USER MANUAL

_OP-XA V

ARTURIA

_The sound explorers

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Product version: 1.4.0

Revision date: 14 November 2022

Thank you for purchasing Arturia OP-Xa V!

This manual covers the features and operation of the OP-Xa V.

Be sure to register your software as soon as possible! When you purchased OP-Xa V you were sent a serial number and an unlock code by e-mail and/or the Arturia Software Center app. 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 or features without notice or obligation.

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.

Introduction

Congratulations on Your Purchase of Arturia OP-Xa V

We'd like to thank you for purchasing OP-Xa V, a virtual instrument recreation of the classic Oberheim® synth from the 1980s.

We've painstakingly studied and modelled every nuance of the original hardware to provide you with the classic sound and experience of a legendary synthesizer. But we didn't stop there – we've expanded on the original design with new features that make this classic synthesizer a powerhouse instrument adapted to a modern workflow.

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 - either use the original features on the main panel for a classic experience, or dive deep into the advanced features to create sounds not possible with the original hardware.

We hope using it will bring excitement and joy to your music making!

The Arturia Team

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1. WELCOME

1.1. History of Oberheim® Electronics

Founded in 1969 by Tom Oberheim, Oberheim® Electronics was a prominent synthesizer and drum machine manufacturer from the 197Os and 198Os.

One of the first synthesizers released under the brand was the monophonic Synthesizer Expansion Module (SEM) in 1974. This was quickly followed by the release of the Four Voice and Two Voice synthesizers, which utilized multiple SEMs to create polyphony, and became the first widely available and affordable synthesizers to use the concept of voice allocation to distribute played notes across a limited number of hardware voices.

Throughout the late 197Os, Oberheim® continued to refine the design and features of its synthesizer platform, abandoning the relatively bulky SEMs in favor of compact printed circuit boards called voice cards. During the late 197Os and early 198Os Oberheim® released the OB-1 and OB-X, followed by the OB-Xa and OB-8. Oberheim® also released several drum machines during this period of time, including the DMX and DX, which became widely-used by hip-hop and dancehall music artists.

In 1984, the Oberheim® company ran into financial trouble and declared bankruptcy. The company was acquired by a group and continued to operate under the name Oberheim® ECC. A couple of years following the acquisition, Tom Oberheim left the company to pursue a new venture. Throughout the mid-198Os the company continued to release products like the popular Xpander and Matrix-12 synthesizers. In 1988 the company again declared bakruptcy and was ultimately purchased by Gibson. Under Gibson management the company went through a difficult period of restructuring, losing some of its top talent and scrambling to finish products in the pipeline. During the Gibson period, the company produced the OB-Mx in collaboration with Don Buchla and later re-released several products like the Matrix 1000 and the Strummer. Gibson then stopped development and licensed the Oberheim® name to an Italian organ company, Viscount, who released digital synthesizers during the 199Os, such as the OB-12.

From 1998 to 2019 the Oberheim® name and brand was largely abandoned. In 2009 Tom Oberheim resurrected the SEM line and began producing it under his own brand, TomOberheim.com. In 2015 he announced the OB-6, which was created in collaboration and partnership with Dave Smith Instruments. In 2019, as a "gesture of goodwill to the musical instrument industry", Gibson officially returned the brand and intellectual property to Tom, paving the way for a new era of Oberheim® instruments to come.

1.2. About the OB-Xa

Oberheim®'s flagship synthesizer, the OB-Xa, was released in 1980, a year after the original OB-X. Both polyphonic synths sport a 2-oscillator design, offered in 4, 6, or 8-voice configurations. A significant difference from the original OB-X design was the abandonment of discrete circuits for oscillators and filters in favor of Curtis integrated circuits. This reduced manufacturing costs and simplified the internal design so that the OB-Xa could be more easily serviced and was generally more stable and reliable than its predecessor.

While the fundamental architecture of the two synths remained largely the same, the transition to Curtis circuits offered a few notable differences. The discrete analog sound of the OB-X has sometimes been described as more raw and wild, while the OB-Xa more controlled and refined. The Curtis filters on the OB-Xa are also switchable between 2-pole (-12dB/oct) or 4-pole (-24dB/oct), while the original OB-X only offered 2-pole filtering. This allowed for more aggressive options when sculpting sound frequencies on the OB-Xa.

Another improvement was the ability to split the keyboard with different programs for each half, essentially turning the OB-Xa into two 4-voice polysynths and further expanding its sonic potential. Other notable changes include a programmable Chord feature, portamento, various modulation enhancements, and a program memory that could be expanded to store up to 120 programs, a significant improvement over the original's 32 programs.

One major difference in the oscillator design was the removal of oscillator cross-modulation that was available on the original OB-X. This allowed one oscillator to modulate the frequency of the other, a technique referred to as FM synthesis. On the OB-Xa, this feature was replaced by the ability to modulate the pulse width of the second oscillator with the filter envelope. But don't worry - our recreation includes the best of both worlds!

1.3. Arturia's Secret Ingredient: TAE®

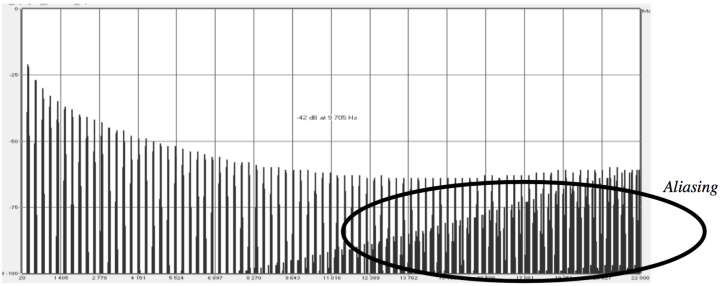
TAE® (True Analog Emulation) is Arturia's technology for emulating the analog circuits used in vintage synthesizers. TAE®'s software algorithms result in spot-on emulation of analog hardware. This is why OP-Xa V offers an unparalleled quality of sound, as do all of Arturia's virtual synthesizers.

TAE® combines major advances in the several domain of synthesis:

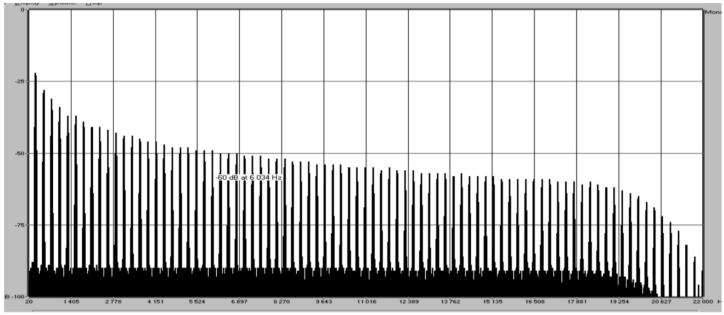
1.3.1. Aliasing-Free Oscillators

Standard digital synthesizers produce aliasing in high frequencies, especially when using Pulse Width Modulation (PWM) or Frequency Modulation (FM).

TAE® enables the creation of oscillators that are completely free of aliasing in all contexts and behaviors (PWM, FM, and more) and does so without any CPU cost.



Linear frequency spectrum of a current well-known software synthesizer

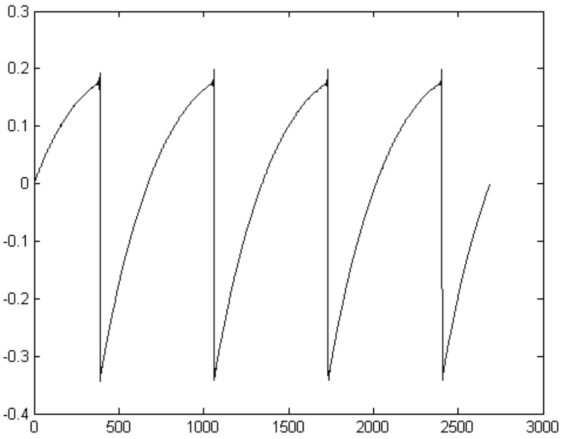


Linear frequency spectrum of an oscillator modeled with TAE®

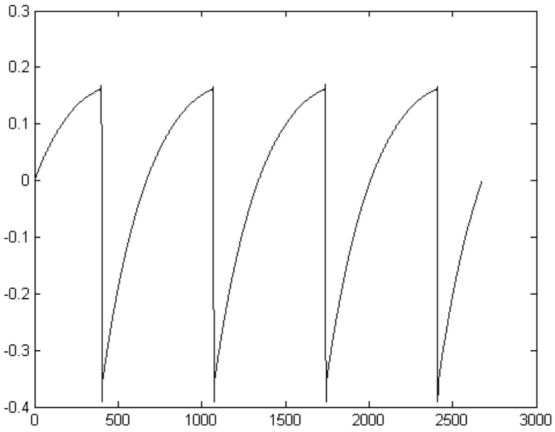
1.3.2. A Better Reproduction of Analog Oscillator Waveforms

The waveforms produced by the oscillators in analog synthesizers are affected by the presence of a capacitor in the circuits. The discharge of such capacitors results in a slight 'bend' in the original waveform (most notably for sawtooth, triangular and square waveforms). TAE® reproduces the result of this capacitor discharge in software.

Directly Below is a plot of a waveform from one of the hardware instruments that Arturia has emulated, followed by one generated by Arturia's TAE®. As you can see, the waveforms are quite similar and both are equally deformed by the low-pass and high-pass filtering.



Temporal representation of the sawtooth waveform of a hardware synthesizer



Temporal representation of a sawtooth waveform reproduced by TAE®

1.3.3. Additional factors

Analog oscillators in vintage hardware were often unstable in their operation. Their waveforms differed slightly from one period to another and the starting point for each period (in Trigger mode) could vary due to changes in temperature and other environmental conditions. These stability "problems" were, in fact, largely responsible for the beloved "warm" sound of many synthesizers! TAE® accurately reproduces the inherent instability of vintage oscillators, resulting in a fatter and "bigger" sound that captures the magic of vintage synths.

1.4. Arturia's Version of OB-Xa

The OB-Xa is one of Oberheim®'s most sought-after synthesizers. They are rare to find, expensive to purchase and hardware devices have become increasingly difficult to incorporate into modern workflows. Transporting bulky equipment can be inconvenient and hardware devices are often prone to breakdown. Hardware can also present certain workflow limitations, since devices can only serve one function at a time.

At Arturia we pride ourselves on offering the best of both worlds - the uncompromised quality and character of the original hardware, delivered in a convenient software package that is adapted to a modern workflow. Arturia's OP-Xa V is a faithful recreation of the original hardware, capturing all of its nuances and sonic character with utmost detail. In addition to this, we have expanded on the original design with new features and capability not found on the original unit, including:

- 4 waveform types per oscillator, instead of 2.
- Oscillator cross-mod feature of the original OB-X.
- Advanced modulation capabilities.
- 9 high-quality effects.
- Up to 8 voices of unison.
- Up to 16 voices of polyphony.
- Stereo Spread feature for creating thick, wide, moving sounds.
- Run multiple instances with different settings.
- Automate synth parameters from your DAW.
- Unlimited patch recall.

2. ACTIVATION AND FIRST START

OP-Xa V works on computers equipped with Windows 8 or later and macOS 10.13 or later. You can use the instrument in standalone mode or as an Audio Unit, AAX, VST2, or VST3 instrument inside your Digital Audio Workstation (DAW) software.

2.1. Activate the OP-Xa V license

Once OP-Xa V has been installed, the next step is to activate your license for the instrument. This is a simple process that is done through a separate program called the Arturia Software Center.

2.1.1. The Arturia Software Center (ASC)

If you have not already installed the ASC, you can do so by going here: Arturia Downloads & Manuals.

Look for the Arturia Software Center at the top of the page, and then download the version of the installer that you need for your system (macOS or Windows).

Once the software is installed:

- Launch the Arturia Software Center (ASC).
- Log into your Arturia account.
- Scroll down to the My Products section of the ASC.
- Click the Activate button and follow the instructions.

That's it!

2.2. OP-Xa V as a plug-in

OP-Xa V comes in VST, 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 OP-Xa V as a plug-in, all audio and MIDI device settings are handled by the 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 OP-Xa V as a plug-in instrument inside your host software, its interface and settings work the same way as in standalone mode, with a few small differences:

- OP-Xa V will synchronize to your DAW's host tempo/bpm rate, when tempo is a factor
- You can automate numerous parameters using your DAW's automation system
- You can use more than one instance of OP-Xa V in a DAW project (in standalone mode you can only launch one instance of OP-Xa V)
- You can run the output of OP-Xa V through any additional audio effects available to your DAW such as delay, chorus, filters, etc.
- You can route OP-Xa V's audio outputs more creatively inside your DAW using the DAW's own audio routing system.

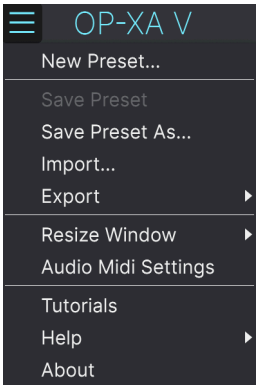
2.3. Initial setup for Standalone Use

If you would like to use OP-Xa V in standalone mode, you will need to set up your instrument and ensure that MIDI and audio signals are flowing properly through the software. You generally only need to do this one time unless you make major changes to your computer. The setup process is the same on both Windows and macOS computers.

> ! This section only applies to readers that plan to use OP-Xa V in standalone mode. If you are only going to use OP-Xa V as a plug-in inside a host music software, you can safely ignore this section (your host music software handles these things).

2.3.1. Audio and MIDI settings

At the top left of OP-Xa V is a pull-down menu. Click it to reveal the following:



Select **Audio MIDI Settings** to bring up the following window. Note that this menu is only available when using OP-Xa V in Standalone mode:

Starting from the top we have the following options:

- **Device** selects which audio driver and device will handle playback of OP-Xa V. This can be your computer's internal driver, or an external soundcard driver. The name of your hardware interface may appear in the field below depending on your selection.

♪ On macOS devices, including external audio interfaces, use the built-in CoreAudio driver. The device can be selected from the second menu.

- **Output Channels** lets you select which of the available device outputs will be used for playback. If your selected device only has one stereo output, then only one option will appear here; If your device has more than two outputs, then you can select a specific pair of outputs.

- **Buffer Size** menu lets you select the size of the audio buffer your computer uses to calculate sound.

♪ A larger buffer means a lower CPU load as the computer has longer periods of time to process commands and fewer interruptions, but this can result in a noticeable latency between a key-press and hearing a result (an obvious problem when playing an instrument). A smaller buffer means lower latency between pressing a key and hearing the note, but a higher strain on your CPU. A fast, modern computer should easily be able to operate at low sample buffer sizes (256 or 128 samples) without audio glitches. However, if you do hear clicks, pops, or artifacts, try increasing the buffer size until you have smooth playback without any glitches. The latency time is displayed in milliseconds on the right-hand side of this menu.

- **Sample Rate** menu lets you set the sample rate at which audio is sent out of the instrument. The options listed here will depend on the capability of your audio interface hardware.

♪ Virtually all audio hardware can operate at 44.1 or 48 kHz which is perfectly fine in most applications, including OP-Xa V. Higher sample rates place greater loads on the CPU so we recommend staying at 44.1 or 48 kHz unless you have a specific requirement to work at high sample rates.

- **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.

- **Play Test Tone** plays a simple test tone to help you troubleshoot audio issues. You can use this feature to confirm that the instrument is routed correctly through your audio interface and audio is playing back where you expect to hear it (your speakers or headphones, for example).

- Your connected MIDI devices will appear in the **MIDI Devices** area. Note that this is only displayed if MIDI devices are present on your computer. Click the check box to accept MIDI data from the device you want to use to trigger the instrument. Note that you can select more than one MIDI device if you wish to play OP-Xa V from multiple controllers.

- **Tempo** sets the tempo of the OP-Xa V sequencer. When using OP-Xa V inside a host music software as a plug-in, the instrument gets tempo information from your host software.

2.4. Taking OP-Xa V for a Test Drive

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

If you haven't done so already, launch OP-Xa V as a plug-in or as a standalone instrument. If you have a MIDI controller set up, use it to play some notes on OP-Xa V. If not, use your mouse to play the on-screen keyboard.

The Left and Right arrows at the top of the instrument let you step through all of OP-Xa 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 it affects the sound.

Play freely with the controls – nothing is saved unless you specifically save a preset (described later in this User Guide), so there is no chance of messing up any of OP-Xa V's factory presets.

At this point, we can wrap up the installation and test drive. We hope you have gotten off to a smooth start. The rest of this guide will help you work your way through all of the OP-Xa V features on a section-by-section basis. By the time you reach the end, we hope you'll understand all of OP-Xa V's features and will be using the instrument to create fantastic music!

3. THE USER INTERFACE

In this chapter we'll start with an overview of the OP-Xa V user interface. This will give you an idea of how the instrument is organized and where to find things. The point here is to establish how the interface is composed at a high level. We'll dive deeper into the main panel and explain every module in detail in the next chapter.

3.1. High-Level Overview

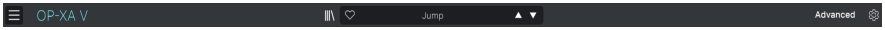
OP-Xa V is neatly subdivided into three sections as shown in the illustration above.

1. **The Upper Toolbar:** This is where you handle administrative tasks such as saving, loading and browsing presets, editing various setup and configuration parameters, adjusting MIDI mappings and accessing advanced features of OP-Xa V. We will go over the Toolbar in the next section of this chapter.

2. **The Main Panel:** Here is where you will likely spend most of your time when working with OP-Xa V. It contains a detailed reproduction of the OB-Xa panel and features. We will go over this panel in the Main Panel And Features [p.44] section of this guide.

3. **The Lower Toolbar:** This section provides quick access to a number of important parameters and useful bits of information such as CPU usage, polyphony mode and your selected MIDI channel. We will go over the Lower Toolbar at the end of this chapter.

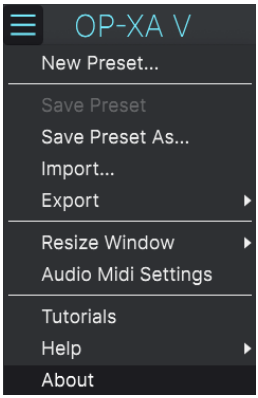
3.2. The Upper Toolbar



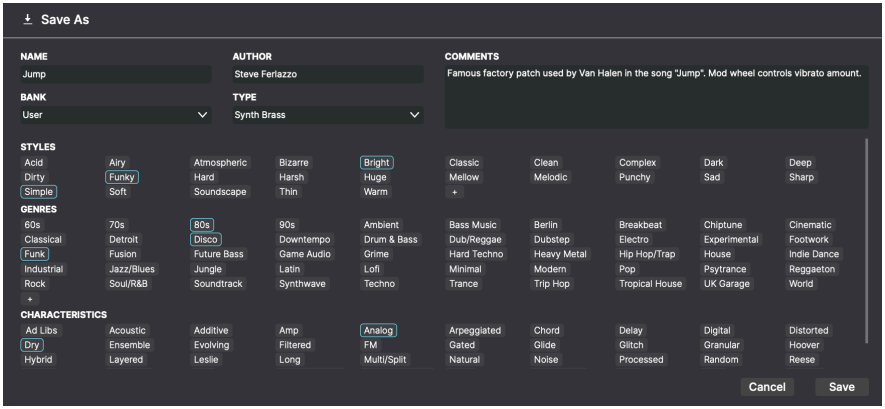
The toolbar that runs along the top of the instrument provides access to many useful features including the OP-Xa V menu, preset browsing features, access to OP-Xa V's "advanced" mode, various MIDI mapping features.

3.2.1. The OP-Xa V menu

Clicking the OP-Xa V box at the top-left corner opens a pull-down menu and lets you access nine important features.



- **New Preset:** This option creates a new preset with default settings on all parameters. It is a good place to start if you would like to create a new sound from scratch.
- **Save Preset:** This option will overwrite the currently loaded preset with any changes you have made. If you would like to save the current preset under a different name, use the "Save As..." option below.
- **Save Preset As...** This lets you save your preset under a different name. Clicking this option reveals a window where you can name your preset and enter information about it.



♪ Arturia's powerful browsing system lets you save much more than just a preset name. For example, you can enter the Author's name, select a Bank and Type, select tags that describe the sound, and even create your own Bank, Type, and Characteristics. This information can be read by the preset browser and is useful for searching the presets banks later. You can even enter freeform text comments in the Comments field, which is handy for providing a more detailed description of a sound. This can help you remember a sound or to provide context to other OP-Xa V users with which you are collaborating.

- **Import:** This command lets you import a preset file, which can be either a single preset or an entire bank of presets.
- **Export Menu:** You can export presets in two ways: as a single preset or as a bank.
    - Export Preset: Exporting a single preset is handy when you want to share a preset with someone else. The default path to these files will appear in the "save" window, but you can create a folder at another location if you like. The saved preset can be reloaded using the *Import Preset* menu option.
    - Export Bank: This option can be used to export an entire bank of sounds from the instrument, which is useful for backing up or sharing presets. Saved banks can be reloaded using the *Import Preset* menu option.
- **Resize Window:** The OP-Xa V window can be resized from 50% to 200% of its original size without any visual artifacts. On a smaller screen such as a laptop you may wish 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. The controls work the same at any zoom level but smaller controls can be easier to see at higher magnification levels.

♪ While working with OP-Xa V, you can also use the keyboard shortcuts Ctrl & +/- (or Cmd & +/-) to quickly adjust the window size. Note that in some DAWs, the same key commands may be used for zoom. In this case, the DAW takes priority.

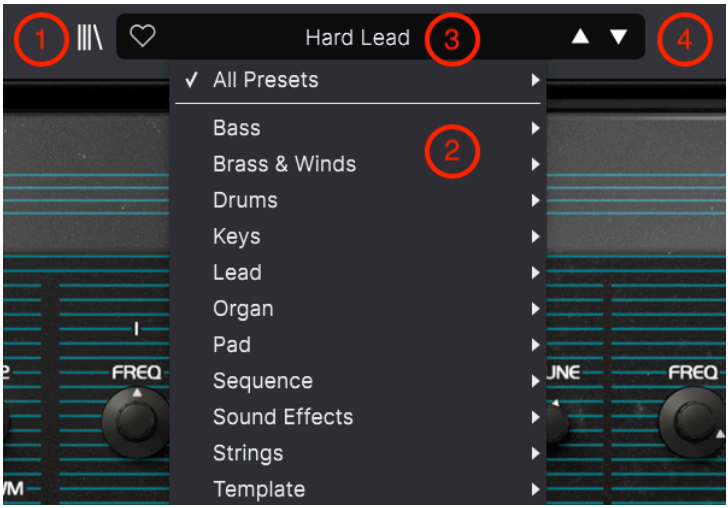
- **Audio Settings (only available in stand-alone mode):** Here you manage the way the instrument transmits audio and receives MIDI. See the section Audio and MIDI settings for more information about this topic.

! The Audio Settings menu is only available in when using OP-Xa V in Standalone mode. When using OP-Xa V as a plugin, the host software handles all of the parameters in this menu including audio and MIDI routing, buffer size settings, and more.

- **Tutorials:** OP-Xa V comes with tutorials that walk you through different features of the instrument. Select one of the tutorials to get step-by-step descriptions of how to make the most of the OP-Xa V features.
- **Help:** This section provides handy links to the OP-Xa V User Guide and the OP-Xa V Frequently Asked Questions page on Arturia's website. Note that accessing these pages will require an Internet connection.
- **About:** Here you can view the OP-Xa V software version and developer credits. Click the About window again to close it.

3.2.2. Browsing Presets

OP-Xa V comes packed with lots of great-sounding factory presets and we hope you'll create many more of your own custom presets. To help you search through large numbers of presets, we have a powerful preset browser with a number of features to help you find sounds quickly.



The browsing features of the Toolbar (shown above) include the following:

1. The **Preset Browser Button** (four-lines icon) opens and closes the preset browser. This is covered in detail in the next chapter, The Preset Browser [p.27].

2. The **Preset Filter** (set to "All Types" in the image above) helps you narrow down your selection. For example, you can narrow your search to only include presets tagged with *Keys*, *Lead*, or *Pads* so that you can find those sounds more quickly. To use this feature, click this section to open a pull-down menu and select any preset from the various categories ("Keys" "Lead" "Pads" etc.) This will load that preset and set the filter to only show you other sound tagged. You can now use the Preset Name or Arrow Icons to step through the filtered options. To reset the filter and show you all options, open the menu and select any preset from the "ALL TYPES" menu.

3. The **Preset Name** is listed next in the toolbar. Clicking on the name reveals a pull-down menu with other available presets. Click on any name to load that preset or click away from the menu to close it.

4. The **Arrow icons** select the previous or next preset in the filtered list. This is the same as clicking on the preset name and selecting the next option in the list, but does it with only one click.

♪: The Previous and Next arrows can be MIDI mapped. This means you can use buttons on your MIDI Controller to easily step through the available presets without having to use the mouse at all.

3.2.3. Accessing OP-Xa V's Advanced Features

OP-Xa V is not just a very accurate emulation of the classic OB-Xa hardware. It actually contains many modern and powerful features that today's music makers will find very useful. Since many of these advanced features would look out of place on a vintage synthesizer like the OB-Xa, we have chosen to hide the modern touches away in the Advanced Panel. This way, if you want the authentic sound and feeling of using a vintage OB-Xa, you can have it using just the front panel control. If you need some powerful modern functions (like multistage envelopes, advanced modulation mappings and powerful studio effects), no problem – you can have that with just one click!

The **Advanced** button on the right side of the Upper Toolbar open OP-Xa V's Advanced Features section. This section is covered in detail in the Advanced Panel And Features [p.61] section of this guide.

3.2.4. Side Panel Settings

At the far right of the Toolbar, a gear-shaped icon opens up a panel on the right side, containing four tabs:

- **Settings:** Global settings (MIDI receive channel) and Preset settings including number of polyphonic voices, number of unison voices, envelope reset, and tutorials.
- **MIDI:** MIDI Learn functions for use with external controllers.
- **Macro**: Assignments for four Macros that control multiple parameters with a single knob twist.
- **Tutorials:** In-app interactive tutorials, also accessed from the main menu.

These topics are covered in the Side Panel [p.19] section later in this chapter.

3.3. The Lower Toolbar

The Lower Toolbar runs along the bottom of the OP-Xa V user interface and provides quick access to several important parameters and useful bits of information.

- **1. Parameter Name:** Displays the name of the parameter as you adjust or hover on controls. The current value of the control is listed in a tool tip that appears next to the control.
- **2. Undo/Redo:** Keeps track of your edits and changes.
    - **Undo (left arrow):** Undoes the last change in OP-Xa V.
    - **Redo (right arrow):** Redoes the last change in OP-Xa V.
    - **Undo History (center menu icon):** Displays a list of recent changes. Click on a change to restore the patch to that state. This can be useful in the event you happened to go too far in your sound design and want to revert to an earlier version.
- **3. CPU Meter and Panic Button:** Displays the current CPU usage of the instrument. Clicking on the CPU will send a MIDI panic, silencing all notes resetting MIDI signals in the event of stuck notes or other issues.
- **4. Macro Knobs:** These four knobs control multiple parameters with a single turn. Assigning parameters to them is covered in the Macros section of the Side Panel [p.19] section below.

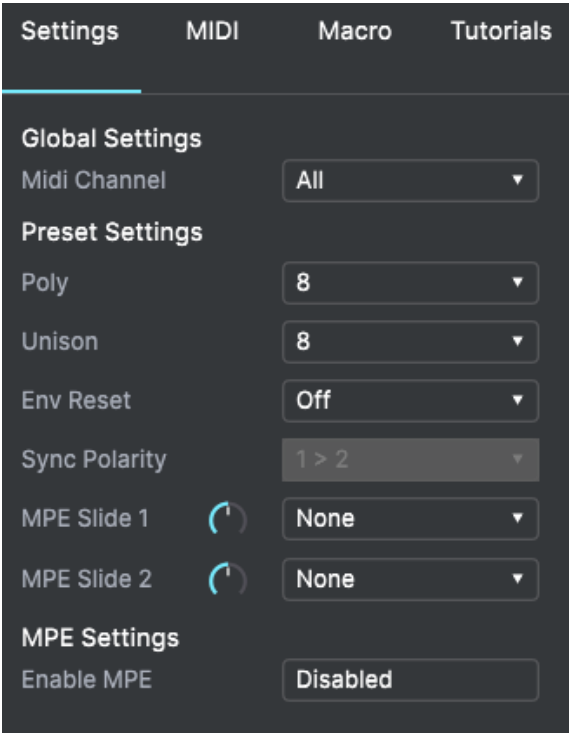
♪ If oscillator sync is turned on, the Lower Toolbar will also display sync routing options. These duplicate the menu in the Side Panel [p.19] Settings tab, described below.

3.4. The Side Panel

The gear-shaped icon at the top right of the upper toolbar opens the Side Panel, which in turn contains four useful tabs. Let's take them from left to right.

3.4.1. Settings

This tab covers Global and Preset settings. Global settings are the same for every Preset; Preset settings are saved at the Preset level.



- **MIDI Channel:** Selects the MIDI channel(s) on which OB-Xa will receive MIDI input. You can select ALL (omni) or channels 1-16.
- **Poly:** Sets the maximum voice pool of OP-Xa V, from 1 to 16 voices. If Unison is not used, this is a simple tool for limiting CPU usage. If Unison is used (see below), this parameter is interrelated with the Unison parameter and limits polyphony.
- **Unison:** Sets the maximum voices available when the Unison button on the main OP-Xa V panel is active. This can cause two behaviors, both of which fatten up the sound.
- **Mono Unison:** Setting **Poly** to thesame number of voices as **Unison** uses all available voices, resulting in monophonic legato playing. This is how unison mode worked on the original OB-Xa. This is also the default setting when creating a new Preset.

♪ Changing **Poly** to fewer voices than the current Unison setting will limit the Unison voices as well.

- **Poly Unison:** Setting **Poly** to higher number of voices than Unison (ideally a multiple) allows polyphonic playing with unison.

♪ When active voices have reached the maximum voice pool, OP-Xa V will steal voices from the oldest notes.

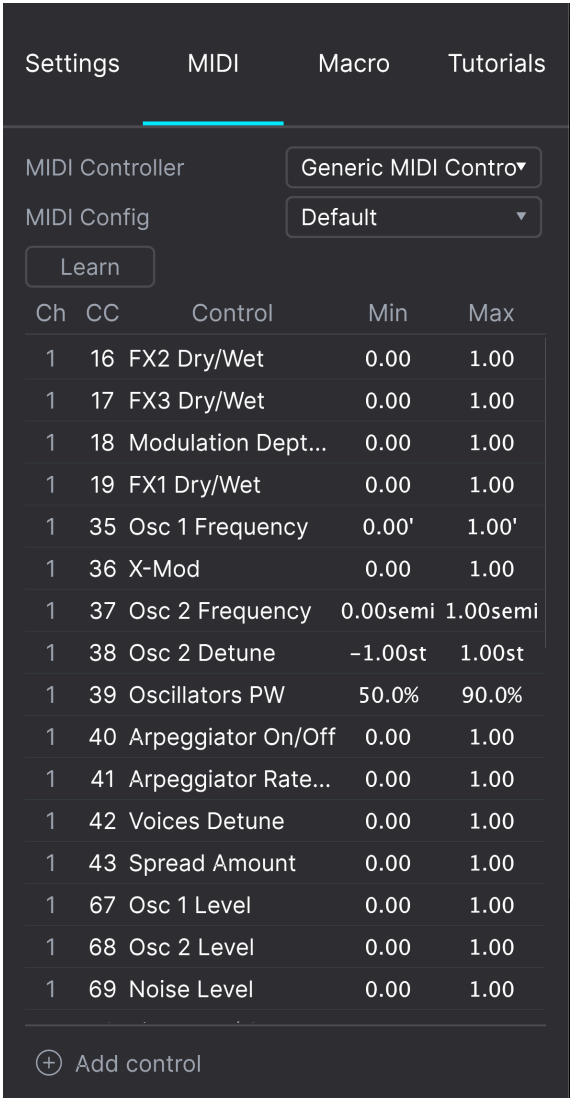
- **Env Reset:** Provides two options for how the envelopes in OP-Xa V work:
    - **On:** The default behavior. Each voice's envelope level starts from zero every time it is re-triggered.
    - **Off:** This reflects the behavior of early OB-Xa hardware, on which attack and release phases were interrelated. When the same voice is re-triggered, its envelope level picks up where it left off.

♪ If you set a long release and play a few notes, new notes may start from a higher level than zero if their voices' release phases are still trailing off. The best way to hear this is using mono unison [p.19] playing.

- **Sync Routing:** When Oscillator 2's Sync button is active, this determines which oscillator is the boss.
    - **1>2:** Oscillator 2's waveform period syncs to that of Oscillator 1.
    - **2>1:** Oscillator 1's waveform period syncs to that of Oscillator 2.

3.4.2. MIDI Tab

This is where OP-Xa V may be placed in MIDI Learn mode. In this mode, all MIDI-assignable parameters on the main 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.



3.4.2.1. Assigning and Unassigning Controls

Click the **Learn** button in the MIDI tab to put OP-Xa V into Learn mode. Controls available for assignment are purple. Controls that are already assigned are red.(You can re-assign them, though.)

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.23] described below.

3.4.2.2. Min and Max Values

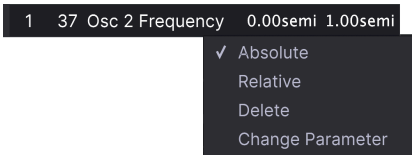
The **Min** and **Max** value columns for each parameter in the list let you scale the amount by which a parameter in OP-Xa V changes in response to a physical control movement. For example, you may wish to limit the range of a filter sweep even though you're probably going to turn the knob all the way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

Drag up or down on a value to change it. Values are expressed as decimal fractions from zero to 1. It is possible to set the maximum lower than the minimum. This reverses the polarity of the physical controller; i.e. turning it up will turn the assigned parameter down.

In the case of switches which only have two positions (On or Off, etc.), those would normally be assigned to buttons on your controller. But it is possible to toggle those with a fader or another control if you like.

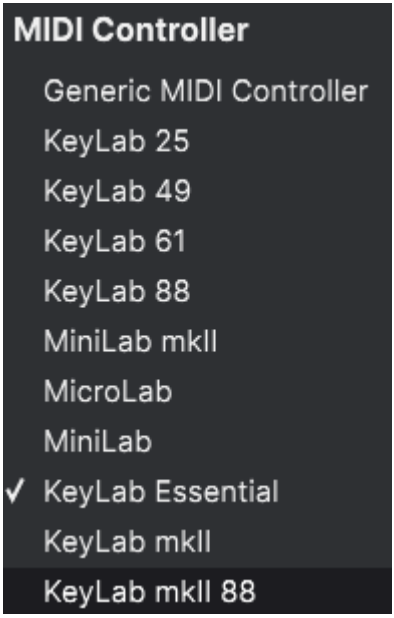
3.4.2.3. MIDI Parameter Menu

Control-clicking or right-clicking on any item in the list of assigned parameters brings up a convenient menu with the following options, which can be different for each parameter.



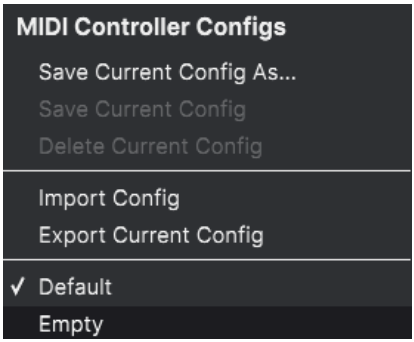
- **Absolute:** The assigned parameter in OP-Xa V tracks the literal value your physical controller is sending out.
- **Relative:** The assigned parameter in OP-Xa V will go up or down from its current value in response to physical controller movements. This is often useful when using endless 360-degree 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 OP-Xa 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.

3.4.2.4. MIDI Controller Menu



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

3.4.2.5. MIDI Config Menu



Another drop-down lets you manage different sets of MIDI maps for controlling OP-Xa 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 OP-Xa V without having to build all the assignments from scratch each time you swap hardware.

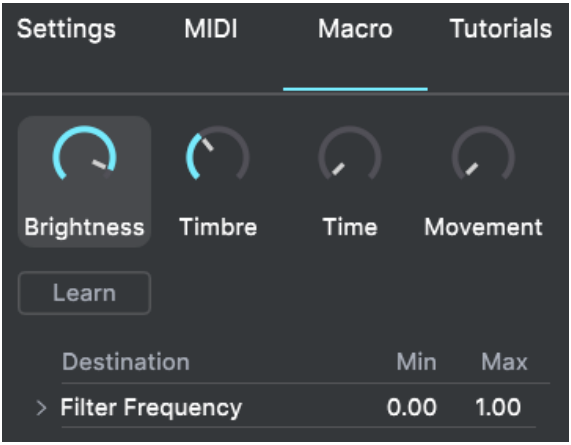
For example, if you have multiple hardware controllers (small live keyboard, large studio keyboard, pad controller, etc.), you can create a profile for each of them one time and then quickly load it here. This saves you from having to redo the MIDI mapping assignments from scratch each time you swap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

Two options in this menu are especially powerful:

- **Default:** Gives you a starting point with predetermined controller assignments.
- **Empty:** Removes the assignments of all controls.

3.4.3. Macro Tab

This tab handles assignments for the four Macro knobs at the right side of the lower toolbar. You can assign multiple parameters to each one, then MIDI Learn [p.21] the Macro itself to a physical control if you want.



♪ Macros are saved at the Preset level.

3.4.3.1. Macro Slots

Click one of the Macro knobs to select which Macros you want to work with. The default names are Brightness, Timbre, Time, and Movement, but you can rename them by clicking in the name field at top center. The knob to its left corresponds to the knob of the same name in the Lower Toolbar.

3.4.3.2. Making Macros

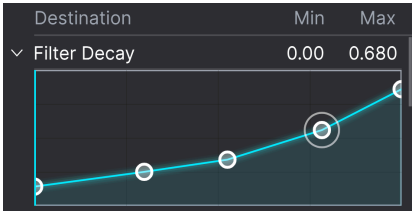
Click the Learn button in the Macro tab and you will see that the process works much like MIDI assignments – available destinations turn purple and ones already assigned turn red. Click on a purple control onscreen and its name will appear on the list.

To remove a parameter from the Macro, control- or right-click its name in the list and select Delete. Parameters under Macro control have **Min** and **Max** values and may be scaled by dragging up or down directly on the number, similarly to MIDI assignments. To reverse the polarity of a parameter (i.e. have it go down when you turn the Macro knob up and vice-versa), set the minimum value higher than the maximum.

♪ There are no rules for which parameter(s) to put in a given Macro. In theory you could name a Macro after a favorite pet and group a handful of unrelated parameters there. In practice it's probably better to keep things more descriptive.

3.4.3.3. Macro Curves

Beyond simple scaling, you can customize a curve that determines how each parameter under the Macro's control proceeds from its minimum to maximum value and back when you turn the Macro knob. Click the > icon next to the parameter name to open the curve window.

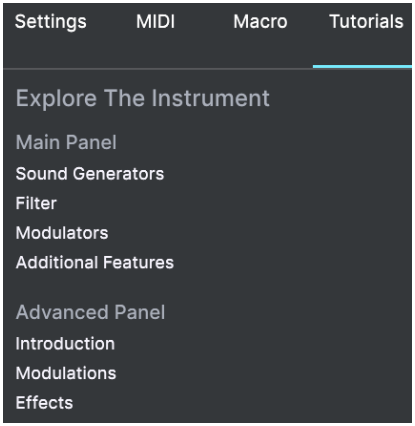


Click on the curve to add a breakpoint, represented by a small circle. You can then drag the point and the curve segments between it and its nearest neighbors will change accordingly. Right- or control-click on a point to remove it. The first and last breakpoints cannot be removed.

♪ A simple diagonal line would produce a linear curve, but the potential fun here is to make things non-linear.

3.4.4. Tutorials

In this tab, which can also be opened by selecting Tutorials from the Main Menu [p.13], you can click on titles for the individual chapters, which in turn will take you through different areas of OP-Xa V in steps. The parts of the panel to focus on are highlighted as you go.



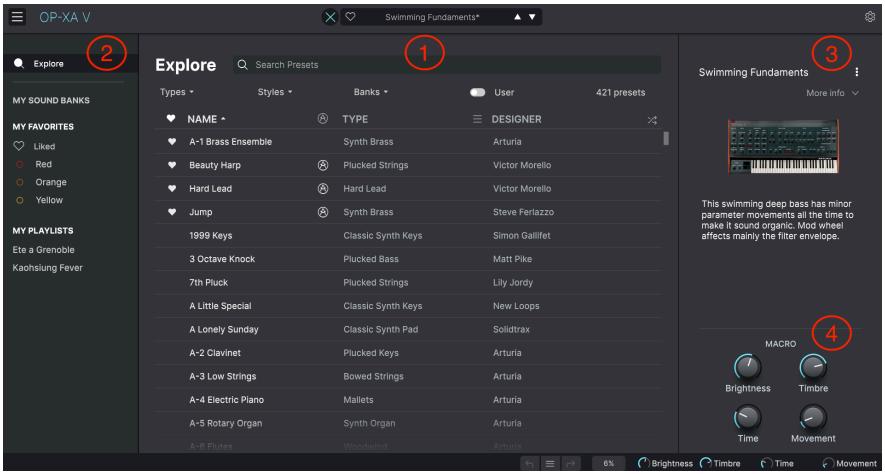
! If you're editing a Preset, make sure to save it before opening the Tutorials because doing so will load a new Preset and overwrite your changes. The Tutorials also take over the Side Panel space when in use.

4. THE PRESET BROWSER

The Preset Browser is how you search, load, and manage sounds in OP-Xa V. It has different views but they all access the same banks of Presets.

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

The browser has four main areas:



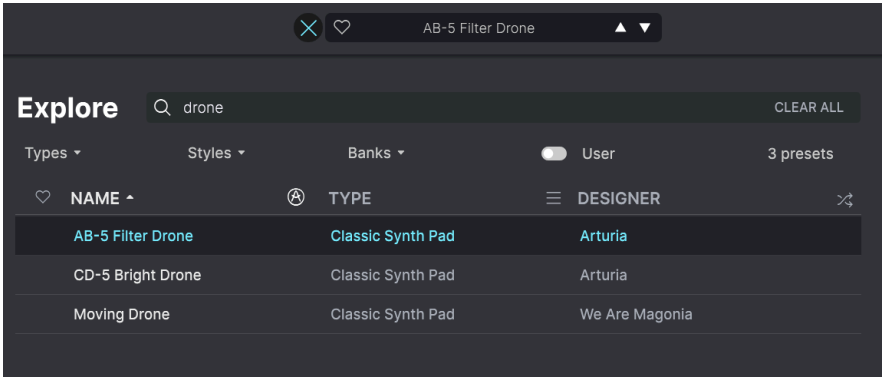
The full Preset Browser window

Number	Area	Description
1.	Search and Results [p.28]	Search Presets with text strings, and by tags for Type and Style.
2.	Sidebar [p.32]	Manage Banks, Favorites, and Playlists.
3.	Preset Info [p.35]	Summary of Bank and Tags, Designer name, and description info for current Preset.
4.	Macro Knobs [p.38]	Large size duplicates of Macro knobs in Lower Toolbar.

4.1. 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.29] 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.



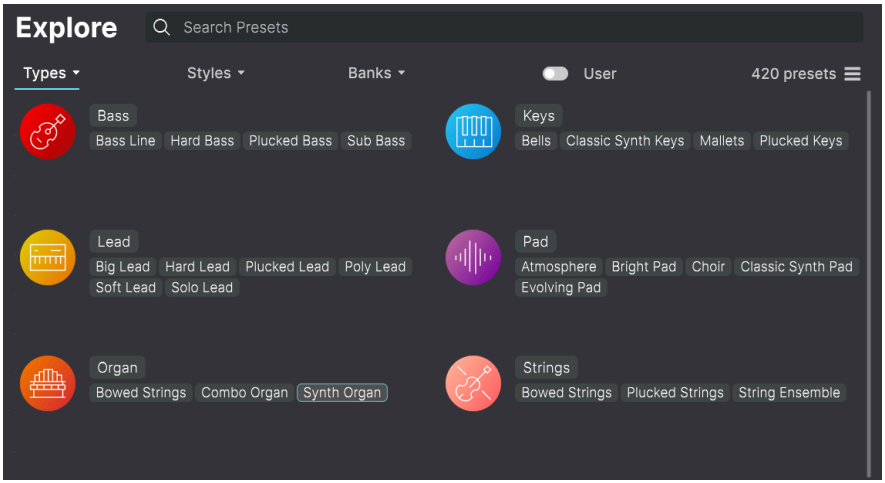
Filter by typing text in the Search field

4.2. 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.

4.2.1. Types

Types are categories of instruments and musical roles: bass, leads, strings, pads, organs, and more. With a clear search bar, click the **Types** button to bring up a list of types. Notice that each type also has several sub-types:



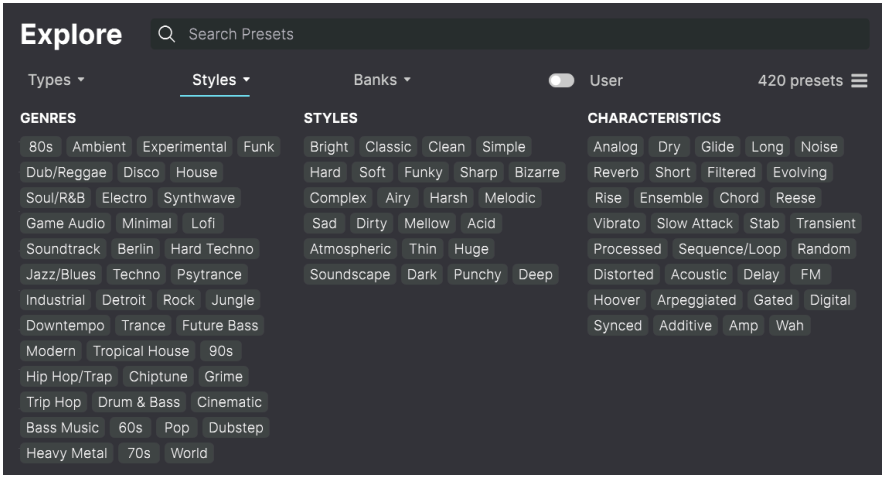
Click any one of them, and the results will show only Presets that match that tag. You can also select multiple Types using Cmd-click (macOS) or Ctrl-click (Windows). For example, if you aren't sure whether the Preset you're looking for was tagged with Keys or Pad, select both to broaden the search.

Results columns can be inverted by clicking the arrow buttons to the right of their titles (Name, Type, Designer).

4.2.2. 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 decades, Trance, Techno, Synthwave, Disco, etc.
- *Styles*: General "vibe" such as Atmospheric, Dirty, Clean, Complex, Mellow, etc.
- *Characteristics*: Sonic attributes such as Analog, Evolving, Distorted, Dry, Rise, 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 usually disappear. 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.

4.2.3. Banks

Next to the **Types** and **Styles** buttons is the **Banks** button, which lets you do your search (using all the methods above) within the factory bank or user banks.

4.3. 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.

4.3.1. Sorting the Preset Order

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

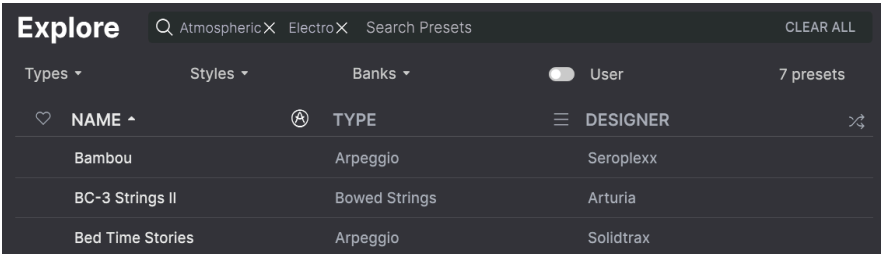
Click the **TYPE** header in the second column to do the same thing by Type.

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.32].

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.

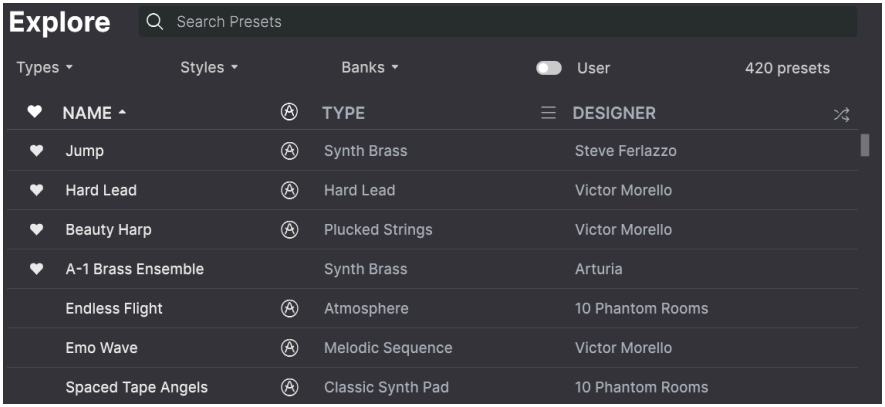
4.3.2. Clearing Tags

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.



4.3.3. Liking Presets

As you explore and create Presets you can mark them as Liked by clicking the **heart** next to their names. later, click on the heart icon to put all of your favorites at the top of the Results list.

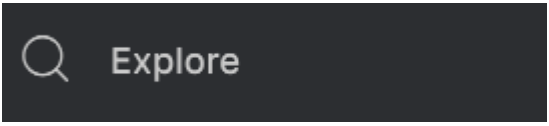


Use as many of the sorting and filtering features as you need and you will find the exact sound you want every time.

4.4. Sidebar

The leftmost section of the Preset Browser determines what is displayed in the Search and Results [p.28] section.

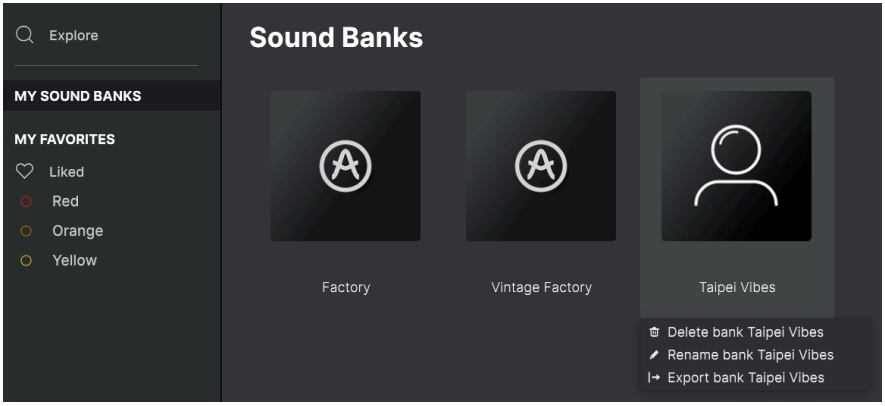
The topmost option is:



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

4.4.1. My Sound Banks

Clicking **My Sound Banks** brings up a window with all of the currently available Sound Banks, starting with the Factory bank. User banks appear next to it, and can be deleted, renamed, or exported by right-clicking them.

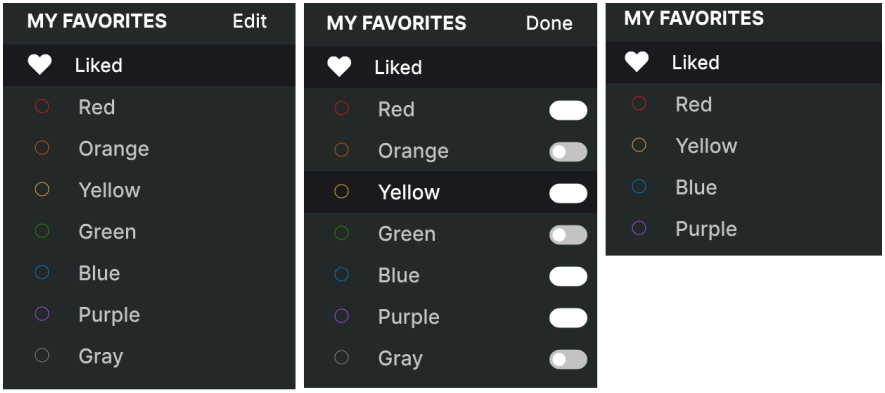


4.4.2. My Favorites

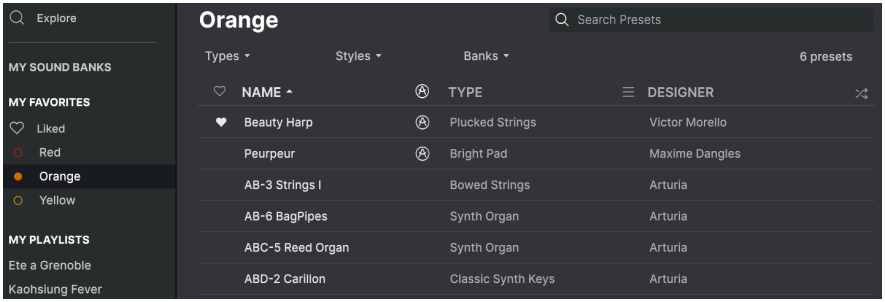
The middle part of the Sidebar has a menu called **My Favorites**, which allows you to color-code certain groups of Presets for easy access. It also includes the **Liked** group, so you can quickly find Presets you've marked with the heart icon.

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

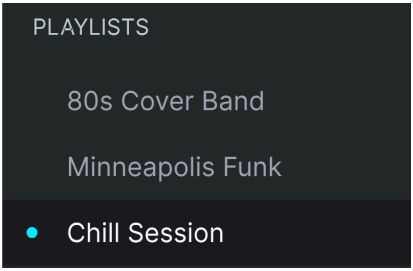
Please note, that you can also rename these favorites into Bass, Leads, et cetera. Just right-click on the favorite and enter a new name.



To add Presets to a particular set of Favorites, simply drag and drop them over the appropriate color. Then click on the color itself to display your grouping.



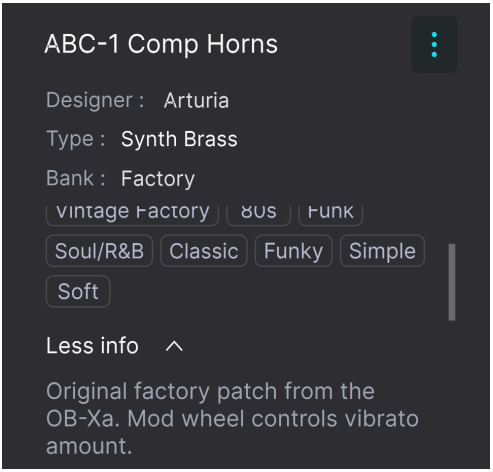
4.4.3. My Playlists



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.39] below.

4.5. Preset Info Section

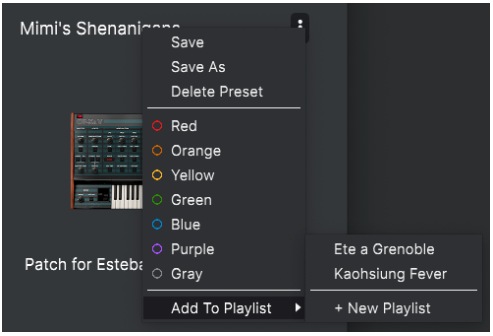
The right side of the browser window shows specific information about each Preset. The information for User Presets (but not Factory ones) may be changed here: Name, Type, Favorite, etc.



To make the desired changes, you can type in the text fields, use one of the pull-down menus to change the Bank or Type, and click the + sign to add or delete Styles.

Types and Styles changes you make here are reflected in searches. For example, if you remove the "Funky" Style tag and then save that Preset, it will not show up in future searches for Funky sounds.

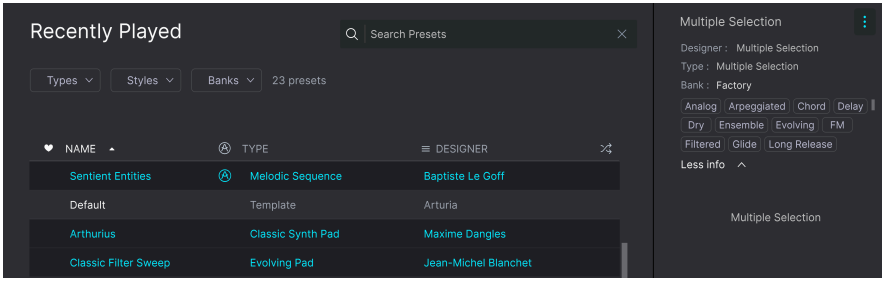
Clicking on the three-dots icon at the top right pops up a menu with organizational options for the Preset.



Options include **Save Preset**, **Save Preset As**, **Delete Preset**, and **Add to Playlist**, complete with an option to create a new Playlist. The lines with color icons allow you to add the Preset to a particular group of Favorites, which is described above.

4.5.1. Editing Info for Multiple Presets

If you'd 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.



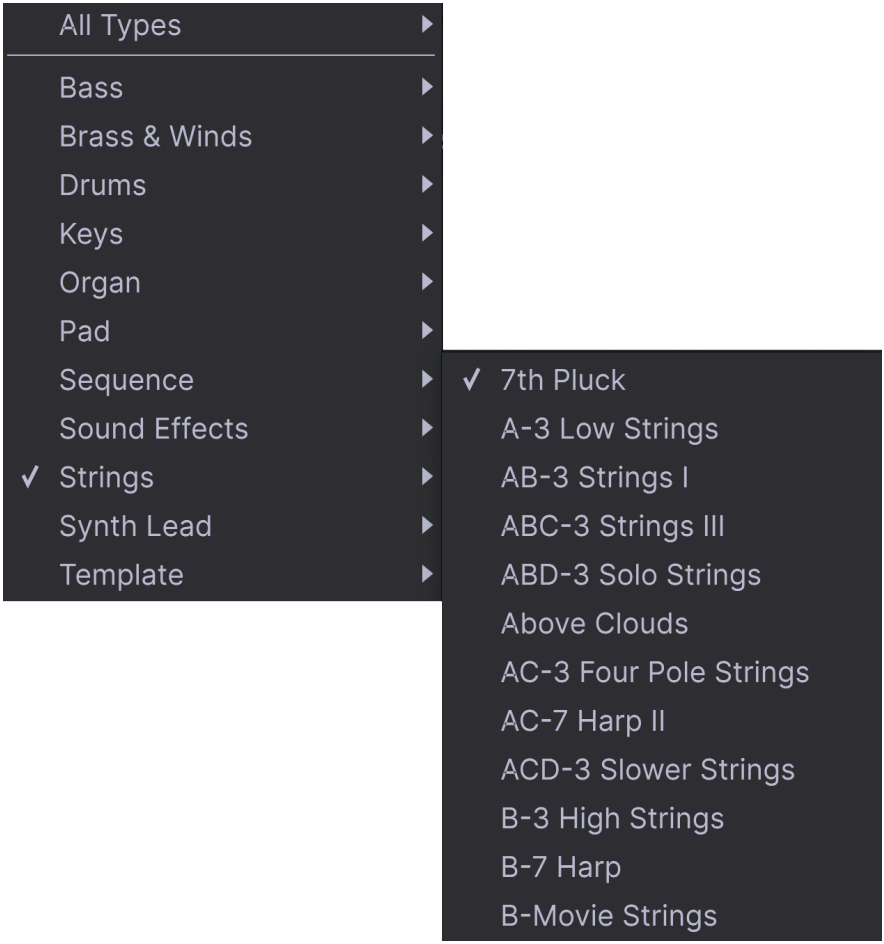
♪ If you want to alter the information for a Factory Preset you must first use the *Save As* command to re-save it as a User Preset. After this the Info section will gain Edit and Delete buttons at the bottom of the window.

4.6. 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 this menu is **All Presets**, and it brings up a submenu of literally every Preset in the current bank.

Below this are options that correspond to the Type tags. Each of these brings up a submenu of all Presets of its 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.

4.7. Macro Knobs

These are simply larger duplicates of the Macro knobs in the Lower Toolbar. Move one and its partner moves with it.

Assigning parameters to Macros is covered in the Macro Tab [p.25] section of Chapter 3.

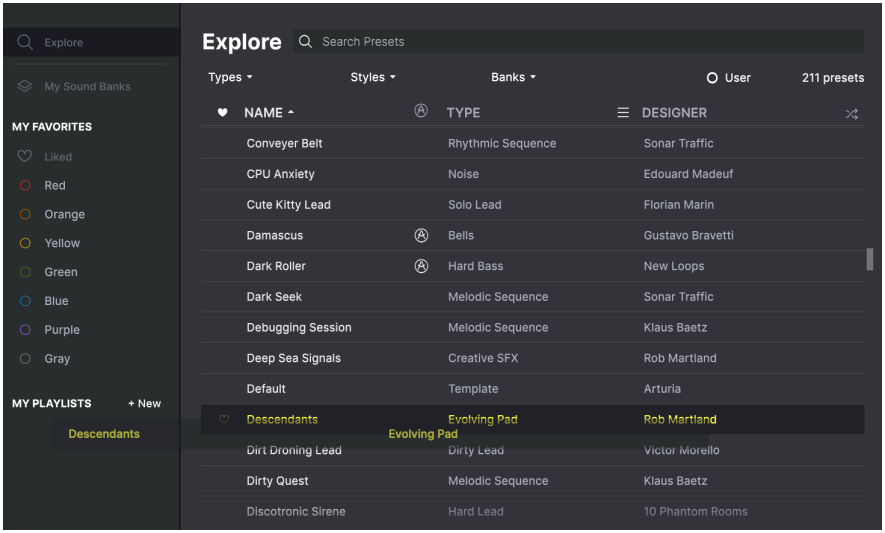
4.8. Playlists

Playlists are a 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 reordered and grouped into Songs, a handy addition to a set list.

The subheading **My Playlists** appears under **My Favorites** in the Sidebar. However, when you first start using OP-Xa V, you'll have no Playlists yet, and **My Playlists** won't be there yet. To make it appear, you'll have to create your first Playlist.

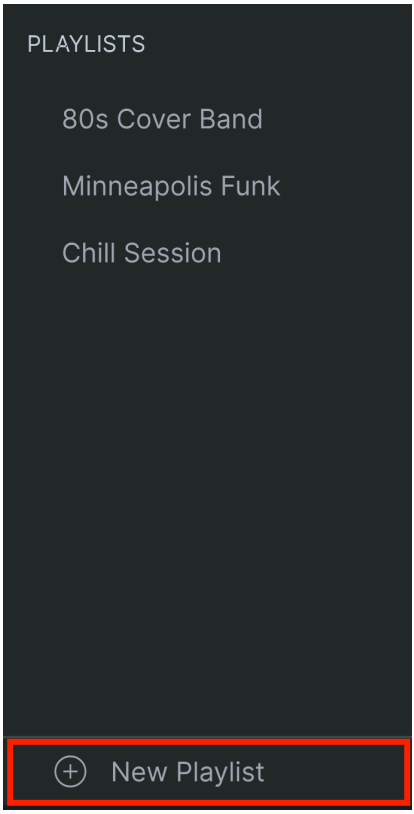
4.8.1. Create your first Playlist

To get started, drag any Preset to the Sidebar. The **My Playlists** heading will appear, along with a **+ New** icon. Drop the Preset onto the **+ New** icon, and you will then be given a pop-up to name your first Playlist. Once you've created one Playlist, the **My Playlists** heading will become a permanent part of the Sidebar.



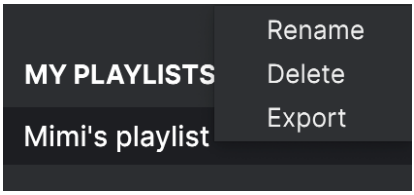
4.8.2. Add a Playlist

To add a Playlist, hover your mouse over the **My Playlists** heading and click the **+ New** icon when it appears.



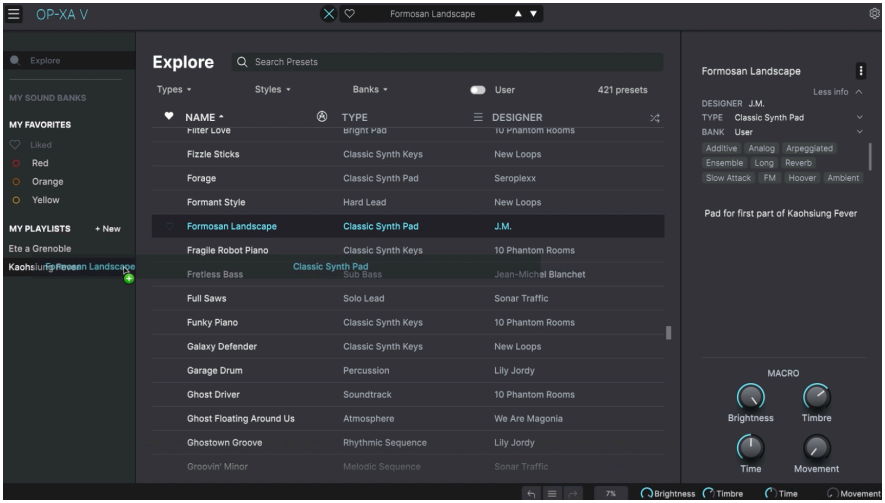
Give the Playlist a name and it will appear in the Playlists menu in the Sidebar.

Once you've created some Playlists, right-clicking on a Playlist name will pop up a set of options – you can **Rename**, **Delete**, or **Export** the Playlist to your computer, as a file with the .aplst extension.



4.8.3. Add a Preset

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

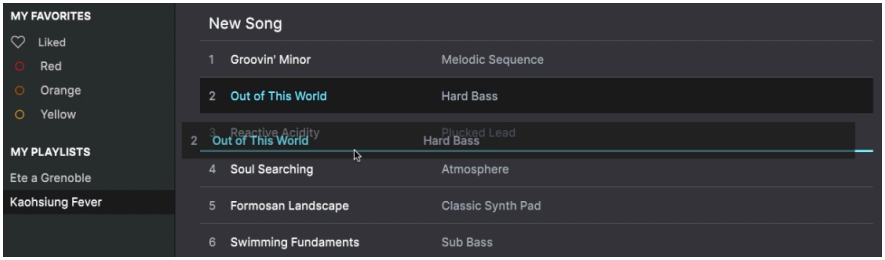


Click and drag from the Search Results list onto one of the playlists

To view the contents of a playlist, click on the playlist name.

4.8.4. Re-order the Presets

Presets may be reorganized within a Playlist. For example, to move a Preset from slot 3 to slot 4, drag and drop the Preset to the desired location.

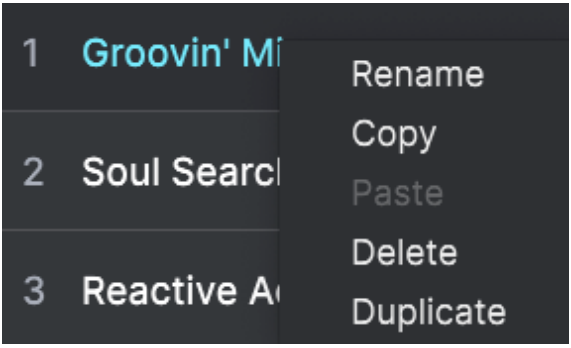


The yellow line indicates the final destination of the Preset you're dragging.

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

4.8.5. Remove a Preset

To delete a Preset from a playlist, right-click on its name to bring up a pop-up menu.

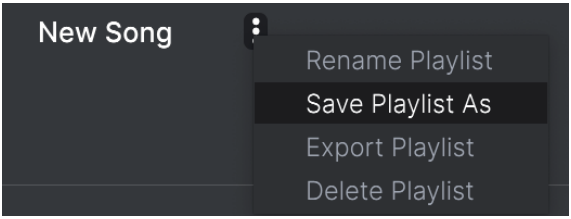


This menu also includes **Rename**, **Copy**, **Paste**, and **Duplicate** options. More management options are described below.

4.8.6. New Song and Playlist Management

The **New Song** button creates a new Song at the bottom of the Playlist. You can name it, then click and drag it to position it in the Playlist and add Presets to it in the desired order.

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.

5. MAIN PANEL AND FEATURES

If you look at the OP-Xa V front panel, you'll see that the synthesizer is composed of 12 different sections, each dedicated to a different function of the synth. But we didn't stop there - in addition to providing faithful recreations of the original modules and controls, we have also expanded on the original design by offering additional modulation and effects which can be found in the Advanced Panel (see the Advanced Panel And Features [p.61] chapter of this manual).

In this section we'll explain each feature of the Main Panel and its associated controls.

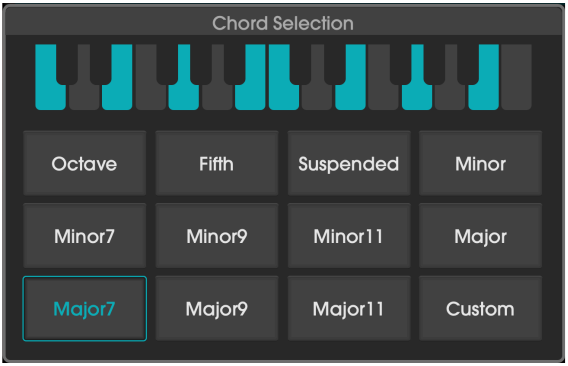
5.1. Master Section

This section contains several global instrument controls.

- **Volume:** Controls the output volume.
- **Hold:** Enables the instrument's Hold function. While active, any notes played will sustain infinitely. Disable Hold to stop sustaining notes.

> ♪ Note that the state of the Hold function is not saved with preset data. It will always default to "off" when loading a preset.

- **Chord:** Enables the Chord feature. While active, pressing a single key will trigger multiple notes.
- **Sel:** Click the **Sel** button to the right to program the notes of the chord. The panel displays a two-octave range, with the bottom note representing the pressed key. Click the keys to add additional notes to the chord at various intervals above the pressed key.



The Chord Selection window also has 11 chord presets. If you select a preset then switch back to Custom, the notes you selected are retained.

> ♪ While using the Hold and Chord features, if the instrument reaches its polyphony limit as specified in the Lower Toolbar Settings [p.18], OP-Xa V will automatically stop the oldest voices in order to trigger new ones.

- **Master Tune** controls the tuning of the instrument, from -12 semitones to +12 semitones.

5.2. Voices Section

- **Unison Detune:** Determines the amount of detuning that will be applied to voices **only** when the Unison button is active. At lower positions slight detuning can add serious girth to the sound, while moving the knob higher will increase the pitch detuning and result in more dissonance.

- **Unison:** Enables and disables the Unison feature. While active, a key press triggers multiple voices playing the same note with small variations in tuning. This can be used to create a thicker, denser sounds. The number of voices triggered while Unison is active is based on the Unison setting in the Side Panel [p.19].

- **Stereo Spread and Pan:** These switches toggle between two modes that can be used to enhance stereo width.

The original OB-Xa could individually pan each of its 8 voices across the stereo field, which was accomplished by adjusting little pan pots inside the synth or on the side panel. We have included these controls for an authentic experience, minus the screwdriver, in the Voice Pan [p.48] section. In addition to this, our Stereo Spread feature provides a dynamic panning system.

When the **Spread** button is active, OP-Xa V duplicates oscillator and filter modules for the left and right chanenels, essentially like running a separate instance of OP-Xa V. In this mode, the **Spread Knob** below controls how much or little variation is introduced. In addition, the Advanced Controls [p.47] located below can be used to further tweak the variations.

When the **Pan** button is active, OP-Xa V assigns voices across the stereo space on every new note, as specified by the Voice Pan Controls [p.48]. The Spread knob controls deviation from center.

- The **Spread Knob** controls the amount of stereo width applied to the sound. At minimum position, the output will be mono. Turning up this control will gradually expand the stereo field. The effect will be dependent on the Stereo Mode selected via the switches above.

> ! Unison and Spread features can quickly increase CPU usage, especially when using polyphony and long note releases. If you experience drop-outs, lower the Unison or Poly settings, decrease the Loudness Release, or increase the audio buffer setting.

5.2.1. Stereo Spread Advanced Controls

This section contains additional controls that dial in the behavior of the Stereo Spread mode to add further movement to the sound. While the **Stereo** button is active, hover over the left cover situated above the Pitch-Bend and Mod Wheel area, then click it to reveal this panel.

> ♪ For these controls to have any effect, note that **Stereo** mode needs to be selected and the **Spread Knob** turned up.

- **LFO Stereo:** Adjusts the phase of the left and right channel LFO copies in degrees, from -180 to +180 degrees. In the center position the LFO cycles of both channels will be in sync, while values to the left or right offset their relative cycles.

  > ♪ For LFO Stereo to have any effect, note that a target needs to be enabled in the Modulation section and the associated **Depth** control turned up.

- **Osc Stereo:** This bipolar pot adjusts the relative tuning of the left and right oscillator copies. In middle position, there is no detuning. Moving the knob to the left will gradually tune down one of the copies, while moving it to the right will gradually tune it up.

- **Filter Stereo:** This controls the amount of filter variation between the right and left channels.

In addition, there is another LFO in this section that can add further movement to the sound by modulating the stereo position of each of the two channel copies:

- **Movement Amt:** Controls the amount of panning.

- **Movement Rate:** Controls the panning rate, from OHz to 3Hz.

5.2.2. Voices Pan Controls

This section contains the 8 voice panning trim pots. While **Pan** switch is active, hover over the cover situated above the bottom octave of the keyboard then click it to reveal this panel if it is not already visible.

As on the original, here you can adjust the static panning of each voice to create stereo panning on each new note. As each voice is triggered, you will see a red LED indicating the currently-playing voice. Use the trim pots to set the stereo pan position for each voice. The distance from center is determined by the **Spread Knob** in the Voices Section.

> ♪ While the original hardware could only reproduce up to 8 voices of polyphony, OP-Xa V provides up to 16 voices. When using 16-voice polyphony the panning trim pots adjust both sets of 8 voices - the first pot will adjust both voice 1 and voice 9, and so on.

5.2.3. Voice Dispersion Controls

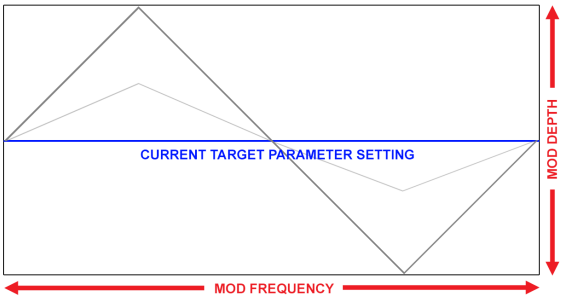
New to OP-Xa V as of Arturia V Collection 8.1, Voice Dispersion is a sophisticated way to add just the right amount of vintage analog character, and it goes way beyond simple detuning. The controls are hidden under another "hatch" just above the center of the virtual keyboard.

Voice Dispersion sets the variation between aspects of each polyphonic synth voice, corresponding to the condition of a hardware unit. There are three preset levels plus a Custom setting.

- **Preset Buttons:** Clicking a button selects a progressively higher level of variance.
    - **1:** Factory
    - **2:** Aged
    - **3:** Out of Calibration
- **Custom:** Lets you set up a custom condition uding the trim pots to the right.
    - **Pitch:** Sets the amount pitch detuning between the voices for non-Unison playing.
    - **PW:** Sets the level of pulse width variation between voices when Oscillator square waves are active.
    - **Cutoff:** Controls the variance in the Filter Frequency between voices.
    - **Reso:** Controls the variance in the Filter Resonance between voices.
    - **Env:** Adds differences in envelope behavior between voices.
    - **Mod:** Adds differences in modulation depth between voices.

5.3. Modulation Section

This section contains settings for the Low Frequency Oscillator (LFO). An LFO is used to modulate instrument properties, such as filter cutoff and oscillator pitch, to create movement and evolution to the sound. This Modulation section is hard-wired to control a specific subset of parameters, just as it was offered in the original OB-Xa. There is also a flexible Envelope Modulation section in the Advanced Panel [p.61], which allows you to modulate just about any instrument control. To get an idea of how an LFO affects a target parameter, see this illustration:



Example of Triangle waveform modulating a target effect parameter. LFO amount determines the amplitude of the oscillation around the current setting, while frequency determines the speed of the modulation.

♪ LFO modulation is bipolar, so the target effect parameter will be modulated in a positive and negative direction from its current setting.

- **Rate:** Controls the rate, or speed, of the LFO.
- **Sync:** Locks the rate of the LFO to tempo subdivisions. When using the plug-in version of OP-Xa V, the LFO rates will be synchornized to the tempo of your project.
- **Waveform:** This menu offers 7 different shapes for the LFO: Sine, Triangle, Saw, Ramp, Square, Sample & Hold, and Sample & Hold (Smoothed).
- **Key Retrig:** Activates LFO retriggering, which will restart the LFO cycle every time a new note is played. While disabled, the LFO will run freely regardless of played notes.

The LFO is subdivided into two modulation "paths", each with its own Depth control and set of dedicated target parameters.

- **Mod Depth 1:** Controls the depth or amplitude of the modulation applied to any parameters whose modulation is enabled via the switches below.
- **Osc 1 Freq:** Enables and disables modulation of Oscillator 1's frequency.
- **Osc 2 Freq:** Enables and disables modulation of Oscillator 2's frequency.
- **Filter Freq:** Enables and disables modulation of the Filter cutoff frequency.
- **Mod Depth 2:** Controls the depth or amplitude of the modulation that will be applied to any parameters whose modulation is enabled via the switches below.
- **Osc 1 PWM:** Enables and disables modulation of Oscillator 1's pulse width. Note that this will only have an effect if square wave is enabled for Oscillator 1's waveform.
- **Osc 2 PWM:** Enables and disables modulation of Oscillator 1's pulse width. Note that this will only have an effect if square wave is enabled for Oscillator 2's waveform.
- **Volume:** Enables and disables modulation of the Master volume, allowing you to create a tremolo effect.

♪ The LFO is duplicated for each stereo channel. When working with sounds that utilise the Stereo Spread feature, you can control the phase of each channel's LFO via the **LFO Stereo** control in the Stereo Spread Advanced Controls [p.47]. This enables you to create rich stereo movement in the modulation.

5.4. Oscillator Section

This section contains the oscillator settings, which determine the fundamental aspect of the sound. It features 2 independent oscillators, which can also optionally be cross-modulated to create interesting and out-there timbres - this was a popular feature available on the original OB-X, but was subsequently removed on the OB-Xa. We have brought it back for the OP-Xa V and have also made it a continuous control, rather than an on/off switch.

- **Osc 1/2 Frequency:** These knobs set the frequency of each oscillator. Oscillator 1 is adjusted in octaves, while Oscillator 2 is adjusted in semitones.
- **Osc 1/2 Waveform:** These switches specify the waveform for each oscillator. While the original OB-Xa only had the choice of saw or square wave, our version includes 4 different waveform types that can be activated with different combinations of switches, similarly to how this functioned on the OB-8.

Switch positions for each waveform:

Saw

Triangle

Square

Saw+Square

♪ If you are not hearing any difference in sound as you adjust Oscillator 2's settings, make sure that the Osc 2 Volume control is turned up in the Filter section mixer.

- **Sync** Synchronizes the oscillators to produce a classic "hard sync" sound. This means the second oscillator immediately restarts itself any time the first oscillator completes a cycle, regardless of where the second oscillator is in its own cycle. The resulting "hard sync" sound is very rich in harmonics and always stays in tune with the dominant oscillator.

When **Sync** is active, a menu for the Sync Routing [p.19] appears in the lower toolbar [p.18]. Here you can decide which oscillator is dominant for sync purposes: 1 or 2.

♪ When sync is enabled, sweeping the synced oscillator's Frequency knob will provide a variety of complex and interesting tones. For adventurous sounds that "move" try using an LFO, envelope, or other control source to modulate the oscillator's frequency automatically.

- **Osc 2 Detune:** Allows you to apply further fine tuning to Oscillator 2.
- **X-Mod:** Controls the amount of cross-modulation that will be applied to Oscillator 1 from Oscillator 2. This allows you to create a ring-modulator type sounds.
- **Pulse Width:** Controls the pulse width for the square waveform. When set to maximum, a square wave is generated. Decreasing the control gradually shrinks the positive phase of the waveform, resulting in a more nasal sound. This control only has an effect if square waveform has been enabled for either oscillator.

5.5. Filter Section

This section contains the filter controls, which are responsible for scultping the frequency spectrum and timbre of the sound. OP-Xa V is equipped with a faithful recreation of the Curtis low-pass filter used in the original hardware.

- **Frequency:** Controls the cutoff frequency of the filter. Frequencies above this setting will be rolled off, at -12dB/oct or -24dB/octave depending on the position of the **4 Pole** switch.

> ♪ In the Advanced Panel, try assigning Velocity to Cutoff Frequency with positive modulation. Now the harder you press a key, the more the filter will open up, resulting in a brighter sound.

- **Resonance:** Sets the intensity of the resonance peak around the cut-off frequency. While the **4 Pole** switch is in the off position (2-pole filtering), turning up Resonance will boost frequencies at the cutoff point. While the **4 Pole** switch is in the on position (4-pole filtering), turning up Resonance not only boosts frequencies at the cutoff point, but will also attenuate frequencies outside the cutoff point resulting in a quieter sound with more emphasis around the cut-off frequency.

- **Mod:** Sets the amount of modulation that will be applied to the Filter Frequency from the Filter Envelope.

- **4 Pole:** Determines whether the filter operates in 4-pole mode (-24db/oct when switch is on) or 2-pole mode (-12db/oct when switch is off). 4-pole is a more aggressive filtering mode, which will filter out more of the sound above the cutoff Frequency.

- **Track:** Enables keyboard tracking for the filter. While keyboard tracking is active, the filter Frequency will be adjusted dynamically based on played notes - playing lower notes will automatically set the cut-off Frequency lower, while playing higher notes allows more high frequencies through. This helps make the filtering more musical and balanced.

5.5.1. Mix Knobs

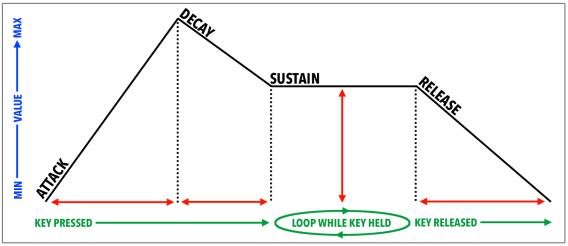
The following three controls function as a mixer, allowing you to adjust the blend of signal going into the filter.

- **Osc1:** Controls the amount of Osc1 signal sent into the filter.
- **Osc2:** Controls the amount of Osc2 signal sent into the filter.
- **Noise:** Controls the amount of Noise that can be optionally blended in to add grit to the signal.

5.6. Envelopes Section

This section contains the envelope generators, which are responsible for scultping the "shape" of the sound over time. There is a Loudness Envelope that controls the amplitude of the signal, and there is also a Filter Envelope that controls the Filter Frequency.

These envelopes are typically referred to as ADSR envelopes (attack-decay-sustain-release). The image below illustrates the various stages of an ADSR envelope:



5.6.1. Filter Envelope

The Filter Envelope controls are as follows:

- **Attack:** Controls the duration of the Attack stage of the Filter Envelope.
- **Decay:** Controls the duration of the Decay stage of the Filter Envelope.
- **Sustain:** Controls the amplitude of the Sustain stage of the Filter Envelope. When holding a note, the envelope will settle into this stage for as long as the note is held, after the initial Attack and Decay stages complete.
- **Release:** Controls the duration of the Release stage of the Filter Envelope, which describes how long it will take for the envelope to reset to it's minimum position once a note has been released.

♪ The initial minimum value of the Filter Envelope modulation corresponds to the current settings of the **Frequency** knob. The amount of positive (upward) modulation that will be applied by the Filter Envelope can be controlled with the **Filter Modulation** knob.

♪ The original hardware featured an F-Env switch which let you modulate the pitch of OSC2 using the Filter Envelope. In OP-Xa V the filter envelope (F-Env) can be freely assigned to any parameter, including Osc2 Pitch, in the Input Modulators [p.64] section.

5.6.2. Loudness Envelope

The Loudness Envelope controls are as follows:

- **Attack:** Controls the duration of the Attack stage of the Loudness Envelope.
- **Decay:** Controls the duration of the Decay stage of the Loudness Envelope.
- **Sustain:** Controls the amplitude of the Sustain stage of the Loudness Envelope. When holding a note, the envelope will settle into this stage for as long as the note is held, after the initial Attack and Decay stages complete.
- **Release:** Controls the duration of the Release stage of the Loudness Envelope, which describes how long it will take for volume to decrease to silence once a note has been released.

5.6.3. Envelope Reset

The **Env Reset** parameter in the Settings tab of the Side Panel [p.19] affects how the envelopes re-trigger.

- **On:** Each voice's envelope level starts from zero every time it is re-triggered. This reflects the behavior commonly expected of envelopes on polyphonic synths.
- **Off:** This imitates the behavior of earlier OB-Xa units, on which attack and release phases were interrelated. When the same voice is re-triggered, its envelope level picks up where it left off.

> ♪ If you set a long release and play a few notes, new notes may start from a higher level than zero if their voices' release phases are still trailing off. The best way to hear this is using mono unison [p.19] playing.

5.7. Vibrato Section

This sections contains controls for the Vibrato. Vibrato can be useful for creating expression, by applying modulation to the pitch of the signal. This is similar to a technique often used by string players, who slide a finger up and down a string quickly while bowing or plucking the string.

In OP-Xa V, having an independent Vibrato section also means you can save the LFO for other creative uses.

- **Osc1 Vibrato:** Enables and disables Vibrato for Osc1.
- **Osc2 Vibrato:** Enables and disables Vibrato for Osc2.
- **Vibrato Rate:** This knob controls the speed of the Vibrato, from slow to fast.
- **Vibrato Depth:** This knob sets the amount of pitch modulation that will be applied, from subtle up to 3 semitones.
- **Vibrato Shape:** These three buttons select the waveform for the pitch modulation.

> ♪ In the Advanced Panel [p.61], try assigning Aftertouch to Vibrato Depth. Now, when you apply pressure to a key on an after touch-capable keyboard, you can bring in Vibrato to taste as you change pressure.

5.8. Portamento Section

This section governs the Portamento. Also known as glide, this is another technique that can be used to add expression to the sound. Live instrument players will often use portamento playing - sliding from one pitch to another - to create expressive moments in their performance.

When using Portamento, each key press will slide to the pressed note from the previously pressed note.

- **Time:** Sets the duration it will take for the pitch to arrive at the pressed note from the previously pressed note. Set this control to minimum (O s/octave) if you don't want any portamento.

- **Quantize:** This switch enables and disables pitch quantization. When Quantize if off, the pitch will smoothly modulate from note to note, without any steps. When Quantize is on, the pitch will change in 1-semitone increments, producing a glissando effect.

5.9. Arpeggiator Section

An arpeggiator allows you to hold down one or more notes and hear those notes played back in a pattern. When a single note is held it will be repeated; when two or more notes are held the arpeggiator will alternate between them; and so on. With an Arpeggiator, the pitch values are defined by which keys you hold down. Octave jumps can also be defined and randomized, so the arpeggios can be as intricate as you want them to be.

An arpeggio is basically an outline of a chord; rather than hearing all of the notes at once, they are delivered at different times. Many great pieces of music have arpeggios at their core, from Bach's Prelude 1 in C Major to Eddie Van Halen's hammer-on guitar solo in "Eruption".

In some ways an arpeggiator is more improvisational than a step sequencer, because you can decide on the spur of the moment to change which notes the arpeggio will produce by changing which notes you are holding, and how many.

The controls are:

On: Turns the arpeggiator on and off.

Rate: Sets the speed of the arpeggiator.

Sync: Specifies whether the arpeggiator will free-run or be locked to a tempo. When Sync is off, the rate is adjustable from 0.1 to 50 Hz. When Sync is on, the rate is adjustable from 1 to 1/64th of the current tempo, with 1/4 Bar equal to one beat.

> ♪ The tempo is set in the Audio MIDI Settings, or, by the DAW's tempo setting when running OB-Xa as a plug-in.

5.9.1. Pattern

When you click on the Pattern area of the arpeggiator, a drop-down menu allows you to make a selection from six different response patterns for the arpeggiator, and how many octaves the arpeggiator will cover.

Mode	Description
As Played	Held notes will be arpeggiated in the same order they were played.
Up	Notes are played back in ascending order. New notes are inserted into the arpeggio as they are played.
Down	Notes are played back in descending order. New notes are inserted into the arpeggio as they are played.
Up-down 1	Held notes are played back in ascending order and then descending order. The highest and lowest notes are triggered twice and then the direction is reversed.
Up-down 2	Held notes are played back in ascending order and then descending order. The highest and lowest notes are triggered only once and then the direction is reversed.
Random	Held notes are played back in random order.

♪ The Arpeggiator works in conjunction with Chord mode. When **Chord** is active in the Master Section [p.44] and the Arpeggiator is on, holding a single note will play through the chord specified in the **Sel** window!

5.9.1.1. Octave

When 1 is selected, the arpeggiator will play just the notes in the keyboard range you're playing. When 2 is selected, it will play those notes, then repeat them an octave higher before restarting the cycle. Octaves 3 through 6 increase the range similarly.

5.10. Mod Wheel and Pitch-Bend

This sections contains performance controls and settings for the Pitch Bend and Modulation wheels. You can adjust these controls on-screen but they are best controlled by the pitch bend and modulation wheels on your keyboards. On the original hardware these were more levers than wheels, so that's how we rendered them in OP-Xa V.

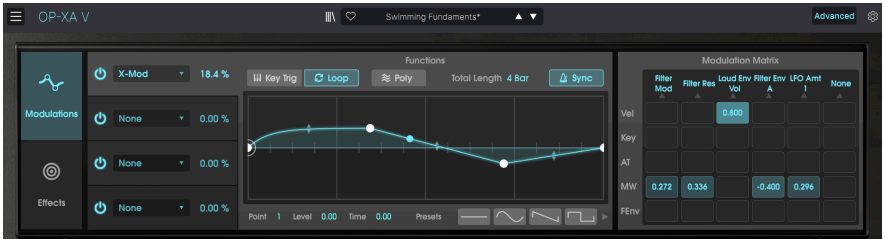
- **Bend Amount:** Controls the range of the Pitch Bend wheel in various note intervals - 1st, 2st, minor third, major third, fourth, fifth, seventh, 1 octave or 2 octaves.

- **Osc2 Only:** This switch sets whether the Pitch-Bend Wheel will affect both oscillators or just Oscillator 2. Performing bends with the latter (on) setting can be quite sonically interesting.

6. ADVANCED PANEL AND FEATURES

Now that we've covered the classic features in the Main panel, let's dive deeper and explore the Advanced Panel.

6.1. Overview



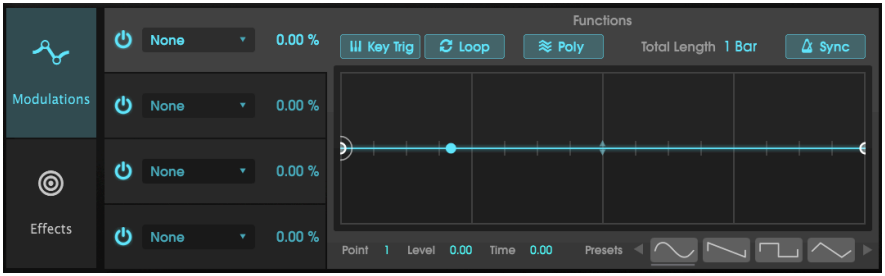
Things have come a long way since 1980 when Oberheim® launched the OB-Xa. We now have technologies that musicians from the 1980s could only dream about and these technologies are actively driving music-making forward. Take the envelope generator as one small example. This was initially a simple device with primitive attack, hold and decay parameters. Today it has evolved into a complex multi-stage device that lets you freely draw and manipulate envelopes on-screen with a mouse. The level of control, precision and repeatability offered today would be unimaginable to an engineer from the 1980s. This is just one example, but all other areas of electronic music instruments have evolved just like the envelope generator. Musical expectations are much higher now.

At Arturia, we are not content to simply model a classic synthesizer with astounding accuracy and leave it at that. We want to make powerful instruments that are relevant to the music makers of today. We try to do this in a way that is tasteful and honors the sound and legacy of original instrument and this is why we hide the advanced features of the OP-Xa V in a mode that you only see *if* you want to go further. This way, if you just want to get the classic OB-Xa experience – without all the modern touches – you can have that by default. However, if you are ready to access the state-of-the-art features under the hood, click the **Advanced** button at the right of the Upper Toolbar.

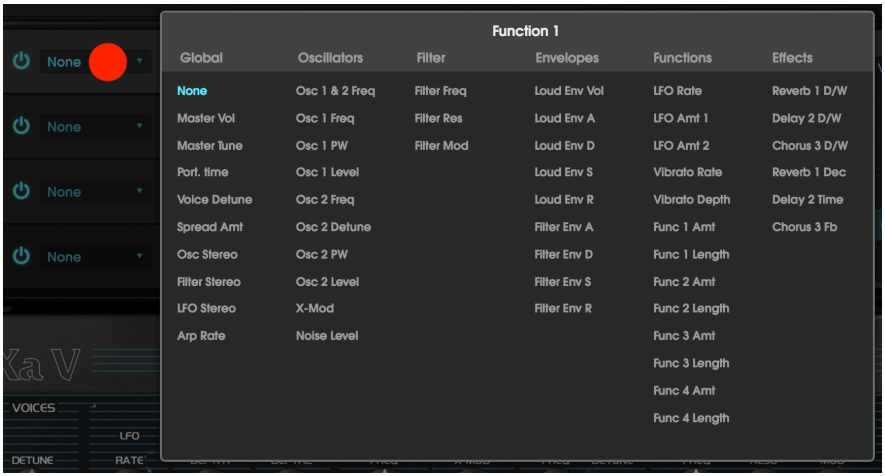
6.2. Navigating the Advanced Features

OP-Xa V's advanced features are separated into two sections as shown on the left of the interface: **Modulations** and **Effects**. Click on a tab to reveal its features. The currently displayed panel is highlighted.

6.3. Modulation Section



The Modulation section lets you generate up to four highly complex envelopes that you can then use to modulate nearly any parameter of OP-Xa V. These are more than just typical envelopes - they are flexible modulation sources that can act like traditional envelopes, LFOs, or even step sequencers.



Select any of the four envelopes by clicking on their boxes on the left side of the screen. Modulations can be switched on and off altogether using the **On/Off** icons.

Destination Menu: Displays a pop-up of every available destination in OP-Xa V.

> ♪ Right-clicking the frame around the Destination menu allows you to copy the envelope to any of the other 3 envelope slots.

Modulation Amount: Drag up and down on this number to adjust the depth of modulation on the chosen destination. This is bipolar and can be set from 100% to -100%.

In the middle of the screen is the visual display. Envelopes have two fixed points at the start and end of the display in the zero position, but you are otherwise free to create complex shapes with up to 16 breakpoints in total. Click in the display to add a new point. Right-click (or control-click) to remove it. Click and drag to move it, or use the following parameters for even more precise control:

- **Point:** Shows the currently selected point. Drag up or down to change points (or just click on them).
- **Level:** Shows the level (Y-axis) of the selected point. Drag up or down to move the point.
- **Time:** Displays the time in milliseconds between the selected point and its nearest neighbor to the left in the display. Drag up or down to lengthen or shorten the time.

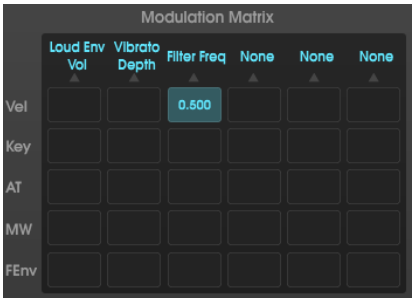
By default, a linear path is drawn between points. However, you can drag the small arrows (located halfway between two points) up or down to add a curve to the connecting segment.

Across the tip are 5 parameters that affect the overall behavior of the envelope.

- **Key Trig:** When on, new notes restart the envelope from the beginning. When off, the envelope free-runs.
- **Loop** When on, the envelope will repeat continuously (not unlike an LFO). When off, it will play "one-shot."
- **Poly** When on (poly mode), each voice will generate its own envelope when triggered, allowing you to offset the modulation between voices. When off, (mono mode), the envelope cycle will be synced across all playing voices.
- **Total Length:** parameter determines how long it will take for the envelope to play fully. Drag up and down to change.
- **Sync:** When on, Total Length is expressed in bars or rhythmic divisions of a bar relative to master tempo. When off, Total Legnth is expressed in absolute time from 5 milliseconds to 20 seconds.

Finally, the **Presets** on the bottom right let you select from a variety of envelope shapes, which you can use as-is or as a starter for designing your own. The horizontal arrows scroll through preset shapes.Click on any shape to load it into the selected envelope slot.

6.3.1. Input Modulation Matrix



The Input Modulation Matrix lets you connect five MIDI performance control sources to almost any destination within OP-Xa V. Each row corresponds to a different source:

- **Vel:** Velocity
- **Key:** Keyboard Tracking
- **AT:** Aftertouch
- **MW:** Modulation Wheel
- **FEnv:** Filter Envelope

> ♪ The original hardware featured an F-Env switch which let you modulate the pitch of OSC2, as well as the Filter Frequency, using the Filter Envelope. In OP-Xa V, this envelope is now freely assignable to just about any parameter you wish to control.

Each column corresponds to a modulation destination, selectable by clicking the name at the top of the column.

To assign a modulation routing,

- 1. Select a destination.
- 2. Click the box where the destination and source intersect.
- 3. Drag up or down in that box to set the modulation amount.

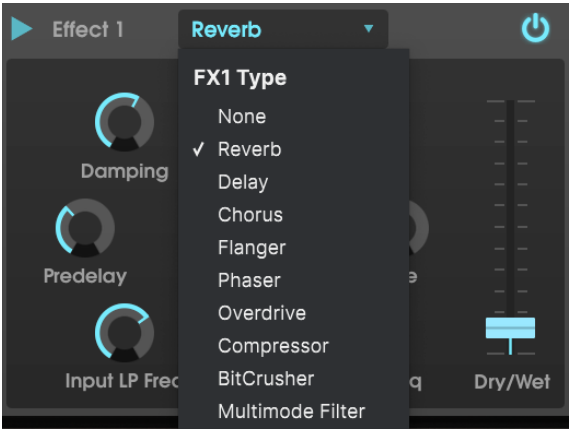
Modulations in this matrix can be positive or negative. To set very precise amounts (-1.000 to +1.000 in increments of .001), right-click and drag. To eliminate a connection, double-click it.

> ♪ Example case: Map Celocity to filter frequency so that OP-Xa V's sound becomes brighter as you play harder. To do this, first select the destination by clicking on one of the boxes at the top of each column and selecting Filter Freq from the menu that appears. In the main panel, set the Filter Freq knob to 100Hz. Next, find the box in the modulation matrix where the Vel row and Filter Freq column intersect. Click-drag this box up and down as you play notes of varying velocity.

6.4. Effects Section

6.4.1. Selecting an Effect

OP-Xa V includes 9 powerful effects that can be arranged serially or in parallel. To start using and editing the effects, click the **Effects** section in Advanced mode. Here you will see three effect slots. Each slot has its own **Power** switch to enable and disable its effect and a pull-down menu to select the effect that you would like to use.



Each slot also has a **Wet/Dry** slider that controls the percentage of the original signal that passes through to the output. Moving this all the way down will effectively bypass the effect. Finally, the **Serial** and **Parallel** Arrows at the top of the panel let you decide if you want the effects to be arranged serially or in parallel. In Serial mode, OP-Xa V's output goes from one effect to the next in succession; In parallel mode, OP-Xa V's output goes into all three effects at the same time and the output of the three effects are then mixed together.

> ♪ All effect parameters are MIDI-assignable, which means you can use the MIDI "Learn" function to map them to hardware controls on an external USB MIDI device.

6.4.2. Each Effect in Detail

Each of the effects has its own unique controls and indicators. We will discuss each effect separately below.

6.4.2.1. Reverb

This effect simulates the reverberant sound of a room or large space by creating a large number of filtered echoes that fade or decay over time. You can greatly affect the character of the reverberant sound by adjusting knobs controlling delay, filter and various other parameters.

The controls are:

- **Damping:** Controls the brightness of the sound by attenuating high frequency content of the reverberant echoes. Low settings will provide very little damping and will result in a bright sound; high settings will filter much of the high frequencies and will result in a duller sound.
- **MS Mix:** This knob controls the stereo width of the reverberation. Low settings will sound monophonic whereas high settings will have a wide, expansive stereo sound field.
- **Predelay:** Sets the amount of time before the input signal is affected by the reverb. Adjusting this parameter can affect the sense of space.
- **Decay:** Sets how much time it takes for reverberant echoes to fade away.
- **Size:** Controls the size of the reverberant space. Low settings result in smaller sounding rooms whereas high settings sound like massive halls and chambers. Use this knob in conjunction with the Predelay to achieve a variety of different sonic spaces.
- **Input LP Freq:** This is a low pass filter that can be used to remove some of the high frequency tones that can make reverberation sound "sizzle-y" or unnaturally bright. This filtering happens on the input signal before the reverberation takes place. Use this knob in conjunction with the Input HP Freq knob to dial in clear reverberations.

- **Input HP Freq:** This is a high pass filter that can be used to remove some of the low frequency tones that can make reverberation sound muddy, indistinct, and washed out. This filtering happens on the input signal before the reverberation takes place. Use this knob in conjunction with the Input LP Frequency to dial in clear reverberations.

6.4.2.2. Delay

A delay can increase the spaciousness of a sound without making the sound "swim" the way some reverbs do. It can also be used as a rhythmic counterpoint to accentuate a groove. This delay repeats the input signal and creates an echo, giving it more space and depth. The Time dial offers a range of settings from 2 milliseconds to two seconds (2000 ms).

> ♪ This is a modern digital delay that provides clear, precise echoes that common in contemporary delay effects.

The controls are:

- **Delay Time:** Sets the length of the delay. Turning the dial clockwise increases the delay time; turning in the opposite direction shortens it. Values here are shown in either bars or milliseconds, depending on how Sync is set (see below).
- **Sync:** Locks the delay to the current tempo of the DAW (or OP-Xa V's internal tempo when using the standalone version). When Sync is switched on, Delay Time is displayed in Bars. If Sync is deactivated, Delay Time is shown in milliseconds.
- **Rate Synced Type:** Sets the timing of the delays from Binary, Ternary (Triplet) or Dotted. This parameter is only active when Sync is engaged (it does nothing when Sync is switched off).
- **Width:** This knob controls the stereo width of the delay. Low settings will sound monophonic whereas high settings will have a wide, expansive stereo sound field.
- **Ping Pong:** Hard-pans alternating delays left and right, so that they bounce from left to right.
- **Feedback:** Determines how much of the Delay's output is fed back into its own inputs. Higher settings mean that the delay will be heard for a longer period of time before fading out.

♪ Setting Feedback to its maximum amount will mean that a signal is looped infinitely and never fades out. This effectively turns the Delay into a looper!

- **HP Freq:** This is a high-pass filter that can be used to remove some of the low frequency tones that can make the delay sound "muddy" indistinct and washed out. This filtering happens on the input signal before the delay takes place. Use this knob in conjunction with the LP Frequency to dial in clear delays.

- **LP Freq:** This is a low-pass filter that can be used to remove some of the high frequency tones that can make delay sound unnaturally bright. This filtering happens on the input signal before the delay takes place. Use this knob in conjunction with the HP Freq knob to dial in clear delays.

6.4.2.3. Chorus

A chorus module recreates the sound of multiple takes of an instrument being combined in a mix. The effect works by duplicating the incoming signal, delaying one side while using an LFO to slowly modulate the delay time and mixing the delayed signal back with the original sound. To make the choral sound more rich and lush, the signal can be duplicated multiple times and modulated by separate LFOs.

♪ The chorus effect is very similar to the Flanger effect (see below) except chorus delay times tend to be longer (0.6ms minimum for this effect) which results in a subtle and pleasing choral effect.

The controls are:

- **LFO Shape**: Selects the shape of the LFO used to modulate the delayed voices.
- **Voices:** Sets the number of duplicated voices in the chorus effect, from one to three voices.
- **Delay:** Sets delay time for the chorus effect.
- **Stereo Mode:** The output of the chorus can be set to stereo for a wider and more modern sound or mono for a more vintage sound.
- **Depth**: Sets the strength of the LFO's modulation on the delayed signal, from very subtle to quite extreme.
- **Freq:** Adjust the speed of the chorus by setting the LFO rate.
- **Feedback:** Determines how much of the Chorus output is fed back into its own input.

6.4.2.4. Flanger

The Flanger effect is similar in principle to the Chorus effect above, except that the delay time tends to be much shorter (as low as 0.001ms in the case of the effect). The extremely short delay time produces a "comb filter" effect that sweeps up and down through the harmonics of the original signal.

Flanging can create both subtle and extreme effects, depending on the Frequency and Depth of the modulation. With higher Depth settings you will begin to hear changes to the pitch of the sound. This is how the circuits in an analog flanger work, and we have taken care to recreate these conditions in our software.

The controls for the effect are:

- **Shape:** Selects the shape of the LFO used to modulate the delayed voices.
- **Polarity:** This determines whether the feedback polarity will be positive or negative. This can provide smoother or harsher flanging effect depending on your other settings, so experiment with positive and negative settings to see what works best for your track.
- **Stereo:** The output of the flanger can be set to stereo for a wider and more modern sound or mono for a move vintage sound.
- **Freq:** Sets the LFO's modulation rate for the minimum delay time.
- **Min Delay:** Sets a minimum limit for the delay time, which can be useful for controlling the flanger's harmonic content.
- **Depth:** Sets the strength of the LFO's modulation. This is set to "max out" at less than 100% to limit runaway feedback.
- **Feedback:** Determines how much of the flanger's output is fed back into its own input.
- **LP Freq:** Sets the lowpass cutoff frequency for the flanger. Frequencies above this are not flanged.
- **HP Freq:** Sets the highpass cutoff frequency for the flanger effect. Frequencies below this are not flanged.

6.4.2.5. Phaser

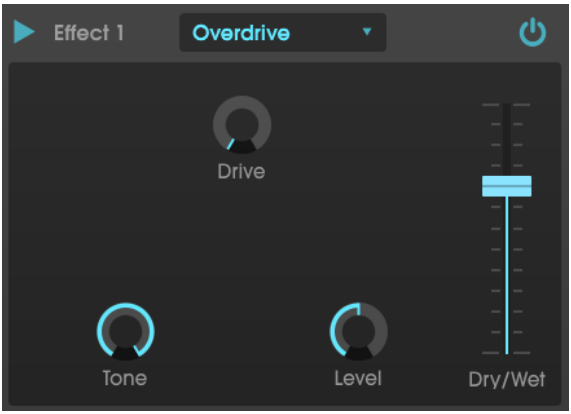
Phase shifting is a sweeping effect that was first popularized in the 1960s. It adds motion and a swirling character to the sound. It works by splitting the incoming signal, changing the phase of one side, and recombining it with the unaffected signal. This creates a notch-comb filter which can be swept through the frequency spectrum, causing the signature "whooshing" sound of the phase shifter. This particular phaser is a stereo model with tempo synchronization.

The controls are:

- **LFO Rate:** Sets the speed of the LFO. If tempo synchronization is enabled (see below), this parameter is displayed in bars. If synchronization is disabled, the Rate parameter is displayed in Hz.
- **Sync:** Locks the phaser's LFO to the current tempo of the DAW.
- **Rate Synced:** Sets the timing of the delays from Binary, Ternary (Triplet) or Dotted. This parameter is only active when Sync is engaged (it does nothing when Sync is switched off).
- **LFO Amount:** Sets the strength of the LFO's modulation.
- **LFO Shape:** Sets the wave shape of the modulating LFO
- **Frequency:** Sets the center frequency at which the phaser affects the incoming signal
- **Feedback:** Effectively controls the amount of phaser resonance. Look out! Higher settings can make the filtering effect very pronounced.
- **N Poles**: Sets the number of poles used in the sweeping filter. Low settings will have a gentler sound whereas high settings will have a more pronounced sound.
- **Stereo:** Sets the stereo width of the effect, from mono to maximum stereo (hard left to hard right).

6.4.2.6. Overdrive

This effect add gain to a signal causing it to clip and distort. This introduces new harmonics that add a harsh edge to sounds. This is similar to an overdrive pedal for a guitar.



The controls are:

- **Drive:** Sets the overdrive amount.
- **Tone:** Brightens the sound and adds a harsher edge through a high frequency shelving filter.
- **Level:** Sets the output level of the overdrive. This allows you to compensate for increased output caused by the drive.

6.4.2.7. Compressor

At its core, a compressor is simply used to maintain a consistent level of sound. You can think of it as a very fast manual control that turns down the volume when the input is too loud and raises it again when the loud parts have passed. Over the decades, audio engineers have found many creative uses for compressors beyond simply evening out loudness levels. For example, many mix engineers use compressors to bring an increased sense of power and excitement to a single track or an overall mix.

If you are using a compressor in a chain of effects, the compressor can keep the attack transients of a sound from overloading the input of the next effect. It can also re-contour a sound that naturally decays quickly so that it has a longer sustain. Drums are often compressed to add punch. Compression is also routinely added to radio and television audio levels to keep them within a certain volume range.

The controls are:

- **Makeup:** Switches the compressor's automatic make-up gain feature on and off. This feature compensates for the natural reduction in output loudless as the compressor brings down peaks.

- **Attack:** Sets the speed with which the compression will react to an incoming signal. Short attack times mean the compressor will immediately affect an incoming signal. Longer attack times allow momentary peaks to slip through before the compressor has a chance to affect on the signal. In some cases this can be desirable as it allows a signal to maintain some of its natural "attack" transients before it starts working.

- **Release:** Sets the release time of the compressor. Generally, this is set such that the output of the compressor sounds natural and transparent. However, many contemporary artists deliberately choose to set this to more extreme values in order to achieve "pumping" and "breathing" artifacts. Go ahead and experiment–maybe you'll stumble upon a sound you love!

- **Threshold:** Sets the loudness level above which the compressor will begin to work. The compressor ignores signals that fall below the threshold.

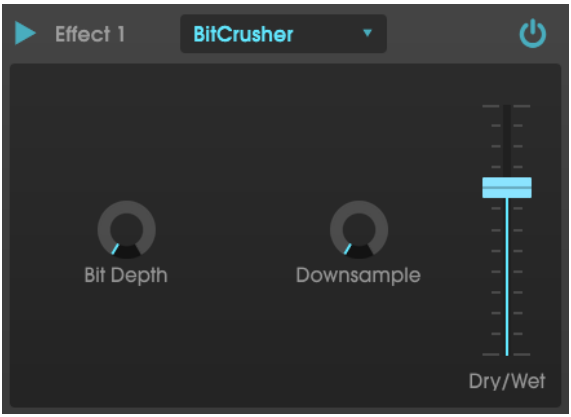
- **Input Gain:** Adds gain to the signal before the start of the compression process.

- **Ratio:** The compressor ratio determines the amount of compression that will be applied once the threshold is reached. For example, if the ratio is set to 2:1, signals exceeding the threshold by 2 db will be allowed to increase by only 1 dB. An 8 dB increase will be reduced to a 4 dB increase, and so on.

- **Output Gain:** Controls the final output level of the compressor.

6.4.2.8. BitCrusher

Arturia instruments generate very high-fidelity sounds, however, in some scenarios you may prefer a gritty lo-fi sound. The BitCrusher effect can really help make this happen! It adds nasty digital distortion by intentionally reducing the bit depth and sampling rate of incoming signals.



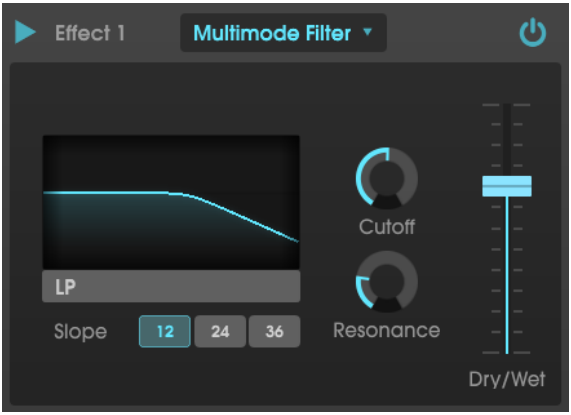
To explore this effect, start by setting the Bit Depth and Downsample dials to the minimum settings. Then gradually turn each dial up to reduce the bit depth and sampling rate of the incoming signal. Each knob has a different degrading effect and you can experiment with different settings to find the perfect blend of sonic destruction for your sound!

The controls are:

- **Bit Depth:** Reduces the resolution of your sound (i.e., the number of bits used to render an output) as this knob is turned up. There is no reduction at the minimum setting and extremely reduction at the maximum setting.

- **Downsample:** Resamples the already bit-reduced signal (set by the Bit Depth knob). As you turn up this knob, your incoming signal will be re-sampled at lower and lower frequencies, increasingly destroying the fidelity of the pure sound.

6.4.2.9. Multimode Filter



Multimode Filter is a powerful sound shaping filter, that offers an additional way of sculpting frequencies at the output stage.

The controls are as follows:

- **Filter Mode:** Chooses from one of 5 different filter modes: Low Pass, High Pass, Band Pass, Comb Feed Back, Comb Feed Forward.

> ♪ The LP, HP and BP filter modes also display an additional parameter for changing the slope of the filter: -12, -24, or -36db/octave.

- **Cutoff** controls the cut-off frequency of the filter.
- **Resonance** controls the resonance around the cut-off frequency.

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