USER MANUAL

_JUP-8000 V

ARTURIA

_The sound explorers

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Product version: 1.0

Revision date: 22 April 2025

Thank you for purchasing Jup-8000 V!

Be sure to register your software as soon as possible! When you purchased Jup-8000 V, a serial number and an unlock code were sent to you by e-mail. These are required during the online registration process.

Special Messages

Specifications Subject to Change:

The information contained in this manual is believed to be correct at the time of printing. However, Arturia reserves the right to change or modify any of the specifications without notice or obligation to update the hardware or software that has been purchased.

IMPORTANT:

The software, when used in combination with an amplifier, headphones or speakers, may be able to produce sound levels that could cause permanent hearing loss. DO NOT operate for long periods of time at a high level or at a level that is uncomfortable.

If you encounter any hearing loss or ringing in the ears, you should consult an audiologist.

EPILEPSY WARNING – please read before using Jup-8000 V

Some people are susceptible to epileptic seizures or loss of consciousness when exposed to certain flashing lights or light patterns in everyday life. This may happen even if the person has no medical history of epilepsy or has never had any epileptic seizures. If you or anyone in your family has ever had symptoms related to epilepsy (seizures or loss of consciousness) when exposed to flashing lights, consult your doctor prior to using this software.

Discontinue use and consult your doctor *immediately* if you experience any of the following symptoms while using this software: dizziness, blurred vision, eye or muscle twitches, loss of consciousness, disorientation, or any involuntary movement or convulsion.

Precautions to take during use

- Do not stand too close to the screen
- Sit a good distance away from the screen
- Avoid using if you are tired or have not had much sleep
- Make sure that the room is well lit
- Rest for at least 10 to 15 minutes per hour of use

Introduction

Congratulations on your purchase of Arturia Jup-8000 V!

As with all of our products, we believe in offering the best of both worlds in a single package and letting you choose how you want to use it. Jup-8000 V offers all of the sound and features of the Roland JP-8000, a virtual analog polyphonic synthesizer that defined the sound of electronic dance music, especially the trance style, from the late 1990s onward.

Jup-8000 V provides you with all of the sound and features of the original, with added benefits such as DAW integration, additional effects, and a slew of advanced Arturia features. We can't wait to hear the sonic adventures you will take with it!

Peace, love, and music,

The Arturia team

Be sure to visit the www.arturia.com website for information about all of our other great hardware and software instruments. They have become indispensable, inspiring tools for musicians around the world.

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1. WELCOME TO JUP-8000 V!



Thank you for purchasing Arturia Jup-8000 V. As of release, it is the only software reproduction of the Roland JP-8000 virtual analog synthesizer, and a proud new member of our V Collection of software emulations of classic synths and keyboards. This powerhouse of a synth took the late 1990s by storm. Introduced as an all-around studio and performance synthesizer – but with a clear nod to electronic dance music in its marketing materials – it fused familiar analog sounds, new and complex waveforms, and hands-on control thanks to its generous complement of knobs, buttons, and sliders.

The JP-8000 appealed to everyone from the studio sound designer to the "weekend warrior" playing gigs in a local band. One group in particular, though, elevated the instrument to cult status: creators of electronic dance music, especially in the subgenre known as trance. They loved one of its more novel waveforms, the now iconic *Supersaw*, which was a stack of seven sawtooth waves that could be detuned relative to one another. This let players create the thick pads and stabs popular in trance music.

Let's take a look at the original, then introduce you to our version, Jup-8000 V.

1.1. The original JP-8000



It's important to understand the JP-8000 in the context of the keyboard landscape at the time. In the 1990s, knobs on synthesizers made a comeback. Comeback? Looking at hardware synths today, it's hard to believe they were ever gone, but they were. The 1980s were dominated by synths whose panels consisted of preset selection buttons, a small display, and a data entry slider for programming. This included the best-selling Yamaha DX7, Korg DW series, and Roland's own JX-8P, D-50, and Alpha-Juno synths. This was in part because every keyboard company was chasing the DX7's success, but also because a membrane-button array was less expensive than a dozen or more knobs and sliders. Add the fact that digital sound engines could go places analog could not, and synths of this design became hugely popular because they offered legit pro sounds at a price most musicians could afford.

Demand for real-time control and "analog warmth" eventually returned, but synths with real analog circuitry and spacefaring names like Andromeda and Voyager wouldn't blast off until the early 2000s. The '90s solution was the *virtual* analog synth: digital under the skin, but covered in controls and prioritizing analog-style sounds. The Nord Lead 1 (1994) was arguably first in this new category, and the JP-8000 (1997) was part of the late-'90s surge that also gave us the Access Virus, Korg Z1, and Yamaha AN-1X.

1.1.1. Supersaw and beyond



The original JP-8000's oscillator 1 controls

The first of several things that made the JP-8000 special was the Supersaw waveform. Again, it consists of a group of seven sawtooth waves: a central wave that stays in tune, and three waves both slightly above and slightly below it in pitch. The player could adjust the detuning spread and the mix between the central wave and detuned waves. It was similar to the unison detune available on some analog polysynths, except that thanks to the JP-8000's DSP power, it could be played polyphonically.

The Supersaw wave is legend among electronic music producers, used and adored by artists including BT, Ferry Corsten, Paul Van Dyk, and Armin van Buuren. For this reason, people forget that oscillator 1 in the JP-8000 could do some other cool tricks, such as a feedback waveform (a sawtooth fed through resonating comb filters) and Triangle Mod, which introduced a basic form of wavefolding. Skip to the more about the waveforms [p.21] subsection of chapter 3 if you'd like to learn exactly how each waveform behaved.

Other niceties that made the JP-8000 ideal for dance production included RPS (real-time phrase sequencing), which essentially let the player work with loops. In the words of Roland's brochure, "the RPS function allows you to assign complete licks to any of the 48 keys." What Roland called Motion Control could then record passes of control movements up to eight measures long as the playback looped.

The rackmount JP-8080 added more preset memory, external audio input, and an internal vocoder termed the voice modulator – not to be confused with the modulation source [p.106] of the same name in Jup-8000 V.

Today, the JP-8000 has become a modern classic, and many are still in daily use as trance/groove machines and general-purpose synthesizers alike.

1.2. Why Jup-8000 V?



Jup-8000 V Advanced view, showing the Multi-Arp

Since the JP-8000 was *virtual* analog and Jup-8000 V is a software instrument, you might be wondering "Why make a virtual version of a synth that was already virtual?" The first part of our answer is that it's an important piece of musical history and an acknowledged waypoint in synthesizer development. The second is that it lends itself very well to our philosophy.

First and foremost, we are obsessively dedicated to reproducing the authentic sound and experience of the real thing. But that doesn't mean we restrict the design to a knob-for-knob copy of the original in a way that would limit options for you, the sonic explorer. Instead, we strive to add functionality that both preserves the spirit of the original and makes it make musical sense in a modern, DAW-based creator's environment.

So, we like to think of Jup-8000 V as the synth the original designers might have made if the resources existed at the time.

1.2.1. What did we add?

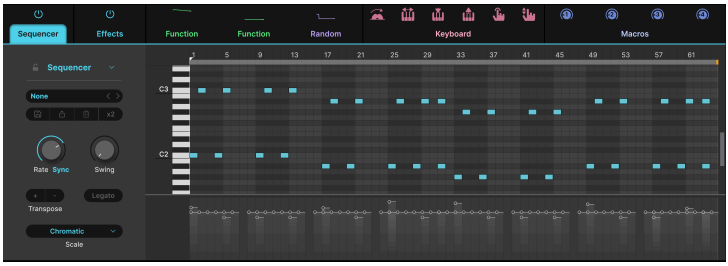


Four effects slots with 18 FX types each are available in Jup-8000 V

Like on most synths of the era, effects were limited – the JP-8000 offered chorus and delay. Jup-8000 V includes a suite of 18 studio-quality effects, with up to four available at once. The newest of these is the Trance Gate [p.79], whose audio chopping and stuttering capability is a perfect complement to the JP-8000 legacy.

In place of the JP-8000's arpeggiator is our Multi-Arp [p.36], a 4-part pattern generator that goes far beyond the repetitive up-and-down fare of traditional arpeggiators. It features a host of pattern presets, step-level control over rhythm, odd step lengths, and much more.

Improving upon the original's real-time phrase sequencing (RPS), there is a full Sequencer [p.48] with piano-roll editing:



Jup-8000 V's piano-roll Sequencer

All modulation routings from the original hardware are duplicated on the main panel, but that's the tip of the iceberg. Three modulation slots offer a choice of five flexible sources each: an ADSR envelope, our signature Functions (multi-breakpoint curves and shapes), a Random value generator, the Voice Modulator (which sends a new modulation value each time the instrument plays a voice), and the Mod Sequencer – a programmable step sequencer dedicated to sending modulation values. Best of all, you can create modulation routings via a single drag-and-drop motion.

Then, MIDI-based modulation sources include mod wheel, note, velocity, release velocity, channel aftertouch, and slide (finger position on the Y-axis of a key, on supporting controllers). MPE (MIDI polyphonic expression) is supported.

You can access all these features in the Advanced panels, or for a purer experience, close this view and play an exact duplicate of the original.

1.3. Jup-8000 V feature summary

- Authentic and accurate modeling of the JP-8000 sound
- Oscillator 1 features legendary Supersaw wave as well as Feedback Osc and Triangle Mod sound sources
- Oscillator 2 offers triangle, sawtooth, and pulse waves with PWM on the latter
- Filter with lowpass, bandpass, and highpass modes; 12dB and 24dB slopes
- Dedicated Filter Envelope
- LFO, Envelope, and Velocity modulation of filter cutoff
- Up to 16-voice polyphony as well as mono legato and mono retrigger playing modes
- Main LFO with tempo sync and fade-in
- Secondary assignable LFO keyed to the modulation wheel
- Programmable four-part Multi-Arpeggiator with tons of patterns and step-based rhythmic control
- Piano-roll sequencer with up to 64 steps and selectable scales
- Full DADSR envelopes in Modulators section, in addition to the main panel envelopes
- Functions create complex modulation shapes with multiple breakpoints
- Random value modulation source
- Voice Modulator sends a different value each time Jup-8000 V triggers a synth voice
- Mod Sequencer applies highly flexible step sequencing to sending modulation amounts
- Assignable MIDI modulation sources: wheel, keyboard track, velocity, release velocity, aftertouch, and slide
- Full MPE support for polyphonic expression with compatible controller
- Nearly all functions can be MIDI-learned to physical controls
- Macros control multiple parameters with a single knob twist
- A plethora of Presets from the industry's most talented sound designers

And now ... Jup-8000 V!

2. ACTIVATION AND FIRST START

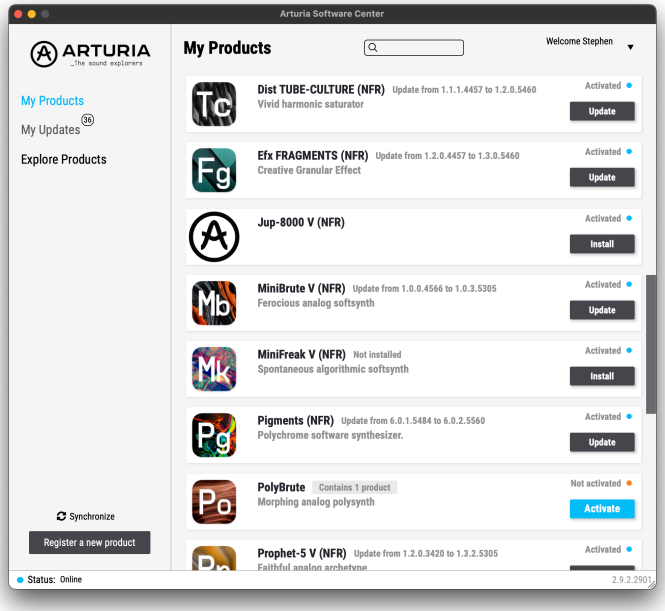
2.1. Register, activate, and install Jup-8000 V

Jup-8000 V works on computers equipped with Windows 10 or later and macOS 11 or later. You can use it as a stand-alone instrument or as a plug-in for your favorite DAW (Digital Audio Workstation) in Audio Units, AAX, VST2, or VST3 format.

Before you install or register the software, you'll need to create a My Arturia account here, using an email address and password of your choice: https://www.arturia.com/createanaccount/

While it's possible to handle registration, activation, and other tasks manually online, it's far simpler to download and use the Arturia Software Center app, which can be found here: https://www.arturia.com/support/downloads&manuals

You'll enter your email address and password to set up Arturia Software Center, which acts as a central location for all of your Arturia software registrations and activations. It also helps you install and update your software by keeping track of current versions.



You can register, activate, and install your product inside Arturia Software Center by pressing the **Register a new product** button, and clicking the boxes to **Activate** and then **Install** your software. The registration process will require you to enter the serial number and the unlock code you received when you bought your software.

You can also do this online by logging into your account and then following the instructions here: http://www.arturia.com/register

Once you've registered, activated, and installed Jup-8000 V, it's time to get it to talk to your computer.

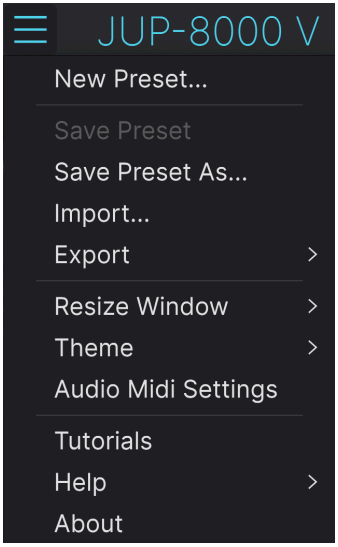
2.2. Initial setup for stand-alone use

If you would like to use Jup-8000 V in standalone mode, you will need to ensure that its MIDI input/output and audio outputs are being routed properly to and from the software. You'll generally only need to do this once, unless you change your MIDI controller or audio/MIDI interface. The setup process is the same on both Windows and macOS.

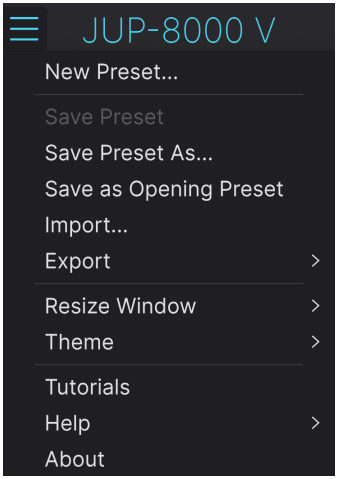
> ! This section only applies to those of you who plan to use Jup-8000 V in stand-alone mode. If you are only going to use Jup-8000 V as a plug-in inside a host DAW or other music software, you can safely ignore this section – your host music software handles these settings.

2.2.1. Audio and MIDI settings: Windows

At the top left of the Jup-8000 V application is a pull-down menu. It contains various setup options.

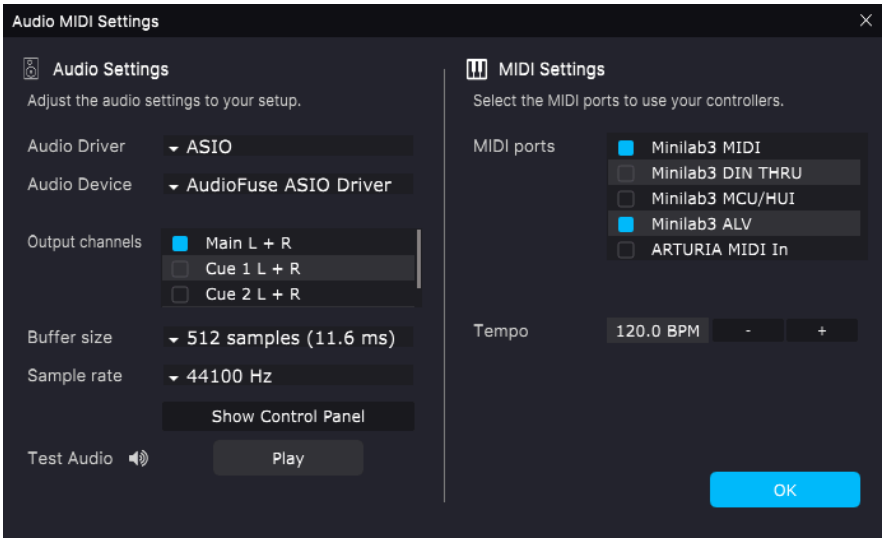


The main menu when Jup-8000 V is in stand-alone mode



The main menu when Jup-8000 V is run as a plug-in

Click on **Audio Midi Settings** to open the following window. This works in the same way on both Windows and macOS, although the names of the devices available to you will depend on the hardware you are using. Remember, this menu option is only available (and needed) when running Jup-8OOO V in stand-alone mode.



Audio and MIDI settings for Windows

Starting from the top, you have the following options:

- **Driver:** Selects which audio driver will handle playback of Jup-8OOO V. This can be your computer's internal driver, a generic ASIO driver, or an external soundcard or interface driver. The name of your hardware interface(s) may appear in the field below, depending on your selection.
- **Device** Selects the audio hardware through which you will hear Jup-8OOO V.
- **Output Channels** lets you select which of the available outputs will be used to route audio out. If you only have two outputs, this selection box will not be shown. If you have more than two, you can select a specific pair of outputs.
- The **Buffer Size** menu lets you select the size of the audio buffer your computer uses to calculate sound. The latency in milliseconds is displayed after the buffer size setting.

> ! A smaller buffer means lower latency, i.e. a shorter delay between pressing a key and hearing the note, but loads your CPU more heavily and can cause pops or clicks. A larger buffer means a lower CPU load, as the computer has more time to think, but can result in a noticeable delay between playing a note and hearing it. A fast, modern computer should easily be able to operate at a buffer size of 256 or even 128 samples without clicks. If you still hear clicks, enlarge the buffer size until they stop.

- The **Sample Rate** menu lets you set the sample rate at which audio is sent out of the instrument.

! The options here will depend on what your audio device can support; nearly every device can operate at 44.1 kHz or 48 kHz, which will be perfectly fine for most applications. If you have a specific need to use a higher sample rate, up to 96 kHz, Jup-8000 V will happily support that.

- The **Show Control Panel** button will jump to the system control panel for whatever audio device is selected.

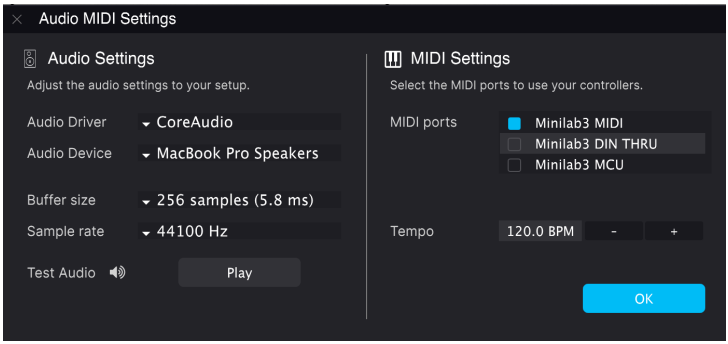
! Note that this button is only available in the Windows version.

- **Test Tone** sends a short test tone when you click the **Play** button, to help you troubleshoot audio issues. You can use this feature to confirm that the instrument is routed correctly through your audio interface and that audio is playing back where you expect to hear it (your speakers or headphones, for example).
- The **MIDI Devices** area will display any MIDI devices you have connected to your computer (if any). Click the check box to accept MIDI from the device(s) you want to use to control the instrument. You can select multiple MIDI devices at once with the checkboxes.

! In stand-alone mode, Jup-8000 V listens for all MIDI channels, so there's no need to specify a channel.

- **Tempo** sets a base tempo for features inside Jup-8000 V such as LFO and effects sync. When using Jup-8000 V as a plug-in, the instrument gets tempo information from your host software.

2.2.2. Audio and MIDI settings: macOS



Audio MIDI Settings for macOS

The menu for setting up audio and MIDI devices for macOS is accessed in the same way as for Windows, and the setup process is nearly identical. All options work the same way as described above in the Windows section. The only difference is that all macOS devices, including external audio interfaces, use the CoreAudio driver built into macOS to handle routing. In the second drop-down menu under **Device**, choose the audio device you wish to use.

2.2.3. Using Jup-8000 V as a plug-in



Here, Jup-8OOO V is shown running as an AU plug-in within Apple Logic Pro.

Jup-8OOO V comes in VST2, VST3, Audio Unit (AU), and AAX plug-in formats, for use in all major DAW software such as Ableton Live, Cubase, Logic, Pro Tools, Studio One, and more.

When using Jup-8OOO V as a plug-in, all audio and MIDI device settings are handled by your host music software. Please refer to your host music software's documentation if you have any questions about loading or using plug-ins.

Note that when you load Jup-8OOO V as a plug-in instrument inside your host software, its interface and settings work the same way as in standalone mode (see below), with a few small differences:

- Jup-8OOO V will synchronize to your DAW's host tempo/BPM when sync is required
- You can automate numerous parameters using your DAW's automation system
- You can use more than one instance of Jup-8OOO V in a DAW project
- You can run the outputs of Jup-8OOO V through any additional audio effects available in your DAW, such as delay, chorus, filters, etc.
- You can route Jup-8OOO V's audio outputs creatively inside your DAW, using the DAW's own audio routing system.

2.3. Playing Jup-8000 V for the first time

Now that you have Jup-8000 V up and running, let's take it for a quick test drive!

If you haven't done so already, launch Jup-8000 V as a plug-in or as a stand-alone instrument. If you have a MIDI controller set up, use it to play some notes on Jup-8000 V. You can also use your mouse to play the on-screen keyboard or use the keys of your computer keyboard [p.35].

The up and down arrows at the top of the instrument let you step through all of Jup-8000 V's available presets. Try playing a few, and when you find one that you like, try adjusting some of the other on-screen controls to see how they affect the sound.

Play with the controls, and don't worry – nothing is saved unless you specifically save a preset (described later in this User Guide), so there is no risk you'll mess up any of Jup-8000 V's factory presets.

We hope this chapter has gotten you off to a smooth start. Now that you're up and running, the rest of this guide will help you work your way through all of Jup-8000 V's features on a section-by-section basis. By the time you reach the end, we hope you'll understand all of Jup-8000 V's capabilities – and will be using this fantastic instrument to create equally fantastic music!

3. MAIN PANEL



This chapter covers the controls numbered in red above

In this chapter we will cover the core controls and synthesizer functions of Jup-8000 V, which are as follows:

Number	Area	Description
1.	Oscillator 1 [p.19]	Adjusts the sound of Oscillator 1 including Supersaw waveform
2.	Oscillator 2 [p.22]	Controls for Oscillator 2 including pulse wave with PWM
3.	Oscillator Common [p.24]	Settings common to both oscillators including a two-stage mod envelope, sync, and cross-modulation
4.	Filter [p.27]	3-mode resonant filter with selectable slopes and dedicated ADSR envelope
5.	Amp Envelope [p.30]	Amplitude ADSR envelope with LFO and velocity depth adjustments
6.	LFO [p.31]	Settings for LFO including sample-and-hold waveform, tempo sync, and fade-in
7.	Pan section [p.32]	Places pre-FX sound in the stereo field; with LFO depth adjustment
8.	Tone controls [p.33]	Simple treble and bass boost/cut knobs
9.	FX mixes [p.33]	Mirrors of the dry-wet sliders in Effects [p.62] section; knob labels follow selected FX
10.	Performance controls [p.34]	Pitch-bend and modulation wheels, mod-dedicated LFO, and glide
11.	Keyboard [p.35]	Onscreen keys for playing with mouse or computer keyboard

3.1. Common behaviors

All Arturia virtual instruments share some common control behaviors to make editing sounds easier. These behaviors are common to every control in Jup-8000 V.

3.1.1. Value pop-ups



Hovering over the Glide knob shows the current value

Move or hover on any control and a pop-up banner or "tool tip" will display its value, as well as the units for that value (semitones for pitch, Hz for frequencies, etc.).

3.1.2. Parameter descriptions



Operating or hovering on any control displays its name and a brief description of its function in the left corner of the lower toolbar [p.127].

3.1.3. Fine adjustment

Hold the right mouse button or Control key while dragging on any knob to adjust it more slowly. This helps when you want to dial in precise values.

3.1.4. Double-click for default

Double-click on any knob to return it to its factory default setting.

3.2. Oscillator 1



Oscillator 1 features the novel Supersaw and Feedback waveforms

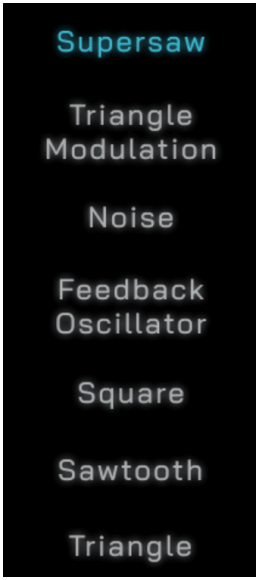
Oscillator 1 is the main oscillator; on the original JP-8000, it was chiefly responsible for the instrument's signature sound.

3.2.1. Waveform select and sliders



Oscillator 1 with the Feedback Osc waveform selected

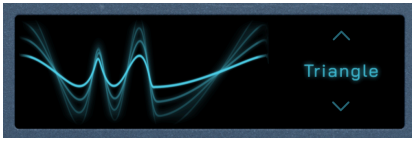
The JP-8000 broke ground by offering some novel and complex waveforms in addition to traditional synth waves. In Jup-8000 V, you can select these with the up/down arrows or by clicking the wave name to display the following menu:



The two vertical sliders change functions based on which waveform is chosen. The chart below explains what they do. After the chart, we explain more about the waveforms themselves.

Waveform	Description	Slider 1	Slider 2
Supersaw	7 stacked sawtooth waves	**Detune**: Sets amount of detuning between the waves	**Mix**: Adjusts the relative volume between the detuned waves and the central, in-tune wave
Triangle Modulation	Wavefolded triangle wave	**Shape**: Varies the shape of the wave (see below)	**LFO**: Scales modulation depth from the main LFO [p.31] to the Shape parameter
Noise	White noise, filterable	**Cutoff**: Sets the cutoff of a dedicated lowpass filter	**Res**: Sets the resonance of a dedicated lowpass filter
Feedback Oscillator	Sawtooth wave through comb filter with feedback path	**Harm**: Sets the frequency of the comb filter	**Fdbk**: Sets the amount of post-filter signal fed back into the comb filter
Square	Square wave with PWM	**PW**: Varies the pulse width of the wave	**LFO**: Scales modulation depth from the main LFO [p.31] to the PW parameter
Sawtooth	Shapable saw wave	**Shape**: Varies the shape of the saw wave (see below)	**LFO**: Scales modulation depth from the main LFO [p.31] to the Shape parameter
Triangle	Shapable triangle wave	**Shape**: Varies the shape of the triangle wave (see below)	**LFO**: Scales modulation depth from the main LFO [p.31] to the Shape parameter

3.2.1.1. More about the waveforms



Middle C on the Triangle waveform with the Shape parameter at maximum

The best way to learn how the sliders affect the different waveforms is to hold some notes, listen, move the sliders, and watch the visualizer shown above. It shows a real-time view of the waveform's shape and phase, and will change upon playing different notes. Here are some more details about each waveform, which we hope you find helpful.

Supersaw: The Supersaw defined the sound of trance music from the late 1990s onward. The JP-8000 was the synth that introduced it. It is essentially a unison detune function, stacking up seven voices and detuning them relative to each other, then letting you mix in the detuned portion. On an analog synth, this normally takes up all the voices, requiring monophonic playing. Because the JP-8000 was *virtual* analog, it had the computing power to play polyphonically. It also kept the detuning within a musical range that didn't sound "out of tune" even at high settings. The center wave was in tune, and three waves to either side were progressively lower or higher in pitch. The **Mix** slider balances their volume with the center wave, with the **Detune** slider controlling the overall tuning spread.

Triangle Modulation: *Wavefolding* means taking the highest peaks and lowest valleys of a waveform's positive and negative cycles and folding them over so they're pointing the opposite way – as if the waveform were cut out of crafting paper. The result is more harmonics, some of them non-contiguous. In Jup-8000 V, the Triangle Modulation waveform is folded once, with the **Shape** control adjusting the time interval between the peaks.

Noise: Like on the original, this is the only noise source you'll find in Jup-8000 V, so it's designed to be flexible. Its dedicated lowpass filter is independent of the main Filter [p.27] section. With the **Cutoff** at maximum, the result is familiar "white noise." **Resonance** can introduce a whistling quality, or at maximum, turn the noise into a sine wave. Adjusting the Cutoff will then change the pitch of the sine wave. Note that keyboard tracking is active on the noise Cutoff all the time. This lets the sine wave play fully at all pitches, but is also present when you turn Resonance down. That is, noise will sound brighter as you play higher notes.

Feedback Oscillator: A *comb filter* involves a series of notches spaced more or less evenly, visually resembling the teeth of a comb. Tuning a comb filter to certain frequencies creates harmonically interesting sounds, and is often an ingredient of modeling synthesis. Here, the core waveform is a sawtooth wave, and the comb filter has a feedback path. By playing both sliders against one another, you can evoke choirs, organs, bells, or even a distorted electric guitar.

Square: A square wave consists of a fundamental pitch and odd harmonics only. A perfect square has positive and negative cycles of equal durations, and has a reedy tone. When the cycles are unequal in duration, it becomes a *pulse* wave. Pulse *width* refers to the difference in duration between the cycles, and changes the harmonics subtly. Modulate this from the LFO for moving harmonic variation.

Sawtooth: The sawtooth wave is the workhorse of synthesis because it contains odd and even harmonics. The one in Jup-8000 V can be shaped. Shape here is not unlike pulse width, but it affects the entire shape of the waveform even more. At either extreme of the **Shape** slider, the wave will have a strong fundamental pitch. In the middle, the sound becomes thinner, as though a highpass filter were applied.

Triangle: Like the square, the triangle wave has only odd harmonics, but as the harmonics increase in pitch they get quieter faster, resulting in a "dirty sine" tone electronic producers like for sub-bass. Set to minimum, the **Shape** slider produces a traditional triangle. As you raise it, higher overtones are added. At the top, it turns into an almost-square wave.

3.2.2. Oscillator 1 pitch



Oscillator 1's pitch controls

The pitch controls for Oscillator 1 are simple:

- **Octave**: Offsets the pitch up or down by 1 or 2 octaves
- **Coarse**: Tunes Oscillator 1 in semitones (half-steps in the chromatic scale)

Coarse pitch goes up or down by discrete semitones only. So, setting Coarse pitch to +12 semitones has the same effect as setting the Octave to +1. Oscillator 1 does not have a fine pitch control, but Oscillator 2 does.

3.3. Oscillator 2



Oscillator 2 is more conventional analog synth fare than Oscillator 1

3.3.1. Waveforms

Three waveforms are on hand in Oscillator 2: square/pulse, triangle, and sawtooth. Select one by clicking the "LED" buttons.

3.3.2. Pulse width

If (and only if) the square/pulse wave is selected, the sliders vary the pulse width.

- **Pulse Width**: Adjusts the duty cycle of the wave, resulting in different harmonics
- **PWM depth**: Scales modulation depth from the main LFO [p.31] to the pulse width

For more about pulse width, see its description in More about the waveforms [p.21].

3.3.3. Oscillator 2 pitch



Oscillator 2's pitch controls

Oscillator 2 offers two pitch controls:

- **Coarse**: Adjusts the pitch in semitones (half-steps in the chromatic scale), with a range of +/- 4 octaves (48 semitones)
- **Fine**: Fine-tunes the pitch in cents (hundredths of a semitone), with a range of +/- 50 cents

3.4. Oscillator Common



As its name implies, this section is home to settings that affect both oscillators. We named it after the section on the hardware JP-8000 but, in fact, it's all about cool modulations.

3.4.1. Sync

Oscillator 2 may be hard-synced to Oscillator 1 by toggling the **Sync** switch. This locks the starting phase of Oscillator 2 to the frequency of Oscillator 1, such that both phases start at the same time even if the two oscillators' pitches are set differently. This has the effect of forcing Oscillator 2 have the same base frequency. Audibly, the oscillators will not sound out of tune with each other regardless of their pitch settings, so vary the Coarse and Fine pitches of Oscillator 2 to experiment with overtones.

♪ Musically, hard sync can produce edgy and interesting results. One of the most famous of these is the "quacking" synth sound that enhances the bass line of the song "Let's Go!" by The Cars.

3.4.2. Ring modulation



Oscillator 2 can also be ring-modulated by Oscillator 1, whose controls change the character of the modulation. When **Ring** is engaged, the modulated signal (the effect on Oscillator 1) replaces the audio signal of Oscillator 2. This means that the Mix [p.28] knob in the Filter section becomes a dry/wet balancer for Oscillator 1 without ring modulation versus Oscillator 1 with it. Oscillator 2 itself is not heard as an audio source.



Oscillator 2's signal replaced by ring-modulated Oscillator 1 on the Mix knob

(The **Mix** knob was in the Oscillator Common section on the original hardware. For design reasons, we put it in the Filter [p.27] area of Jup-8000 V.)

In the analog world, ring modulation was a form of sound generation where two oscillators are input to a circuit made of four diodes in a ring. The output frequencies are the sum and difference of the input frequencies, which don't follow the pitch and harmonic structure of the inputs. To create clanging metallic tones, set the **Coarse** pitch of Oscillator 2 to a non-octave number of semitones. Use an octave interval for more harmonious sounds.

> ♪ Ring modulators also exist in hardware such as pedals and Eurorack modules. With these, an external audio input and internal oscillator are the two sound sources. The BBC famously employed a ring modulator to create the sinister voice of *Doctor Who*'s cyborg enemies, the Daleks.

3.4.3. X-Mod

The **X-Mod** knob adjusts the depth of basic FM (frequency modulation) of Oscillator 1 by Oscillator 2. Adjusting any of Oscillator 2's settings will audibly effect Oscillator 1; varying the width of the pulse/square wave can get especially crazy.

Unlike with the ring modulation, Oscillator 2 can be heard as its own audio source alongside its effects on Oscillator 1. So, if you favor Oscillator 2 with the Mix knob, you'll hear the "pure" sound of Osc 2 *and* the FM-affected sound of Oscillator 1.

> ! If the *Supersaw* or *Noise* waveform is selected in Oscillator 1, X-Mod is not available. This reflects the behavior of the original hardware. Applying FM to a Supersaw would defeat its musical purpose, and doing so to noise is ... let's say it's the synth equivalent of dividing a number by zero.

3.4.4. Modulation Envelope section



The right half of the Oscillator common section contains a modulation envelope. This is a dedicated envelope with two time phases: attack and decay. It can be assigned to the pitch of both Oscillators 1 and 2, the pitch of Oscillator 2 alone, or to modulate the **X-Mod** [p.25] knob described above.

3.4.4.1. Destinations

Use the **Mod Dest** "LED" buttons to select one of the available destinations.

3.4.4.2. Mod envelope controls

The **Env** knob sets the depth of the envelope's effect on the assigned destination(s). It can send a positive (clockwise) or inverted (counterclockwise) envelope. Then, the sliders control the segment times:

- **Attack**: The time it takes to go from zero modulation to the depth set by the **Env** knob
- **Decay**: The time it takes to return to zero modulation from that depth

The times begin in milliseconds, and the decay phase can be a lot longer (up to 54.8 seconds) than the attack phase (up to 23.9 seconds). Since these are absolute amounts, the envelope may *sound* slower or faster depending on the **Env** depth setting. It's more accurate to say they're covering more or less ground in the same amount of time.



Attack and Decay times 1 second; medium envelope depth



Attack and Decay times 1 second; maximum envelope depth

For example, with a shallow pitch envelope depth and both attack and decay set to one second (left), the pitch glides gently up then back down. Change the depth to maximum (right), play a note, and the envelope seems to be positively rushing. Another analogy: If you ride a bicycle to a restaurant that's half as far away as your usual favorite, but at the same speed, you'll arrive sooner.

3.4.5. LFO modulation

The main LFO [p.31] can also modulate the destination selected in the Oscillator Common section. It can be used together with the Modulation Envelope, but can also overwhelm the envelope at extreme depth settings. The bipolar **LFO** knob adjusts the depth.

3.4.6. Combining modulations



Ring modulation, sync, and x-mod all active at once

Can you use Ring modulation, Sync, and X-Mod (or two out of three) at the same time? yes! The three modulations work roughly in parallel between the two oscillators. The sum of the **LFO** and **Env** depth knobs feeds this modulation block, which in turn feeds the Filter section's **Mix** [p.28] balance. A few rules of thumb govern what you hear:

- **Ring mutes Osc 2**: As mentioned, Ring modulation replaces the audio output of Oscillator 2 with the *effect* of the modulation on Oscillator 1. You never hear Oscillator 2 "naked" with **Ring** turned on.
- **Sync versus Ring**: Since hard sync locks the oscillators' phases, ring modulation produces far less dissonance. It still has an effect, but the Daleks have left the building.
- **X-Mod versus Sync**: Even with Sync on, X-Mod *can* still produce dissonance depending on the settings, especially if you experiment with the width of the pulse/square wave and odd intervals of Coarse pitch.

3.5. Filter



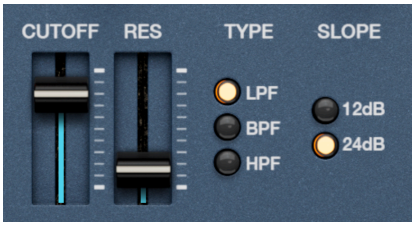
The Jup-8OOO V filter section

We have duplicated the sound and behavior of the original filter in detail. It offers three modes, two slopes, and four modulation inputs including a dedicated envelope.

3.5.1. Oscillator Mix

The **Mix** knob simply adjusts the balance of Oscillators 1 and 2 fed into the filter. At 12 o'clock, equal amounts of each oscillator are heard. To hear *only* Oscillator 1 or 2, turn the knob all the way counter-clockwise or clockwise.

3.5.2. Main Filter controls



Here is where you will find the main controls governing filter behavior.

3.5.2.1. Cutoff and Resonance

- **Cutoff**: Sets the frequency at which the filter starts to block frequencies outside of the passed range
- **Resonance**: Emphasizes a peak of frequencies at the cutoff point

3.5.2.2. Filter Type

- **LPF**: Lowpass; blocks frequencies above the cutoff
- **BPF**: Bandpass; blocks frequencies to either side of the cutoff
- **HPF**: Highpass; blocks frequencies below the cutoff

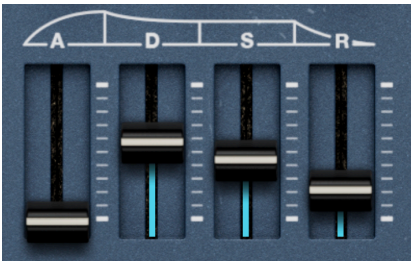
3.5.2.3. Filter Slope

Two slopes are available, selected by clicking the LED buttons:

- **12dB**: 12 decibels per octave
- **24dB**: 24 decibels per octave

> ♪ What does "per octave" mean? When a filter blocks frequencies outside the permitted range, it doesn't cut them off all at once like a cliff. It has a slope. With a slope of 12dB per octave, frequencies are reduced by 12dB for every octave they stray outside of the permitted range. An audio term for this range is "passband," i.e. those frequencies that are allowed to pass.

3.5.3. Filter Envelope



The Filter has a dedicated ADSR envelope wired to the cutoff frequency. The familiar controls are:

- **Attack:** The time it takes for the envelope to rise to peak level once a note is played
- **Decay:** The time it takes for the envelope to fall from peak level to the sustain level
- **Sustain:** The level at which the envelope remains as long as a note is held
- **Release:** The time it takes for the envelope to go from the sustain level to zero when a note is released

3.5.4. Filter modulations



Four sources can modulate the filter cutoff frequency, creating animation in the brightness of the sound. Each has a knob to adjust the depth.

- **Key**: Keyboard tracking
- **LFO**: The main LFO [p.31]
- **Env**: The envelope [p.29] described above
- **Vel**: MIDI velocity (affects how much the *envelope amount* affects the cutoff!)

All knobs except Velocity are *bipolar*, meaning they can send positive or negative values. Setting the Envelope to a negative value will invert its shape. Velocity sends positive values only – though you could make a separate modulation assignment in the advanced Modulators [p.89] view to send lower values with increasing velocity.

> ♪ The higher the keyboard tracking value, the more the cutoff frequency shifts upward as you play higher notes. This is commonly used with lowpass filtering to compensate for our ears' natural rolloff curve and ensure that synth leads or acoustic instruments don't sound unnaturally dull in higher pitch ranges.

3.6. Amp Envelope



Amplitude (VCA in analog synth parlance) has its dedicated envelope, again with ADSR controls:

- **Attack:** The time it takes for the volume to rise to peak level once a note is played
- **Decay:** The time it takes for the volume to fall from peak level to the sustain level
- **Sustain:** The level at which the volume remains as long as a note is held
- **Release:** The time it takes for the volume to go from the sustain level to zero when a note is released

3.6.1. Amp Envelope modulations

You can then modulate the envelope with two sources:

- **Vel**: MIDI velocity, as from a keyboard controller
- **LFO**: The main LFO [p.31]

As with the Filter envelope, LFO modulation is bipolar whereas velocity sends positive values only.

3.6.2. Volume knob

The **Vol** knob simply sets the voice output volume, upstream of any FX applied in the Effects [p.62] view. So, be aware that FX there can further increase (or decrease) the final output level. Also, the Volume knob is eligible to be an advanced modulation [p.89] destination.

3.7. LFO



Here is what we have been calling the main LFO of Jup-8000 V. This is the LFO whose depth affecting various sources is adjusted by the **LFO** knobs in oscillator, filter, and other sections. (A secondary LFO is keyed to the modulation wheel, in the Performance controls [p.34] section of the panel.)

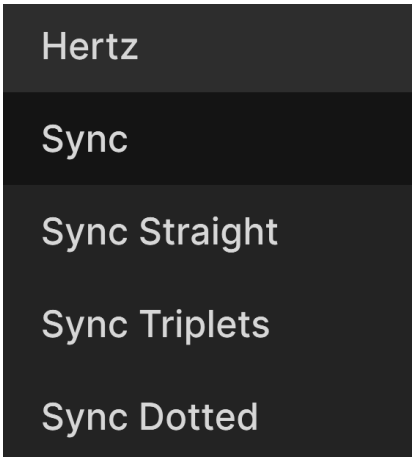
3.7.1. LFO Waveform

Four waveforms are available for the modulation shape: triangle, square, sawtooth, and sample-and-hold, selected by clicking one of the four LED buttons.

> *Sample-and-hold* refers to sampling an audio source (most often white noise) at time intervals, then applying that value to a modulated destination. Map it to filter cutoff to create a burbling effect. Subjectively it sounds random, but random value generation is not what is actually going on.

3.7.2. Rate and tempo sync

The LFO speed, adjusted by the **Rate** knob, can free-run in Hertz (cycles per second) or sync to rhythmic divisions/multiples of musical bars in your project tempo. Click the **Sync** button to bring up the following menu:



LFO tempo sync options menu

- *Hertz:* Free-running with no tempo sync
- *Sync:* Straight, triplet, and dotted ratios are all present when you turn the knob
- *Sync Straight:* Only even rhythmic values are represented
- *Sync Triplets:* Triplet feel; a quarter-note = three eighth-notes played in the space of two
- *Sync Dotted:* Dotted feel; a quarter-note = a dotted eighth-note followed by a 16th-note

3.7.3. Fade and Retrigger

With **Retrig** active, the LFO waveform will start at the beginning of its cycle each time Jup-8000 V calls for a voice, as when you play a note.

Finally in the LFO section, the **Fade** knob introduces a delay wherein the LFO action fades in some time after you play a note. The time is in milliseconds and goes up to 27.3 seconds.

3.8. Pan section



Here, you can place Jup-8000 V's voice output in the stereo field. Panning is per voice and upstream of the Effects [p.62] in the Advanced view. So, FX you apply there that have a stereo adjustment can further affect the stereo position as heard.

- **Pan**: Adjusts the position per voice in the stereo picture
- **LFO**: Scales modulation depth from the main LFO to the **Pan** knob

3.9. Tone controls



These simple boost/cut controls raise or attenuate low and high frequencies. In fact, they are shelving EQs with frequencies of 230 Hz for bass and 1,500 Hz for treble.

3.10. FX mixes



Four knobs are on hand that act as "mirrors" for the dry/wet sliders of up to four FX in the Effects [p.62] tab of the Advanced view. Their positions correspond left-to-right to the FX order, and the knob names change to match the FX device in each slot. If no effect is inserted in a slot, the corresponding knob is greyed-out.

3.11. Performance controls



To the left of the onscreen keyboard, the section labeled **MOD** is home to wheels, glide, and an assignable LFO keyed to the modulation wheel.

3.11.1. Glide

The **Glide** knob brings in *portamento*, meaning the pitch of successive notes will bend smoothly to one another as they're played. It works with polyphonic playing. If you select *Mono Legato* in the lower toolbar's Polyphony [p.128] menu, only notes played before fully releasing the previous notes will have portamento.

3.11.2. Arp

This button is an overall on/off toggle for the Multi-Arp [p.36], the four-part arpeggiator available in the Advanced view.

3.11.3. Pitch-bend wheel

The pitch-bend wheel allows for expressive pitch gestures in synth solos. Its range is set in the Side Panel [p.130] and is equal in the up and down directions. When released, it springs back to its middle (zero) position.

3.11.4. Mod LFO and wheel



The modulation wheel works in conjunction with a dedicated second LFO. Using the LED buttons, you can route it to one of three destinations:

- *Pitch*: The pitch of both oscillators. Modulation preserves pitch intervals and detuning set in the oscillators' controls.
- *Filter*: Cutoff frequency of the Filter.
- *Amp*: Voice output level, i.e. the Volume knob in the Amp Envelope [p.30].

3.11.4.1. Rate and Depth

The **Rate** knob adjusts the LFO speed in Hertz; there is no tempo sync like on the main LFO.

Depth is bipolar, and sets the maximum amount the modulation wheel sends when raised all the way. This is useful because in live performance, you may want to proceed through a subtle range of modulation depth, or *not* have the depth max out when you slam the wheel on your MIDI controller.

3.12. Onscreen keyboard

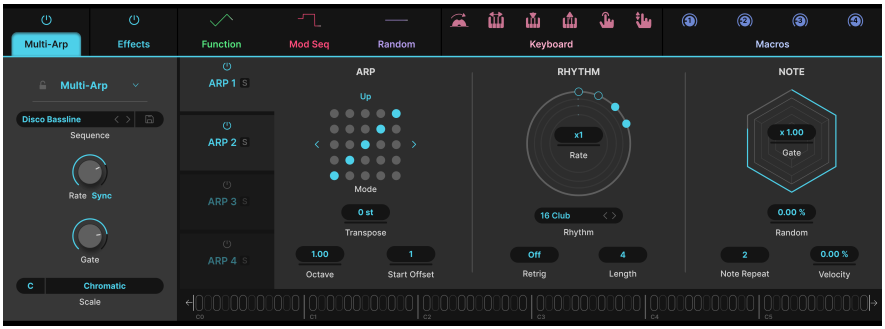
The onscreen keyboard is handy for working on a laptop without any other MIDI input device. Clicking on a key closer to its front edge increases the MIDI velocity of the note.

3.12.1. Playing from a computer keyboard



You can play an octave plus a ninth in the key of *C* using a standard QWERTY keyboard, according to the diagram above. In addition, the **Z** key shifts the pitch range an octave down and the **X** key shifts it an octave up.

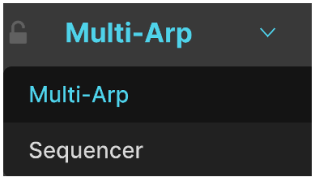
4. MULTI-ARP



The 4-part Multi-Arp in Jup-8000 V

The Multi-Arp is a four-track arpeggiator capable of some dazzling polyrhythms, since each track can have different pattern and rhythmic settings. Unlike a sequencer, an Arpeggiator plays only as long as notes are held, and transforms chords into repeating note patterns.

To access it, press the Advanced button [p.126] at the top right of the Jup-8000 V window to open the Advanced views, then click the tab all the way on the left.

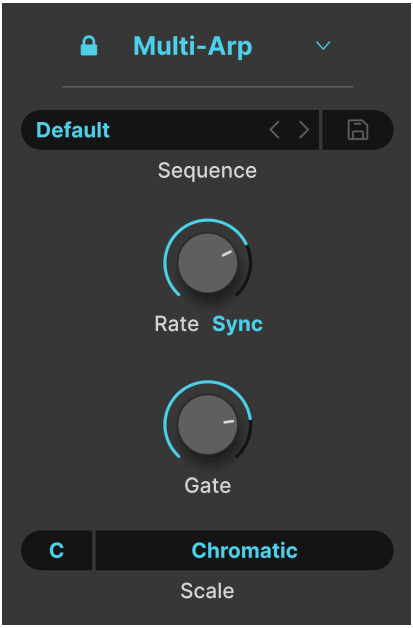


The leftmost tab in the Advanced view shows either the Multi-Arp or the Sequencer

The leftmost tab might contain either the Multi-Arp or the Sequencer [p.48], which we cover in the next chapter. If the Sequencer is present, click the drop-down carat icon to display the above menu, where you can switch to the Multi-Arp.

> The Multi-Arp can output MIDI data to play other instruments [p.47].

4.1. Global settings

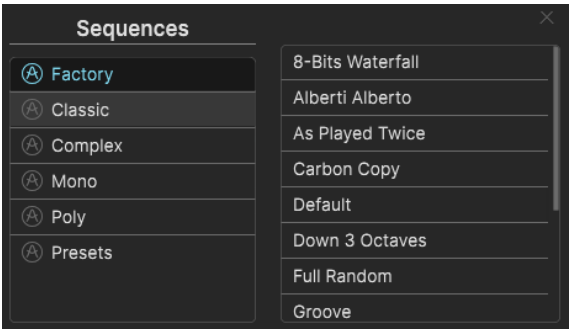


Certain settings are common to all four tracks of the Multi-Arp, so let's begin there.

4.1.1. Lock

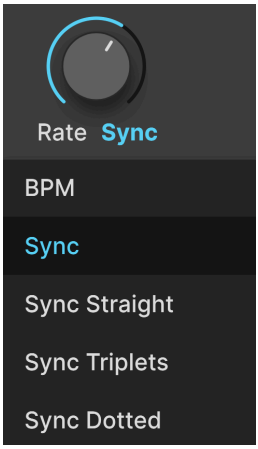
The padlock icon at upper left ensures the current Multi-Arp settings will not change even if you change the Jup-8000 V Preset. This is useful for crafting an arpeggio as you browse for the perfect sound to play it.

4.1.2. Multi-Arp presets



A variety of setups for the Multi-Arp are available by clicking on the Sequence menu. You can also use the arrows to step through them one at a time. Click the disk icon to save all the current Multi-Arp settings as a user preset. You will be prompted to name it, then you can recall it at any time from the user bank.

4.1.3. Rate and tempo sync



The Multi-Arp's rate can run free or be synced to project tempo via a drop-down menu accessed by clicking below the **Rate** knob. The options are:

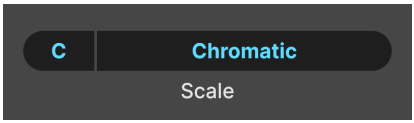
- *BPM:* Free-running in beats per minute
- *Sync:* Straight, triplet, and dotted ratios are all serially when you turn the knob
- *Sync Straight:* Only even rhythmic values are represented
- *Sync Triplets:* Triplet feel; a quarter-note = three eight-notes played in the space of two
- *Sync Dotted:* Dotted feel; a quarter-note = a dotted eighth-note followed by a 16th-note

4.1.4. Global Gate time

Gate time shortens or lengthens the duration each note is played by the Multi-Arp. In musical terms, this leads to a more sustained sound at longer gate times and a clipped sound at shorter ones.

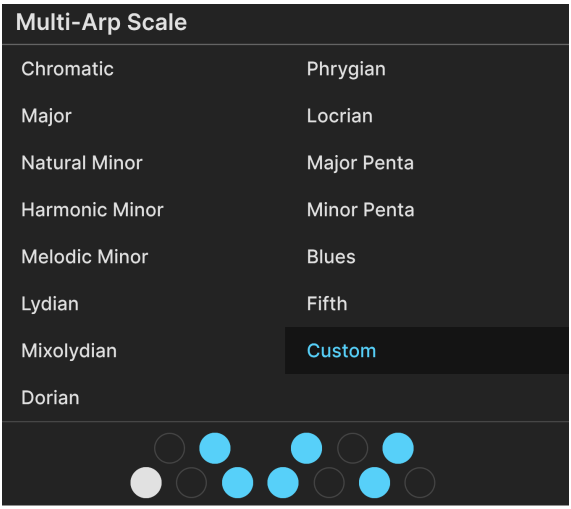
Thanks to a gate multiplier [p.46] per Multi-Arp track, each track can have a different effective gate time.

4.1.5. Scales



The field on the left selects the root note

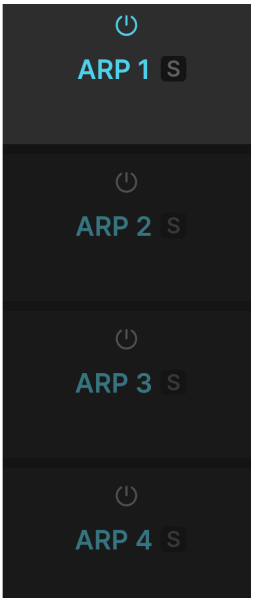
The Multi-Arp can play chromatically (all notes are fair game) or be confined to a number of scales and modes from traditional music theory. Click on the note field to the left to set the root note of the scale. Then click on the scale name to bring up the following menu:



Notice the *Custom* option. This sets a scale that you define by clicking on the blue circles at the bottom of the menu, which are arranged as a piano octave. Blue indicates an allowed note.

4.2. Settings per part

From here on, the other settings are independent per track/part, but all four parts have the same options.

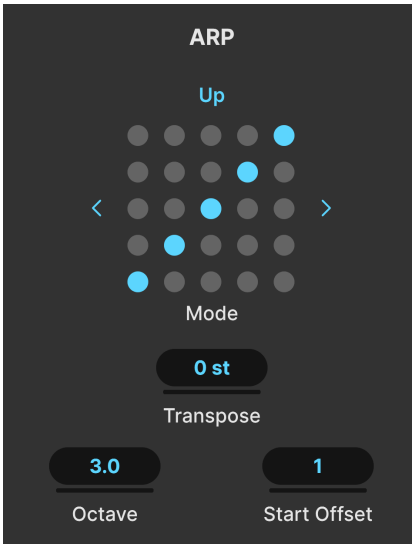


Click one of the tabs in this column to select a part to work on.

Each tab includes the following pair of utility settings:

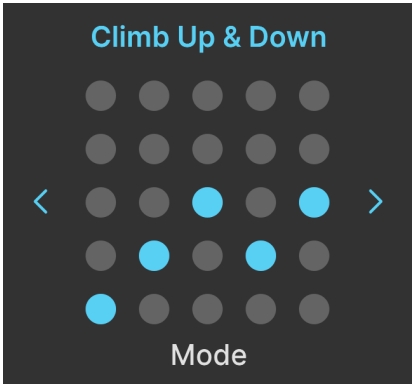
- **On/off button:** Turns the part on or off while retaining its settings
- **Solo:** Solos the part (i.e. mutes playback of the others) so you can work on it by itself

4.2.1. Arp Section

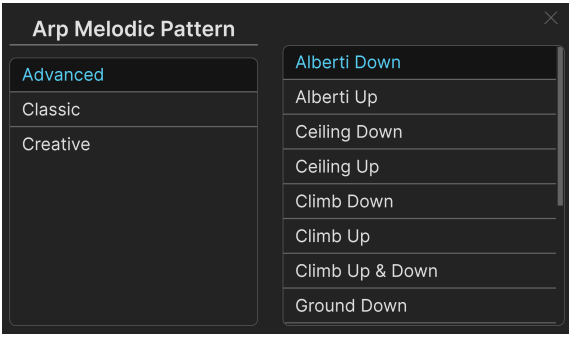


Many vintage synth arpeggiators had simple up, down, up/down, and random modes that controlled the order in which the synth played notes in a held chord. The Multi-Arp gives you so much more.

4.2.1.1. Pattern

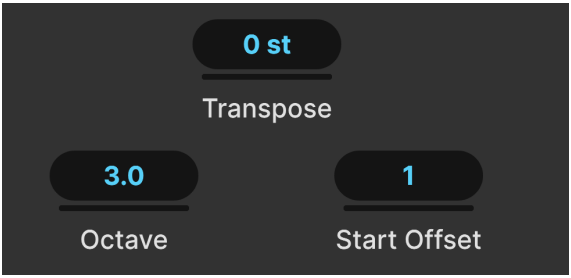


The 5 x 5 matrix of dots illustrates the current pattern. This doesn't necessarily mean the pattern has five notes; it's simply a visual reference for the up and down directions the pattern takes. You can audition the patterns using the arrows, or click on the matrix to display the full menu, with categories on the left and patterns on the right:



- *Classic:* Traditional modes like those found on most analog synth arpeggiators
- *Advanced:* Patterns that follow more complex rules while still keeping a strong sense of repetition
- *Creative:* Fun, unconventional patterns that experiment with different melodic and rhythmic phrasing

4.2.1.2. Arp settings



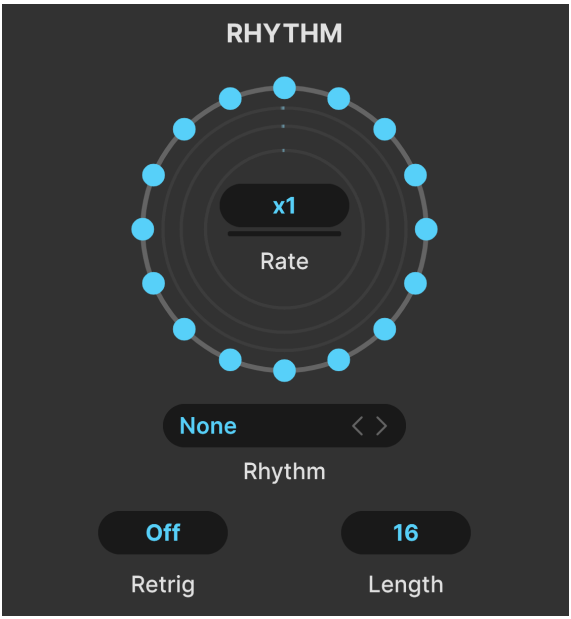
Three further settings govern the pattern behavior.

- **Transpose:** Changes the pitch of all notes in the pattern in semitones
- **Octave:** Determines the range of the pattern in octaves, including partial octaves
- **Start offset:** Defines which step in the pattern is the first step played

Drag up or down on any of the fields to edit them.

> ♪ Values for Octave range are expressed as "X.Y" and are decimal. Given that a chromatic scale has 12 notes, a range of 3.5 octaves would therefore split the octave at the tritone – i.e. F# assuming a root note of C.

4.2.2. Rhythm section



In the Multi-Arp, patterns are not restricted to playing evenly-spaced series of notes. The Rhythm section allows you to determine the rhythm of the pattern.

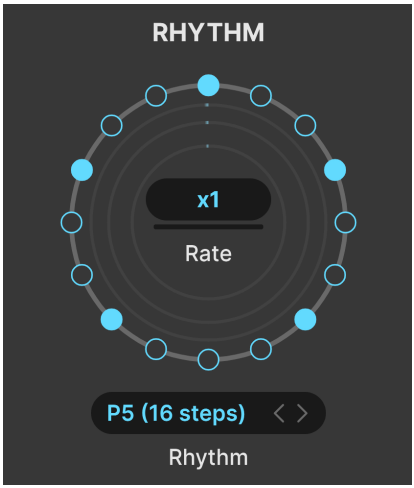
Notice the concentric circles ringed with 16 blue dots.

- Each dot represents a note. When all dots are active (blue), the pattern plays like on a conventional arpeggiator: evenly. This is also the case if active dots are evenly spaced.
- When dots are deactivated (by clicking on one), this represents a rest or rhythmic gap before the next note plays.
- In terms of pitch, the next note played is *still* the next note in the pattern according to the set scale [p.39] – no notes are skipped – but that note will not play until the rest period has elapsed.
- The four circles correspond to the four Multi-Arp parts, from the outermost (part 1) proceeding inward. When you switch parts, the corresponding circle is populated with dots.

4.2.2.1. Rhythm rate

The **Rate** setting in the center of the circles is a multiplier/divider. It causes the individual Multi-Arp part to run at a fraction or multiple of the global Rate [p.31]. Experiment with this across more than one part for some wild avant-garde polyrhythms!

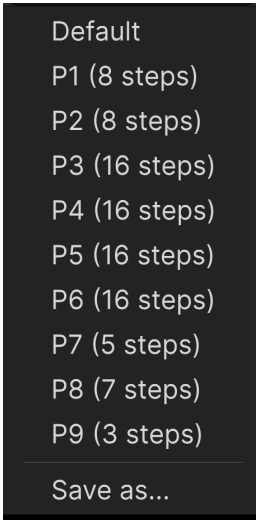
4.2.2.2. Rhythm presets



Brubeck might have liked this rhythm preset

The Multi-Arp comes with nine factory presets (plus the default of all 16 steps active) for rhythms.

Step through them with the arrows, or click on the name field to bring up the menu:



Notice that some of the presets support odd or unusual step lengths. Once you have set up the dots, you can also save your own by clicking "Save as..." and naming it in the prompt that pops up. It will then be available in the menu.

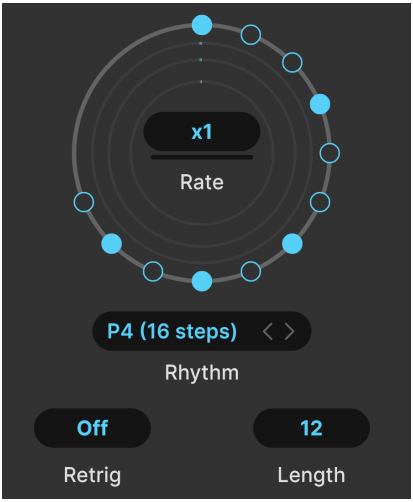
4.2.2.3. Retrigger



Retrig is a draggable field which causes the Multi-Arp pattern to restart from the beginning. It has quite a lot of options, which you just drag through – there is no pop-up menu.

- *Off:* Pattern loops normally
- *Note:* Pattern restarts when a MIDI note is received
- *Whole number values:* Pattern restarts every so many musical bars
- *Fraction values:* Pattern restarts at subdivisions of a bar, e.g. 1/8

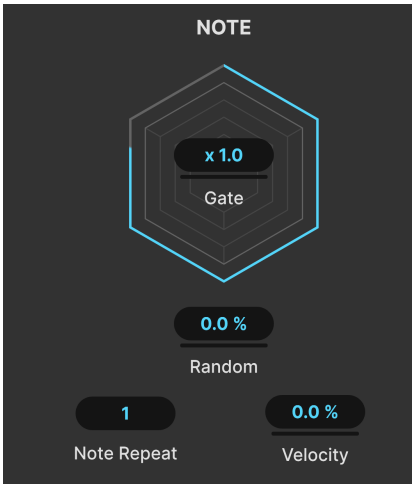
4.2.2.4. Length



A pattern with 12 steps, 5 of which are speaking

Length simply sets the overall pattern length. The default is 16 steps, but you can set odd or untraditional lengths. In the above example, when the pattern completes step 12, it returns to step 1 and starts working through the steps all over again.

4.2.3. Note section



The hexagon graphic visualizes gate time

The final section of the Multi-Arp governs how individual notes behave.

4.2.3.1. Gate multiplier

In the center of the hexagon graphic – a visualizer for the individual Multi-Arp part's gate time – is a multiplier/divider field. This makes the selected part's gate time a multiple or division of the global Gate time [p.39], allowing the different parts to "speak" with a more sustained or shortened note duration.

4.2.3.2. Note parameters

The final parameters for individual notes in the Multi-Arp part are as follows:

Random introduces randomness to the part's gate time, octave, and velocity. Octave randomness is subject to the range set by the Octave parameter, which must be set to a value greater than 1.0 for randomness to be heard.

Note Repeat adjusts how many times a note is repeated at each step before the pattern moves on to the next step, from one to four times.

Velocity is an offset for MIDI velocity as played by the Multi-Arp part, and expressed as a percentage. In terms of what you can hear, it makes arpeggiated notes louder or softer.

4.3. Global Visualizer



Across the bottom of the Multi-Arp is a visualizer in which all notes played by all active parts (remember, there are four) illuminate the ovals, which you may notice correspond to piano keys. Brighter ovals correspond to notes in the currently selected part while the slightly dimmer ones indicate notes from the other parts. Click the arrows on either end to move through the entire possible note range, as the visualizer has screen space to show six octaves.

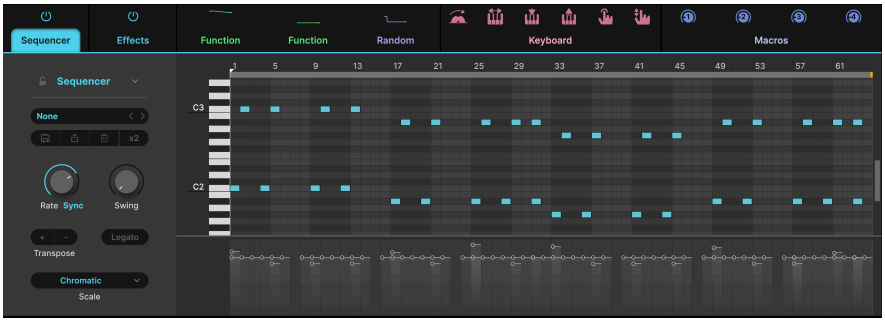
4.4. Using the Multi-Arp externally

In addition to playing Jup-8000 V, the Multi-Arp can transmit its MIDI note data to an external destination such as another virtual instrument or even a MIDI interface. This allows you to use its sophisticated patterns and rhythmic options to play other synths!

Jup-8000 V does not contain settings or controls for this. Most DAWs, as well as plug-in host programs geared for live performance, can route MIDI from a given virtual instrument track to another instrument track MIDI track, or port and channel on a connected MIDI interface. If the track in which Jup-8000 V resides is configured to transmit MIDI, and the instrument on the other end is configured to receive it, that instrument should play the Multi-Arp's output.

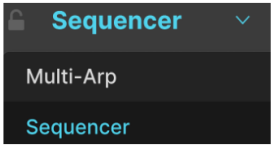
Consult your DAW or host program's documentation for the exact MIDI routing settings to make.

5. SEQUENCER



Jup-8000 V offers a full-featured polyphonic sequencer with up to 64 steps. All Sequencer settings are ultimately saved as part of the overall Jup-8000 V Preset [p.139].

To access it, press the Advanced button [p.126] at the top right of the Jup-8000 V window to open the Advanced views, then click the tab all the way on the left.



The leftmost tab in the Advanced view shows either the Sequencer or the Multi-Arp

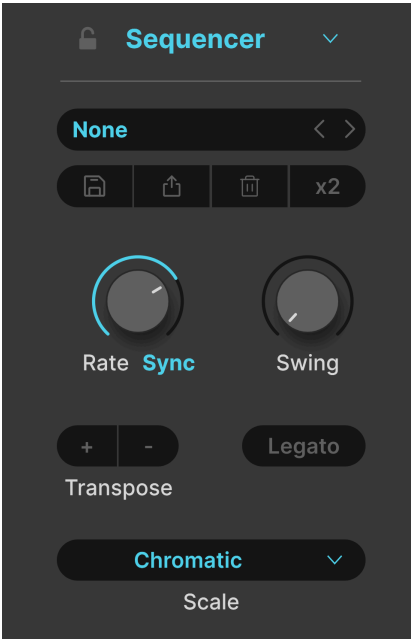
The left most tab might contain either the Sequencer or the Multi-Arp [p.36], which we covered in the previous chapter. If the Multi-Arp is present, click the drop-down carat icon to display the above menu, where you can switch to the Sequencer.

5.1. Basic behavior

Before you dive in, it's helpful to know some basics about how the Sequencer works.

- **MIDI triggering**: The Sequencer is triggered by a MIDI note-on. It will continue playing until it receives the corresponding MIDI note-off. The point is that you can trigger complex riffs from a single key, like the real-time phrase sequencing (RPS) of the original JP-8000.
- **Monophonic triggering**: Although the Sequencer can *generate* polyphonic content (i.e. multiple notes can be on the same step), it responds to one MIDI note at a time in terms of triggering, with last-note priority.
- **Root key**: By default, the root note/key of the sequencer is *C*. Playback automatically transposes to incoming MIDI notes. Due to the last-note priority, transposition will occur whether the notes are played legato or not.
- **Looping**: The Sequencer is always in loop mode, and will cycle through the number of steps defined by the sequence length [p.57] setting.
- **Grid divisions**: The sequencer uses a grid, which can be seen in the Ruler [p.55]. Each step is further subdivided into *four* grid units. Normally, you would use one note per step in a sequencer, but here, nothing prevents you from adding multiple shorter notes (at the same or different pitches) within a single step.

5.2. Global settings



The Sequencer is arranged with controls that govern its overall behavior on the left and the piano roll on the right; the latter takes up most of the Sequencer interface.

5.2.1. Lock

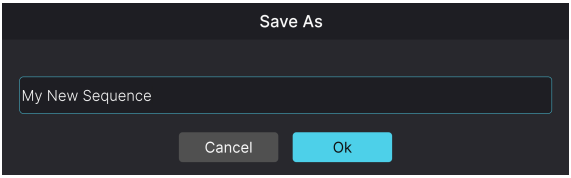
The padlock icon at upper left preserves the current Sequencer settings even if you change the Jup-8000 V Preset. This is useful for editing a sequence or switching preset patterns as you browse for an appropriate sound to play it.

5.2.2. Sequencer presets



A variety of setups for the Sequencer are available by clicking on the Sequence menu. You can also use the arrows to step through them one at a time. Categories of sequences appear on the left side; individual sequences on the right. Note that Sequencer presets include the pattern of steps *and* all settings such as Rate, Scale, etc.

5.2.3. Saving a sequence



Click the disk icon to bring up the Save Sequence dialogue

Click the floppy disk icon to save the current sequence, with all settings. The above dialogue will appear, where you can type in a name. Saving your first sequence will create a bank called *User* in the Sequencer presets menu, where all your saved sequences will be available.

5.2.4. Exporting a sequence



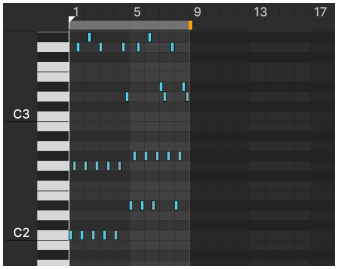
Click-drag the share icon to export your sequence data

You can export sequence data to your DAW or the computer desktop. Simply click, hold, and drag the share icon. If you drag it to a MIDI track or virtual instrument track in your DAW, it will appear there and play as you heard it within Jup-8000 V (using the different instrument your track is driving). If you drag it to the computer, it will appear as a standard MIDI file.

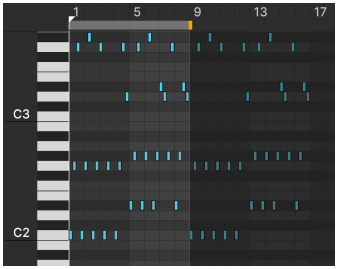
5.2.5. Clearing the sequence

The trash can icon erases all steps in the sequence. If you click it by accident, you can restore the sequence using the Undo [p.128] function in the Lower Toolbar.

5.2.6. Duplicating the sequence



An 8-step sequence before x2 is applied



The same 8-step sequence after x2 is applied

The **x2** button duplicates the sequence pattern, including all steps and velocity [p.57] settings. If clicked once, the first step of the duplicated sequence is placed on the next available step *after* the position of the sequence length bar [p.57].

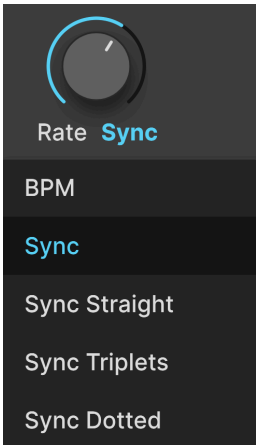
Click **x2** again, and the sequence will paste at the next available step. You can repeat the operation and fill the entire grid up to the maximum of 64 steps. If the pattern length exceeds the number of steps left, the **x2** action will copy as many steps as there are room for; i.e. it will truncate the pattern past step 64.

5.2.6.1. Duplicating selected notes

If you have selected certain notes [p.58] within a pattern, only these will be duplicated when you click **x2**. The series of notes will paste beginning at the next available step after the *latest* note in the selected group.

> ♪ For duplicating groups of selected notes, we recommend using the standard copy-paste operation instead, as it gives you better control. We cover this in Editing sequences [p.58] later in this chapter.

5.2.7. Sequencer rate and tempo sync



The Sequencer's rate can run free or be synced to project tempo via a drop-down menu accessed by clicking below the **Rate** knob. The options are:

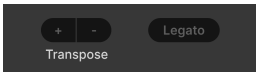
- *BPM:* Free-running in beats per minute
- *Sync:* Straight, triplet, and dotted ratios are all serially when you turn the knob
- *Sync Straight:* Only even rhythmic values are represented
- *Sync Triplets:* Triplet feel; a quarter-note = three eight-notes played in the space of two
- *Sync Dotted:* Dotted feel; a quarter-note = a dotted eighth-note followed by a 16th-note

5.2.8. Swing



Swing is often described as a "behind the beat" rhythmic feel, and the Sequencer has a range of 50 to 75 percent. Fifty percent represents a "straight" feel, meaning that a pair of tied eighth-notes is played evenly. Whereas, 75 percent means that same pair is played as a dotted eighth-note plus a 16th-note. That is, the note durations between them are split 75/25.

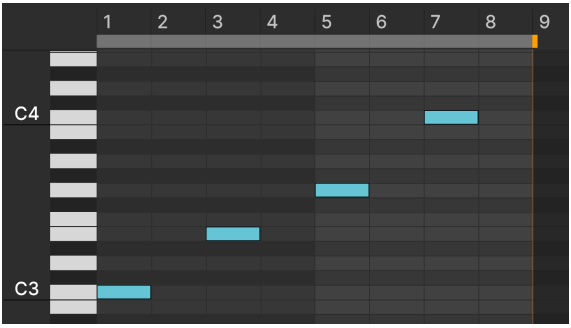
5.2.9. Transpose



The +/- buttons simply transpose the entire sequence up or down from its default key of *C*. For example, if you click + twice, playing a *C* on your controller will trigger a pattern that is now in the key of *D*.

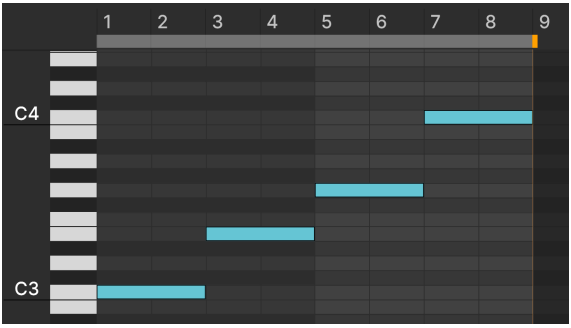
5.2.10. Legato

Legato is a one-click operation that extends the length of each note in the pattern to the beginning of the next note in the pattern. For example, here is a simple arpeggio using every other step in an 8-step pattern:



A four-note pattern before clicking Legato

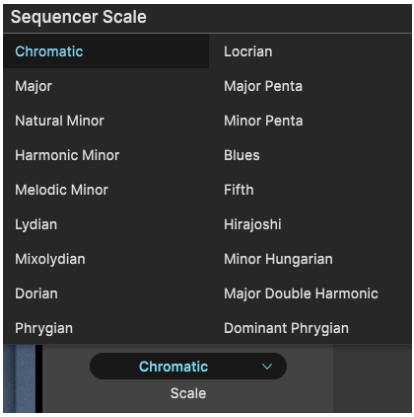
After clicking the **Legato** button, each note is lengthened to meet up with the next note:



The same pattern after clicking Legato

Note that there are reasons you might not *hear* notes smoothly blending into one another; for example, if the amp envelope of the sound has a short decay time to a low or zero sustain level.

5.2.11. Sequencer scales



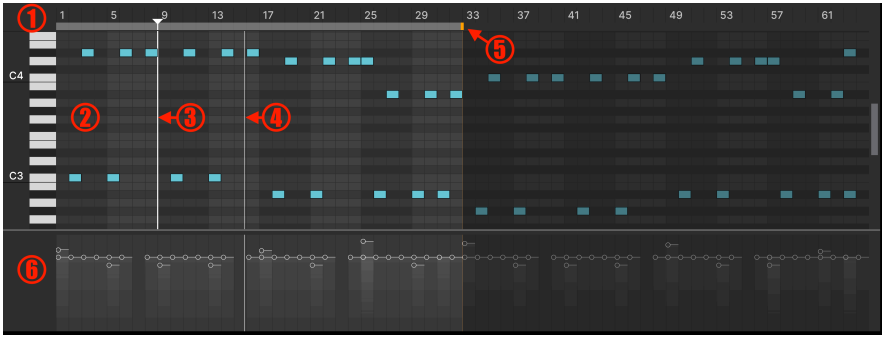
Using the scale menu at the bottom left of the Sequencer window, you can impose one of 18 scales/modes on the sequence. The default is the 12-note chromatic scale. Choose a different scale, such as harmonic minor, and the appearance of the piano roll will change.



The Sequencer piano roll with the harmonic minor scale selected

Now, some of the lanes for the notes are greyed out. This indicates a note that is not in the chosen scale. Notes cannot be added to steps in these lanes. If you switch scales, any active notes in newly "prohibited" lanes will shift downwards to the closest permitted note in the scale. If you switch *again* to the scale where the prohibited notes are permitted, they will return to their original positions as they were when first added or moved.

5.3. The Piano Roll



The piano roll zoomed out to show all 64 steps of the sequence

"Piano roll" is a common type of sequencer interface, so named because it has a vertical piano keyboard down the left side to indicate note values, and the note lanes and active steps resemble the perforated paper rolls that drove early player pianos. Let's look at the interface areas of the piano roll first, then we'll explore how to edit sequences.

Number	Name	Function
1.	Ruler [p.55]	Displays and numbers the steps in the sequence
2.	Note lanes	Shows active steps; lanes correspond to vertical piano keys
3.	Cursor bar [p.56]	Clickable location cursor; snaps to bar lines
4.	Playhead [p.56]	Shows real-time playback position when sequence is running
5.	Sequence length bar [p.57]	Sets the number of bars that will loop
6.	Velocity lane [p.57]	Sliders to set MIDI velocity for each active note

5.3.1. Ruler, scroll, and zoom



The ruler zoomed in to show 8 steps

The ruler sits across the top of the piano roll, and is numbered to indicate steps. Depending on the zoom level, the numbering changes dynamically. If 1-28 steps are shown, every step has a visible number. From 29 to 64, the first number in every group of *four* steps is displayed (1, 5, 9, 13, etc.).

5.3.1.1. Zoom the piano roll

Position the mouse cursor in the numbered ruler area (not in the grey strip just below, which sets sequence length) so that it changes to a hand. Now, drag *vertically* to zoom the ruler and the entire piano roll display.

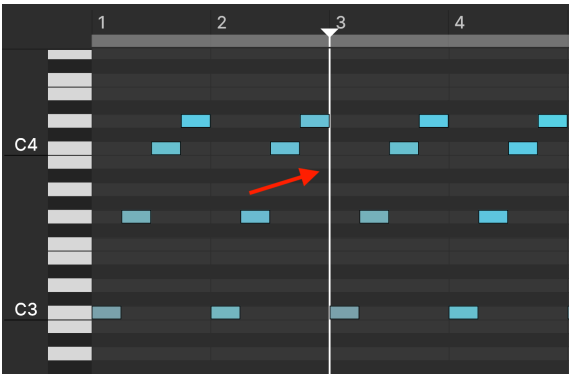
- *Drag up*: Zooms out, showing more steps from left to right
- *Drag down*: Zooms in, showing fewer steps from left to right

Zooming is centered around the mouse cursor position where you started, with the steps expanding or contracting on either side.

5.3.1.2. Scroll the piano roll

Drag *horizontally* in the numbered ruler area to scroll the ruler and piano roll left or right. Scrolling *vertically* changes the visible pitch range. Use the scroll bar on the right side of the piano roll; if you have a wheel mouse, the wheel should do this by default.

5.3.2. Cursor bar

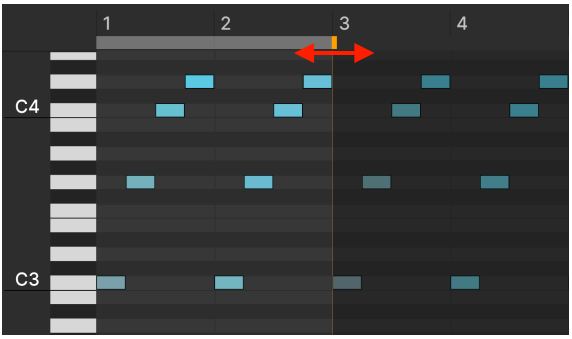


The vertical cursor bar, identifiable by the triangle on top in the ruler area, can be positioned by clicking anywhere in the note lanes – preferably in a black/grey area so as not to accidentally select an active note. The cursor bar serves as an editing marker: Any note or series of notes you've copied will be pasted starting at the bar. The cursor bar always snaps to grid lines.

5.3.3. Playhead

Not to be confused with the cursor bar, the Playhead is simply a moving vertical line (which does not extend into the ruler area) that indicates the current sequence position during playback.

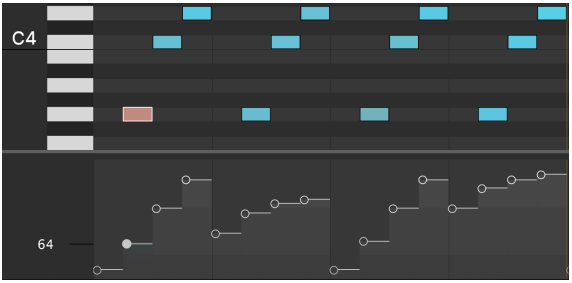
5.3.4. Sequence length



The Sequence length bar

To adjust the length of the sequence, drag the yellow tab found in the lighter grey horizontal strip just below the ruler. If the piano roll is displaying fewer than 64 steps, the tab may be offscreen to the right, so you will need to zoom out [p.55] to see it. Steps and notes outside of the sequence length are still visible (and not deleted), but only the notes within the set length will play.

5.3.5. Velocity lanes

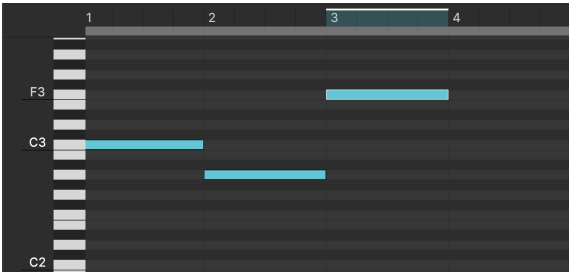


The bottom of the piano roll contains velocity sliders for each active note

Across the bottom of the piano roll is a dedicated lane for MIDI velocity. Every active note has a slider, and if multiple notes are stacked in a chord in the same step, you will see multiple sliders in the corresponding column below. We'll go over them in detail in the subsection Note velocity [p.60] below.

> The horizontal length of each slider matches the note duration [p.60], which must be adjusted on the note itself.

5.4. Editing sequences

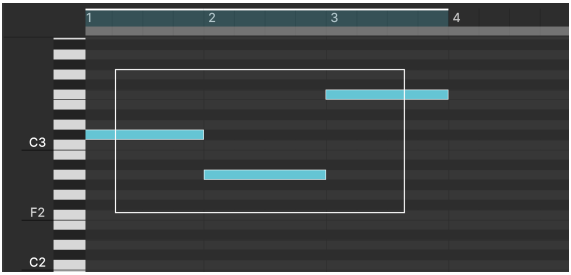


_F3_ in step 3 is selected; step 3 is also highlighted in the ruler

Working with notes in the piano roll is designed to be easy, drawing on key commands you already use in your computer OS. For example, copy and paste actions work as they would for text: Ctrl-C (Windows) or Command-C (macOS) to copy; Ctrl-V or Command-V to paste. You can alter the factory patterns [p.50] or create your own starting with a blank piano roll, then save the results [p.50].

! Editing in the Sequencer is *destructive*. Since overlapping notes cannot exist within the same grid space, operations such as moving, duplicating, copy-paste, and duration changes will overwrite any notes that occupy the destination steps and/or grid units.

5.4.1. Selecting notes



You can click-drag to select multiple notes

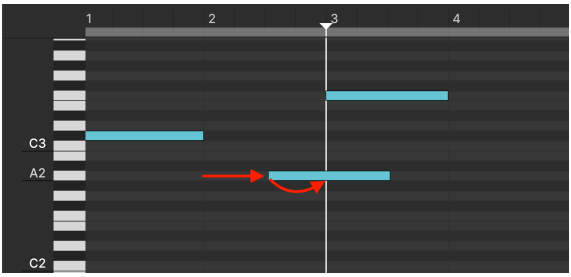
To select an individual note, click on it. To select multiple notes, you can drag a "marquee" rectangle as shown above, or hold Shift while clicking each note. Shift-clicking allows you to select notes that are not adjacent to one another.

5.4.2. Create and remove notes

Double-click in any step to create a note there. The note name and octave (e.g. *F3*) of the step you hover over is displayed to the left of the vertical piano keys.

Double-click on an active note to delete it. You can also delete single or multiple selected notes with the delete/backspace key.

5.4.3. Moving notes



The _A2_ being moved from step 2 to step 3

You can click-drag an individual note to move it anywhere in the piano roll. Hover over a note, and you will see a four-way cursor icon indicating it is ready to be moved. If multiple notes are selected, they will all move together, with the time and pitch intervals between them preserved.

To duplicate a note, hold Alt (Windows) or Option (macOS) while dragging. Multiple selected notes are all duplicated, again preserving the time and pitch intervals between them.

You can also move and notes using the cursor (arrow) keys on your computer keyboard.

- *Up/down*: Transposes note(s) in semitones
- *Shift + up/down*: Transposes notes in octaves
- *Left/right*: Moves notes backward or forward along the timeline

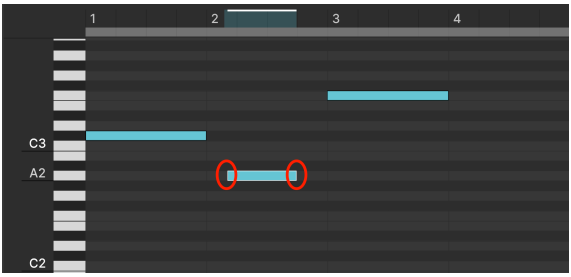
To move the note horizontally in finer increments, hold Ctrl (Windows) or Command (macOS), then use the left/right cursor keys. Hold Alt (Windows) or Option (macOS) to move the note an entire grid unit.

5.4.4. Duplicating notes

To duplicate a note, hold Alt (Windows) or Option (macOS) while dragging. Multiple selected notes are all duplicated, again preserving the time and pitch intervals between them.

You can also duplicate notes using the computer keyboard. Select the note(s), then press Ctrl-D (Windows) or Command-D (macOS).

5.4.5. Note duration



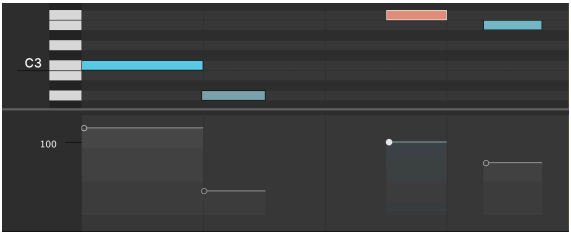
Shortening the duration of _A2_ in step 2, at both the beginning and end

Hover over the left or right edge of a note, then click-drag horizontally to adjust its duration. If multiple notes are selected, dragging changes the duration of all of them while preserving any pre-existing timing differences.

Hold Alt (Windows) or Option (macOS), then use the right cursor key to add one step to the note's duration. The left cursor key will retract that increase until you reach the original note duration, but you cannot use this method to extend the beginning of the note to the left, i.e. backwards on the timeline.

> Changing a note's duration changes the absolute time at which the Sequencer sends the MIDI note-on or note-off message for that note. Hence, envelope attack and release phases are triggered at the beginning and end of the note itself, not necessarily the step it occupies.

5.4.6. Note velocity



Below the piano roll grid are sliders that adjust the velocity of each note independently. Their horizontal width matches the duration of each note.

When you hover over a velocity slider, the corresponding note turns pink, as seen in the image above. When you adjust the slider, the MIDI velocity value (1-127) is displayed in the blank area beneath the piano keys. At higher values, the note's color brightness increases. At very low values, the note turns grey.

You can also edit velocity for a note or group of selected notes by holding Alt (Windows) or Command (macOS) while dragging vertically with the left mouse button on any of the selected notes. Existing differences between note velocities are preserved proportionally.

5.4.6.1. Velocity slider position



In a complex sequence with steps playing polyphonically, the velocity slider lane can become quite crowded, so here's a tip to avoid possible confusion. Remember that in a given step or grid space, the vertical positions of the sliders indicate MIDI velocity. Unlike the piano roll itself, they *do not* correspond to pitches of the notes. The above screenshot shows an example: Since *E3* has a lower velocity than *C3*, its slider is below the slider for *C3*.

5.5. Using the Sequencer with a DAW

The Jup-8000 V Sequencer is obviously useful when the synth is played in stand-alone mode. It lets you perform creative musical passages and riffs by simply playing one key on your controller. But how would you use it when the instrument is run as a plug-in, in the context of a DAW project? After all, your DAW already has powerful MIDI sequencing capabilities.

One answer is that it can speed your workflow if you want to add a repeating musical part – a bass line, top loop, series of chord stabs, or something else – to an arrangement. The part resides within Jup-8000 V. This means that the MIDI or virtual instrument track driving Jup-8000 V needs just two events: a MIDI note-on where you want the part to begin playing, and a note-off where you want it to stop. In between, you can add additional note-ons to transpose the part, and since Jup-8000 V's Sequencer receives monophonically, you still only need the single note-off at the end.

In other words, the application is similar to how you might use an arpeggiator – except in the Sequencer, you can create note-by-note custom and polyphonic parts an arpeggiator cannot.

6. EFFECTS



Jup-8000 V includes a suite of powerful stereo effects curated from our latest V Collection of virtual instruments. You can use up to four effects at once, and each of the four effects slots offers a choice of 18 pedal-style effects.

Click the **Advanced** button at the top right of the Upper Toolbar [p.121] to open the Advanced Panel. Then select the **Effects** tab, second from the left. Notice the on/off button above the tab? It bypasses *all* effects while retaining their settings.

Depending on the size [p.123] of the Jup-8000 V window, you may need to scroll down to see the effects.

6.1. Effects routing

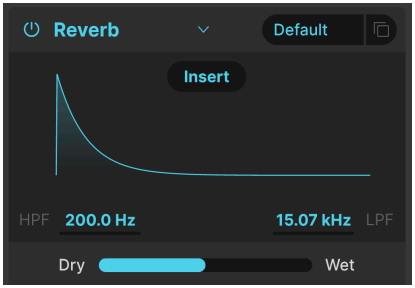


Jup-8000 V effects are routed serially left to right

By Default, effects routing is "hard-wired" as serial. The signal is first processed by the effect in the slot at far left, then moves from left to right. This keeps things simple. Just set up the effects chain you want, like a guitar pedalboard.

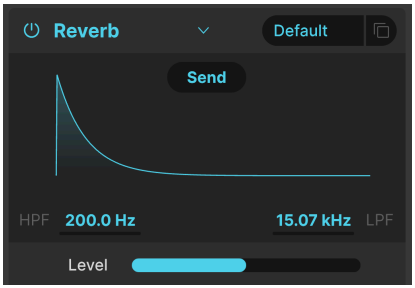
6.1.1. Send/Insert toggle in Spatial FX

The *Spatial* effects (Reverb, Delay, Tape Echo, and PS Delay) also offer send-based parallel routing. Most often, you'll encounter the effects in Insert mode, which follows the serial scheme we just described:



The Reverb in Insert mode

Click the **Insert** button, and it will change to **Send**, like so:

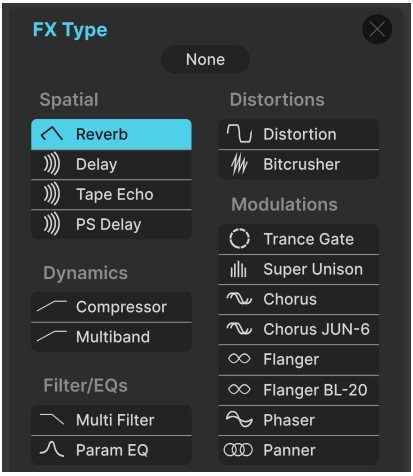


The Reverb in Send mode

Noice that the Dry/Wet slider [p.66] has now changed to a **Level** slider. When an effect is in Send mode, it sits in parallel with whatever effects are still Inserts. The Insert effects still follow left-to-right serial routing. So, let's say you have a Parametric EQ, Distortion, and Compressor in an insert chain, in that order. If the fourth effect is Reverb, raising the **Level** slider applies Reverb to the output of Jup-8000 V independently of the other three effects.

> In practice, this can make a big difference. Reverb, for example, is often the final effect in a chain. If the chain is entirely serial, *all* the post-FX sound is inside the reverb space. You may or may not want that result. If you prefer the reverb only affect the pre-FX instrument sound, switch to Send routing.

6.2. Selecting an effect



The effects in Jup-8OOO V offer 18 types in five categories

Click the name field at the top of any of the effects slots (you can also click any empty square that says "none" above it) to bring up the effects selection menu. The effects are divided into five categories to make choosing a little easier.

- *Spatial:* Reverb, delays, and tape echo
- *Dynamics:* Compressor and Multiband Dynamics
- *Filter/EQs:* Multi-mode synth-like filter and parametric equalizer
- *Distortion:* Distortion effect with 16 different algorithms; Bitcrusher
- *Modulations:* Super Unison, choruses, flangers, phaser, and stereo panner

The full list of effect types [p.66] with descriptions of all their parameters is further below.

6.2.1. Effects copy



An effect in one slot can be copied to any of the other three

You can copy any effect, with its settings, to another slot. Click the double-document (overlapping squares) icon, then select a slot from the above pop-up menu. The effect in the original slot is not changed or swapped.

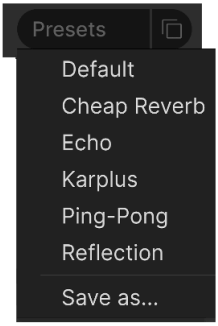
6.2.2. Effects swap



Grab the six-dot icon to drag the effect to another slot

When your cursor is in an effect's area, notice the six-dot icon that appears in the title bar. Click and hold on it to drag the effect to a different slot. The other effects will then rearrange, preserving the remaining effect order as much as possible.

6.3. Effect presets



The factory presets for the Delay effect in Jup-8000 V

Each effect type in Jup-8000 V comes with a handful of presets, accessed by clicking on "Presets" at the top right of the name bar within an effects slot.

The presets can be great starting places, not to mention convenient for when you want to grab a sound quickly, so please do explore them all. Notice the "Save as" option, which will bring up a dialogue box that prompts you to name and save any settings you like as your own FX preset. This is then saved within the overall Jup-8000 V Preset. "Save" is available only when working on a user preset, i.e. one you've already copied with a "Save As" operation.

6.4. Effect types

It's almost time to explore each effect individually – including our most recent addition, the Trance Gate [p.79]. To start out, though, we will cover a handful of features common to all of them.

6.4.1. On/Off

Each effects slot has an on/off button at its upper left. This lets you bypass the individual effect without losing its settings. This is useful for soloing a slot as you build and adjust your effects rack.

6.4.2. Dry/Wet mix

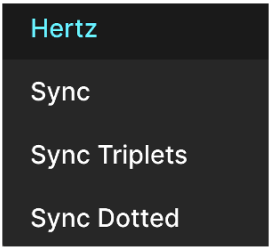


Most of the effects have a slider for **Dry/Wet mix**, i.e. how much pre-effect vs. post-effect signal you hear. There are three exceptions:

- The **Multiband** effect has an *Amount* slider
- The **Parametric EQ** has a *Scale* slider
- The **Stereo Pan** effect has an *Amount* slider

♪ Remember that due to the serial routing, a sound that's relatively dry with respect to one effect may still be carrying a lot of the previous one in the chain.

6.4.3. Effects tempo sync



Engaging Sync makes tempo-division options available for the time setting in the Delay

Some effects offer tempo-sync options for their time or rate parameter in addition to running freely in absolute units such as Hz or fractions of a second. The mode is chosen by clicking on the blue label adjacent to a Time or Rate knob, then choosing from the pop-up menu shown above. The bright pink word may read "Seconds," "Hertz," "Sync," or some variant thereof depending on the current sync setting.

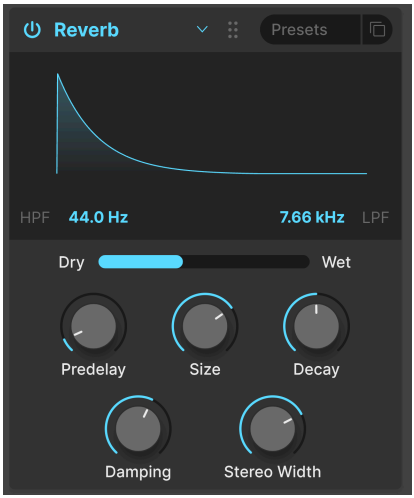
Then, adjusting the related parameter will display a pop-up that shows the current division or multiple of your project tempo. A *t* suffix after the value indicates a triplet value, *d* denotes a dotted value, and no suffix means a "straight" rhythmic feel.

The effects with tempo sync in Jup-8000 V are:

- Delay
- Tape Echo
- PS Delay
- Trance Gate
- Chorus JUN-6
- Flanger
- BL-20 Flanger
- Phaser
- Stereo Pan

Now, let's visit the effects in the order in which they appear on the menu. In general, you can adjust two of the parameters that also have knobs by clicking and dragging inside the effect's graphic visualizer. In the charts below, we mark *(H)* for those you can drag horizontally and *(V)* for those you can drag vertically.

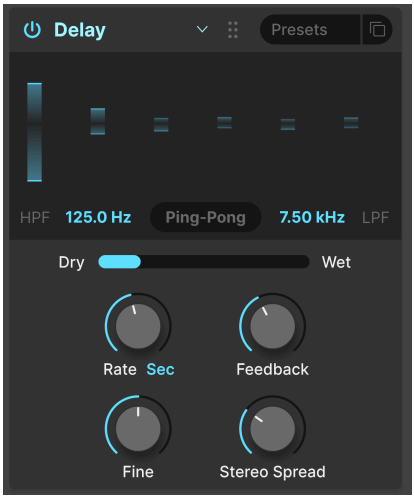
6.4.4. Reverb



Reverb is the sound of a space – a recording studio, concert hall, stairwell, tiled bathroom, you name it. Reverb is often used as the final effect in a chain to put everything else that's going on into the same acoustic space, lending cohesiveness to the sound.

Control	Description
HPF	Reduces the high-frequency content before processing
LPF	Scoops out the low-frequency content before processing
Predelay	Sets the amount of time before the input signal is affected by the reverb
Decay (V)	Determines the length of time the reverb effect will last
Size (H)	Adjusts the size of the room: counter-clockwise is smaller, clockwise is larger
Damping	Controls the rate at which the high frequencies decay
Stereo Width	Adjusts the reverb from mono to an increasingly wide stereo space

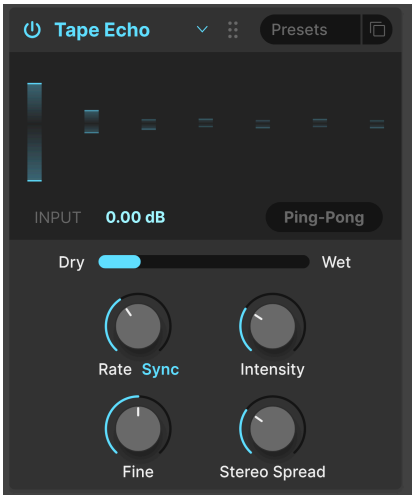
6.4.5. Delay



Delay is a generic term for any effect that makes a copy of an input sound and repeats it later, one or more times. There are three delay effects in Jup-8000 V, and this first one sounds good all around.

Control	Description
HPF	Higher values reduce low-frequency content with each echo
LPF	Higher values reduce high-frequency content with each echo
Time (H)	Changes the length of the delay, with unsynced and tempo-sync options (sync, triplets, dotted)
Fine	Fine-tunes the delay time using an offset in milliseconds
Feedback (V)	Adjusts how many times the delay will repeat
Stereo Spread/ Width	Higher values increase the distance between the left and right sides of the delayed signal
Ping Pong	Toggles alternating left/right echoes with exact rhythmic spacing; Stereo Spread parameter becomes Stereo Width

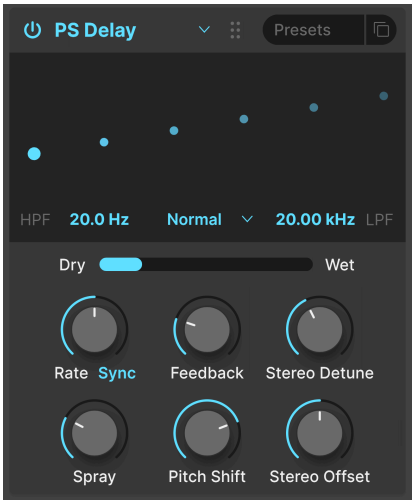
6.4.6. Tape Echo



Tape Echo is a characteristic of early tape-based delay machines such as the Maestro Echoplex and Roland Space Echo. Input sounds are recorded to a loop of tape with one or more playback heads to create the echoes. Because tape loops can be unstable and shift in pitch and timbre, they produce an effect that is warmer and less precise than a digital delay.

Control	Description
Input	Adjusts the incoming signal to achieve varying amounts of analog saturation
Time (H)	Changes the length of the delay, with unsynced and tempo-sync options
Intensity (V)	Sets the feedback amount of the delayed signal
Fine	Fine-tunes the delay time using an offset in milliseconds
Stereo Spread/ Width	Higher values increase the distance between the left and right sides of the delayed signal
Ping-Pong	Toggles alternating left/right echoes with exact rhythmic spacing; Stereo Spread parameter becomes Stereo Width

6.4.7. PS Delay



PS stands for **pitch-shifting** delay, a classic effect popularized by the Eventide Harmonizer. It works like a conventional delay, but in addition to being fed back to create echoes, the delayed audio signals are subjected to a pitch shift, either up or down.

Control	Description
HPF	Controls the cutoff of a highpass filter that affects the delayed signal only
LPF	Controls the cutoff of a lowpass filter that affects the delayed signal only
Time (H)	Sets delay time, with unsynced and tempo-sync options
Feedback	Controls how much of the delayed signal feeds back into the effect to be delayed again
Stereo Detune	Detunes the delayed signal relative to the incoming signal
Spray	Adds a scattering effect across the sound for each successive echo with slightly randomized echo times
Pitch Shift (V)	Adjusts the amount that the delayed signal is pitch-shifted relative to the incoming signal
Stereo Offset	Offsets the delayed signal in the stereo picture

6.4.8. Compressor



A **Compressor** is used to control the dynamic range of a sound: it reduces the difference between the softest and loudest levels a sound can have. It does this based on reducing a gain by a certain amount (the ratio) once the audio releases a certain level (the threshold).

Control	Description
Threshold (H)	Sets the level where compression will begin
Ratio (V)	Determines the amount of compression to be applied once the threshold is reached
Attack	Adjusts the speed with which the compression will be applied once the threshold is reached
Release	Sets the release time of the compressor
Output Gain	Use this to compensate for changes in volume if compression settings lower the output gain
Makeup	Enables control of the output level to compensate for the gain reduction of the input

♪ There's an old joke that's great for understanding compressors. Threshold is how loud your music has to be before your parents tell you turn it down. Ratio is how much you turn it down. Attack is how fast your parents react once it's too loud. Release is how soon you turn it back up once they're gone.

6.4.9. Multiband



A multiband compressor works like a series of regular compressors, but each one works on a separate range of frequencies (*band*). First used by mastering engineers to squeeze the maximum level out of recordings, these compressors are now used for subtle sculpting, sound design, special effects, and much more.

The multiband compressor is probably the most complex effect type in Jup-8000 V, first of all because there are things you can *only* adjust by dragging inside the effect's graphic visualizer. It can work on up to three frequency bands, and you can use the two on/off under the low and high bands to turn them on and off. You can also drag up or down on the numbers below the visualizer to set the frequency crossover between the low and mid bands (left number) and mid and high bands (right number).

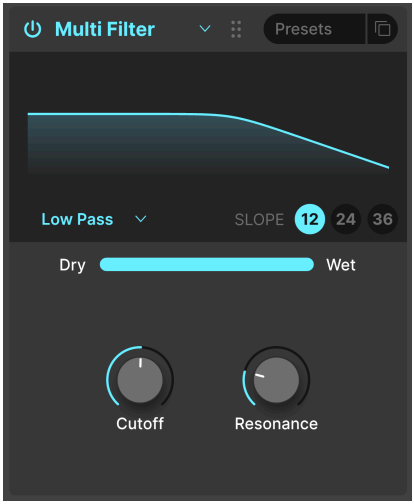
On top of all that, it's also an *expander*, which means it can boost soft signals. The blue bars with horizontal lines inside on the top are for compression; those below are for expansion.

With all this in mind, here is the parameter rundown:

Control	Description
Threshold (V)	Drag the border of a blue bar to adjust the point at which the compression (or expansion) starts working
Ratio (V)	Drag *inside* of a bar to adjust the amount of compression or expansion for that band. Increasing ratios are depicted by denser horizontal lines, until the inside bar turns solid blue at maximum
Band On/ Off Icons	The high and/or low bands may be switched off, resulting in a 2- or 1-band compressor/ expander
Low-Mid Crossover	Drag on this field, located at the lower left of the visualizer, to change the crossover point between the low and mid bands
Mid-High Crossover	Drag on this field, located at the lower right of the visualizer, to change the crossover point between the mid and high bands

Control	Description
Out Low	Independent output level control for low band
Out Mid	Independent output level control for mid band
Out High	Independent output level control for high band
Input	Sets the overall input gain
Attack	Sets the time it takes for the compressor/expander to "grab" the signal once a threshold is reached
Release	Sets the time it takes for the compressor/expander to "let go" of the signal once the signal falls beneath the threshold
Output	Governs the overall makeup gain while preserving the difference in output between the bands

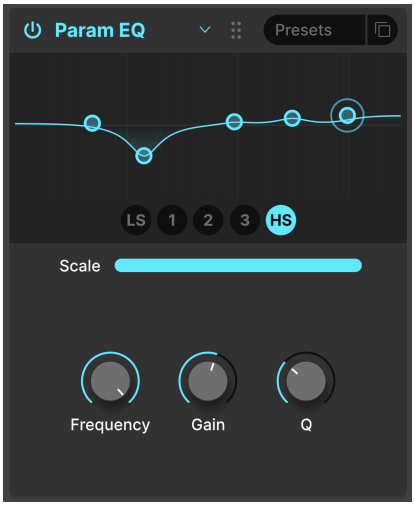
6.4.10. Multi Filter



Sometimes it's nice to have an extra filter handy for further sculpting your tone without needing to tie up Synthx V's main filter. The Multi Filter has five modes: lowpass, highpass, bandpass, feedback comb, and feed-forward comb . The comb filters simulate the behavior of a flanger with two different tonal qualities – CombFB produces a series of evenly spaced peaks, and CombFF produces evenly-spaced notches.

Control	Description
Filter type	Drag up or down on the letters to the lower left of the visualizer to choose the filter type
Slope	Click a selection at the lower right of the visualizer to choose the filter steepness; these do not apply to the comb filters
Cutoff (H)	Adjusts the cutoff frequency of the filter
Resonance (V)	Sets the resonance of the filter, which is a peak of frequencies clustering near the cutoff

6.4.11. Parametric EQ

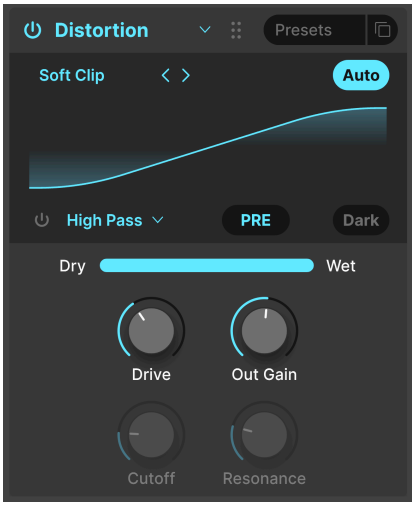


The Parametric Equalizer lets you sculpt tone precisely, as opposed to the broad tonal strokes you get from a synth filter or tone controls. It can be used to boost or cut certain frequencies gently or surgically, to alter the overall sound or remove problem frequencies.

The EQ in Jup-8000 V has five bands, and you can adjust the frequency, gain (boost or cut), and Q (how wide the band is around the selected frequency) for each. In fact, the ability to tweak the frequency and bandwidth is just what "parametric" means.

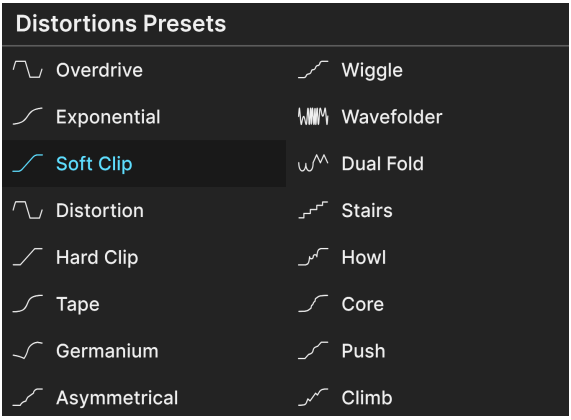
Control	Description
Band select	Click one of the points in the visualizer or one of the five buttons below to select the band the next controls listed will affect
Scale	Adjusts the overall impact of the EQ curve on your sound
Frequency (H)	Selects the center frequency of the current band
Gain (V)	Adjusts the boost or cut to the level of the current band
Q	Adjusts the width of the spectrum around the Frequency that is affected by the boost or cut

6.4.12. Distortion



Distortion in Jup-8000 V offers 16 different algorithms derived from our flagship distortion effect, Dist COLDFIRE. Each has its unique sonic signature – and they can transform sounds in ways ranging from subtle warmth to all-out devastation.

6.4.12.1. Distortion algorithms



The 16 distortion types

Select the type of distortion by clicking on the left and right arrows at the top left of the effect's visualizer area, or bring up the pop-up menu shown above by clicking on the distortion type name between the arrows.

What do the algorithms sound like? Some come from familiar types of analog distortion – examples include gradually increasing amounts of gain (*Overdrive*, *Exponential*, *Soft Clip*, *Distortion*, *Hard Clip*), *Tape* saturation, and *Germanium* transistor preamp tone.

Other distortions are more digital in character – in addition to *Wavefolder* and *Dual Fold* which fold the peaks of waveforms to create more harmonics, there are unusual types such as **Asymmetrical**, **Wiggle**, **Stairs**, **Howl**, **Core**, **Push**, and **Climb**.

Rather than offering lengthy technical descriptions of what each algorithm is doing "under the hood," we encourage you to click through them and explore their sound for yourself.

6.4.12.2. Common distortion controls

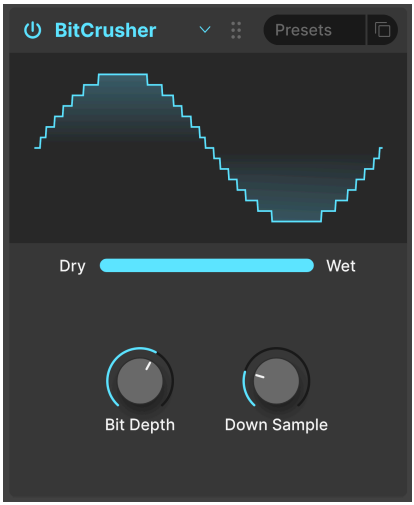
The distortion algorithms mostly share the same parameters, as well as an integrated lowpass/bandpass/highpass filter, as shown on this chart:

Control	Description
Drive (H)	Sets the amount of distortion via driving the input
Out Gain	Use this to compensate for increased output gain caused by the Drive setting
Auto (button)	Applies automatic volume compensation to the post-effect output
Filter on/off (button)	Toggles the integrated multi-mode filter
Filter pre/post (drag on text)	Places the integrated filter before or after the distortion process
Filter mode (pop-up)	Selects lowpass, bandpass, or highpass
Cutoff	Adjusts integrated filter cutoff frequency
Resonance	Adjusts integrated filter resonance
Dark	Applies high-frequency dampening to the output signal

Exceptions/additions to the above are:

- **Overdrive** is the only algorithm that also has a **Tone** control, which adjusts the brightness of the distorted portion of the output.
- The **Wavefolder** algorithm features a sine/sawtooth toggle for the folding in place of the filter pre/post setting.

6.4.13. Bitcrusher



A **bitcrusher** does exactly what it sounds like: it crushes bits! Technically, it can reduce both the bit depth and the sample rate of the signal. Bit depth (e.g. 16-bit vs. 8-bit) deals with differences in volume; sample rate (e.g. 44,100 kHz, like a CD) deals with frequency response. When musicians talk about the "lo-fi" sound of vintage samplers, game consoles, or computers, they're talking about bitcrushing.

Control	Description
Bit Depth (V)	Reduces the number of bits used to render increments of amplitude
Downsample (H)	Divides the sample rate used to represent the signal

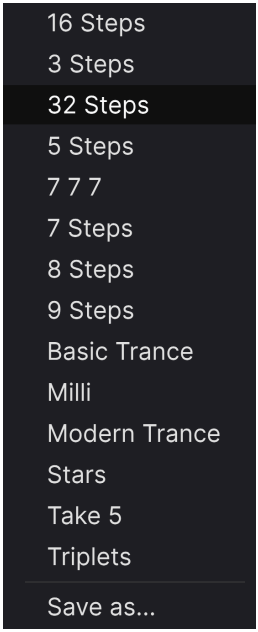
6.4.14. Trance Gate



Trance Gate creates chopping, gating, and stutter effects known from trance music, but it's useful in any application where you might want sequenced breaks in the sound. It loops a sequence of gates, from 2 to 32 steps, and you can select and adjust the envelope shape of each step. The moving circular display shows the sequence in real time. The envelope shape of the step is shown in the center of the circle. The parameters in the upper half of the interface work as follows:

Control	Description	Values
Length	Sets the length of the gate sequence	2 to 32 steps
Shape	Sets the basic envelope shape of the gate	Classic (square), Decay (saw), Rise (ramp), Trapezoid, Triangle
Rotate	Rotates the entire sequence clockwise or counterclockwise	Mouse click = 1 step
x2	Doubles the number of steps in the sequence	Up to 32 steps

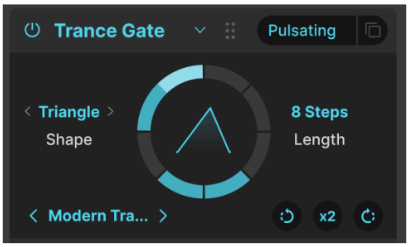
You can also select from 14 starter sequences using the menu to the lower left of the circle display. As this shows, gate sequences can have odd or unusual numbers of steps, and steps do not need to be of equal duration.



Then, the knobs in the lower half of the interface perform these actions:

Control	Description	Values
Rate	Sequence rate, with unsynced and tempo-synced options	Sync, Sync Straight, Sync Triplets, Sync Dotted
Morph	Further adjusts the shape of the chosen Envelope Type	Shape shown in graphic visualizer
Ratchet	Subdivides the steps of the sequence to create roll effects	1, 2, 3, 4
Reset	Causes the sequence to start from step 1 after the specified number of bars have elapsed	Off; 2, 4, 8, 16 bars
Retrig	Causes the sequence to start from step 1 when a MIDI note is received	On/off

6.4.14.1. Gate sequence editing

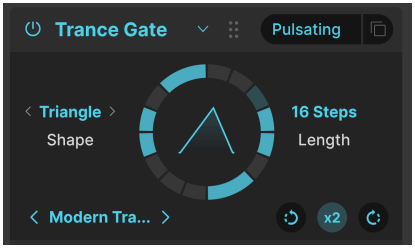


Trance Gate "Pulsating" preset; notice the inactive steps and longer tied step

You can visually edit the sequence on the circle graphic. You are not limited to steps of equal length, nor do all steps in a sequence need to be active. Browse through the Trance Gate's presets [p.65] and you'll see what we mean.

Action	Description	Result
Click on active step	Turns step off	Sound is muted during that step
Click on inactive step	Turns step on	Sound is heard during that step
Click-drag on active steps	Ties steps together	Separate steps become one longer step
Click-drag on inactive steps	Activates steps without tying them	Sound is now heard during activated steps
Hover on tied step	Previews untying the step	Step is displayed as two discrete steps
Click on tied step	Unties the step	Step audibly becomes two discrete steps
Right-click on active step	Turns step off	Sound is muted during that step
Right-click-drag on active steps	Turns dragged steps off	Sound is muted during those steps

Note that clicking **x2** preserves the proportion of active to inactive steps, as well as the ties:

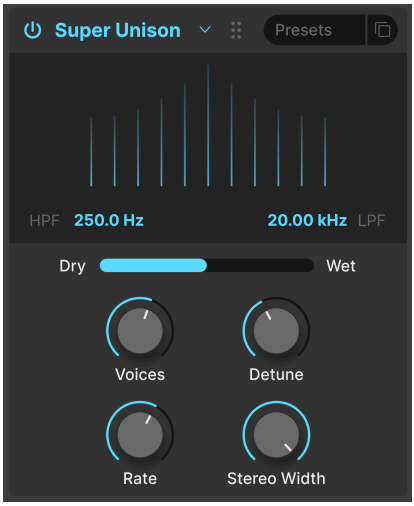


The "Pulsating" preset after clicking the x2 multiplier

If you click **x2** on the "Pulsating" preset we've been using as an example, the result is the above sequence.

> Editing gate sequences takes some practice on the circular interface. Remember to reach for the Undo [p.128] button in the lower toolbar to back out of any undesired changes. When you get a sequence you like, use the *Save as* operation in the effect presets menu.

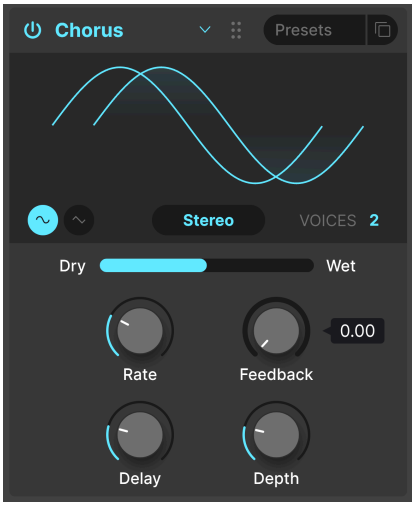
6.4.15. Super Unison



Not unlike a synth's Unison mode, this effect adds duplicates of the input signal to itself, with the option to detune them. The graphic indicates the amount of detuning between the voices horizontally and volume of detuned voices vertically. The original signal is the tallest line in the center.

Control	Description
HPF	Controls the cutoff of a highpass filter that affects the processed signal only
LPF	Controls the cutoff of a lowpass filter that affects the processed signal only
Voices (H)	Sets the number of unison voices
Detune (V)	Determines the detuning amount
Rate	Adjusts the speed of modulation of all voices
Stereo Width	Adjusts the spread of the voices across the stereo image

6.4.16. Chorus



Chorus is an effect first developed in the mid-1970s by Roland for the Jazz Chorus amplifier and CE-1 pedal. In a chorus, the dry signal is mixed with one or more slightly delayed copies of itself (called *voices*), whose amount of delay is gently varied by an LFO to create a sense of thickness.

Control	Description
Rate	Adjusts the speed of the chorus
Depth	Controls the intensity of the chorus
Feedback (V)	Adjusts the amount of chorused signal that is fed back into the effect
Delay (H)	Sets the amount of delay applied to the input signal
Stereo/ Mono	Toggles between mono or stereo operation
Voices	Selects the number of delay lines the chorus will use (1, 2, or 3), with a different starting phase for each voice
Shape	Selects sine or triangle as modulation waveform

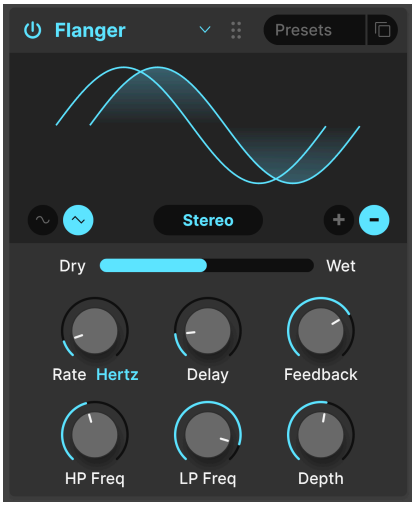
6.4.17. Chorus JUN-6



One of the most famous chorus effects is the one built into the Juno-6 synthesizer and its successors. This chorus is an accurate model of the original.

Control	Description
Rate (H)	The chorus rate, with unsynced and tempo-synced options
Depth (V)	The depth of the chorus effect in milliseconds
Phase	The phase of the chorused signal relative to the dry signal

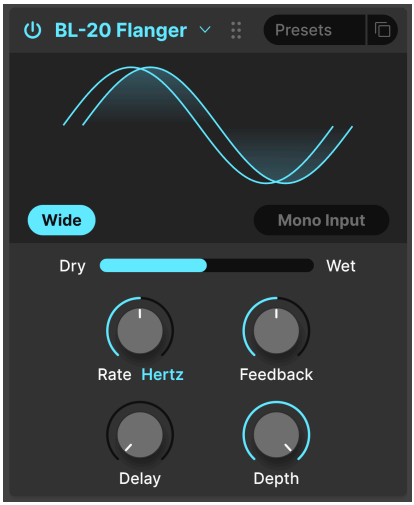
6.4.18. Flanger



The Flanger is an intense time/modulation effect. It originated from audio engineers pressing on the flange (rim) of a moving tape reel to slow down the playback a tiny bit. Combined with the original signal, this produces the signature "jet engine" effect.

Control	Description
Rate	Adjusts the rate of the LFO that controls the flanging speed, with tempo-synced options
Delay (H)	Changes the delay time between flanged and original signals, which affects the harmonic content
Feedback (V)	Adds feedback for a harsher or "ringing" sound. Maximum is 99% to avoid runaway feedback
Depth	Adjusts the depth of the delay that modulates the flanged signal
Mono/Stereo	Toggles between mono or stereo operation
+/-	toggles the Flanger's phase shifting between additive and subtractive
HP Frequency	Determines the amount of low-frequency content that will enter the flanger effect
LP Frequency	Determines the amount of high-frequency content that will enter the flanger effect

6.4.19. BL-20 Flanger



The BL-20 Flanger is based on the sound of Arturia's Flanger BL-20 plug-in, which is in turn based on the sound of the rare and beautiful-sounding Bel BF-20 hardware flanger from the 1970s.

Control	Description
Wide	Provides a wider stereo image by inverting the phase of the LFO modulating the right channel
Mono Input	When engaged, optimizes the flanger for processing a monaural signal
Rate	Adjusts the rate of the flanger, with unsynced and tempo-synced options
Delay (H)	Adjusts the audible depth of the flange effect
Feedback (V)	Adjusts the amount of effected signal feeding back into the flanger
Depth	Adjusts the depth of the LFO that modulates the delayed signal

6.4.20. Phaser

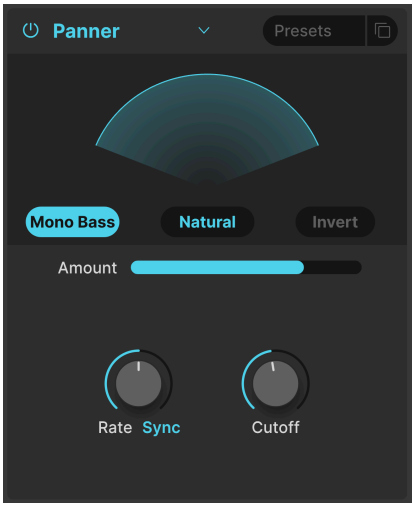


Phase shifting splits the incoming signal, changes the phase of one side, and recombines it with the unaffected signal. Modulation of this signal via an LFO results in a notch-comb filter that sweeps through the frequency spectrum, causing that familiar "whooshing" sound.

♪ Two iconic uses of the phaser are on analog strings by Gary Wright and Jean Michel Jarre, and on electric piano by Steely Dan.

Control	Description
Rate	Adjusts the rate of the phaser, with unsynced and tempo-synced options
Feedback (V)	Controls the amount of phased signal feeding back into the effect for a more resonant sound
Amount	Adjusts the intensity of the phasing effect
Frequency (H)	Sets the harmonic center of the phasing effect
N. Poles	Determines the steepness of the phaser's filter frequency response
Mono/Stereo	Toggles the phaser between mono and stereo output

6.4.21. Panner



The Panner automatically moves the stereo position of the Jup-8000 V sound, to provide motion and breadth.

Control	Description
Rate	Controls the speed of stereo panning, with tempo-synced and unsynced options
Natural/ Linear	Toggles whether the signal pans according to a linear volume relationship between the sides, or a gentler logarithmic curve
Invert	Flips the side-to-side panning
Mono Bass	When engaged, low frequencies will not be panned, which may be desirable for a solid bass sound with movement in the treble
Cutoff	When Mono Bass is active, this sets the point at which low frequencies (50-200Hz) will not be panned

7. MODULATORS



Envelope



Function



Random Generator



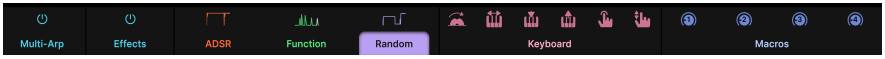
Voice Modulator



Mod Sequencer

Jup-8OOO V's all-new modulation section features easy drag-and-drop assignment of modulation sources. To access it, click the Advanced button [p.126] to open the Advanced view. The Multi-Arp [p.36] and Effects [p.62] tabs reside here too – and we already covered those in previous chapters.

7.1. Overview



Every tab to the right of the Effects tab is a Modulation source. These can further be divided into internal sources, MIDI sources [p.114], and Macros [p.117]. The first three tabs are for internal sources, and you have a choice of *five* source types for each of those three slots:

Source	Color Code	Description
Envelope [p.95]	Amber	DADSR envelope generator
Function [p.97]	Green	Hyper-flexible shape creator
Random [p.104]	Violet	Complex random value generator
Voice Modulator [p.106]	Teal	Sends a new modulation value each time Jup-8OOO V triggers a voice
Mod Sequencer [p.108]	Magenta	Modulation sequencer for sending stepped values

To the right of these are the MIDI modulators [p.114]: performance gestures such as the mod wheel, keyboard note, key and release velocity, aftertouch, and MPE slide, which refers to the position of your finger along the Y-axis of a key on an MPE controller [p.132]. MIDI modulators are color-coded pale pink.

Finally, we have the four Macros [p.117]. These control multiple parameters with a single knob twist. Then you could MIDI learn each Macro to a physical knob or fader for powerful command over your performance. Macros are color-coded indigo.

7.1.1. Assigning a modulation

Jup-8000 V features a new drag-and-drop approach designed to remove the guesswork and squinting from assigning modulation routings. Suppose we want to assign the Random generator to oscillator mix to create an interesting timbral variation between the oscillators.



Jup-8000 V makes assigning modulations easy with drag-and-drop

- Step 1. Click-hold on the source's icon or animated thumbnail (not the text tab below it). The icon will turn into a 4-way arrow, as shown above.
- Step 2. As you begin to drag the source, a bubble with its name appears.
- Step 3. Drop the bubble on the destination, in this case the oscillator mix, like so:



Dropping a source on a destination creates a Quick Edit knob

Notice the Quick Edit knob that appears below the destination, matching the color of the source. Turn it to adjust the modulation amount in a positive or negative direction. It reappears any time you hover over that destination.

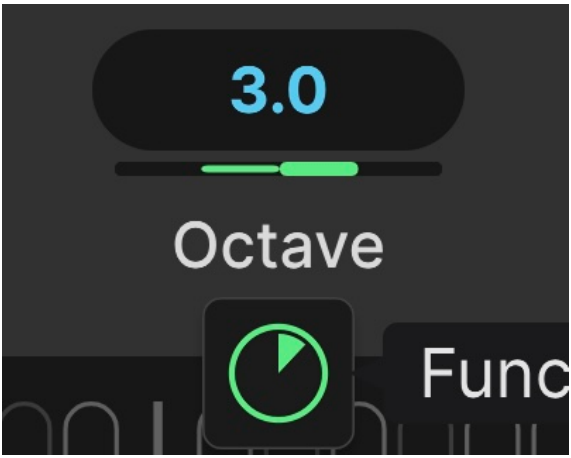


Hover over the Quick Edit knob to see the modulation amount around the source

If you hover over the quick edit knob, a "collar" around a knob or line adjacent to a slider appears in matching color to indicate the modulation amount. The collar/line appears in one of two ways:

- If the modulation source is bipolar, the collar extends in both directions from the destination control's position (as shown above).
- If the modulation source is unipolar, the collar extends in one direction from the destination control's position.

With parameters that appear as numerical fields, a black line underneath the field indicates it is an eligible modulation destination.



The Octave parameter of the Multi-Arp modulated by a Function

Assign a source, and the line will display a color-matching bar to show the modulation source type and amount, as shown above.

You can assign as many sources as you want to a destination, and Quick Edit knobs will appear under it. When a destination is receiving modulation, the standard collar that indicates its position animates to show the real-time effect on the destination value.

Don't forget that you can assign modulation sources to parameters in the Multi-Arp, Effects, and even other modulation sources. Simply select the destination area using the text tabs, then drag on an icon/thumbnail to make the assignment.

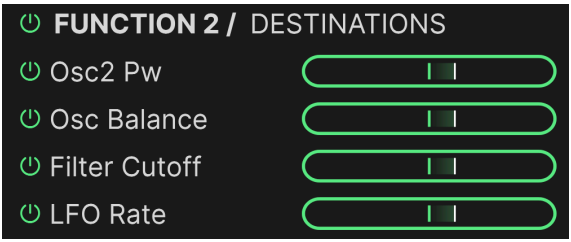
7.1.1.1. Viewing sources at the destination



Envelope, Function, and Random sources all assigned to oscillator mix

There are two ways to view modulation assignments once they're made. This first method is when you want to see which sources modulate a given destination. Simply hover over the destination (you may need to click in its general area first) to display as many Quick Edit knobs as there are sources. In turn, hovering over a Quick Edit knob will display a pop-up identifying the source and modulation amount.

7.1.1.2. Viewing destinations at the source



Function assigned to oscillator mix, Oscillator 2 PW, cutoff, and LFO rate

The second approach displays a list of which destinations are modulated by the chosen source. Click on the source's thumbnail/icon (not the text tab) to show the list. Here are its basics:

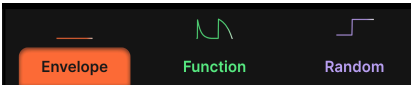
- Individual and global on/off buttons mute the modulation routing without deleting it
- Horizontal sliders control positive/negative amounts and correspond to the Quick Edit knobs at each destination
- Hover on the destination text and it scrolls so you can read the whole thing
- Move the mouse cursor out of the list area to hide it

7.1.2. Remove a modulation assignment

To remove an assignment, double-click on its Quick Edit knob underneath the destination. This first sets the value to zero. Then when your cursor leaves the area, the Quick Edit knob disappears. If you want to disable the modulation without removing it (so that you can hear other things better, for example), use the on/off buttons in the Source View lists. In any case, drag-and-drop makes it easy to redo any assignment deleted accidentally.

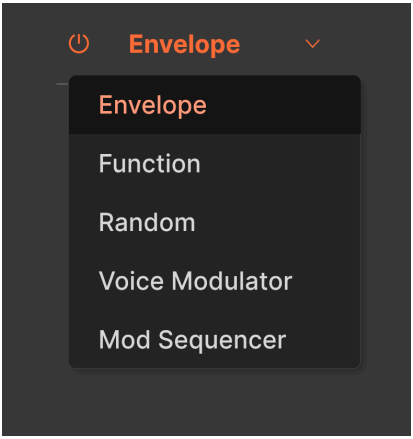
7.1.3. Selecting an internal source type

You can mix and match source types in the first three slots any way you like. Here's how you do it.



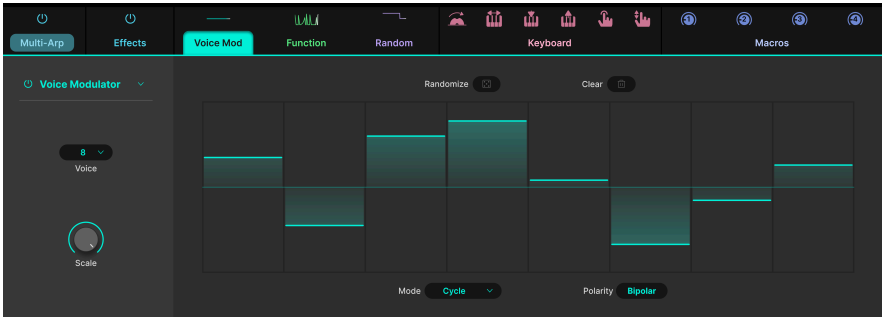
Click an internal slot's tab to select it

First, choose one of the three tabs. Here, we have picked the first, currently populated by an Envelope.



The modulation source select menu

Now, go to the left side of the screen and click the drop-down menu. Suppose we want to change that Envelope to a Voice Modulator. Select it from the menu and presto:



Now, the Voice Modulator occupies the first modulation slot

7.1.4. About modulation source assignment and order

Selecting a different modulation source for one of the three available slots does *not* change any of the assignments for that slot – a source assigned to multiple destinations will retain them all.

On the destination end, the Quick Edit knobs always reflect the order of modulation slots/sources from left to right in the modulation view. So, remember what an Envelope (first slot), Function (second slot), and Random (third slot) all assigned to VCF frequency looks like when you hover over the Frequency knob:

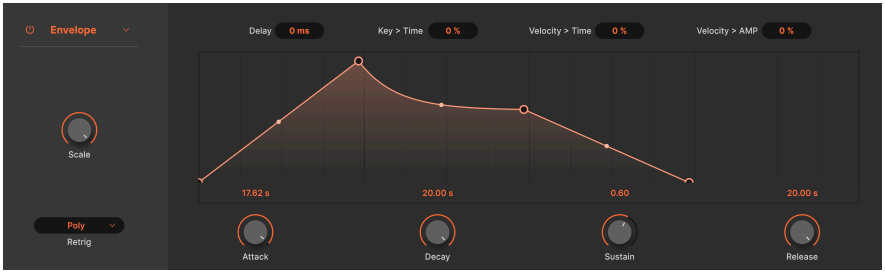


If, for example, you change the Envelope to the Voice Modulator, that first Quick Edit knob changes color to reflect this, and the assignment itself remains in place:



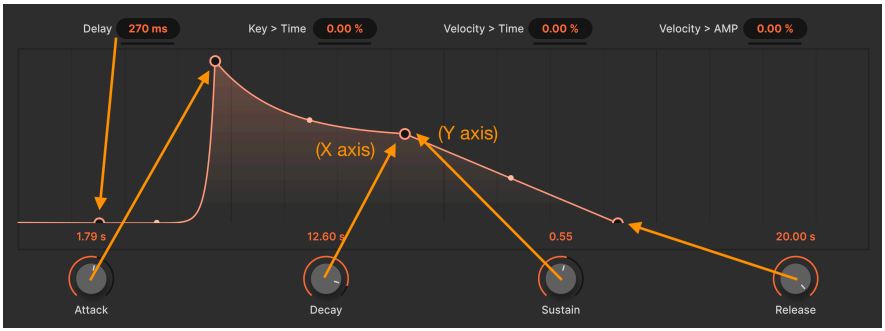
Now let's examine the modulation source types themselves!

7.2. Envelope



The Envelope modulation source

The Envelope (Envelope) source type is essentially a synth envelope generator, with the addition of an adjustable delay before the attack phase begins – so technically it's a DADSR. You can adjust its main settings with either the knobs or by moving the breakpoints in the graphic visualizer. Try it and you'll see their actions mirror each other.

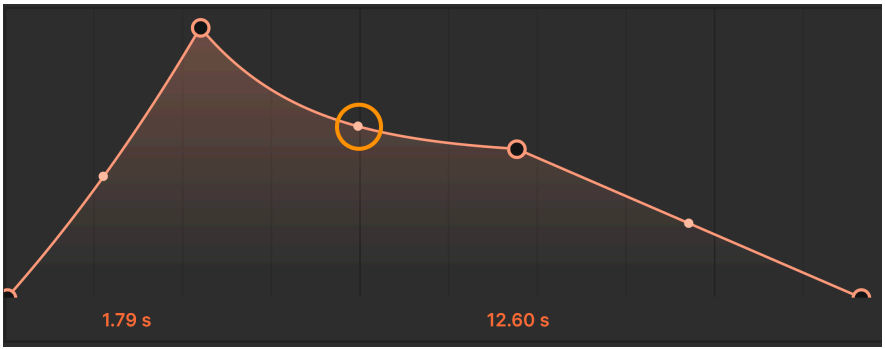


Each parameter mirrors the position of a breakpoint in the graphic envelope

7.2.1. Envelope Scale

The **Scale** knob at far left sets a ceiling on the overall modulation output of the envelope. You can think of it as determining the Envelope's peak level at the top of the attack phase.

7.2.2. Envelope curves



Grab the handle to adjust the shape of the envelope segment

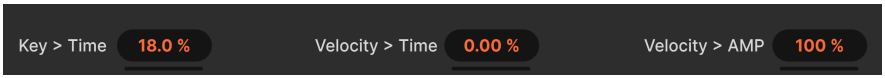
You can also adjust the shape of the envelope segment between each breakpoint. Hover over the small dot in the center of a segment. Up and down arrows will appear. Now, click and drag the segment into the desired shape.

7.2.3. Main envelope parameters

The main envelope parameters work as expected:

- **Delay:** Adds a time lag before the attack phase begins
- **Attack:** Sets the time it takes for the envelope to rise to peak level once a note is played
- **Decay:** Sets the time it takes for the envelope to fall from peak level to the sustain level
- **Sustain:** Adjusts the sustain level at which the envelope remains as along as a note is held
- **Release:** Sets the time it takes for the envelope to fall from the sustain level when a note is released

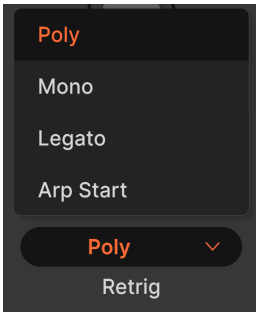
7.2.4. Envelope MIDI modulations



Three more parameters let MIDI notes and velocity affect the envelope for added expression.

- **Key > Time:** Envelope times (attack, decay, release) become more sensitive to keyboard note
- **Velocity > Time:** Envelope times (attack, decay, release) become more sensitive to MIDI velocity
- **Velocity > Amp:** Scale parameter becomes more sensitive to velocity

7.2.5. Envelope Retrigger

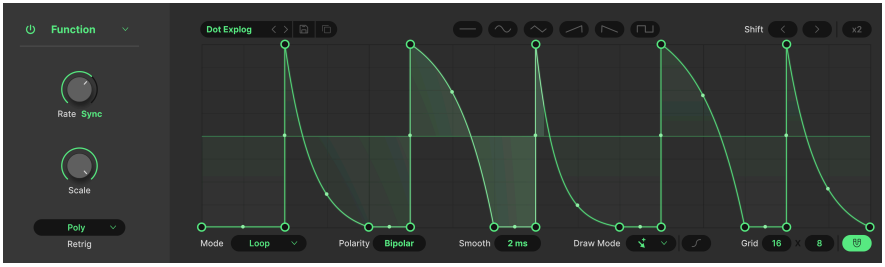


The retrigger settings determine what actions will start the envelope over from the beginning of its cycle, and how notes are affected.

- *Poly:* Each new note starts the cycle over only for that note, i.e. every note gets its own cycle
- *Mono* Each new note starts the cycle over for *all* currently held notes
- *Legato:* New notes played legato (before previous notes are released) will *not* retrigger the envelope
- *Arp Start:* Envelope retriggers at the beginning of any active Multi-Arp track

To get familiar with these, assign an Envelope to something quite audible, like a filter cutoff. Then play notes, listen, and watch the tracer puck glide along the envelope curve, looking for when it goes back to the beginning.

7.3. Function

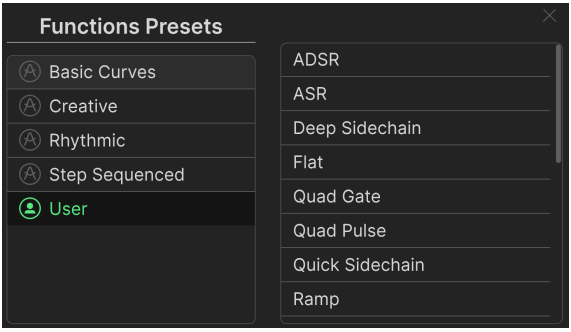


The Function generator can be thought of as a highly flexible envelope-meets-LFO – if the two were fused by a mad scientist. The concept is that you can create any kind of modulation shape you can imagine.

7.3.1. Function Scale

As with the Envelope, the leftmost knob sets the scale (overall output) of the function while preserving all of the time and level relationships within it.

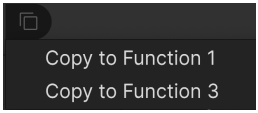
7.3.2. Function Presets



Function categories are on the left; individual presets on the right

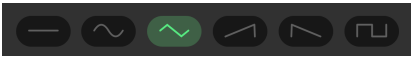
Before we create our own functions, click on the Presets field to see the factory selections and get an idea of just how many shapes a function can take. On the left are general categories of functions. Click the disk icon to save your own creations. A user category will then appear in the left column of the menu.

7.3.3. Function Copy



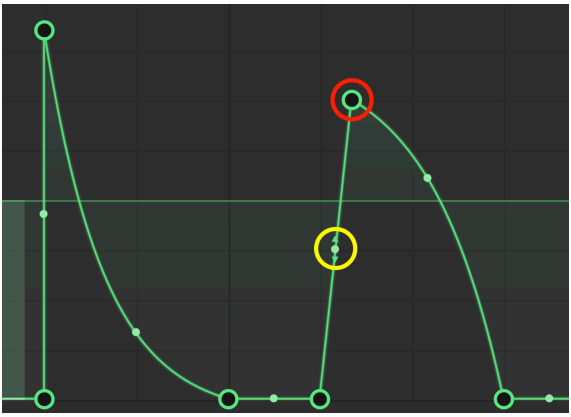
Click the double-document icon to copy the selected Function's settings to another Function occupying either of the other two slots. If a different modulation source (Envelope, Random, or Mod Sequencer) is currently in the target slot, copying will *not* overwrite that setting. You first need to put a Function in that slot, then perform the copy operation.

7.3.4. Function LFO shapes



In addition to this preset library, there are six basic waveshapes intended for using the Function like an LFO or starting your own shape: flat, sine, triangle, ramp, aw, and square.

7.3.5. Breakpoints and grab handles



A breakpoint is circled in red; a grab handle in yellow

Functions let you create any curve or shape of modulation with two simple tools: *breakpoints* and *grab handles*. A *breakpoint* is a point in time at which the modulation changes direction. (It doesn't have to – you could use a breakpoint as a spot where, for example, the curve increases or decreases in steepness – but changing direction is usually what a breakpoint is for.)

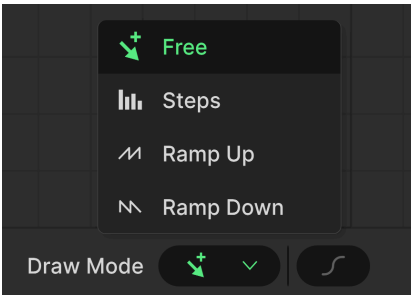
Left-click on the graph to add a breakpoint. Right-click on the point to delete it – a quick confirmation pop-up will appear.

Between any two breakpoints, there is a *grab handle* that you can drag to change the shape or intensity of the curve between those two points, much like with the Envelope. Leaving a handle in mid-position would create a more or less straight line between points. Dragging it as far as it will go in a direction generally creates a steep "knee" shape.

Between grab handles and breakpoints, any shape can be created, from a simple sine wave for an LFO to a conventional synth-style Envelope to extremely complex shapes.

7.3.6. Drawing Tools

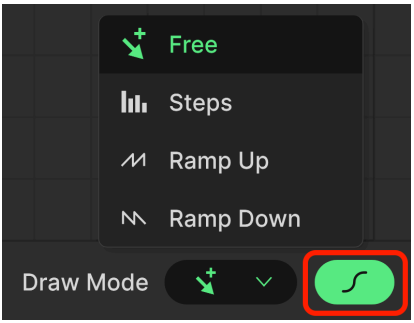
Click on **Draw Mode** to bring up the list of drawing tools. These can speed up your Function creation by letting you draw repeating shapes via click-dragging inside the visualizer.



- *Free:* Creates a single point
- *Steps:* Creates a repeating square wave-like pattern
- *Ramp Up:* Creates a rising sawtooth pattern
- *Ramp Down:* Creates a falling sawtooth pattern

Position the mouse in the visualizer so that your cursor becomes a pencil icon, then drag.

7.3.6.1. Curve



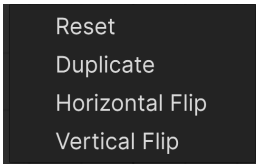
The S-shaped curve button to the right of the Draw Mode menu toggles a more curved shape for the Function's segments. The exact shape change is different from one Function to another; it is merely meant as another creative tool.

7.3.6.2. Grid and Magnetize



When the magnet button is lit, moving breakpoints around the display will "snap to grid," aiding you in creating rhythmic Functions or precise shapes. You can then drag up and down on the numerical fields to adjust the resolution of the grid in both the horizontal and vertical axes.

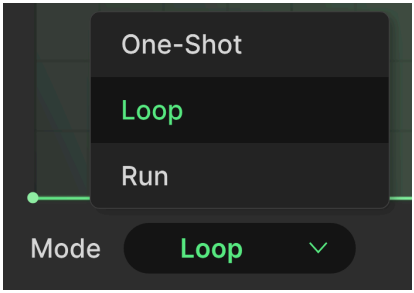
7.3.6.3. Additional editing tools



Right-click anywhere in the display *other* than on a breakpoint to bring up the above menu of editing options:

- *Reset:* Resets the function to "flatline" – be careful with this one!
- *Duplicate:* Performs a Duplicate [p.102] operation
- *Horizontal Flip:* Creates a mirror image of the function horizontally
- *Vertical Flip:* Creates a mirror image of the function vertically

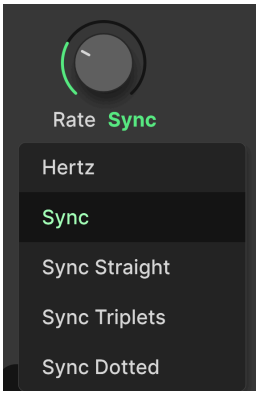
7.3.7. Function Mode



The **Mode** setting is an important one, because it selects whether the Function behaves more like an envelope or more like an LFO.

- *One-Shot:* The Function plays through once, i.e. more like an envelope
- *Loop:* The Function plays repeatedly and can retrigger from the start point based on a selectable event
- *Run:* The Function plays repeatedly and only returns to the start point when it reaches the end

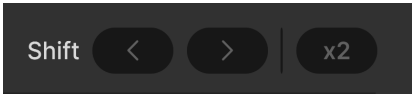
7.3.8. Function Rate and tempo sync



The rate of the Function can run free or be synced to project tempo via a drop-down menu accessed by clicking below the **Rate** knob. The options are:

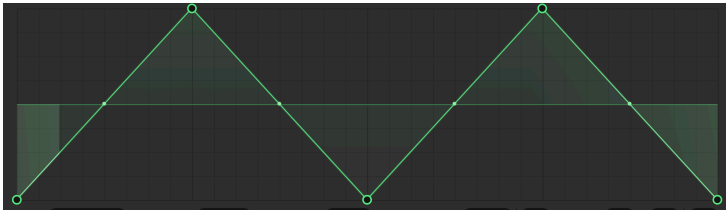
- *Hertz:* Free-running with no tempo sync
- *Sync:* Straight, triplet, and dotted ratios are all present serially when you turn the knob
- *Sync Straight:* Only even rhythmic values are represented
- *Sync Triplets:* Tempo is synced with a triplet feel; a quarter-note = three eighth-notes played in the space of two
- *Sync Dotted:* Tempo is synced with a dotted feel; a quarter-note = a dotted eighth-note followed by a 16th-note

7.3.9. Function Shift and Duplicate

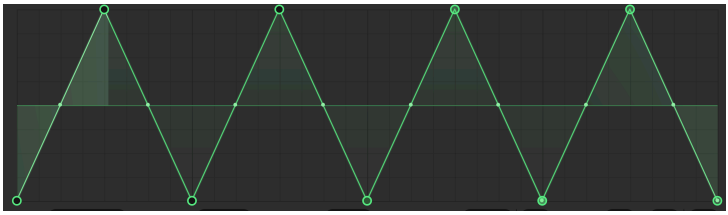


The **Shift** arrows will move the function forward or backward in time by one block along the horizontal axis of the grid.

Duplicate (the button labeled **x2**) doubles the pattern of the function over the same amount of time. For example, take a simple triangle wave that looks like this:



Click the **x2** button once, and it transforms into this:



You can repeat this operation.

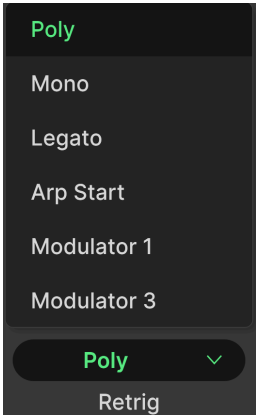
7.3.10. Function Polarity and Smooth



The **Polarity** field toggles whether the Function output sends positive values only (Unipolar) or positive and negative values (Bipolar).

Drag on the **Smooth** field to smooth out transitions at the breakpoints. This can help if you hear unwanted clicks in the sound as the Function plays.

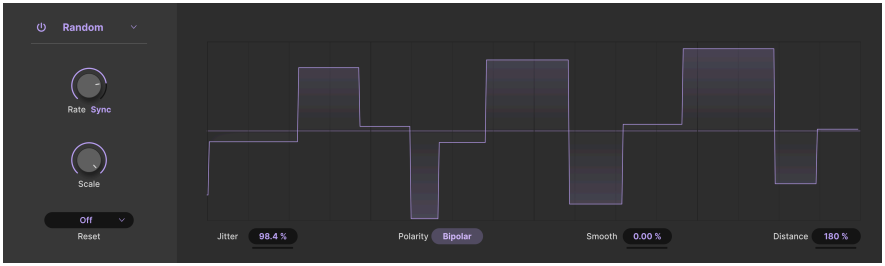
7.3.11. Function retrigger



Finally, you can decide which action restarts the Function from the beginning of its cycle, much like the Envelope.

- *Poly:* Each new note starts the cycle over only for that note, i.e. every note gets its own Function cycle
- *Mono* Each new note starts the cycle over for *all* currently held notes
- *Legato:* New notes played legato (before previous notes are released) will *not* retrigger the Function
- *Arp Start:* Function retriggers at the beginning of any active Multi-Arp track
- *Modulator:* Function restarts when either of the Modulators in the other two slots restarts (there are always two of these options)

7.4. Random



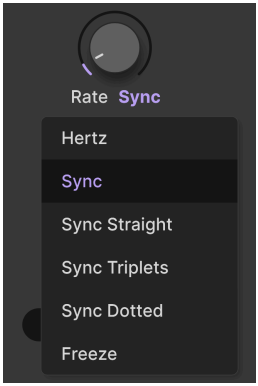
The Random modulator does exactly what its name implies: It generates a stream of random values that can then modulate any destination you assign. It's based on the similar modulation source in our flagship software synth Pigments, but streamlined to the most musically useful parameters.

- **Jitter:** Introduces further random variance in the timing of when each new value is generated
- **Polarity:** Toggles whether positive and negative (Bipolar) or only positive (Unipolar) modulation output values are generated
- **Smooth:** Adds transition time between Random value changes, which can help smooth out unwanted clicks
- **Distance**: Sets the time between the current and upcoming value change; expressed as a percentage

7.4.1. Random Scale

The **Scale** button determines the maximum or "ceiling" modulation output generated by the Random engine (in both positive and negative directions if the Randomizer is set to Bipolar priority).

7.4.2. Random Rate and tempo sync

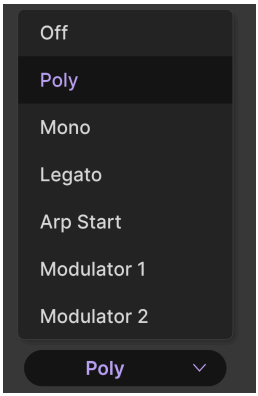


The rate of the Random generator can run free or be synced to project tempo via a drop-down menu accessed by clicking below the **Rate** knob.

The options are:

- *Hertz:* Free-running with no tempo sync
- *Sync:* Straight, triplet, and dotted ratios are all present serially when you turn the knob
- *Sync Straight:* Only even rhythmic values are represented
- *Sync Triplets:* Tempo is synced with a triplet feel; a quarter-note = three eight-notes played in the space of two
- *Sync Dotted:* Tempo is synced with a dotted feel; a quarter-note = a dotted eighth-note followed by a 16th-note
- *Freeze:* Stops Random value generation but preserves the current value

7.4.3. Random retrigger

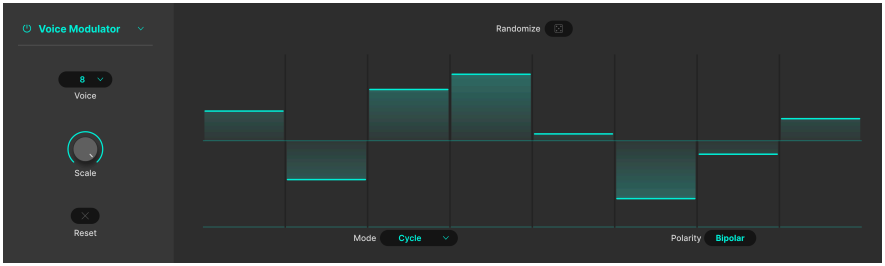


Finally, you can decide which action restarts Random value generation from the beginning of the cycle.

- *Off:* Random generator does not retrigger
- *Poly* Each new note starts the cycle over the current note only; i.e. each note gets its own cycle
- *Mono* Each new note starts the cycle over for *all* currently held notes
- *Legato:* New notes played legato (before previous notes are released) will *not* retrigger the Random generator
- *Arp Start:* Value generation retriggers at the beginning of any active Multi-Arp track
- *Modulator:* Value generation restarts when either of the Modulators in the other two slots restarts (there are always two of these options)

♪ Experiment with the *Freeze* tempo sync setting together with the different retrigger modes for some creative possibilities. For example, with the *Legato* setting and tempo sync frozen, the Random generator outputs a new value only upon receiving a non-legato MIDI note. Use *Arp Start* and the random value will change at the beginning of a Multi-Arp cycle. In this way, you can tie new modulation values to your playing, to musical phrases, and so on.

7.5. Voice Modulator



This very cool new modulation generator outputs a new value each time Jup-8000 V triggers a voice (usually because you, the sequencer/arpeggiator, or a DAW track plays a MIDI note). For example, you could assign it to filter cutoff to hear a different amount of brightness with each successive note, or to pan position to bounce a sound around the stereo field. You could also create "dispersion" or drift-like behavior of any destination parameter, mimicking the behavior of aged analog synths.

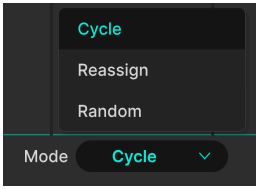
Drag the bar of a Modulator step up or down to set its value.

7.5.1. Voice Count and Mode

The **Voice** menu at the left chooses how many voices are used by the modulator, from 1 to 8. Select 2, for example, and you will see only two steps in the bar graph display.

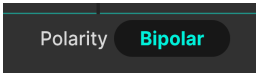


The **Mode** parameter determines how steps in the Voice Modulator call on Voices from the sound engine:



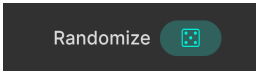
- *Cycle:* Each new voice advances the Voice Modulator one step
- *Reassign:* If a note has been played before, the Modulator uses the step already used for that note; if it has not, it advances to the next step
- *Random:* Each new note grabs a random step from the Modulator cycle

7.5.2. Voice Modulator Polarity



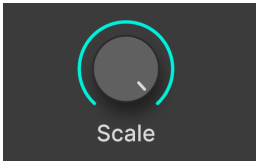
You can toggle the Voice modulator between unipolar and bipolar operation. When Unipolar, it will send only positive modulation values and you will be able to raise or lower the step bars relative to the bottom (zero). In Bipolar mode, both positive and negative values are sent, and you can move the step bars to either vertical side of the center line in the display.

7.5.3. Randomize



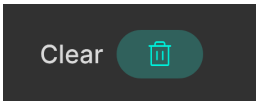
Clicking the icon that looks like a gaming die will set all active steps in the modulation sequence to random values. You can do this any number of times.

7.5.4. Voice Modulator Scale



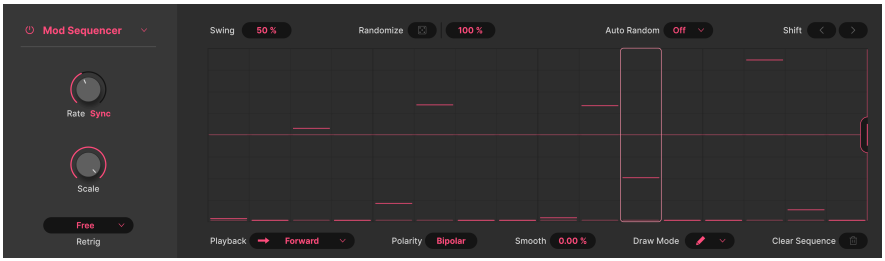
Similar to other modulator types, the **Scale** knob adjusts the overall modulation amount while preserving the relative value differences between the steps.

7.5.5. Clear



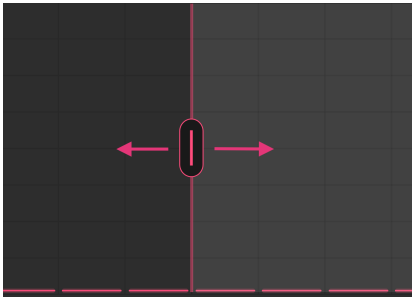
Clicking the trash can icon simply sets all the modulation steps to zero, letting you start over. If you do this by accident, you can use the undo or history [p.128] functions to revert and get them back.

7.6. Mod Sequencer



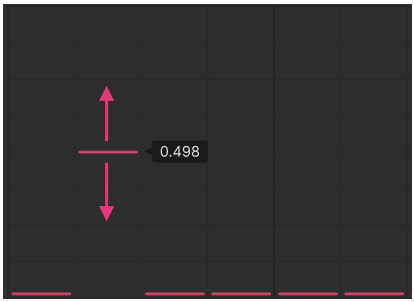
The Mod Sequencer in Jup-8000 V is much like one that could be used to play notes, only it's for sending modulation values to destinations. (You *could* play notes with it in a fashion – by assigning it to oscillator pitch!) It offers adjustable pattern lengths up to 16 steps, one-click random pattern generation, auto-randomization of pattern data, swing, four playback modes, and much more.

7.6.1. Setting the pattern length



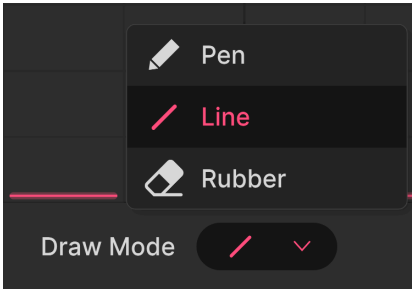
Grab the vertical magenta handle (usually found at the right side of the window) and slide it back and forth to adjust the overall length of the pattern.

7.6.2. Setting the value of a step



To enter data at any step, click anywhere within a step on the grid to position the horizontal bar. You can then drag the bar up and down to fine-tune its value.

7.6.3. Drawing modes

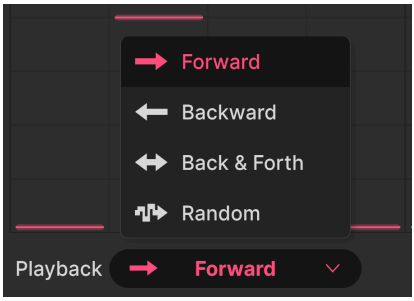


Similarly to the Functions, the Mod Sequencer has drawing tools to speed up pattern creation. Click the **Draw Mode** icon to show the pop-up.

- *Pen:* Free-drawing; drag the cursor horizontally and vertically to enter a new value at each step
- *Line:* Creates an ascending or descending series of steps when you drag the cursor on the grid
- *Rubber:* Eraser tool; sets step values to zero as you drag

> To make successive slopes with the Line tool, release the mouse button once you are satisfied with your line. Then start at the next step and make a new line.

7.6.4. Mod Sequencer Playback mode



In this pop-up menu, you can set how the Mod Sequencer runs through the pattern.

- *Forward:* Sequence only plays left to right
- *Backward:* Sequence only plays right to left
- *Back & Forth:* Sequence plays in one direction then reverses; first and last steps are repeated
- *Random:* Sequence jumps to random steps

7.6.5. Swing

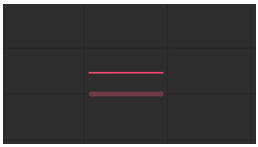


Swing is often described as a "behind the beat" rhythmic feel, and the Mod Sequencer has a range of 50 to 75 percent, which you change by dragging up or down on the number. Fifty percent represents a "straight" feel, whereas 75 percent means that two eighth-notes are played as a dotted eighth plus a 16th-note. That is, the note durations between them are split 75/25.

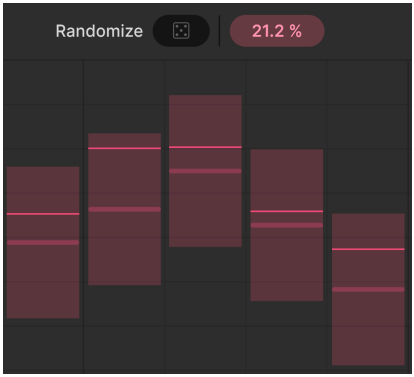
7.6.6. Randomize



Click the "dice" icon to generate a completely random set of values for all steps. In any given step, the dimmer, slightly thicker bar represents the original set step value and the thinner, brighter bar the random one, like so:

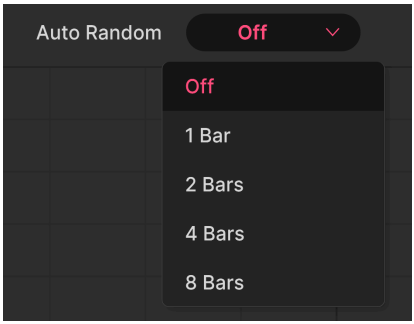


7.6.6.1. Random range



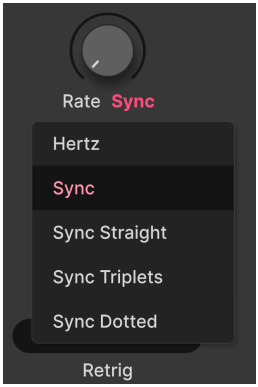
The percentage field to the right of the dice restricts the range within which a random value can be generated above and below the set value. Hover over it and the sequencer displays the ranges as vertical bars.

7.6.6.2. Auto-Random



You can also let the Mod Sequencer generate a new set of random step values every bar or every two, four, or eight bars using the above menu.

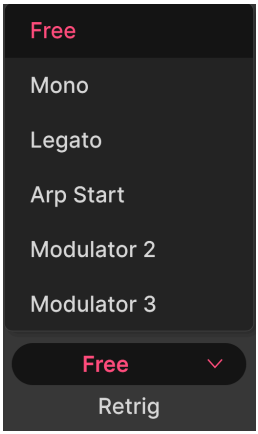
7.6.7. Mod Sequencer Rate and tempo sync



Like the Functions and the Random generator, the sequencer can free-run or sync to project tempo. Access these options by clicking beneath the **Rate** knob:

- *Hertz:* Free-running with no tempo sync
- *Sync:* Straight, triplet, and dotted ratios are all present serially when you turn the knob
- *Sync Straight:* Only even rhythmic values are represented
- *Sync Triplets:* Tempo is synced with a triplet feel; a quarter-note = three eighth-notes played in the space of two
- *Sync Dotted:* Tempo is synced with a dotted feel; a quarter-note = a dotted eighth-note followed by a 16th-note

7.6.8. Sequencer retrigger



As with the other modulators, you can determine which events will cause the sequencer to start over from the beginning of the pattern, via the menu at the lower left of the window.

- *Free:* Sequence pattern does not retrigger
- *Mono* Each new note starts the pattern over for *all* currently held notes
- *Legato:* New notes played legato (before previous notes are released) will *not* retrigger the pattern
- *Arp Start:* Sequence pattern retriggers at the beginning of any active Multi-Arp track
- *Modulator:* Pattern restarts when either of the Modulators in the other two slots restarts (there are always two of these options)

7.6.9. Other parameters

A handful of now-familiar parameters rounds out the Step Sequencer's utility.



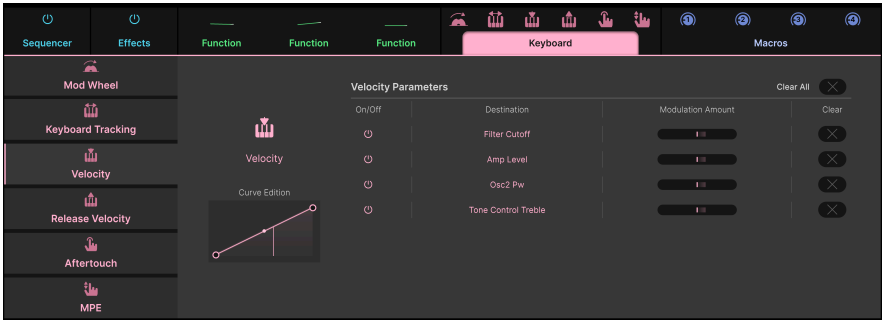
- **Polarity:** Determines whether the Sequencer sends positive values only (Unipolar) or positive and negative values (Bipolar).

- **Smooth:** The higher **Smooth** is set, the more gradual the transition between steps becomes. At zero, the output is simply star-stepped as it appears onscreen. At 100 percent, it becomes a completely smooth curve that passes through all the step values.

- **Shift:** The Shift arrows at upper right move the sequence forwards or backwards one step at a time. For example, when shifting forward, the value in step 1 moves to step 2, and so on, until the final step in the pattern becomes step 1.

- **Clear Sequence:** The trash can icon at the lower right sets all step values to zero. If you do this by accident, you can use the undo or history [p.128] functions to restore them.

7.7. MIDI modulators

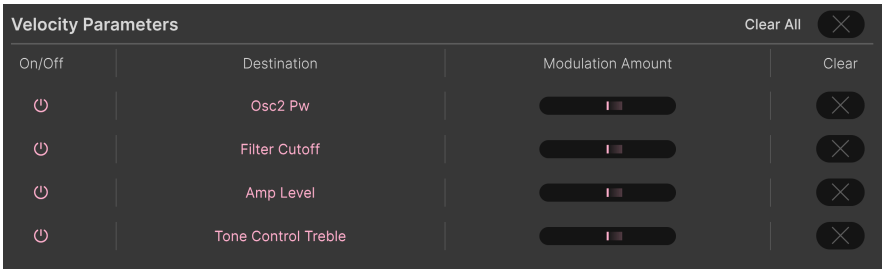


Color-coded pale pink, the MIDI modulators can all be found on the tab that displays the word "Keyboard" (when you hover on of the other icons in this section; "Keyboard" changes to the name of the selected modulator). This is because they all represent MIDI messages that come from a keyboard or other controller – and hence gestures that can make musical performance more expressive. There are six of them:

- **Mod Wheel:** Position of the modulation wheel
- **Keyboard Tracking:** MIDI note number
- **Velocity:** MIDI playing velocity assuming velocity-sensitive hardware
- **Release Velocity:** How quickly a note-off occurs assuming hardware that senses this
- **Aftertouch:** Channel after-pressure on supporting hardware
- **MPE Slide:** Finger position on the Y-axis of a key or other surface, on supporting MPE controllers [p.132]

All of these work more or less identically: They translate some form of kinetic motion (from a musical input device) into a MIDI continuous controller message that can in turn be applied as a modulation source. For that reason, we will take Velocity as the example for this section, because its parameters apply to all other MIDI modulators.

7.7.1. The parameter list



MIDI modulators can display all current destinations

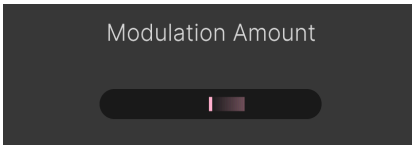
Once you have assigned some modulation routings [p.90] using the convenient drag-and-drop method, the destinations for a MIDI modulator appear here.

Note that filter cutoff and voice volume have their own velocity depth knobs on the main panel, so if those parameters are also assigned here, it can add to their value – or subtract from it if polarity is negative.

7.7.1.1. On/Off buttons

Each destination has an on/off toggle that mutes the modulation without deleting the routing assignment.

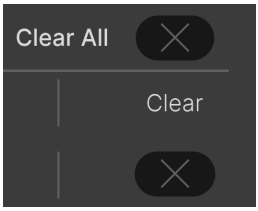
7.7.1.2. Modulation Amount



Horizontal mod amount sliders duplicate the Quick Edit knobs at the destinations

Each destination row also has a Modulation Amount slider. These mirror the actions of the Quick Edit knobs visible when hovering over [p.92] a destination. From here you can easily adjust the MIDI modulator's effect on all destinations.

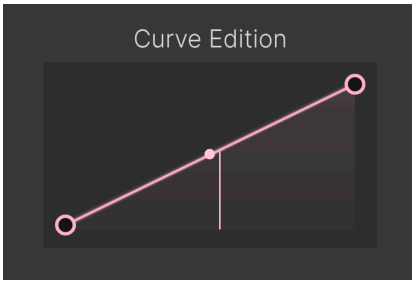
7.7.1.3. Clear buttons



You can quickly delete any modulation routing by clicking its X icon – or delete them all by clicking the **Clear All** X.

Fear not! If you do this by accident, you can recover your routings with the Undo [p.129] button in the Lower Toolbar.

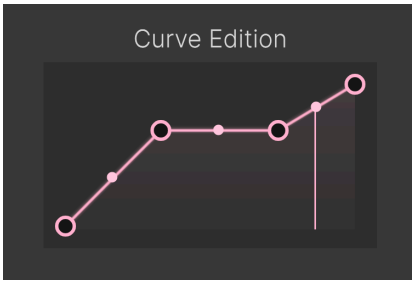
7.7.2. Control curves



A simple linear control curve; vertical line indicates last received value

You can also edit the controller curve for each MIDI modulator. That is, how it translates physical motion into MIDI. The default curve is shown above. The vertical line represents the last value received by the modulator: how hard you played a key in the case of velocity, what position the mod wheel was left in, and so on.

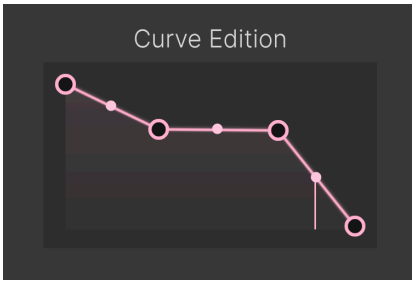
7.7.2.1. Custom curves



A custom control curve

You can edit the default curve for any MIDI modulator with a process very similar to editing Functions [p.99]: Click in the curve to add breakpoints, drag the grab handles to shape the curve segments, and right-click to remove breakpoints. The first and last breakpoints cannot be deleted.

7.7.2.2. Inverse curves

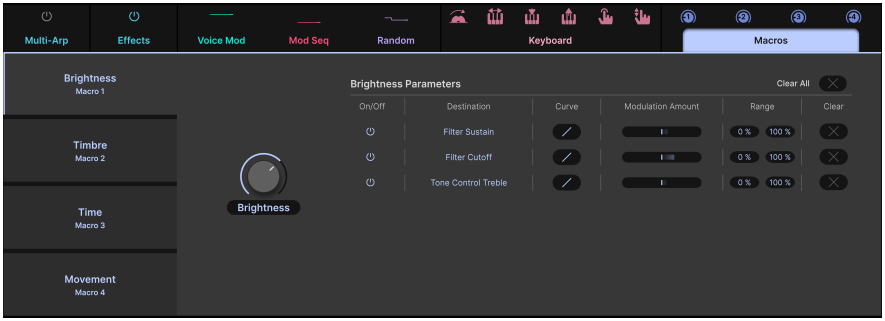


An inverse control curve

You can also program inverse curves. In the case of velocity, this would make the modulation value *lower* the harder you strike the keys.

> ♪ One application for inverse curves would be to crossfade two signals by using a positive curve on one and an inverse curve from the same modulation source on the other.

7.8. Macros

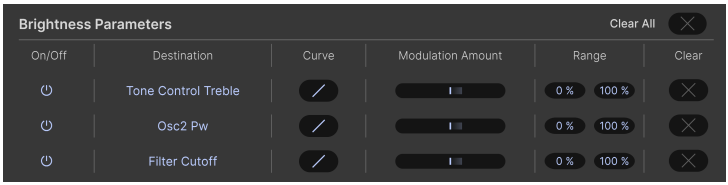


Macros are a longtime staple of Arturia instruments. They let you assign a virtual knob to multiple other parameters. You can then MIDI-learn the Macro to a physical knob or fader. Jup-8OOO V features four Macros, and they work a lot like the MIDI modulators, with a few small differences.

Macro knobs are mirrored in both the Lower Toolbar [p.127] and Preset Browser [p.151].

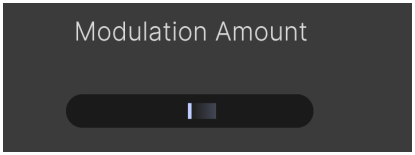
> Macros are called Brightness, Timbre, Time, and Movement by default. This does not restrict where you can assign them. They work identically, and can be freely renamed [p.119].

7.8.1. Macros parameter list



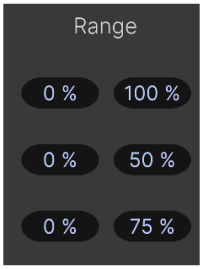
As with the MIDI modulators, the parameter list for any Macro shows all active destinations.

7.8.1.1. Macro modulation amounts



The horizontal sliders mirror the Quick Edit knobs at the various destinations [p.92], giving you a "mission control" center over all modulation amounts.

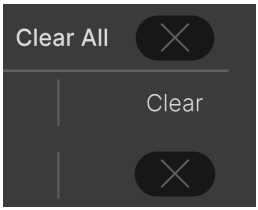
7.8.1.2. Macro ranges



Drag in the minimum and maximum number fields to adjust the macro's range

You can also adjust the range within which turning a Macro knob affects the destination, and you can do so independently for each assigned destination. This works by restricting the range of the *destination* control such that the Macro is only active there. It's useful because you may want a quick knob twist to affect some parameters more than others.

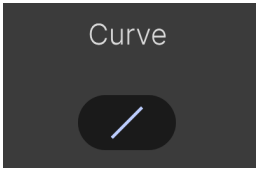
7.8.1.3. Clear icons



You can quickly delete any Macro routing by clicking its X icon – or delete them all by clicking the **Clear All** X.

> Fear not! If you do this by accident, you can recover your routings with the Undo [p.129] button in the Lower Toolbar.

7.8.1.4. Macro curves



You can change the shape of each Macro's curve by dragging on the small Curve icon. Unlike with MIDI modulators, there is no breakpoint editing or inverse capability here.

7.8.2. Macro master knob



Finally, each Macro has a master knob for sending modulation values to all the Macro's destinations. This knob can be MIDI-learned, but it cannot be a modulation destination itself.

7.8.2.1. Renaming the Macro

Click in the name field below the knob to type in a new name for the Macro.

8. USER INTERFACE



This chapter covers everything that is not in the main panel and advanced views – all the utilitarian functions that make Jup-8000 V a pleasure to use in a modern music production environment.

The toolbars above and below the main panel [p.17] of Jup-8000 V contain a number of important functions for Preset selection, housekeeping, and other utility settings.

Then there's the side panel, where you make important global and MIDI settings, and explore Jup-8000 V via interactive tutorials.

The Upper Toolbar includes:

- The Main Menu [p.121]
- The Preset Name Pane and Preset Browser [p.139] access button
- The button to open the Advanced Views [p.126], which include the Multi-Arp [p.36], Effects [p.62], and Modulators [p.89]
- An overall output volume [p.126] knob with small VU meters
- A gear-shaped icon that opens the side panel [p.130]

The Lower Toolbar includes:

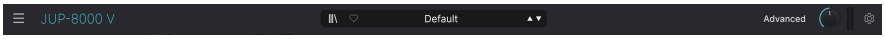
- The parameter description area [p.18] that shows info when you hover over any control
- The Hold button [p.127] to sustain notes
- The Polyphony [p.128] menu, which sets the number of voices played
- Undo, Redo, and History [p.128]
- The CPU Meter [p.129] and Panic [p.129] functions
- Duplicate knobs for the Macros [p.130] found in the Modulation strip and Preset Browser
- A corner grab handle [p.130] for resizing the Jup-8000 V window

The side panel includes:

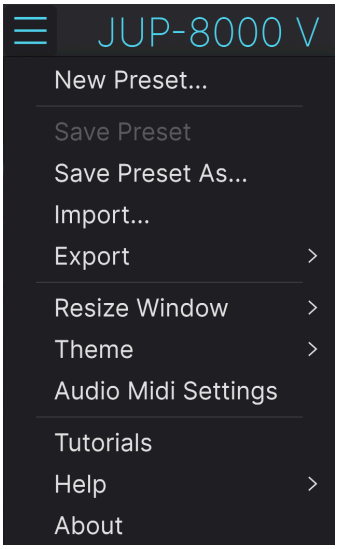
- Settings [p.131] tab for important global and preset-based settings
- MIDI [p.133] for assigning MIDI controllers
- Tutorials [p.124] to familiarize you with Jup-8000 V

8.1. Upper Toolbar

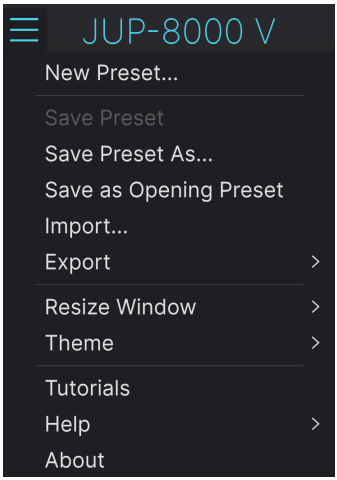
Let's start with the Upper Toolbar, covering its functions from left to right.



8.1.1. Main Menu



The main menu when Jup-8000 V is in stand-alone mode



The main menu when Jup-8000 V is run as a plug-in

Clicking the "hamburger" icon (three horizontal lines) in the top left corner of the upper toolbar opens the Main Menu, a drop-down menu that lets you access a number of useful functions related to Preset management and more.

8.1.1.1. New Preset

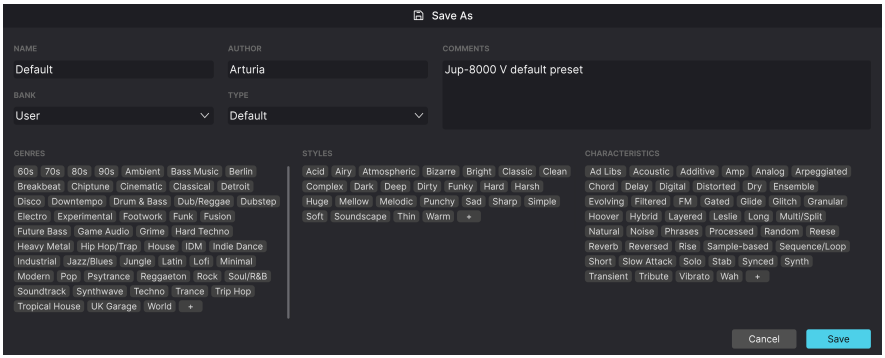
Creates a new Default Preset with initialized settings for all parameters.

8.1.1.2. Save Preset

Overwrites the current Preset with any changes you have made. This applies only to user presets, so this option is greyed-out for factory presets.

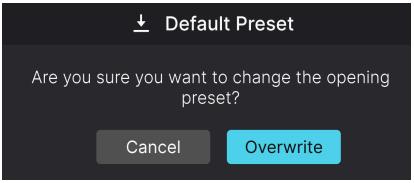
8.1.1.3. Save Preset As...

This option saves the current settings of Jup-8OOO V under a new Preset name. Clicking this option reveals a window where you can name your Preset and enter more detailed information about it:



♪ The Bank, Author, and Type fields are all useful when searching for Presets in the Preset Browser [p.139]. All of the words in boxes you see below that are tags [p.141], which can further help refine searches in the Preset Browser.

8.1.1.4. Save as Opening Preset



The confirmation dialogue for saving the current preset as the default

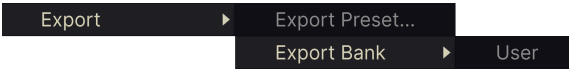
Available when Jup-8OOO V is used as a plug-in, this option makes the current Preset the default with which Jup-8OOO V opens whenever you create a new instance of it on a track.

8.1.1.5. Import ...

This command lets you import a Preset file or an entire Bank stored on your computer. It opens a navigation window in your computer's OS to find the proper files. Importing a Preset will place it into the User bank.

8.1.1.6. Export

You can export Presets to your computer in two ways: as a single Preset, or as a Bank. In either case, an OS-level navigation window lets you specify where to save the file(s). Both individual Presets and Banks have the filename extension *.jp8x*.



- **Export Preset:** Exporting a single Preset is handy for sharing a preset with someone else. The saved preset can be reloaded using the **Import** menu option.
- **Export Bank:** This option exports an entire Bank of Presets, which is useful for backing up or sharing many Presets at once. Saved Banks can be reloaded using the **Import** menu option.

8.1.1.7. Resize Window



Jup-8000 V can be resized from 50% to 200% of its default size (100%) without any visual artifacts. On a smaller screen, such as a laptop, you may want to reduce the interface size so it doesn't dominate the display. On a larger screen or a second monitor, you can increase the size to get a better view of the controls and graphics.

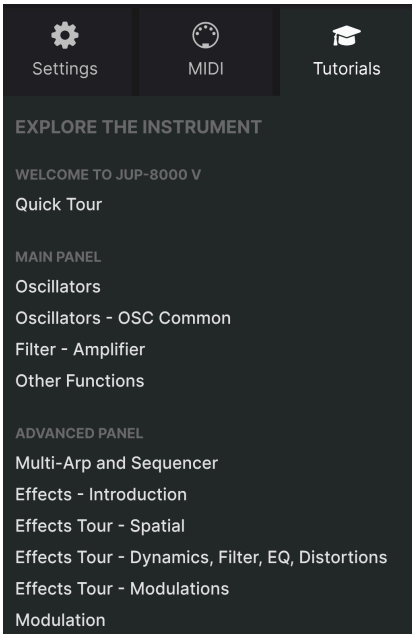
You can also do this using keyboard shortcuts: every time you press CTRL- (Windows) or CMD- (macOS), the window will shrink by one size increment, and every time you press CTRL+ (Windows) or CMD+ (macOS), the window will grow by one size increment.

In addition, you can click-drag the resize handle [p.130] at the right of the lower toolbar to make the Jup-8000 V window any size.

8.1.1.8. Audio MIDI Settings

These appear only if Jup-8000 V is working in stand-alone mode. Used as a plug-in, settings such as audio device and buffer/latency are handled in the context of your DAW or host software. Refer to the chapter on Activation [p.11] for details on the settings for both Windows and macOS. They work in much the same way in stand-alone mode.

8.1.1.9. Tutorials



Jup-8000 V comes with interactive tutorials that walk you through different features of the plug-in. Clicking this option opens a pane on the right side of the window where the tutorials appear. Select one to access step-by-step descriptions that highlight the relevant controls and walk you through the process.

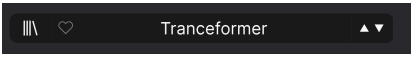
8.1.1.10. Help

Get more help by visiting links to this user manual and Frequently Asked Questions pages on Arturia's website. You will need an internet connection to access these pages.

8.1.1.11. About

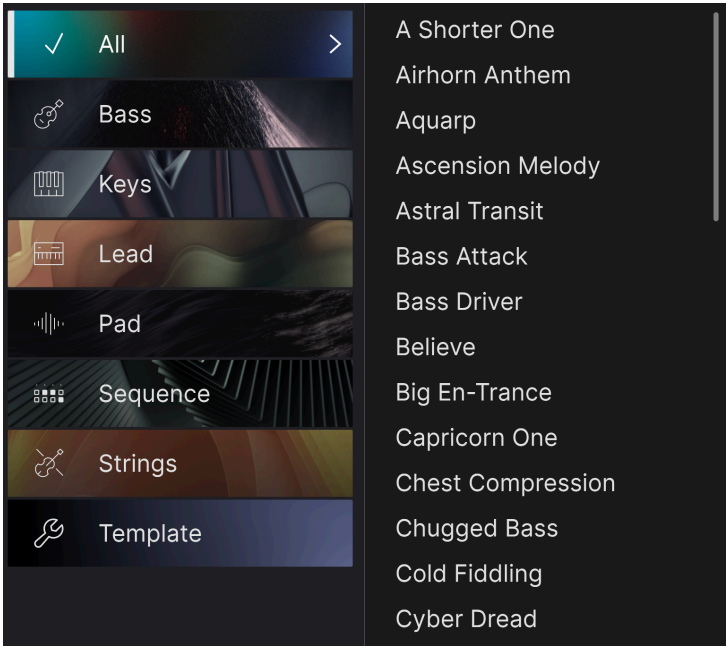
Here you can view the software version and developer credits. Click again anywhere on the screen (outside the About window but inside the plug-in) to make this pop-up window disappear.

8.1.2. Preset Browser access and Name Pane



The Preset Name Pane

Clicking the "books on a shelf" button opens the Preset Browser [p.139], which offers a myriad of ways to browse, sort, and organize Presets in Jup-8000 V.

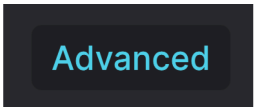


Clicking on the Preset name also opens up quick drop-down menus for selecting Presets outside of the Browser, as shown above. You can select to look at lists of Presets organized by Type, as shown above, or look at All Presets at once.

Everything you need to know about managing Presets is covered in detail in the next chapter [p.139]. This includes working with Favorites, which are tagged by clicking the heart icon.

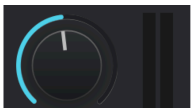
> An asterisk just after the name in the Preset Name Pane (*) indicates that you've edited that Preset.

8.1.3. Advanced Button



Near the upper right corner of the top toolbar is the **Advanced Button**. This changes the lower area of the main panel (where the onscreen keyboard is usually seen) into the tabbed views for the Multi-Arp, Modulators, and Effects.

8.1.4. Output volume



This knob simply controls the main output level of Jup-8000 V. VU meters to its right display the levels.

8.1.5. Gear icon



This opens the side panel [p.130] where settings, Macros, and tutorials reside.

8.2. Lower Toolbar

The Lower Toolbar of the Jup-8000 V interface can be thought of in terms of left and right halves. On the left is the parameter description display, and on the right are controls and pop-up menus for several useful utility functions.

8.2.1. Parameter descriptions



This Control Description pops up when you mouse over the Speed knob in the Main Panel

Operate or hover on any knob, button, icon, or other control, and a brief description of what it does appears in the lower left-hand corner. That is the only item on the left side.

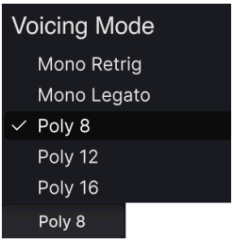
If a description is too long to fit in the space, it will scroll horizontally after hovering on the control for three seconds.

8.2.2. Hold



The **Hold** button acts like a sustain pedal. You can use it, for example, to sustain notes as a Multi-Arp or Sequencer part is playing while you edit the sound.

8.2.3. Polyphony

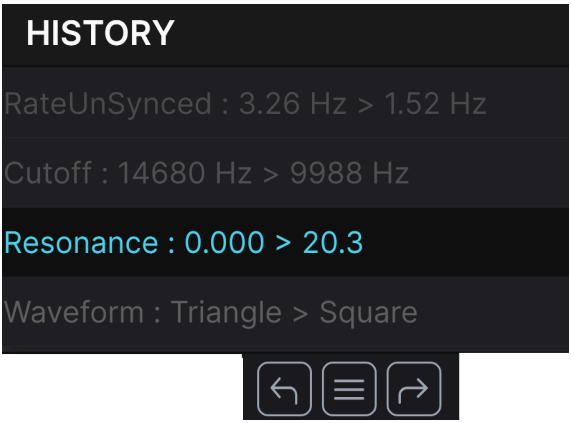


The Poly menu shows the maximum number of voices

In polyphonic mode, Jup-8000 V has up to 16 voices. There are also *Mono Legato* and *Mono Retrigger* modes.

- *Poly 8/12/18*: Polyphony of 8, 12, or 16 notes
- *Mono Legato*: Monophonic; envelopes and glide do not retrigger when you play a new note before fully releasing the previous one
- *Mono Retrig*: Monophonic; envelopes always retrigger when notes are played

8.2.4. Undo, Redo, and History



Jup-8000 V remembers every control move you have made

When editing a virtual instrument, it's all too easy to overshoot the sweet spot for one or more controls, and then wonder how to get back to where you were. Like all Arturia plug-ins, Jup-8000 V offers comprehensive Undo, Redo, and History functions so that you always have a safe way back.

8.2.4.1. Undo

Click the left arrow to revert to the state before the most recent edit you made. You may click repeatedly to undo several edits in reverse time order.

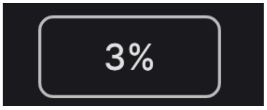
8.2.4.2. Redo

Click the right arrow to redo the most recent edit you undid. If you have undone several, you may click repeatedly to redo them in forward time order.

8.2.4.3. History

Click the center "hamburger" (three lines) button to open the History window, as shown above. This provides a step-by-step account of every move you have made in Jup-8000 V. Clicking on an item in the list not only re-executes that move – it returns the plug-in to the overall state it was in when you first made that move.

8.2.5. CPU Meter



At far right is the **CPU Meter**, which displays the overall load Jup-8000 V is placing on your computer CPU. Since it deals only with this plug-in, it is not a substitute for the resource metering tools in your DAW.

8.2.5.1. Panic



Mousing over the CPU Meter accesses the PANIC function

Mouse over the CPU Meter, and it will display the word PANIC. Click to send an all-sounds-off command that silences any sound processed through Jup-8000 V. This is a momentary command, so sound will resume if your DAW is still playing.

In the event of serious runaway audio (say, from an unrelated delay effect that has gone into a feedback loop), stop your DAW playback and disable the plug-in causing the problem.

8.2.6. Macro controls



These controls can affect multiple parameters by turning just one of them, and mirror the actions of the knobs found in the Preset Browser. What they do can be assigned in the Modulators [p.89] Advanced view. Factory Presets are pre-programmed with useful Macros.

8.2.7. Resize handle



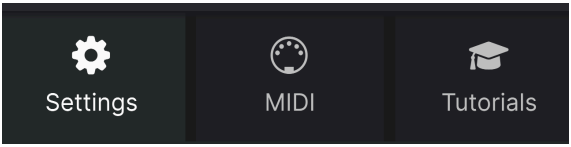
Grab and drag the diagonal lines to the right of the Macro controls to resize the Jup-8000 V window. When you let go, the window will snap to the nearest size available in the Resize Window [p.123] menu.

8.2.8. Max View button



Sometimes, you may see the above button with two diagonal arrows appear over the resize handle. This happens when, for some reason, the window size is not displaying all of the controls of Jup-8000 V. Click it to restore a full view of the open controls.

8.3. The Side Panel



The Side Panel's tab selections

The gear-shaped icon at the top right of the Upper Toolbar opens the **Side Panel**, which in turn contains three tabs covering important subsystems that you won't have to access quickly when you're playing or editing sounds in Jup-8000 V:

• **Settings**: Global settings such as MIDI receive channels, splits, octave shift, and Poly mode

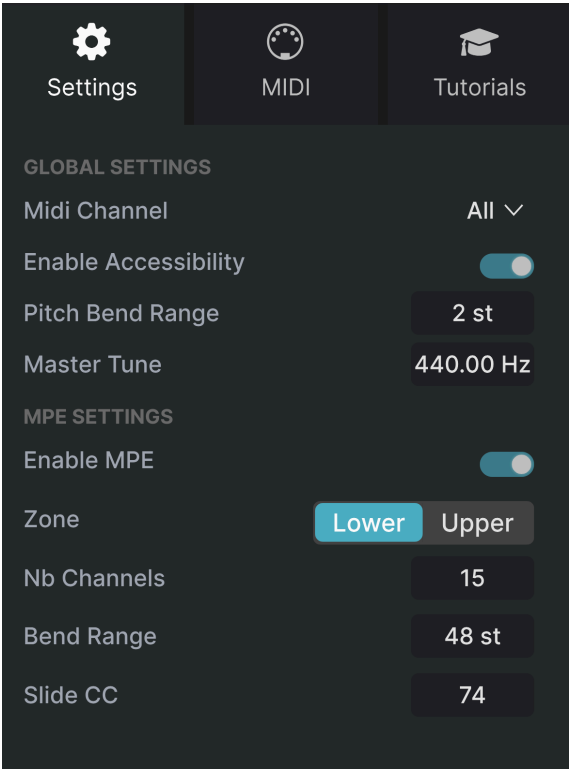
• **MIDI**: MIDI Learn functions for use with MIDI CC messages sent from a controller or DAW

• **Tutorials**: In-app interactive tutorials, also accessible from the main menu

Let's look at them from left to right.

8.3.1. Settings Tab

This tab controls how Jup-8OOO V responds to incoming MIDI as well as other master settings.



The Side Panel's Settings tab

8.3.1.1. MIDI Channel

Selects the MIDI channel(s) on which Jup-8OOO V will receive MIDI input. You can select a particular channel, or choose "All" for Omni mode.

8.3.1.2. Enable Accessibility

This grants Jup-8OOO V access to your computer's system-level accessibility tools for differently abled persons.

8.3.1.3. Pitch Bend Range

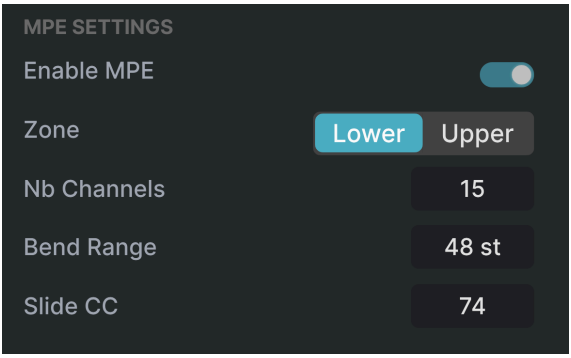
This menu selects the range of Jup-8OOO V's pitch-bend wheel, from 1 to 12 semitones. The bend amount is the same in both the up and down directions.

8.3.1.4. Master Tune

Sets the overall tuning of Jup-8OOO V, with a default of the note middle *A* at 44OHz. The range is from 4OO-48OHz.

8.3.1.5. MPE settings

Jup-8OOO V supports MIDI Polyphonic Expression (MPE). This exciting application of the MIDI protocol allows a multi-dimensional controller to send polyphonic expressive controls (like pitch-bend, aftertouch, or your finger location on the Y axis of a key) on a per-note basis. This is done by using separate MIDI channels to carry each note's expressive data separately. This data is then interpreted by synthesizers like Jup-8OOO V, allowing you to play with polyphonic aftertouch, slide (Y-axis position on a key), and more, depending on what your controller hardware supports.

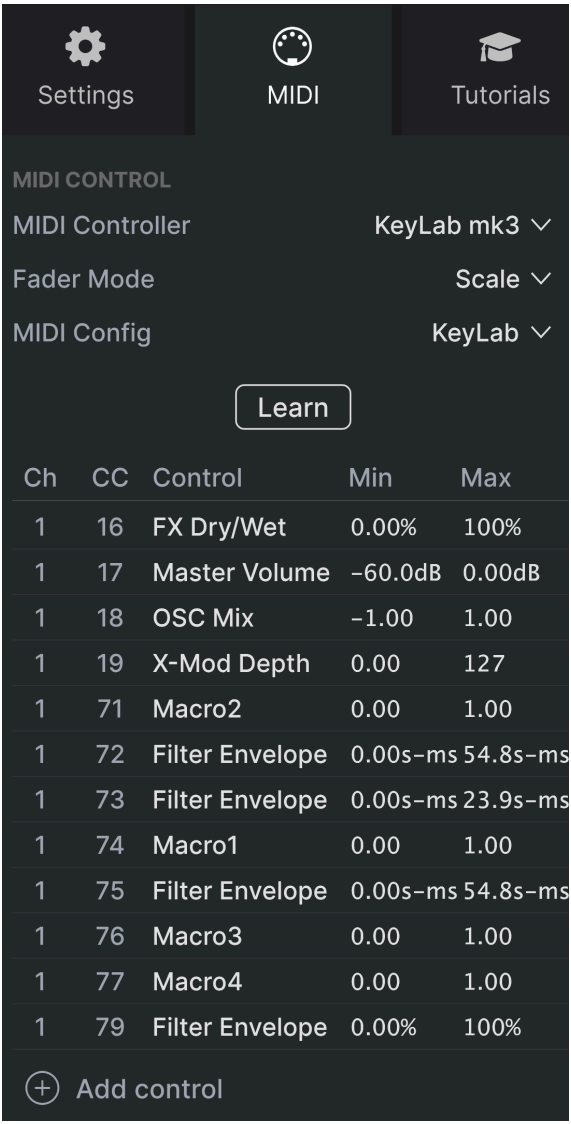


The MPE controls are:

- **Enable MPE:** Turns MIDI Polyphonic Expression mode on and off
- **Zone:** If an MPE-capable controller can be split into lower and upper zones, this selects which zone sends the MPE messages
- **No. Channels:** Sets the maximum number of MIDI channels (and therefore simultaneous notes) on which MPE messages may be sent
- **Bend Range:** Sets the maximum pitch bend range of each note, up to 96 semitones (48 by default). This should be set to the same value as on your hardware MPE controller
- **Slide CC:** Determines the MIDI continuous controller message that *slide* (moving your finger toward or away from you along the Y axis of a key) sends. The default is CC 74 (filter cutoff)

> ♪ Examples of MPE controllers include the Haken Continuum, ROLI Seaboard series, and Keith McMillen Instruments KBoard Pro.

8.3.2. MIDI Tab

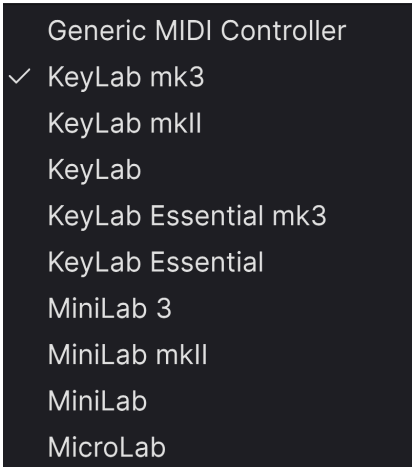


The Side Panel's MIDI tab

This is where Jup-8000 V may be placed in MIDI Learn mode. In this mode, all MIDI-assignable parameters on the Hardware Panel are highlighted and you can map physical controls on your MIDI controller to them. A typical example might be to map a real expression pedal to the Master Volume control, or a physical knob on the MIDI controller to the Frequency knob of the Filter section.

Notice that some of the names in the above image look redundant, but they're actually different parameters. Hover on a name in the list and it will scroll horizontally.

8.3.2.1. MIDI Controller menu



The MIDI Controller menu

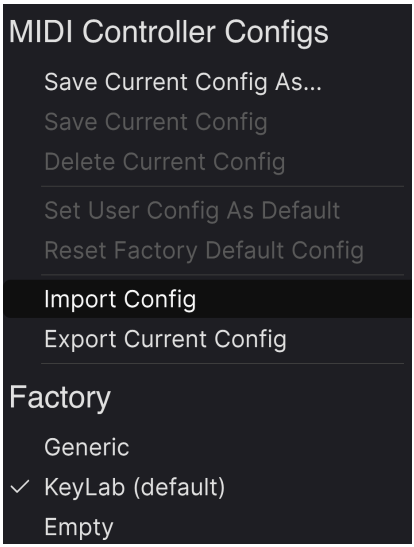
At the top right of the MIDI tab is the **MIDI Controller** drop-down menu, where you can select templates for many Arturia MIDI controllers. These map physical controls to many "most wanted" parameters in Jup-8OOO V for a plug-and-play experience. A Generic template is also provided for third-party MIDI controllers.

8.3.2.2. Fader Mode

This menu sets how Jup-8OOO V responds to fader movements received from your MIDI controller. (We did not include knobs, as most controllers have endless rotary encoders these days.)

- *None* Jup-8OOO V leaves it up to your hardware settings
- *Hook*: Jup-8OOO V begins receiving the CC once the fader passes the stored value
- *Scale*: Jup-8OOO V receives the CC as soon as you move the fader

8.3.2.3. MIDI Config menu



The MIDI Config menu

The **MIDI Config** drop-down lets you manage different sets of MIDI maps for controlling Jup-8000 V from MIDI hardware. You can Save/Save As the current MIDI assignment setup, Delete it, Import a configuration file, or Export the currently active one.

This is a quick way to set up different hardware MIDI keyboards or controllers with Jup-8000 V, without having to build all the assignments from scratch each time you swap hardware.

For example, if you have multiple hardware controllers (small live keyboard, large studio keyboard, pad controller, etc.), you can create a profile for each of them, save them, and then quickly load them here. This saves you from having to redo the MIDI mapping assignments from scratch each time you swap hardware.

The Factory area at the bottom has three useful options:

- *Generic*: Loads a "one size fits all" set of control assignments
- *Default*: The middle option tracks the controller selected in the MIDI Controller menu
- *Empty*: Removes the assignments of all controls

8.3.2.4. Assigning and unassigning controls



When MIDI Learn is active, available parameters are purple and already-assigned parameters are red.

Click the **Learn** button in the MIDI tab to put Jup-8000 V into Learn mode. Controls available for assignment are purple. Controls that are already assigned are red, but can be reassigned if desired. The screenshot above shows the assigned and unassigned controls for Jup-8000 V's Default configuration.

Click any purple control and its name will appear in the list. Now, move a control or operate a switch on your MIDI controller. The corresponding control onscreen will turn red and the assigned MIDI CC number will appear in the list to the left of the parameter name.

To unassign a control onscreen, control-click or right-click it. Alternative methods of assignment are available in the MIDI Parameter Menu [p.137] described below.

> Remember to look beyond the main panel: the Multi-Arp, Effects, and Modulators in the Advanced view all contain many parameters eligible for MIDI-learning!

8.3.2.5. MIDI channel, CC, and min and max values

The first two columns in every MIDI assignment list the MIDI Channel (**Ch**) and MIDI Continuous Control Change number (**CC**) for the assignment. Up to 16 Channels are available on any MIDI stream, and the 127 possible MIDI Control Change numbers, while freely assignable, follow certain conventions on most instruments. For example, Modulation Wheel is almost always MIDI CC 1, Master Volume is CC 7, and Sustain Pedal is CC 64.

You can click on any number in the channel column to change the value in a pop-up menu. You can click on a number in the CC column to type in a new CC directly.

The **Min** and **Max** value columns for each parameter in the list let you scale the amount by which a parameter in Jup-8000 V changes in response to a physical control movement. For example, you may wish to limit the range of a filter sweep, even though you're probably going to turn the knob all the way during a live performance.

Drag up or down on a value to change it. Setting the maximum lower than the minimum reverses the polarity of the physical controller, i.e. turning it *up* will turn the assigned parameter *down*.

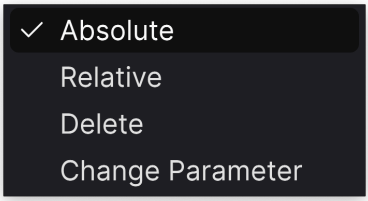
Switches that only have two positions (On/Off, etc.) would normally be assigned to buttons on your controller, but it's possible to toggle those with a fader or another control if you like.

> ♪ Don't forget that many settings in the Advanced views (Multi-Arp, Effects, and Modulators), not just settings on the main panel, may be MIDI Learned.

You can also add a destination parameter to the list manually by clicking the *Add control* (+ sign) at the bottom of the list. This will bring up a *huge* menu of literally every MIDI-addressable parameter in Jup-8000 V.

8.3.2.6. MIDI Parameter Menu

Control-clicking or right-clicking on any item in the list - only the list, not the main interface - of assigned parameters brings up a convenient menu with the following options, which can be different for each parameter.



Right-clicking a parameter gives you these options

- *Absolute*: The assigned parameter in Jup-8000 V tracks the literal value your physical controller is sending out.
- *Relative*: The assigned parameter in Jup-8000 V will go up or down from its current value in response to physical controller movements. This is often useful when using endless 360-degree encoders that don't have physical motion limits.
- *Delete*: Removes the assignment and turns the corresponding onscreen control purple again.
- *Change Parameter*: Brings up a large sub-menu of every assignable parameter in Jup-8000 V. This lets you change the assignment of the current CC/physical control manually, and is useful when you know exactly the destination you're looking for.

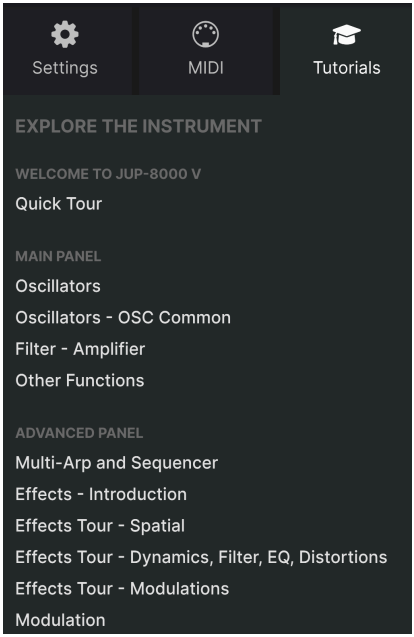
8.3.2.7. Reserved MIDI CC numbers

Certain MIDI Continuous Controller (CC) numbers are reserved and cannot be reassigned to other controls. These are:

- Pitch Bend
- Aftertouch (Channel Pressure)
- All Notes Off (CC #123)

All other MIDI CC numbers may be freely assigned to control any parameter in Jup-8000 V.

8.3.3. Tutorials



In this tab, which can also be opened by selecting **Tutorials** from the Jup-8000 V main menu [p.121], you can click on titles for the individual chapters, which in turn will take you through different areas of Jup-8000 V in steps. The parts of the panel to focus on are highlighted as you go.

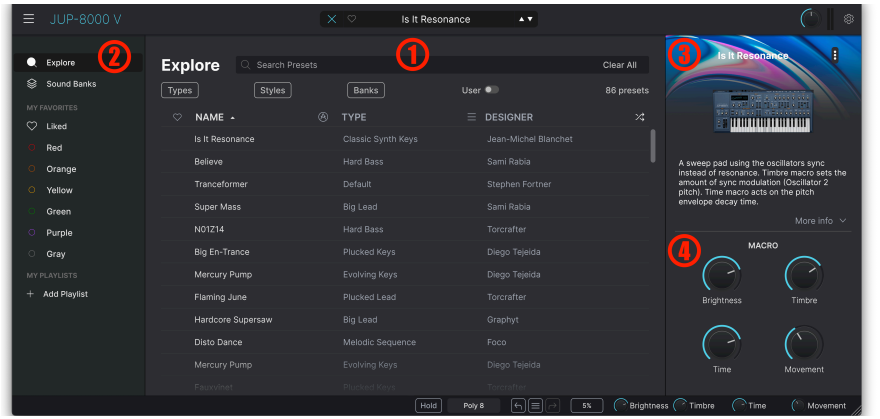
! If you're editing a Preset, make sure to save it before opening the Tutorials, because doing so will load a new Preset and overwrite your changes. The Tutorials also take over the Side Panel space when in use.

9. THE PRESET BROWSER

The Preset Browser is how you search, load, and manage sounds in Jup-8000 V. It can display different views but they all access the same Presets and subgroups of Presets.

To access the browser, click the browser button (the icon looks like books on a library shelf). To close the browser, click the **X** that appears in its place.

The browser has four main areas:

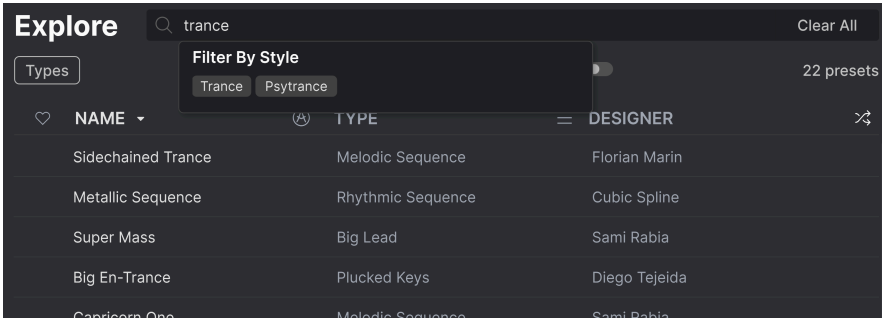


Number	Area	Description
1.	Search and Results [p.140]	Search Presets with text strings, and by tags for Type and Style.
2.	Sidebar [p.145]	Manage Banks, Favorites, and Playlists.
3.	Preset Info [p.147]	Summary of Bank and Tags, Designer name, and description info for current Preset.
4.	Macro Knobs [p.151]	Large size duplicates of Macro knobs in Lower Toolbar and the Macros tab.

9.1. Search and Results

Click on the Search field at the top and enter any search term. The browser will filter your search in two ways: First, by matching letters in the Preset name. Then, if your search term is close to that of a Type or Style [p.141] it will include results fitting those tags as well.

The Results list beneath shows all Presets that fit your search. Click the X icon at right to clear your search terms.



If search results include a tag pop-up, it means your search term corresponds to one or more tags

9.1.1. "Filter by" pop-up

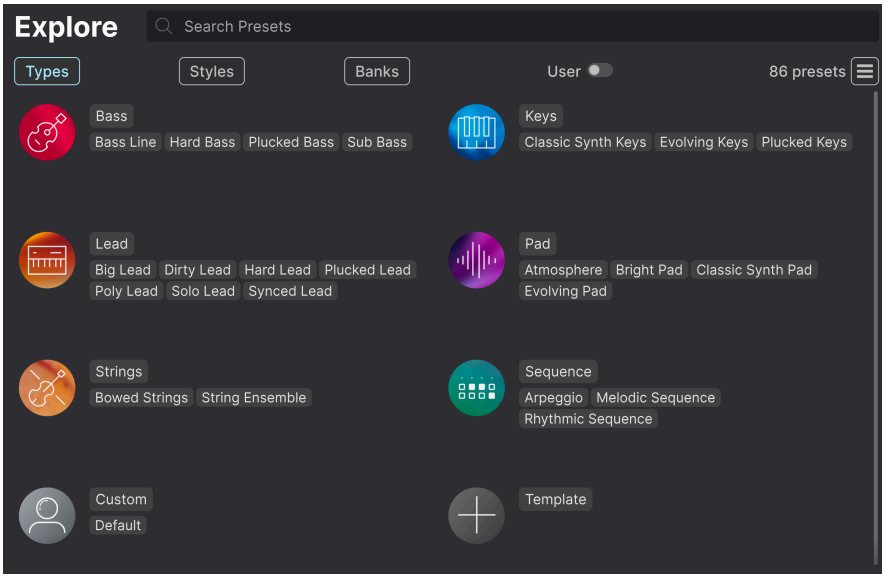
In the above image, note the pop-up beneath the search bar. This appears when your search text ("analog" in this example) corresponds to Presets' tags as well as to letters in the preset name. One or more tag groups may appear. Click on any tag to limit your search results to Presets that have that tag.

9.2. Using tags as a filter

You can narrow (and sometimes expand) your search using different tags. There are two kinds of tags: *Types* and *Styles*. You can filter by one, the other, or both. Our extensive range of MIDI controller keyboards also allows you to browse sounds directly from the MIDI keyboard.

9.2.1. Types

Types are categories of instruments. In Jup-8000 V, Types include Bass, Keys, Lead, Pad, Strings, Organ, and more – most with subtypes that further define the kind of instrument or sound. The final Type is a Template Type for designing your own Presets. With a clear search bar, click the **Types** button to bring up this list.



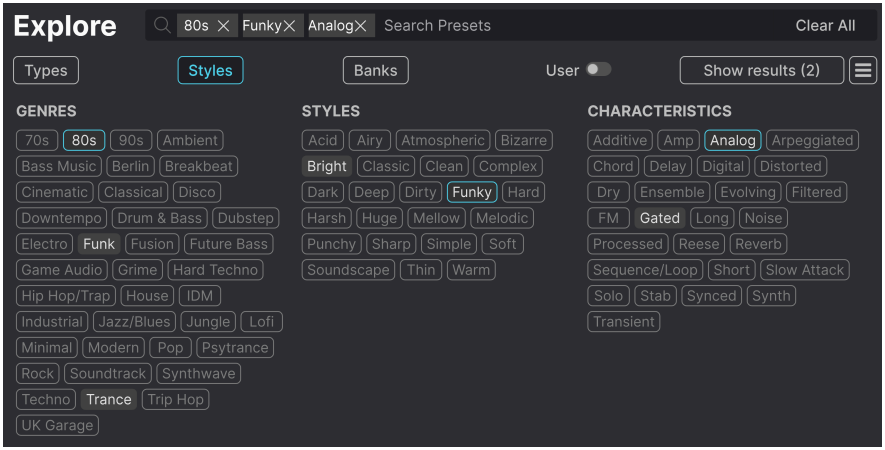
Click any one of them, and the results will show only Presets that match that tag. You can also select multiple Types using Cmd-click (macOS) or Ctrl-click (Windows). For example, if you aren't sure whether the Leads Preset you're looking for was tagged with the subtype "Poly Lead" or "Solo Lead", select both to broaden the search.

Results columns can be sorted and reverse-ordered by clicking the arrow buttons to the right of their titles (Name, Type, Designer).

9.2.2. Styles

Styles refine your search according to further musical attributes. Accessed by the **Styles** button, this area has three further subdivisions:

- *Genres*: Identifiable musical genres such as 80s, Cinematic, Fusion, Synthwave, etc.
- *Styles*: General "vibe" such as Atmospheric, Complex, Dark, Punchy, etc.
- *Characteristics*: Even more detailed sonic attributes such as Analog, Evolving, Layered, Transient, etc.



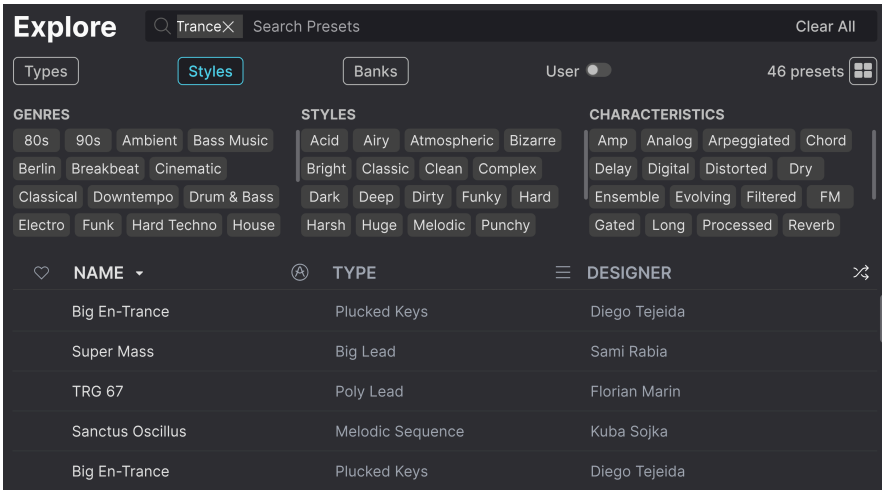
Click on any tag to select it. Click again (or right-click) on any selected tag to de-select it. Notice that when you select a tag, several other tags become unavailable. This is because the browser is narrowing your search by a process of elimination. De-select any tag to remove that criterion and widen the search without having to start all over again.

9.2.3. Banks

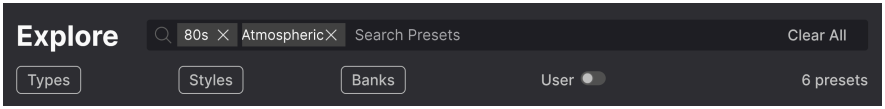
Next to the **Types** and **Styles** buttons is the **Banks** button, which lets you perform your search (using all the methods above) within the factory bank or user banks, as well as anything you've purchased from the Arturia Sound Store.

9.3. Search results window

Click the **Show Results** button if you cannot already see your list of results. Click the sort arrow to reverse the alphabetical order of any column. You can also click the "hamburger" (three lines) icon next to **Show Results**. The icon will change to four panes, and you will be able to see the Presets that fit your selected tags below groupings of Genre, Style, and Characteristic tags, like so:



9.3.1. Sorting the Preset order



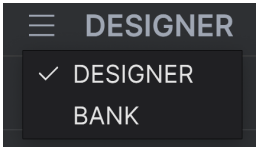
Click the **NAME** header in first column of the Results list to sort Presets in ascending or descending alphabetical order.

Click the **TYPE** header in the second column to do the same thing by Type.

Click the **Arturia logo** to the left of **TYPE** to bring factory-featured Presets to the top of the list. These will appear just under any Presets you have liked [p.144].

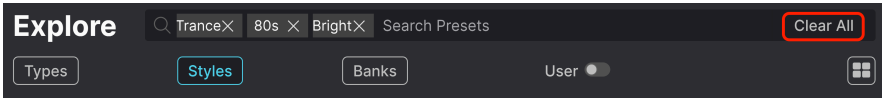
Click the **User** toggle switch to restrict your search to Presets in user banks.

The third column has two header options: **DESIGNER** and **BANK**. Click the icon with three lines to choose between the two. Then click either header name as with the other two columns to switch the alphabetical order.



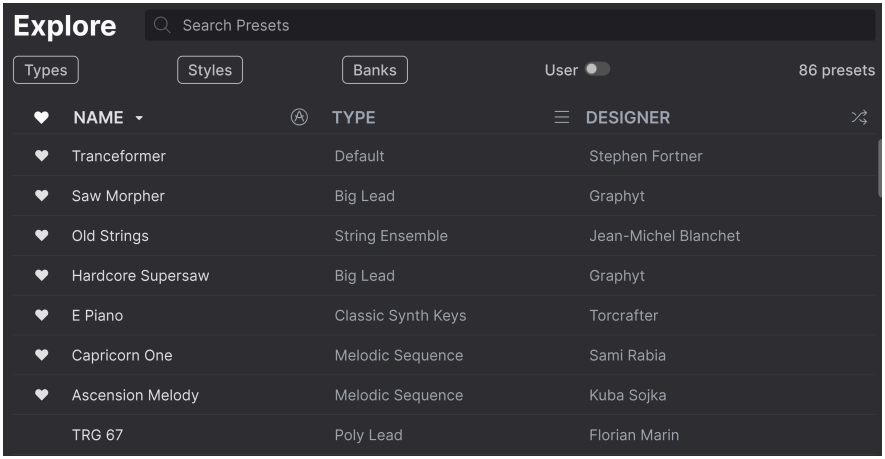
9.3.2. Clearing tags

Just above the Types, Styles, and Banks buttons, you will see labels for all the active tags in a search. Click the X next to any one to remove it (and thus broaden the results). Click **CLEAR ALL** to remove all tags.



9.3.3. Liking Presets

As you explore and create Presets you can mark them as Liked by clicking the **heart** that appears to the left when you hover the mouse over a preset name. Later, click on the heart icon at the top to put all of your favorites at the top of the Results list.



9.3.3.1. Shuffle Presets



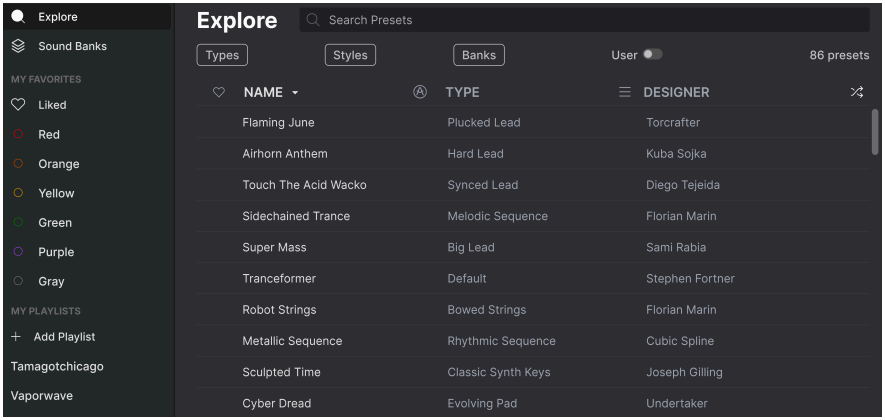
Clicking the "crossed arrows" button randomly reorders the Presets. This can be useful for finding something you like when your search results are a long list that takes time to scroll through – it might bring a killer Preset to the top. Shuffle mode is a toggle, so clicking it again will restore your search results to however they were previously sorted (by name, type, etc.).

Use as many of the sorting and filtering features as you need and you will find the exact sound you want every time.

9.4. Sidebar

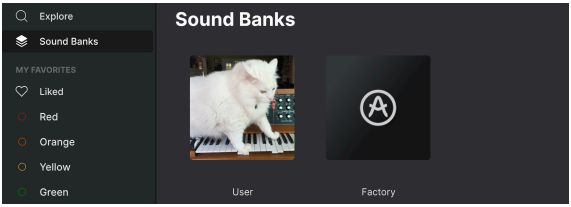
The leftmost section of the Preset Browser determines what is displayed in the Search and Results [p.140] section.

The topmost option is **Explore**:

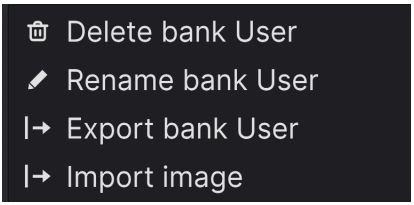


The **Explore** section is the default, letting you search the current bank of Presets loaded into Jup-8000 V as we did in the previous section.

9.4.1. Sound Banks



Clicking **Sound Banks** brings up a window with all of the currently available Sound Banks. Right click on the image or name of a User bank (anything but the Factory bank) to bring up this menu:



You can import a custom bank icon image in PNG format

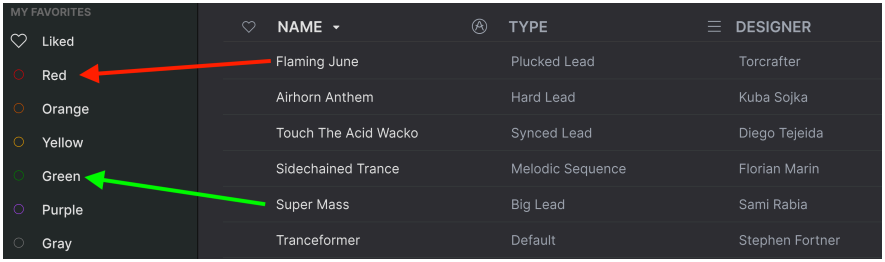
From here, you can delete, rename, or export the bank. You can also import custom user images in PNG format, as shown above.

9.4.2. My Favorites

The middle part of the Sidebar has a menu called **My Favorites**, which allows you to color-code certain groups of Presets for easy access. It also includes the **Liked** group, so you can quickly find Presets you've marked with the heart icon.

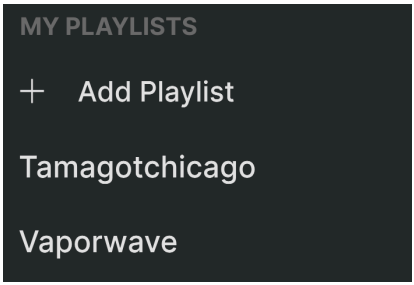
To decide which colors you'd like to display, hover over **My Favorites** and click **Edit**. Then use the toggle switches to select which colors you'd like to see or hide, and then click **Done**.

Please note that you can also rename these favorites as desired. Just right-click on the color name in the sidebar and enter a new name.



To add Presets to a particular set of Favorites, simply drag-and-drop them onto the appropriate color, or right-click the Preset name and select the color. Then click on the color itself to display your grouping.

9.4.3. My Playlists

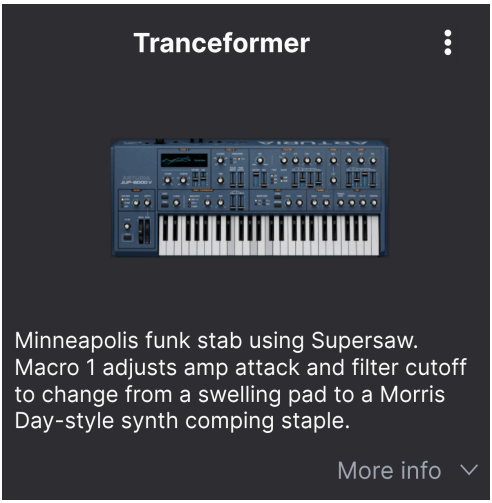


The bottom part of the sidebar displays any Playlists you have created or imported. Playlists are a very powerful management tool for set lists for gigs. Learn more about them in the Playlists section [p.152] below.

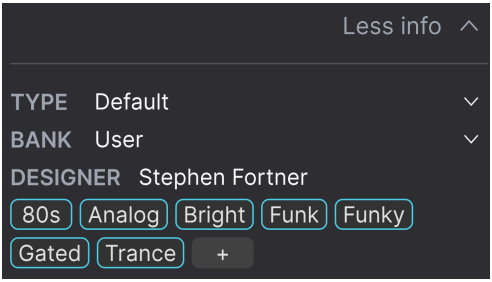
> If you don't see anything here, it is because you haven't created any Playlists yet. Head to the Playlists [p.152] section at the end of this chapter to find out how.

9.5. Preset Info section

The right side of the browser window gives a brief description of each Preset.



For user Presets (not factory Presets) you can edit this description by simply clicking in it and typing. Click "More info" at the bottom right of this pane to open up an area you can scroll down to:



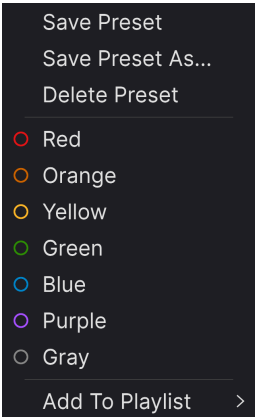
Again for User Presets only, you can change the Type and Bank via pull-down menus, enter a Designer name, and click the + sign to add or delete Style tags. When you click this icon, the results area is occupied by an edit list in which you can select and deselect Styles, Genres, and Characteristics:



Notice that each group has its own + icon at the end. Clicking this lets you create your own Styles, Genres, or Characteristics. Click the **X** at upper right when finished editing.

Type and Style changes you make here are reflected in searches. For example, if you remove the "Complex" Style tag and then save that Preset, it will not show up in future searches for Complex sounds. Again, all of this is possible only with user Presets.

Clicking on the three-dots icon at the top right pops up a management menu for the Preset.

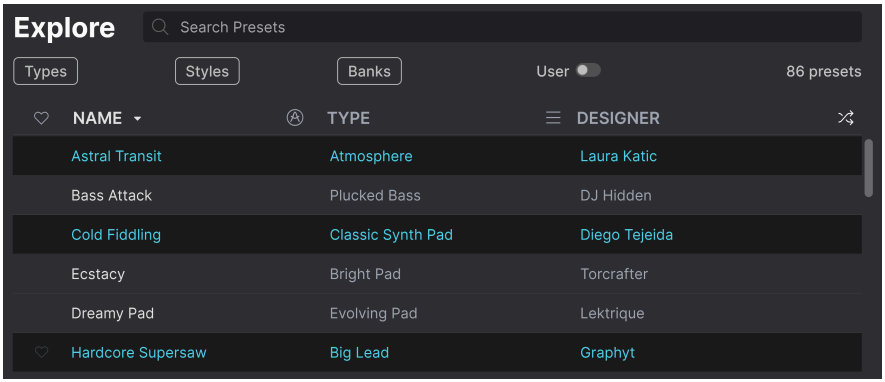


Options include *Save Preset*, *Save Preset As*, *Delete Preset*, and *Add to Playlist*, complete with an option to create a new Playlist [p.152]. (You cannot overwrite or delete factory Presets, so the Save and Delete options appear for user Presets only.)

The dots with color icons allow you to add the Preset to a particular group of color-coded Favorites, as described above [p.146].

9.5.1. Editing info for multiple presets

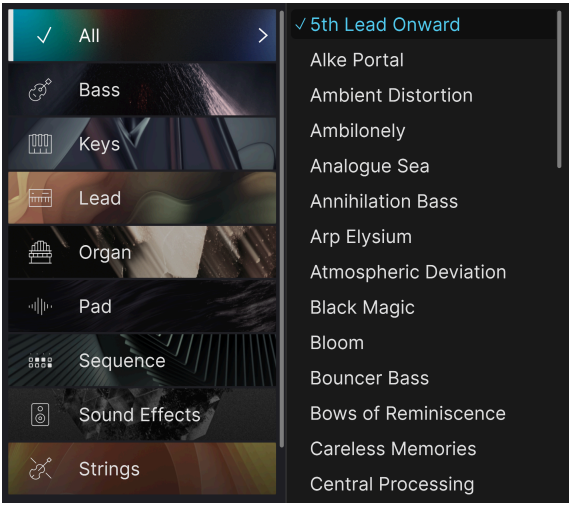
If you would like to move several Presets to a different bank while preparing for a performance, or enter a single comment for several Presets at the same time, it's easy to do. Simply hold command (macOS) or ctrl (Windows) and click the names of the Presets you want to change in the Results list. Then enter the comments, change the Bank or Type, etc., and save the Preset.



♪ If you want to alter the information for a Factory Preset you must first use the *Save As* command to re-save it as a User Preset.

9.6. Preset selection: other methods

Click on the Preset name in the center of the Upper Toolbar to bring up a drop-down menu. The first option in the left column of this menu is *All*, and it brings up a submenu of literally every Preset in the current bank, in alphabetical order.



Below this are categories that correspond to Types. Each of these brings up a submenu of all Presets of the selected Type.

If you have an active search by Type and/or Style, the up/down arrows to the right of the Preset name will step through only the results that conform to your search.

However, *All Presets* in the drop-down menu always ignores those criteria. Likewise for the Type choices below the line – they always include all Presets within that Type.

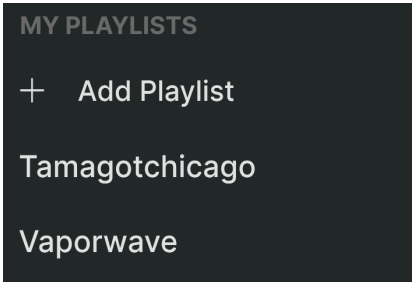
9.7. Macro knobs

These are simply larger duplicates of the Macro knobs in the Lower Toolbar and on the Macros tab. Macros let you control multiple other settings in Jup-8000 V with a single knob twist, and Arturia virtual instruments typically provide four of them.



You can assign Macros to parameters in the Modulators [p.89] section of the Advanced view. We describe how to do this, and how to rename the knobs themselves, in the Macros [p.117] portion of Chapter 6.

9.8. Playlists

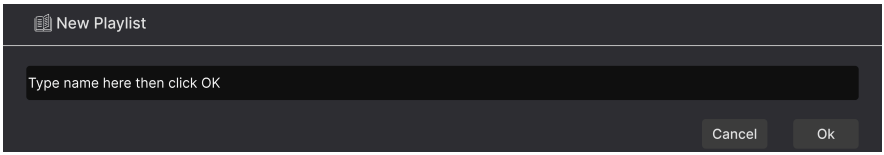


Playlists offer a powerful way to collect Presets into different groups for different purposes, such as a set list for a particular performance or a batch of Presets related to a particular studio project. Within a Playlist, Presets can be further grouped into Songs, a handy addition to a set list.

The subheading *My Playlists* appears under **My Favorites** towards the bottom of the Sidebar. When you first start using Jup-8000 V, you'll have no Playlists yet – but it's very easy to create one!

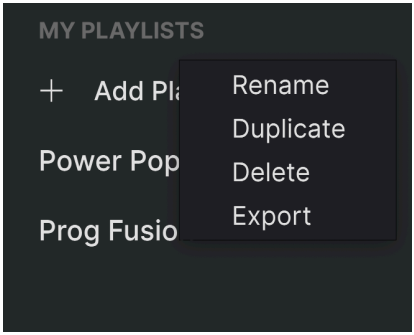
9.8.1. Create your first Playlist

To get started, click **Add Playlist**. The following pop-up will appear, prompting you to name your Playlist.



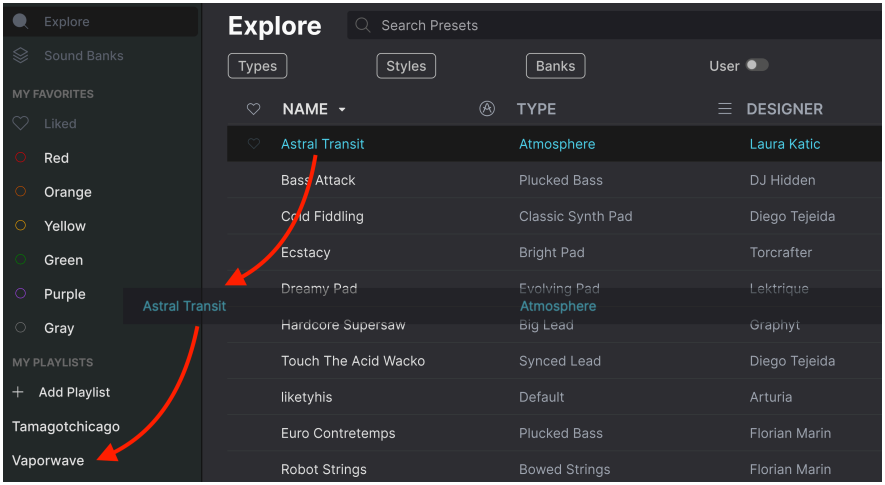
Once you've entered a name, that Playlist will now appear in the **My Playlists** section of the sidebar. You can create as many Playlists as you like.

Right-clicking on a Playlist name will pop up a set of options - you can *Rename*, *Duplicate*, *Delete*, or *Export* the Playlist to your computer, as a file with the extension *.aplst*.



9.8.2. Add a Preset

You can use all of the options in the Explore view to locate Presets for your Playlist. When you find a desired Preset, click-drag it onto the Playlist name.

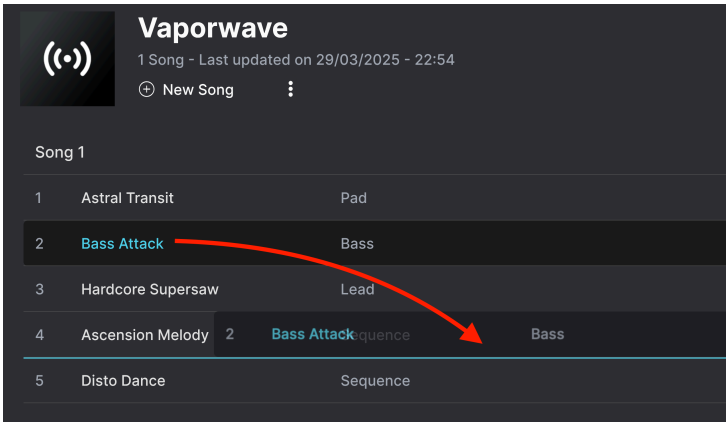


Dragging a preset to a Playlist

To view the contents of a Playlist, click on the Playlist name. By default, Presets dragged into a new Playlist will appear under "New Song" inside the Playlist. More about Songs [p.155] is below.

9.8.3. Re-order the Presets

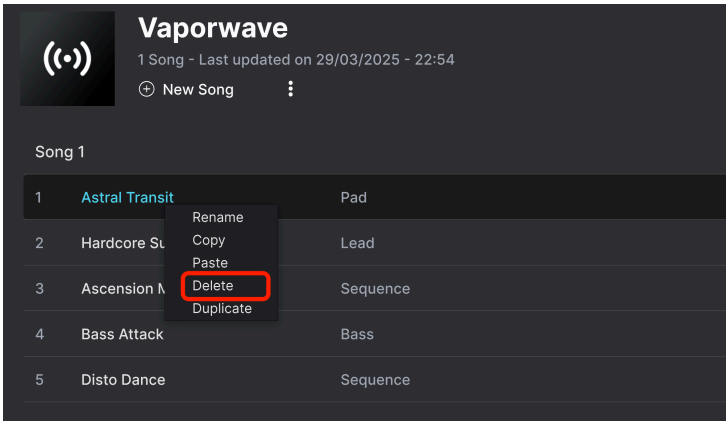
Presets may be reorganized within a Playlist. For example, to move a Preset from slot 1 to slot 4, drag and drop the Preset to the desired location.



This will move other Presets up in the list to accommodate the new location of the Preset you just moved. A light blue line will briefly appear at the "insert point."

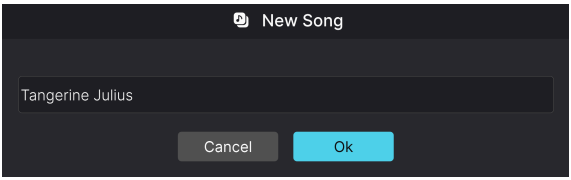
9.8.4. Remove a Preset

To delete a Preset from a playlist, select the Playlist, then right-click on the Preset's name in the Results Pane to bring up a pop-up menu. This will only delete the Preset *from the Playlist*, not delete the Preset from the Jup-8000 V browser!



This menu also includes **Rename**, **Copy**, **Paste**, and **Duplicate** options. More management options are described below.

9.8.5. Song and Playlist management

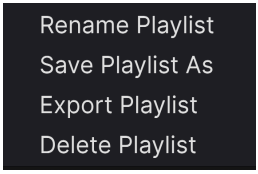


The new song naming dialogue in Playlists

Any Playlist can be further divided into *Songs*, an ideal tool for managing set lists for a live show. The **New Song** button prompts you to name a song, then places it at the bottom of the Playlist. You can then click and drag it to position it in the Playlist and add Presets to it in the desired order. You can have multiple songs in each Playlist, and when dragging a song by its title, it brings all its Playlists with it, in order. Right-click on the song name for Rename, Paste, and Delete options.

Song names don't have numbers by default (Preset names in a Playlist do), but of course you can begin a song name with a number.

To access other Playlist management options, click on the three-dots icon next to the **New Song** button. This brings up a pull-down menu:



- **Rename Playlist**: Renames the current Playlist without making a copy.
- **Save Playlist As**: Creates a duplicate of the playlist with "Copy" appended to the name. You can change the name before saving.
- **Export Playlist**: Exports your Playlist to a location on your computer, with the filename extension "aplst."
- **Delete Playlist**: Deletes the current Playlist but does *not* delete any of the Presets in it.

9.8.6. MIDI control of Playlists

Since Playlists are ideal for live performance, you do not need to mouse around on a screen to use them. Instead, you can select Playlists, Songs, and Presets by sending values on the following MIDI continuous controllers:

- *CC OO:* Selects a Playlist
- *CC 32:* Selects a Song within the current Playlist
- *MIDI Program Change:* Selects Presets within the current Song

Ideally, you could program buttons to send value-up and value-down increments on each of these CCs if your MIDI controller has this capability.

That's all there is to the Preset Browser! We hope you will enjoy many hours exploring the factory Presets and creating your own.

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