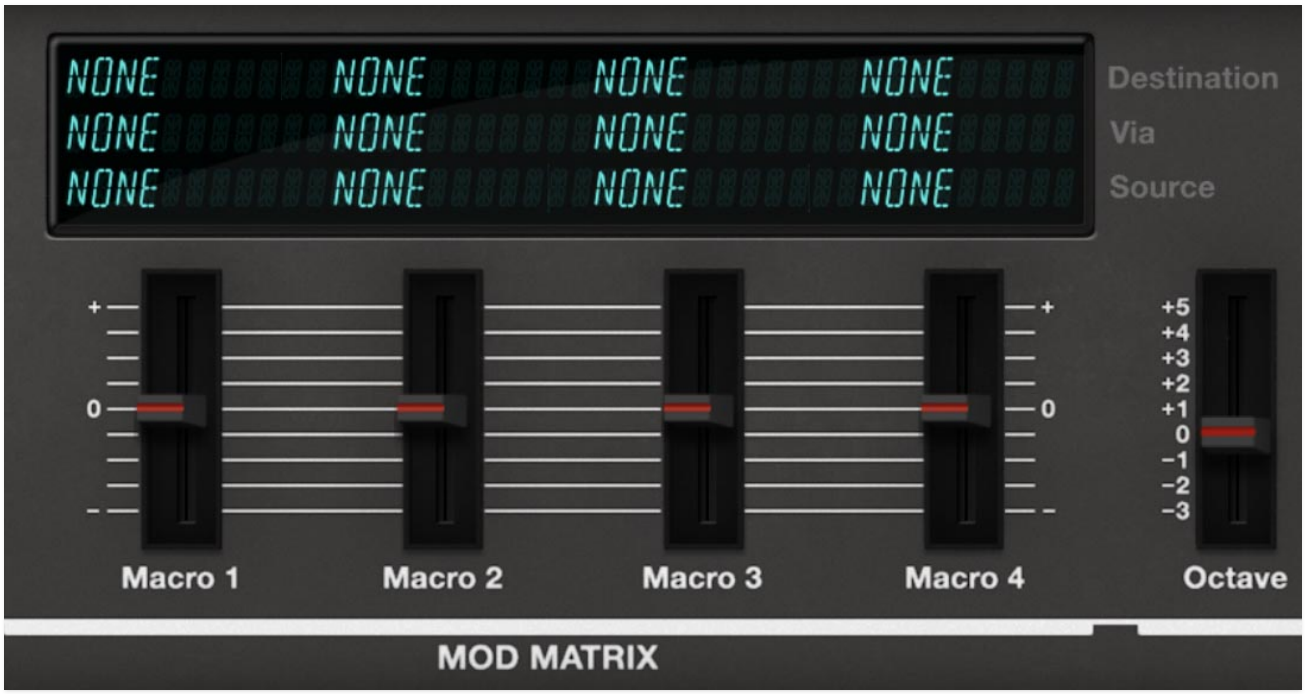
The Keyboard view includes four **Macro** sliders and a **Mod Matrix** display. The Macro sliders control the modulation amount for modulation slots **1–4**, giving you quick, hands-on control over how strongly each modulation routing affects the sound.

For example, if modulation slot 1 routes **LFO 1** to oscillator pitch, **Macro 1** controls the amount of that modulation. If modulation slot 2 routes an envelope to filter cutoff, **Macro 2** controls how much of that envelope movement is applied. This makes the Macro sliders useful for broad musical changes, such as adding vibrato, increasing filter movement, bringing in more animation, or shaping expressive response without rebuilding the routing itself.

The **Mod Matrix** display is where you create and edit these modulation routings. Each of the four slots includes fields for **Source**, **Destination**, and **Via**. Click a field in the display to choose the desired modulation source, destination, or control path from the menu. Sources may include LFOs, envelopes, keyboard controls, pedal, pressure, MPE sources, sequencer sources, effects sources, and more, depending on the routing.

The **Via** field lets one control influence or scale another modulation assignment. For example, you might route an LFO to oscillator pitch, then use the mod wheel as the Via control so the wheel determines how much vibrato is applied.

The Macro sliders and Mod Matrix become even more powerful when used with **Macro Motion** in the Sequencer, where the modulation amount for a selected Macro can be sequenced step by step. We'll cover that in more detail later. For now, think of the Mod Matrix as the place where you define the modulation routings, and the Macro sliders as the hands-on controls for adjusting how much of those routings are applied.



The Signal-Flow Display

The signal-flow display in the upper-right area of the Keyboard view is one of the best ways to understand ESQ-1's architecture, but it isn't simply a diagram. In **Edit** mode, it also functions as a selector for choosing which oscillator/DCA section you want to edit.

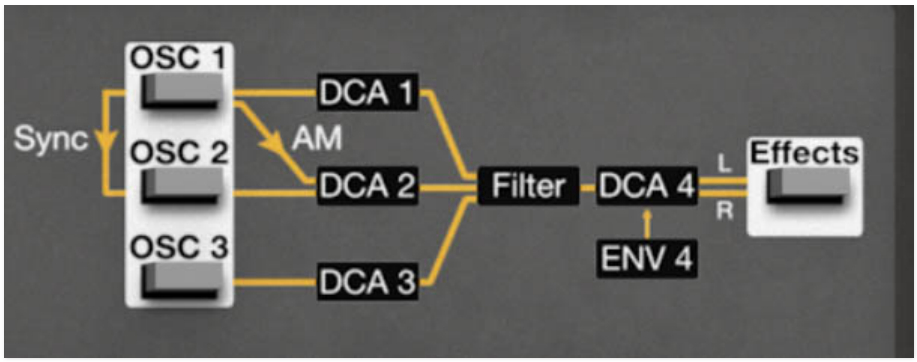
At the beginning of the chain are **OSC 1**, **OSC 2**, and **OSC 3**. Each oscillator passes through its own DCA: **DCA 1**, **DCA 2**, and **DCA 3**. These signals are then combined and sent through the **Filter**, followed by **DCA 4**, and then into the effects.

This diagram shows the basic order of operations that defines the instrument's sound.

- First, the oscillators generate the raw digital wave material.
- Next, DCA 1, DCA 2, and DCA 3 shape the level of each oscillator before filtering.
- Then the filter shapes the combined tone.
- After that, DCA 4 controls the final voice level, usually shaped by ENV 4.
- Finally, the effects add space, movement, and color. Clicking the Effects button here toggles the view to the Effects section.

In **Edit** mode, click the desired oscillator/DCA block in the signal-flow display to bring up its related controls. For example, clicking the **OSC 1 / DCA 1** area displays the editing controls for OSC 1 and DCA 1, including oscillator settings and DCA level/modulation controls. This makes the signal-flow display both a visual map and a practical navigation tool.

Once you understand this flow, the panel makes much more sense. **DCA 1**, **DCA 2**, and **DCA 3** shape the individual oscillator levels before the filter, while **DCA 4** controls the final level of the complete filtered voice. The filter in Play mode and Edit mode is the same filter, just presented with different levels of access. ENV 4 isn't just another envelope floating around with no job. It's tied to the final amplifier stage, which makes it central to how the sound begins, sustains, and ends.



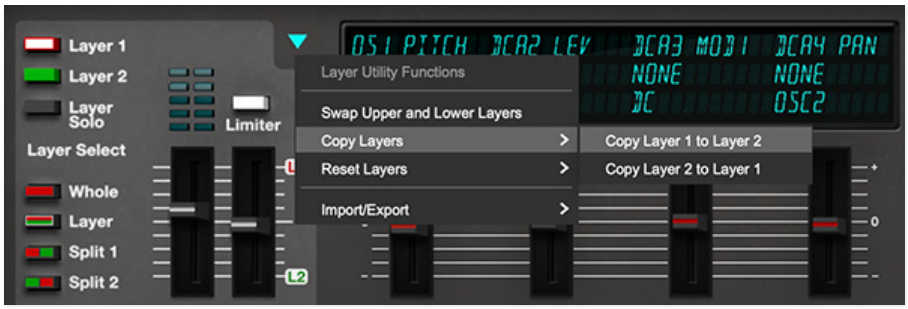
Using the Keyboard View Musically

The Keyboard view is designed to let you move between broad performance control and deeper programming.

A useful workflow is:

- Start in **Play** mode.
- Choose the layer you want to edit.
- Use **Layer Solo** if you need to isolate it.
- Adjust the oscillator, filter, ENV 4, Macro, and Mix controls.
- Switch to **Edit** mode for deeper voice and DCA shaping.
- Use **Env** mode to refine envelope behavior.
- Use **Mod** mode to add movement.
- Use **Seq** mode to add rhythmic or patterned motion.
- Open the **Effects** view when the raw patch is working and you're ready to add polish, depth, width, or damage.

You don't have to edit in that exact order, but it's a good way to avoid getting lost. Build the sound first, animate it second, dress it up last. Unless you're making experimental noise, in which case dressing it up first and dissecting it later is also valid.

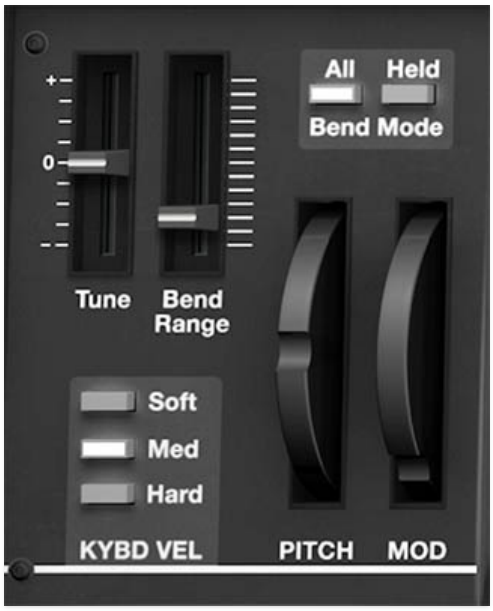


Tip: A number of views display turquoise triangles. Click on these for context-sensitive pop-up utility menus that offer functions like copy and swap, as explained later in this user guide.

Performance Controls

The performance controls in the left “wheel box” are where ESQ-1 handles several important real-time playing behaviors: master tuning, pitch bend range, pitch-bend response, keyboard velocity response, and modulation-wheel performance.

These controls may look simple, but they have a big effect on how the instrument feels under your hands. Use them to match ESQ-1 to your controller, your playing style, and the musical role of the patch.



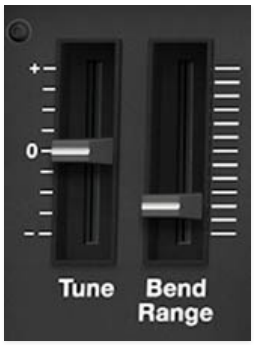
Tune

Tune adjusts the overall tuning of the instrument up or down by one semitone. This is useful when you need to fine-tune ESQ-1 against other instruments, match a track that isn’t perfectly tuned, or create intentional pitch offsets for special effects or layered setups.

Control:

• **Tune** – Adjusts master tuning up or down, with a range of approximately **-1 semitone to +1 semitone**.

Tip: For normal use, leave Tune centered. If a preset suddenly sounds slightly sharp or flat compared to the rest of your session, check Tune before diving into oscillator settings.



Bend Range

Bend Range sets how far the pitch wheel bends notes up or down. At lower settings, the pitch wheel creates smaller, more subtle pitch changes. At higher settings, it can bend notes by as much as one octave up or down.

Control:

• **Bend Range** – Sets the pitch wheel range, from subtle bends up to ±1 octave.

Tip: For expressive leads, try a bend range of a whole step or a few semitones. For dramatic synth effects, octave jumps, or sound-design mayhem, increase the range.

Bend Mode

Bend Mode determines which notes are affected by the pitch wheel.

This is especially important when using long releases, sustained notes, layered patches, or performance gestures where some notes are still sounding after you've released the keys.

Options:

• **All** – Pitch bend affects **all notes currently sounding**, including notes that are still fading out because of long release times or sustain behavior.

• **Held** – Pitch bend affects only the notes that are currently being held on the keyboard or MIDI controller. Notes that are still sounding but no longer held are not bent.

Tip: Use **All** for traditional pitch-bend behavior, where the whole sounding patch bends together. Use **Held** when you want to bend only the notes under your fingers while released notes continue fading naturally. This can be especially useful for long-release pads, layered sounds, and more expressive solo playing.

Pitch Wheel

The **Pitch** wheel bends notes up or down according to the current **Bend Range** and **Bend Mode** settings. Move the wheel upward to bend pitch up. Move it downward to bend pitch down. The amount of bend depends on how far you move the wheel and how wide the Bend Range is set.

Related controls:

• **Bend Range** – Determines how far the wheel bends pitch.
• **Bend Mode** – Determines whether the bend affects all sounding notes or only held notes.

Tip: For leads and basses, a smaller bend range usually feels more controllable. For effects, transitions, and dramatic gestures, wider bend ranges can be much more fun.



Mod Wheel

The **Mod** wheel provides real-time modulation control. What it does depends on how the current patch is programmed. In many presets, the Mod wheel may add vibrato, open the filter, increase LFO depth, bring in effects, or intensify some other modulation assignment. Because ESQ-1 has a flexible Mod Matrix, the Mod wheel can be used as a performance source for many different destinations.

Control:

• **Mod Wheel** – Sends modulation-wheel performance data to any patch routings that use the wheel as a modulation source.

Tip: If moving the Mod wheel doesn't seem to do anything, check the patch's modulation assignments. The wheel needs to be routed to a destination, such as LFO depth, filter cutoff, oscillator pitch, oscillator level, or an effects parameter.

Keyboard Velocity

Keyboard Velocity controls how ESQ-1 responds to how hard or softly you play. This lets you adjust the feel of the instrument to match your MIDI controller and playing style. A patch that feels too jumpy, too flat, or too hard to control may simply need a different velocity response setting.



Options:

• **Soft** – Makes ESQ-1 respond more easily to lighter playing. Use this if your controller feels stiff, or if you want softer playing to produce more expressive response.

• **Med** – Provides a balanced velocity response. This is a good general-purpose setting for most playing styles and controllers.

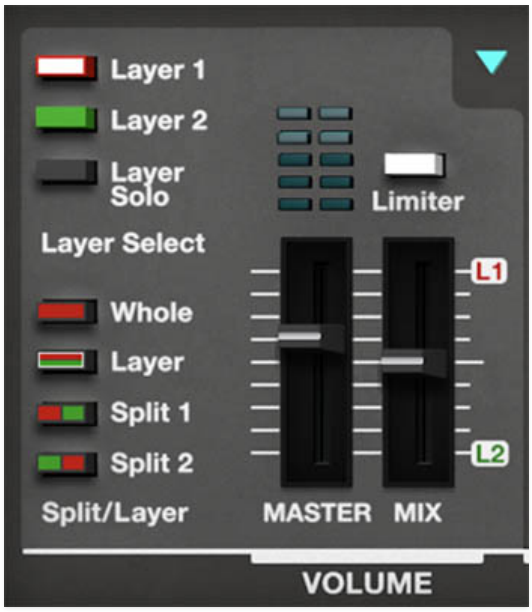
• **Hard** – Requires stronger playing to produce higher velocity response. Use this if the patch feels too sensitive, too bright, or too dynamic with normal playing.

Tip: If a patch feels lifeless, try **Soft** or **Med** before changing the sound itself. If a patch gets too bright or aggressive when you play normally, try **Hard**. Velocity response is often the difference between "this preset is fine" and "this preset actually feels good."

Splits, Layers, and Voice Modes

Cherry Audio's Ensoniq ESQ-1 gives you two fully independent synth layers: **Layer 1** and **Layer 2**. Each layer has its own complete synth engine, including oscillators, DCAs, filter, envelopes, modulation, macros, Motion settings, voice behavior, and effects.

This is one of Cherry Audio's biggest expansions of the ESQ-1 concept. A preset can be a single focused sound, two sounds stacked together, or two different sounds split across the keyboard. Each layer can also have up to **32 voices**, giving ESQ-1 generous room for long releases, dense chords, layered pads, sequenced patterns, and expressive performance setups.



Layer 1 and Layer 2

The interface uses color to make the layer structure easy to follow. **Layer 1** is shown in red, and **Layer 2** is shown in green. This color coding appears throughout the instrument, including the layer controls, keyboard range display, and effects section.

When you select a layer, you're choosing which layer is currently being edited. In a layered or split preset, you may hear both layers at the same time, but the front-panel controls affect the selected layer.

Controls:

• **Layer 1** – Selects Layer 1 for editing. Layer 1 is color-coded red.

• **Layer 2** – Selects Layer 2 for editing. Layer 2 is color-coded green.

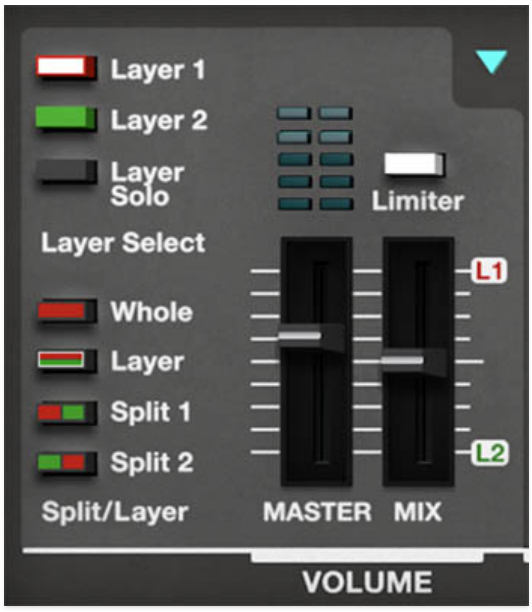
• **Layer Solo** – Solos the currently selected layer, making it easier to hear and edit one layer at a time.

Tip: If you move a filter slider, change an oscillator wave, or adjust an envelope and don't hear the expected change, check which layer is selected. You may simply be editing the other layer.

The Volume Section

The **Volume** section controls how the layers are used and balanced. It lets you select the active layer, choose Whole, Layer, Split 1, or Split 2 mode, solo the selected layer, adjust the master output level, and balance Layer 1 against Layer 2.

This section answers one of the most important performance questions in the instrument: "Am I playing one sound, two stacked sounds, or two sounds split across the keyboard?"



Controls:

• **Whole** – Plays the selected layer across the full keyboard.

• **Layer** – Stacks Layer 1 and Layer 2 across the full keyboard.

• **Split 1** – Places Layer 1 on the lower keyboard range and Layer 2 on the upper range.

• **Split 2** – Places Layer 2 on the lower keyboard range and Layer 1 on the upper range.

• **Master** – Controls the overall output level of the instrument.

• **Mix** – Balances Layer 1 and Layer 2. Move toward **L1** to emphasize Layer 1, or toward **L2** to emphasize Layer 2.

• **Limiter** – Helps control peaks and keeps louder layered sounds from becoming too unruly at the output.

Tip: In a layered patch, the Mix slider is one of the fastest ways to reshape the sound without editing either layer. If Layer 1 provides a warm pad and Layer 2 adds a bright digital shimmer, Mix decides whether the patch feels soft and rounded or more open and sparkling.

Whole Mode

Whole mode plays the selected layer across the full keyboard. This is the simplest way to use ESQ-1 when you want to focus on one sound.

Whole mode is especially useful when building a patch from scratch, exploring oscillator waves, adjusting the filter, shaping envelopes, or troubleshooting modulation. It keeps the signal path clear and lets you hear exactly what the selected layer is doing.

Tip: Start in Whole mode when designing a new sound. Once one layer feels good on its own, switch to Layer or Split mode and build around it.

Layer Mode

Layer mode stacks Layer 1 and Layer 2 across the full keyboard. When you play a note, both layers sound together.

This is where ESQ-1 can become especially lush, wide, and animated. One layer might provide the attack while the other supplies the sustain. One might be bright and digital while the other is darker and filtered. One might use slow modulation while the other remains steady.

Layer mode is excellent for pads, keys, leads, soundscapes, hybrid brass, animated textures, and large performance sounds.

Tip: A good layered patch usually gives each layer a clear job. Try using Layer 1 for body and Layer 2 for attack, shimmer, motion, width, or edge. If both layers are trying to be the whole sound, they may fight each other.

Split 1 and Split 2

Split 1 divides the keyboard so **Layer 1** plays on the lower range and **Layer 2** plays on the upper range.

Split 2 reverses that arrangement: **Layer 2** plays on the lower range, and **Layer 1** plays on the upper range.

Splits are useful for performance setups such as bass on the left hand and lead on the right, pad below and keys above, or a sequenced lower part with a manually played upper sound.

Tip: Use **Split 1** if Layer 1 is your lower sound and Layer 2 is your upper sound. Use **Split 2** if those roles are reversed. It’s much faster than rebuilding the patch.

Keyboard Range Controls

In Layer and Split modes, the keyboard range controls above the on-screen keyboard show where each layer is assigned. Drag the range handles to define each layer’s playable area.

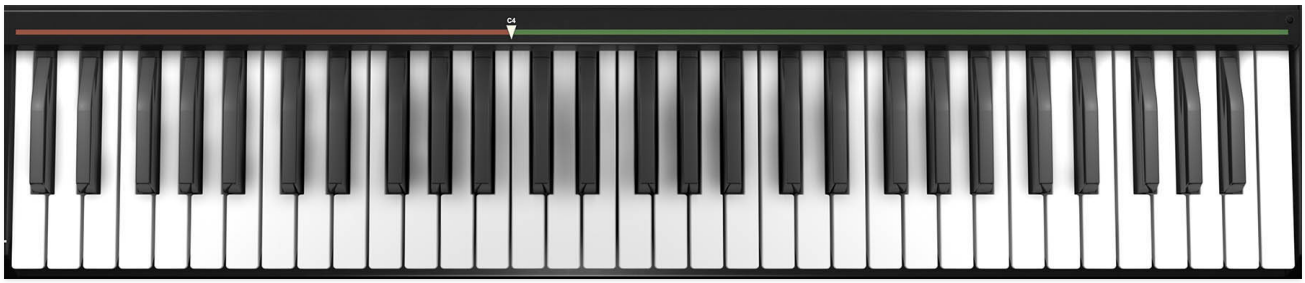
In Layer mode, the two layers can cover the full keyboard or overlap in specific ranges. In Split modes, the range display shows the lower and upper zones, making it easy to adjust the split point.

Tip: Choose the split point based on the part you intend to play. A left-hand bass may need more lower range than a simple drone, while a right-hand lead may need enough room for bends, expressive playing, and the occasional dramatic flourish.









Layer Solo

Layer Solo lets you hear only the currently selected layer. This is one of the most useful controls when working with layered or split sounds.

A preset may sound like one unified patch, but underneath, the two layers may be doing very different things. Soloing each layer lets you hear what each one contributes.

Use Layer Solo when balancing oscillator levels, adjusting envelopes, editing modulation, setting effects, or diagnosing a patch that sounds muddy, too bright, too slow, or too busy.

Tip: After editing a layer in solo, turn Layer Solo off and listen again in context. The goal is not for each layer to sound perfect by itself. The goal is for the two layers to work together.

Copying and Managing Layers

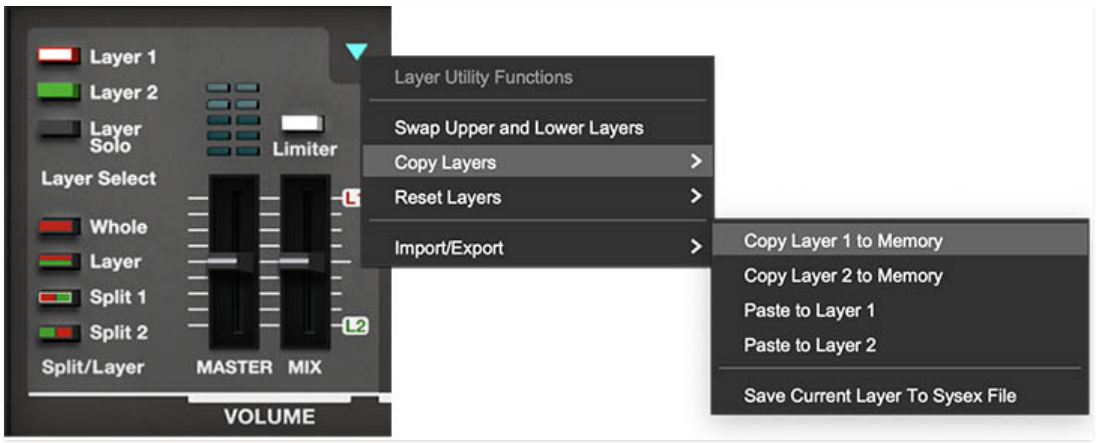
The turquoise triangle in the Volume section opens layer Utility options. These let you copy, paste, reset, swap, import, or export layer data.

This is very useful when building layered sounds. You can copy a layer, paste it to the other layer, then modify the copy to create a wider, brighter, darker, slower, or more animated version of the original.

Common uses:

- Copy Layer 1 to Layer 2, then detune or filter Layer 2 for width.
- Copy a finished sound to the other layer and give it a slower attack.
- Save a layer as a SysEx file for reuse or archiving.
- Create a Dual layer or Split layer preset from two other preset layers.
- Reset one layer without disturbing the other.
- Swap upper and lower layers when reworking a split.

Tip: Try copying a strong single-layer sound to the second layer, then change only the waveform, filter mode, envelope attack, or effects. It’s a quick way to create a richer patch while keeping both layers musically related.



Example: If you want to create a new Dual or Split preset by combining two existing presets from the library, you can use the Import/Export feature. This allows you to copy a layer to memory and then paste it into a new or existing preset. Keep in mind that, depending on your source, you may need to switch from Whole to Split or Dual mode at some point to ensure there is a suitable destination for the layer you have in memory.

Let's say you like a preset called *Ambient EP*, and it's a single Whole layer preset. But you want to split it, and put some strings in the Lower layer to play with your left hand.

Change *Ambient EP* to Split mode, and save it with a new name, like *Ambient Split*. Now you can switch to the Lower layer; it is now an INIT tone. Now you can create your string from scratch, or you can go find

another tone to import. Let's do the latter...

You find a tone you like called *Low Strings*, and it's another Whole preset. Go to Utility / Import/Export and choose Copy to Upper Memory.

Go back to your *Ambient Split* preset. Click Utility, and Import/Export and select Paste to Lower.

Your preset now has a split that is made up of the parameters of *Low Strings* on the Lower split, and *Ambient EP* on the Upper. Re-save *Ambient Split* so as not to lose your work. At this point, you may want to go in and adjust each layer individually for level, panning, change the split point, and so on.

This is the same method by which you would combine presets for a Dual layer patch, but you don't have to deal with the split point. Don't forget: depending on your sources, you may need to switch between layers, or from Whole to Split or Dual mode, to ensure you are copying the correct layer to memory, and making available a destination to paste the layer you have in memory.

Editing Layers

Layer editing is straightforward once you remember the rule: **the selected layer is the layer you're editing**.

If Layer 1 is selected, the panel controls affect Layer 1. If Layer 2 is selected, they affect Layer 2. This applies to oscillator settings, filter, envelopes, modulation assignments, macros, Motion settings, effects, and voice behavior.

Also note that **Layer 2 becomes available for editing when Layer mode is enabled** in the Split/Layer section. If you're in Whole mode, the interface focuses on the selected single-layer setup. Switch to Layer, Split 1, or Split 2 when you want access to both layers as part of a combined preset.

Tip: Program each layer separately first. Use Whole mode or Layer Solo to get one layer working musically, then combine the layers and adjust Mix, effects, and modulation.

Voice Mode Parameters

The **Voice** display, found in **Edit** view, controls how ESQ-1 responds to the notes you play. This includes playing mode, maximum polyphony, detune amount, and glide behavior.

These settings have a major effect on the feel of a patch. The same oscillator, filter, and envelope settings can behave very differently as a polyphonic pad, monophonic bass, detuned unison lead, or MPE performance sound.

To edit a Voice parameter, click the appropriate field in the display. Some fields open a menu, such as **Mode**. Others can be adjusted by clicking and dragging, such as **Voices**, **Detune**, and **Glide Amount**. The **Glide On/Off** field toggles glide behavior.



Mode

Mode selects how ESQ-1 assigns voices when you play.

Options:

• **Poly** – Standard polyphonic mode. Use this for chords, pads, keys, layered textures, and most general-purpose playing.

• **Unison** – Stacks voices together for a thicker, more powerful sound. Use this for leads, basses, aggressive digital brass, and big synth hooks.

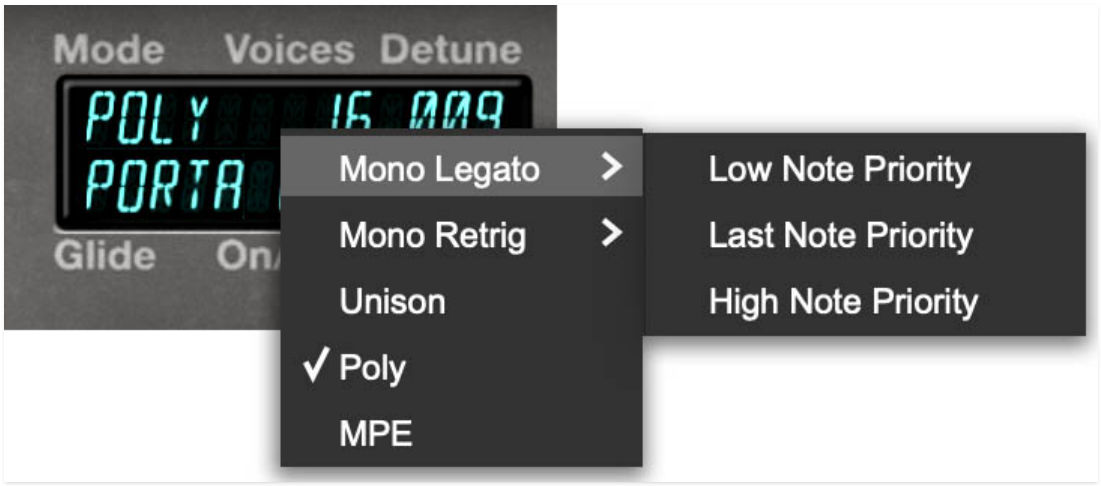
• **Mono Legato** – Plays one note at a time with connected behavior when notes overlap. Useful for smooth leads, basses, and expressive solo patches.

• **Mono Retrig** – Plays one note at a time and retriggers notes more explicitly. Useful for punchy basses, plucks, and leads where each note should have a clear new attack.

• **MPE** – Enables MIDI Polyphonic Expression for compatible controllers.

Both **Mono Legato** and **Mono Retrig** include note-priority choices: **Low Note Priority**, **Last Note Priority**, and **High Note Priority**. Low priority favors the lowest held note, high priority favors the highest held note, and last priority plays the most recently pressed note.

Tip: Use **Mono Legato** for smooth connected lines and **Mono Retrig** when every note needs a fresh attack. For basses, Low Note Priority can feel classic and stable. For modern lead playing, Last Note Priority often feels most natural.



Voices

Voices sets the maximum number of voices available for the selected layer, up to **32 voices**.

This is unusually generous polyphony. A single layer can support large chords, long releases, sequenced parts, and dense textures without quickly running out of voices. In layered patches, each layer has its own voice allocation.

In **Unison** mode, the Voices setting also affects how many voices are stacked together. Higher settings create a bigger, thicker sound, but use more polyphony per note.

Tip: Use higher voice counts for pads, keys, long releases, and layered textures. Use lower or more focused settings for basses, leads, and sounds that need to stay tight.

Detune

Detune spreads stacked voices slightly apart in pitch, creating thickness, width, and motion.

At low settings, Detune adds subtle richness. At higher settings, it creates stronger beating and a wider, more animated sound. Detune is especially useful for unison leads, huge pads, wide digital brass, and bold synth textures.

Use it carefully on bass sounds, where too much pitch spread can weaken the low end. For leads and pads, you can usually push it further.

Tip: Decide where the width should come from: oscillator detuning, voice detuning, layer differences, stereo effects, or modulation. You don't always need all of them at once.

Glide: Portamento and Glissando

The lower row of the Voice display controls glide behavior. Depending on the selected setting, glide can create smooth portamento-style pitch transitions or stepped glissando-style movement between notes.

Controls:

• **Glide On/Off** – Enables or disables glide.

• **Amount** – Controls how strongly or slowly the pitch moves from one note to the next. Lower amounts create faster, subtler transitions. Higher amounts create longer, more obvious slides.

Glide is especially useful in mono modes. In **Mono Legato**, glide can make connected notes slide smoothly into each other, which is excellent for expressive leads, bass lines, and solo parts. In **Mono Retrig**, glide can still provide pitch movement, but with a more clearly articulated retriggered feel.

Tip: For classic synth leads, use Mono Legato with a modest glide amount. For basses, keep glide short unless you want obvious slides. For sci-fi effects or dramatic transitions, increase the amount and let the notes travel.

MPE

MPE, short for **MIDI Polyphonic Expression**, allows compatible controllers to send expressive data for individual notes rather than applying the same pitch bend, pressure, or controller movement to the entire instrument at once.

To use ESQ-1 with an MPE-capable controller, you must select **MPE** from the **Mode** parameter in the Voice display. This is essential. If MPE is not selected here, ESQ-1 will not respond to MPE performance data from your controller, even if the controller is transmitting MPE correctly.

Once MPE mode is enabled, you can use **MPE X**, **MPE Y**, and **MPE Z** as modulation sources in the Mod Matrix. The exact physical behavior depends on your controller, but in general:

• **MPE X** is commonly used for left/right pitch-style movement.
• **MPE Y** is commonly used for forward/backward or vertical touch-position movement.
• **MPE Z** is commonly used for pressure.

Tip: For expressive pads, route **MPE Z** to filter cutoff or oscillator level so individual notes bloom as you press into them. For leads, route **MPE X** to pitch and **MPE Z** to vibrato depth or filter brightness.

Using Effects With Layers

The Effects view supports the two-layer architecture with separate effects chains for **Layer 1** and **Layer 2**, plus a **Global** chain that processes both layers together.

This means each layer can have its own processing before both layers pass through the shared Global effects.

Example:

Layer 1 might use chorus to create a wide pad.
Layer 2 might use compression and delay for a defined key or lead.
The Global chain might add reverb to place both layers in the same space.

Tip: Use layer effects for identity. Use Global effects for shared polish, ambience, and glue.

Practical Layering Ideas

A strong layered patch usually begins with contrast.

Try these approaches:

• Pair a bright digital attack layer with a darker sustained layer.
• Use one layer as the main harmonic bed and the other as shimmer or motion.
• Use one layer for the core key sound and another for transient brightness or octave reinforcement.
• Use one layer as a stable lead center and the other as a slightly detuned support layer.
• Use one layer as a slow pad and the other as a texture that fades in later.

Tip: The best layered sounds often feel like one instrument, not two presets playing at once. Use Mix, envelopes, filter settings, and effects to make the layers cooperate.

Practical Split Ideas

Splits are ideal for performance and composition. A classic setup is bass on the lower keys and lead on the upper keys. Another useful setup is pad below and keys above, with the lower range holding sustained harmony while the upper range plays rhythmic or melodic parts.

You can also create a split where one layer is sequenced or arpeggiated while the other remains manually playable. This can make a single preset feel like a small arrangement.

Tip: In split patches, watch envelope release times. A long-release lower layer can blur fast left-hand changes, while an upper layer with too short a release may feel abrupt if it’s meant to float.

Avoiding Layer Overload

Two independent layers, 32 voices per layer, three oscillators per voice, modulation, Motion tools, and effects give you a lot of power. They also give you many opportunities to overbuild.

If a layered preset sounds too dense, solo each layer and listen separately. Check for overlapping frequency ranges, similar envelopes, excessive release times, too much low end, or too many bright oscillators competing for attention.

Common fixes:

• Reduce one layer with the **Mix** slider.
• Darken one layer’s filter.
• Shorten the release on one layer.
• Reduce low-end content from the upper layer.
• Use different envelope attacks so both layers don’t speak at exactly the same moment.
• Move some depth or space to the Global effects rather than both layer effects.

Tip: Layering works best when each part has a job. If one layer provides body and the other adds color, motion, attack, or space, the patch will usually feel intentional.

Quick Layering Exercise

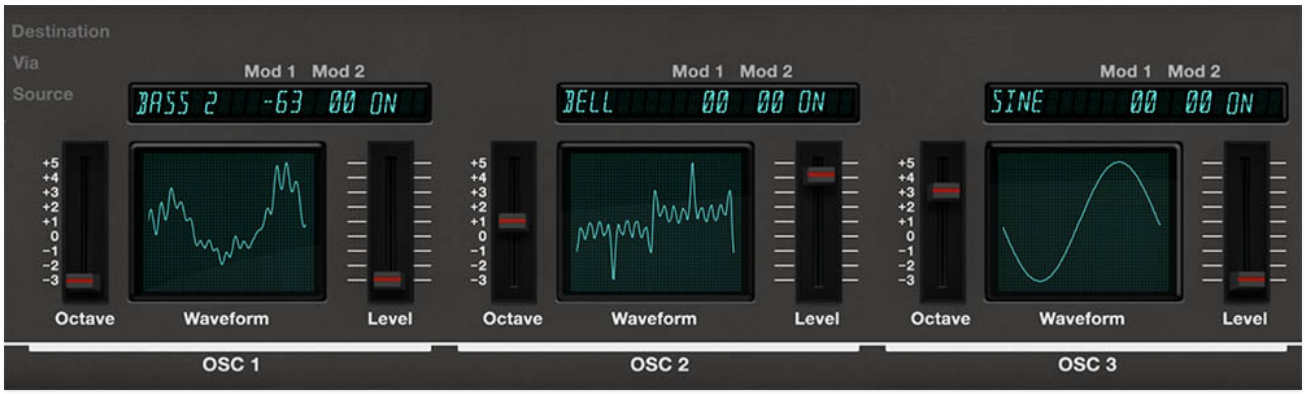
- Start with a single-layer sound in **Whole** mode. Choose a warm waveform blend and shape it with the filter and ENV 4. This will be the body layer.
- Switch to **Layer** mode and select the second layer. Use **Layer Solo** so you can hear it by itself. Create a brighter or more textured sound with a faster attack and a slightly shorter release.
- Turn Layer Solo off and use the **Mix** slider to blend the two layers. The first layer should provide the foundation. The second should add definition, shimmer, or motion.
- Now open the Effects view. Add a subtle effect to only one layer, such as chorus on the body layer or delay on the brighter layer. Then add a small amount of Global reverb to place both layers together.

Quick Split Exercise

- Create or load a bass sound on Layer 1. Keep the envelope tight and the low end focused.
- Create or load a lead, key, or pad sound on Layer 2. Give it enough brightness and release to work in the upper range.

- Select **Split 1** so Layer 1 plays on the lower part of the keyboard and Layer 2 plays on the upper part. Adjust the keyboard range controls until the split point feels natural.
- Play a left-hand bass part and a right-hand melody or chord part. Then adjust the **Mix** slider until the two layers feel balanced.

Tip: If the bass feels too roomy, reduce its release or effects. If the upper layer feels too dry, add delay or reverb to Layer 2 or the Global chain.



Oscillators and Digital Waves

The oscillators are where every ESQ-1 sound begins. They define the raw harmonic character of the patch before the filter, envelopes, modulation, and effects get involved. Those later stages are powerful, but they're always working with whatever the oscillators give them.

On many analog synths, oscillator choices usually mean familiar shapes such as sawtooth, square, pulse, triangle, and maybe noise. ESQ-1 starts from a broader place. Its oscillators play digitally stored waveforms, including classic synth waves, sampled and multisampled waves, additive waves, formant waves, and band-limited waves.

That's the first important ESQ-1 programming idea: don't treat the waveform selector as a minor detail. On this instrument, the waveform is often the personality of the patch.

Where the Sound Begins

The original ESQ-1 was called a **digital wave synthesizer** because its oscillators used digitally stored waveforms rather than traditional analog oscillator circuits. Cherry Audio's Ensoniq ESQ-1 uses the actual original 32 ESQ-1 waveforms, officially licensed for this instrument.

Every ESQ-1 voice begins with three **Digital Wave Oscillators**: **OSC 1**, **OSC 2**, and **OSC 3**.

Each oscillator plays one digital waveform, then passes through its own DCA before entering the filter:

OSC 1 → DCA 1
OSC 2 → DCA 2
OSC 3 → DCA 3

The three DCA outputs are then mixed together and sent into the filter, followed by **DCA 4**, and then effects.

This oscillator/DCA pairing is essential to understanding the ESQ-1. The oscillator chooses the waveform and pitch behavior. The DCA controls how much of that oscillator reaches the filter, and how that level can be modulated over time.

Selecting an Oscillator/DCA Pair

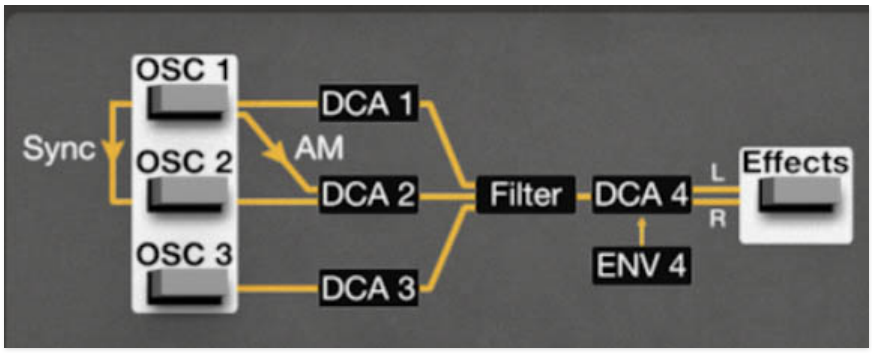
In **Edit** view, use the signal-flow display in the upper-right area of the panel to select the oscillator/DCA pair you want to edit.

Click OSC 1 / DCA 1 to edit OSC 1 and its related DCA 1 controls.

Click OSC 2 / DCA 2 to edit OSC 2 and DCA 2.

Click OSC 3 / DCA 3 to edit OSC 3 and DCA 3.

This means the signal-flow display isn't just a diagram. It's also a navigation tool. Select the oscillator/DCA block you want, then edit its waveform, tuning, level, and modulation controls.



OSC 1, OSC 2, and OSC 3

Each oscillator has its own waveform, pitch settings, and modulation controls. The three oscillators are similar in function, but their real power comes from how you combine them.

A useful approach is to give each oscillator a job. One oscillator might provide the body of the sound. Another might add brightness, weight, detuning, or interval tuning. A third might contribute texture, attack, motion, or unusual color.

For example, a pad might use a warm wave on OSC 1, a brighter detuned wave on OSC 2, and a formant or additive wave on OSC 3 at a lower level. A bass might use one oscillator for low-end weight, another for definition, and a third for a short attack layer.

You don’t have to use all three oscillators all the time. One well-chosen ESQ-1 waveform can be enough. But when you do use multiple oscillators, try to give each one a musical purpose.

Controls:

• **Waveform** – Selects the digital wave played by the oscillator. The waveform is the raw harmonic material of the sound, so this choice has a major effect on the patch’s character.

• **Octave** – Sets the oscillator’s octave range. Use this to place an oscillator in the right register, add low-end weight, create octave stacks, or add upper harmonic sparkle.

• **Semi** – Adjusts oscillator pitch in semitone steps. Use this for musical intervals such as octaves, fifths, fourths, or other harmonic relationships. A fifth above the main oscillator can add strength to leads, drones, and bold layered sounds.

• **Fine** – Provides small pitch adjustments for subtle detuning. Use Fine to thicken a sound, add gentle beating between oscillators, or create wider pads and leads. Small amounts add life. Larger amounts become more obviously unstable.

• **Mod 1 / Mod 2** – Sets modulation sources and amounts for the oscillator. Click the modulation source field to choose a source, then use the Mod slider to set the amount. Oscillator pitch can be modulated by LFOs, envelopes, velocity, keyboard tracking, mod wheel, pedal, external control, pressure, MPE sources, and other available modulation sources.

Tip: Use **Semi** for intentional musical intervals, and **Fine** for subtle animation. If the sound feels too thin, detune one oscillator slightly. If it feels too messy, reduce Fine detuning or lower the level of the supporting oscillator.

Waveform Selection

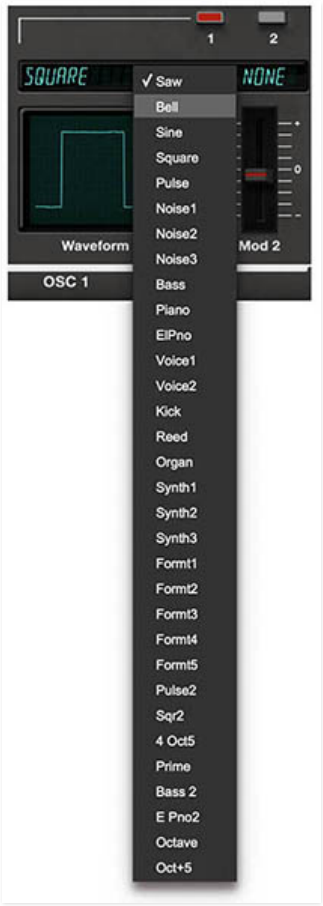
The **Waveform** control selects the digital wave used by the oscillator. Cherry Audio’s ESQ-1 uses the original 32 ESQ-1 waveforms, officially licensed for this instrument.

Unlike a simple analog oscillator section, ESQ-1’s waveform library gives you a wide range of harmonic starting points. Some waves behave like classic synth sources. Others bring in sampled character, vocal color, metallic overtones, organ-like harmonics, noise-based textures, and deliberately constructed synthetic spectra.

When choosing a waveform, listen for its basic personality. Is it bright or dark? Smooth or buzzy? Hollow, nasal, metallic, vocal, noisy, or bell-like? Does it have a clear pitch center? Does it work best as the main sound, or as a subtle layer?

A waveform that sounds too strange by itself may be perfect underneath another oscillator. A bright metallic wave might be too much as the main body of a patch, but excellent as an attack layer. A simple wave may seem plain until it’s detuned, filtered, modulated, or combined with another wave.

Tip: Audition waves in context. The “wrong” waveform at full level may become exactly right at a lower DCA level.



Understanding the ESQ-1 Waveform Library

The original ESQ-1 waveforms fall into several broad families:

- Classic synth waveforms
- Sampled and multisampled waves
- Additive synthesis waves
- Formant waves
- Band-limited waves

Understanding these families makes waveform selection more useful than simply scrolling until something sounds interesting, though that remains a perfectly honorable method of synthesis.

A waveform is the raw material of a sound. Technically, it’s a single cycle of a sound wave stored in digital memory and played repeatedly by the oscillator to create a continuous pitched tone. Some ESQ-1 waves are simple and familiar, while others contain complex harmonic combinations that would be difficult or impossible to create with a basic analog oscillator.

That’s why changing waveforms on ESQ-1 can feel more dramatic than switching from sawtooth to square on a traditional analog synth. You’re not just choosing a different shape. You’re choosing a different

harmonic fingerprint.

Classic Synth Waveforms

The classic synth waves connect ESQ-1 to traditional subtractive synthesis. These include familiar sources such as **SAW**, **SINE**, **SQUARE**, and **PULSE**, along with noise-based waves and a bell wave.

SAW is bright and harmonically rich, making it a strong starting point for brass, strings, basses, and classic analog-style sounds.

SINE contains only the fundamental, giving it a pure tone that works well for flutes, organs, soft layers, and low-end reinforcement.

SQUARE has a hollow quality because it contains odd-numbered harmonics, making it useful for classic synth leads, basses, clarinet-like tones, and reedy colors.

PULSE is very bright and can add strong harmonic energy.

The noise waves are stored digital waveforms rather than continuously random analog noise. This means they repeat as pitched waves and can sound very metallic and clangorous depending on where you play them on the keyboard or transpose their pitch with the Oscillator's **Octave** control. **NOISE 1, NOISE 2,** and **NOISE 3** each have their own unique character and can be useful for metallic, clangorous, unpredictable components, including attack transients and mallet-like pings.

Tip: Use classic synth waves when you want ESQ-1 to behave more like a subtractive synth, then bring in the more unusual waves when you want the digital character to step forward.

Sampled and Multisampled Waves

Some ESQ-1 waves are based on real musical sources, including **BASS**, **PIANO**, **EL PNO**, **VOICE 1**, **VOICE 2**, **KICK**, **REED**, and **ORGAN**.

These are not full-length samples in the modern sampler sense. They are single-cycle or multisampled waveform sources that capture part of the character of the original sound. The oscillator then plays them as pitched waveforms.

That distinction matters. The **PIANO** wave is not a modern sampled grand piano, and **VOICE** is not a replacement choir. These waves are more like concentrated timbral DNA. They give you recognizable acoustic character while still behaving like synth oscillator sources.

Don’t take the names too literally. **BASS** can become a clav-like tone. **VOICE** can become a pad, reed, or ghostly texture. **ORGAN** can work for bells or hollow layered sounds. The name is a hint, not a rule.

Some of these waves are multisampled, meaning different source waves are used across different keyboard ranges to preserve more natural tonal behavior. From the user’s point of view, they behave like regular waves, but internally they’re designed to play more musically across the keyboard.

Tip: Use sampled waves when you want a patch to suggest a real-world instrument without giving up synth-style control over filtering, envelopes, modulation, and effects.

Additive Synthesis Waves

The additive waves, including **SYNTH 1**, **SYNTH 2**, and **SYNTH 3**, were created by combining selected harmonics in specific amounts.

These waves are useful when you want tones that feel clearly synthetic but not generic. They can work well for animated pads, digital brass, hollow leads, layered keyboard sounds, and sounds that need a strong harmonic identity before the filter gets involved.

Because additive waves contain carefully chosen harmonic patterns, they often respond beautifully to filtering. A small cutoff movement may reveal one part of the wave while hiding another. Resonance can emphasize particular harmonic areas. Layering an additive wave with a simpler wave can create a sound with both stable body and unusual color.

Tip: Try additive waves as secondary oscillators. They can add harmonic interest without taking over the whole patch.

Formant Waves

The formant waves, labeled **FORMT 1** through **FORMT 5**, are some of ESQ-1's most distinctive sources. These waves have strong frequency peaks, similar to pushing one band of an equalizer very high. They tend to have a nasal, vocal-like quality and are excellent component waves for synthetic vocals, strings, reeds, and animated textures.

Each formant wave emphasizes a different frequency area, moving from lower to higher formant regions. This makes them useful for adding vowel-like color without using an actual voice sample.

Formant waves are often best used as part of a blend rather than as the entire sound. Try using one oscillator as a warm foundation, then bring in a formant wave at a lower DCA level to add human-like color or a slightly talking quality.

Tip: A quiet formant layer can make a pad feel more alive. It's the difference between "nice synth pad" and "wait, is this thing trying to say something?"

Band-Limited Waves

The band-limited waves are designed with restricted harmonic content. Instead of containing a full, broad spectrum, they include selected harmonics or have certain harmonic regions removed.

Examples include **PULSE 2**, **SQR 2**, **4 OCTS**, **PRIME**, **BASS 2**, **E PNO 2**, **OCTAVE**, and **OCT+5**.

These waves are useful when you want harmonic control. **PULSE 2** and **SQR 2** are reduced-harmonic versions of pulse and square-style waves, which can be useful when the full versions are too bright or dense. **4 OCTS** contains octave-spaced harmonics and can work well for organ-like tones or hollow layered sounds. **PRIME** contains prime-numbered harmonics, giving it a more unusual structure. **OCTAVE** and **OCT+5** provide specific interval-based harmonic content inside a single oscillator.

Tip: Use band-limited waves when a patch feels too crowded. Instead of choosing a bright full-spectrum wave and trying to tame it later, start with a wave that already leaves more room.

DCA 1, DCA 2, and DCA 3

Each oscillator passes through its own DCA before reaching the filter. These are not final volume controls for the whole sound. They control the individual oscillator levels before the three oscillator signals are mixed and filtered.

This is one of the most important parts of the ESQ-1 architecture. Because each oscillator has its own DCA, you can control how much of each waveform reaches the filter. You can also modulate those levels, which means the harmonic mix feeding the filter can change over time.

Controls:

• **Level** – Sets the oscillator's level into the filter. Higher settings make that oscillator more prominent. Lower settings make it a supporting layer or subtle color.

• **Mod 1** / **Mod 2** – Sets modulation sources and amounts for the DCA level. Use these to animate the oscillator's level before it reaches the filter.

Tip: Think of DCA 1, DCA 2, and DCA 3 as a programmable oscillator mixer. You're not just balancing three waves. You're deciding how much of each wave enters the filter, and whether those ingredients change as the note evolves.

Modulating DCA Level

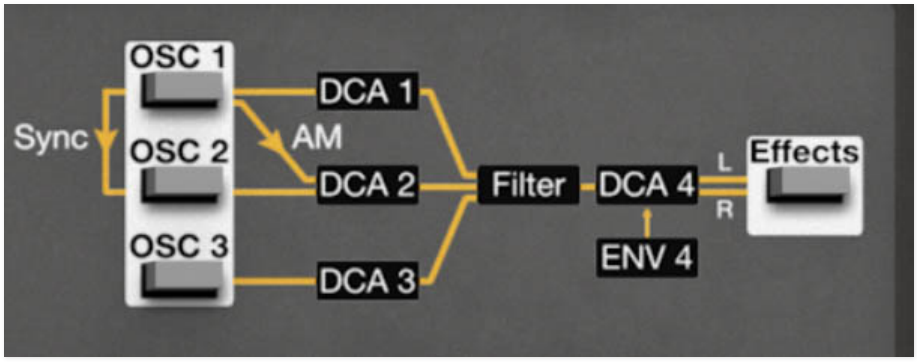
Modulating DCA level is one of the best ESQ-1 sound-design techniques. Instead of using a static blend of three oscillators, you can make the oscillator mix change over time.

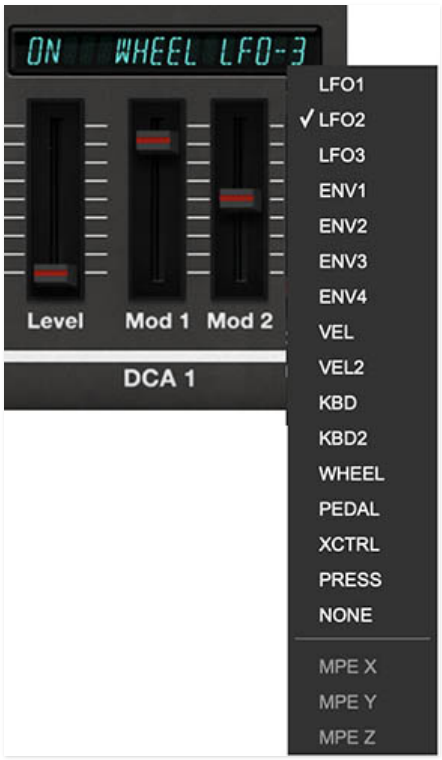
To access the DCA modulation controls, select **Edit** view, then click the desired oscillator/DCA block in the signal-flow display. For example, clicking **OSC 1 / DCA 1** displays the controls for **DCA 1**, including **Level**, **Mod 1**, and **Mod 2**. The same approach applies to the other oscillator DCA stages.

Use an envelope to make a bright oscillator appear only at the beginning of a note. Use a slow envelope to fade in a digital texture behind a warm pad. Use velocity to bring in a sharper waveform when you play harder. Use an LFO to pulse one oscillator against another. Use pressure, pedal, or MPE to bring a hidden layer forward while holding a note.

This creates a different kind of motion than a normal filter sweep. The filter is not simply opening and closing over the same sound. The actual waveform mix entering the filter is changing.

Tip: Try using OSC 1 as the main body, OSC 2 as a bright attack layer controlled by a fast envelope, and OSC 3 as a slow fade-in texture. The result can feel like one sound with internal movement, not three oscillators stacked together.





Tuning and Detuning Oscillators

Oscillator tuning lets you create pitch relationships between the three oscillators. At the simplest level, all three oscillators can be tuned to the same pitch for a full, unified sound. This works well for pads, basses, leads, and classic polysynth-style patches.

You can also tune oscillators in octaves. For example, keep OSC 1 at the main pitch, tune OSC 2 one octave down for weight, and tune OSC 3 one octave up for brightness or definition. This adds size without making the patch feel harmonically complicated.

Use **Semi** for intentional musical intervals such as octaves, fifths, or fourths. Use **Fine** for subtle pitch differences, beating, width, and animation.

For pads, slow beating between slightly detuned oscillators can create movement before you add LFOs or effects. For leads, detuning can add size and presence. For basses, be careful. Too much detuning in the low register can make the bottom end feel unfocused.

Tip: For a solid bass, keep one oscillator stable and centered. Add only a small amount of detune to a supporting oscillator at a lower DCA level.

Mode Panel



The Mode Panel on the right (red for Whole or Layer 1, green for Layer 2) groups optional functions related to the interaction between oscillators (Sync and Amplitude Modulation) and envelope behavior (Restart, Full Cycle).

Oscillator Sync

Sync lets Oscillators 1 and 2 interact in a more harmonically complex way. In oscillator sync, it syncs the phase of Oscillator 2 to Oscillator 1 forcing it to restart its waveform cycle each time Oscillator 1 restarts. This can create brighter, sharper, more animated harmonic content, especially when the synced oscillator's pitch is changed or modulated.

Sync is useful for aggressive leads, bright sweeps, digital brass-style sounds, animated effects, and tones that need extra bite or motion.

Setting Up Oscillator Sync

To set up oscillator sync:

- **Go to the Keyboard view.**
- **Enable Sync**
  Click the **Sync** button in the Mode Panel beneath the signal-flow diagram at the upper right of the panel.
- **Turn on Oscillator 1 and 2 then set the oscillator's waves and tuning**
  Start with relatively simple waveforms on Oscillator 1 and 2 such as saw or square while learning sync. Then adjust **Octave**, **Semi**, and **Fine** on Oscillator 1 and 2 to hear how tuning affects the synced tone. In general, setting Oscillator 2's pitch higher than Oscillator 1 creates a more pronounced sound character.
- **Modulate the synced oscillator's pitch**
  For classic sync sweeps, keep the main Oscillator 1 pitch stable and modulate Oscillator 2's pitch with an envelope, LFO, wheel, pressure, or another modulation source. This keeps the perceived note anchored while the harmonic content changes dramatically.

Musical Uses

A classic sync technique is to hold one oscillator steady while sweeping the pitch of the synced oscillator. The pitch of the note remains stable, but the tone becomes brighter, more animated, and more vocal-like

as the synced oscillator moves.

Because ESQ-1's oscillators use digital waves, sync can become especially colorful. Simple waves tend to produce cleaner, more predictable sync tones. More complex waves can produce sharper, stranger, and more characterful results.

Tip: Start with simple waveforms when learning sync. Once you understand how the controls interact, try more complex waves for extra digital edge, bite, and attitude.



AM: Amplitude Modulation

AM, or **amplitude modulation**, creates complex harmonic tones by using the amplitude of Oscillator 1 to modulate the amplitude of Oscillator 2. Instead of simply mixing oscillators together, AM generates additional harmonic content ("sideband frequencies") at the sum and differences of the frequencies of the two oscillators. This can produce FM-like metallic, bell-like, clangorous, sharp, glassy, or distinctly digital textures. AM can be subtle or dramatic. When the oscillators are tuned to more complex intervals the effects can be more extreme.

Setting Up AM

To set up amplitude modulation:

- **Go to the Keyboard view.**
- **Enable AM**
  Click the **AM** button in the Mode Panel beneath the signal-flow diagram at the upper right of the panel.
- **Turn on Oscillator 1 and 2 then set the oscillator's waves and tuning**
  Start with simple waveforms while learning AM, such as **SINE**, **SAW**, **SQUARE**, or other basic waves. These make it easier to hear what AM is doing. Once you understand the behavior, try more complex ESQ-1 waves for sharper, stranger, and more animated tones.
- **Adjust oscillator tuning**
  Use **Octave**, **Semi**, and **Fine** to change the pitch relationship between the oscillators. Small tuning changes can add edge or shimmer. Wider intervals can create bells, clangs, metallic attacks, and unusual digital textures.
- **Balance oscillator levels with the DCAs**
  Use the oscillator DCA **Level** controls to balance the result. AM tones can become intense quickly, so try lowering the level of the more aggressive oscillator if the sound becomes too harsh or crowded.

Musical Uses

AM is especially useful for:

• Bell-like tones
• Electric piano-style attacks
• Metallic pads
• Percussive digital sounds
• Industrial textures
• Sound effects
• Sharper, more animated digital keys

A good starting technique is to use one oscillator as the stable body of the sound, then use AM to introduce harmonic edge from another oscillator. Adjust the tuning of the modulating oscillator slowly and listen for

sweet spots. Small changes can make a big difference.

Tip: If you're new to AM, start with a stable main oscillator and introduce AM carefully. It's easy to go from "interesting color" to "robotic cookware accident," which may or may not be exactly what you need.



Modulating Oscillator Pitch

Oscillator pitch can be modulated directly from the oscillator's own panel controls or through the main **Mod Matrix**.

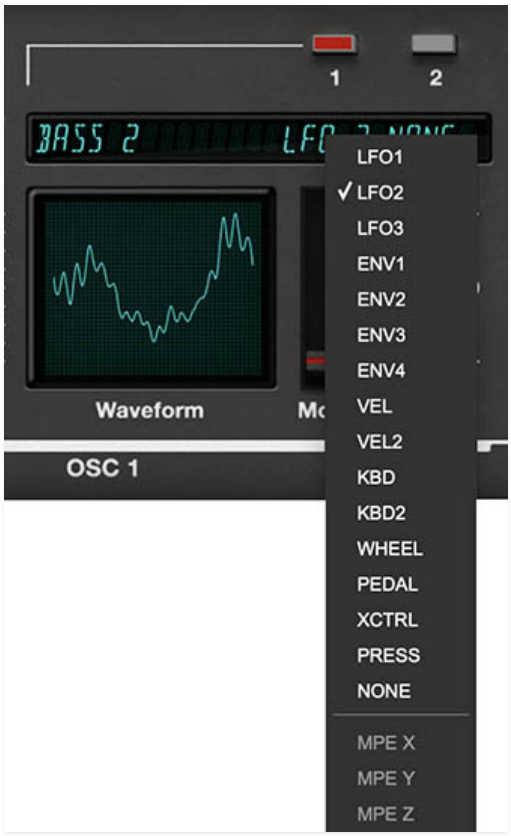
In each oscillator panel, the modulation source dropdown lets you choose what will modulate that oscillator's pitch. This gives you a fast, local way to add pitch movement to a specific oscillator without leaving the oscillator section.

You can also create oscillator pitch modulation from the main Mod Matrix. This is useful when you want a central view of the patch's modulation routings, or when you want to include oscillator pitch as part of a larger performance gesture using macros, controllers, or MPE.

Common uses:

• **LFO to pitch** – Adds vibrato, pitch drift, or animated movement.
• **Envelope to pitch** – Creates pitch attacks, drops, risers, percussion, or sync-style sweeps.
• **Velocity to pitch amount** – Lets harder playing add more pitch snap or movement.
• **Wheel, pressure, or pedal to pitch** – Adds expressive performance control.
• **MPE X/Y/Z to pitch or timbre** – Allows compatible MPE controllers to shape pitch or related behavior per note.

Tip: Small pitch modulation adds life. Large pitch modulation creates drums, lasers, risers, drops, unstable textures, and other useful studio misbehavior. For musical vibrato, keep the amount modest. For special effects, proceed with questionable judgment.



Using One, Two, or Three Oscillators

You don’t always need all three oscillators. Sometimes one strong waveform, shaped well, is enough.

One oscillator is useful for clean basses, simple plucks, bell-like tones, focused leads, digital keys, and sounds that need space in a mix. It’s also the best way to learn the waveforms, because you can hear each source clearly.

Two oscillators are perfect for contrast. Use them for detuned thickness, octave reinforcement, bright/dark layering, attack/body combinations, or interval sounds. Two oscillators are often easier to balance than three when you want richness without clutter.

Three oscillators create the biggest and most complex sounds. Use all three when you want a main tone, a support layer, and a special ingredient such as a transient, sub-octave, upper harmonic, formant color, or slowly fading texture.

Tip: If all three oscillators are loud and bright, the sound can become dense very quickly. Give each oscillator a job: primary, support, and color.

Practical Oscillator/DCA Recipes

Warm Hybrid Pad
Use OSC 1 for a smooth body wave, OSC 2 for a slightly brighter detuned wave, and OSC 3 for a subtle formant or additive wave. Keep DCA 1 strongest, DCA 2 moderate, and DCA 3 lower. Add slow modulation to DCA 3 so the texture appears gradually.

Digital Bass With Bite
Use OSC 1 as the main bass tone. Add OSC 2 at the same pitch or one octave down for support. Use OSC 3 as a bright attack component at a lower level. Keep detuning minimal, use a tight ENV 4 shape, and add a quick filter envelope movement for definition.

Glassy Digital Key
Choose a bright or bell-like wave for OSC 1. Add OSC 2 with a complementary wave at a lower level. Tune

OSC 2 slightly above or below OSC 1 for gentle motion, or an octave higher for sparkle. Keep the filter fairly open so the waveform character remains clear.

Sync Lead
Use two oscillators with relatively simple waves to start. Enable sync, keep the master pitch stable, and modulate the synced oscillator's pitch with an envelope. Add delay for width and drama. Once the basic patch works, try more complex waveforms.

Evolving Texture
Use three different waveforms. Let OSC 1 provide the foundation, OSC 2 add subtle detuned support, and OSC 3 bring in a more unusual wave. Use an envelope, LFO, pressure, or Macro to fade OSC 3 in over time.

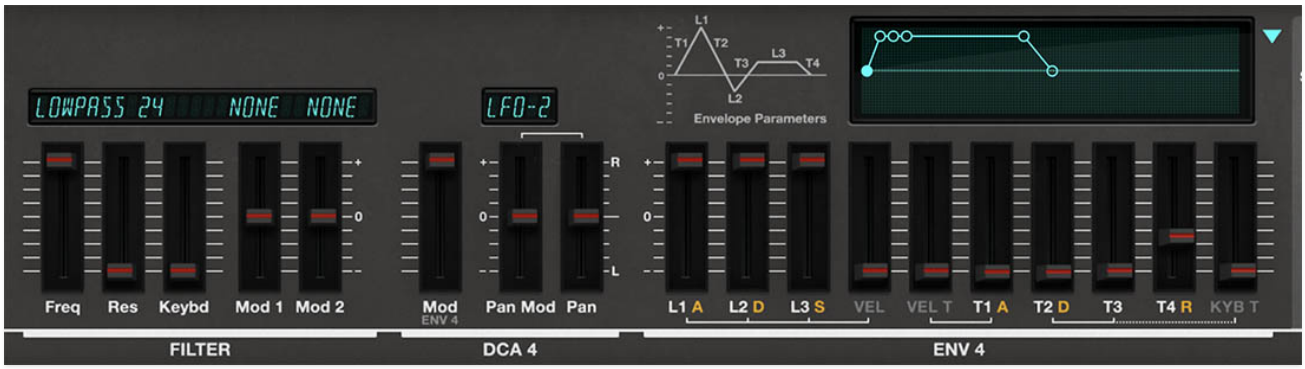
A Good Way to Learn the Oscillators

Start with a simple preset or initialized patch in **Whole** mode. Turn down OSC 2 and OSC 3 so only OSC 1 is heard. Open the filter so you can hear the waveform clearly, then step through the available waves.

Listen for brightness, body, attack, harmonic complexity, pitch center, and mood. Choose a waveform you like, then bring in OSC 2 at a lower level. Try tuning it an octave up, an octave down, or a fifth above OSC 1. Then bring in OSC 3 as a subtle texture or attack component.

Now close the filter slightly and listen again. Many ESQ-1 waves reveal their best qualities only once they're filtered, blended, or modulated.

The important lesson is that ESQ-1's tone is built from relationships. Waveform choice, tuning, DCA level, filtering, and modulation all interact. Change one piece, and the whole patch can shift. That's the fun of it.



Filter and Amplifier

Shaping the Sound After the Oscillators

After **OSC 1**, **OSC 2**, and **OSC 3** pass through **DCA 1**, **DCA 2**, and **DCA 3**, their signals are combined and sent into the **Filter**. This is where the raw digital wave material starts becoming a finished musical sound.

The basic post-oscillator signal path is: **DCA 1 / DCA 2 / DCA 3 → Filter → DCA 4 → Effects**

In plain English: the oscillator DCAs balance the ingredients, the filter shapes the tone, and the final amplifier shapes how the finished sound begins, sustains, and fades away.

The Filter

The ESQ-1 filter shapes the combined output of the three oscillators. It controls brightness, focus, and harmonic balance. Because ESQ-1 begins with digital waveforms, the filter has a particularly important job. Some waves are bright, glassy, buzzy, metallic, vocal-like, or harmonically dense. The filter lets you tame them, focus them, smooth them, animate them, or push them into more expressive territory.

One Filter, Two Views

The filter appears in both **Play** view and **Edit** view, but it's the same filter. They are not separate filters.

Play view gives you quick access to the most immediate filter controls, including **Freq** and **Res**. This is useful when you're browsing presets, making fast tone adjustments, or shaping a sound while playing.

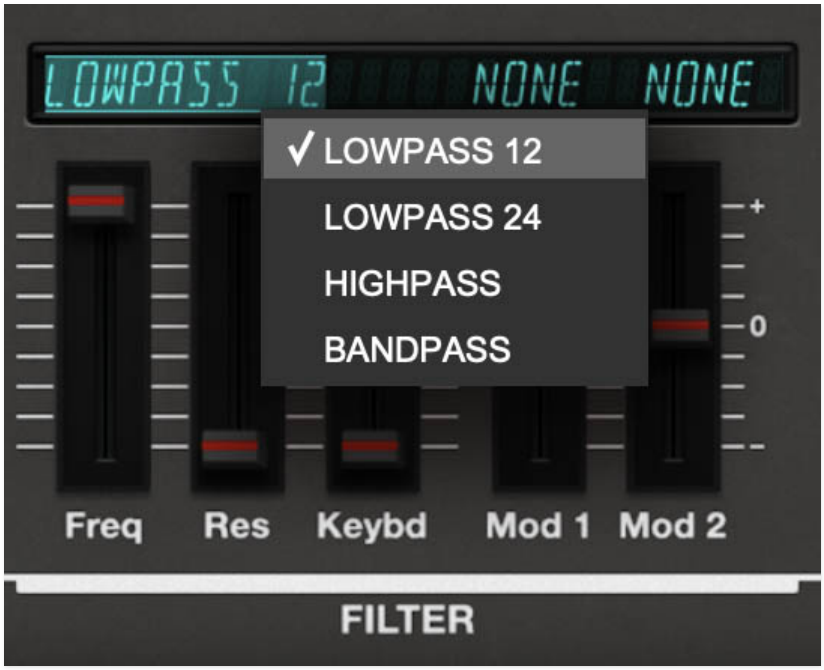
Edit view shows the full filter section, including **Freq**, **Res**, **Keybd**, **Mod 1**, and **Mod 2**. Use Edit view when you want deeper control over filter behavior, keyboard tracking, or filter modulation.

Tip: Use **Play** view when you just want to brighten or darken a sound quickly. Use **Edit** view when you want the filter to respond to envelopes, LFOs, velocity, keyboard position, performance controls, or MPE.



Filter Modes

Cherry Audio’s ESQ-1 expands the original ESQ-1 concept with four selectable filter modes. This makes the filter much more flexible than a simple lowpass-only design.



• **Lowpass 12** – A gentler lowpass filter that reduces high frequencies more gradually. Use it when you want to soften a sound without making it too dark. It works well for pads, strings, digital keys, brass-like sounds, and patches where you want warmth while preserving some upper harmonic air.

• **Lowpass 24** – A steeper lowpass filter that removes high frequencies more aggressively. Use it for round basses, punchy plucks, darker pads, classic synth leads, and sounds where you want the cutoff and resonance to make a stronger statement.

• **Highpass** – Removes lower frequencies while allowing higher frequencies through. This is useful for thinning a layer, creating airy textures, reducing low-end buildup, or making one layer sit above another in a mix.

• **Bandpass** – Emphasizes a narrower range of frequencies around the cutoff point while reducing material above and below it. This can create nasal, vocal-like, reedy, telephone-like, resonant, or special-effect tones. It’s especially useful with formant waves, reed-like waves, and complex digital textures.

Tip: In a layered patch, try **Lowpass 24** on one layer for body and **Highpass** or **Bandpass** on the other for air, edge, or vocal-like color. This can make a sound feel bigger without becoming muddy.**Filter Controls:**

• **Filter Mode Display** – Shows the currently selected filter mode. Click the filter name display above the **Res** and **Keybd** sliders to choose the filter type: **Lowpass 12**, **Lowpass 24**, **Highpass**, or **Bandpass**.

• **Freq** – Sets the filter cutoff frequency. Higher settings let more brightness through. Lower settings reduce high-frequency content for a darker or rounder sound.

• **Res** – Controls resonance, emphasizing frequencies around the cutoff point. Low settings add subtle focus. Higher settings create more bite, edge, and synthetic character.

• **Keybd** – Sets keyboard tracking for the filter cutoff. Higher settings make the filter follow the keyboard more strongly, so higher notes can stay brighter and lower notes can stay warmer.

• **Mod 1 / Mod 2** – Let you assign modulation sources to the filter cutoff and set their modulation amounts. Click the source field in the display to choose a source, then adjust the corresponding Mod slider

to set how strongly it affects the filter. Positive and negative amounts move the cutoff in opposite directions.

Tip: If a sound feels dull in the upper register, increase **Keybd** so the filter opens more as you play higher notes. If the sound gets too bright or thin at the top of the keyboard, reduce it.

Mod 1 and Mod 2: Filter Modulation

Mod 1 and **Mod 2** let you animate the filter cutoff from within the Filter section. This is the easiest place to create filter movement without going to the main Mod Matrix.

Click the modulation source field above the Mod slider to choose a source, then adjust the corresponding **Mod 1** or **Mod 2** amount. The amount can be positive or negative, allowing the modulation to move the cutoff in either direction.

Common uses:

- **Envelope to filter cutoff** – Creates plucks, brass-like attacks, swells, and filter sweeps.
- **LFO to filter cutoff** – Creates slow motion, rhythmic pulsing, wah-like movement, or tempo-synced animation.
- **Velocity to filter cutoff** – Makes harder-played notes brighter and more articulate.
- **Pressure or MPE to filter cutoff** – Lets you open the filter expressively while holding notes.
- **Pedal or Wheel to filter cutoff** – Gives hands-on performance control over brightness.

Tip: If filter modulation seems weak, check the base **Freq** setting. If the filter is already fully open or nearly closed, modulation may not have enough useful room to move.



Filter Envelope Movement

Unlike many synthesizers, ESQ-1 does not have a dedicated **Filter Envelope Amount** knob sitting next to the cutoff and resonance controls. Instead, filter envelope movement is created through modulation.

The quickest method is to go to **Edit** view, find the **Filter** section, and use **Mod 1** or **Mod 2** to assign an envelope to the filter. Choose **ENV 1**, **ENV 2**, or **ENV 3** as the modulation source, then set the Mod amount to determine how strongly the envelope moves the cutoff.

Positive amounts generally open the filter as the envelope rises. Negative amounts can make the envelope pull the cutoff in the opposite direction. You can also route an envelope to filter cutoff from the main **Mod Matrix**, which is useful when you want the filter movement to be part of a larger modulation setup.

Tip: Set the basic **Freq** value first, so the sustained tone feels right. Then add envelope modulation to create the attack, sweep, swell, or movement around that base tone.

Filter Plucks
A classic filter pluck starts bright, then quickly becomes darker. To create this, start with a bright waveform or oscillator blend, set the filter cutoff moderately low, then use an envelope to open the filter briefly at

the start of the note.

This works well for synth basses, digital plucks, sequenced patterns, short comping sounds, and percussive keys.

Try this:

- Set **Freq** low enough that the sustained tone is warm.
- Use **Mod 1** or **Mod 2** to assign an envelope to filter cutoff.
- Set a positive modulation amount.
- Use a fast envelope attack and a quick decay.
- Adjust **Res** for more bite if needed.

Tip: If the pluck isn't bright enough, increase the envelope modulation amount or raise **Freq** slightly. If the body of the sound stays too bright, lower **Freq** and let the envelope create the attack.

Filter Swells

Filter swells are useful for pads, strings, atmospheres, and cinematic textures. Start with the filter somewhat closed, then use a slow envelope or LFO to open it gradually as the note sustains.

This works beautifully with ESQ-1's digital waves. A complex waveform can begin dark and mysterious, then slowly reveal its upper harmonics as the filter opens.

Tip: For swelling pads, pair a slow filter opening with a slow **ENV 4** attack. The volume fades in while the tone brightens, making the sound feel more natural and less like someone simply turned up a knob.

Filter Motion With LFOs

LFO modulation creates repeating filter movement. Depending on rate, depth, waveform, and sync, this can produce subtle drift, rhythmic pulsing, wah effects, tremolo-like movement, or tempo-locked patterns.

The ESQ-1 LFOs include **L1**, **Delay**, and **L2**, so filter motion can fade in or change intensity over time. This is especially useful for sounds that start stable, then become more animated as they sustain.

Tip: For a pad that gradually comes alive, route an LFO to filter cutoff, set the LFO movement subtly, then use the LFO's **L1 / Delay / L2** behavior so the motion develops after the note begins.

Velocity and Filter Response

Velocity can make the filter respond to how hard you play. This is one of the simplest ways to make a patch feel more expressive.

A soft note can remain darker and warmer, while a harder note opens the filter for more brightness and attack. This works especially well for keys, basses, plucks, brass-like patches, and expressive layered sounds.

Tip: If a patch sounds good but feels flat, try adding velocity-to-filter modulation before adding more effects. Sometimes the sound doesn't need to be bigger. It just needs to respond to your hands.

The Filter and Digital Waves

The ESQ-1's filter behaves differently depending on which waveforms are feeding it. Simple waves respond in familiar subtractive-synth ways: lower the cutoff and they get darker, add resonance and they get more focused.

Complex digital waves can be more surprising. As the filter moves, different harmonic regions may appear or disappear. A wave that sounds harsh with the filter wide open may become warm and useful when filtered. A wave that sounds plain at one cutoff setting may become interesting at another.

Tip: Don't judge a waveform with the filter wide open only. Many ESQ-1 waves reveal their best musical use when partially filtered.

Pre-Filter DCAs and the Filter

DCA 1, **DCA 2**, and **DCA 3** determine how much of each oscillator enters the filter. This affects how the filter behaves. If a bright oscillator is loud, the filter has more high-frequency content to shape. If that oscillator is quiet, the filter response may be dominated by a darker or simpler wave.

That means filter movement and oscillator-level movement can work together. A pad might fade in a bright oscillator while the filter gradually opens. The result is more animated than a simple filter sweep over a fixed oscillator mix.

Tip: For evolving sounds, don't rely only on filter cutoff. Modulate oscillator DCA levels too. Movement before the filter plus movement at the filter is one of the ESQ-1's best tricks.

DCA 4: Final Amplifier

After the filter, the signal passes through **DCA 4**, the final amplifier stage. DCA 4 controls the overall level of the complete filtered voice.

A simple way to remember it:

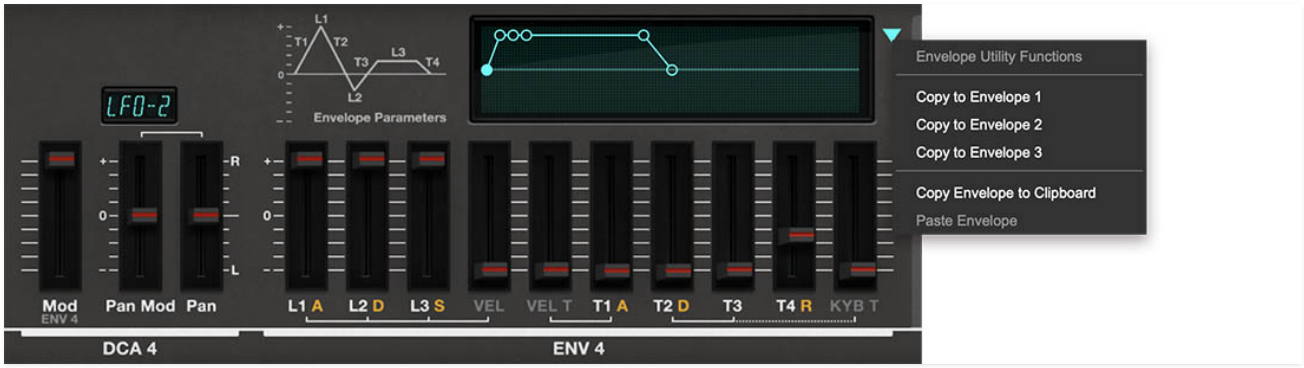
DCA 1, DCA 2, and DCA 3 control the oscillator ingredients.
DCA 4 controls the finished voice.

DCA 4 is where the sound's final loudness behavior is shaped. It determines how the complete sound comes in, holds, and fades away.

ENV 4 and DCA 4

ENV 4 is closely tied to **DCA 4** and functions as the main final volume envelope. This makes ENV 4 one of the most important parts of the instrument. Even if the oscillator and filter settings stay exactly the same, changing ENV 4 can make the patch behave like a completely different kind of sound.

Envelopes are covered in greater detail in the Envelopes chapter.



Common ENV 4 uses:

- Fast attack for immediate notes
- Slow attack for pads and swells
- Short decay and low sustain for plucks
- High sustain for held tones
- Long release for smooth fades
- Short release for tight, clean note endings

Tip: If a sound feels too abrupt, too slow, too long, or too short, check **ENV 4** first. It's often the fastest way to change the musical role of a patch.

Sound Design Recipes

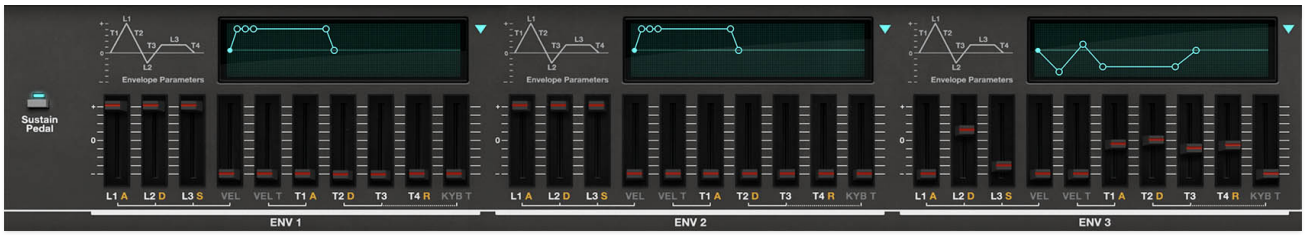
Warm Pad
Use a rich oscillator blend, set the filter cutoff moderately low, use **Lowpass 12** or **Lowpass 24**, and set ENV 4 with a slow attack and long release. Add slow filter modulation from an envelope or LFO.

Punchy Hybrid Bass
Choose a strong waveform for OSC 1, add a second oscillator for weight or definition, and use **Lowpass 24** for a stronger subtractive character. Add a short filter envelope movement for attack and keep ENV 4 tight.

Digital Pluck
Use a bright or complex waveform, set the filter cutoff moderately low, and use envelope modulation to open the filter quickly at the start of the note. Set ENV 4 for a fast attack, quick decay, low sustain, and release that suits the tempo.

Expressive Lead
Use one or two strong oscillator waves, keep the filter open enough for presence, and add resonance for focus. Route mod wheel, pressure, or MPE to filter cutoff or vibrato for performance expression.

Evolving Texture
Use three different waveforms, set the filter cutoff lower than expected, and use slow LFO or envelope modulation to move the cutoff. Fade in one oscillator through its DCA for internal harmonic motion, then add delay or reverb.



Envelopes

Shaping Sound Over Time

Envelopes are one of the main reasons a synthesizer feels musical instead of mechanical. They determine how a sound changes from the moment you press a key to the moment it fades away. A waveform by itself is just raw tone. An envelope gives it character that evolves over time. They’re the difference between a digital wave sitting there like a static object, and a playable instrument that responds, moves, and behaves to your playing like a genuine instrument should.

On Ensoniq ESQ-1, envelopes are especially important because they can do much more than shape volume. They can animate oscillator pitch, oscillator level, filter cutoff, amplifier level, and other modulation destinations. This means an envelope can make a sound pluck, swell, brighten, darken, bend, strike, fade, bloom, or shift from one tonal personality to another while a note is held.

The ESQ-1 includes four envelopes: **ENV 1**, **ENV 2**, **ENV 3**, and **ENV 4**. The first three are shown together in **Env** mode, where you can edit their shapes in detail. **ENV 4** is closely tied to **DCA 4**, the final amplifier stage, and is shown prominently in Play and Edit modes because it controls the overall volume behavior of the voice.

Not Just ADSR

Many synthesizers use a familiar ADSR envelope: Attack, Decay, Sustain, and Release. The ESQ-1 envelope design is a little more flexible. Instead of a simple ADSR layout, each ESQ-style envelope uses multiple **levels** and **times**. The levels define target points in the envelope shape, while the times define how long it takes to move from one point to the next.

The basic idea is simple. The envelope starts when a key is played, rises or falls toward one level, moves to another level, then settles at a sustain level until the key is released. After release, it moves back down according to the release time.

This gives you more detailed control than a basic ADSR envelope. You can create shapes that behave like familiar ADSR envelopes, but you can also create more unusual contours: rising envelopes, falling envelopes, stepped-feeling shapes, slow transitions, sharp attacks, or shapes that begin one way and then settle somewhere unexpected.

In other words, the ESQ-1 envelope isn't simply a gate. It’s a programmable contour.

ENV 1, ENV 2, and ENV 3

In **Env** mode, the main panel displays **ENV 1**, **ENV 2**, and **ENV 3**. Each envelope has its own graphical display, making it much easier to understand the shape you’re creating. As you adjust the level and time controls, the display shows how the envelope rises, falls, sustains, and releases.

ENV 1, ENV 2, and ENV 3 are general-purpose modulation envelopes. They can be used to shape many parts of the sound, depending on how they’re assigned in the modulation system. For example, one envelope might control filter cutoff, another might shape oscillator pitch, and another might fade in the level of a particular oscillator through its DCA.

This is where ESQ-1 sound design gets interesting. You’re not limited to one envelope for volume and one for filter. You can use envelopes as independent motion sources, each with its own shape and musical

purpose.

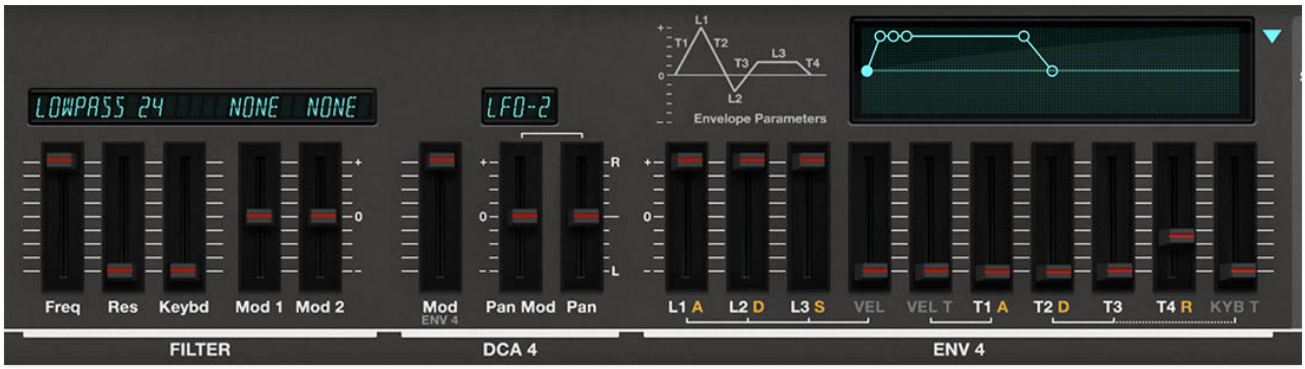
A classic use would be assigning an envelope to the filter so the sound starts bright and then settles into a darker tone. A more distinctly ESQ-style use would be assigning an envelope to one oscillator's DCA, causing a bright or metallic wave to appear only at the beginning of a note, while the other oscillators provide the sustained body. The listener hears one sound, but inside the patch, several things are moving.

ENV 4 and the Final Amplifier

ENV 4 has a special role. It is closely associated with **DCA 4**, the final amplifier stage after the filter. In most everyday programming, ENV 4 functions as the main volume envelope for the complete voice. This means ENV 4 determines how the finished sound begins, sustains, and ends. It controls whether a patch has an immediate attack, a slow fade-in, a short pluck, a long release, or a smooth pad-like tail.

Because ENV 4 is so central to the final sound, Cherry Audio's ESQ-1 gives you quick access to ENV 4 controls from the main panel. That makes sense. Even a small change to ENV 4 can completely alter how a patch feels under your fingers.

Take the same oscillator and filter settings and give them a fast attack, short decay, low sustain, and short release. Now the sound behaves like a pluck. Give it a slow attack, high sustain, and long release, and it becomes a pad. The raw tone may be identical, but the musical role has changed completely. That's why ENV 4 is one of the most important controls on the synth.



DCA 4 Level and Pan Controls

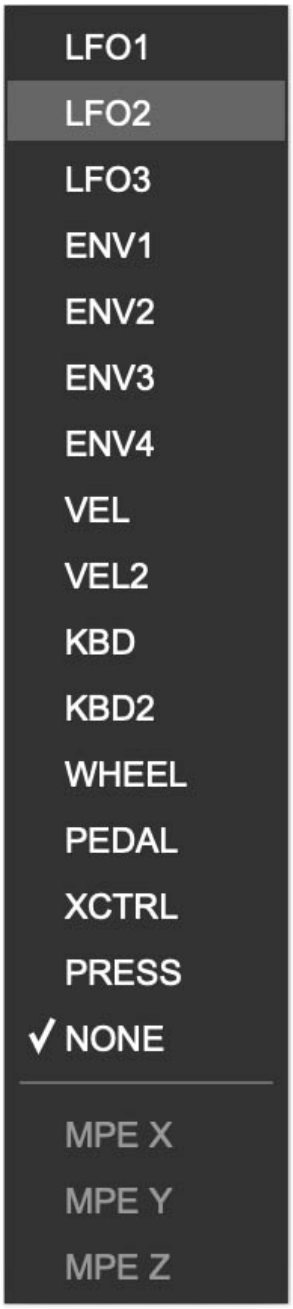
The DCA 4 section also includes additional modulation and pan controls, so the final voice level and stereo position can respond to envelopes, LFOs, velocity, keyboard position, wheel, pedal, pressure, or other modulation sources.



Controls:

• **Mod** – Sets the amount of level modulation applied to DCA 4 from Envelope 4. This is where **ENV 4** controls the final volume shape of the voice. Higher amounts allow the modulation source to have a stronger effect on the final level.

• **Pan Mod Source Display** – Click the small display above the **Pan Mod** slider to choose a pan modulation source. Available sources include **LFO 1**, **LFO 2**, **LFO 3**, **ENV 1**, **ENV 2**, **ENV 3**, **ENV 4**, **VEL**, **VEL 2**, **KBD**, **KBD 2**, **WHEEL**, **PEDAL**, **XCTRL**, **PRESS**, and **NONE**. MPE sources may also appear when MPE is available/enabled.



• **Pan Mod** – Sets how strongly the selected modulation source moves the voice in the stereo field. Positive and negative values determine the direction and depth of the pan movement.

• **Pan** – Sets the base stereo position of the voice, from left to right. Use this to place the selected layer in the stereo field before adding modulation.

Tip: Think of **Pan** as the starting position, and **Pan Mod** as the movement around that position. For a stable sound, keep Pan centered and Pan Mod low or off. For animated stereo movement, choose an LFO as the Pan Mod source and raise Pan Mod until the sound starts moving across the stereo field.

Using Pan Mod Musically

Pan modulation can make a sound feel wider, more animated, or more spatially alive. It works especially well on pads, arpeggios, bells, digital keys, and evolving textures.

Good uses:

• **LFO to Pan** – Creates automatic stereo movement. Slow LFOs work well for pads and textures; faster LFOs can create tremolo-like stereo effects.

• **Velocity to Pan** – Lets harder-played notes appear in a slightly different stereo position. Use subtly for a more dynamic, less static feel.

• **Keyboard tracking to Pan** – Can spread notes across the keyboard, with lower notes leaning one way and higher notes leaning the other.

• **Pressure or Pedal to Pan** – Allows real-time performance control over stereo placement.

• **Envelope to Pan** – Moves the sound during the note, such as starting slightly left and settling toward center, or creating a quick stereo gesture at the attack.

Tip: Stereo motion is powerful, but it can get seasick quickly. For basses and leads, keep Pan Mod subtle or centered. For pads, arpeggios, and sound-design patches, a little movement can make the sound feel much more alive.

Envelope Levels: L1, L2, and L3

Each envelope includes three main level targets: **L1**, **L2**, and **L3**.

- **L1** is the first level the envelope reaches after a note is played. In a typical volume-style envelope, this often acts like the peak attack level.
- **L2** is the next level the envelope moves toward. This is often used like a decay target.
- **L3** is the level where the envelope settles while the key is held. In a familiar ADSR-style shape, this behaves like the sustain level.

The important thing to understand is that these are target levels. The envelope doesn't simply turn on and off. It travels from one level to another over time.

For a simple pluck, L1 might be high, L2 lower, and L3 very low or zero. The sound jumps quickly to a strong attack, then falls away. For a sustained pad, L1, L2, and L3 might all remain fairly high, with the times adjusted to create a slow, smooth shape. For a more unusual modulation contour, the levels can be set so the envelope rises, falls, and rises again.

When ENV 1, ENV 2, or ENV 3 are used as modulation sources, these levels determine the strength and direction of the modulation contour. When ENV 4 is shaping DCA 4, the levels define the loudness contour of the finished voice.

Envelope Times: T1, T2, T3, and T4

The **T** controls set how long the envelope takes to move from one level stage to the next. If the **L** controls define where the envelope goes, the **T** controls define how quickly it gets there.

Controls:

• **T1** – Sets the time it takes the envelope to move from silence to **L1** after a note is played. This is the envelope's attack stage. Shorter settings create an immediate start; longer settings create a slower fade-in.

• **T2** – Sets the time it takes the envelope to move from **L1** to **L2**. This can create a quick drop after the attack, a smoother transition into the body of the sound, or a more gradual tonal or volume change.

• **T3** – Sets the time it takes the envelope to move from **L2** to **L3**. This lets the sound continue changing while the key is held.

• **T4** – Sets the release time, or how long the envelope takes to fade after the key is released. Shorter settings make notes stop tightly; longer settings let them linger.

Because ESQ-1 envelopes include multiple level targets and multiple time stages, they can create more sculpted shapes than a basic ADSR envelope. A sound can have one behavior at the attack, another during the body of the note, and another after key release.

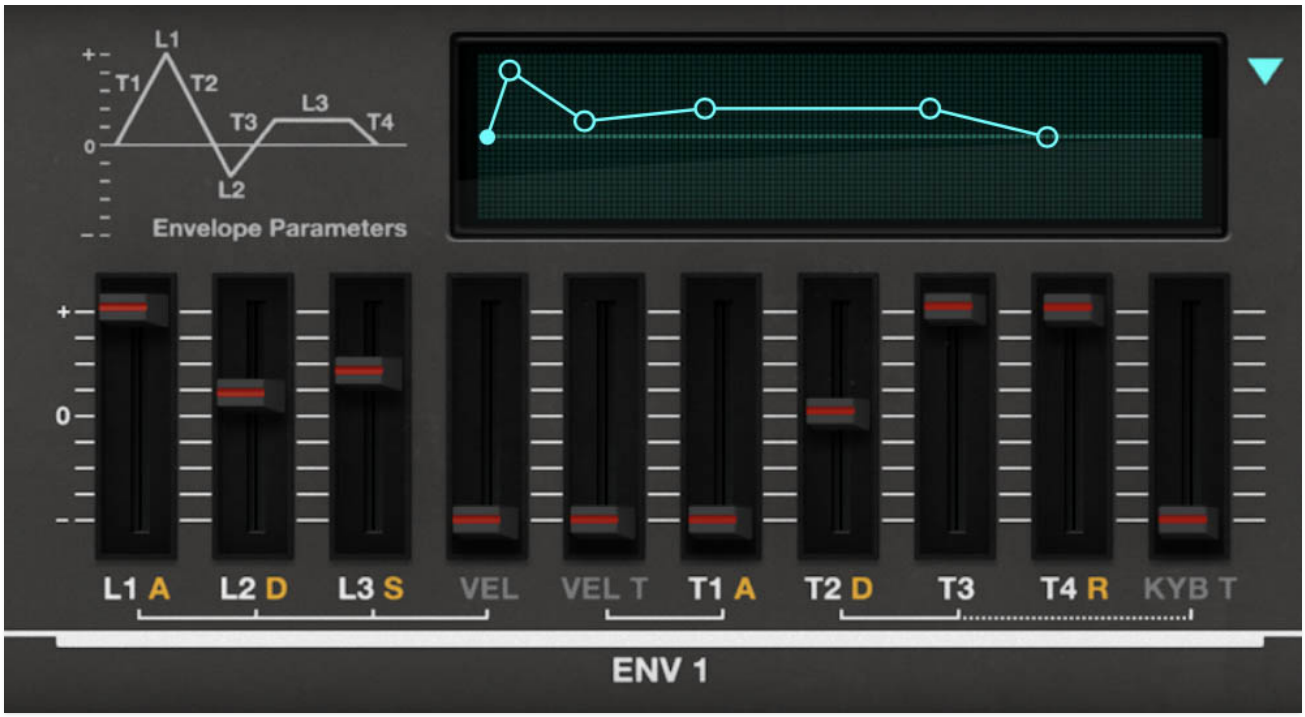
Tip: Fast times create sharp, percussive behavior. Slow times create fades, swells, and evolving transitions. For plucks, start with fast T1 and shorter T2/T3 settings. For pads, try a slower T1 and longer

T4.

Reading and Editing the Envelope Display

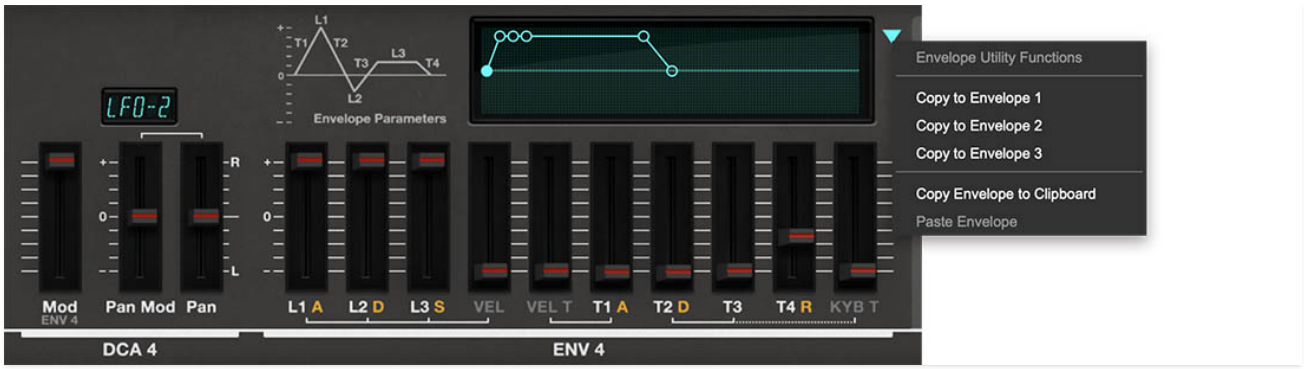
The graphical envelope displays in Env mode show each envelope as a contour, making it much easier to understand how the levels and times relate to each other. This is especially helpful because ESQ-1 envelopes are more flexible than a simple ADSR layout. The display lets you see whether the envelope is rising quickly, falling gradually, sustaining high, dipping low, or releasing slowly.

The display is also editable. Click and drag the circular handles on the envelope graph to reshape the envelope directly. Dragging a handle changes the related level and time values, giving you a fast, visual way to shape the envelope without thinking only in terms of individual parameter sliders. This is often the quickest way to rough in a musical envelope, especially for sounds with more complex contours.



When programming your own sounds, use your ears first, but let the display help you understand what's happening. If a sound has a slow fade-in, you'll see a longer T1 slope. If it has a quick attack and short decay, you'll see a fast rise followed by a quick move toward a lower level. If a modulation envelope is doing something unexpected, the graphic can help you spot whether one of the level or time settings is causing it.

The turquoise triangle at the right side of the envelope display opens the **Envelope Utility Functions** menu. This menu lets you copy the current envelope shape to another envelope, copy the envelope to the clipboard, or paste a copied envelope shape when available. This is a very useful shortcut when you want two envelopes to start from the same contour, then customize one of them for a different purpose.



For example, you might create a filter envelope you like, copy it to another envelope, and then adjust the copy so it fades in an oscillator level or shapes another modulation destination in a related way. Or you might copy a carefully tuned envelope from ENV 1 to ENV 2, then make ENV 2 slightly slower, sharper, or deeper. It's a quick way to create coordinated movement without rebuilding the same shape by hand.

The envelope display is there to make the envelope easier to see, easier to edit, and easier to reuse. For a synth with this much modulation potential, that's not just a convenience. It's a sanity-preservation feature.

Velocity and Envelope Attack Response

The envelope sections include a velocity-related timing control labeled **VEL T**. This is Cherry Audio's version of the original ESQ-1's **T1V** parameter, which stood for velocity attack control.

VEL T makes the envelope's first time stage respond to how hard you play. More specifically, it affects **T1**, the envelope's attack time. As VEL T is increased, harder keystrokes shorten T1, causing the envelope to reach its first level more quickly.

This is a very useful performance feature because it lets the same sound respond with different attack behavior depending on your touch. Play softly, and the envelope can rise more slowly and gently. Play harder, and the attack can become sharper, faster, and more immediate.

For a string-like or pad sound, VEL T can let soft notes bloom gradually while harder notes speak with more definition. For a pluck, key, or mallet-style sound, it can make accented notes feel more crisp and percussive. For a filter envelope, harder playing can make the brightness arrive more quickly, giving the impression of stronger articulation.

The important distinction is that VEL T does not simply make the envelope "more intense." It changes how velocity affects the **attack time** of the envelope. If T1 is already set to zero, VEL T won't have any audible effect, because there's no attack time left to shorten. But when T1 has some length to it, VEL T can make a patch feel much more responsive and playable.

Keyboard Decay Scaling

The envelope sections also include a keyboard-based timing control labeled **KYB T**. This is Cherry Audio's version of the original ESQ-1's **TK** parameter, which stood for keyboard decay scaling.

KYB T changes the envelope's decay timing depending on where you play on the keyboard. As KYB T is increased, higher notes shorten **T2** and **T3**, making them decay faster than lower notes. The higher the KYB T setting, the greater the difference in decay time between the low and high ends of the keyboard.

This is useful because many acoustic instruments don't decay evenly across their entire range. Piano is the classic example: low notes tend to ring longer, while higher notes decay more quickly. KYB T lets you bring some of that range-sensitive behavior into an ESQ-1 patch.

For plucked, keyed, mallet, piano-like, or bell-like sounds, KYB T can make the envelope feel more natural across the keyboard. Lower notes can remain fuller and longer, while higher notes become tighter and more articulate. It can also be useful for synth basses, digital keys, and percussive sounds where the upper register feels too smeared or the lower register feels too short.

Like VEL T, KYB T only affects timing stages that have time to change. If T2 and T3 are both set to zero, KYB T won't have any audible effect. But with meaningful T2 and T3 values, it's a subtle and powerful way to make the envelope feel less static and more instrument-like across the keyboard.

Sustain Pedal

The **Sustain Pedal** control in Env mode determines how the envelopes respond to sustain pedal behavior. This is especially important for performance sounds such as pads, keys, layered textures, and split setups. The sustain pedal may seem like a basic performance feature, but in a layered synth like ESQ-1, it can become an important part of a sound's character.

With sustain behavior enabled, held notes can continue according to pedal input, allowing you to sustain chords while changing hand position, layering phrases, or playing over the top. This is useful for broad pads, cinematic textures, sustained keys, and performance patches where the sound needs to linger naturally.

For shorter sounds, sustain pedal behavior can also be creatively useful. A pluck or digital key can become more atmospheric when sustained into delay or reverb. A split patch can hold a lower layer while you play an upper lead. A layered pad can become a harmonic bed that supports additional movement from the sequencer or arpeggiator.

Env Restart

The **Env Restart** button in the Mode Panel controls whether envelopes restart when new notes are played. When envelope restart is enabled, a newly played note starts its envelope from the beginning. This gives each note a clear and consistent attack. It's useful for plucks, basses, keys, sequenced parts, and any sound where the beginning of each note needs to be well defined.

When envelope restart is not enabled, envelopes may continue from their current state instead of restarting from the beginning, depending on the voice behavior and playing style. This can create smoother transitions, especially for legato lines, pads, and sounds where repeated hard retriggering would feel too abrupt.

Musically, this is really a feel control. A bass line often benefits from clear envelope restarting because each note needs punch and definition. A slow pad may feel more natural when transitions are smoother. A lead may go either way: restart for precise articulation, or smoother behavior for connected phrases.

If a sound feels too choppy, check Env Restart. If it feels too soft or indistinct at the start of each note, check it again.



Env Full Cycle

The **Env Full Cycle** button in the Mode Panel determines whether envelopes are allowed to complete their full programmed shape once triggered. This can be useful for sounds where the envelope contour is an important part of the patch, even if the key is released quickly. For example, a percussive envelope, pitch sweep, filter motion, or evolving modulation shape may need to play through its full movement to create the intended effect.

With Full Cycle behavior enabled, an envelope can behave more like a triggered event. This is useful for percussion, sound effects, sequenced patterns, rhythmic modulation, and sounds where the contour itself is part of the musical gesture.

With Full Cycle disabled, envelope behavior is more directly tied to how long you hold the key. Release the key sooner, and the envelope moves into its release behavior sooner. This is often what you want for

expressive playing, pads, leads, and traditional keyboard parts.

The choice depends on the sound. If the envelope is shaping normal musical articulation, you may want it to respond closely to note length. If the envelope is creating a specific motion or event, Full Cycle can help preserve that gesture.



Envelopes and Oscillator Levels

One of the most powerful uses of envelopes in ESQ-1 is controlling the levels of individual oscillators through DCA 1, DCA 2, and DCA 3. This lets the harmonic makeup of a sound change over time before it reaches the filter.

For example, imagine a patch where OSC 1 provides the main sustained tone, OSC 2 adds a bright attack, and OSC 3 provides a slow-moving digital texture. An envelope can make OSC 2 appear only at the beginning of the note, giving the sound a sharp front edge. Another envelope can fade OSC 3 in gradually, so the sound becomes more complex as it sustains.

This kind of programming is very different from simply filtering a static oscillator mix. The filter is receiving a changing blend of waveforms, so the whole sound evolves from the inside. For ESQ-1 programming, this is one of the best tricks. It’s how you can make digital waves become more animated and expressive.

Envelopes and the Filter

Using an envelope to control filter cutoff is a classic subtractive synthesis techniques, and it works well on ESQ-1. A fast filter envelope can create bright attacks for basses, plucks, keys, and brass-like sounds. A slower envelope can make a pad develop gradually. A more dramatic envelope can create sweeps, effects, and animated digital textures.

Because the ESQ-1 uses digital waveforms, filter envelopes can reveal different parts of a wave over time. A bright, complex wave may begin with a sharp attack, then settle into a warm body. A darker wave may open gradually into something more vocal or brassy. A metallic wave may become more playable when the filter envelope controls how much of its edge appears.

For musical programming, set the filter cutoff first so the sustained tone feels right. Then add envelope modulation to create the movement into or away from that tone. This usually works better than opening the filter all the way and wondering why the envelope isn’t doing anything dramatic. A filter needs room to move.

Envelopes and Pitch

Envelopes can also be used to modulate oscillator pitch. This is useful for both musical and special-effect purposes. A small, fast pitch envelope can add a subtle attack transient, making a sound feel more percussive or expressive. A downward pitch movement can give drums, basses, and effects a stronger impact. A larger pitch sweep can create sci-fi effects, risers, drops, or classic sync-style motion when used with oscillator sync.

For musical sounds, keep pitch envelope amounts small unless you want the pitch movement to be obvious. A tiny pitch snap at the beginning of a note can add life without making the sound feel out of tune. Larger movements are better for effects, percussion, and experimental textures.

Envelopes and Layered Sounds

Because Cherry Audio’s ESQ-1 has two fully independent layers, envelope programming becomes even more useful. Each layer can have its own envelope behavior. One layer might have a fast, percussive

attack, while the other fades in slowly. One might release quickly, while the other lingers. One might use a filter envelope for brightness, while the other stays darker and steady.

This is a powerful way to build sounds that feel larger than a single patch. A layered key can have a bright digital attack on one layer and a warm sustained body on the other. A split patch can use tight envelopes for a left-hand bass and smoother envelopes for a right-hand pad or lead. A Motion-based preset can use envelopes to make rhythmic parts more articulate while sustained layers provide atmosphere.

When a layered preset sounds too busy, solo each layer and check the envelopes. Often the problem is not the waveform or the effects. It’s that both layers are trying to speak at the same time, in the same way, with the same shape. Give each layer a different envelope role and the sound usually opens up.

Practical Envelope Examples

For a **warm pad**, use ENV 4 with a slower attack, a high sustain level, and a longer release. Add a slow filter envelope if you want the sound to brighten gradually as it fades in. If the pad feels too static, use another envelope to slowly introduce the level of a brighter oscillator.

For a **digital pluck**, use a fast attack, quick decay, low sustain, and short-to-medium release. A filter envelope can create the bright initial snap, while ENV 4 controls how quickly the note falls away. This works especially well with delay, where the envelope keeps the original note tidy and lets the echoes provide space.

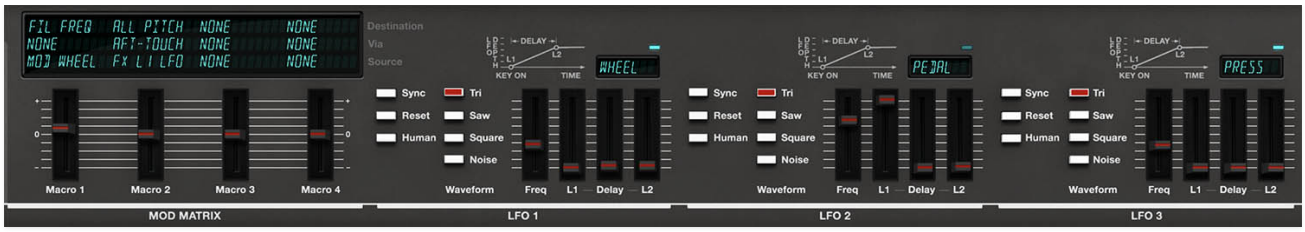
For a **hybrid bass**, keep ENV 4 tight and controlled. Use a fast attack and a release that suits the tempo of the part. Then use a filter envelope to add a quick brightness burst at the beginning of each note. If the bass needs more definition, use an envelope to briefly raise the level of a brighter oscillator.

For a **brass-like patch**, use an envelope that opens the filter quickly but not instantly. Real brass doesn’t usually appear out of nowhere like a light switch. Give the attack a little shape, let the filter settle, and use ENV 4 to support the phrase with a strong sustain.

For an **evolving texture**, think beyond volume. Use ENV 4 to create the overall fade-in and release, but use ENV 1, ENV 2, or ENV 3 to change oscillator levels, filter cutoff, or pitch over time. The goal is a sound that continues revealing new color after the note begins.

An Envelope Exercise

- Start with a single-layer sound in Whole mode. Use one oscillator and choose a waveform with a clear tone. Open the filter enough to hear the wave clearly.
- Now adjust ENV 4. Start with a fast attack, medium sustain, and short release. Play a few notes. Then lengthen the attack and notice how the sound becomes softer. Lengthen the release and notice how the sound begins to linger. Lower the sustain and shorten the decay stages to create a more plucked shape.
- Next, assign or adjust an envelope to control the filter. Set the filter cutoff to a moderately low position, then use the envelope to open it at the start of the note. Listen to how the brightness changes independently from the volume.
- Finally, use an envelope to bring in another oscillator through its DCA. Let the second oscillator appear only at the attack, or fade in slowly after the note begins. This shows how envelopes can shape not only volume and brightness, but the actual harmonic ingredients of the sound.
- Once you hear that, the ESQ-1 envelope system starts to make much more sense. You’re not just drawing volume shapes. You’re composing the internal motion of the patch.



Modulation, LFOs, Macros, and MPE

A static sound can be beautiful. But on a synthesizer as deep as the Ensoniq ESQ-1, the real magic often begins when the sound starts evolving and changing.

Modulation is how you make that happen. It lets one part of the instrument control another part. An envelope can open the filter. An LFO can add vibrato. Velocity can make harder-played notes brighter. Polyphonic aftertouch and MIDI Polyphonic Expression (MPE) allows supported controllers add expressive per-note movement. This is how the ESQ-1 shines at being a real performance instrument.

The original ESQ-1 was known for its unusually flexible modulation system, especially for its era. Cherry Audio's ESQ-1 keeps that spirit intact while giving you a clearer, more visual way to work. Instead of thinking of modulation as something hidden in a tiny display, you can see assignments, use Macro sliders, work with three LFOs, and connect performance gestures to meaningful musical changes.

What Is Modulation?

A modulation system has two basic parts: **sources** and **destinations**.

- A **source** creates movement or control. Examples include LFOs, envelopes, velocity, aftertouch, Macro sliders, pedals, and MPE gestures.
- A **destination** is the parameter being controlled. Examples might include oscillator pitch, oscillator level, filter frequency, amplifier level, pan, effect amount, or another assignable parameter.

A simple modulation assignment might be:

- **LFO 1 → Oscillator Pitch.** This creates vibrato.

Another might be:

- **Velocity → Filter Frequency.** This makes harder-played notes brighter.

A more performance-oriented assignment might be:

- **Mod Wheel→ Filter Frequency.** This lets the Mod Wheel open or close the filter to brighten or darken a sound.

This is the basic idea behind modulation: use one musical action or movement to control another part of the sound.

Tip: Start with one obvious modulation assignment before building complex patches. A single well-chosen routing is often more musical than five routings all fighting for the same spotlight.

The Mod Page

Click the **Mod** mode button in the Keyboard view to open the main modulation/LFO panel. This page contains the **Mod Matrix**, four **Macro** sliders, and **LFO 1**, **LFO 2**, and **LFO 3**.



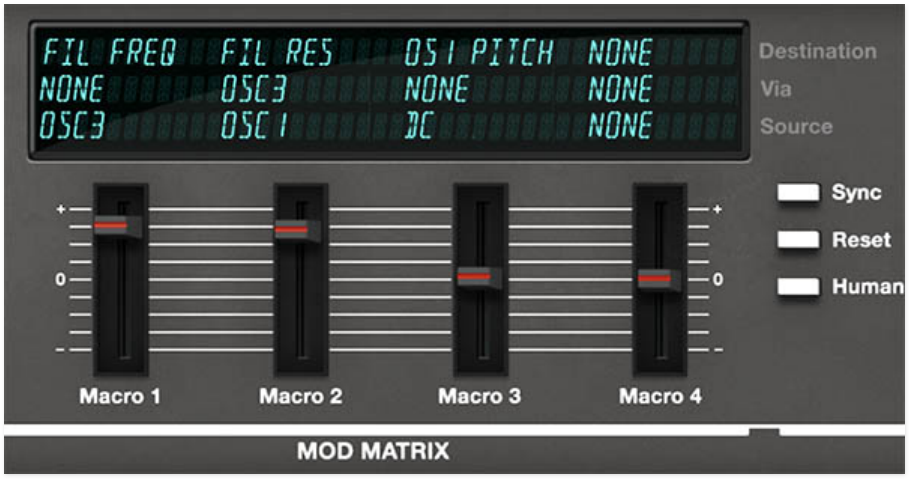
The LFOs are repeating modulation sources. They can create vibrato, tremolo, filter movement, rhythmic pulsing, pitch drift, animated textures, and other repeating changes.

ESQ-1's LFOs are more flexible than basic LFOs because each one includes its own level contour. This means an LFO doesn't have to start at full strength and stay there. It can fade in gradually, fade out, begin subtly and grow stronger, or start boldly and settle down.

Tip: Think of the Mod page as the place where you give the patch behavior. The oscillators create tone. The modulation system makes it move.

The Mod Matrix

The **Mod Matrix** display shows modulation assignments for the current layer. This is where you connect modulation sources to destinations and control how strongly those sources affect the sound.



Each Mod Matrix row includes:

- **Destination** – The parameter being controlled.
- **Via** – An optional controller or source that scales the modulation.
- **Source** – The modulation source creating the movement or control.

The four **Macro** sliders beneath the display correspond to the four Mod Matrix rows. Each Macro sets the amount for its matching modulation slot.

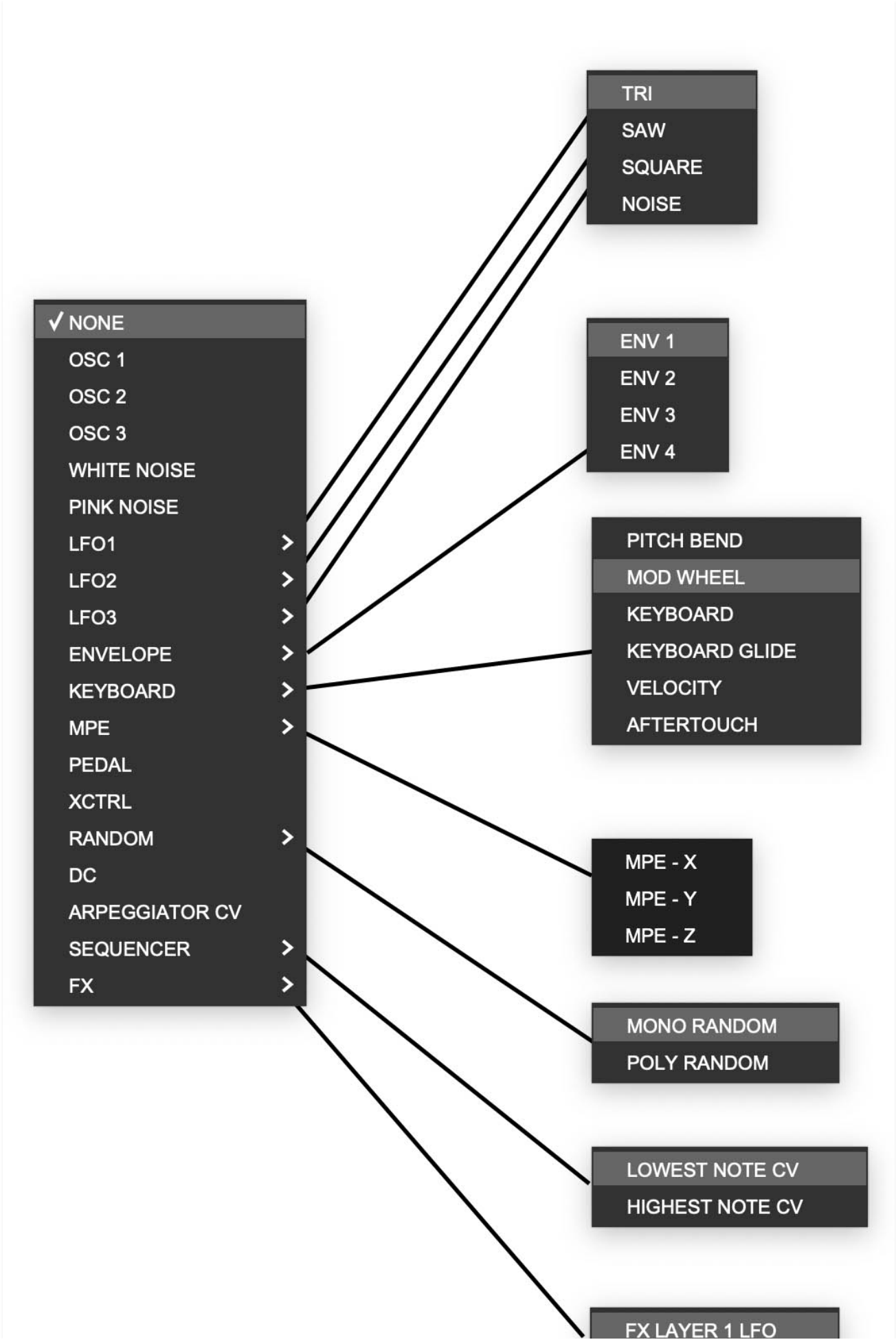
For example:

Macro 1 controls the modulation amount for **Mod Matrix slot 1**.
Macro 2 controls the modulation amount for **Mod Matrix slot 2**.
Macro 3 controls the modulation amount for **Mod Matrix slot 3**.
Macro 4 controls the modulation amount for **Mod Matrix slot 4**.

This makes the Macro sliders less like generic "performance knobs" and more like direct modulation amount controls. They determine how much each Mod Matrix assignment affects the sound.

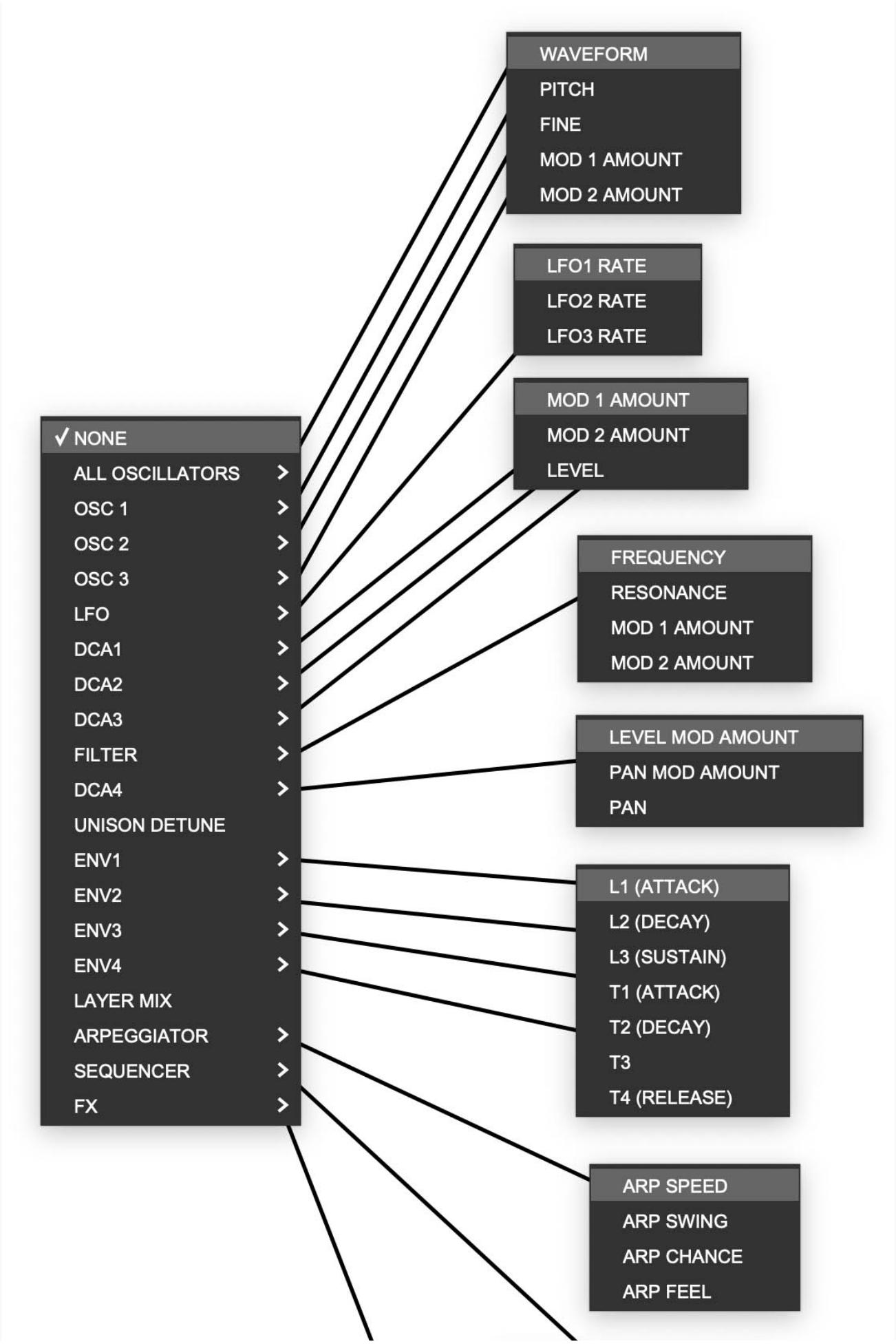
Tip: If a preset changes when you move a Macro slider, check the matching Mod Matrix row. That row tells you what the Macro is actually controlling.

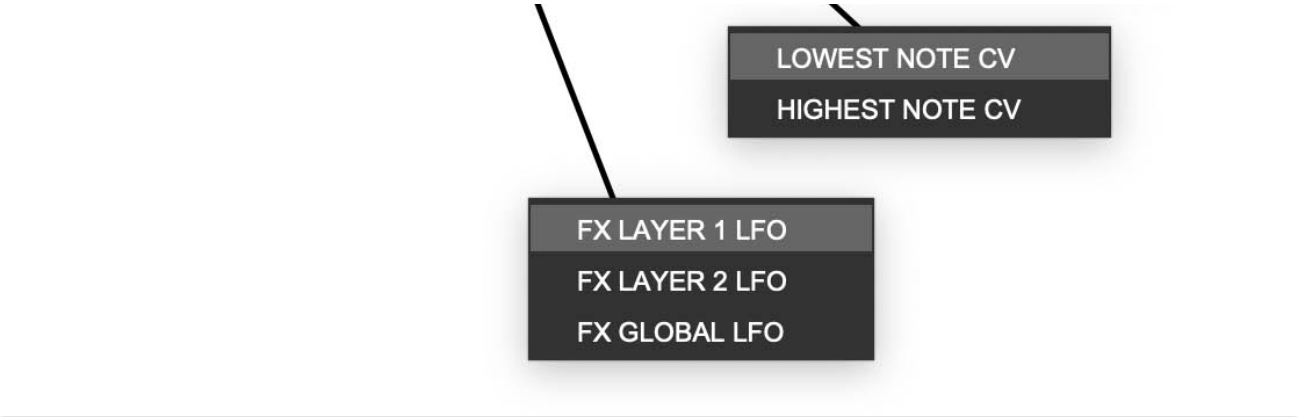
Here are the mod sources found in the Mod Matrix


✓ NONE
OSC 1
OSC 2
OSC 3
WHITE NOISE
PINK NOISE
LFO1
LFO2
LFO3
ENVELOPE
KEYBOARD
MPE
PEDAL
XCTRL
RANDOM
DC
ARPEGGIATOR CV
SEQUENCER
FX
TRI
SAW
SQUARE
NOISE
ENV 1
ENV 2
ENV 3
ENV 4
PITCH BEND
MOD WHEEL
KEYBOARD
KEYBOARD GLIDE
VELOCITY
AFTERTOUCH
MPE - X
MPE - Y
MPE - Z
MONO RANDOM
POLY RANDOM
LOWEST NOTE CV
HIGHEST NOTE CV
FX LAYER 1 LFO



Here are the mode destinations found in the Mod Matrix


✓ NONE
ALL OSCILLATORS
OSC 1
OSC 2
OSC 3
LFO
DCA1
DCA2
DCA3
FILTER
DCA4
UNISON DETUNE
ENV1
ENV2
ENV3
ENV4
LAYER MIX
ARPEGGIATOR
SEQUENCER
FX
WAVEFORM
PITCH
FINE
MOD 1 AMOUNT
MOD 2 AMOUNT
LFO1 RATE
LFO2 RATE
LFO3 RATE
MOD 1 AMOUNT
MOD 2 AMOUNT
LEVEL
FREQUENCY
RESONANCE
MOD 1 AMOUNT
MOD 2 AMOUNT
LEVEL MOD AMOUNT
PAN MOD AMOUNT
PAN
L1 (ATTACK)
L2 (DECAY)
L3 (SUSTAIN)
T1 (ATTACK)
T2 (DECAY)
T3
T4 (RELEASE)
ARP SPEED
ARP SWING
ARP CHANCE
ARP FEEL



Modulation Amount and Polarity

Most modulation assignments include an amount, and that amount can often be positive or negative.

A **positive** amount moves the destination in one direction.
A **negative** amount moves it in the opposite direction.

For example, positive envelope modulation to filter cutoff usually opens the filter as the envelope rises. Negative modulation can pull the cutoff in the opposite direction.

Positive velocity-to-filter modulation can make harder-played notes brighter. Negative velocity-to-filter modulation can make harder-played notes darker.

Tip: Negative modulation is easy to overlook, but it’s extremely useful. It lets one source push different destinations in opposite directions, which can make a patch feel more intentional and expressive.

The Three LFOs

ESQ-1 includes three independent LFOs: **LFO 1**, **LFO 2**, and **LFO 3**.

Each LFO can be used as a modulation source. One might provide delayed vibrato, another might move the filter, and a third might add rhythmic or random motion to oscillator level, pan, or another destination.

A useful programming approach is to give each LFO a job:

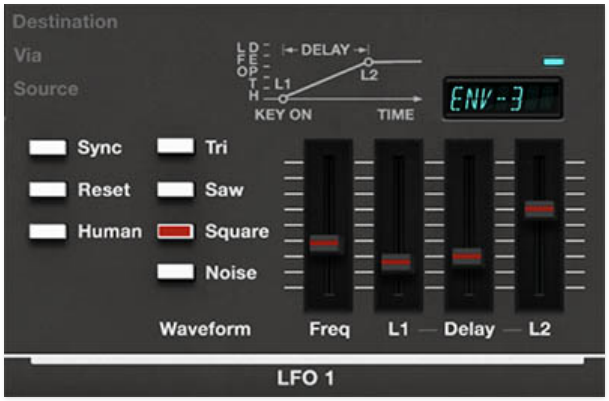
• Use one LFO for pitch or vibrato.
• Use one LFO for filter or timbral movement.
• Use one LFO for rhythmic, random, or special-effect motion.

Tip: Naming the job in your head helps keep complex patches sane. “LFO 1 is vibrato, LFO 2 is filter motion, LFO 3 is weirdness” is a surprisingly effective filing system.



LFO Controls

Each of ESQ-1's three LFOs has its own controls for waveform, speed, sync, reset behavior, human variation, level contour, and modulation depth.



Controls:

• **Sync** – Locks the LFO timing to the instrument or host tempo. When Sync is off, the LFO runs freely according to the **Freq** control. When Sync is on, the LFO follows tempo-based timing divisions.

• **Reset** – Determines whether the LFO restarts its cycle when a new note is played. Enable Reset for consistent note-to-note behavior. Turn it off when you want freer, more organic movement.

• **Human** – Adds variation to the LFO behavior. On the original ESQ-1, Human added a random element to LFO frequency, making the modulation feel less rigid and mechanical.

• **Waveform** – Selects the LFO shape: **Tri**, **Saw**, **Square**, or **Noise**.

• **Freq** – Sets the LFO speed. Lower settings create slow movement. Higher settings create faster vibrato, tremolo, pulsing, or special effects.

• **L1** – Sets the starting LFO level when a note begins.

• **Delay** – Controls how quickly the LFO level moves from **L1** to **L2**.

• **L2** – Sets the final LFO level after the Delay transition. The LFO remains at this level while the key is held.

• **Mod Source Display** – Selects a modulation source that can further control the LFO output level. This is useful for mod wheel vibrato, pressure-controlled modulation, or more complex motion.

Tip: The LFO waveform creates the movement shape. **L1**, **Delay**, and **L2** shape how much of that movement is heard over time.

LFO Waveforms

The LFO waveform determines the shape of the modulation movement.

• **Tri** – Creates smooth rising and falling motion. Useful for vibrato, tremolo, panning, filter sweeps, and gentle animation.

• **Saw** – Creates ramp-style movement. Useful for repeating rises, filter ramps, pitch sweeps, pulsing effects, and directional motion. For a falling saw effect, use a negative modulation amount at the destination.

• **Square** – Jumps between values. Useful for trills, stepped filter movement, rhythmic gating, abrupt tremolo, and obvious electronic effects.

• **Noise** – Creates random modulation. Useful for pitch instability, filter flicker, noisy attacks, chaotic motion, and animated textures that shouldn't feel predictable.

Tip: For musical vibrato, start with **Tri**. For rhythmic jumps, try **Square**. For unpredictable movement, try **Noise.**



Modulating an LFO

Each LFO can have its output level controlled by another modulation source. The selected modulation source is shown in the small display near the LFO controls.

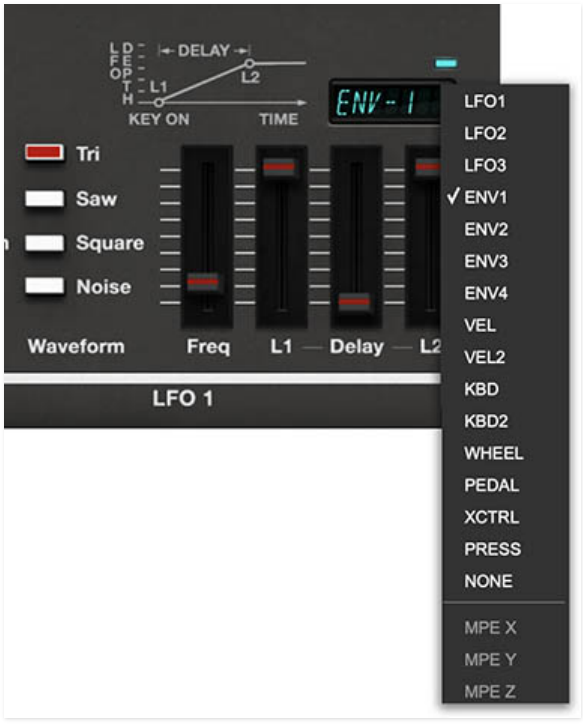
This modulation is added to the depth created by **L1**, **Delay**, and **L2**. In other words, L1, Delay, and L2 define the LFO's own level contour, and the selected source can further increase or shape the LFO's output.

This is especially useful for performance control.

Example: Mod Wheel Vibrato

1. Route an LFO to oscillator pitch.
2. Choose a smooth waveform, such as **Tri**.
3. Set the LFO to a musical vibrato speed.
4. Set **L1** low so vibrato doesn't start automatically.
5. Select **Wheel** as the LFO's modulation source.
6. Move the mod wheel to bring in vibrato while playing.

Tip: This is a more expressive approach than permanent vibrato. The note can begin clean, then the player decides when to add movement.



LFO Modulation Examples

Delayed Vibrato

Delayed vibrato is one of the most useful LFO techniques on ESQ-1. It lets a note begin cleanly, then adds vibrato after the sound has started.

Try this:

1. Assign **LFO 1** to oscillator pitch.
2. Choose **Tri** as the LFO waveform.
3. Set **Freq** to a moderate vibrato rate.
4. Set **L1** low.
5. Set **L2** to the desired vibrato depth.
6. Adjust **Delay** so the vibrato fades in after the note begins.

This works well for leads, flute-like sounds, vocal-style patches, strings, and expressive solo lines.

Tip: If the vibrato feels too obvious, lower L2. If it arrives too soon, adjust Delay for a slower transition. If it feels too mechanical, try enabling Human.

Tremolo and Level Movement

An LFO routed to amplifier level or oscillator level can create tremolo or pulsing motion. For smooth tremolo, use a triangle waveform and a moderate speed. For choppier motion, use square. For rhythmic pulsing, enable Sync and use a tempo-based rate.

On ESQ-1, level modulation can be especially interesting when applied to individual oscillator DCAs. Modulating **DCA 1**, **DCA 2**, or **DCA 3** changes the level of one oscillator before the filter. This means the harmonic blend feeding the filter changes over time.

Tip: Use modulation to move the ingredients, not just the finished sound. A bright oscillator can shimmer in and out while the rest of the patch stays steady.

Filter Movement

LFOs are excellent for moving the filter. Slow filter movement can make pads and textures breathe. Moderate movement can add groove to chord parts. Synced movement can create rhythmic patterns. Noise movement can add grit and instability.

Try this:

1. Set the filter cutoff slightly darker than you want the final sound to be.
2. Route an LFO to filter cutoff.
3. Use a slow or moderate LFO speed.
4. Set a modest modulation amount.
5. Increase depth or enable Sync for more obvious rhythmic movement.

Tip: Give the filter room to move. If cutoff is already fully open or nearly closed, LFO movement may have little useful effect.

Pitch Modulation

Pitch modulation can be subtle, expressive, or completely unhinged. ESQ-1 is happy to help either way.

Small pitch modulation creates vibrato, drift, and ensemble-like motion. Larger amounts can create sirens, risers, drops, trills, special effects, unstable digital textures, and animated sync-style tones.

Good uses:

• Triangle LFO to pitch for vibrato
• Slow LFO to pitch for drift
• Square LFO to pitch for trills
• Saw LFO to pitch for ramps
• Noise LFO to pitch for instability
• Subtle pitch modulation on one oscillator for pad movement

Tip: For musical vibrato, use small amounts. For basses, be careful: pitch movement in the low register can quickly make the sound feel unfocused.

Pedal and XCtrl

The Keyboard view includes **Pedal** and **XCtrl** MIDI assignment controls. These allow external performance controls to become modulation sources.

A pedal can be excellent for expressive changes while both hands remain on the keyboard. Use it to open the filter, fade in a layer, increase reverb, control volume, or bring in modulation.

XCtrl can be used as an additional external controller source. Depending on your MIDI setup, this might be assigned to a knob, slider, wheel, or other continuous controller.

Tip: A strong performance setup might use velocity for brightness, aftertouch for vibrato, a pedal for filter opening, and a Macro for effects intensity. That gives you several expressive dimensions without making the patch feel complicated.

Velocity as Modulation

Velocity is one of the most useful modulation sources because it responds directly to how hard you play.

A simple velocity-to-filter assignment can make a sound brighter when played harder. This works well for keys, plucks, basses, brass-like sounds, and leads.

Velocity can also control oscillator levels. For example, a bright waveform can become more prominent only when you play harder. This gives the patch a sharper attack at higher velocities while keeping softer notes warmer.

Good uses for velocity:

• Brightness response
• Oscillator level changes
• Sharper attacks
• More expressive keys and plucks
• Dynamic filter movement
• Louder or more intense effects response

Tip: If velocity only makes the sound louder, the patch may still feel flat. Try using velocity to change brightness, oscillator mix, or attack character.

Aftertouch and Pressure

Aftertouch, or pressure, lets you add expression after a note is already held. Depending on your controller, this may be channel aftertouch or polyphonic/MPE-style pressure.

Pressure is excellent for vibrato, filter opening, brightness, level swells, oscillator mix changes, and effects intensity. It works especially well on sustained sounds such as leads, pads, strings, choirs, and drones.

Good uses for pressure:

• Pressure to vibrato depth
• Pressure to filter cutoff
• Pressure to oscillator level
• Pressure to LFO depth

• Pressure to delay or reverb mix
• Pressure to layer intensity

Tip: A good pressure assignment feels like expression, not a sound explosion. Use enough to make the patch respond, but not so much that every sustained note turns into a dramatic incident.

KYBD and KYBD 2 Mod Sources

The **KYBD** and **KYBD 2** modulation sources use keyboard position as a modulation source. In other words, the note you play determines the modulation value. Lower notes produce one value, higher notes produce another.

This is useful when you want a parameter to change gradually across the keyboard. For example, you might make higher notes brighter, reduce the level of a waveform in the lower register, or make modulation depth increase as you play up the keyboard.

KYBD provides a positive-going keyboard tracking signal. As you play higher notes, the modulation value increases. This is useful for classic keyboard tracking behavior, such as opening the filter more on higher notes.

KYBD 2 uses a different curve that moves from negative values in the lower keyboard range to positive values in the upper range. Around the middle of the keyboard, the modulation effect is near zero. This makes it useful for creating behavior that changes around a center point: lower notes can reduce a parameter, while higher notes increase it.

Tip: Use **KYBD** when you want a parameter to increase as you play higher notes. Use **KYBD 2** when you want the lower and upper keyboard ranges to push a parameter in opposite directions. For example, KYBD 2 can make low notes darker while high notes become brighter, or reduce oscillator level below middle C while increasing it above middle C.

DC Mod Source

DC is a constant modulation source. It doesn’t cycle like an LFO, change over time like an envelope, or respond to your playing like velocity or pressure. Instead, it provides a steady value that can be used to offset a destination.

The amount setting determines how much offset is applied. A positive amount pushes the destination in one direction. A negative amount pulls it in the opposite direction.

This can be useful when you want to nudge a parameter through the modulation system rather than changing its main control directly. For example, DC can be used to raise or lower an oscillator level, bias a filter cutoff, shift a modulation depth, or create a fixed offset before another modulation source does its work.

Good uses for DC:

• Adding a fixed offset to a modulation destination
• Biasing filter cutoff through the Mod Matrix
• Raising or lowering an oscillator DCA level
• Creating a static modulation amount for testing a routing
• Pushing a parameter in the opposite direction with negative modulation
• Setting up a “baseline” value before adding moving modulation

Tip: Think of **DC** as a steady hand on a control. It doesn’t move by itself, but it can push a destination up or down by a fixed amount. If an LFO is motion and an envelope is shape, DC is offset.

Macro Motion and Sequenced Modulation

The four Macro sliders normally set the modulation amounts for the four Mod Matrix slots. **Macro Motion** takes that idea further by letting the Sequencer change those modulation amounts step by step.

When **Macro Motion** is enabled in the Sequencer and **Mod Source** is selected, the Sequencer no longer has to trigger notes. Instead, it can act as a modulation sequencer, varying the amount of modulation applied by one of the four Mod Matrix slots.



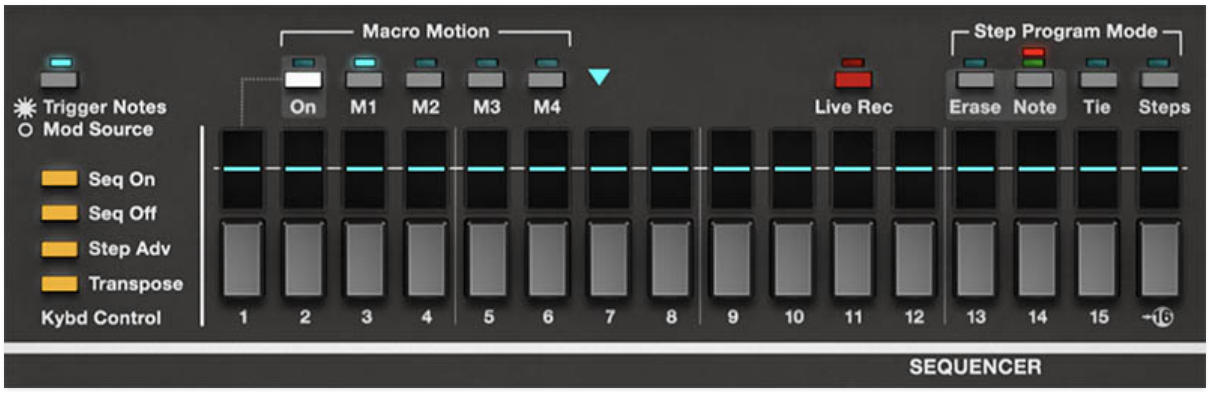
Controls:

- **M1** – Animates the amount for Mod Matrix slot 1.
- **M2** – Animates the amount for Mod Matrix slot 2.
- **M3** – Animates the amount for Mod Matrix slot 3.
- **M4** – Animates the amount for Mod Matrix slot 4.

For example, if Mod Matrix slot 1 routes **ENV 1** to filter cutoff, enabling Macro Motion for **M1** lets the Sequencer vary the strength of that filter envelope movement on each step. Some steps can have a sharp, bright filter sweep, while others have little or none.

Refer to the "**Arpeggiator and Sequencer**" chapter for details on how to use the Sequencer to control Macro Modulation.

Tip: The Mod Matrix defines what is being modulated. Macro Motion defines how the modulation amount changes over time.



Macro Motion Shape Menu

The turquoise triangle near the Macro Motion section opens a menu of preset motion shapes. These can quickly create step-based modulation patterns such as ramps, saws, alternating high/low shapes, waves, and rhythmic patterns.

Use these as starting points, then adjust individual steps by hand if needed.

Good uses:

- Ramp shapes for gradual builds
- Saw shapes for repeating rises or drops
- Alternating high/low shapes for pulsing motion
- Wavy shapes for smoother movement
- Rhythm shapes for more complex step emphasis

Tip: Load a preset shape, listen, then edit. The shapes are starting points. Refer to the "**Arpeggiator and Sequencer**" chapter for details on how to use the Sequencer to control Macro Modulation.



MPE

MPE, short for **MIDI Polyphonic Expression**, allows compatible controllers to send continuous, expressive touch control for individual notes instead of applying the same pitch bend, pressure, or controller movement to the entire instrument (generally known as channel aftertouch). That means one note in a chord can bend, brighten, or respond to pressure while the other notes remain unchanged.

To leverage the expanded potential of MPE, you need an MPE-compatible controller such as those from companies like Expressive E, Roli, Roger Linn Design, Haken Audio, Ableton, and others.

In previous Cherry Audio instruments such as Dreamsynth, Sines, Miniverse, DCO-106 and others, the MPE implementation required the user to change to MPE mode in Settings, then map the controls in the MIDI MPE Control Tab.

In ESQ-1, MPE is now more integrated into the modulation system. To use MPE, select **MPE** as the current **Voice Mode**. If MPE is not selected in the Voice Mode display, ESQ-1 won’t respond to MPE performance data from your controller, even if the controller is transmitting MPE correctly.

In MPE mode, ESQ-1 responds to up to 15 polyphonic voices per layer (one MIDI channel is reserved for control information). Note that MPE mode is individually configured and assigned on a per layer basis.

Once MPE is enabled, the Mod Matrix and the Modulation Panels for OSC, DCA, LFO, and Filter allow you to freely assign **MPE X**, **MPE Y**, and **MPE Z** as modulation sources.

Typical MPE sources:

• **MPE X** – Often associated with left/right movement, commonly used for per-note pitch bends.

• **MPE Y** – Often associated with forward/backward or vertical touch-position movement, commonly used for timbral control.

• **MPE Z** – Usually associated with pressure.

Tip: Voice Mode enables MPE. Assignments in Mod Matrix and/or the Modulation Panels for OSC, DCA, LFO, and Filter determine what those MPE gestures actually do.

Note: Other MPE dimensions such as strike and release are not directly supported in ESQ-1.

Using MPE Musically

MPE is most powerful when used musically rather than as a technical demonstration.

Try these approaches:

• For pads, route **MPE Z** to filter cutoff or oscillator level so individual notes bloom inside a chord.

• For leads, route **MPE X** to pitch and **MPE Z** to vibrato depth or filter brightness.

• For digital keys, use MPE pressure or slide to add brightness, tremolo, or subtle pitch movement.

• For evolving textures, assign MPE gestures to filter cutoff, oscillator mix, formant-wave level, LFO depth, or effects mix.

Tip: The most musical MPE assignments usually feel like natural gestures: slide to bend or brighten, press to intensify, move along the playing surface to change tone.

A Note on MPE Controllers

Cherry Audio's ESQ-1 includes several MPE presets, which were designed using the 2026 Osmose CE controller by Expressive E. **Consider the MPE presets included with ESQ-1 as practical examples and starting points.**

As MPE technology is still in its early stages, we've noticed that different manufacturers like Roli, Keith McMillan, Haken, and Expressive E have varying default implementations and interpretations of how MPE should function with their hardware. Some presets may require fine-tuning to align with your hardware or to suit your personal preferences for expressive performance.

For example, when using MPE to express filter frequency or pitch more effectively with certain controllers, you may need to increase some parameter values in the preset. Some controllers automatically map the MPE X dimension to pitch, so you might have to disable this mapping in the presets and save (overwrite) them to work better with your gear. Additionally, you may find you need to adjust the settings for the lower and upper ranges in the controller's configuration software. Consult your controller documentation for further details.

Practical Modulation Recipes

Delayed Vibrato Lead
Route an LFO to oscillator pitch. Use a smooth waveform, moderate frequency, low L1, higher L2, and adjust Delay so vibrato fades in after the note begins. Add pressure or a Macro to control overall vibrato amount.

Expressive Filter Pad
Route velocity lightly to filter cutoff so harder notes start brighter. Route pressure to filter cutoff or LFO depth so held notes can bloom. Add a slow LFO to the filter with Human enabled for gentle variation.

Moving Digital Texture
Use one LFO for slow filter motion, another for subtle oscillator pitch drift, and an envelope to fade in the

level of a complex digital wave. The sound begins clearly, then develops harmonic motion as it sustains.

Rhythmic Sequence Patch
Use synced LFOs for filter or level movement, plus Macro Motion for step-based modulation intensity. Enable Reset if you want each note or step to behave predictably.

Velocity-Layered Key
Route velocity to the level of a brighter oscillator. Soft playing produces a round tone, while harder playing adds attack and sparkle.

MPE Pad
Route per-note pressure to filter cutoff and subtle oscillator level. Individual notes within a chord can brighten or shift independently, creating expressive movement that would be dif

Avoiding Modulation Clutter

Because ESQ-1 offers many modulation possibilities, it’s easy to overdo it. A patch with too much modulation can feel unfocused, especially if several sources are moving the same destination at once.

When a sound feels chaotic, simplify. Turn down one modulation amount at a time. Check whether multiple LFOs are moving the filter. Check whether envelopes and Macros are fighting over the same parameter. Check whether oscillator levels are changing so much that the filter never receives a stable tone.

Tip: A good patch often has one or two main movements, plus a few subtle supporting gestures. Not everything needs to move. Stillness gives motion something to contrast against.

Building Expressive Patches

When designing a patch, think in terms of performance questions:

• What should happen when you play harder?
• What should happen when you hold a note?
• What should happen when you move a Macro?
• What should happen when you press into the keyboard?
• What should happen over time without touching anything?

A bass might need velocity brightness, tight envelope response, and very little LFO movement. A pad might need slow LFO drift, pressure-controlled brightness, and a Macro for adding shimmer. A lead might need delayed vibrato, aftertouch control, and a filter Macro. A sequence might need synced modulation and predictable LFO reset behavior.

Tip: Start with the musical role, then build the modulation around it. The result will feel intentional rather than busy.

Simple Modulation Exercise

Here’s a quick way to learn the basic modulation workflow:

- Start with a simple single-layer patch in **Whole** mode.
- Choose one oscillator waveform, set a comfortable filter position, and shape the sound with **ENV 4**.
- Go to **Mod** mode and set **LFO 1** to a smooth waveform such as a sine wave.
- Assign **LFO 1** lightly to oscillator pitch for vibrato.
- Set **L1** low, **L2** slightly higher, and adjust **Delay** so the vibrato fades in after the note begins.
- Assign velocity to filter cutoff. Play softly, then harder, and listen to how the sound responds.
- Assign a Macro to filter cutoff or effects mix. Move the Macro while playing and listen for a useful performance gesture.
- Try enabling **Human** on the LFO and listen to whether the modulation feels less rigid.

This exercise covers the heart of ESQ-1 modulation: repeating motion, performance response, and hands-on control. Once those ideas are clear, deeper routings become much easier to explore.

Arpeggiator and Sequencer

The **Motion** view is where ESQ-1 turns held notes, programmed steps, and modulation routings into musical movement. It contains two closely related tools: the **Arpeggiator** and the **Sequencer**.



The **Arpeggiator** takes the notes you play and turns them into repeating patterns.

The **Sequencer** lets you program up to 16 steps (x 4 patterns) of notes, chords, rests, ties, or modulation changes. Together, they can create bass lines, pulsing chords, animated textures, evolving modulation patterns, and rhythmic phrases that can be played, transposed, reshaped, and performed in real time.

Think of the Motion view as ESQ-1's movement engine. You can use it to generate ideas, drive patterns, animate modulation, or turn a simple sound into something that feels like a performance.



Motion View Overview

The Motion view is divided into two main areas.

The **Arpeggio** section is on the left. It creates arpeggiated patterns from notes you play or hold.

The **Sequencer** section occupies the center and right side of the page. It contains step buttons, playback controls, keyboard control options, Macro Motion, pattern selection, programming tools, timing controls, and layer start/stop buttons.

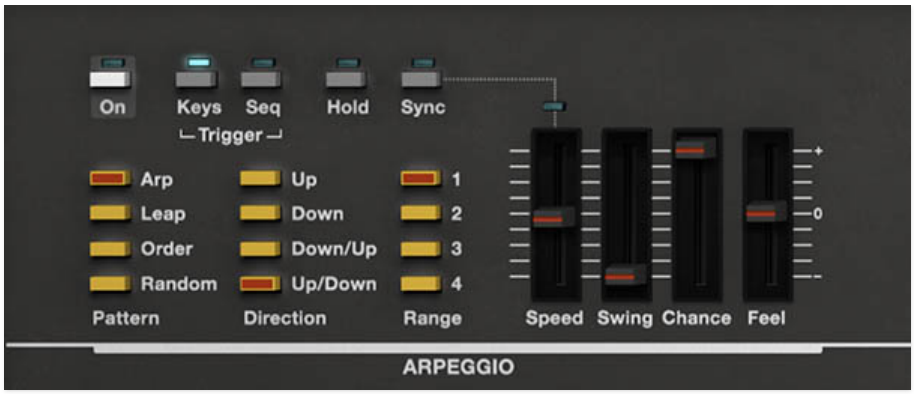
The basic difference is simple:

- The Arpeggiator transforms notes you play into patterns.
- The Sequencer stores step-based information and plays it back.

The Sequencer can also do something especially useful: it can function as a **modulation sequencer** instead of a note sequencer. That means it doesn't always have to play notes. It can also create step-based changes in modulation amount, allowing a held sound to pulse, brighten, shift, or evolve rhythmically.

Tip: Use the Arpeggiator when you want played notes transformed into a pattern. Use the Sequencer when you want to program the pattern yourself, or when you want the pattern to control modulation instead of notes.

Arpeggiator



The **Arpeggiator** turns held notes into repeating patterns. Hold a chord, and the arpeggiator plays its notes one at a time according to the selected trigger, pattern, direction, range, speed, and groove settings.

This is useful for classic pulsing synth lines, bass patterns, rhythmic comping, cascading melodic figures, and happy musical accidents caused by one chord inspiring new ideas.

Arpeggiator Controls

Controls:

• **On** – Turns the arpeggiator on or off. When enabled, played or held notes are processed by the arpeggiator. When disabled, notes play normally.

• **Trigger: Keys / Seq** – Determines what drives the arpeggiator. **Keys** means the arpeggiator is triggered by notes you play or hold. **Seq** means the arpeggiator is driven by the Sequencer.

• **Hold** – Keeps the arpeggiator running after you release the keys. Play a new chord or note group to change the held pattern.

• **Sync** – Locks arpeggiator timing to the master tempo. In plug-in use, this follows your DAW tempo. In standalone use, it follows ESQ-1's internal tempo.

• **Pattern: Arp / Leap / Order / Random** – Chooses how the arpeggiator selects notes from the notes you're holding. **Arp** provides classic arpeggiator behavior. **Leap** creates wider note movement. **Order** plays notes in the order you entered them. **Random** plays held notes in unpredictable order.

• **Direction: Up / Down / Down-Up / Up-Down** – Determines the movement direction of the arpeggio.

• **Range: 1–4** – Sets how many octaves the arpeggiator spans. Lower ranges stay close to the notes you're holding. Higher ranges create wider, more dramatic movement.

• **Speed** – Controls how fast the arpeggiator plays. When Sync is enabled, Speed follows tempo-based divisions.

• **Swing** – Adds groove by shifting the timing of alternating steps.

• **Chance** – Controls the probability that notes will play. Lower settings skip more notes, creating gaps and variation.

• **Feel** – Adjusts the timing character of the arpeggio, helping the pattern feel more relaxed, more urgent, or less rigid.

Tip: Start with **Pattern: Arp**, **Direction: Up**, **Range: 1 or 2**, **Sync: On**, and a steady Speed. Once the basic pattern feels good, add Swing, Chance, or a wider Range for movement.

Using Trigger: Keys and Seq

The **Trigger** buttons determine whether the arpeggiator responds directly to your playing or follows the Sequencer.

Keys is the classic arpeggiator mode. Play or hold notes, and the arpeggiator cycles through them.

Seq lets the Sequencer drive the arpeggiator. This can create more complex rhythmic and melodic behavior because the sequencer provides structure while the arpeggiator adds pattern movement.

Tip: Use **Keys** when you want a traditional playable arpeggio. Use **Seq** when you want the sequencer and arpeggiator to interact.

Arpeggiator Ideas

Classic Synth Arp
Use **Arp**, **Up**, **Range 1 or 2**, **Sync On**, and a steady Speed. Add a little Swing if the pattern feels too stiff.

Cascading Digital Pattern
Use **Leap**, set Range to **3** or **4**, lower Chance slightly, and add delay. This works beautifully with bright waves and moderate filter movement.

Generative Motion
Use **Random** with Chance below maximum. Add delay or reverb so skipped notes create space and the effects fill in the gaps.

Hands-Free Performance
Enable **Hold**, then adjust filter cutoff, Macros, or effects while the arpeggio runs. This lets the arpeggiator behave more like a living performance part than a static pattern Sequencer.

Sequencer

The **Sequencer** is a 16-step pattern and motion engine. It can record and play back notes or chords, but it can also be used as a modulation sequencer. This dual role is central to understanding the Motion view.

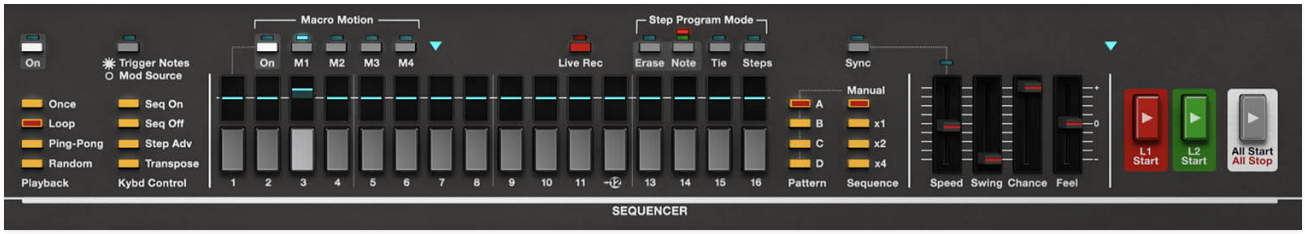
When **Trigger Notes** is selected, the Sequencer plays note events. Steps can contain notes, chords, rests, ties, and related musical step data.

When **Mod Source** is selected, note triggering is disabled, and the Sequencer acts as a modulation source instead. In this mode, the steps define modulation values rather than notes.

In other words:

Trigger Notes = the Sequencer plays notes.
Mod Source = the Sequencer animates modulation.

Tip: If a sequence is playing notes when you expected modulation, check whether **Trigger Notes** is selected. If nothing is triggering notes, check whether **Mod Source** is selected.



Sequencer Controls

Controls:

• **Trigger Notes / Mod Source** – Selects whether the Sequencer plays note events or acts as a modulation source. **Trigger Notes** enables note sequencing. **Mod Source** disables note triggering and lets the Sequencer create step-based modulation values.

• **Step Buttons 1–16** – Represent the steps in the pattern. In note sequencing, steps can contain notes, chords, rests, or ties. In modulation sequencing, steps can define modulation values.

• **Step Length** – Sets the active sequence length. Click the step number below a step button to set the sequence length. For example, clicking **12** creates a 12-step sequence.

• **Playback: Once / Loop / Ping-Pong / Random** – Determines how the sequence moves through its steps. **Once** plays the sequence one time. **Loop** repeats it. **Ping-Pong** plays forward and backward. **Random** plays steps unpredictably.

• **Keyboard Control: Seq On / Seq Off / Step Adv / Transpose** – Determines how the keyboard interacts with the Sequencer. **Seq On** starts playback from the keyboard. **Seq Off** stops playback from the keyboard. **Step Adv** advances one step at a time from key presses. **Transpose** lets you transpose the running sequence from the keyboard.

• **Live Rec** – Records performance into the Sequencer in real time.

• **Step Program Mode: Erase / Note / Tie / Steps** – Provides tools for entering and editing sequence data step by step.

• **Pattern A / B / C / D** – Selects one of four pattern slots. Each pattern can store its own sequence data.

• **Sequence: Manual / x1 / x2 / x4** – Determines how patterns advance or repeat. **Manual** lets you select patterns manually. **x1**, **x2**, and **x4** determine how many times a pattern repeats before moving to the next pattern.

• **Sync** – Locks sequencer timing to the master tempo. In plug-in use, this follows your DAW tempo. In standalone use, it follows ESQ-1's internal tempo.

• **Speed** – Controls playback rate. When Sync is enabled, Speed follows tempo-based divisions.

• **Swing** – Adds groove by shifting alternating steps.

• **Chance** – Controls the probability that steps will play.

• **Feel** – Adjusts the timing character of the sequence.

• **L1 Start / L2 Start / All Start / All Stop** – Starts or stops Motion playback for Layer 1, Layer 2, or both layers together.

Tip: Don't assume every sequence needs to be 16 steps. Odd lengths such as 5, 7, 11, or 13 can create patterns that shift against a 4/4 groove in interesting ways.

Using the Sequencer for Notes

To use the Sequencer as a traditional note sequencer, select **Trigger Notes**. Then use **Live Rec** or **Step Program Mode** to enter notes, chords, rests, ties, and sequence behavior.

A simple note-sequencing workflow:

- Select **Trigger Notes**.
- Choose **Pattern A**.
- Set the sequence length by clicking the step number below the desired final step.
- Choose a playback mode, such as **Loop**.
- Enable **Sync** if you want the sequence locked to tempo.
- Use **Live Rec** to record a performance, or use **Step Program Mode** to enter notes manually.
- Adjust **Speed**, **Swing**, **Chance**, and **Feel** until the pattern sits musically.

Tip: For bass lines, keep the sound tight and use shorter release times. For chords, try longer steps, ties, or slower speeds. For digital plucks, reduce Chance slightly and add delay for space.

Using Keyboard Control

The **Keyboard Control** buttons let you decide how the keyboard interacts with sequencer playback.

Seq On starts the sequence from the keyboard.

Seq Off stops sequencer playback from the keyboard.

Step Adv advances the sequence one step at a time with key presses. This is useful for experimental rhythms, manual sequencing, or triggering step changes without a steady clock.

Transpose lets you transpose the running sequence from the keyboard. This turns the sequence into something you can play harmonically. Program the pattern once, then move it through different keys in real time.

Tip: Transpose is excellent for bass lines, repeating riffs, and arpeggiated-style patterns. Instead of reprogramming the sequence for every chord change, use the keyboard to shift it.

Using Pattern A, B, C, and D

The Sequencer includes four pattern slots: **A**, **B**, **C**, and **D**. Each pattern can store its own sequence data.

This lets you create variations within a preset. Pattern A might be the main idea, Pattern B a busier version, Pattern C a breakdown, and Pattern D the “maybe this is brilliant, maybe I need sleep” version.

The **Sequence** controls determine how these patterns advance or repeat. **Manual** lets you select patterns yourself. **x1**, **x2**, and **x4** determine how many times a pattern repeats before moving to the next pattern.

Tip: Use Patterns A–D to create related variations instead of trying to make one pattern do everything.

Live Rec and Step Program Mode

Live Rec records performance into the Sequencer in real time. Use it when you want to capture a played idea rather than entering it step by step.

Step Program Mode is better when you want precision. It lets you build or edit a sequence one step at a time.

Step Program Mode tools:

- **Erase** – Removes step contents.
- **Note** – Enters or edits note information.
- **Tie** – Connects notes across steps for sustained notes.
- **Steps** – Supports step-based entry and sequence length behavior.

Tip: Use Live Rec when feel matters. Use Step Program Mode when accuracy matters. Use both when you’re pretending this was the plan all along.

Sequencer Timing and Groove

The Sequencer has its own **Speed**, **Swing**, **Chance**, and **Feel** controls.

Speed controls the playback rate.

Swing adds groove by shifting alternating steps.

Chance controls whether steps play.

Feel adjusts timing character, helping the sequence sit more naturally or push/pull against the beat.

These controls make the Sequencer more musical than a rigid row of steps. Swing can make a pattern groove. Chance can create variation. Feel can make the timing less mechanical. Speed determines whether the pattern crawls, pulses, dances, or panics.

Tip: Chance is especially useful for modulation sequencing. A filter-motion pattern with less than 100 percent Chance can create unexpected accents, gaps, and variation.

Layer Start and All Stop

Because ESQ-1 has two independent layers, Motion playback can be started independently for each layer.

Controls:

- **L1 Start** – Starts Motion playback for Layer 1.

• **L2 Start** – Starts Motion playback for Layer 2.

• **All Start** – Starts Motion playback for both layers.

• **All Stop** – Stops Motion playback for both layers.

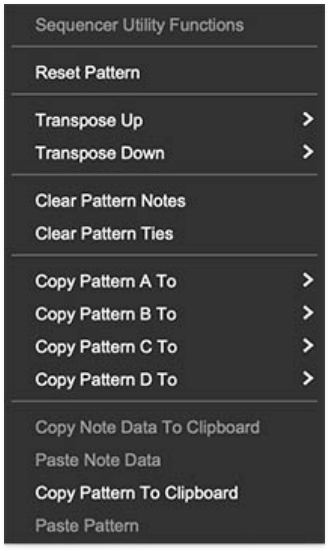
This makes the Motion view feel more like a performance system. One layer might run a sequence while the other remains manually playable. Both layers might run related patterns. One layer might provide a rhythmic bass while the other supplies a sequenced texture or arpeggiated upper part.

Tip: Not every layer needs to move. A steady layer underneath a moving layer often works better than two layers competing for rhythmic attention.

Managing Sequences

In addition to hands-on editing, the Sequencer features a dropdown menu (click the triangle in the upper-right corner of the Sequencer panel) with a set of utilities for managing your patterns quickly:

- **Reset Pattern** – Clears the current pattern and returns all steps to their default state. This creates a clean slate when you want to start over.
- **Transpose Up / Transpose Down** – Shifts the entire sequence up or down in pitch 1 semitone or 12 semitones (1 octave). Handy for re-keying a riff without re-entering every note.
- **Clear Pattern Notes** – Removes all note values from the sequence while leaving ties and accents untouched.
- **Clear Pattern Ties** – Deletes all tie information while keeping notes and accents intact.
- **Clear Pattern Accents** – Strips away all accents, leaving note and tie data in place.
- **Copy Pattern A/B/C/D** to– Duplicates one pattern bank into the other. Good for creating variations without starting from scratch.
- **Copy Note Data to Clipboard / Paste Note Data** – Lets you copy just the note information from one pattern and paste it into another, even across different presets or incidents of Trident.
- **Copy Pattern to Clipboard / Paste Pattern** – Copies or pastes the entire pattern (notes, ties, accents, the works) to or from the clipboard.



Macro Motion

Macro Motion lets the Sequencer animate the modulation amount for one of the four Mod Matrix slots.

Normally, the four Macro sliders in the Mod view set static modulation amounts:

Macro 1 controls the amount for **Mod Matrix slot 1**.
Macro 2 controls the amount for **Mod Matrix slot 2**.
Macro 3 controls the amount for **Mod Matrix slot 3**.
Macro 4 controls the amount for **Mod Matrix slot 4**.

When **Macro Motion** is enabled, the Sequencer can vary one of those modulation amounts step by step. This turns a static modulation routing into rhythmic or evolving motion.

The important idea is:

The Mod Matrix defines what is being modulated.
Macro Motion defines how the modulation amount changes over time.

Macro Motion Controls

Controls:

• **Macro Motion On** – Enables Macro Motion behavior. When enabled, step values can sequence the modulation amount for the selected Macro slot.



• **M1** – Animates the amount for Mod Matrix slot 1 / Macro 1.

• **M2** – Animates the amount for Mod Matrix slot 2 / Macro 2.

• **M3** – Animates the amount for Mod Matrix slot 3 / Macro 3.

• **M4** – Animates the amount for Mod Matrix slot 4 / Macro 4.

• **Macro Motion Shape Menu** – Opened by the turquoise triangle near the Macro Motion section. Provides preset motion shapes such as ramps, saws, alternating high/low shapes, waves, and rhythmic patterns.

Tip: Macro Motion doesn't decide what the modulation means. The Mod Matrix does. If M1 controls filter movement, Macro Motion becomes a filter-motion sequencer. If M2 controls oscillator level, it becomes an oscillator-blend sequencer.

Using the Sequencer for Modulation

To use the Sequencer as a modulation tool, select **Mod Source** instead of **Trigger Notes**. In this mode, the Sequencer does not trigger notes. Instead, the steps define modulation values.

A simple Macro Motion workflow:

- Go to **Mod** view.
- Set up a modulation routing in the Mod Matrix. For example, route **ENV 1** to **Filter Cutoff**, or **LFO 1** to oscillator level.
- Note which Mod Matrix slot you used: slot 1, 2, 3, or 4.
- Go to **Motion** view.
- Select **Mod Source**.

- Enable **Macro Motion On**.
- Choose the matching Macro Motion button: **M1**, **M2**, **M3**, or **M4**.
- Adjust the step values to change the modulation amount over time.

For example, if Mod Matrix slot 1 routes **ENV 1** to filter cutoff, selecting **M1** lets the Sequencer vary the strength of that filter envelope movement on each step. Some steps can have a strong, bright filter sweep. Others can have little or none.

If Mod Matrix slot 2 routes **LFO 1** to oscillator pitch, selecting **M2** lets the Sequencer vary pitch modulation amount step by step. Vibrato might appear only on certain steps or become stronger across the pattern.

Tip: Macro Motion can make a sustained chord feel animated without triggering new notes. Hold a pad, sequence the modulation amount, and let the tone move underneath your fingers.

Macro Motion Shape Menu

The turquoise triangle near the Macro Motion section opens a menu of preset motion shapes. These are useful when you want step-based modulation quickly without drawing every step manually.

Good uses:

• **Ramp shapes** – Gradually increase modulation across a pattern.

• **Saw shapes** – Create repeating rises or drops.

• **Alternating high/low shapes** – Create rhythmic pulsing.

• **Wavy shapes** – Create smoother motion.

• **Rhythm patterns** – Add more complex step emphasis.

Load a preset shape, listen, then edit individual steps if needed.

Tip: Preset shapes are starting points, not rules. Load one, then adjust it until it serves the patch instead of showing off the menu.



Practical Motion Ideas

Classic Arpeggiated Synth Part
Enable the Arpeggiator, choose **Keys** trigger, select **Arp** or **Order**, set Direction to **Up** or **Up/Down**, enable **Sync**, and adjust Speed to match the track.

Tip: Add a little Swing if the part feels too stiff.

Cascading Digital Pattern
Use **Leap**, set Range to **3** or **4** octaves, lower Chance slightly, and add delay.

This works well with bright digital waves, moderate filter movement, and a tempo-synced delay.

Tip: If the pattern becomes too busy, reduce Range or increase Chance so fewer notes disappear unpredictably.

Transposable Bass Line
Program a sequence in **Pattern A**, enable **Transpose** under Keyboard Control, and use the keyboard to move the sequence through different keys.

Keep the sound tight and focused so the sequence stays clear.

Tip: Shorter release times help bass sequences stay punchy instead of blurring together.

Evolving Pad Motion
Select **Mod Source**, assign **M1** to a filter or oscillator-level modulation routing, enable **Macro Motion**, and create a slow ramp or wavy pattern.

Hold a chord and let the Sequencer animate the tone without triggering new notes.

Tip: This is one of the best uses of Macro Motion: the notes stay still, but the sound keeps changing.

Rhythmic Filter Accents
Route an envelope or LFO to filter cutoff in the Mod Matrix, select the corresponding Macro Motion slot, then create a 16-step modulation pattern with higher values on accented steps.

Tip: Use lower modulation values on some steps instead of turning everything up. Contrast is what makes the accents work.

Layered Motion
Run a note sequence on Layer 1 and use Layer 2 for a sustained pad with modulation sequencing. Or reverse the idea: let Layer 1 provide the pad while Layer 2 provides arpeggiated or sequenced detail.

Tip: Start one layer at a time with **L1 Start** or **L2 Start**. Once each layer works on its own, use **All Start** to hear the full motion setup.

Avoiding Motion Overload

The Motion view is powerful, so it’s easy to overbuild. If a patch feels too busy, simplify one element at a time.

Turn off the Arpeggiator and listen to the Sequencer alone. Disable Macro Motion and listen to the notes without sequenced modulation. Reduce Chance if the pattern is too dense, or raise it if too many notes are disappearing. Shorten releases if sequenced notes blur together. Reduce effects if the motion becomes cloudy.

Tip: Motion is most effective when there’s something stable for it to move against. A steady layer underneath a moving layer often works better than two layers both trying to lead the parade.

Simple Motion Exercise

Here’s a quick way to learn the Motion view:

- Start with a single-layer sound in **Whole** mode.
- Go to **Motion** view and enable the **Arpeggiator**.
- Set Trigger to **Keys**, Pattern to **Arp**, Direction to **Up**, Range to **2**, and Sync to **On**.
- Hold a chord and adjust Speed until the arpeggio sits comfortably.
- Lower Chance slightly and add a little Swing.
- Turn to the Sequencer, select **Trigger Notes**, choose **Pattern A**, and set a sequence length by clicking a step number.
- Record or enter a simple pattern, then try **Loop** and **Ping-Pong** playback.
- Switch from **Trigger Notes** to **Mod Source**.
- Set up a Mod Matrix routing such as **ENV 1 → Filter Cutoff** or **LFO 1 → Oscillator Level**.
- Enable **Macro Motion**, choose the corresponding **M1–M4** slot, and adjust step values so the modulation amount changes as the sequence runs.

This exercise shows the heart of the Motion view: notes can move, modulation can move, and the two can work together.

Effects

Three Effects Chains for Layered Sound Design
ESQ-1 provides three separate effects chains for enhancing, shaping, and polishing your sounds: one for **Layer 1**, one for **Layer 2**, and one **Global** chain for the final combined signal.

This gives you a much more flexible effects structure than simply placing one shared effect chain at the end of the instrument. Each layer can have its own processing first, then both layers can pass through shared Global effects for final polish.

The basic routing is:

Layer 1 sound engine → Layer 1 effects → Global effects
Layer 2 sound engine → Layer 2 effects → Global effects

Each effects chain includes five effect slots, so you can process the two layers independently before they reach the final Global chain. For example, Layer 1 might use chorus and reverb for a wide pad, while Layer 2 uses compression and delay for a more focused attack. The Global chain can then add final ambience, EQ, compression, limiting, or other processing that helps the whole preset feel unified.

Controls and Concepts:

• **Layer 1 Effects Chain** – Processes only the Layer 1 sound engine.

• **Layer 2 Effects Chain** – Processes only the Layer 2 sound engine.

• **Global Effects Chain** – Processes the combined output of both layers.

• **Five Slots Per Chain** – Each chain can host up to five Cherry Audio effects.

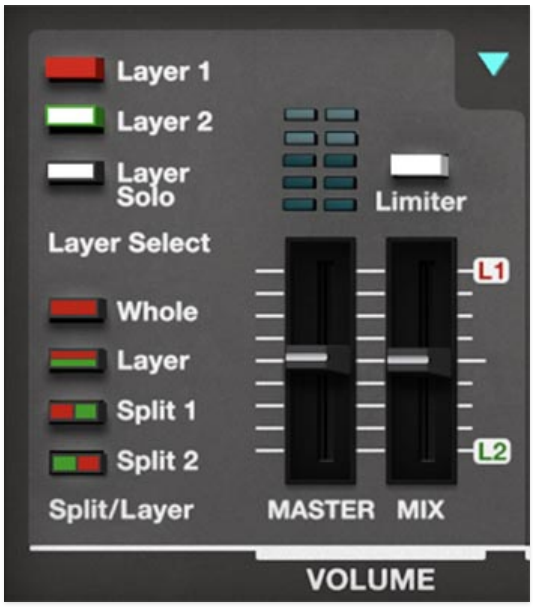
• **Effect Modulator** – Provides dedicated modulation for adding movement to effect parameters.

Tip: Use the layer effects to give each layer its own identity. Use the Global effects to make the finished patch feel connected, polished, and ready to sit in a mix.

How this Changes The Way You Design Patches
Instead of asking, “What effect should I put on the synth?” You should ask, “Which part of the synth deserves which effect treatment?” That’s a much more mix-friendly way to build patches, because you’re not forcing your entire sound through the same effects chain..

Tip: Start patches with no effects, then assign effects by role. Build the tone first. Then decide what needs movement, width, grit, or which should stay clean so the patch has definition.

Important Practical Note
Effects can change gain. They can also emphasize certain frequencies and create peaks. This is why ESQ-1 includes a limiter.



Tip: *The mini FX panel is always visible, but click the **Effects** tab at the bottom right for the full parameter view and deeper editing. Alternatively double-click the effects "footer" (the part with the always-visible mod and mix controls) to toggle the view from mini to full.*

Quick Controls (Always Available)

Even if you're in Keyboard View, the most essential FX controls are always within reach, sitting neatly under the chain:

- **All FX On/Off** – Instantly bypasses the entire chain.
- **Level** – Adjusts the overall level of the chain.
- **Stereo** – Widens (or narrows) the stereo field after processing.

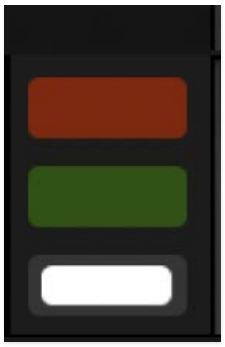


Section Selectors (Color-Coded)

At the bottom of the panel you'll see three colored squares. These pick which effects chain you're editing:

- **Red** – Layer 1
- **Green** – Layer 2
- **Gray** – Global (affects entire output signal path)

Click the color, build your chain, and get creative. Each chain is fully independent, so yes, you can have chorus and delay on Layer 1 and a Phaser and Envelope Filter on Layer 2.



Per-Effect Controls

Each effect block in a chain has its own set of mini-controls:

- **On/Off** – Toggle the effect.
- **Solo** – Bypass all other effects to hear just this one.
- **Remove** (X) – Delete the effect from the chain.
- **Menu** – Copy, paste, duplicate, move, swap, or save.
- **Modulation Amount** – From the Effect Modulator.
- **Wet/Dry Mix** – Blend processed vs. dry signal.



The Effect Modulator

Sometimes you may want to modulate a delay time or a phaser sweep for extra movement or a bit of weirdness. Enter the **Effect Modulator**. It's a dedicated LFO just for the effects. Used subtly, the Effect Modulator can add motion and depth. Push it harder, and things can get more dramatic and unstable. Either way, it’s one of the quickest ways to make an effect feel more varied and animated.

Each effect has one specific parameter that is permanently tied, or “hard-wired,” to the Effect Modulator. In other words, you don’t assign modulation destinations manually. The destination is already chosen for you by the effect’s design.

To see which parameter is being modulated, look for the arrow labeled “**Mod**” on the effect’s panel. That graphic points from the affected control down toward the Effect Modulator, making it easy to spot the modulation target at a glance. If a control has that arrow, it’s the one the Effect Modulator will affect.

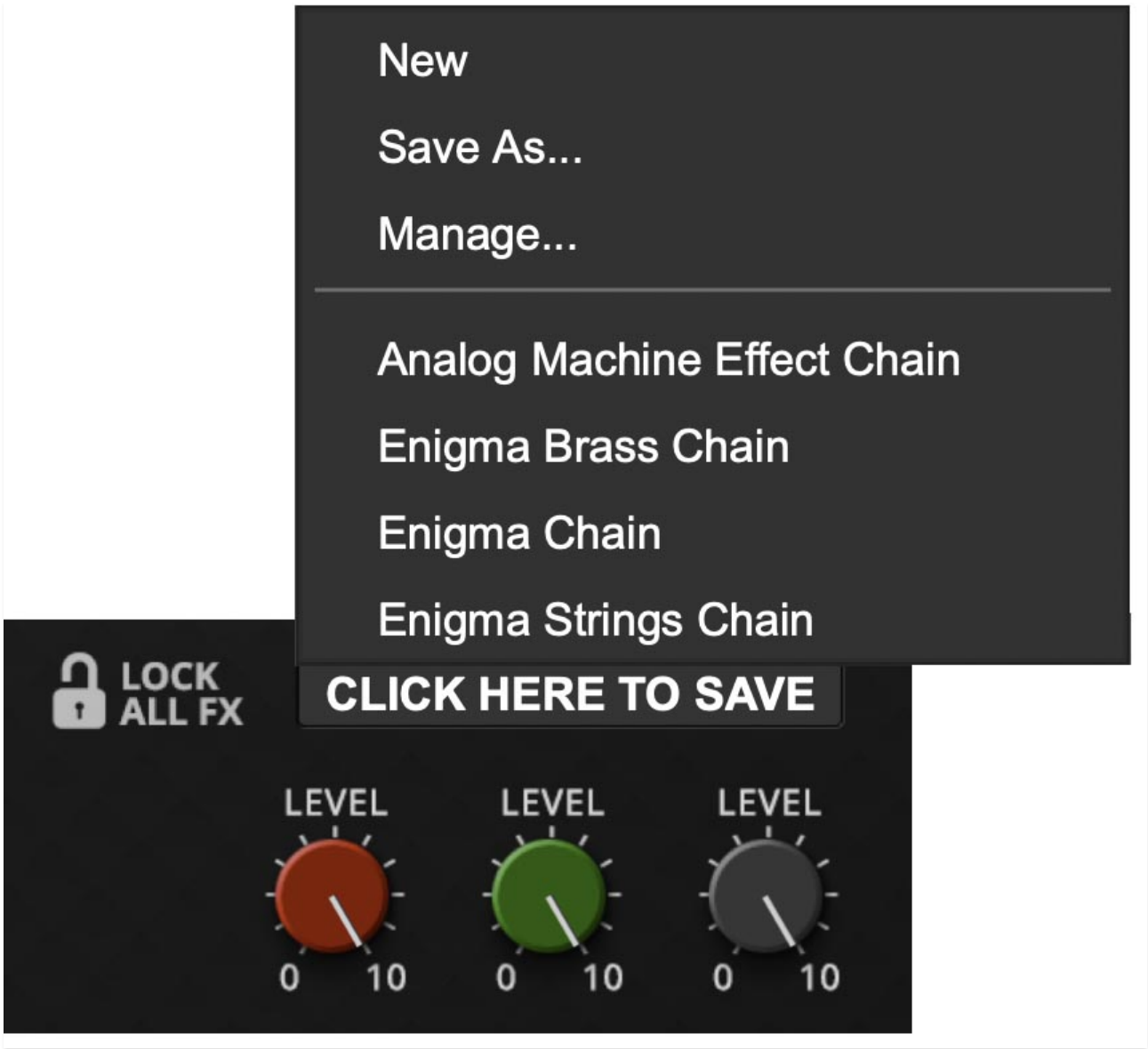
This means every effect has its own built-in modulation relationship. On one effect, the Effect Modulator might animate delay time. On another, it might sweep a tonal or spatial parameter. The exact target depends on the effect, but the visual cue is always the same: Follow the “Mod” arrow.



Effect modulator controls include:

- **Speed** – 0.01 Hz to 20 Hz, or tempo-syncable from 1/64T to 8 beats. LED above flashes in time.
- **Waveform** – Ramp, sawtooth, triangle, sine, square, or random.
- **Delay** – Fade-in time for modulation (0–5000 ms).
- **Sync** – Locks modulation speed to host tempo.
- **Mod Wheel** – Lets your MIDI Mod Wheel scale the modulation depth in real time.
- **Key Reset** – Restarts the waveform with each key press.





Managing Effects Chains

Building and wrangling effects and effect chains straightforward. Use the Effects menu dropdown (the triangle) to save and move effects and chains.

- **Add an Effect** – In the Effects View, click the *Select Effect* dropdown to pick your effect, then tweak away.
- **Delete an Effect** – Click the “X” next to its name.
- **Save a Chain** – Display the Full Effects view → Use the *Click Here To Save* dropdown menu → Save As. Name it, reuse later.
- **Recall a Saved Chain** – Load from the same dropdown.
- **Solo an Effect** – Hit the “S” button; all others mute.
- **Reorder** – Drag the effect by its top “grip” edge to rearrange.
- **Numerical Edit** – Double-click a knob/slider, type a value, press Enter.
- **Copy Effect to Another Layer** – Click the triangle dropdown → Copy To → choose the desired destination (Layer or Global).
- **Copy or Move Entire Chain** – Click the triangle dropdown → Copy/Move Effect Chain To → choose the desired destination.

- **Duplicate an Effect** – Click the triangle dropdown → Duplicate (places a copy right next to it).
- **Swap an Effect** or chain – Click the triangle dropdown → Swap an Effect Chain with → choose the desired destination.
- **Align Effects** – Click the triangle dropdown → Align All Effects to automatically shift all effects to the left, closing any empty slots in between.
- **Lock All FX** – Click the padlock icon to keep the current effects chain in place when switching presets. Any new preset you load will use your locked chain instead of its own, making it easy to carry your favorite effect setup from sound to sound.



Practical Tips

- Don’t overlook the **Global chain**. A touch of reverb or EQ here can glue everything together.
- The **Effect Modulator + Mod Wheel** combo is excellent for live performance. Map it, and suddenly your phaser swoops in only when you push the wheel.
- Try saving a few **favorite chains** and re-using them across presets. Treat them like your personal pedalboards.
- Extreme stereo widening can be fun in headphones, but keep an ear on mono compatibility if you’re making tracks.
- The library of Effect Chains that you build over time is shared with other Cherry Audio instruments that utilize this same system, from Trident Mk III synthesizer (October 2025) onward.

Gain Staging and Troubleshooting

1. **“I’m tweaking effects but nothing changes.”**
   You’re likely editing the wrong Layer.
2. **“Everything sounds washy.”**
   You probably put big space effects on Global effects. Use effects on Player 1 or Layer 2 for character, and use Global effects lightly for cohesion.

The Effects

There are 20 effects in total to add potency to any sound. Whether you’re after subtle polish, full-throttle grit, or spacey atmospheres, these effects add even more character to any patch.



Digital Delay

Delay pedals and tape echoes have been a keyboardist’s sidekick for decades. The Digital Delay offers three classic flavors:

- **Digital** – Clean, pristine repeats.
- **Tape** – Warm, saturated echoes.
- **Ping Pong** – Echoes that bounce between left and right for stereo ambience.

Controls:

- **Delay Time** – Sets the gap between repeats (1 ms to 2000 ms). With Sync on, times follow the beat (1/64T to 8 bars). This can be controlled by the Effect Modulator.
- **Feedback** – Controls how many repeats you get. Low values = slapback echo; high values = infinite runaway.
- **Spread** – Adjusts the stereo width of the delayed signal.
- **Damp** – Softens repeats by filtering highs, making echoes darker and rounder.
- **Mod Rate / Mod Depth** – Adds modulation to delay time. Subtle settings = chorus shimmer; extreme = pitch warbles and glitching.

Tip: Try Digital mode with high feedback and a little modulation depth for a psychedelic wash that hovers on the edge of freak out.



Tape Echo

Few effects are as iconic as tape echo. Originally created with loops of magnetic tape and multiple playback heads, these machines defined the sound of countless dub records, psychedelic jams, and experimental soundscapes. the **Tape Echo** captures all that vintage character without the headaches of demagnetizing heads or replacing tape loops.

Controls:

- **Mode Selector** – Chooses which playback heads are active. Each mode offers different rhythmic subdivisions and textures, from simple single repeats to multi-head cascades.

- **Repeat Rate** – Sets the delay time. Lower values = slower, spaced-out repeats; higher values = rapid-fire echoes. With **Sync** engaged, rates lock to host tempo. Modulation can be applied here by the Effect modulator for even more vintage spaciness and psychedelic vibes.
- **Intensity** – Controls feedback (how much of the echo feeds back into itself). Low settings = quick fadeouts; higher values = dense, self-oscillating repeats and greater sonic mayhem.
- **Heads Indicators (1–3)** – Lights show which tape heads are active for the selected mode.

Practical Tip:
For classic dub-style echo, select multiple heads with **Intensity** cranked high, then ride the **Repeat Rate** knob during playback for wild pitch sweeps. For more subtle use, stick to a single head and moderate intensity to add depth without overwhelming the mix.



Digital Reverb

Back in the ’70s, reverb meant spring tanks or giant plates welded into studio walls. Digital reverbs were exotic, studio-only beasts. The Digital Reverb gives you a compact, modern reverb with three classic models:

- **Room** – Tight, natural ambience.
- **Hall** – Expansive, lush decay.
- **Plate** – Smooth, metallic sheen.

Controls:

- **Predelay** – Time before the reverb kicks in (0–150 ms). Longer predelays create a sense of bigger space. This can be controlled by the Effect Modulator.
- **Decay** – Length of the reverb tail, from short and snappy to cavernous. Modulation target. This can be controlled by the Effect Modulator.
- **Highpass / Lowpass Filters** – Shape the tone of the reverb by trimming boomy lows or harsh highs.
- **Mod Routing Switch** – Chooses whether modulation affects Predelay or Decay.

Tip: Use a short Room reverb on Strings to glue them into a mix, or a long Plate on Brass for cinematic atmosphere.



Galactic Reverb

When you need more than a room, hall, or plate to launch your sound into the stratosphere, reach for **Galactic Reverb**. Designed for cavernous, cosmic spaces, it excels at ambient washes, cinematic swells, or simply making your synth sound like it has left the building (and maybe the planet).

Controls:

- **Predelay** – Sets the time before the reverb begins (0–150 ms). Short settings keep things tight; longer values create separation between the dry attack and the wash of reverb. This can be controlled by the Effect Modulator.

- **Decay Time** – Determines how long the reverb tail lingers. Dial it short for manageable ambience, or long for infinite, space-drifting sustain.
- **High Freq** – Adjusts the tonal brightness of the reverb by shaping the high-frequency response. Higher settings yield shimmering, airy tails; lower settings make the reverb darker.
- **Low Freq** – Sets how much low end is preserved in the reverb. Keep it up for a massive, bass-heavy wash, or pull it back to avoid muddiness.
- **Damp Amount** – Controls the damping of reflections over time. Higher values cause the reverb tail to lose brightness as it decays, simulating natural absorption in real spaces.

Tip:
For lush pads, combine a long **Decay Time** with a rolled-back **Low Freq** and moderate **Damp Amount** to create a deep but clear ambient space. On leads, try adding a touch of **Predelay** so the note speaks with presence before the reverb bloom takes over.



Spring Reverb

Spring reverb is one of the most distinctive ambience effects in music history. From surf guitar twang to vintage organs to early synths patched through amps, its metallic, splashy character has a charm all its own. The **Spring Reverb** recreates the sound of physical springs housed in tanks, complete with extra controls that let you shape it far beyond the originals.

Controls:

- **Drive** – Pushes the input signal into the springs. Higher settings increase saturation and grit, adding vintage bite to the reverb.

- **Predelay** – Sets the time gap before the reverb begins (0–150 ms). Useful for keeping the dry attack clear before the spring kicks in.
- **Decay** – Adjusts how long the spring vibrations last. Low values yield short, splashy bursts; higher settings give longer, ringing tails. This can be controlled by the Effect Modulator.
- **Highpass / Lowpass** – Filters that trim unwanted lows or highs from the reverb signal. Use them to tame muddiness or harsh metallic overtones.
- **Tension** – Simulates the tightness of the springs. Looser adds a wobblier, more boingy character. Tighter adds a more controlled, refined response.

Tip:
For vintage organ vibes, set **Decay** short and **Tension** loose to get that splashy, percussive spring burst. For a more modern twist, roll back the **Lowpass**, tighten the **Tension**, and add a touch of **Drive** for a darker, thicker ambience.



Distortion & EQ

Sometimes clean just won't cut it. Distortion adds grit, attitude, and warmth. The Distortion & EQ effect offers four modes:

- **Tube** – Smooth overdrive like a cranked guitar amp.
- **Fuzz** – Aggressive, buzzy saturation modeled after germanium fuzz pedals.
- **Sat** – Tape-style saturation for warmth and compression.
- **EQ** – A standalone 3-band equalizer without added drive.

Controls:

- **Drive** – Amount of gain/saturation (active in Tube, Fuzz, and Sat modes). This can be controlled by the Effect Modulator.
- **Level** – Output volume to balance the effect.
- **Bass / Middle / Treble** – ±15 dB gain for tone shaping.
- **Mid Band Frequency** – Selects which frequencies the Middle control boosts/cuts.
- **Modulation Target** – In Tube, Fuzz, and Sat modes, Drive is modulatable. In EQ mode, the Mid Band frequency can be modulated.

Tip: A touch of tape saturation can add body to pads without sounding distorted. Crank Fuzz on a Lead sound to make it snarl.



Dual Phaser

Phase shifters were everywhere in the ’70s, and the legendary Mu-Tron Bi-Phase set the standard. The Dual Phaser brings that same rich, sweeping character times two.

Each phaser has its own controls, but you can sync them together or let them run wild independently.

Controls (per phaser):

- **Speed** – Sweep rate (0.01 Hz–8 Hz, or tempo-synced from 1/64T to 8 beats).
- **Depth** – Intensity of the phasing effect.
- **Stages** – Number of filters in the phaser circuit. More stages = deeper, more pronounced sweeps.

  - Phaser 1: 4 or 8 stages.
  - Phaser 2: 6 or 12 stages.
- **Resonance** – Emphasizes the notches for sharper, more hollow tones.
- **Mix** – Balances between Phaser 1 and Phaser 2. This can be controlled by the Effect Modulator.
- **Sync** - the **Sync switch** determines whether the two phaser stages run free and independent or whether one is locked to (synchronized with) the other:
  - **Off** (unsynced):
    Each phaser has its own LFO running freely. This means they can drift in and out of alignment, creating evolving, swirling movement and complex stereo textures.
  - **On** (synced):
    The second phaser's sweep is locked to the first. Instead of moving independently, both phasers cycle together, so you get a more unified, rhythmic phase motion. This setting is tighter and more predictable, useful when you want a consistent pulse or groove.

Tip: Try syncing both phasers at different stage settings (e.g., 4 vs. 12) for complex, evolving sweeps.



Flanger & Chorus

These two modulation effects use short delays to create movement and depth. Flanging mixes dry and very short-delayed signals for a sweeping “jet plane” comb-filter sound. Chorus uses slightly longer delays to thicken tones, simulating multiple instruments playing together.

Flanger Controls:

- **Speed** – LFO rate of the sweep (0.01 Hz–8 Hz, or tempo-synced).
- **Depth** – Amount of sweep applied.
- **Delay** – Sets the base delay time (1–13 ms). Shorter = brighter notches.

- **Resonance** – Boosts the notches, producing the classic jet-flange effect.

Chorus Controls:

- **Speed** – LFO rate of the sweep (0.01 Hz–8 Hz, or tempo-synced).
- **Depth** – Amount of sweep applied.
- **Waveform** – Shape of the LFO (sine, triangle, saw, ramp). Each yields a different flavor of movement.

Shared Control:

- **Mix** – Balances Flanger and Chorus. This can be controlled by the Effect Modulator.

Tip: Use a slow, shallow chorus on Brass to add width without getting in the way, or crank up flanging on a lead synth for ’70s sci-fi vibe.



Envelope Filter

The Envelope Filter is a triggered modulation effect. Every time you play a key, it generates a filter sweep. Unlike a traditional envelope follower that reacts to signal volume, this one gives you consistent, predictable sweeps. Great for auto-wah effects, synth zaps, and funky textures.

Envelope Section:

- **Shape** – Pick an envelope contour (ramp, triangle, square, etc.). Shapes determine how the filter cutoff moves over time. Square acts more like an LFO.
- **PARA/POLY Switch**
  - **PARA (Paraphonic)-** One shared envelope and filter for all notes.

- **POLY (Polyphonic)**- Each note triggers its own envelope and filter, enabling more detailed, note-specific modulation.

Length – Duration of the envelope sweep. Short = snappy; long = slow evolving.

- **Envelope Amount** – Sets how far the filter cutoff moves in response to the envelope.

Filter Section:

- **Cutoff** – Base frequency of the filter. The envelope adds/subtracts from this point.
- **2-Pole / 4-Pole** – Choose slope steepness: 2-pole = smoother; 4-pole = sharper. This can be controlled by the Effect Modulator.
- **Resonance** – Boosts frequencies at the cutoff, making sweeps more dramatic.
- **Drive** – Adds gain before the filter for extra grit and presence.

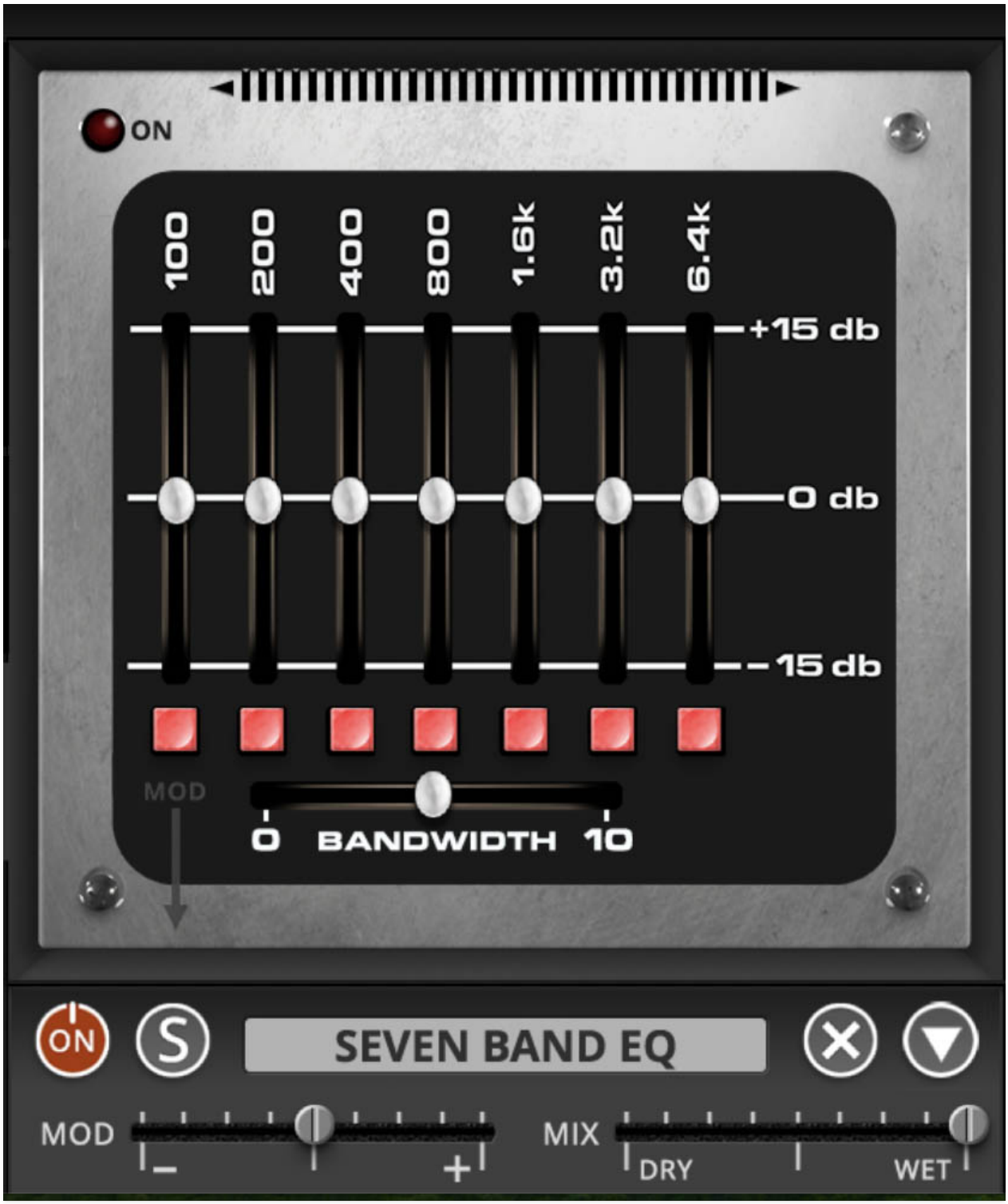
Other Controls:

- **Gain (Trimmer)** – Balances the output level.
- **MOD Slider** – Adjusts how much modulation is applied.
- **MIX Slider** – Balances dry vs. processed.

Tip: Set a long ramp-up shape with high resonance on Strings for dramatic sweeps that evolve with each note, or go short and snappy for funky auto-wah leads.

Tip 2: Filters on Filters

You don’t have to trigger the Envelope Filter with an envelope at all. Just leave the sensitivity low and it becomes a fixed filter instead. This essentially gives you an extra paraphonic filter that you can apply to a single sound, or drop in the global FX chain for the whole mix. Stack it with the synth's built-in filters, and the multiple filters line up in series to carve out shifting bands of tone. This technique is an excellent way to shape formant-like textures, focus a patch more narrowly, or travel to new sonic realms the synth never imagined.



Seven Band EQ

Equalization is one of the most fundamental tools in shaping sound, and the **Seven Band EQ** makes it straightforward and musical. Modeled after classic graphic equalizers, this effect lets you boost or cut seven key frequency ranges to sculpt tone, tame problem areas, or bring out character in any sound.

Controls:

- **Frequency Bands (100, 200, 400, 800, 1.6k, 3.2k, 6.4k Hz)** – Each vertical slider boosts or cuts its band by up to ±15 dB. Push up to emphasize, pull down to reduce.
  - **100 Hz** – Sub-bass and low-end weight. This can be controlled by the Effect Modulator.
  - **200 Hz** – Warmth or muddiness.

- **400 Hz** – Body and thickness (or boxiness if overdone).
- **800 Hz** – Midrange punch.
- **1.6 kHz** – Presence and edge.
- **3.2 kHz** – Clarity and attack.
- **6.4 kHz** – Brightness and air.

- **Bandwidth** – Adjusts how wide or narrow each band's effect is. Lower values = broader, smoother curves. Higher values = tighter, more surgical adjustments.

As with all other effects, the **Seven Band EQ** can be modulated, opening the door to rhythmic tone-shaping or evolving filter-like sweeps across multiple bands.

Tip: Use gentle boosts or cuts across a few bands for natural tone shaping. For example, trimming a little **200 Hz** mud while boosting **3.2 kHz** clarity on Brass. Or crank up **100 Hz** and **6.4 kHz** together to give synth basses thump and sparkle.



Ring Modulator

Ring modulation is the sound of science fiction ray guns, metallic clangs, and otherworldly textures. By multiplying your signal with an internal oscillator, it creates sum and difference frequencies that often sound inharmonic, robotic, or downright alien. The **Ring Modulator** gives you full control over how wild (or subtle) things get.

Controls:

- **Gain** – Adjusts the input level sent into the modulator. Higher gain means a stronger, more pronounced effect. This can be controlled by the Effect Modulator.

- **Range (High/Low)** – Switches the oscillator's frequency range. Low is better for tremolo-like modulation; High ventures into bell tones and metallic territory.
- **Freq** – Sets the frequency of the carrier oscillator. Lower settings = slow, throbbing tremolo. Higher = clangorous sidebands.
- **Wave** – Selects the oscillator's waveform: sine for smooth, or square for harsher, edgier modulation.
- **Rate** – Controls oscillator speed when in Low range (essentially tremolo rate). Syncs to tempo when **Sync** is enabled.
- **Amount** – Sets the depth of modulation, from subtle shimmer to total signal disintegration.
- **Drive** – Adds gain and harmonic grit after the modulation stage, thickening or dirtying up the output.

Tip: For classic sci-fi flying saucer tones, set **Range** to High, pick a sine wave, and crank **Freq** into the audio range. For more musical use, try Low range with Rate synced to tempo and it becomes a tempo-locked tremolo that adds groove without going completely alien.



Lushverb

If you want your sounds to swim in ambience, **Lushverb** is your go-to. As the name suggests, it’s built for wide, dreamy reverberation that can be subtle and supportive or massive and enveloping. With tone-shaping filters and built-in modulation, it excels at everything from natural roominess to lavish, evolving textures.

Where **Galactic Reverb** reaches for infinite, cosmic expanses, **Lushverb** focuses on silky smoothness and animated depth. It's the kind of reverb that enhances synths, vocals, and pads by wrapping them in a glowing halo.

Controls:

- **Predelay** – Time before the reverb kicks in. Short gives an immediate wash. Longer gives a clearer separation between dry sound and reverb bloom. This can be controlled by the Effect Modulator.
- **Early Reflections** – Shapes the very first echoes you hear when a sound bounces off walls. Low settings keep things tight and intimate, like you're in a smaller space. Higher values push those reflections further forward, adding presence, punch, and a sense of real room before the tail blooms. Great for adding dimension without always using longer decay times.
- **Decay** – Sets the length of the reverb tail, from short ambience to cavernous sustain. Can be modulated. This can be controlled by the Effect Modulator.
- **Highpass / Lowpass** – Trim low-end rumble or high-end fizz in the reverb signal to keep mixes clean.
- **Damp** – Determines how much brightness is lost over time. Higher values give tails that darken as they fade.
- **Mod Rate / Mod Depth** – Add movement to the reverb tail by modulating its delay lines. Subtle settings = gentle shimmer; extreme settings create chorus-like animation.
- **Sync** – Locks modulation to host tempo for rhythmic effects.
- **Mod Switch (Predelay/Decay)** – Chooses whether modulation applies to the Predelay or Decay parameter.

Tip:
For ambient pads, set a long **Decay**, roll off some lows with the **Highpass**, and add a touch of **Mod Depth** for evolving atmospherics. For tighter mixes, use shorter **Predelay** and keep **Decay** moderate, adding just enough **Damp** to sit naturally under the dry sound.



Lo-Fi

Sometimes perfection is the enemy of vibe. **Lo-Fi** is designed to rough up your sound with the kinds of imperfections that make old recordings feel warm and gritty. From dusty vinyl crackle to wobbly tape warble, this effect can take pristine synth tones and throw them straight into the basement of a 1970s record store.

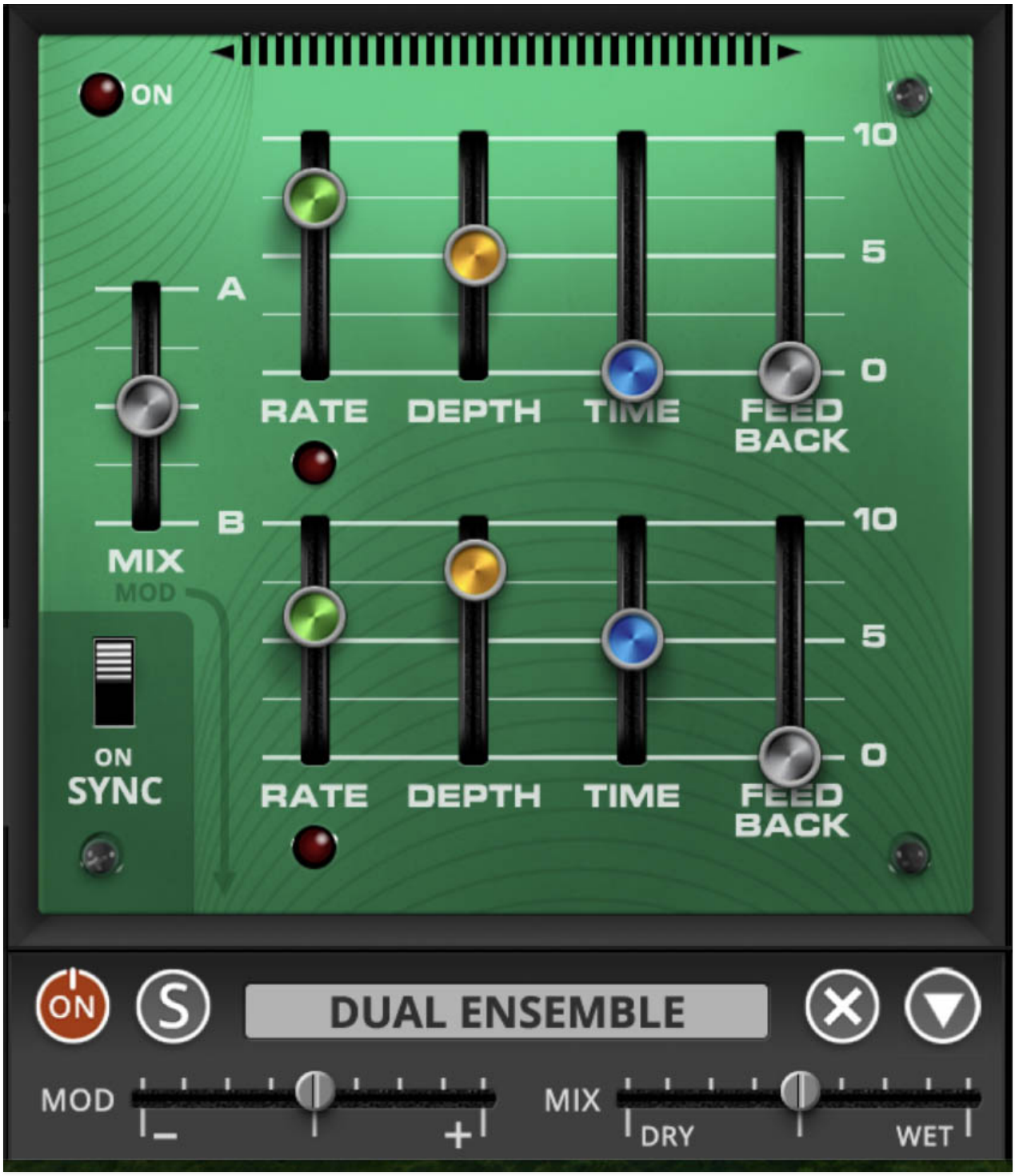
Controls:

- **Vinyl** – Adds record-like crackle and pops. Higher settings = more frequent, louder artifacts.
- **Wow** – Simulates the slow pitch drift of a warped record or stretched tape.

- **Flutter** – Adds faster, jittery pitch variations, like a worn cassette transport.
- **Hiss** – Introduces broadband noise, reminiscent of tape or cheap electronics.
- **Hum** – Injects mains hum into the signal, with a switch for **50 Hz / 60 Hz** to match regional power noise flavors. This can be controlled by the Effect Modulator.
- **Random (center knob)** – Introduces unpredictable fluctuations across the effect parameters, enhancing the chaotic, analog feel.
- **Noise Gate** – To help keep the grit under control, Lo-Fi includes a **Gate**. Think of it as an automatic volume control. It lets your instrument through when you're playing, and slams the door shut when things go quiet, keeping hiss, hum, and crackle from hanging around between notes.
  - **Enable Button**: Switches the gate on and off.
  - **ATT (Attack)**: How quickly the gate opens when you play a note. A fast attack gives you sharp, immediate entrances; a slower attack eases the noise in more gently.
  - **REL (Release)**: How quickly the gate closes after the sound drops below the threshold. A short release cuts noise instantly. A longer release lets things fade more naturally.

  Gate Tip: When using long-decay sounds (especially with reverb or delay), you might hear "chatter," a sputtering, open-close-open stutter as the gate struggles to decide whether the tail is loud enough to keep. If that happens, try increasing the **Release** for smoother fades, or dial back your effect tails slightly. A touch of balance here makes the difference between vintage character and sounding like a broken speaker.

Lo-Fi Tip: For subtle retro flavor, add a touch of **Wow** and **Hiss** to synth pads. For full-on grit, crank **Vinyl** and **Hum** and let the **Random** knob do its thing. It's great for lo-fi hip-hop or downtempo textures that need a worn, nostalgic character.



Dual Ensemble

The lush, swirling sound of ensemble effects is a hallmark of vintage string machines and poly synths. The **Dual Ensemble** effect gives you two fully independent ensemble units for everything from subtle shimmer to deep, swirling motion.

Controls (for each Ensemble A & B):

- **Rate** – Sets the speed of the modulation (how fast the pitch/phase shifts). Slow adds gentle drift; fast adds warbly motion.
- **Depth** – Controls how far the pitch is detuned by the modulation. Low adds subtle thickening; high adds seasick wobble.

- **Time** – Adjusts the base delay time of the effect. Longer times = looser, more chorus-like feel; shorter times = tighter, phase-like coloration.
- **Feedback** – Feeds the delayed signal back into itself for resonance and more pronounced movement.

Shared Control:

- **Mix** – Balances between Ensemble A and Ensemble B. Use it to layer two different modulation speeds and depths for a rich, evolving chorus. This can be controlled by the Effect Modulator.

Tip: For classic string-machine shimmer, set both ensembles with slow **Rates** and low **Depths**, then balance them with the **Mix** slider. For a more psychedelic wash, give one ensemble a slow, deep drift and the other a faster, shallower variation. The interaction creates a lush, animated stereo field.

Note: If you're torn between **Dual Ensemble** and **Chorus/Flanger**, think of it this way: Ensemble excels at smooth, swirling textures with a vintage string-machine flavor, while Chorus/Flanger covers more dramatic sweeps, jet whooshes, and thicker doubling effects.



Dual Delay

Why settle for one echo when you can have two? The **Dual Delay** lets you run two independent delay lines side by side for everything from tight rhythmic interplay to wide, spacious echoes. Each delay has its own controls, and you can sync them to tempo, run them free, or send them bouncing across the stereo field in ping-pong mode.

Controls (per Delay Line 1 & 2):

- **Time** – Sets the delay length. With **Sync** engaged, times lock to tempo divisions; in **Free Run** they're adjustable in milliseconds.

- **Feedback** – Determines how many repeats occur. Low = quick slapback; high = long echoes or self-oscillation.
- **Damp** – Applies high-frequency damping to the repeats, making them darker and more natural as they fade.

Shared Controls:

- **Mix (1/2)** – Balances between Delay 1 and Delay 2. This can be controlled by the Effect Modulator.
- **Sync/Free Run Switch** – Toggles between tempo-synced and free-running time modes.
- **Spread** – Adjusts stereo spacing of the delays. Low = centered echoes; high = wide, panned echoes.
- **Ping-Pong** – Sends repeats alternating left and right for a classic stereo bounce.

Tip: For rhythmic complexity, set Delay 1 to dotted eighths and Delay 2 to quarters, then spread them wide for instant “U2-style” echo textures. For ambient sound design, keep both delays long, add plenty of **Damp**, and engage **Ping-Pong** for endless stereo wash.

Note: If you’re wondering whether to reach for **Dual Delay** or **Digital Delay**, here’s the difference: Digital Delay is quick and straightforward, with classic single-line flavors (digital, ping-pong). Dual Delay offers more flexibility, stereo interplay, and rhythmic layering. This is great when you want echoes to become part of the composition.



Compressor

Compression is a powerful tool for shaping the dynamics of your synths. It can make basses hit harder, leads sit firmly in a mix, and pads feel more even and controlled. The Compressor keeps things simple, with just the essential controls you need to add punch, presence, or smoothness to your patches. It operates with a fixed threshold of –12 dB and built-in auto makeup gain, ensuring consistent levels without extra balancing work, making it very plug-and-play. Dial in Attack and Release to taste, push the Input until you like what you hear, and you’re good. There's no need to trouble with gain staging or threshold hunting.

Controls:

- **Ratio (slider at top)** – Sets how much the signal is reduced once it passes the threshold. Lower ratios (4:1) create gentle smoothing. Higher ratios (12:1, 20:1) give firm control.
- **Input** – Adjusts how much signal is pushed into the compressor. More input equals more compression.
- **Output** – Balances the overall level after compression so the processed signal matches or exceeds the bypassed sound.
- **Attack** – Controls how quickly the compressor reacts, measured in milliseconds (ms). Fast is tight and snappy; slow allows more of the transient bite through.
- **Release** – Sets how quickly the compressor recovers, measured in milliseconds (ms). Fast = punchier feel; slow = smoother, sustained leveling.
- **VU Meter** – Shows how much gain reduction is being applied, so you can see the effect as well as hear it.
- **Auto Makeup Gain** – One common side effect of compression is that the overall signal level can drop as peaks are reduced. Normally you'd compensate for this with an Output (or Makeup Gain) control, nudging the level back up by ear. The Compressor effect saves you that step by including built-in auto makeup gain that you can switch on or off. With it on, as you increase compression, it automatically boosts the signal so your processed sound stays roughly as loud as the uncompressed version. The benefit is that you can focus on shaping punch and dynamics without constantly juggling output levels, making the Compressor faster and more intuitive to use.

Compressor Specs:

- Input: -20dB to +20dB
- Output: -20dB to +20dB
- Attack: .1ms to 200ms
- Release: 5ms to 3000ms
- Detector HP: 100Hz
- Threshold: -12dB
- Soft Knee (-3dB below threshold)

Tip: For synth bass, use a medium **Attack** and fast **Release** to keep the low end solid without losing punch. On pads, slower **Attack** and **Release** settings even out the dynamics, giving you a warm, flowing texture that sits perfectly under leads and arpeggios.

Note: the Compressor is the one effects unit that does not utilize the Effect Modulator, and has no mapping applied to it.



BBD Flanger

Flanging is all about mixing a signal with a very short, modulated delay, creating swooshing comb-filter effects. The **BBD Flanger** nails the character of vintage bucket-brigade analog units, known for their warm, slightly gritty sound compared to pristine digital models. This makes it ideal for thickening synths, adding movement to pads, or creating the classic jet plane sweep.

Controls:

- **Speed** – Sets the LFO rate that modulates the delay time. Slow is good for gradual sweeps; fast is good for rapid, shimmering motion. This can be controlled by the Effect Modulator.
- **Intensity** – Adjusts how much the LFO affects the delay time. Subtle settings are good for gentle movement; higher is good for deeper sweeps.

- **Manual** – Manually offsets the flanger's delay time. Use it to set the starting point of the sweep or to park the flanger for static comb-filter tones.
- **Feedback** – Feeds part of the output back into the input. Low gives a smooth, subtle flange. High gives a resonant, metallic sweep with a signature jet-like sound.
- **Sync** – Locks the modulation rate to host tempo for time-synced sweeps.

Tip: For classic "jet whoosh" effects, set **Feedback** high, **Speed** slow, and **Intensity** deep. For subtler chorus-like thickening, keep **Intensity** low, **Manual** slightly offset, and a bit of **Feedback**.

Note: If you're deciding between **BBD Flanger** and **Flanger/Chorus**, here's the distinction: BBD Flanger delivers darker, warmer, more organic sweeps. This is perfect for vintage-style movement. Flanger/Chorus offers cleaner, brighter modulation and the flexibility to switch into chorus mode.



DCO Chorus

Inspired by the legendary stereo chorus of the Juno-60, the DCO Chorus adds rich, swirling movement to analog pads and is great for beefing up textures with that classic 80s spread. The Juno-60’s original chorus gave its single-oscillator engine a depth and width that made it a hallmark of synthpop and electronic music.

Controls:

I – The first mode gives a rich chorus effect, adding width and shimmer. It's ideal for thickening pads, strings, and other sounds. This can be controlled by the Effect Modulator.

II – The second mode intensifies the chorus effect by increasing the modulation speed by 70%. It great for lush textures, or anything where you want the synth to bloom.

I + II – Both modes engaged simultaneously. This third variation was a feature of the Juno-60 (pressing both buttons) and became a go-to trick for an unmistakably intense chorus. The modulation speed is faster, the depth shallower, and it uses a sine wave instead of a triangle wave.

Noise Level (knob) – Adds a subtle analog-style noise floor to the effect chain, helping the chorus feel less digital and more lived–in.

Tip: For a warm pad with some movement, set mode II, dial Noise Level low, and let the chorus breathe. Want your lead to spread? Use I + II, pull Noise Level up a bit, then stack a subtle delay behind it for full ’80s width.



Panner

The Panner effect brings life and movement to your patch in the stereo field. Use it to animate a wandering pad, give your lead a swirling stereo motion, or simply place layers dynamically across the stereo field. By controlling how your sound moves left-to-right, how wide the sway is, and how quickly it sweeps, you can turn a static sound into a living soundscape. To trigger the Panner, press a key on the keyboard. If you continue to down a key (or keys), pressing other keys won't retrigger the effect.

Controls:

Rate (Min → Max) – Sets the speed of the movement across the stereo field. Lower settings slow down the pan sweep; higher settings make the motion rapid and rhythmic. This can be controlled by the Effect

Modulator.

Width (Min → Max) – Determines how far the sound moves from left to right. At minimum the motion is subtle; at maximum it spans the full stereo spectrum.

Offset (Left ↔ Right) – Lets you set the starting point or bias of the movement. Move towards “Left” to start or favor the left side; move towards “Right” to start/favor the right.

Shape – Selects the modulation waveform used for panning (sine, triangle, saw, square). Different shapes give different character to the movement.

Smoothing (Hard ↔ Soft) – Controls how quickly the panning transitions occur: “Hard” gives abrupt jumps or sharp movement, “Soft” smoothens the glide between positions.

Mode Switch (Manual / ON / Trig Once / Trig ON) –

- **Manual**: Panning follows the Offset knob only – no automatic sweep.
- **ON:** Continuous automated panning according to Rate, Width, Shape, and Offset.
- **Trig Once**: On receiving a trigger event (i.e. pressing a key on the keyboard), the panning sweep runs once and then stops. In this mode, the Attack knob is active.
- **Trig ON**: On receiving trigger events, panning restarts automatically each time a key is pressed (if no other keys are currently held down). In this mode, the Attack knob is active.

Attack (Min → Max) – Active when Mode is set to Trig Once or Trig On. Sets how quickly the panning sweep begins after the trigger. Short values give an immediate sweep. Longer values ease in gradually.

SYNC (Off / On) – When ON, the Rate control syncs to the synth's own tempo setting (in standalone mode) or if used in a DAW, to the project tempo. When OFF, Rate is freely set in Hz.

Tip: For a slowly drifting stereo pad, set Width relatively high, Rate low (around 1 – 2), Shape to triangle, Mode to ON, and Smoothing to Soft. If you want a lead that jumps left-right on each note trigger, switch to Mode to Trig Once, set Attack short, Width high, Rate moderate, and tie the trigger to your note-on event for dramatic stereo hops.



Pulser

The Pulser effect is a flexible 16-/32-step gate/sequencer built to inject rhythmic motion into sustained sounds or static patches. Think of it as a live, programmable tremolo, stutter or step-gate engine that sits on the end of your signal chain and chops or paces your synth voice, turning pads, leads or drones into patterns that rhythmically pulsate with life.

Controls:

Attack (0-10) — Determines how hard the gate opens at each step. Lower values give sharp, abrupt cuts. Higher values soften the entrances so the gating effect is smoother and less choppy.

Sustain (0-10) — Sets how long the gate stays open during each active step. At maximum sustain, the silence holds for the length of the step.

Length (Min → Max) — Sets the number of active steps in the sequencer. In Single mode this runs from 2 – 16 steps.In x32 mode the total length doubles (up to 32 steps).

Playback (Single / Dual / x32) —

- Single: Runs one sequencer of up to 16 steps.
- Dual: Enables two independent 16-step sequences running simultaneously (so you can layer or offset patterns).
- x32: Runs a single sequence of up to 32 steps (essentially the 16-step engine doubled).

Speed (Min → Max) — Controls the rate at which the sequence advances. Higher values make faster step changes; lower values slow things down for broad rhythmic movement. This can be controlled by the Effect Modulator.

Direction switch (▶ / ◀) — Determines playback direction: forward (▶) or reverse (◀). Reverse mode can yield unexpected textures, especially when gating sustained patches.

Sync (Off / On) — When ON, the Speed parameter locks to your host tempo or internal clock; when OFF, Speed is free-running.

16 Step Buttons — Each button corresponds to one step in the sequence. Clicking a button toggles the gate on that step (active) or off (muted). A lit button means the signal passes; unlit means the gate is closed for that step.

Tip:

For a dramatic stutter effect, set Length to approximately 8, Speed moderate (so each step aligns with a 16th-note), Attack low for crisp gate opens, Sustain around mid for choppy rhythm. Use the forward direction. On the other hand, for evolving drone motion, try Length = 16, Speed = slow, Attack = high, Sustain = long, Direction = reverse, and use Sync = Off so the pattern drifts free of the tempo grid.

Power Tip: Rhythmic Crossfire

The Pulser becomes even more powerful when you use it in multiple effect lanes. Try assigning different Pulser settings to the VCF and BPF with one running a short, percussive 8-step pattern, and the other a slower 16-step pulse. Set the VCF layer’s playback to forward and the BPF to reverse, then balance them with the Master Balance control.

The result is a hypnotic interplay of gated rhythms weaving in and out of each other. This is great for creating Berlin-school sequences, rhythmic ambient beds, or anything that needs motion without a drum track.

For bonus chaos, switch one Pulser to Dual mode and the other to x32, and let the overlapping cycles drift naturally out of sync.

MIDI Controllers Setup and the MIDI Tab

Assigning Internal and External Hardware Controls

Assigning internal and external hardware controls adds a whole new dimension of control and musicality to patches, and it's really easy to do. The **MIDI Tab** is where all controller assignments can be viewed and tweaked, and we'll go through all of its parameters and functions. We recommend reading this whole section to best take advantage of ESQ-1's full array of MIDI control assignment possibilities.

First, though, we'll give you a quick look at how to assign an external hardware controller to a ESQ-1 control using MIDI Learn, so you can get started with basic MIDI control while you're learning the fancy stuff.

Quick and easy controller assignment

In this example, we'll assign a hardware slider/knob control to Filter's **Freq** parameter.

- Begin by right-clicking on the **Freq** knob and selecting *MIDI Learn,* as shown here:



- A transparent purple overlay appears over the slider, indicating that it's in MIDI Learn mode:



- Now move the desired hardware control device. The purple overlay disappears and the hardware control will move the onscreen knob.
- If you have second thoughts (or accidentally put the wrong control into learn mode), learn mode can be aborted by right-clicking and selecting *Stop Learning*.
- If you later decide you don't like that mapping, right-click the control and select *Unlearn*.

When in MIDI Learn mode, any already-assigned controller numbers will show in squares. These indicate the MIDI continuous controller number for the assigned hardware control (these are also displayed in the MIDI Tab at left).

Once a MIDI controller has been assigned, in addition to real-time control of a ESQ-1 parameter, you'll also be able to record and play back controller data from a DAW.

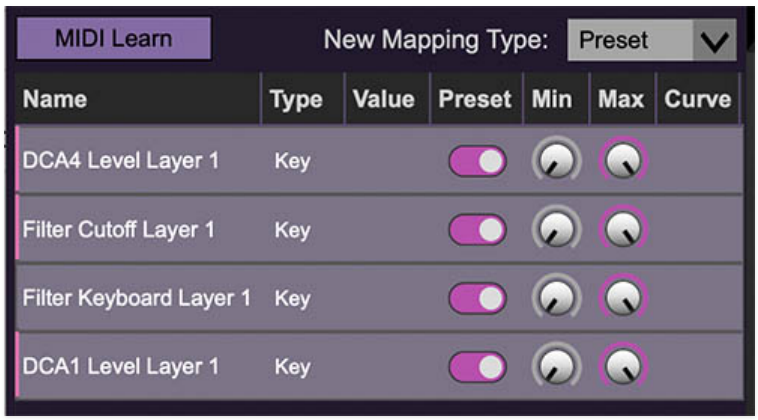
The MIDI Tab

This is command central for all MIDI controller assignments. Here you'll be able to see information about all currently assigned controllers and adjust control ranges.

- To view or hide the MIDI Tab, click the *MIDI* button in the purple top toolbar:



Here's what a typical set of assignments in the MIDI Tab might look like. Let's take a tour around the MIDI Tab:



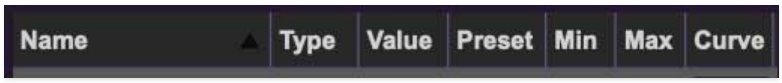
MIDI Learn button- This is almost exactly the same as enabling MIDI Learn mode by right-clicking a control. Click the *MIDI Learn* button to enter learn mode (all controls turn purple). Unlike right-clicking on specific knobs, where ESQ-1 automatically exits controller assignment mode, clicking the *MIDI Learn* knob "stays on" to enable assignment of multiple hardware controls. This is handy for quickly assigning a bunch of sliders or the buttons of a grid-style controller.

- To assign multiple controls, click *MIDI Learn*, click an on-screen control.
- Move the desired hardware knob or slider.
- Continue clicking and assigning on-screen controllers until all desired controls are assigned.
- Click *Stop Learning* to exit learn mode.

Remember that a single hardware knob/slider/button isn't limited to controlling just one parameter - a single hardware controller can simultaneously operate as many controls as you'd like.

New Mapping Type- This popup menu selects whether newly assigned MIDI mappings will be global (affects all sounds and doesn't change when different presets are selected) or saved with individual presets.

MIDI Tab Columns



Name- Displays the name of the parameter being controlled.

Type- There are five possible types of controller automation in ESQ-1:

- **Note**- Notes played on a MIDI keyboard controller, expressed as C-1 to G9
- **CC (MIDI Continuous Controller)**- The standard 128 MIDI controller numbers as defined in the MIDI spec. More specifically, these are the controllers transmitted by hardware knob and slider controls. MIDI CC’s can be used to control parameters in real-time or recorded and played back within DAW software.

- **MMC (MIDI Machine Control)**- The MIDI control protocol for tape machine-style transport controls. Back in the dark ages, this was used to control old TASCAM and Fostex reel-to-reel monsters, but it's useful if your MIDI controller has tape-style transport control buttons.
- **Aftertouch**- Some keyboard controllers transmit controller data when keys are pressed and released as they're held down. The vast majority of keyboard controllers with aftertouch transmit "mono" aftertouch only; in other words, aftertouch data is the sum of all keys to one single data stream. ESQ-1 responds to mono aftertouch as well as poly aftertouch, provided your USB/MIDI controller is poly AT capable.
- **Key**- This allows keys of the computer QWERTY keyboard to act as button controls for ESQ-1's onscreen controls.

Value- Displays the specific automation controller. In the case of a *Note* this would show a MIDI note number (C-1 to G9, for a MIDI CC, this would be the MIDI CC controller number, etc. Clicking on the value opens a pop-up menu where all values are displayed and can be selected.

Preset- This slider works in conjunction with the *New Mapping Type* menu. In the left position (gray background), the MIDI mapping is global (affects all sounds and doesn't change when different presets are selected), in the right position (lavender background), the MIDI mapping is saved with, and only affects the current sound preset.

The *Preset* switch is super convenient, because it means MIDI mappings can easily be set to global or per-preset status at any time.

Min- Sets a limit on the lowest value any automation control can set a mapped controller to. This actually recalibrates the range of the automation controller to the remaining parameter range.

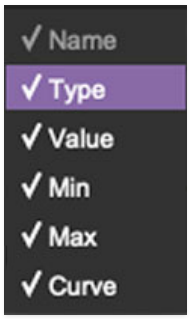
Max- Sets a limit on the highest value any automation control can set a mapped controller to. This actually recalibrates the range of the automation controller to the remaining parameter range.

Not only can parameter ranges be limited via the the *Min* and *Max* knobs, mapped control destinations can be *inverted* – just set the *Min* knob value higher than the *Max* knob value.

Limiting and inverting parameter ranges with the *Min/Max* controls is particularly useful when setting up a single hardware control to operate multiple parameters. Combined with the *Curve* control, these capabilities let you create powerful and finely tuned "macro" control combinations, all activated from one MIDI control.

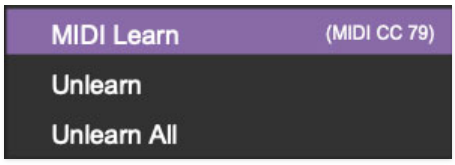
Curve- These allow the customization of how incoming MIDI CC controls affect the movement of ESQ-1's onscreen controls, ranging from exponential to linear to logarithmic curves.

MIDI Tab Column Configuration Right-Click Menus
Right-clicking anywhere in the top row (*Name*, *Type*, *Value*, etc.) displays the **Column Configuration Menu**:



Checking/unchecking these allows you to hide or display each column. This has no effect on control assignments, it just cleans up the view when you don't need to see certain things.

Right-clicking on an assigned parameter opens this pop-up menu:



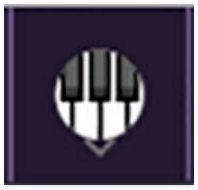
It offers the following operations:

MIDI Learn- This is used to change the controller assigned to a particular parameter.

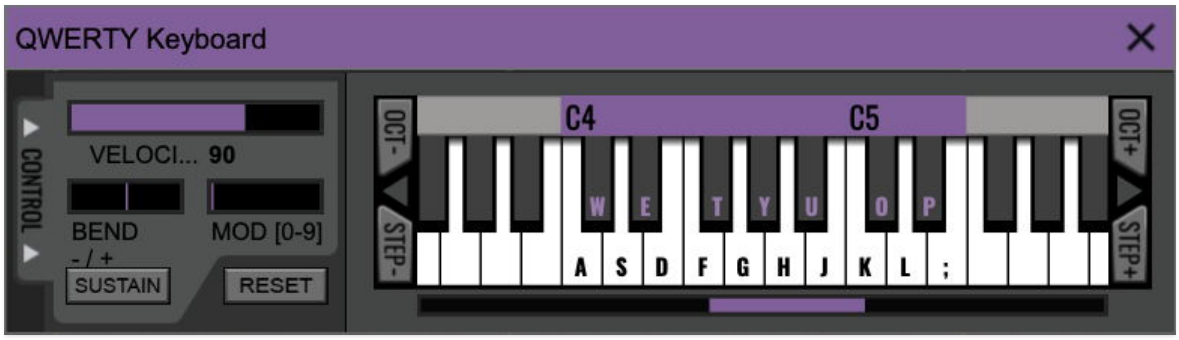
Unlearn- Deletes the selected automation parameter.

Unlearn All- Deletes all controller assignments for the patch. ESQ-1 will display a warning dialog prior to deletion in order to thwart potential unlearn-related disasters.

QWERTY Musical Typing Keyboard (MTK)



ESQ-1 can be played by clicking its onscreen keyboard with a mouse or trackpad, but if you don't have a MIDI keyboard attached to your computer, there's a better way - your computer's QWERTY computer keyboard can be used to play notes. We call this the **Musical Typing Keyboard** (**MTK**). Following is a list of MTK keyboard modifiers and functions:



Opening and Closing the MTK - Click the the circular keyboard icon in the top toolbar. To close the MTK, click the keyboard icon in the top toolbar, or click the *X* in the top right corner.

Play Notes- To trigger notes, press the corresponding computer keyboard key or mouse click the onscreen keys.

Adjust Currently Visible MTK Range- Slide the purple scroll bar horizontally to adjust the currently visible keyboard range.

Adjust Overall Visible Keyboard Range- Clicking and dragging the right edge of the MTK window allows the overall size of the window to be adjusted. This lets you view more or less of the onscreen keyboard. Note that the MTK window's borders cannot exceed the overall outside dimensions of the ESQ-1 window.

Shift Range Up/Down Octave- Click the *OCT-* and *OCT+* buttons at the top left and right of the onscreen MTK. The current range is displayed above the keyboard.

Shift Range Up/Down Semitone- Click the *STEP-* and *STEP+* buttons at the bottom left and right of the onscreen MTK. The current range is displayed above the keyboard.

Hide/View Controllers- Clicking *CONTROL* at the far left hides and displays velocity, bender, mod, and sustain control parameters. Hiding the control view makes more space available for the keyboard.

Pitch Bend- To pitch a note or notes, press the + or - computer keyboard keys while playing a note. Bend depth is determined by the setting of the *Pitch Bend* slider above the keyboard in ESQ-1's UI. Notes can also be pitchbent by clicking the mouse in the *Bend* area.

Mod Wheel- To add mod wheel modulation, press the number keys from *0-9* (above the character keys) while playing a note. The modulation amount will vary from none (*0*) to full modulation (*9*). Note that modulation will "stick" at the selected number; to disable modulation, click the *0* key. Mod can also be engaged by clicking the mouse in the mod bar area.

Sustain- The *Sustain* button mimics the functionality of a standard sustain pedal. Click the [TAB] key to engage sustain, or [SHIFT]+[TAB] to lock it. The *Sustain* button can also be engaged by mouse clicking it.

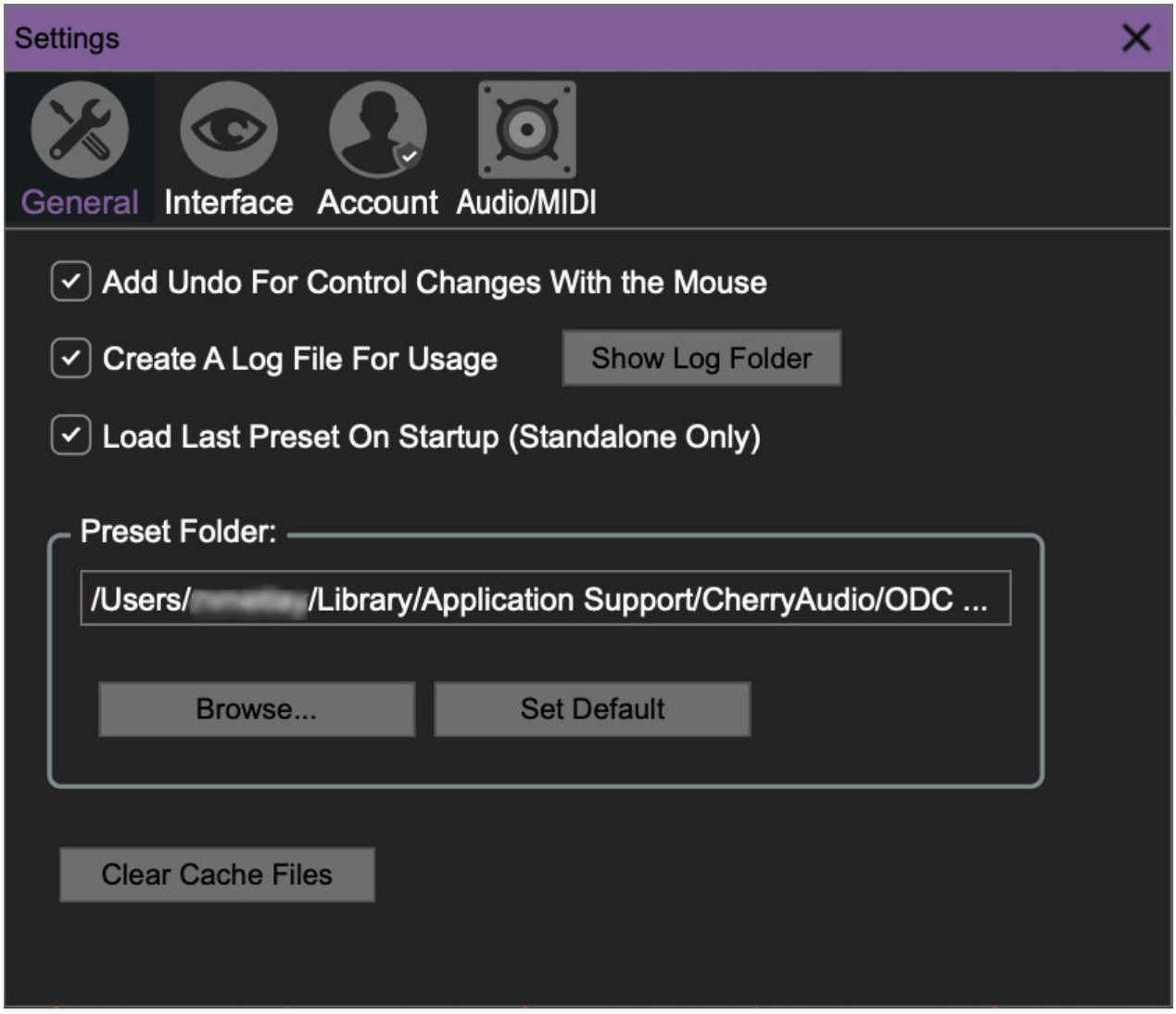
Reset- Initializes all MTK parameters including keyboard range and control parameters.

Settings

Clicking the **Settings** gear opens a window with multiple tabs for configuring various "under-the-hood" settings. These are mostly set-and-forget kind of parameters - all the stuff you'll want to tweak will be on the main display, as it should be!

The Settings tabs are: General, Interface, Account, and (on the standalone version of ESQ-1) Audio/MIDI.

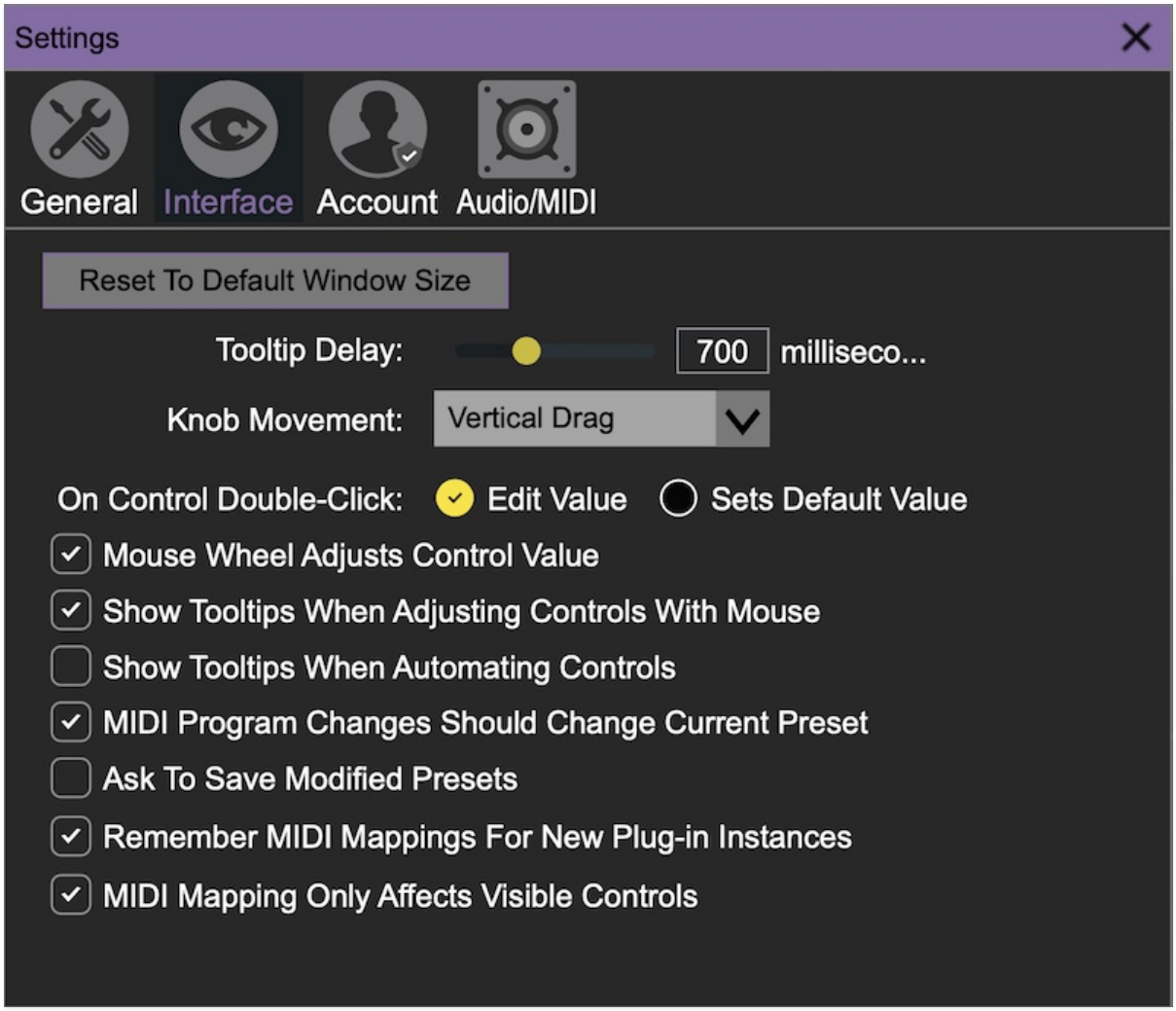
General



- **Add Undo For Control Changes With the Mouse**- Enabling this allows undo of knob/slider/button adjustments. You'll want this on if you want the ability to undo all aspects of patch editing and programming.
- **Create A Log File For Usage-** This creates a text doc of all of ESQ-1's internal and routines during use. It is mainly intended for our tech staff should you experience any issues. Clicking *Show Log Folder* opens the folder containing ESQ-1 log file docs.

- **Load Last Preset On Startup (Standalone Only)**- Automatically loads the last preset used when ESQ-1 standalone version is started.
- **Preset Folder-** Displays the current location of ESQ-1's sound presets. This can be changed by clicking and typing in the field.
  - **Browse...** - Displays the current location of preset folder in the file manager.
  - **Set Default-** Sets the current displayed *Preset Folder* path as the default location
- **Clear Cache Files-** Deletes all log files, temporary sounds, and the image cache.

Interface

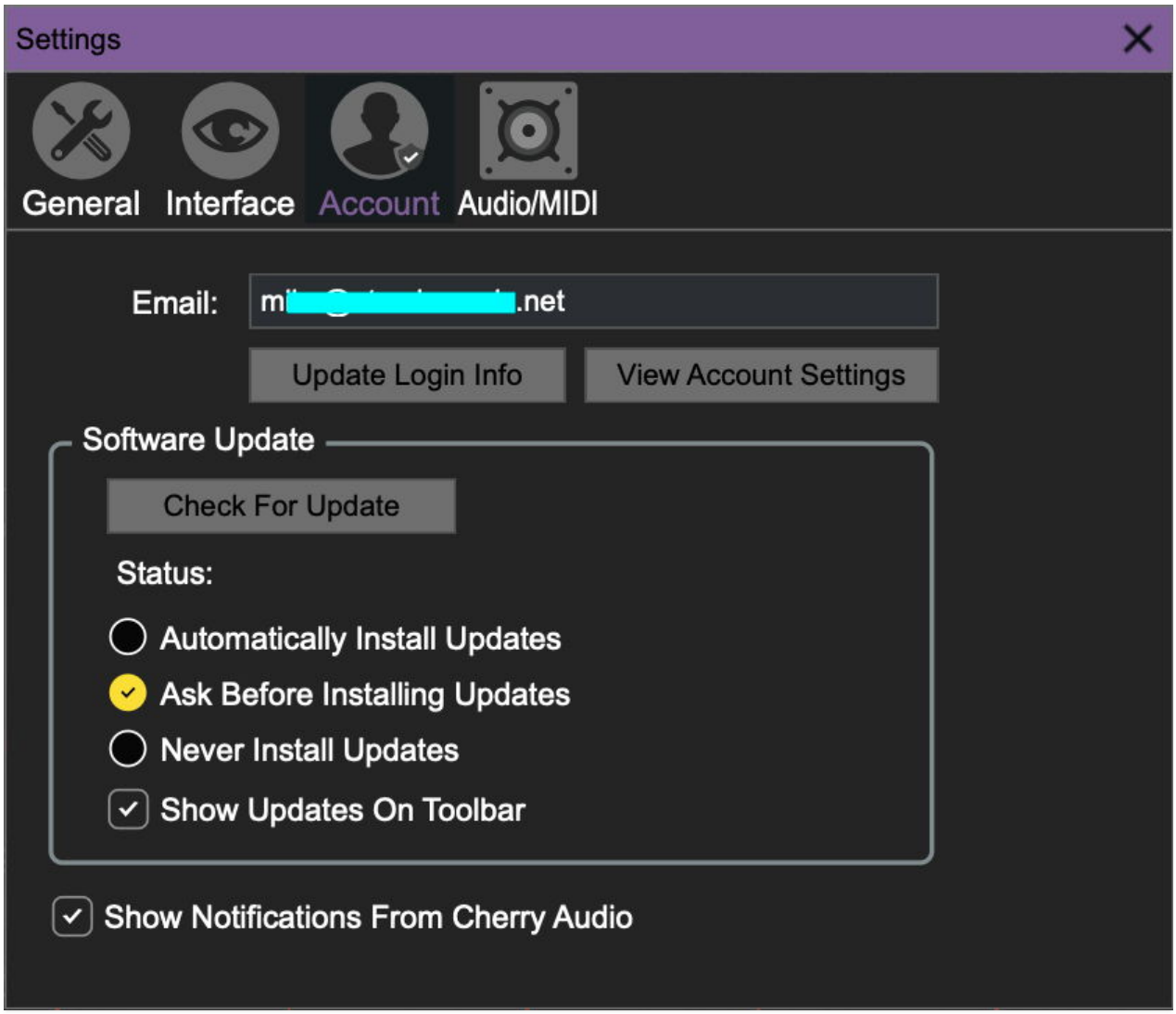


Allows customization of ESQ-1's user interface settings.

- **Reset To Default Window Size-** Resets the ESQ-1 workspace to default size. Use this to reset the window size if the window somehow becomes too large for your display and can't be resized (pretty sure we fixed that bug a while back though!).
- **Tooltip Delay-** Tooltips are those informative bits of text that pop up when hovering over a control (go ahead and try it, we'll wait...). The *Tooltip Delay* setting defines how long you must hover before the tooltip pops up.
- **Knob Movement-** Defines how mouse movements relate to turning onscreen knobs. It defaults to *Vertical Drag*, but can be changed to *Horizontal Drag*, or *Rotary Drag* if you're one those folks that cut their teeth on the *Steinberg Model E* VST back in 2000.

- **On Control Double-Click**- Defines what happens when the mouse is double-clicked on a control. If *Edit Value* is selected, an exact number can be entered by typing the number and hitting [ENTER] or [RETURN]. If *Sets Default Value* is selected, double-clicking a control resets it to its default value.
- **Mouse Wheel Adjusts Control Value-** Enabling this lets you adjust knob, slider, and switch values by moving the mouse wheel. This works great with a standard mouse wheel, but you'll want to disable it if you're using an Apple Magic Mouse (which will move the control AND scroll the window).
- **Show Tooltips When Adjusting Controls With Mouse-** Displays parameter tooltips/values when the mouse is hovered over a control or as a control is moved with mouse clicked.
- **Show Tooltips When Automating Controls-** Displays parameter tooltips/values next to controls any time a control is changed, i.e. if a control is moved via an assigned MIDI controller or a *Perform* panel knob, etc.
- **MIDI Program Changes Should Change Current Preset-** Allows MIDI program change messages to change ESQ-1 patches.
- **Ask To Save Modified Presets-** This opens a dialog window asking if you'd like to save changes if a patch has been edited and a new patch is selected. If you're the type that likes to click through presets and tweak a control here and there, it can be annoying to have a window pop-up asking if you'd like to save every time you switch presets - if you're that person, keep this turned off.
- **Remember MIDI Mappings For New Plug-in Instances**- When enabled, ESQ-1 remembers all global MIDI Tab controller settings.
- **(NEW) MIDI Mapping Only Affects Visible Controls-** this option allows users to assign the same physical control of a controller and MIDI CC to identical functions in both upper and lower layers. When enabled, only the currently displayed layer will respond to adjustments, enabling users to easily switch between layers and independently modify parameters such as cutoff and ADSR with a single set of controls.

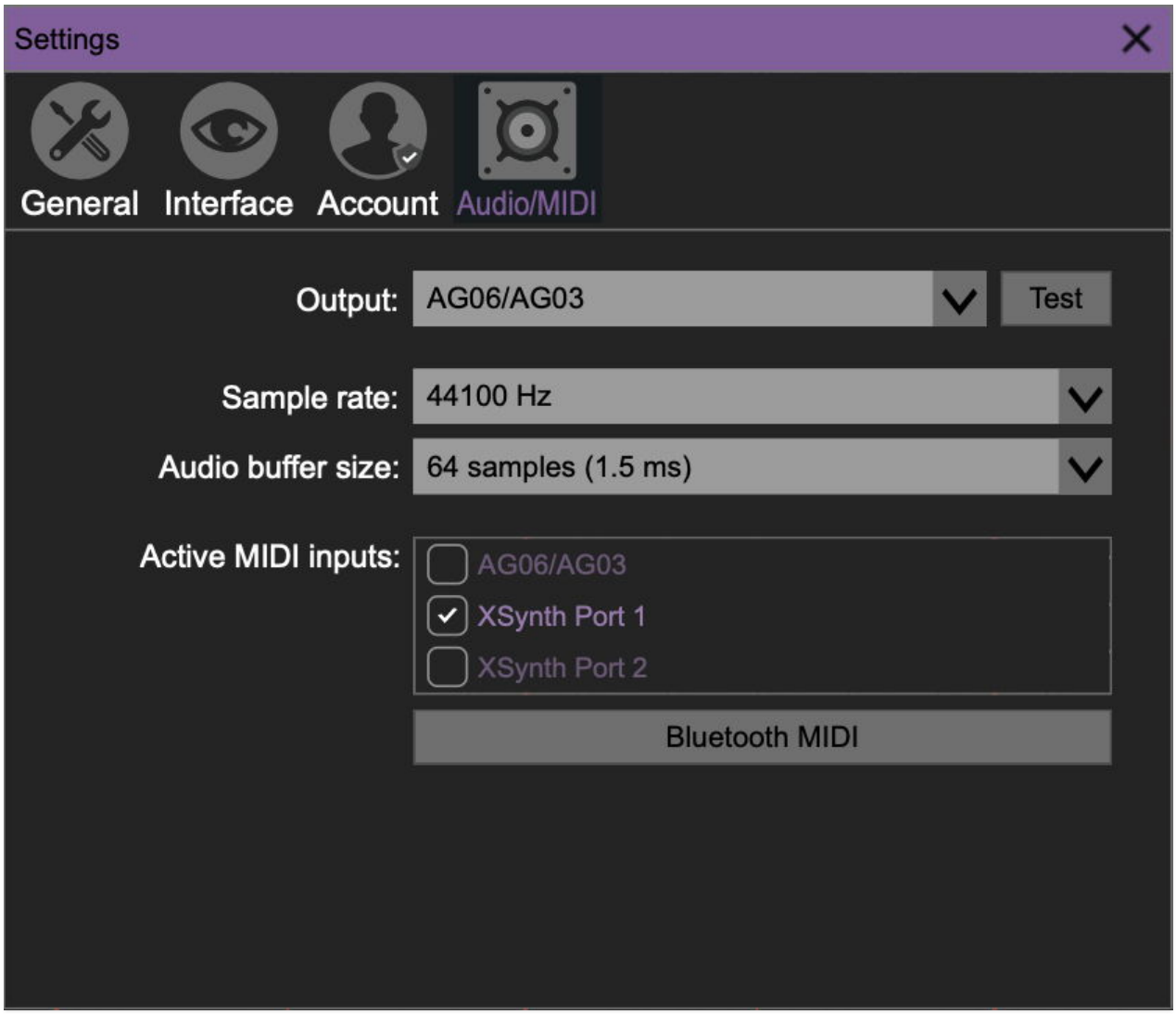
Account



Settings for your personal login information and account.

- **Email**- Displays the email address of the current login.
- **Update Login Info**- No, this isn't where you sign up to keep informed of news and tour dates for jazz/rock fusion superstar, and monumental Odyssey player, Herbie Hancock. (That would be **here**.) Clicking this opens the same email and password login screen you'll see when initially launching ESQ-1.
- **View Account Settings-** This takes you to the Cherry Audio website, where you can login and verify your settings or make changes. This won't work on a computer that's not connected to the Internet. (If it does, consult your local exorcist *immediately*.)
- **Software Update-** Here's where you can manually check for an update, and set up how much ESQ-1 does on its own to keep you updated.
- **Show Notifications From Cherry Audio-** Because hey, we love you, and sometimes just reaching out is the right thing to do.

Audio/MIDI



These are settings for audio and MIDI hardware input and output.

1. **This tab is only visible in the standalone version of ESQ-1.**

- **Output**- Use this drop-down menu to choose a physical audio output source. This defaults to *Built-In Line Output*, i.e. your computer's onboard system audio, but you'll get better fidelity with an external professional audio interface. The biggest audible difference is usually reduced background noise or hum, but external audio hardware also offers greater flexibility in terms of number of inputs and outputs and built-in mic or low-level instruments pres (i.e. electric guitars). The *Test* button will produce a sine wave when clicked; this will help with troubleshooting. In other words, "Why can't I hear anything? Aargh!"
- **Sample Rate-** This sets the global sample rate. Lower sample rates offer better performance, but if you have a fast computer, high sample rates may offer slightly improved fidelity – or at the very least, they'll give you something to argue about on audio online forums rather than writing and playing music.
- **Audio Buffer Size**- As with any digital audio app, this defines performance vs. note latency, and will largely depend upon computer CPU speed. A professional external audio interface will almost always exhibit better performance than "built-in" system audio. Lower settings will result in less latency (in the form of faster response to notes played), but will increase the chances of audio dropouts or crackling noises.
- **Active MIDI Inputs**- Enable MIDI input sources, i.e. MIDI/USB keyboards, pad controls, MIDI knob/fader control surfaces, etc. Check boxes to enable one or more devices. **If a MIDI/USB controller isn't working in standalone mode, make sure the appropriate box is checked here.** (We put this tip

all the way at the end of this manual, to make it extra challenging to figure out why things aren't working. You're welcome!)

Importing and Exporting ESQ-1 SysEx Data

Cherry Audio's Ensoniq ESQ-1 can import compatible original ESQ-1 SysEx sound data, allowing vintage hardware programs, cartridge dumps, third-party libraries, and decades of user-created sounds to be brought into the software instrument.

SysEx, short for **System Exclusive**, is a type of MIDI message used to send manufacturer-specific data between instruments, computers, librarians, and storage utilities. For the original ESQ-1, SysEx made it possible to save and transfer programs digitally rather than manually recording every parameter setting, a noble pursuit best left to monks, archivists, and people with unusually forgiving wrists.

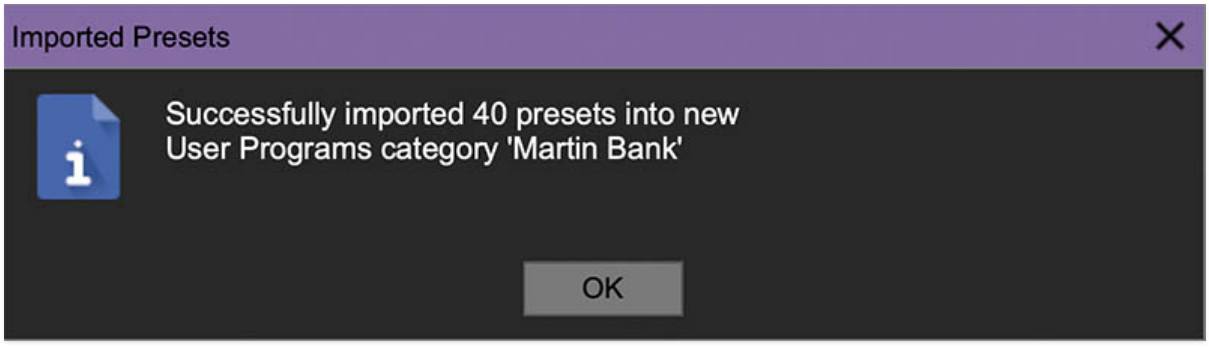
- To import a SysEx file, drag and drop a compatible .syx file anywhere onto the Cherry Audio ESQ-1 interface.
- If the file contains valid ESQ-1 program data, the instrument recognizes it and translates the sound into its native preset structure. Depending on the file, you may be importing a single program or an entire bank.
- Once imported, the sounds appear in the Preset Browser, where they can be loaded, played, edited, saved, favorited, and organized like any other ESQ-1 preset.

Imported SysEx data contains the stored voice-programming information from the original hardware, including oscillator wave selections, tuning, DCA behavior, filter settings, envelopes, LFOs, modulation assignments, and related program data. Cherry Audio's ESQ-1 translates this information as accurately as possible, preserving the character of the original sound while making it usable in the modern software environment.

The ESQ-1 hardware has three distinct kinds of SysEx data: a single patch, a bank of patches, and sequencer data. Cherry Audio's ESQ-1 can import single patch SysEx data and patch bank SysEx data. It does not import (or export) sequencer data, as the software's sequencer is a completely different design than the original sequencer.

Cherry Audio's ESQ-1 is able to assemble original split/layered patches when importing an entire bank, because the bank includes standard ESQ-1 patch data for all 40 patches. If single patch SysEx data is imported into our software, the software ignores any split or layer information in the unavailable patch files.

Because these sounds were created for the original hardware, some may sound great immediately, while others may benefit from level adjustments, effects, filter refinement, or updated performance controls. Once imported, they can be layered, split across the keyboard, processed with effects, enhanced with new modulation, animated with Macro Motion, routed through different filter modes, assigned to MIDI or MPE control, and reshaped with the same tools available to any Cherry Audio ESQ-1 preset.



Working With Imported Legacy Sounds

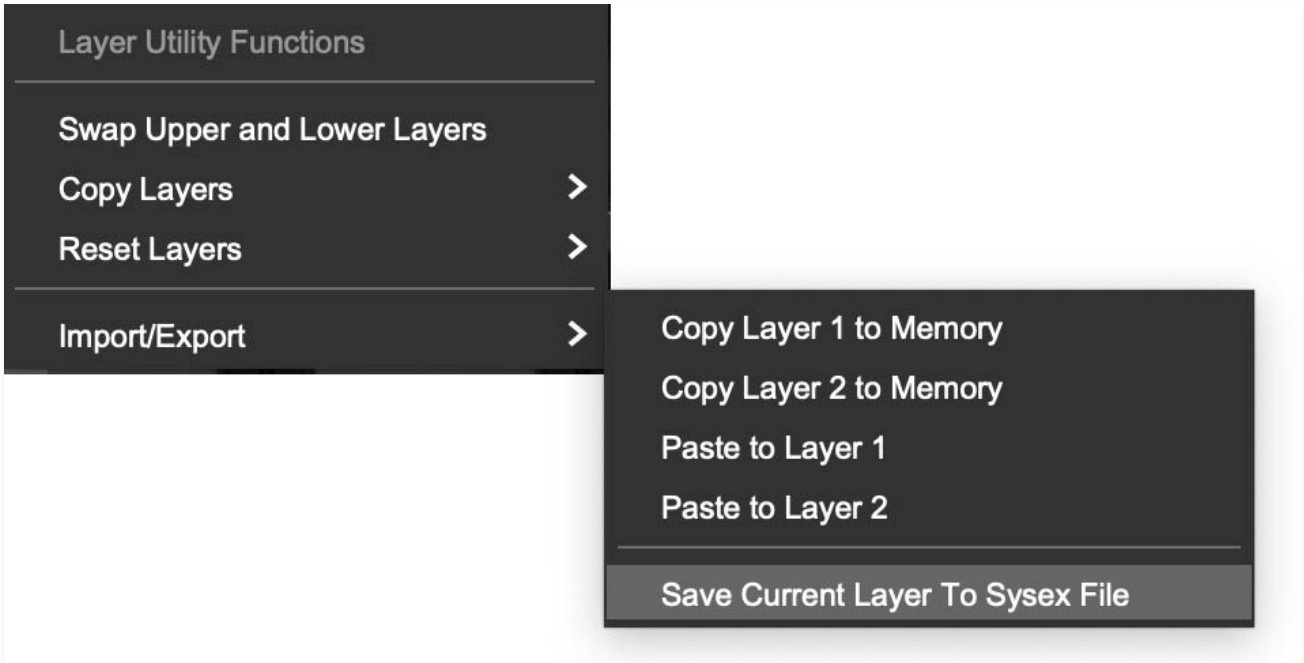
Imported ESQ-1 sounds are a great way to explore the instrument's history, but they're also useful for modern sound design. Try loading an imported patch, then making one focused change at a time:

- Add a second layer for width or contrast.
- Try a different filter mode.
- Assign a Macro to filter cutoff, oscillator level, or effects mix.
- Use Layer effects to modernize the sound without changing its core character.
- Copy the imported layer, paste it to Layer 2, and modify the copy.
- Use Motion or Macro Motion to animate a formerly static patch.

The best part is that you don’t have to choose between preservation and expansion. Cherry Audio’s ESQ-1 lets you bring original ESQ-1 sounds forward, then decide whether to leave them classic, tweak them to your taste, or use them as the basis for entirely new sounds of your own.

Exporting ESQ-1 SysEx Data

Cherry Audio’s ESQ-1 can also export layer data as SysEx. To export the currently active layer, open the turquoise **Layer Utility Functions** menu in the Volume section, then choose **Save Current Layer To Sysex File**. Name the file, choose a location, and save it. This lets you preserve a layer as ESQ-1 SysEx data, move sounds between setups, or archive individual layer sounds outside the main preset system.



In practice, any preset (excluding effects, arpeggiator, sequencer, modulation matrix, and MPE settings) can be exported from Cherry Audio's ESQ-1 to the ESQ-1 hardware, and it will sound nearly identical. To send the exported SysEx file back to the ESQ-1 hardware, you will need a utility application such as SysEx Librarian, MIDI-OX, or Bome SendSX.

Cherry Audio’s ESQ-1 only allows exporting individual patch SysEx files, not a complete 40-patch bank. As a result, when you export a sound, you can't save a fully split or layered preset. An exported patch will include only the parameters for either the Lower 1 layer or the Lower 2 layer, not both.

Note that Cherry Audio’s ESQ-1's sliders and controls allow for precision decimal values, such as 16.25. ESQ-1 hardware generally has parameters with integer values from 0 to 32. When exporting to SysEx, all values are rounded to the nearest integer value for compatibility with the hardware.