USER MANUAL

OB-Xa V

ARTURIA

_The sound explorers

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Thank you for purchasing Arturia's OB-Xa V!

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

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

Special Messages

Specifications Subject to Change:

The information contained in this manual is believed to be correct at the time of printing. However, Arturia reserves the right to change or modify any of the specifications 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's OB-Xa V

We'd like to thank you for purchasing OB-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

Table Of Contents

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 products released under the brand was the monophonic Synthesizer Expansion Module (SEM) in 1975. This was quickly followed by the release of the Four Voice and Two Voice synthesizers, which utilized multiple banks of 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 delared 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 several digital synthesizers throughout 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 abandonement of discrete circuits for oscillators and filers 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 agressive options when sculpting sound frequencies on the OB-Xa.

Another improvement was the ability to split the keyboard with different programs for each half of the keyboard, 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®

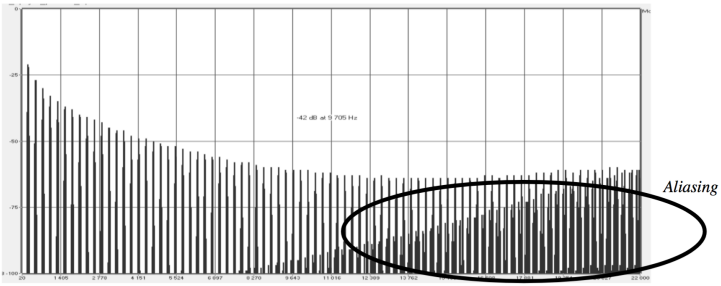
TAE® (True Analog Emulation) is Arturia's technology for emulating the analog circuits used in vintage synthesizers. TAE®'s software algorithms result in spot-on emulation of analog hardware. This is why OB-Xa V offers an unparalleled quality of sound, as do all of Arturia's virtual synthesizers.

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

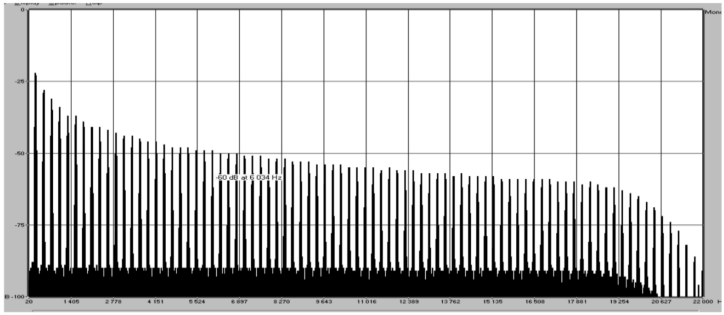
1.3.1. Aliasing-free oscillators

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 (PWM, FM...) and does so without any CPU cost.



Linear frequency spectrum of a current well-known software synthesizer

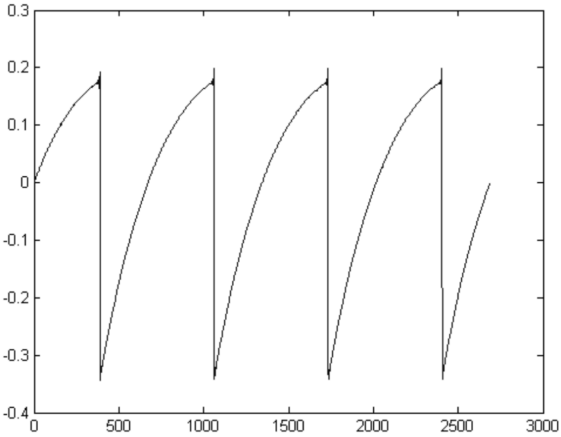


Linear frequency spectrum of an oscillator modeled with TAE®

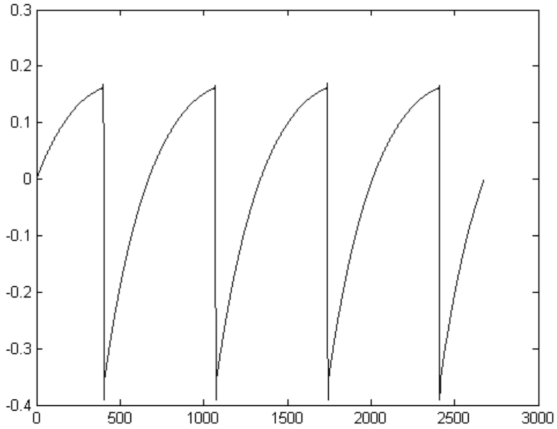
1.3.2. A better reproduction of analog oscillator waveforms

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 OB-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

OB-Xa V works on computers equipped with Windows 7 or later and macOS 10.10 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 OB-Xa V license

Once OB-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 Updates & 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. OB-Xa V as a plug-in

OB-Xa V comes in VST, Audio Unit (AU) and AAX plug-in formats for use in all major DAW software such as Ableton, Cubase, Logic, Pro Tools and so on. When using OB-Xa V as a plugin, 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 plugins.

Note that when you load OB-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:

- OB-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 OB-Xa V in a DAW project (in standalone mode you can only launch one instance of OB-Xa V)
- You can run the output of OB-Xa V through any additional audio effects available to your DAW such as delay, chorus, filters, etc.
- You can route OB-Xa V's audio outputs more creatively inside your DAW using the DAW's own audio routing system.

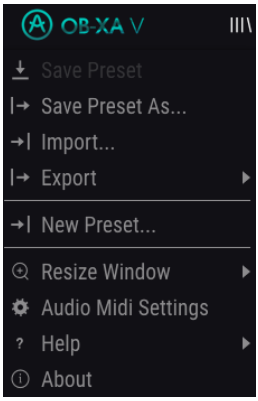
2.3. Initial setup for Standalone Use

If you would like to use OB-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 OB-Xa V in standalone mode. If you are only going to use OB-Xa V as a plugin 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 OB-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 OB-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 OB-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 all devices, including external soundcards, 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 keypress 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) without audio glitches. However, if you do hear clicks, pops and 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 OB-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 OB-Xa V from multiple controllers.

- **Tempo** lets you set the tempo of the OB-Xa V sequencer. When using OB-Xa V inside a host music software as a plugin, the instrument gets tempo information from your host software.

2.4. Taking OB-Xa V for a test drive

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

If you haven't done so already, launch OB-Xa V as a plugin or as a standalone instrument. If you have a MIDI controller set up, use it to play some notes on OB-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 OB-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 OB-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 OB-Xa V features on a section-by-section basis. By the time you reach the end, we hope you'll understand all of OB-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 OB-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 explain every module in detail in the next chapter.

3.1. High-Level Overview

OB-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 OB-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 OB-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.25] section of this guide.

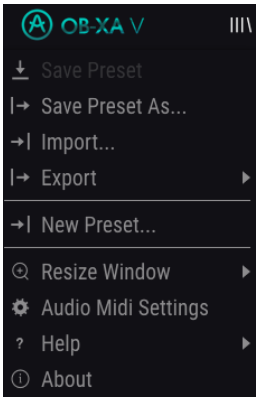
3. **The Lower Toolbar:** This section provides quick access to a number of important parameters and useful bits of information such as CPU usage, polyphony mode and your selected MIDI channel. We will go over the Lower Toolbar at the end of this chapter.

3.2. The Upper Toolbar

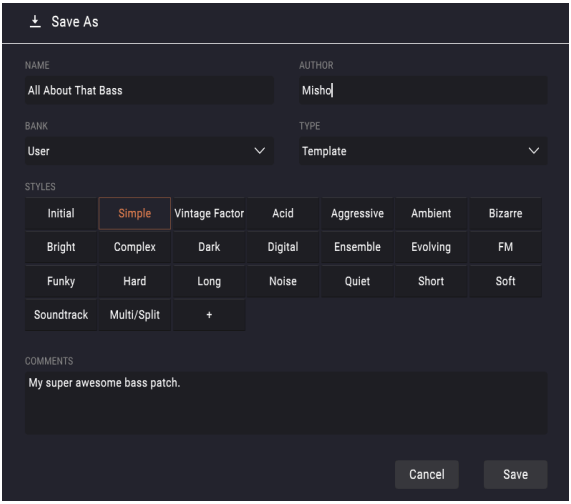
The toolbar that runs along the top of the instrument provides access to many useful features including the OB-Xa V menu, preset browsing features, access to OB-Xa V's "advanced" mode, various MIDI mapping features.

3.2.1. The OB-Xa V menu

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



- **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 OB-Xa V users with which you are collaborating.

- **Import Preset:** 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.
- **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.
- **Resize Window:** The OB-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 OB-Xa V, you can also use the keyboard shortcuts Ctrl & +/- (or Cmd & +/-) to quickly adjust the window size.

- **Audio Settings: (only available in Standalone 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 OB-Xa V in Standalone mode. When using OB-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:** OB-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 OB-Xa V features.
- **Help:** This section provides handy links to the OB-Xa V User Guide and the OB-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 OB-Xa V software version and developer credits. Click the About window again to close it.

3.2.2. Browsing Presets

OB-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** (on the left) opens and closes the preset browser. This is covered in detail in the next section of this guide

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 OB-Xa V's Advanced Features

OB-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 Features section. 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 downward facing double-arrows on the right side of the Toolbar open OB-Xa V's Advanced Features section. This section is covered in detail in the Advanced Panel And Features [p.39] section of this guide.

3.2.4. MIDI Features

At the far right of the Toolbar, there are two MIDI-related options: A MIDI connector icon that switches MIDI Learn mode on and off, and a MIDI Controller Configuration menu. Both of these topics are covered in the MIDI Learn and Configuration [p.19] section later in this chapter.

3.3. The Lower Toolbar

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

- **Parameter Name** on the left displays the name of the parameter as you adjust controls. The current value of the control is listed in a tooltip that appears next to the control.
- **Unison** specifies the number of Unison voices that will be generated while the Unison function is active, from 1 to 8.
- **Poly** specifies the maximum voice pool of OB-Xa V, from 1 to 16 voices. This voice pool is shared with Unison voices and limits polyphony (how many notes can sound simultaneously) when Unison is used. To illustrate this, let's assume that the **Poly** setting is set to 16 voices. If Unison is set to 8 the maximum available polyphony will be **2** (8 unison voices * 2 notes = 16 maximum voices). If Unison is set to 4 the maximum available polyphony will be **4** (4 unison voices * 4 notes = 16 maximum voices)

  While Unison is active, the **Poly** setting can be used to achieve two types of behaviors:

  - **Mono unison** - setting **Poly** to same number of voices as **Unison** uses all available voices for unison, 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 patch from the menu.

    ♪: Changing **Poly** to fewer voices than the current Unison setting will automatically update the Unison voices to match available voice pool.

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

    ♪: When active voices have reached the maximum voice pool, OB-Xa will "steal" voices from the oldest notes.

Undo undoes the last change in OB-Xa V.

Redo redoes the last change in OB-Xa V.

Undo History lets you to see 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 configuration.

- **MIDI Ch** selects the MIDI channel(s) on which OB-Xa will receive MIDI input (All, 1-16).

> ♪: By default, OB-Xa V will receive MIDI data on all 16 MIDI channels (All setting). You can change this by selecting a specific channel in the lower toolbar. You will need to do this if, for example, you want to use an external controller with multiple instances of OB-Xa V. In this situation, every instance of OB-Xa V can be set to a unique channel, and you can change the preset or MIDI channel on your controller to control the different instances of OB-Xa V.

- **Panic Button** resets all MIDI signals in the event of stuck notes or other issues.
- **CPU Meter** displays the current CPU usage of the instrument.

> !: If the CPU meter is high, you may hear clicks, pops and other audible glitches in playback. In this case, consider increasing the audio buffer size setting. This is found under Audio Settings when working in Standalone Mode or in your host music software's preferences menu. Alternatively, you can limit polyphony with the Poly and Unison settings.

3.4. MIDI Learn and Configuration

The MIDI plug icon at the top right side of the upper toolbat places OB-Xa V in "MIDI learn" mode. In this mode, all MIDI-assignable parameters are shown 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 module.

Notice in the image above that some of the assignable controls appear in red whereas others are in purple. Purple controls are unassigned whereas red ones have already been assigned to an external MIDI control.

3.4.1. Assigning / Un-assigning controls

When MIDI Learn mode is switched on, click on any purple control to select it. Then turn a knob, move a slider or push a button on your MIDI controller. Your selected on-screen control will change from purple to red, indicating that a link has been made between your hardware control and the on-screen software parameter.

> !: Pitch Bend is a reserved MIDI controller that cannot be assigned to other controls.

A popup window appears providing additional information and various adjustable parameters about the newly "learned" connection.

3.4.2. Min / Max value sliders

By default, a hardware control will span the entire range of the on-screen control (i.e., from 0 to 100%). The minimum and maximum value sliders let you restrict the range something other than 0%-100%. For example you may want the Master Gain to be controllable via hardware from 30% to 90%. To do this, set *Min* 0.30 and *Max* to 0.90. The relationship between the physical control and the on-screen control will now be scaled such that volume cannot go below 30% or above 90%. This is very useful for making sure you cannot accidentally make the sound too quiet or too loud when performing.

3.4.3. Relative control option

In the MIDI Control Setup box, there is a checkbox labelled "Is Relative". Check this box if your hardware MIDI control is sending "relative" MIDI messages. Leave this box unchecked if the MIDI controller is sending out "absolute" messages (this is the more common behavior).

A "relative" change instructs the receiving device to increase or decrease its current value. The receiving device (OB-Xa V in this case) interprets this command as "increase/decrease your current value." This type of control is often implemented on "endless" or "360 degree" knobs that do not have hard stops at the ends of their range. The advantage of this is that physical knobs always remain in sync with on-screen controls. However, not all hardware devices support this mode of operation which is why both options are available in OB-Xa V.

> ♪: There are two common types of messages when working with MIDI knobs: Absolute and Relative. Absolute positioning sends the exact position of the knob as a specific numerical value (i.e., "Set value to 54, 55, 56, etc.") when you turn the knob on your hardware controller. This is the most common implementation and is almost always used when using potentiometer knobs with "hard" stops at the ends. One downside to this implementation is that if you change presets, your physical knob and on-screen control will be "out of sync" with each other and turning the physical control can cause the on-screen control to suddenly jump to that position.

3.4.4. Unassigning or "un-learning" a MIDI mapping

Click the **Unassign** button to disconnect or "un-learn" the MIDI mapping of an on-screen control.

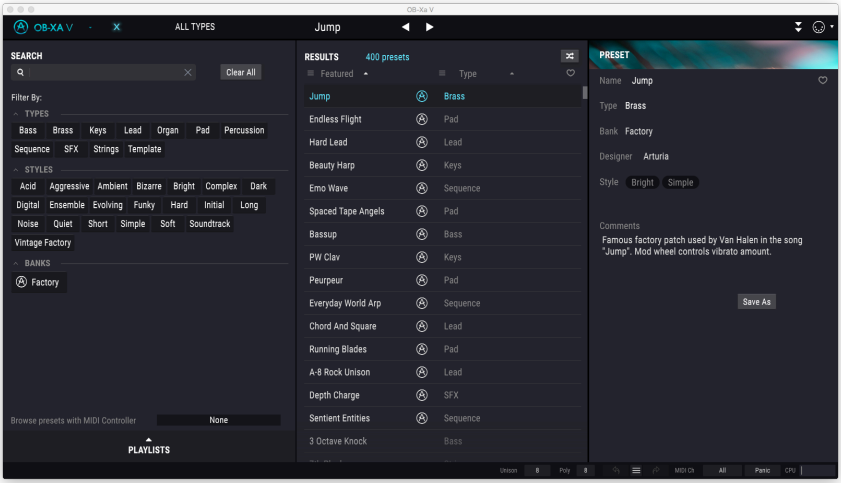
3.4.5. MIDI controller configuration

The small downward facing arrow at the right edge of the toolbar lets you manage different setups of MIDI mappings for controlling OB-Xa V. For example, if you have multiple hardware controllers (small "live performance" keyboard, large "studio" keyboard, pad based 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.

Once you have created a profile, you can save, delete, import or export it using the options in this menu.

Your MIDI Mapping profiles are listed at the bottom of this pull-down menu and the currently active profile has a checkmark next to it.

3.5. The Preset Browser in Detail



The Preset Browser (shown above) is where you can search through all of the presets to OB-Xa V. Open the Preset Browser by clicking the library symbol on the toolbar. To close the Preset Browser and return to the main screen, click the "X" that appears in the Toolbar.

To narrow down the presets and help you find the preset sounds you want, you can enter keywords in the search bar or click any of the available tags on the left column of the browser.

The results of your search are listed in the middle column. You can easily audition any displayed preset by clicking on it and playing a connected MIDI keyboard. You can sort the list results in various ways by clicking the column headers directly above the preset names. If you're feeling spontaneous, click the Random button at the top right to randomly select one preset from the results list. This is a fun and quick way to audition sounds without having to step through the list one-by-one.

Details about the currently selected preset are listed in the right column. If you really like a preset, click the heart icon at the top-right corner to tag that preset as a favorite. Click the heart icon again to un-like the preset. Once you've added some presets as favorites, you can click the Heart icon in the middle view to only display those presets.

Options for saving or deleting patches are listed at the bottom of this column.

> ♪: Factory presets cannot be modified, deleted or overwritten. Only "User" (user generated) presets can be deleted, overwritten or saved under a different name. This is done by using the "Delete" "Save" or "Save As" buttons at the bottom of the right column. If you have modified a Factory preset and would like to save it, you must save your modified preset under a different name (only the "Save As" option appears in this case since you cannot delete or overwrite factory sounds).

3.5.1. Browse Presets With MIDI Controller

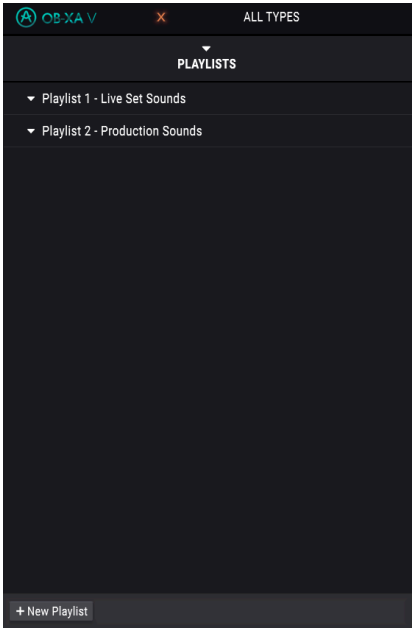
This option allows you to browse presets using the Browse knobs on Arturia MIDI Controllers. This makes it incredibly efficient to quickly audition sounds without having to reach for the mouse. To use this feature, select your Arturia controller from the menu and its Browse knob will be automatically mapped to preset browsing.

3.5.2. Playlists

In the lower left corner of the Preset Browser window is a feature titled Playlists. This is used to collect presets into collection groups, such as a set list for a particular performance or a set of presets related to a particular studio project.

3.5.2.1. Add a playlist

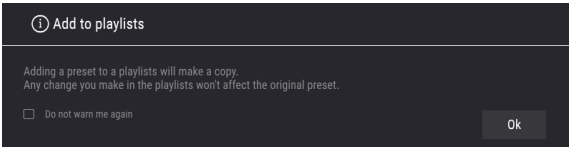
To create a playlist, click the + **New Playlist** button. Give the playlist a name and it will appear in the Playlists menu. To rename the playlist at any time, click the pencil icon at the end of its row.



3.5.2.2. Add a preset to the playlist

You can use the Search window to locate the presets you want to add to your playlist. Once you have found the right preset, click and drag it onto the playlist name on the left.

You will see a message which tells you that the new preset will be duplicated. OB-Xa V will create a copy of the preset so that you can modify settings in the playlist presets without impacting the original preset it is based on, and vice versa.



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

3.5.2.3. Re-order the presets in the playlist

Presets may be reorganized within a playlist. For example, to move a preset from slot 3 to slot 1, drag and drop the preset to the desired location.

This will move the preset into the new location.

3.5.2.4. Remove a preset from the playlist

To remove a preset from a playlist, click the **X** at the end of the preset row.

3.5.2.5. Delete a playlist

To delete a playlist, click the **trashcan** icon at the end of the playlist row.

4. MAIN PANEL AND FEATURES

If you look at the OB-Xa V front panel, you'll see that the synthesizer is composed of 11 different sections or "modules", 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 Advanced Panel And Features [p.39] section of this manual).

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

4.1. 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 instrument's Chord feature. While active, pressing a single key will trigger multiple notes. Click the **Sel** button to the right to program the notes of the chord. The panel displays a one 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.

> ♪: While using the Hold and Chord features, if the instrument reaches its polyphony limit as specified in the Lower Toolbar Settings [p.17], OB-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.

4.2. Voices Section

- **Detune** determines the amount of detuning that will be applied to voices. At lower positions the detuning of each new voice will be gentle, while moving the knob higher will increase the pitch detuning and result in a more dissonant sound.
- **Unison** switch 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 Lower Toolbar [p.17].

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

> ♪: The original OB-Xa had the ability to statically pan each of its 8 voices across the stereo field, but this process had to be done manually by opening up the unit and adjusting "under-the-hood" pan pots inside the unit. We have included these controls for an authentic experience, minus the screwdriver, in the Voice Pan [p.28] section. In addition to this, our Stereo Spread feature provides an even more powerful, dynamic panning system for creating width and dimension to your sound.

    - **Spread Mode** duplicates oscillator and filter modules for each channel - left and right - essentially like running two instances of OBX-a V, one for each channel. Each channel will have slight variations in oscillator and filter settings to create a ticker, wider sound. The Stereo Amount knob controls how much or little variation is introduced. In addition, the Advanced Controls [p.27] located below can be used to further tweak the variations.
    - **Pan Mode** assigns voices across the stereo space on every new note, as specified by the Voice Pan Controls [p.28] located below. The Stereo Amount knob controls deviation from center.

- **Stereo Amount** 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, consider lowering the Unison or Poly settings, or decrease the Loudness Release.

4.2.1. Stereo Spread Advanced Controls

This section contains additional controls that can be used to dialing in the behavior of the Stereo Spread mode to add further movement to the sound. While **Stereo** switch is active, hover over the left cover situated above the keyboard, then click it to reveal this panel.

> ♪: For these controls to have any effect, note that **Stereo Spread** mode needs to be selected and its **Amount** control turned up.

- **Osc Stereo** is a bipolar knob that 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** controls the amount of filter variation between the right and left channels.
- **LFO Stereo** adjusts the phase of the left and right channel LFO copies in degrees, from -180 and +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.

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

- **Movement Rate** controls the panning rate, from 0Hz to 3Hz.
- **Movement Amp** controls the amount of panning.

4.2.2. Voice Pan Controls

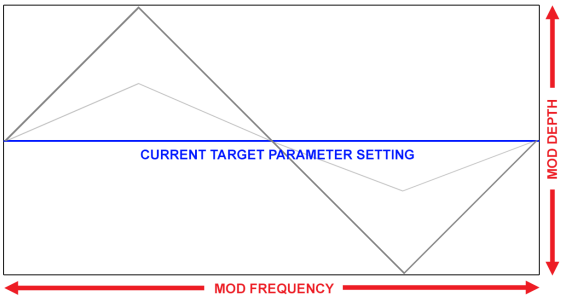
This section contains the 8 voice panning trim pots. While **Pan** switch is active, hover over the right cover situated above the keyboard the click it to reveal this panel.

Just as in 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.

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

4.3. 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.39], which allows you to modulate just about any instrument control. To get an idea of how an LFO affects a target parameter, please 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 (rate) 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** switch locks the rate of the LFO to tempo subdivisions. When using the plug-in version of OB-Xa V, the LFO rates will be synchornized to the tempo of your project.
- **Waveform** menu selects from 7 different shapes for the LFO - Sine, Triangle, Saw, Ramp, Square, Sample & Hold, and Sample & Hold (Smoothed).
- **Key Retrig** switch 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 that will be applied to any parameters whose modulation is enabled via the switches below.
- **Osc 1 Freq** switch enables and disables modulation of Oscillator 1's frequency.
- **Osc 2 Freq** switch enables and disables modulation of Oscillator 2's frequency.
- **Filter Freq** switch 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** switch 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** switch 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** switch 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.27]. This enables you to create rich stereo movement in the modulation.

4.4. 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 Ob-Xa V and have also made it a continuous control, rather than an on/off switch.

- **Osc 1/2 Frequency** knobs set the frequency of each oscillator. Oscillator 1 is adjusted in octaves, while Oscillator 2 is adjusted in semitones.
- **Osc 1/2 Waveform** 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 achieved 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 settings, make sure that the Osc 2 Volume control is turned up in the Filter section mixer.

- **Sync** synchronizes Osc 2 to Osc 1 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 pitch of the first oscillator.

> ♪: When sync is enabled, sweeping the second oscillator's Frequency knob will provide a variety of complex and interesting tones. For even more adventurous tones that "move" try using an LFO, envelope or other control source to modulate the second 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 "on" phase of the waveform, resulting in a thinner, more nasal sound. Note that this control only has an effect if square waveform has been enabled for either oscillator.

4.5. Filter Section

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

- **Frequency** controls the cut-off 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** controls the resonance 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 cut-off band. While the 4 Pole switch is in the on position (4-pole filtering), turning up Resonance not only boost frequencies at the cut-off band, but will also attenuate frequencies outside the cut-off band resulting in a quieter sound with more emphasis around the cut-off frequency.

- **Modulation** sets the amount of modulation that will be applied to the Filter Frequency from the Filter Envelope.

- **4 Pole** switch 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 cut-off Frequency.

- **Track** switch 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 sets the Frequency higher. This can be effective for "balancing" the filtering, such that playing higher notes automatically opens more of the filter to let higher frequencies through.

> ♪: The original hardware featured an F-Env switch which let you modulate the pitch of OSC2, as well as the Filter Cutoff, using the Filter Envelope. In OB-Xa V, this control has been moved to the Advanced Panel [p.39] and is now freely assignable to just about any parameter you wish to control.

4.5.1. Mix Controls

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

- **Osc1 Mix** controls the amount of Osc1 signal sent into the filter.

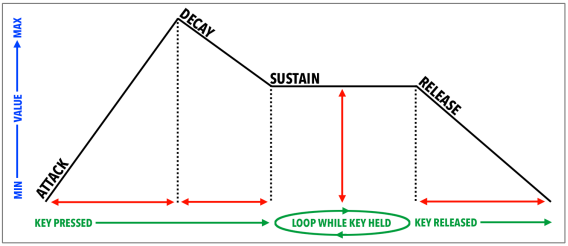
- **Osc2 Mix** controls the amount of Osc2 signal sent into the filter.

- **Noise** controls the amount of Noise that can be optionally blended in to add grit to the signal.

4.6. Envelopes Section

This section contains the envelope controls, 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 bellow illustrates the various stages of an ADSR envelope:



The Filter Envelope controls are as follows:

- **Filter Attack** controls the duration of the Attack stage of the Filter Envelope.
- **Filter Decay** controls the duration of the Decay stage of the Filter Envelope.
- **Filter 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.
- **Filter Release** controls the duration of the Release stage of the Loudness 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 OB-Xa V the filter envelope (F-Env) can be freely assigned to any parameter, including Osc2 Pitch, in the Input Modulators [p.41] section.

The Loudness Envelope controls are as follows:

- **Loudness Attack** controls the duration of the Attack stage of the Loudness Envelope.
- **Loudness Decay** controls the duration of the Decay stage of the Loudness Envelope.
- **Loudness 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.
- **Loudness 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.

4.7. Vibrato Section

This sections contains controls for the Vibrato. Vibrato can be useful for creating expression in the sound, by applying a fast bending effect to the pitch of the signal. This is similar to a technique that's often used by string players, who slide a finger up and down a strings quickly while bowing or plucking the string to add expression and movement to the sound.

- **Osc1 Vibrato** switch enables and disables Vibrato for Osc1.
- **Osc2 Vibrato** switch enables and disables Vibrato for Osc2.
- **Vibrato Rate** controls the speed of the Vibrato, from slow to fast.
- **Vibrato Depth** controls the amount of pitch modulation that will be applied, from subtle up to 3 semitones.
- **Vibrato Shape** switches control the shape of the pitch modulation.

♪: In the Advanced Panel [p.39], try assigning Aftertouch to Vibrato Depth. Now, when you apply pressure to a key after you've pressed it, you can bring in Vibrato to taste as you change pressure.

4.8. Portamento Section

This sections contains controls for the Portamento. Portamento 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.

- **Portamento Time** controls the duration it will take for the pitch to "arrive" at the pressed note from the previously pressed note. Set this control to minimum (0 s/octave) if you don't want any portamento glides.

- **Portamento Quantize** 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, resulting in a stepped modulation.

4.9. Arpeggiator Section

An arpeggiator allows you to hold down one or more notes and hear those notes played back, one after the other. When a single note is held it will be repeated; when two or more notes are held the arpeggiator will alternate between the notes. 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 segment 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.

Arpeggiator On switch turns the arpeggiator on and off.

Arpeggiator Rate sets the speed of the arpeggiator.

Arpeggiator Sync specifies whether the arpeggiator will be free-running, or 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 equaling 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.

4.9.1. 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.

4.9.1.1. 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 and 4 do the same thing: play the notes of the Mode through a 3 or 4 octave range.

4.10. 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.

- **Bend Amount** controls the range of the Pitch Bend wheel in various note intervals - 1st, 2st, minor third, major third, fifth, sevent, 1 octave or 2 octaves.
- **Bend Osc2 Only** switch controls whether the Pitch Bend wheel will affect both Osc1 and Osc2 (off position) or just Osc2 (on position).

5. 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.

5.1. Overview

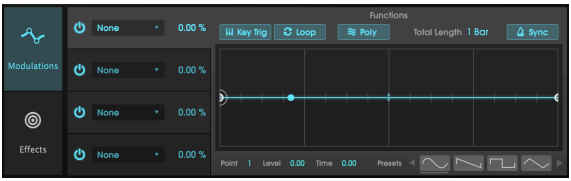
Things have come a long way since 1980 when Oberheim launched the OB-Xa. We now have technologies that musicians from the 1980s could only dream about and these technologies are actively driving music-making forward. Take the envelope generator as one small example. This was initially a simple device 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 OB-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, just click the double arrows at the top-right of the screen.

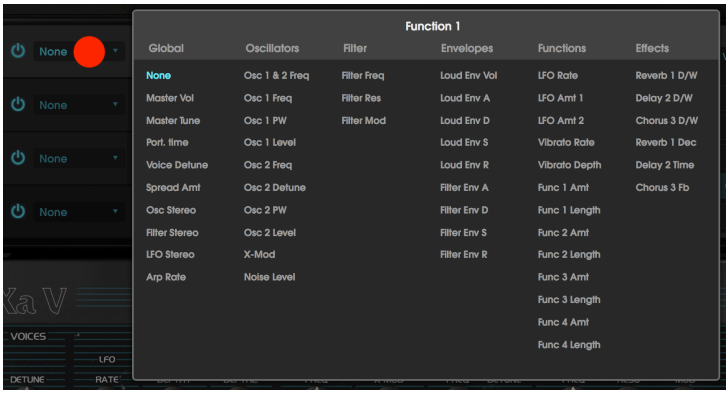
5.2. Navigating the Advanced Features

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

5.3. Modulation Section



The Modulation section lets you generate up to four highly complex envelopes that you can then assign to nearly any parameter of OB-Xa V. These are more than just typical envelopes - they are flexible modulation sources that can act as traditional envelopes, low-frequency modulators (LFO), or even as step sequencers.



Select any of the four envelopes by clicking on their boxes on the left side of the screen. Envelopes can be switched on and off using the **Power** switches. Select the destination of each envelope by clicking on the **Destination** menu ("None" by default), and choosing a parameter from the menu.

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

Once you have selected a destination, you can set the **Modulation Amount** (i.e., strength of envelope's modulation). Note that modulation is bipolar and the effect of an envelope on its destination can be set from 100% to -100%.

In the middle of the screen is the visual display of the envelope. Envelopes are required to 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 up to 16 points in total. Click anywhere in the display area to add a new point. Right-click to remove it. Click and drag to move it.

The **Point**, **Level** and **Time** parameters at the bottom of the display show numerical values for a selected point (indicated by a white halo). These parameters indicate the selected point (1 to 16), its level (from -1 to 1), and its position in the timeline (from O to 1).

By default, a linear path is drawn between points. However, the small translucent arrows (located halfway between two points) can be dragged up or down to add a curve to the connecting segment. Being able to set exact curvature really opens up a world of sound design possibilities over simple linear paths.

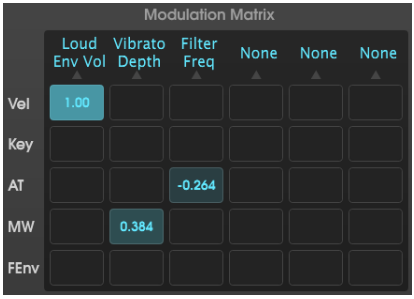
The section on the top displays various parameters pertaining to the displayed envelope. **Loop** switches envelope looping on and off. **Key Trig** switches key triggering on and off (i.e., when this is switched on, new notes re-trigger the envelope; when key triggering is switched off, the envelope runs freely regardless of what is being played).

The **Poly** switch determines whether the envelope will run in monophonic or polyphonic mode. In monophonic mode (Poly switch off), the envelope cycle will be synced across all playing voices. In polyphonic mode (Poly switch on), each voice will generate its own envelope when triggered, allowing you to offset the modulation between voices.

The **Total Length** parameter determines how long it will take for the envelope to play fully. If **Sync** is switched on, playback speed is synchronized and relative to the tempo of your DAW (or OB-Xa V's internal tempo when working in standalone mode) and the Total Length value is displayed in bars. If Sync is switched off, then the Total Length is shown in seconds.

Finally, the **Presets** section on the bottom lets you select from a variety of commonly used envelope shapes. Click on any shape to load it to the currently selected envelope slot. Use the two arrows to scroll through more preset shapes. Once a preset is loaded into the visual display in the center, you can modify it like any other envelope.

5.3.1. Input Modulators



The Input Modulators Section features a powerful modulation matrix, which lets you connect common MIDI values, like velocity and modwheel to nearly *any* destination within OB-Xa V.

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

The inputs of this matrix are listed in a column on the left and the destinations are listed in a row along the top. You can select a destination by clicking on the box at the top of each column and choosing from any of the available options.

You can connect any input to any destination (or multiple destinations) by click-dragging on the square where the input and output intersect. Modulations in this matrix can be positive or negative and can be dialed in with high precision (-1.000 to +1.000 in increments of .001). To eliminate a connection, simply double-click it.

> ♪: You can right-click and drag parameters in the matrix to enter values with very high precision. This can be very handy when fine-tuning your sound design.

Let's take a look at a common use case: As you design sounds, you may find that you want to map keyboard velocity to the filter cutoff, so that as you strike the keys harder on your MIDI controller, OB-Xa V's output become brighter. To do this, first select the destination by clicking on one of the boxes at the top of each column and selecting Cutoff from the menu that appears. Set the filter to about "5". Next, find the box in the modulation matrix where the Keyboard Row and the FilterFreq column intersect. Click-drag this box up and down as you play notes of varying velocity. You should now be able to hear the effect of velocity on the filter cutoff.

5.4. The Effects

5.4.1. Why use effects at all?

The way we think about effects has changed since the 1980s. In earlier times, effects were not considered an essential part of the synthesis process and were used sparingly. Today, effects are a vital component of a sound, and their importance sometimes even supersedes that of oscillators and other sound generators. Why? We believe it's because effects are really effective at adding expression and emotion to raw sounds. We expect that effects will continue to be a source of inspiration and innovation in music and this is why we revive classic effects and modernize them with 21st century touches.

5.4.2. Selecting an effect

OB-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, OB-Xa V's output goes from one effect to the next in succession; In parallel mode, OB-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 effect parameters to hardware controls on an external USB MIDI device. This is covered in the MIDI Learn And Configuration [p.19] section of this guide.

5.4.3. Each effect in detail

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

5.4.3.1. 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.

5.4.3.2. 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 are common in modern delay effects. If you would like a warmer and more modulated delay sound, see the Analog Delay effect below.

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 OB-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.

5.4.3.3. 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.

5.4.3.4. 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.

5.4.3.5. Phaser

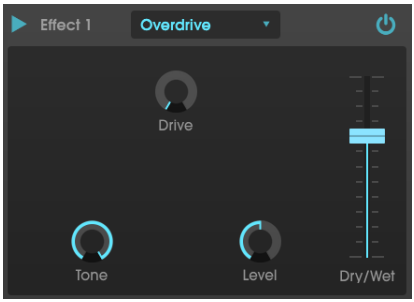
Phase shifting is a sweeping effect that was first popularized in the 1960s. It adds motion and a swirling character to the sound. It works by splitting the incoming signal, changing the phase of one side, and recombining it with the unaffected signal. This creates a notch-comb filter which can be swept 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).

5.4.3.6. Overdrive

Will 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.

5.4.3.7. Compressor

At its core, a compressor is simply a device that is 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.

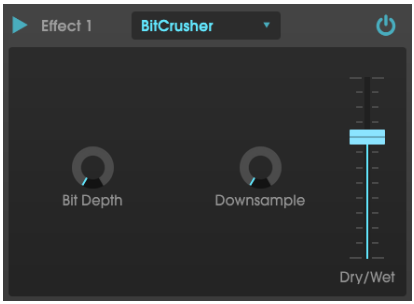
If you are using a compressor in a chain of effects, the compressor can keep the attack transients of a sound from overloading the input of the next effect. It can also re-contour a sound that naturally decays quickly so that it has a longer sustain. Drums are often compressed to add "punch". Compression 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.

5.4.3.8. 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.

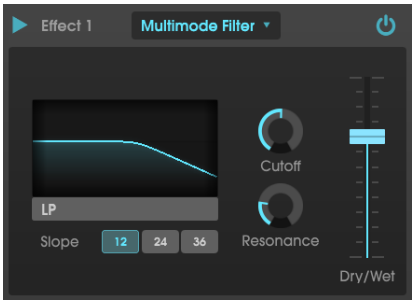


To explore this effect, start by setting the Bit Depth and Downsample dials to the minimum settings. Then gradually turn each dial up to reduce the bit depth and sampling rate of the incoming signal. Each knob has a different degrading effect and you can experiment with different settings to find the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

5.4.3.9. Mutlimode 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.

6. MIDI AUTOMATION

The original OB-Xa was launched in 1980, a few years before the introduction of the MIDI protocol in 1983. This means the OB-Xa hardware was unable to benefit from all the good things brought about by MIDI.

Fortunately things are different with OB-Xa V. The software fully supports the MIDI protocol and this is how the instrument receives information from your host music software about what note to play, how long and with what velocity. The support for MIDI is not limited to basic commands like note-on, note-off and velocity. As with all Arturia software instruments, the MIDI support goes deep into the core of the instrument and you can use MIDI Continuous Control ("CC") messages to automate nearly *any* parameter within OB-Xa V. This opens up entirely new avenues of creative expression.

It's important to note that each host music software (Ableton Live, Logic, Cubase, etc.) implements MIDI automation in its own way and it is impossible for us to provide step-by-step instructions for each host. Therefore, what we will do here is cover the general idea of MIDI CC control and show what it can do in one DAW (Ableton Live). If you are not already familiar with MIDI automation for your host software, please refer to your software's documentation to learn more.

6.1. What is MIDI CC?

To sum it up in one sentence: MIDI CC is like Voltage Control for the digital age.

The original OB-Xa hardware did not include any way of modulating parameters via control signal (or MIDI). This means the only way to change parameters, other than using the built-in modulators like the LFO and envelopes, would be to physically turn them by hand, which would not be possible if you're using both hands to play the instrument.

OB-Xa V changes all that. Nearly every parameter in OB-Xa V can be "voltage controlled", not with actual voltages but with MIDI CC commands. Nearly every control on OB-Xa V (knobs, buttons, etc.) has a unique CC number associated with it and by sending CC data to that number, you can "automate" (i.e., push, turn or move) that control.

This is incredibly powerful. It means you are no longer limited to what you can turn by hand or control through LFO and envelope modulation. You can control OB-Xa V remotely even if you don't see the user interface in front of you. You can even compose complex automation routines in the timeline of your music software and have these changes happen automatically and with perfect repeatability. It is like having dozens of extra hands to precisely turn knobs exactly as you want without making any mistakes.

What's even better is that modern host applications do not even require you to look up cryptic CC numbers for every control you want to manipulate. Most host applications automatically detect and spell out, in plain English, what every CC number controls. Some applications like Ableton Live go even further and let you simply click on an on-screen control to select it without ever having to know anything about CC values at all.

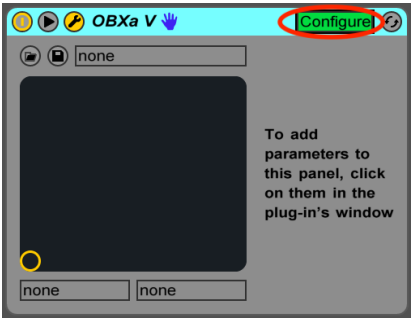
6.2. Selecting knobs to automate with CC

If you want to control OB-Xa V knobs from Ableton Live, you will need to do the following:

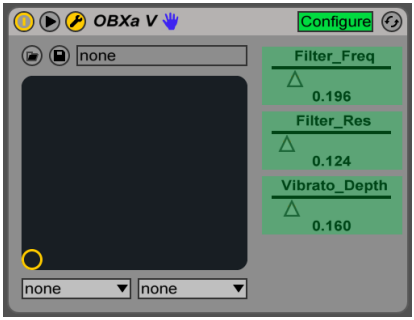
- Drag a copy of the OB-Xa V plugin to an empty MIDI track.

- Click on the downward arrow to unfold the device parameters.

- Click on "Configure" button.



- The OB-Xa V panel will now open and any control that you click inside OB-Xa V will be added to the configuration window (just below the Configure button).



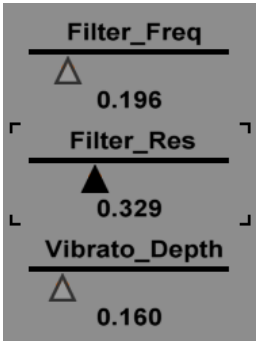
- When you are done selecting controls that you would like to automate, click the "Configure" button again to exit the configuration mode.

6.3. Controlling knobs with CC

In the preceding section, we selected knobs that we want to control with Ableton Live. In this section, we will show you three ways to control your selected parameters.

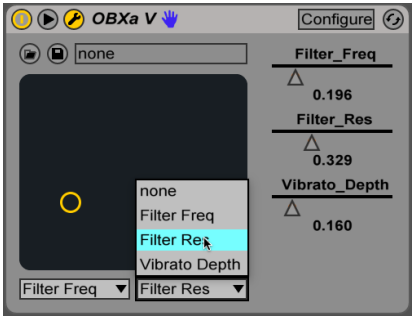
6.3.1. Method 1: Direct Control

The simplest method is to simply click and drag a slider to change it. You can do this even if the OB-Xa V window is closed or buried behind other windows. This is a convenient way of remotely controlling important OBXa parameters directly from Live without having to look at the OB-Xa V user interface.



6.3.2. Method 2: Assign to XY Pad

Another way to control one or two selected parameters with CC is to assign them to the XY Pad. This is done by opening the pull-down menu and selecting any of the controls that you made available in the previous section of this guide. Now you can control your chosen parameters simultaneously by dragging the circle.

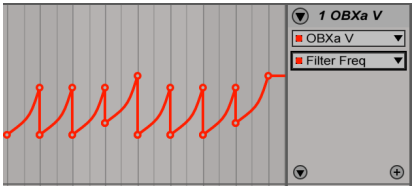


6.3.3. Method 3: Automating MIDI CC in a timeline

Imagine being able to make precise automated adjustments of the attack time, reverb size or any number of other parameters as your song plays through its different sections (verse, chorus, bridge, for example). MIDI CC makes it possible and you can do this through Ableton's track automation features:

- Select the OB-Xa V from the top pull-down menu, then select one of the parameters that you configured in the previous section.

- Click on the line to add breakpoints and drag points to position them in time. As Ableton Live plays you will see the associated knob in OB-Xa V animating and reacting to what you have drawn in the automation lane.



- If you would like to control more than one parameter in a track, you can do so clicking the "+" icon to add more automation lanes to a track, then selecting another parameter automation.

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The use of the software within a network is illegal where there is the possibility of a contemporaneous multiple use of the program.

You are entitled to prepare a backup copy of the software which will not be used for purposes other than storage purposes.

You shall have no further right or interest to use the software other than the limited rights as specified in this Agreement. Arturia reserves all rights not expressly granted.

3. Activation of the Software

Arturia may use a compulsory activation of the software and a compulsory registration of the OEM software for license control to protect the software against unlawful copying. If you do not accept the terms and conditions of this Agreement, the software will not work.

In such a case the product including the software may only be returned within 30 days following acquisition of the product. Upon return a claim according to § 11 shall not apply.

4. Support, Upgrades and Updates after Product Registration

You can only receive support, upgrades and updates following the personal product registration. Support is provided only for the current version and for the previous version during one year after publication of the new version. Arturia can modify and partly or completely adjust the nature of the support (hotline, forum on the website etc.), upgrades and updates at any time.

The product registration is possible during the activation process or at any time later through the Internet. In such a process you are asked to agree to the storage and use of your personal data (name, address, contact, email-address, and license data) for the purposes specified above. Arturia may also forward these data to engaged third parties, in particular distributors, for support purposes and for the verification of the upgrade or update right.

5. No Unbundling

The software usually contains a variety of different files which in its configuration ensure the complete functionality of the software. The software may be used as one product only. It is not required that you use or install all components of the software. You must not arrange components of the software in a new way and develop a modified version of the software or a new product as a result. The configuration of the software may not be modified for the purpose of distribution, assignment or resale.

6. Assignment of Rights

You may assign all your rights to use the software to another person subject to the conditions that (a) you assign to this other person (i) this Agreement and (ii) the software or hardware provided with the software, packed or preinstalled thereon, including all copies, upgrades, updates, backup copies and previous versions, which granted a right to an update or upgrade on this software, (b) you do not retain upgrades, updates, backup copies und previous versions of this software and (c) the recipient accepts the terms and conditions of this Agreement as well as other regulations pursuant to which you acquired a valid software license.

A return of the product due to a failure to accept the terms and conditions of this Agreement, e.g. the product activation, shall not be possible following the assignment of rights.

7. Upgrades and Updates

You must have a valid license for the previous or more inferior version of the software in order to be allowed to use an upgrade or update for the software. Upon transferring this previous or more inferior version of the software to third parties the right to use the upgrade or update of the software shall expire.

The acquisition of an upgrade or update does not in itself confer any right to use the software.

The right of support for the previous or inferior version of the software expires upon the installation of an upgrade or update.

8. Limited Warranty

Arturia warrants that the disks on which the software is furnished is free from defects in materials and workmanship under normal use for a period of thirty (30) days from the date of purchase. Your receipt shall be evidence of the date of purchase. Any implied warranties on the software are limited to thirty (30) days from the date of purchase. Some states do not allow limitations on duration of an implied warranty, so the above limitation may not apply to you. All programs and accompanying materials are provided "as is" without warranty of any kind. The complete risk as to the quality and performance of the programs is with you. Should the program prove defective, you assume the entire cost of all necessary servicing, repair or correction.

9. Remedies

Arturia's entire liability and your exclusive remedy shall be at Arturia's option either (a) return of the purchase price or (b) replacement of the disk that does not meet the Limited Warranty and which is returned to Arturia with a copy of your receipt. This limited Warranty is void if failure of the software has resulted from accident, abuse, modification, or misapplication. Any replacement software will be warranted for the remainder of the original warranty period or thirty (30) days, whichever is longer.

10. No other Warranties

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