_AUGMENTED SERIES

ARTURIA
_The sound explorers

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Introduction

Congratulations on your purchase of an Arturia Augmented SERIES instrument!

Each of the Augmented SERIES contains a large library of multi-sampled instruments, as well as a state-of-the-art synthesis engine – combined within an approachable, exciting software instrument. This will give modern composers and producers immediate access to a comprehensive range of authentic, abstract, and evocative sounds in a variety of playing techniques, as well as an infinite variety of synthesized and hybrid timbres.

This manual covers the features and operation of the Augmented SERIES virtual instruments. There are currently seven in the series:

- Augmented BRASS
- Augmented GRAND PIANO
- Augmented MALLETS
- Augmented STRINGS
- Augmented VOICES
- Augmented WOODWINDS
- Augmented YANGTZE

Because these instruments are identical in layout and function, this manual will present their features in a unified structure.

> ℹ To make the manual easier to read, instead of saying something like "your Augmented SERIES instrument" over and over, we will refer to the software as simply **Augmented**. (We are sure that you can mentally add "BRASS", "STRINGS", etc., on your own.)

In the chapter entitled The Augmented Instruments, you'll find specifics about each particular instrument in the Augmented SERIES, including the one(s) you've purchased.

> ℹ Be careful, though – once you've seen and heard how much this one instrument can do, and you read about what the others have to offer, you're going to want to own them all!

Be sure to register your software as soon as possible! When you purchased this Augmented instrument, you were sent a serial number and an unlock code by e-mail and/or the Arturia Downloads & Manuals. These are required during the online registration process.

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: Protect Your Hearing

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.

Visit Arturia Online

Be sure to visit the www.arturia.com website for information on all our other inspiring hardware and software instruments, effects, MIDI controllers, and more. They have become indispensable tools for many visionary artists around the globe.

Musically yours,

The Arturia Team

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Augmented SERIES: Learn one instrument, access seven sonic universes!

The Augmented SERIES are hybrid instruments unlike any other. Their sonic capabilities range from traditional acoustic sounds to unique and inspiring hybrid textures. Check out what's on offer in the Preset Browser... and don't forget to play with the Macro knobs, and hear how they can tweak and twist your sounds with ease!

1.1. Augmented SERIES sound engine

Every Preset in an Augmented SERIES instrument combines two Layers, each of which has two sound sources (Engines) available. Each Engine can be either a versatile sample player (Sampler) or a powerful synthesizer engine (Synth).

The Sampler engines offer dozens of multi-sampled sounds from a particular family of acoustic instruments – brass, grand piano, mallets, strings, voices, woodwinds, and traditional Chinese instruments. Depending on the specific instrument, these sounds may be presented as solo instruments, paired or in small groups, or as full orchestral sections.

Each library also includes a variety of articulations, from traditional playing styles to more unusual ones, sometimes with the instrument's timbre altered with external *preparations* such as weaving cloth between piano strings, loosening marimba fittings to create rattle, etc.

Each library also comes with its own unique set of processed sounds and some fun additional samples to add even more options to your sonic design.

The Synth engines can have one of four synthesis types (Analog, Granular, Harmonic, and Wavetable), with an additional Simpler engine for added sample manipulation where needed.

The basic interface, called the Play Panel, is extremely simple to use, with eight Macro knobs and easy controls for changing sound sources, relative volumes, and more. To dive deeper, you can click on the Layers and FX buttons to obtain complete control over every aspect of your sound design. Your playing experience can be as simple or complex as you wish – with dozens of amazing factory Presets at your fingertips to get you started, and the potential to create many, many more.

1.2. Features

- Hybrid synthesizer featuring four separate sound sources (Engines).

- Each Layer contains two of these Engines, either a Sampler or a Synth.

- Includes a large library of acoustic instrument samples, as well as additional samples and processed samples.

- Each Engine can be set to one of five types: Analog, Granular, Harmonic, Simpler, and Wavetable.

- Each patch supports up to two simultaneous Samplers or a Simpler.

- Blend Layers and modify various parameters using the Morph Macro.

- There are seven additional programmable Macro knobs, three for the sound engines and four for the FX.

- Each Layer in a patch contains two FX inserts.

- Each patch also includes a global Delay and Reverb on the output.

- Modulation routings allow for complex sound sculpting, with easy drag-and-drop from a central location.

- Modulation sources include 2 LFOs, 2 Function generators, 2 Random signal sources, and 4 Keyboard modifiers.

- Easy MIDI Learn function for quick control setup.

- Built-in arpeggiator with multiple play modes, chord selection, random variations, and more.

2. ACTIVATION AND GETTING STARTED

The Augmented SERIES instruments work on computers equipped with Windows 10 or later and macOS 11 or later. You can use the instruments in standalone mode or as an Audio Unit, AAX, VST2, or VST3 instrument inside your Digital Audio Workstation (DAW) software.

> ℹ Remember that in this manual, we usually will call the instrument **Augmented** rather than Augmented BRASS, Augmented VOICES, etc.

2.1. Activate the license

Once Augmented has been installed, the next step is to activate your license for the instrument. This is a simple process that can be done through a separate program called the **Arturia Software Center (ASC)**.

> ℹ It's also possible to activate your license within the instrument itself, but we recommend ASC. It provides a single place for you to track all of your Arturia licenses, installations, and updates in a clean and easy way.

2.1.1. The Arturia Software Center (ASC)

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

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

Once the software is installed:

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

That's it!

2.2. Augmented as a plug-in

Augmented comes in VST2, VST3, Audio Unit (AU) and AAX plug-in formats for use in all major DAW software such as Ableton Live, Cubase, Logic, Pro Tools, Studio One, REAPER, Bitwig Studio, and many more. When using Augmented as a plug-in, all audio and MIDI device settings are handled by the host music software. Please refer to your host music software's documentation if you have any questions about loading or using plug-ins.

Note that when you load Augmented as a plug-in inside your host software, its interface and settings work the same way as in standalone mode, with a few small differences:

- Augmented plug-ins will synchronize to your DAW's host tempo/BPM rate where appropriate.
- You can automate numerous parameters using your DAW's automation system.
- You can run the output of your Augmented plug-in through any additional audio effects available to your DAW such as delay, chorus, filters, etc.
- You can route the instrument's audio outputs more creatively inside your DAW using the DAW's own audio routing system.
- You can use more than one instance of each Augmented plug-in in a DAW project.

> In standalone mode, you can only launch one instance of each Augmented instrument as a separate application: for example, one instance of Augmented and one instance of Augmented VOICES would have to run as two different programs.

2.3. Initial setup for Standalone Use

If you would like to use Augmented 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.

> ℹ️ This section only applies to readers that plan to use Augmented in standalone mode. If you are only going to use Augmented as a plug-in inside a DAW or other host music software, you can safely ignore this section.

2.3.1. Audio and MIDI settings

At the top left corner of the Augmented main window is an icon with three bars. Click it to reveal the following dropdown menu:

Select **Audio MIDI Settings** to bring up the following window. (This option will not be available on this menu when using Augmented as a plug-in.)
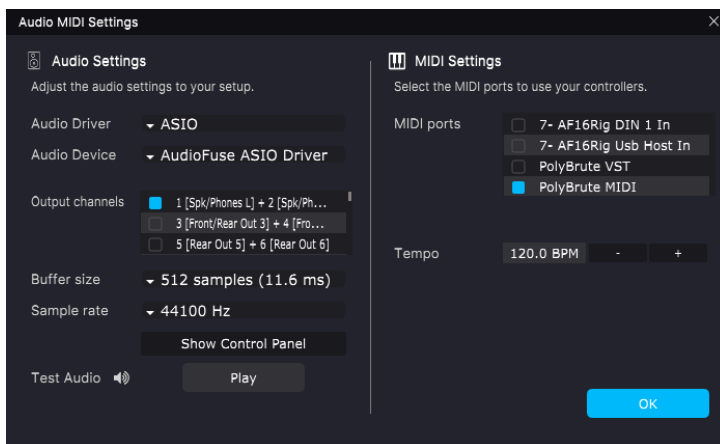
Audio MIDI Settings for Windows
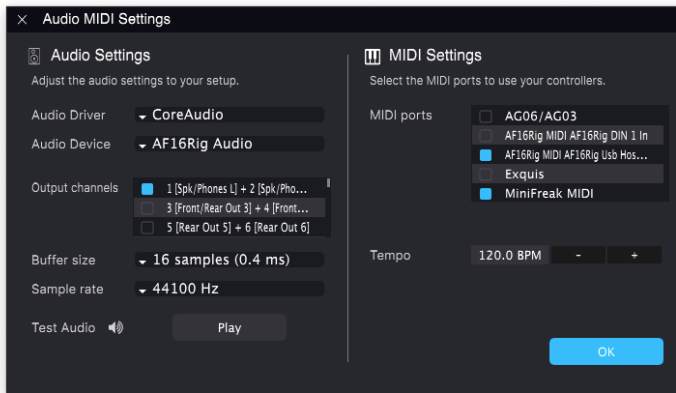
Audio MIDI Settings for macOS

The **Audio Settings** section, on the left side of the window, contains the following settings:

- **Audio Driver** selects which audio driver will handle playback of Augmented. This can be your computer's internal driver, or an external soundcard driver.

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

- **Audio Device** shows the name of your hardware interface, selected from a drop-down menu if you have more than one device connected to your computer.

- **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 this setting will not appear. If your device has more than two outputs, you can select one or more here by checking the appropriate boxes.

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

> ℹ If your computer is an older, slower model, or you're running a lot of CPU-heavy software, set a larger buffer size to lighten the CPU load. Be aware that this could result in significant *latency*: a time delay between pressing a key and hearing a sound, which can be problematic while performing. (The latency is shown in parentheses next to the buffer size setting.) If you have a relatively new and fast computer, you can use a much smaller buffer size to reduce latency. If you start to hear clicks, pops, or interruptions in your audio, then you should increase the buffer size a bit, and play with it until you have the smallest buffer that gives you click-free sound.

- **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 for most applications, including Augmented. Higher sample rates place greater loads on the CPU, so we recommend staying at 44.1 or 48 kHz unless you have a specific reason 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. On the rare occasions when device control is needed in macOS and the interface maker has not provided a control panel app, you can work with your output device in the Audio MIDI Setup utility that comes with every Mac.

- **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).

The **MIDI Settings** section, on the right side of the window, has the following options:

- Your connected MIDI devices will appear in the **MIDI Ports** menu. (Note that this menu is only displayed if at least one MIDI device is connected to your computer.) There will be a check box beside each connected MIDI device. You can use as many as you like to control the Augmented instrument – simply click the check boxes for each device you want to use. (In the screenshot above, a keyboard and separate control surface are being used to control Augmented together.)
- **Tempo** sets the tempo of Augmented's arpeggiator and other clocked parameters like LFO rates. When using Augmented inside a host music software as a plug-in, the instrument gets tempo information from your host software.

2.4. Taking Your Augmented SERIES Instrument for a Test Drive

Now that you have your Augmented instrument up and running, let's take it for a quick test drive!

If you haven't done so already, launch Augmented as a plug-in or as a standalone instrument. If you have a MIDI controller set up, use it to play some notes.

The up and down arrows next to the patch name in the Upper Toolbar let you step through all of the available Presets. Try playing a few, and when you find one that you like, try adjusting some of the other on-screen controls to see how they affect the sound.

You don't have to worry about playing around with any of the controls – nothing you do will be saved unless you specifically save a Preset (we'll get to that later), so there is no chance of messing up any of the factory Presets.

Now you're ready to dive in and start learning your way around Augmented. The rest of this User Manual will help you work your way through all of the features, with a special section at the end for the particular instrument(s) you own. You'll be creating and playing amazing sounds in no time!

Everything we'll cover in future chapters applies equally to all of the instruments in the Augmented SERIES. But before we get to that, let's introduce each of the Augmented instruments and talk about their specific sample libraries.

3.1. Augmented BRASS

Augmented BRASS contains two groups of multi-sampled brass sounds: Chamber Brass and Orchestral Brass.

3.1.1. Chamber Brass

Chamber Brass includes recordings of four classical brass instruments – Horn, Trombone, Trumpet, and Tuba – played by two or more musicians in various pairings (such as Trombone & Trumpet) as well as groups of a single type of instrument (such as Horn), all played with different articulations.

If you've never worked with brass instruments before, you might find these descriptions useful for figuring out which to use for your music:

- The **Horn**, also called the *French Horn*, is a brass instrument with a wide bell, plays with the horn facing away from the audience for a muted and mellow sound. Pitch is controlled by rotary valves, as well as the player's breath force and *embouchure* (lip placement), and inserting one hand into the bell. Orchestral horns are tuned to either Bb or F.

- The **Trombone** is a brass instrument whose pitch is controlled by the movement of a brass slide back and forth. It is tuned to Bb, one octave below the trumpet and one octave above the tuba.

- The **Trumpet** is the highest-pitched of the traditional brass instruments and is frequently used for solo parts. Pitch is controlled by a set of piston valves. Like other brass instruments, the trumpet comes in multiple sizes with different pitch ranges; the most common is tuned to Bb.

- The **Tuba** is the lowest-pitched orchestral brass instrument, tuned to Bb one octave below the trombone and two octaves below the trumpet. With pitch controlled by piston valves and a large upward-facing bell, it is characterized by a deep and powerful tone.

The Chamber Brass samples include the following groupings:

- Horn, Trombone, Trumpet, and Tuba (each with two or more players in unison)

    - The Trumpets include Trumpet Muted (played with a metal mute inserted in the bell for a thinner and more restrained sound)

- Horn & Trumpet

- Trombone & Trumpet

- Tuba & Trumpet

These are available in two different articulations:

- **Staccatissimo**: Very short notes

- **Sustain**: Long sustained notes

3.1.2. Orchestral Brass

The **Orchestral Brass** samples feature recordings of entire orchestral brass sections playing together. These include multiple horns, trombones, trumpets, and tubas, as well as bass trombone, contrabass trombone, and cimbasso (a low-pitched instrument in the trombone family).

The sounds are presented with several playing techniques:

- **Staccato**: Playing short and precise notes, in unison or octaves.

- **Sustain**: Sustained playing in loud, muted, or soft dynamics.

- **Random Forte Piano** and **Random Swells**: Each player's volume changes over time, either producing distinctive changes in overall level or a slowly evolving volume envelope. As each player's level changes, the overall tonal balance of the section will also change – for example, a shift from more tubas playing louder to more horns playing louder.

- **Random Fluttertongue**: Each player flutters their tongue against the mouthpiece of the instrument, producing a very distinctive "fffrrrr" sound. This technique is most commonly used on woodwinds, but here it produces a powerful and dramatic tension effect.

- **Random Reattacks**: Players "reattack" their notes (choosing when to move the bow back and forth) at random times, causing different voices to gain more presence for a moment before returning to the overall sound.

- **Random Ricochet**: Each player flicks the bow down upon the strings to make it bounce and produce a short series of notes. This produces a constantly changing and evolving cluster of notes. When a soloist uses this technique, it's called a *jeté* (see below).

- **Random Vibrato**: Each player slightly varies the pitch of the note being played, thickening and detuning the ensemble for a powerful, heavy effect. Note that in brass instruments, an accompanying variation in volume (*tremolo*) will also always be present, and in these samples that volume change will be more immediately obvious than the pitch variation.

3.2. Augmented GRAND PIANO

Augmented GRAND PIANO has dozens of multi-sampled sounds from a Steinway Model D grand piano, both "pure" and "prepared" in a variety of ways. In addition to these Real Pianos, there are also Processed Pianos and inspiring Additional Samples as well. The samples include traditional playing techniques, along with a variety of unusual playing methods that you wouldn't see in most classical concerts.

The samples in Augmented GRAND PIANO go far beyond traditional instruments played in a conventional manner. While there are samples of conventional playing (**Pure** and **Pure Pop**), the majority of samples are of *prepared pianos*.

A prepared piano is a piano whose inner workings have been altered by adding materials of various sorts in different ways, for example:

- **Felt** woven into the strings or covering the hammers to dull and soften the sound.

- **Hammer Noises**: The unpitched "thump" of the piano hammers without any resonating string sound.

- **Paper** woven between the strings to shorten sustain and add a distinctive "rustling" timbre.

- **Ping Pong**: Ping pong balls are placed on the strings to bounce around as the strings vibrate, re-striking them for ghostly echoes.

There are also samples of pianos played in an unusual manner. Some examples of what you'll find:

- **Bowed**: The piano string is bowed by a length of wire wrapped around it and moved back and forth by the player.

- **Finger Pluck**: The strings are plucked as one might do with a guitar or cello.

- **Soft Mallet**: The strings are played with mallets as might be used on a xylophone. The damper pedal is held down so the sounds sustain.

- **Stick Attack**: The strings are struck with drumsticks. The dampers are in place so the sound isn't sustained.

3.3. Augmented MALLETS

Augmented MALLETS contains multi-sampled sounds in various playing techniques from four of the most common orchestral tonal percussion instruments: the Celeste, Tubular Bells, Marimba, and Vibraphone.

- The **Celeste** (also written "Celesta") is a keyboard instrument with a high, sweet, and delicate sound. Playing a key causes a felt-covered hammer to strike a metal bar and make it vibrate, with wooden resonators to amplify the sound. Perhaps the most famous celeste performance is the main melody of the "Dance Of The Sugar Plum Fairy" from Tschaikovsky's *The Nutcracker*.

- **Tubular Bells** are sets of large hollow metal tubes hung vertically from a frame and struck gently with hammers to produce very pure tones. They have been in use in orchestras and churches since the 19th Century, but achieved popular recognition thanks to Mike Oldfield's hit album *Tubular Bells*.

- The **Marimba** is a set of wooden bars carved to the precise shape and size to produce notes when struck with mallets. They are arranged in roughly the same way as a piano's keys, with a resonator tube of aluminum or plastic under each bar. Originating in Africa, the marimba has spread around the world and is used in many different musical genres, including jazz, Latin American music, and classical. Players hold soft mallets in their hands to strike the bars; often they will have two or more mallets in each hand to play intervals and complex chords.

- The **Vibraphone** is laid out in a manner similar to a marimba, but its bars are made of aluminum and there are rotating discs between the bars and resonators that produce the instrument's characteristic vibrato. It is heavily used in jazz, and playing techniques often revolve around the use of a damper pedal similar to that of a piano, which allows the bars to be damped for short notes or undamped for long, ringing notes.

Playing techniques for the Celeste and Tubular Bells include:

- **Pure**: Notes played in the traditional fashion.

- **Reversed Long** and **Reversed Short**: Recordings played backward, turning traditional notes into long swells with abrupt, bright endings.

Playing techniques for the Marimba include all of the above, as well as:

- **Bowed**: A bow is used to play the bars, producing a swelling and sustaining tone.

- **Paper**: Paper is placed across the bottom of the resonator tubes to create a raspy overtone.

- **Rattle**: The marimba's bars are not secured effectively, causing them to bounce and rattle after every strike.

- **Stick**: The marimba is played with a hard stick rather than a soft mallet for a bright, aggressive sound.

- **Swell**: The same note is played rapidly with increasing force to create a crescendo.

Playing techniques for the Vibraphone include Bowed, Reversed Long, Reversed Short, and Swell, as well as:

- **Pure Tremolo**: Single notes played with subtle tremolo audible as they tail off. In these samples, you can easily hear the stereo placement of low vs. high notes!

- **Coin**: Coins are taped to the vibraphone bars to produce a distinctive buzzing noise with each note.

- **Damped**: Notes are played with the damper in place for a percussive sound with quick decay.

3.4. Augmented STRINGS

Augmented STRINGS contains three groups of multi-sampled string instruments: Solo Strings, Chamber Strings, and Orchestral Strings.

- The **Violin** is the highest-pitched of the bowed string instruments. It is tuned in fifths, G D A E from lowest to highest, and is the most commonly featured instrument for solo playing in a classical setting. It is played sitting or standing, tucked under the player's chin.

- The **Viola** is an instrument occupying the range between the violin and the cello. Traditionally its strings are tuned in fifths, C G D A from lowest to highest, one octave above the cello. Violas vary widely in scale length and shape, and are less well represented than the violin and cello in terms of music composed for them. Like the violin, it is played sitting or standing.

- The **Cello** is tuned in fifths, its four strings tuned C G D A from lowest to highest. It is played sitting down, braced against the floor and the player's legs.

- The **Bass** is the lowest voice in the traditional orchestra. Unlike its smaller siblings, it is tuned in fourths and traditionally has four strings tuned E A D G from low to high. Due to its very long scale length and large size, it is played standing up.

3.4.1. Chamber Strings

The **Chamber Strings** are multi-sampled recordings of small groups of players in over 20 different combinations/articulations. These include multiple violins, violas, celli, and basses, combined violins and celli, and the full ensemble playing together.

The Chamber Strings sounds offer the rich tone of several players' slight tuning differences playing at once, without the potentially overwhelming heaviness of a full orchestral string section.

Each of the groupings will be available in some or all of these articulations/playing techniques:

- **Sustain**: Traditional playing with the bow drawn across the string to produce a steady tone. The player bows the strings between the bridge and the fingerboard for the strongest projection and fullest tone.

- **Pizzicato**: The player plucks the strings with their fingers rather than using the bow, producing a short and percussive sound.

- **Staccato**: Notes are played with shortened lengths, with clear gaps between each note and the next. These are still played with the bow, so they have the usual string attack as opposed to more percussive techniques like pizzicato.

- **Tremolo**: Rapid movement of the bow on the strings to produce a "trembling" effect of rapidly changing volume.

- **Sul Tasto**: The player bows the instrument over the fingerboard itself, far away from the bridge. This produces a softer and more "atmospheric" tone.

3.4.2. Orchestral Strings

The **Orchestral Strings** samples were recorded with a full orchestral string section with multiple violins, violas, celli, and basses playing in unison. The sound is much richer and fuller – but less finely controllable in an arrangement or mix – than the Chamber Strings, like a broad paintbrush vs. a fine one.

In addition to the articulations mentioned above, the Orchestral Strings also feature:

- **Vibrato**: Players add subtle changes in pitch by moving up and down the fingerboard by a tiny amount. This is not the same as tremolo, which is a change in volume.

- **Col Legno**: The bow is flipped upside down with the horsehair facing away from the strings, and the bow's wooden stick is used to strike the strings for a tonally rich percussive sound.

- **Spiccato**: The player bows very lightly, and the friction between the bow hair and the strings causes the bow to "bounce" ever so slightly as it moves across the strings. This creates a rapid series of notes with sharper attacks, with the combination of pitch and bow technique affecting how rapid the notes are.

- **Harmonics**: The player bows while lightly resting a finger partway along the length of the string. This causes the string to vibrate as if it had a shorter length, producing clear and delicate tones. Harmonics can be *natural* (played on the string vibrating along its full length) or *artificial* (played on a string that is being fingered to produce a higher note).

To provide more rich and varied string textures, there are also **Random** articulations, where a particular characteristic is controlled by each player on their own. These include random spiccato, staccato, tremolo, and vibrato, as well as:

- **Random Fortepiano** and **Random Swells**: Each player's volume changes over time, either producing distinctive changes in overall level or a slowly evolving volume envelope.

- **Random Position**: Players vary the position of the bow on the strings, with some playing a more traditional sustained tone while others lean toward a softer sul tasto tone. This produces a sound with a broad range of tone colors.

- **Random Reattacks**: Players "reattack" their notes (choosing when to move the bow back and forth) at random times, causing different voices to gain more presence for a moment before returning to the overall sound.

- **Random Ricochet**: Each player flicks the bow down upon the strings to make it bounce and produce a short series of notes. This produces a constantly changing and evolving cluster of notes. When a soloist uses this technique, it's called a *jeté* (see below).

3.4.3. Solo Strings

The **Solo Strings** are samples from the four instruments played by soloists. While the Chamber and Orchestral strings may well give you all you need for most applications, sometimes you need the very finest paintbrush...

In addition to the articulations found in Chamber and Orchestal Strings, you'll also have these to play with:

- **Jeté**: The player flicks the bow down upon the strings to make it bounce and produce a short series of notes. This technique appears in the Orchestral Strings as **Random Ricochet**.

- **Tip Spiccato**: Spiccato played with the very tip of the bow for a very percussive and thinner sound.

- **Ghost** variants on other articulations (e.g. Ghost Jeté or Ghost Spiccato), which are played on muted strings for a less distinct pitch and softer sound.

3.5. Augmented VOICES

Augmented VOICES offers a wide variety of vocal samples, grouped into **Choir**, **Female Solo**, and **Male Solo**. With these samples, the intent is not to reproduce entire words or sentences, but to create a variety of percussive and sustained textures whose tone depends on the syllables being sung.

3.5.1. Choir

These samples feature a 22-singer mixed vocal choir, with male and female voices singing according to the note range. Simple syllables include *Ah*, *Eh*, *Oh*, and *Oo*.

There are also some very interesting multiple-syllable samples to play with. Some of them start at one sound, change to another, and then back again over the sustain of a note, for example *Ah-Eh-Ah* or *Mh-Ah-Mh*. Others are collections of syllables like *Bah-Nah-Dah* or *Glo-Roh-Doh*, which produce different articulation effects based on sustain and number of notes sustained. You'll want to experiment with these!

Singing articulations include loud and soft **Sustain**, short and percussive **Staccato**, volume **Swell**, and an eerie pitch **Drift**.

3.5.2. Female Solo and Male Solo

These voices come as single syllables or evolving sets of vowels. These include *Aah*, *Dooh*, *Eeh*/*Eee*, *Ei*, *Ha*, *Iih*/*Iii*, *Lah*, *Mm*/*Mmh*, *Ohh*, *Ooh*, and *Uuh*.

> ℹ When two different spellings are given for a syllable, those are the Female/Male names.

- **A-E-I-O-U**: The vocalist sings these five vowel sounds in order.

- **Vibrato**: The vocalist adds vibrato.

- **Staccato**: Short notes, often with slight pitch changes for more realism.

3.6. Augmented WOODWINDS

Augmented WOODWINDS provides two collections of multi-sampled woodwind instruments: **Solo Woodwinds** and **Orchestral Woodwinds**.

3.6.1. Solo Woodwinds

The **Solo Woodwinds** samples focus on four of the instruments found in a classical wind section:

- The **Bassoon** is a large double-reed instrument played sitting down or standing. It has a very wide range of available pitches starting at a low Bb, and it is renowned for its deep and mellow tone.

- The **Clarinet** comes in a variety of sizes; in this sample set includes a Bb soprano clarinet, the most common size. It uses a single reed vibrating against a mouthpiece to create sound, and uses both tone holes and keys to select pitch.

- The **English Horn** or *cor anglais* is a double-reed instrument tuned in F, a deeper-toned relative of the *oboe*. It has a complex system of keys and pads to control pitch. Oh, and it's not English and it's not a horn (brass instrument).

- The **Flute** in this sample set is a traditional Western concert flute tuned in C. It has a metal body with keys and pads, is played sideways with the side of one end held up to the mouth, and creates sound by blowing across a hole in the side called an *embouchure hole*.

Solo Woodwinds offer the following articulations:

- **Staccatissimo**: Very short notes.

- **Sustain**: Long sustained notes.

- **Fluttertongue**: Available on the Flute samples, this technique uses rapid tongue movements to produce a characteristic high-speed tremolo effect.

- **Vibrato**: Available on the Flute samples, this is a slower pitch/volume change than fluttertonguing.

3.6.2. Orchestral Woodwinds

The **Orchestral Woodwinds** samples feature entire wind sections playing together. In addition to the articulations found in the Solo Woodwinds (plus Loud and Soft options for Sustain), there are:

- **Pizzicato**: Very short notes, similar to Staccatissimo.

- **Staccato**: Playing short and precise notes in unison.

In addition to these, there are also **Random** articulations, with each player in the section changing some aspect of their performance at random times:

- **Random Fortepiano** and **Random Swells**: Each player's volume changes over time, either producing distinctive changes in overall level or a slowly evolving volume envelope. As each player's level changes, the overall tonal balance of the section will also change – for example, a shift from more bassoons playing louder to more flutes playing louder.

- **Random Flutter**: Each player flutters their tongue against the mouthpiece of the instrument, producing a very distinctive "fffrrrr" sound. While solo-player fluttertonguing is only provided for flutes in Augmented WOODWINDS, reed instruments have a similar technique, and it is heard here to powerful effect.

- **Random Harmonics**: By varying breath pressure, woodwind players can make their instruments jump to higher harmonics (usually by an octave) for a high, breathy sound. Here, players in the section take turns doing this, sprinkling the sustained sound with sudden tastes of higher octaves.

- **Random Reattacks**: Players "reattack" their notes (choosing when to take a breath) at random times, causing different voices to gain more presence for a moment before returning to the overall sound.

- **Random Staccato**: Each musician plays a series of staccato notes in varying time, starting more slowly, speeding up, and slowing down again. Timing variations between players create an interesting shift in dynamics across the stereo soundstage.

- **Random Vibrato**: Each player slightly varies the pitch of the note being played, thickening and detuning the ensemble for a powerful, heavy effect. Note that in woodwind instruments, an accompanying variation in volume (*tremolo*) will also always be present, and in these samples that volume change will be more immediately obvious than the pitch variation.

3.7. Augmented YANGTZE

Augmented YANGTZE provides a selection of playing techniques from six of the most important string and wind instruments in Chinese history, all of which are still widely played today.

- The **Bass Dizi** is a bamboo flute played sideways, like a traditional European flute. In addition to finger holes and a blow hole, it has a hole covered with a very thin resonating membrane that gives it a 'buzzy' sound rich in harmonics. Dizi have existed in some form or another for over 2500 years.

- The **Erhu** is a string instrument with two strings, played with a bow inserted between them. It has a violin-like tone, and its ancestry stretches back to roughly the 7th Century in what today is Southern China.

- The **Guqin** is the most revered of Chinese instruments, with many famed scholars and poets reportedly playing it. Over at least 3000 years, it has evolved into a 7-string fretless instrument played in the lap with fingernails; it has the longest strings and deepest tones of any Chinese string instrument.

- The **Pipa** is a lute-like instrument with four strings, a large resonant body, and comparatively short neck, played with the fingernails. Over its 2000-year existence, its players have developed a wide variety of techniques, including guitar-like pitch bends.

- The **Xiao** is a bamboo flute blown from one end, like a clarinet or shakuhachi, with a sweet tonality that one ancient Chinese writer likened to the call of the mythical Phoenix.

- The **Yangqin** is a form of dulcimer, with paired strings struck by tiny bamboo mallets. It arrived in China in the 14th Century from the Middle East, and can trace its kinship to European and Middle Eastern instruments like the hammered dulcimer, santoor, and cimbalom.

3.7.1. Articulations: woodwinds

For the woodwind instruments (Bass Dizi and Xiao), articulations include

- **Pure**: Notes played with traditional technique and no flourishes or embellishments.

- **Staccato**: Short and precise notes. Available solo or in octaves.

- **Swell**: a crescendo, sometimes with overblown tones at the end. Available solo, looped solo, and looped octaves.

- These instruments also include **Random** variations with multiple different note characters for more variety, including an evocative **Random Trill Burst** multisample.

3.7.2. Articulations: strings

The string instruments (Erhu, Guqin, Pipa, Yangqin) will include one or more of these playing techniques:

- **Flam** and **Soft Flam**: Notes triggered multiple times before sustaining.

- **Harmonics**: The player bows or plucks while lightly resting a finger partway along the length of the string. This causes the string to vibrate as if it had a shorter length, producing clear and delicate tones. Harmonics can be *natural* (played on the string vibrating along its full length) or *artificial* (played on a string that is being fingered to produce a higher note).

- **Tremolo**: Notes with rapid changes in volume.

- **Tremolo**: Notes with rapid changes in pitch.

- **Random Bounce**: Mallets bouncing on the strings. Also available in a looped version for longer sustains.

The Erhu also includes techniques common to bowed string instruments worldwide:

- **Pizzicato**: The player plucks the strings with their fingers rather than using the bow, producing a short and percussive sound.

- **Broken Sustain**: The sustain of the bowed note is allowed to 'break' for a moment to provide an emotional response.

- **Random Trill**: Multiple notes in two pitches changing rapidly.

- **Swell Vibrato**: Crescendo with pitch changes. Also available in a looped version for longer sustains.

3.8. Processed and Additional Samples

In addition to the sample libraries described in detail below, every instrument in the Augmented SERIES also contains its own special set of **Processed** and **Additional** samples.

In general, **Processed** sounds start with recordings of the featured instruments, which are then processed in various ways. This could be anything from heavy digital effects to running sounds through chains of guitar pedals to re-recording on old tape machines... a wide variety of creative approaches that turn the original sounds into often-unrecognizable new sonic artwords.

Additional samples are often sound sources that are not necessarily linked to the featured instrument, but which sound designers think might work well in combination with them. Even if they do originate with the basic samples, they have been transformed to the point where the original source might not be recognizable at all.

These collecdtions are well worth exploring – you will find unusual atmospheres, special effects to layer with more conventional sounds, and all sorts of other inspiration!

4. THE USER INTERFACE

This chapter will give you an idea of how the Augmented user interface is organized, and where to find its functions.

4.1. High-Level Overview

The Augmented user interface, shown here with Augmented BRASS

Augmented is neatly subdivided into three sections, as shown in the illustration above.

The Upper Toolbar [p.28]: 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 the Advanced features of Augmented. You'll get a guided tour here [p.28].

The Main Window: This is where the controls for using and editing Augmented sounds appear. Depending on what you've selected, you will find these panels of controls here, each of which has its own chapter in this manual:

- The Play Panel [p.54]
- The Layers Panel [p.60]
- The FX Panel [p.81]
- The Arpeggiator Panel [p.107]
- The Modulation Strip [p.110]

The Lower Toolbar [p.32]: This section provides quick access to a number of important parameters and useful bits of information such as CPU usage, Undo & Redo History. Polyphony, and more

4.2. The Upper Toolbar
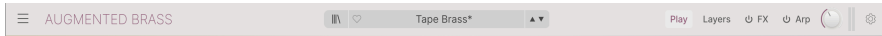
The Upper Toolbar

The toolbar that runs along the top of the instrument provides access to many useful features that impact Augmented as a whole: the Augmented dropdowndown menu, the Preset Browser, the Advanced button, The Main Out control and level meters, and the Side Panel gear icon.

4.2.1. The Augmented menu

Clicking the 3-lines icon at the top left corner opens a dropdown menu for access to a number of important features.
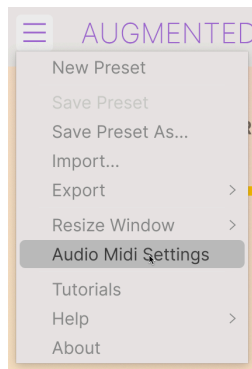
The Augmented menu

- **New Preset**: This option creates a new Preset with default settings on all parameters. It is a good place to start if you would like to create a new sound from scratch.

- **Save Preset**: This option will overwrite the currently loaded Preset with any changes you have made. If you would like to save the current Preset under a different name, use the "Save As..." option below.

- **Save Preset As...**: This lets you save your Preset under a different name. Clicking this option reveals a window where you can name your Preset and enter information about it.

ℹ ♪ 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 Preset banks later. You can also enter your own notes in the Comments field, which is handy for providing a more detailed description of a sound. This can help you remember how a sound works, or provide guidance to other Augmented users with whom you're sharing the patch.

- **Import...**: This command lets you import a Preset file, which can be either a single Preset or an entire bank of Presets.

- **Export Menu**: You can export Presets in two ways: as a single Preset or as a bank.

   - *Export Preset*: Exporting a single Preset is handy when you want to share a Preset with someone else. The default path to these files will appear in the "save" window, but you can create a folder at another location if you like. The saved Preset can be reloaded using the **Import Preset** menu option.

   - *Export Bank*: This option can be used to export an entire bank of sounds from the instrument, which is useful for backing up or sharing Presets. Saved banks can be reloaded using the **Import Preset** menu option.

- **Resize Window**: The Augmented 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 work with at higher magnification levels.
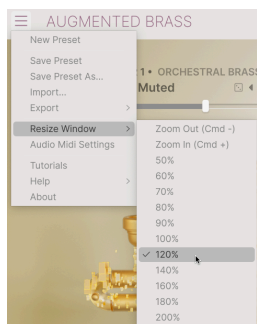
ℹ ♪ While working with Augmented, you can also use the keyboard shortcuts CTRL- / CTRL+ (Windows) or COMMAND- / COMMAND+ (macOS) to quickly adjust the window size by one step down or up. Dragging the lower right corner of the window will also size the interface up or down to the next window size up or down. ! Note that in some DAWs, the same key commands may be used for zoom control. In this case, the DAW will take priority.


- **Audio MIDI Settings (only available in standalone mode)**: Here you can manage the way the instrument transmits audio and receives MIDI. See the section on Audio and MIDI settings [p.8] for more information about this topic.

ℹ ! The Audio MIDI Settings menu is only available when using Augmented in standalone mode. When using Augmented as a plug-in, the host software handles all of the parameters in this menu, including audio and MIDI routing, buffer size settings, etc.

- **Tutorials**: Augmented 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 Augmented features.

- **Help**: This section provides handy links to the Augmented User Guide and the Augmented Frequently Asked Questions page on Arturia's website. Note that accessing these pages will require an Internet connection.

- **About**: Here you can view the Augmented software version and developer credits. Click the About window again to close it.

4.2.2. Browsing Presets

Augmented comes with lots of great-sounding factory 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 Upper Toolbar has the following controls related to the Preset Browser:
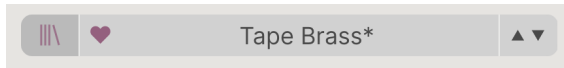
- The **Preset Browser** button (the icon with four lines that like books on a shelf) opens and closes the Preset Browser. This is covered in detail in the next chapter, The Preset Browser [p.44].

- The **Like** button (the heart icon) lets you quickly tag Presets you like. Inside the Preset Browser, it's easy to sort and search for Liked Presets.

- The **Preset Name** is listed next in the toolbar. Clicking on the name reveals a dropdown menu with other available Presets. Click on any name to load that Preset or click away from the menu to close it. Sound categories shown on the left side let you quickly jump into appropriate subgroups of Presets (called Types [p.49]) without having to dive into the Preset Browser itself.
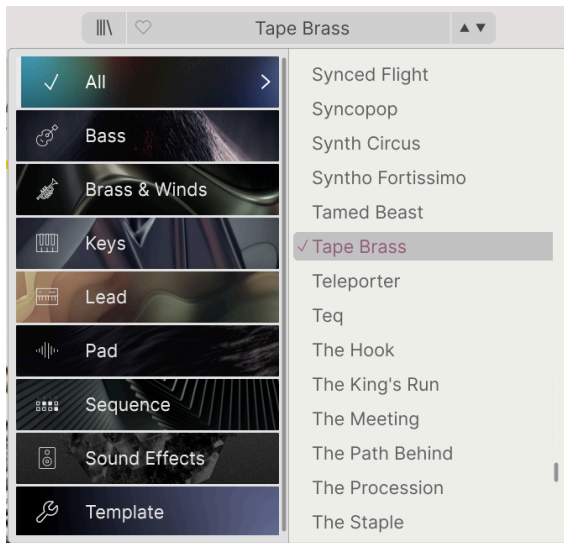
> ℹ️ Note that if you've set any search filters in the Preset Browser [p.44], pulling up any of these lists in this way ignores all of them. You will see all Presets of the appropriate Type.

- 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 patch on the list, but does it with only one click.

4.2.3. Play, Layers, FX, and ARP buttons

Clicking the **Play** button displays the Play Panel [p.54], which contains the most commonly accessed parameters for quick performance and general sound tweaking. It's a simplified interface for auditioning presets or playing live.

Clicking the **Layers** button lifts the hood of Augmented gives you tools to delve deeper into sound design. There is a whole lot to learn here, and you'll find it all in the Layers Panel [p.60] chapter.

Next are the **FX** and **ARP** buttons. You can turn the FX or Arpeggiator on and off from here, or click their names to reveal their settings in the FX Panel [p.81] and Arpeggiator Panel [p.107].

4.2.4. Main Out and meters, Side Panel gear

Next is a knob for the **Main Out**, the overall audio level coming out of the plug-in. Next to it is a set of signal level meters.

At the far right of the Upper Toolbar, a gear-shaped icon opens up the **Side Panel**, which contains functions that are rarely changed and are therefore tucked out of the way until needed. These topics are covered in the Side Panel [p.35] section later in this chapter.

4.3. The Lower Toolbar

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

Engine Drag and Drop: Swap and arrange engine configurations easily using drag-and-drop   Poly 8   2%

On the left, the **Parameter Name** area displays the name of a parameter (and often a description of what it does) when you hover your mouse over it or click on it to adjust its value. The control's current value pops up in a tool tip that appears next to the control.

Engine Drag and Drop: Swap and arrange engine configurations easily using drag-and-drop

The other features on the Lower Toolbar are grouped on the right side:
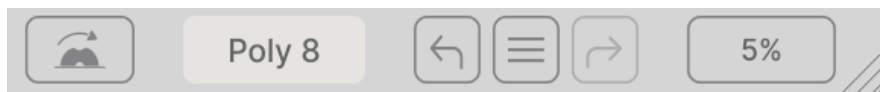
These have the following functions:

- **Mod Wheel**: Lets you activate and edit Mod Wheel Modes [p.119].

- **Polyphony**: opens a pop-up menu that lets you select the polyphony of the plug-in among the options shown below:

- **Undo/Redo**: Keeps track of your edits and changes.

- **Undo (left arrow)**: Undoes the last change in Augmented.

- **Redo (right arrow)**: Redoes the last change in Augmented.

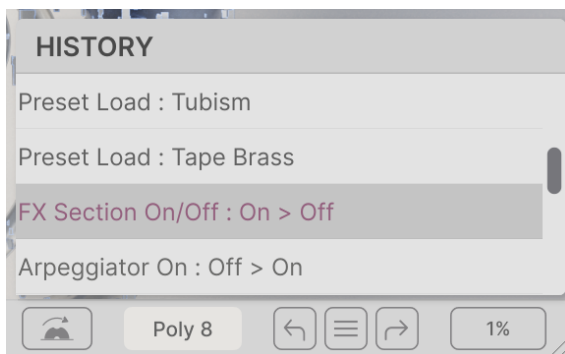- **Undo History (center menu icon)**: Displays a list of recent changes. Click on a change to restore the patch to that state. This can be useful in the event you happened to go too far in your sound design and want to revert to an earlier version.

Left: CPU Meter and Resize handle. Center: PANIC button ; hover on CPU Meter. Right: Size Reset icon ; appears when needed.

- **CPU Meter**: Displays the current CPU usage of the instrument. Hovering your mouse over the CPU Meter will change it into a **PANIC** button. In the event of stuck notes or other issues, licking on PANIC will send a MIDI Panic message, silencing all notes and resetting other MIDI control values.

- **Resize handle**: The diagonal lines in the corner allow you to quickly resize the plug-in window. Click and drag, and when you release the mouse, the interface size will jump to the nearest option on the Resize menu.

- Sometimes opening or closing a side panel or moving the interface on your monitor will cause it to take on dimensions that aren't supported. When this happens, the diagonal lines will change to the two-arrow **Size Reset** icon shown above at right. Click it to reset the interface size to the nearest option on the Resize menu.
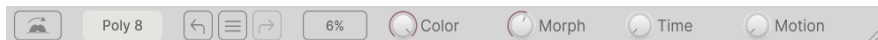
> When you are on any panel other than **Play**, the four Macro knobs will appear on the Lower Toolbar as well.

4.4. The Side Panel

The icon shaped like a gear at the upper right corner accesses the **Side Panel**, which has three tabs:

- **Settings**: Global settings and Preset settings that affect the overall behavior of Augmented.
- **MIDI**: MIDI control and configuration settings, as well as MIDI Learn functions for use with external controllers.
- **Tutorials**: In-app interactive tutorials, which can also accessed from the main dropdown menu.

4.4.1. Settings Tab
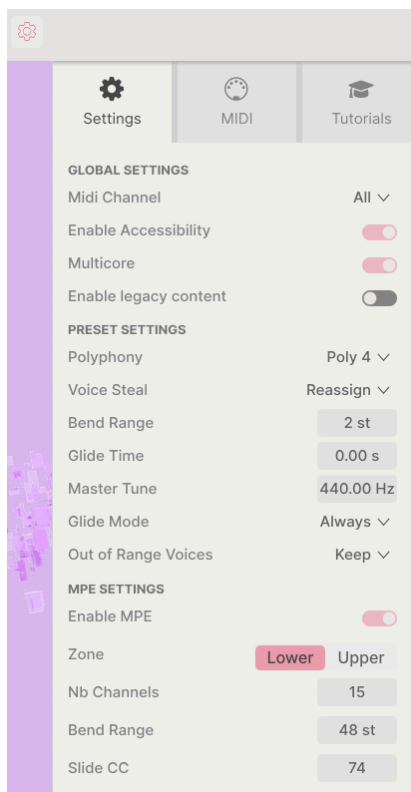
Click **Settings** to access global settings like MIDI channel and MPE (MIDI Polyphonic Expression).

Global Settings

- **MIDI Channel**: Selects the MIDI channel(s) on which Augmented will receive MIDI input. You can select ALL (omni) or channels 1-16.

- **Enable Accessibility**: Enables the voiceover for visually-impaired users. It is ON by default.

- **Multicore**: Enables the instrument to take advantage of multicore processing on computers that offer it.

- **Enable Legacy Content**: Lets you bring in sample content from older versions of Augmented. If you have an older version of an Augmented SERIES plug-in, enable this feature to let you browse for these sounds in the Sampler engine.

Preset Settings

- **Polyphony** Select polyphony for the plug-in from monophonic all the way to 16 voices. This lets you control how much load the plug-in causes on your CPU, and in certain cases controls how the plug-in responds to various playing techniques.

> ℹ️ This menu is identical to the one that pops up when you click on the Polyphony button in the Lower Toolbar.

- **Voice Steal**: Controls how the plug-in distributes voices if you play more notes than the polyphony setting allows. It has two modes: Reassign, where playing a particular note retriggers that note if it's been played already, or Rotate, where voices are retriggered in a fixed order.

- **Bend Range**: Selects the pitch bend range from 1 semitone to 36 semitones (3 octaves).

- **Glide Time**: Sets the time for a glide between notes to complete, from 0 to 10 seconds.

- **Master Tune**: Sets the tuning of the instrument in Hz. Range: 440 to 480 Hz. Double click to return to the default 440 Hz.

- **Glide Mode**: Can be set to glide only on legato playing, or always.

- **Out Of Range Voices**: This setting controls what happens to notes played outside the current patch's Sampler range(s). You can select Keep, which plays all notes anyway, or Kill, which ignores notes outside the Sampler range. This lets you set whether or not a sound that has a Synth engine plays notes just with the Synth when the Sampler is out of range.

MIDI Polyphonic Expression: Augmented supports MIDI Polyphonic Expression (MPE). This exciting addition to the MIDI protocol allows a multi-dimensional controller to send polyphonic expressive controls (like pitch-bend, aftertouch, or your finger location on the Y axis of a key) on a per-note basis. This is done by using separate MIDI Channels to carry each note's expressive data separately, which can then be understood by synthesizers like Augmented. When MPE is enabled, modulation is displayed in the strip at the bottom of the Advanced Panel, in the keyboard modulation settings.

The controls in the MPE menu let you set the following:

- **Enable MPE**: Turns MIDI Polyphonic Expression mode on and off.

- **Zone**: If an MPE-capable controller can be split into lower and upper zones, this selects which zone sends MPE messages.

- **Nb Channels**: Sets the maximum number of MIDI sidechannels (and therefore simultaneous notes) on which MPE messages may be sent.

- **Bend Range**: Sets the maximum pitch bend range of each note, up to 96 semitones (48 by default). This should be set to the same value as what is used on your hardware MPE controller.

- **Slide CC**: Select the MIDI CC number used to send the slide information. By default, this is CC 74, a common choice among MPE controller settings. Note that when MPE is enabled, all controls that are currently set by MIDI Learn to listen to the selected CC will no longer receive it.

4.4.2. MIDI Tab
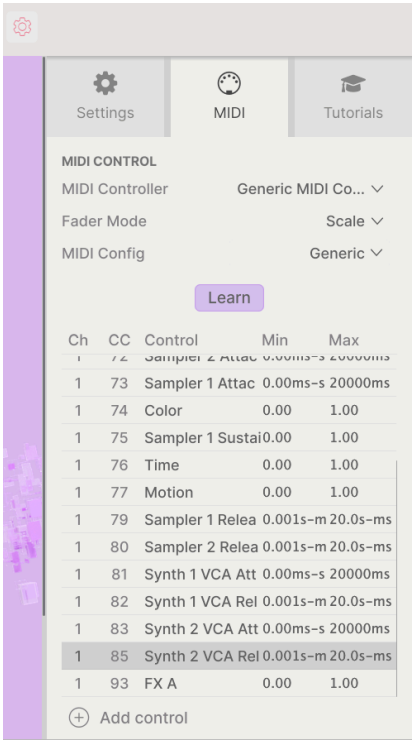
This is where you set MIDI values and set up MIDI Learn, so your physical controllers can change parameters in Augmented.

4.4.2.1. MIDI Controller Menu

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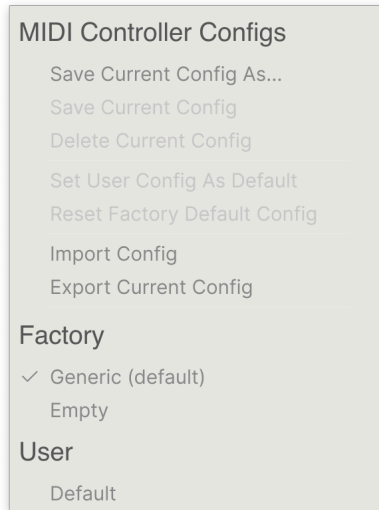
4.4.2.2. Fader Mode

When you use a physical knob or fader on a MIDI control surface, the physical placement of what you're moving might not be the same as where the parameter it controls is currently set. For example, if you have a fader controlling the Morph setting, and you jump to a Preset where Morph is set to 1.0 but your fader is at 0.0 – what happens when you move the fader?

The **Fader Mode** lets you determine that behavior to your preference. It has three modes, which work as follows in the example above:

- **None**: The moment you move the fader, the programmed value instantly jumps to its current position. In our example, touching the fader even a tiny bit will make the programmed Morph value jump from 0.9 straight to 0.0. This keeps the physical and software controls aligned at all times, but it can produce jarring sudden changes.
- **Hook**: The fader will have no effect until it meets or passes the programmed value. In our example, the fader does nothing until it's moved up to 0.9, at which point it "hooks" the programmed value and then controls it normally. This prevents drastic sound jumps, but does involve moving controls around until they find and "hook" the right values.
- **Scale**: Moving the fader will cause the current program setting to change, but in a scaled down manner, until the fader and programmed value match. This is a compromise between None and Hook that some users really like. Experiment with it and see what you think!

4.4.2.3. MIDI Config Menu

MIDI Controller Configs

Save Current Config As...
Save Current Config
Delete Current Config

Set User Config As Default
Reset Factory Default Config

Import Config
Export Current Config

Factory

✓ Generic (default)
Empty

User

Default

This pop-up-down lets you manage different sets of MIDI maps for controlling Augmented from MIDI hardware. You can save/save as the current MIDI assignment setup, delete it, import a Configuration file, or export the currently active Configuration.

This is a quick way to set up different hardware MIDI keyboards or controllers with Augmented without having to build all the assignments from scratch every time you swap hardware.

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

The final three options are handy, but erase all your current work, so be sure to save first.

- **Generic (Default)**: Gives you a starting point with predetermined controller assignments.

- **Empty**: Removes the assignments of all controls.

- **User Default** Save and recall a configurations that makes a good starting point for how _you_ usually work.

4.4.2.4. MIDI Learn

Click the **Learn** button to place Augmented in MIDI Learn mode. In this mode, all MIDI-assignable parameters are highlighted and you can map physical controls on your MIDI Controller to them. A typical example might be to map a mod wheel to the vibrato, or a physical knob on the MIDI controller to control any of the Macro knobs.

Once you've clicked the **Learn** button, look at the main interface to see the controls you can assign. Controls available for assignment are purple. Controls that are already assigned are red, but can be reassigned to new controls easily.

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

To unassign a control onscreen, CTRL-click or right-click it. Alternative methods of assignment are available in the MIDI Parameter Menu [p.41] described below.

This is an incredibly powerful feature, as nearly every function in Augmented can be controlled by MIDI. Just follow the same procedure as above, or simply right-click **Add control** at the bottom of the MIDI tab to reveal the list of assignable controls.

4.4.2.5. Min and Max Values

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

Drag up or down on a value to change it. Values are expressed as decimal fractions from 0 to 1. It is possible to set the maximum lower than the minimum. This reverses the polarity of the physical controller – so turning it up will turn the assigned parameter down.

In the case of switches which only have two positions (On or Off, etc.), those would normally be assigned to buttons on your controller. However, if you want to flip a switch when a fader or knob moves past a certain point, that's easy to set up.

4.4.2.6. MIDI Parameter Menu

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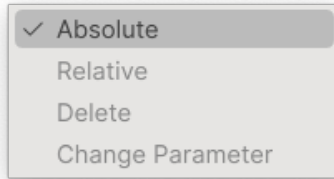

- **Absolute**: The assigned parameter in Augmented tracks the actual value that your physical controller is sending out. For example, if a parameter is set to something like 0.8 but the physical knob is currently at 0, turning the knob a tiny bit will make the parameter value instantly jump down to 0. This may result in a sudden change in the sound.

- **Relative**: The assigned parameter in Augmented will go up or down from its current value in response to physical controller movements. This is often useful when using endless 360-degree encoders that don't have physical motion limits. It also prevents sudden parameter jumps on regular knobs or faders.

! If you use Relative mode on a knob or fader, it's possible, even likely, that either the parameter or the control will "run out of room". For example, suppose the current parameter is at 0.9, but the knob controlling it is at 0.2. If you turn the knob down to 0, the parameter value will go to 0.7 and then get stuck there because you can't turn the knob any farther. On the other hand, if you turn the knob up to 1, the parameter will hit 1.0 almost immediately, and the rest of the knob's travel won't do anything. Relative mode on controls with a fixed travel is best used for parameters that only require a small amount of adjustment.

- **Delete**: Removes the assignment and turns the corresponding onscreen control purple again.

- **Change Parameter**: Pops up a (very!) large submenu of every assignable parameter in Augmented. This lets you change the assignment of the current CC/physical control manually. It's useful when you know exactly the destination you're looking for.

4.4.3. Tutorials Tab
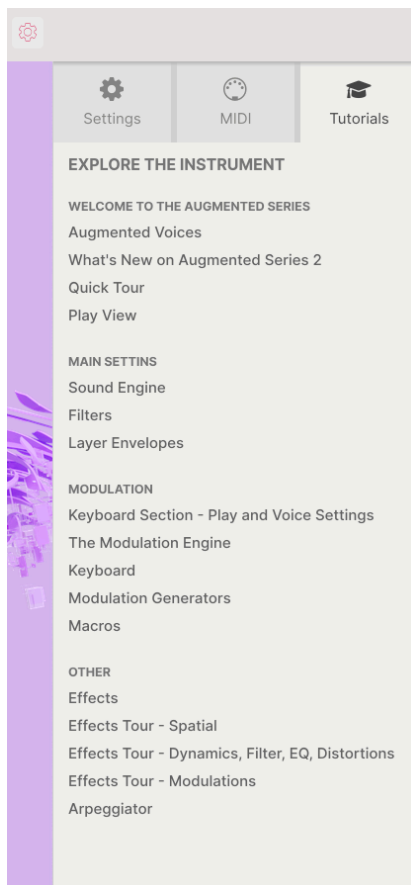
In this tab, which can also be opened by selecting Tutorials from the Main Menu [p.28], you can click on titles for individual chapters, which in turn will take you through different areas of Augmented in easy steps.

As you go through a tutorial, the parts of the panel to focus on are highlighted as you go:

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

5. THE PRESET BROWSER
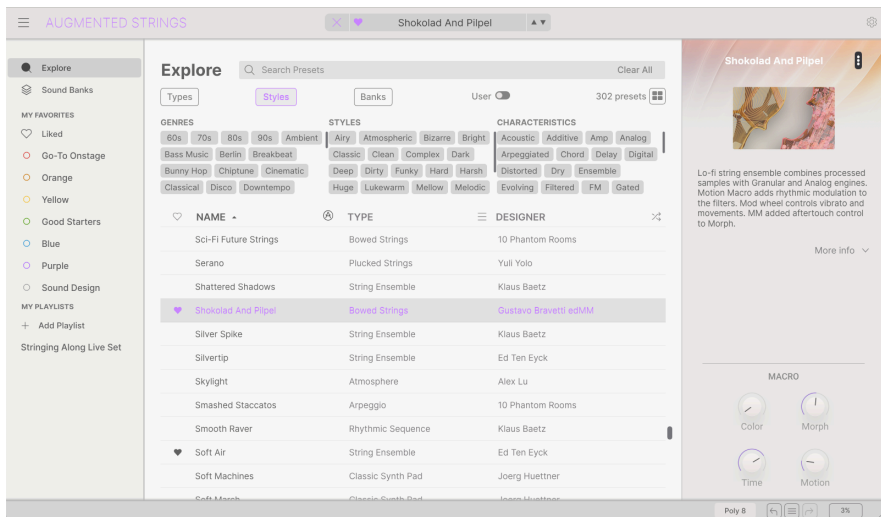
The Preset Browser, shown here in Augmented GRAND PIANO

The Preset Browser is how you search, load, and manage sounds in Augmented. It has a couple of different view options but they all access the same banks of Presets.

To access the Preset Browser, click the 4-lines icon on the Upper Toolbar that looks a little bit like books on a library shelf:
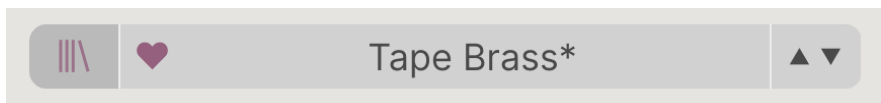
The Preset Browser button on the Upper Toolbar

This will bring up the Preset Browser, which will be familiar to anyone using other Arturia virtual instruments.

The Preset Browser window is broken into three sections:
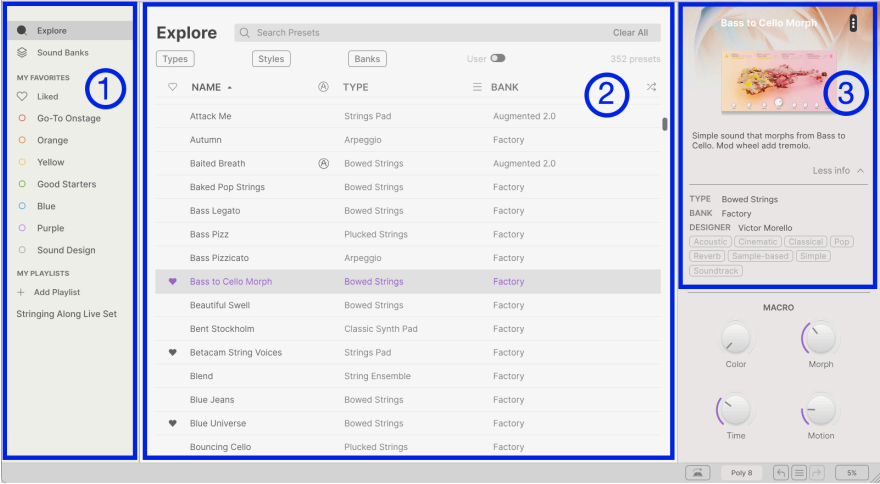
Number	Area	Description
1.	Sidebar [p.46]	Manage banks and Playlists.
2.	Search and Results [p.47]	Search Presets by entering text, or using tags for Type and Style.
3.	Preset Info [p.51]	Summary of Bank and Tags, Designer name, and description info for the selected Preset.

5.1. Sidebar

The leftmost section of the Preset Browser determines what is displayed in the section.

The topmost option is **Explore**:
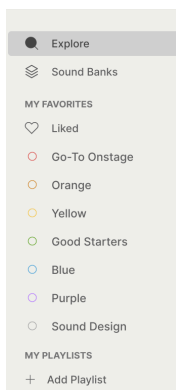
The **Explore** section is the default, letting you search the current bank of Presets loaded into Augmented. We'll cover those features below.

5.1.1. Sound Banks

This selection enables you to choose from the Factory and User banks currently available in Augmented. Any new Banks you acquire will appear here, and a User bank will be created the first time you save a patch of your own. Clicking on a User Bank's icon will let you delete, rename, or export the bank, or import an image to represent the Bank visually. (These options aren't available for the Factory Bank.)
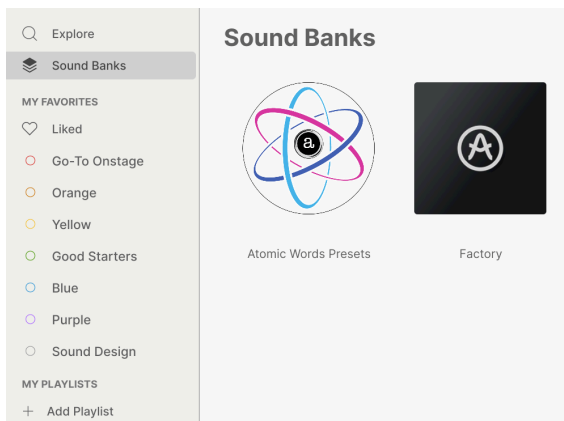
Below this are other options for quickly searching on groups of Presets:

- **Liked**: Presets you have liked using the heart icon. This appears in the leftmost column when you mouse over any item in a results list (see below).

- **Color codes**: Select from up to 7 colors to assign to any Preset, favorite or otherwise. This then allows for quick filtering of your Presets.

> ℹ️ As you can see in the figure above, you can right-click and rename each color code to customize the categories for your needs.

5.1.2. Playlists

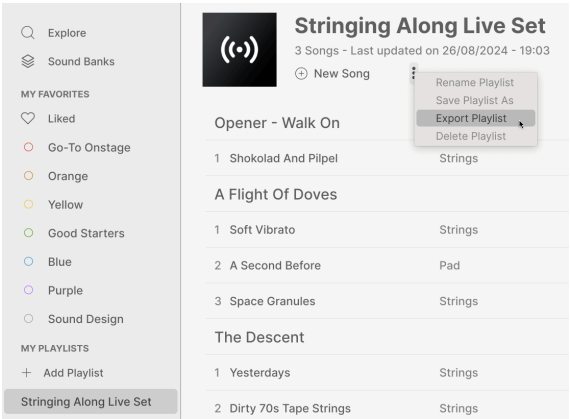A **Playlist** is a set of Presets that have been selected and placed in a certain order, divided up into sections called Songs. You can design a complete live set this way, with all of the Presets you'll need set up in the right order. All you'll need to do is click the arrow for the next Preset and it will move you through the Playlist automatically.

To create a Playlist, click **+ Add Playlist** in the Sidebar, and give it a name in the pop-up box that opens. Later on, you can right-click on its name to rename, duplicate, delete, or export it. Inside the Playlist window, you can add new Songs and name them, or use the 3-dot menu to rename, save, export, or delete the Playlist. Then simply drag and drop Presets from the Explore window into the Playlist, and reorder them by dragging and dropping. Right-click on Songs or Presets for options like rename, copy, paste, delete, duplicate, and so on.

5.2. Search and Results

Click on the Search field at the top and enter any search term. The browser will filter your search in two ways: First, by matching letters in the Preset name. Then, if your search term is close to that of a Type or Style [p.49] it will include results fitting those tags as well.

The Results list beneath shows all Presets that fit your search. Click the X icon at right to clear your search terms.
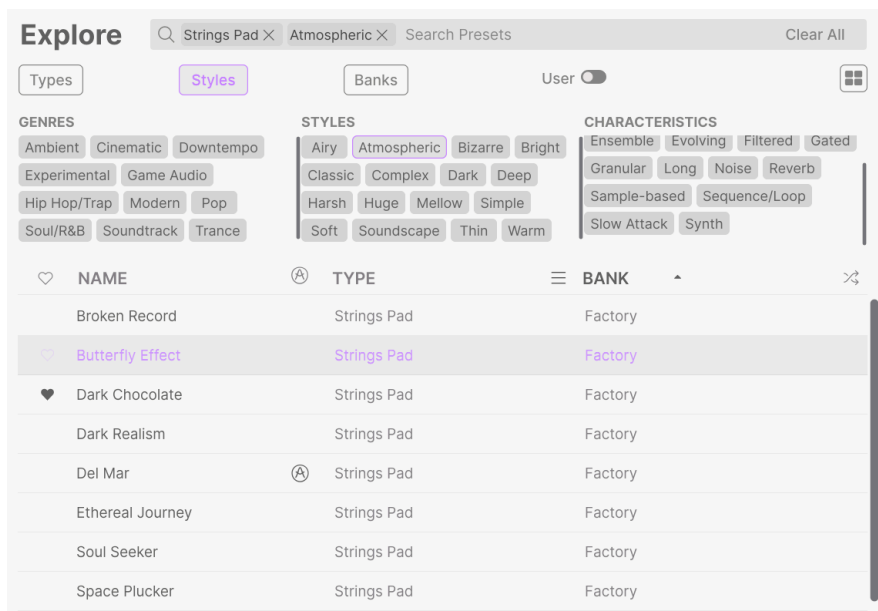
Filter by typing text in the Search field

The columns in the search results are as follows:

- **Likes**: Presets you have Liked will appear with a heart icon here. Click the heart icon to bring your liked Presets (that fulfill your current search criteria) to the top of the list.

- **NAME**: The Preset name. Click on NAME to order the list alphabetically by Name; click again to reverse the order.

- **Arturia logo**: Patches marked with the Arturia logo are featured sounds that we feel are worth special attention, especially for users new to Augmented. Click on the logo icon to bring all those Presets (that fulfill your current search criteria) to the top of the list. Give them a try!

- **Type**: The Type/Subtype of Preset, which can be searched for (see below). Click TYPE to search by Type in alphabetical or reverse alphabetical order.

- **Designer/Bank**: Click the 3-line icon to change this column from Designer name to Bank name, according to whichever criterion you find most useful. Click on the word to sort alphabetically or reverse-alphabetically. Note the **User** switch above this column, which lets you isolate and search only for User Presets.

- **Shuffle**: This button randomizes the list order. Clicking it again removes the shuffle, and clicking again after that reshuffles the list in a different way.

- Finally, above the Shuffle icon, you'll see a number of Presets listed that satisfy the current search criteria. Next to that is an icon that can switch between a list view or Type icon view.

5.3. Using Tags as a Filter

You can narrow (and sometimes expand) your search using different tags. There are two kinds of tags: **Types** and **Styles**. You can filter by one, the other, or both.

5.3.1. Types

Types are categories of instruments and musical roles: Brass Acoustic, Brass Hybrid, Brass Synth, Bass, Keys, Lead, Pad, Sequence, Sound Effects, and Template. With a clear search bar, click the **Types** button to bring up a list of types. Notice that most types also have one or more subtypes:
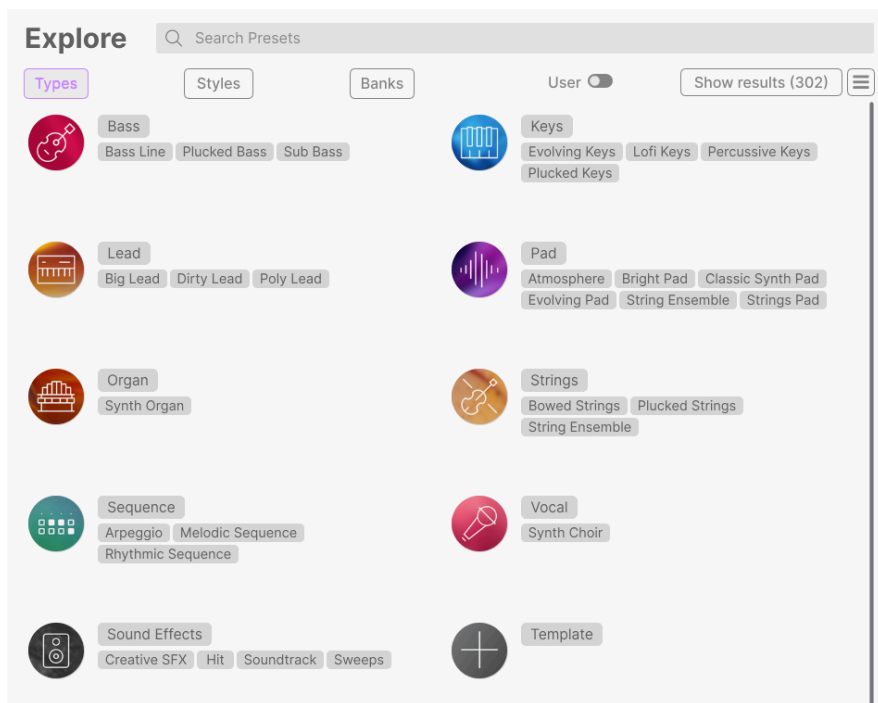
Click any one of them, and the results will show only Presets that match that tag. You can also select multiple Types using COMMAND-click (macOS) or CTRL-click (Windows). For example, if you aren't sure whether the Preset you're looking for was tagged with Keys or Pad, select both to broaden the search.

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

5.3.2. Styles

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

- **Genres**: Identifiable musical genres such as decades, Trance, Techno, Synthwave, Funk, etc.

- **Styles**: General "vibe" such as Atmospheric, Dirty, Clean, Complex, Mellow, etc.

- **Characteristics**: Sonic attributes such as Analog, Evolving, Distorted, Dry, Rise, etc.

Depending on your choice of view (the icon that shows either 3 lines or 4 boxes), you can see entire lists of styles without a list of results underneath...
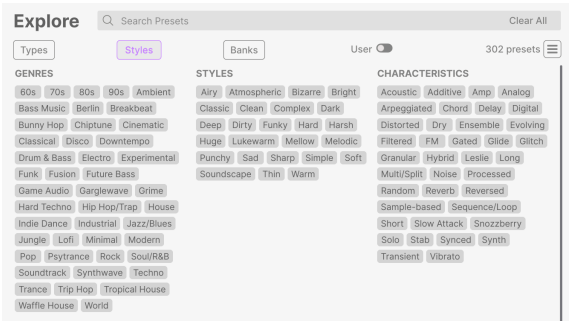
...or you can view the results list, with the three style options shown as scrollable mini-menus.
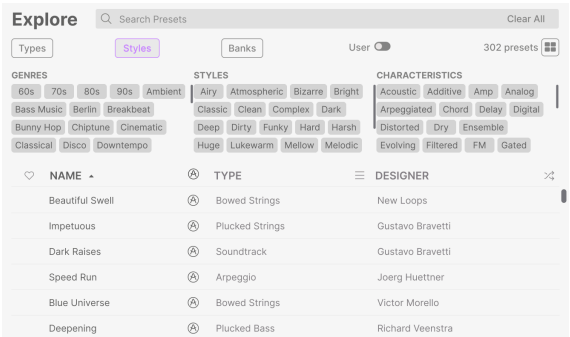
Click on any tag to select it. Click again (or right-click) on any selected tag to de-select it. Notice that when you select a tag, several other tags usually disappear. This is because the browser is narrowing your search by a process of elimination. De-select any tag to remove that criterion and widen the search without having to start all over again.

5.3.3. Banks

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

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

5.4. Preset Info Section

The right side of the browser window shows specific information about each Preset. The information for User Presets (but not Factory ones) may be changed here: Name, Type, Bank, Designer, and the various tags.
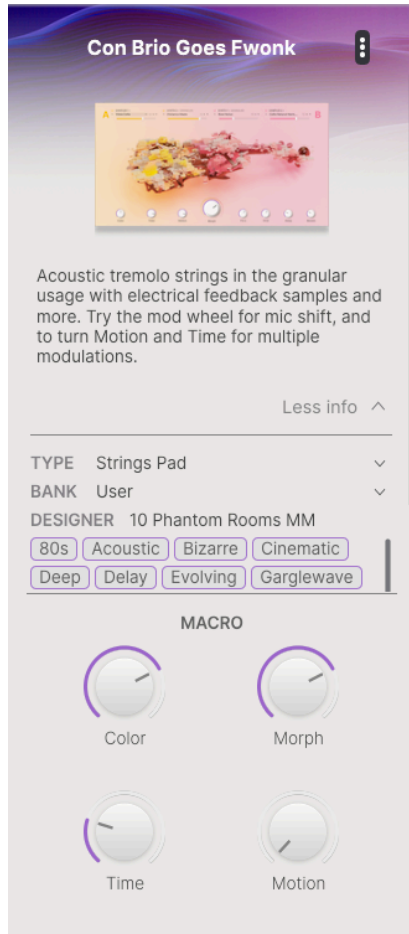
To make the desired changes, you can type in the text fields, use one of the pull-down menus to change the Bank, Type, and Designer, and click on Styles to remove them.

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

Note that there is a + icon at the end of the tag list. If you click on that, it brings up a complete list of Style, Genre, and Characteristic tags. You can add new tags from this list, restore tags you accidentally removed… or click one of the + icons in this window to create your own tags for easier search filtering.

Clicking on the icon with 3 vertical colored dots at the top right provides you with a pull-down menu that lets you Save, Save As, add color labels, or add the Preset to a Playlist (or create a new one for it).
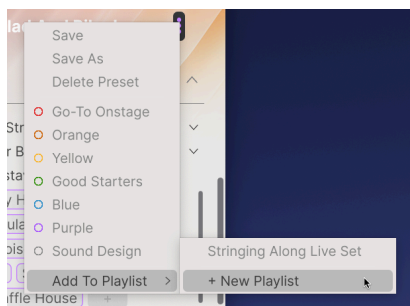
> ℹ The Save and Delete Preset options are not available for Factory Presets, which can't be overwritten or deleted. In that case, use the Save As option to create a User Preset that you can work with.

Finally, at the very bottom of the window are four Preset-related **Macro** knobs with their stored settings. You can play with these settings as you audition the patch and take notes.

5.4.1. Editing Info for Multiple Presets

If you'd like to move several Presets to a different bank while preparing for a performance, or enter a single comment for several Presets at the same time, it's easy to do. Simply hold command (macOS) or ctrl (Windows) and click the names of the Presets you want to change in the Results list. Then enter the comments, change the Bank or Type, etc., and save the Preset. By using the 3-vertical-blue-dot menu in the top right corner, you can also assign these one of the color codes or create/add to a playlist.

♡	NAME	Ⓐ	TYPE	☰	BANK ▾		⤨
	Bass Legato		Bowed Strings		Factory		
♡	Bass Pizz		Plucked Strings		Factory		
	Bass Pizzicato		Arpeggio		Factory		
	Bass to Cello Morph		Bowed Strings		Factory		
	Beautiful Swell	Ⓐ	Bowed Strings		Factory		
	Bent Stockholm		Classic Synth Pad		Factory		
	Betacam String Voices		Strings Pad		Factory		
	Blend		String Ensemble		Factory		
	Blue Jeans		Bowed Strings		Factory		
	Blue Universe	Ⓐ	Bowed Strings		Factory		

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

6. THE PLAY PANEL

The Play Panel, shown here in Augmented GRAND PIANO

The Play Panel is designed to let you quickly and intuitively play with Presets without diving deep into individual parameter tweaks (we'll get to those later [p.60]). It gives you easy access to complicated timbre changes thanks to the Macro knobs, and the ability to quickly swap around and even randomize elements of each Preset. Whether you're auditioning sounds, setting up for live performance, or just having fun, the Play Panel is a great creative playground.

The Play panel has two main sets of controls: the Layer controls along the top, and the eight Macro knobs along the bottom.

6.1. Layer controls

In the Layers Panel [p.60] chapter, we will explain how a Preset in Augmented is structured. For the purposes of the Play Panel, we only need to know a few basic ideas:

- Each Augmented Preset is made up of two Layers (A and B).
- Each of the Layers has two Parts (A1 and A2, B1 and B2).
- Each of these four Parts contains one of Augmented's four sound sources – Sampler 1, Sampler 2, Synth 1, and Synth 2.

On the Play Panel, each of the four parts in a Preset has its own easily-available set of basic controls, the ones you're most likely to use over and over again.
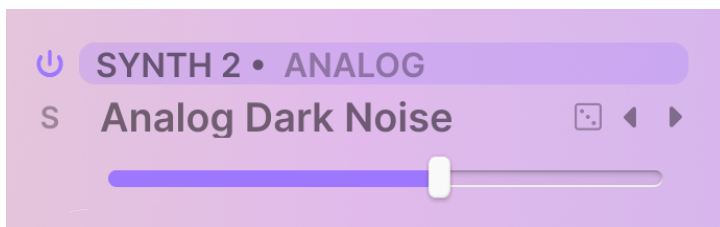
Controls for a Layer/Engine on the Play Panel

These controls include:

- **Bypass**: The power button icon enables a Part. When off, the Part is shut down and does not process audio.
- **Solo**: The **S** icon is a Solo button, which silences all Parts except the one selected. Only one Part can use Solo at a time.
- **Source**: Designates the Source in use for that Part. When it's highlighted (as shown above), it can be dragged and dropped to rearrange the placement of the Parts within the Preset.
- **Part Preset Name**: Click on this to drop down the menus for selecting Part Presets, as described below.
- **Roll The Dice**: This is an easy way to play with a Preset to find new ideas or inspiration. Click the die icon to randomly select and load a Part Preset for it.
- **Part Preset Scroll Arrows**: These icons let you click through the Part Presets available for that Engine.
- **Part Volume Slider**: Controls the relative level of each of the four Parts.

> ℹ If the Part volume is being modulated, you'll see the slider color bar move on its own to reflect the current level at any given moment.

These controls are nearly identical in layout to their counterparts for each Layer in the Layers Panel [p.60].

6.1.1. Selecting Part Presets

Clicking on the name of a Part Preset pops up a menu to select categories and sounds. The menus work in the same way for the Synth and Sampler Engines.

In most cases, the Part Preset menu will have two columns. First will be the Engine type (for Synth Parts) or the Instrument sample collection (for Sampler Parts). The second column will be a list of Part Presets for that Engine or Instrument. Simply scroll and click to make your selection.
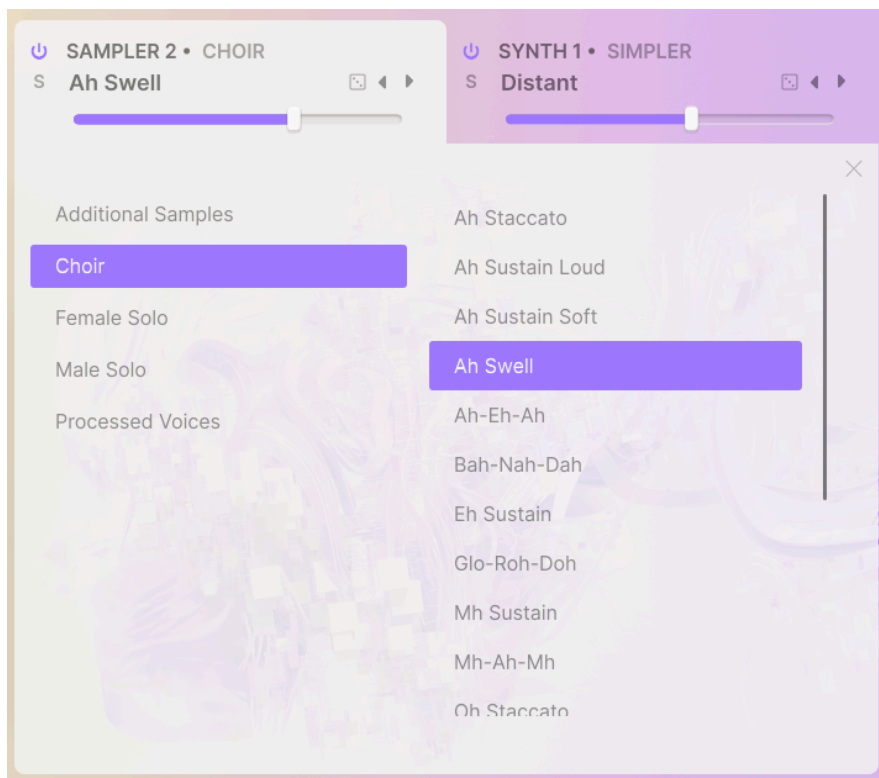
Selecting a Sampler Part Preset within a given Instrument

However, for certain Sampler Instruments (e.g. the Solo Strings in Augmented STRINGS) or Synth Engines (e.g. Harmonic in Augmented STRINGS or VOICES, or Simpler in any Augmented instrument), there may be an extra layer of subdivision, for mappings or sound categories. When this is the case, the browser will have three columns, which are only shown two at a time. Here's how you change which columns you're looking at.

In this example, the first two columns of the Synth Part Preset menu are shown. When you select the Harmonic Engine, a Category column appears:
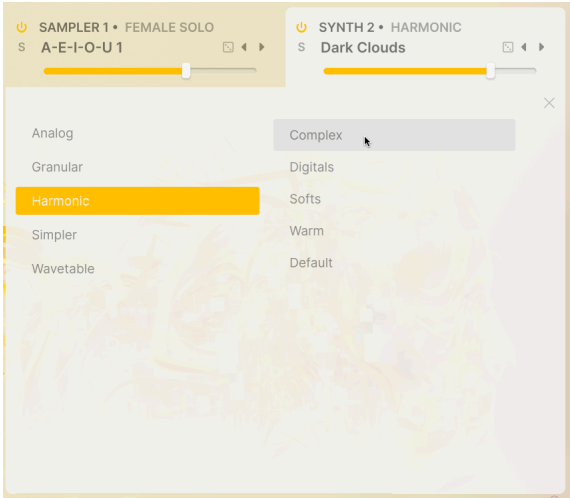
Columns 1 and 2 show Engine (Harmonic) and Category (about to click Complex).

When you click on a Category, the columns will shift to the left, so you can see the actual Presets.

Columns 2 and 3 show Category (Complex) and Preset (Dark Clouds). The cursor is placed to go back to Column 1.

In this view, notice that on the far left, a little bit of the chosen Engine's colored box is still visible (the arrow cursor is touching it). Click on that to shift the columns back to the right, to show the Synth Engines.

Click the X to close the menu.

6.1.2. Engines and display graphics

As you turn the different Engines on and off, watch what happens to the graphic image at the center of the Play Panel. Depending on which Synths or Samplers are on, the graphic will change from relatively traditional acoustic instruments to explosions of bits and bytes. With a little practice, you can tell at a glance the structure of a given Preset... but it's also just beautiful to watch!

6.2. Macro controls

The 8 **Macro** knobs are designed to gather many different types of sound control together in one place, allowing you to control many different parameters with one turn of a knob. Their names suggest their default assignments, but you can assign any of the Macro knobs to control nearly any parameter in Augmented, giving you a massive range of control.

6.2.1. Sound controls
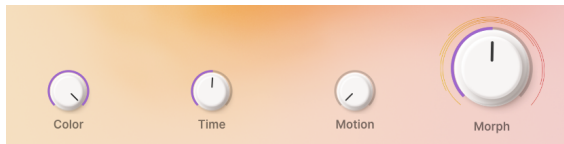
These knobs are intended to provide widespread control over many synth parameters at once.

- **Color**: Defaults to controlling tone color, e.g. Filter Cutoff.

- **Time**: Defaults to envelope control, e.g. Envelope Attack Times or Sustain Levels.

- **Motion** Defaults to movement-based control, e.g. LFO rates and amounts.

- **Morph**: This oversized knob defaults to controlling the balance between Layer A and Layer B, and can also modulate many other parameter settings at once, changing them between how they are stored in the two Layers.

These Macro knobs are all part of the Augmented Modulation [p.110] system, and can be assigned to many more parameters beyond their defaults.

6.2.2. FX controls

These knobs are used to control the FX within a Preset, both those contained within Layers and the Main FX (Delay and Reverb).

- **FX A**: This knob defaults to adjusting parameters linked to the insert effect on Layer A.

- **FX B**: This knob defaults to adjusting parameters linked to the insert effect on Layer B.

- **Delay**: Add movement to your sound with delay. This Macro can control any effect parameter on the Delay, including the wet/dry mix. Delay is an insert effect on the Master bus and the first FX in that chain.

- **Reverb**: Add space to your sound with reverb. This Macro can control any effect parameter on the Reverb, including the wet/dry mix. Reverb is an insert effect on the Master bus, which follows Delay in the FX chain.

> ℹ These knobs are all part of the Modulation system as well. You can assign them to any number of modulations anywhere within Augmented – and you can even turn off their FX control if you want to use them for something else.

6.3. Going deeper

The Play Panel is deliberately designed to be quite simple. Assign MIDI controllers to these controls, and you can get through a whole lot of performing and tweaking without ever having to dive deeper.

There are three other Panels in Augmented, selected from the buttons on the right side of the Upper Toolbar. They are:

- The Layers Panel [p.60], which controls parameters relating to the Layers making up a Preset
- The FX Panel [p.81], which controls the Layer FX and Main FX processors
- The Arpeggiator Panel [p.107], with interactive play controls for Augmented's built-in Arpeggiator.

At the bottom of all three of these panels, you will find the Modulation Strip [p.110] – a central location for all modulation and external control sources, as well as the Macro controls.

In the next four chapters, we will cover all of these essential sections in depth, so you'll understand all of the sound design tools at your command. Let's go!

7. THE LAYERS PANEL

Clicking the **Layers** button in the Upper Toolbar gives you this view:

The Layers Panel and Modulation Strip, as seen in Augmented WOODWINDS

The bottom half of the window is the Modulation Strip [p.110], which has its own chapter later on.

> ℹ️ You'll find the Modulation Strip at the bottom of the window when you're working in the FX Panel [p.81] and Arpeggiator Panel [p.107] as well. It appears in all of these windows so you can easily assign modulations with simple drag-and-drop actions, rather than having to switch views all the time.

The top half of this view is the Layers Panel itself:

The Layers Panel, as seen in Augmented YANGTZE

These are the controls for the Layer-based fuctions in an Augmented Preset.

7.1. Layers

This is the control layout for a typical Layer. Aside from color coding, the two Layers are identical in layout and functions.

Overview of a Layer

We'll discuss the functions in each part of the Layer below... but first, let's examine what actually makes up a Layer.

7.2. Layers, Parts, Sources, and Engines

Each Preset in Augmented is made up of multiple pieces. What are they, and how do they fit together?

- Each Augmented Preset has two **Layers** (A and B).

- Each Layer has two **Parts** – A1 and A2, B1 and B2.

- Each Part contains one of the four sound **Sources** in a Preset – **Sampler 1**, **Sampler 2**, **Synth 1**, and **Synth 2**. They can be dragged and dropped to go into either Part of either Layer.

- Each Layer also has a **Filter** shared between the two Parts.

- a **Tuning** control that transposes both Parts by up to 24 semitones (2 octaves) up or down, and a global **Volume** slider, are at the top of the Layer controls.

> ℹ️ Each Source has a specific means of creating sound, called an **Engine**. The two Samplers have only one type of Engine, but the two Synths have a choice of five Engines. We'll discuss those in the Synth Engines [p.66] section below.

7.3. Part title tabs
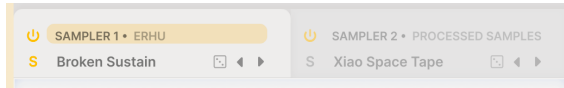
Tabs for the two Parts in a Layer

Each Part has a title tab with the following information and controls:

- **Bypass**: The power button icon enables a Part. When off, the Part is shut down and does not process audio.
- **Solo**: The **S** icon is a Solo button, which silences all Parts except the one selected. Only one Part can use Solo at a time.
- **Source**: Designates the Source in use for that Part. When it's highlighted (as shown above), it can be dragged and dropped to rearrange the placement of the Parts within the Preset. You can change the order of the Sources in a Layer, or move them between Layers.
- **Part Preset Name**: Click on this to drop down the menus for selecting Part Presets, as described below.
- **Roll The Dice**: This is an easy way to play with a Layer to find new ideas or inspiration. Click the die icon to randomly select a Part Preset.
- **Part Preset Scroll Arrows**: These icons let you click through the Part Presets available for that Engine.

These controls are nearly identical in layout to their counterparts for each Part in the Play Panel [p.54].

> ℹ In the image above, the left tab is highlighted because that's the Part we are currently editing. To move to the other Part, just click its tab to bring its controls forward.

7.3.1. Selecting Part Presets

Clicking on the name of a Part Preset pops up a menu to select categories and sounds. The menus work in the same way for the Synth and Sampler Engines.

> ℹ Part Preset Menus work exactly the same way in the Play Panel [p.54], but we'll repeat that information here for clarity.

In most cases, the Part Preset menu will have two columns. First will be the Engine type (for Synth Parts) or the Instrument sample collection (for Sampler Parts). The second column will be a list of Part Presets for that Engine or Instrument. Simply scroll and click to make your selection.
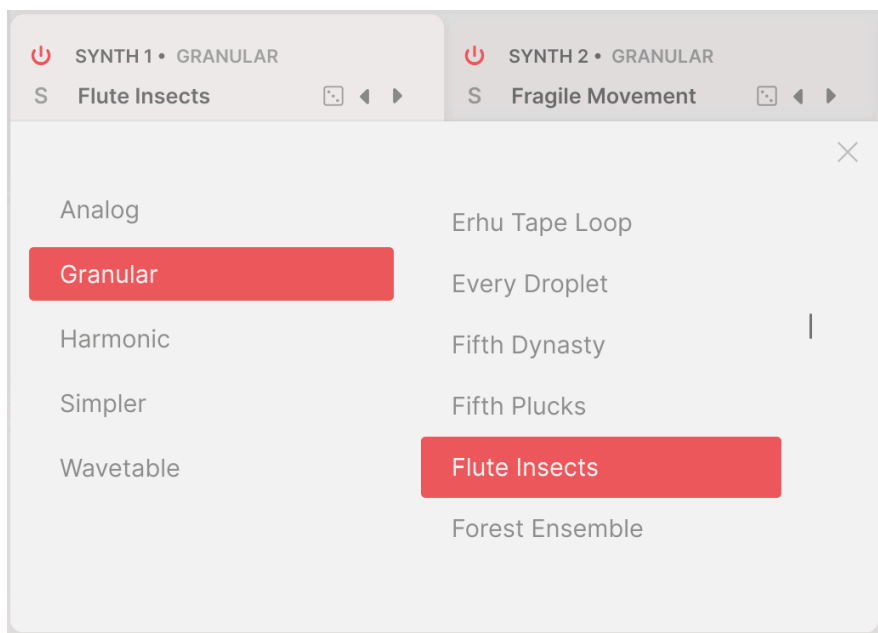
Selecting a Synth Part Preset within a given Engine

However, for certain Sampler Instruments (e.g. the Solo Strings in Augmented STRINGS) or Synth Engines (e.g. Harmonic in Augmented STRINGS or VOICES, or Simpler in any Augmented instrument), there may be an extra layer of subdivision, for mappings or sound categories. When this is the case, the browser will have three columns, which are only shown two at a time. Here's how you change which columns you're looking at.

In this example, the first two columns of the Sampler Part Preset menu are shown. When you select the Erhu Instrument, in addition to the Presets there is also an entry called "mappings", which is not a Preset but a folder of special Presets:
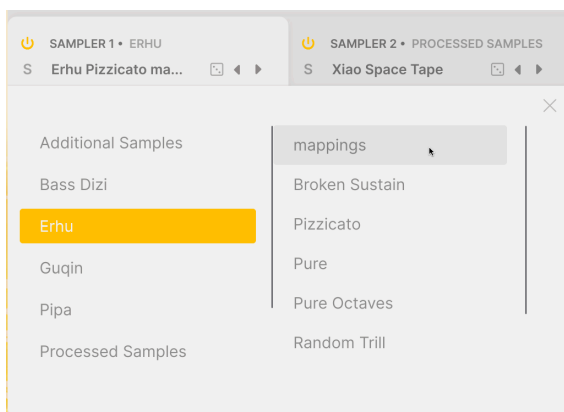
Columns 1 and 2 show Instrument (Erhu) and Presets
(about to click mappings).

When we click on mappings, the columns will shift to the left, so you can see the Presets in this category.
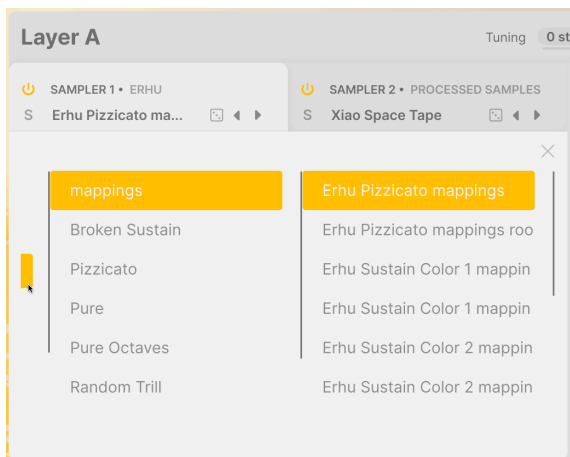
Columns 2 and 3 show (mappings) and its Presets. The cursor is hovering the right edge of Column 1.

In this view, notice that on the far left, a little bit of the chosen Instrument's colored box is still visible (the arrow cursor is touching it). Click on that to shift the columns back to the right, to show the Sampler Instruments.

Click the X to close the menu.

The rest of the Layer control panel has controls for the particular Engine that's been selected for use. We'll look at the Sampler first, then the five Synth Engines.

7.4. Sampler

The Sampler Engine provides the following controls:
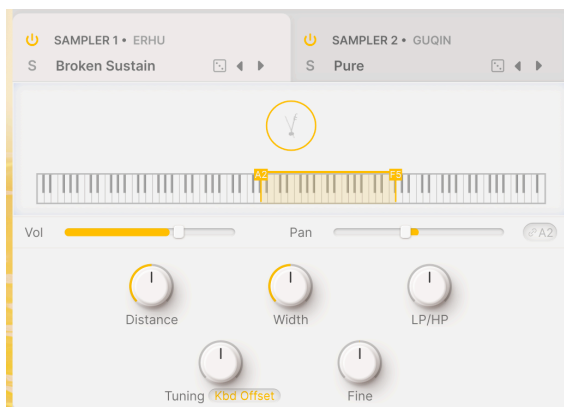
At the top is a graphical icon representing the Instrument (here, an Erhu). Under that is a keyboard showing the range of pitches that the Instrument covers.

Below that are the **Volume** and **Pan** controls, which include meters to show level and panning changes dynamically.

- Volume has a range from –70 dB to +12 dB (default –6 dB).

- Each Part in a Layer can be panned independently from the other, or linked via the Link button next to the Pan slider.

7.4.1. Sample playback

At the bottom are the controls relating to playing back the samples themselves. First are a set of controls for the balance of sounds captured by various microphones when the instruments were sampled.

In the case of Augmented BRASS, STRINGS, WOODWINDS, and YANGTZE, and the Choir sounds in VOICES, each note or sound was recorded with a mic close to the instrument, and a mic farther away for more ambient sound.

- **Distance**: controls the mix balance of the close and far mic sounds. 0.00 means all close, 1.00 means all far, default is 0.50.
- **Width**: controls the stereo width of the sound, from mono (0%) to extreme separation (200%).

Augmented GRAND PIANO and Augmented MALLETS do not offer a Distance control, because they use different mic placement schemes.

Augmented STRINGS has no Distance or Width controls for the Solo instruments, because the instruments are deliberately recorded with only a close mic for a cleanly isolated sound. However, you'll find these controls for the Orchestral and Chamber Strings.

Finally, the non-Choir sounds in Augmented VOICES have no Distance control. Instead, many of them have a **Rand Start** control. This randomizes the start point of a sample when played back, so every note played has a slightly different timbre over time.

7.4.2. LP/HP Filter

The Sampler Engine includes a simple lowpass/highpass filter to quickly adjust the tonal balance of the sample set.

- **LP/HP**: controls the tonal balance from 100% lowpass to 100% highpass, with the default being no filtering.

7.4.3. Sample tuning

There are two levels of sample tuning in the Sampler Engine: one by semitones and one by cents (0.01 semitone).

- **Tuning** lets you alter the pitch of the sample playback in one of two ways, set by a pop-up menu for **Tuning Mode**.

    - **Coarse** lets you pitch-shift the samples by up to 24 semitones (2 octaves) sharp or flat.

◦ **Kbd Offset** lets you shift the samples' playback range by a specific interval. Available intervals include a fourth, a fifth, one octave, an octave and a fourth, an octave and a fifth, or two octaves – either sharp or flat.

> ℹ️ When you use Kbd Offset, the displayed range of the sample will shift in the keyboard diagram above the controls.

- **Fine**: lets you fine-tune the sample pitch by intervals of one cent (1/100 semitone). Small variances in tuning can make a sampled instrument sound more rich and realistic.

7.5. Synth

The Synth is a collection of five different Engines, each designed to augment the Sampler with a wide variety of synthesized timbres.

Let's familiarize ourselves with the controls on these five very different and very capable Synth Engines.

7.5.1. Analog

Analog

The Analog Engine in Augmented is a straightforward virtual analog synthesizer oscillator set, displaying the impeccable sonic quality that musicians have come to expect from Arturia.

- **OSC1, OSC2, OSC3**: Set the waveforms for each of three oscillators. Click and drag to choose between sine, triangle, sawtooth, ramp (rising sawtooth), and square.

- **Volume** with dynamic level display. Range is –70 dB to +12 dB (default –6 dB).

- **Pan** with dynamic panning display. Parts in a Layer can have separate or linked pan positions (via the Link button).

- **Osc2 and Osc3**: Control the levels of OSC2 and OSC3 relative to OSC1. Range: -70.0 dB (muted) to 0.00 dB (unity gain).

- **Noise**: Adjusts the level of the noise generator.

- **FM**: Sets the amount of modulation coming from a source oscillator, affecting the frequency of OSC1 and/or OSC2.

- **Detune**: Sets the amount of detuning between unison voices. Range: 0.00 to 100.00 cents (1 semitone). The default value is 3.00 cents.

- **Coarse**: Adjusts the tuning of the oscillators in semitones. Range: 24 semitones (2 octaves) up or down

- **Fine**: Allows fine-tuning of the oscillators in cents. Range: ±1 semitone (100 cents).

7.5.2. Granular

Granular

Granular synthesis works by taking small pieces of a sample, called *grains*, and manipulating them to create complex textures. The viewer window displays the sample waveform with the Start time as a vertical line.

- **Volume** with dynamic level display. Range is –70 dB to +12 dB (default –6 dB).

- **Pan** with dynamic panning display. Parts in a Layer can have separate or linked pan positions (via the Link button).

- **Start**: Determines the point at which the grain begins playback when triggered. The line on the graphic will move as this setting is changed; you can also change the setting by clicking and dragging the line itself.

- **Density**: Sets how often grains are generated. Use the drop-down menu to specify how the grain generation rate is set:

    ◦ **Hertz** (cycles per second, from 0.050 or 20 seconds per cycle all the way up to 250 Hz)
    ◦ **Sync Straight**, **Sync Triplets**, or **Sync Dotted** (synchronized to the host software's tempo in bars, from 2 bars to 1/256 bar).

- **Size**: Determines the size of each grain. The drop-down menu lets you select between

    ◦ **Time** (1ms to one second)
    ◦ **Sync** (**Straight**, **Triplets**, or **Dotted**) to host tempo in bars from 1/64 to 1/1
    ◦ **Ratio** (a division of the current Density value that was calculated for the grain, from 1/16 to 4/1).

- **Env Shape**: Sets a window that alters the attack and release characteristics of the grains, which can produce results from "smooth" to "clicky." Range: 0.00 to 1.00 (default is 0.50). A graphic under the knob gives a rough idea of the grain shape.

- **FM**: Adds frequency modulation to the pitch of the grains, creating more widely varying tonalities.

- **Coarse**: Adjusts the tuning of the oscillators in semitones. Range: 24 semitones (2 octaves) up or down.

- **Fine**: Allows fine-tuning of the oscillators in cents. Range: ±1 semitone (100 cents).

7.5.3. Harmonic

Harmonic

Much of traditional synthesis is *subtractive* – that is, you start with a complex waveform full of harmonics and then filter out what you don't want. *Additive* synthesis is the opposite: you add up individual sine waves (a pure sine wave has no harmonics) until you have a precise harmonic profile. This form of synthesis is excellent at producing clear and bright tones with lots of treble content.

Traditionally, additive synthesis is highly complex and detailed, but there are ways to simplify the process while retaining highly musical results. Augmented's Harmonic Engine lets you control a series of up to 512 harmonics via just a handful of settings.

The resulting spectrum is displayed in the Visualizer as it evolves over time, with the following controls below it:

- **FM**: Sets the amount of modulation coming from a source oscillator to the fundamental frequency of the harmonic oscillator. That leads to modulation of all of the harmonics in the series.

- **Section**: Sets a "window" in the harmonic series where the spectral filters (see Morph, below) will have an effect.

- **Morph**: Crossfades between 2 factory-programmed spectral filters that boost and cut parts of the harmonic series.

> This parameter should not be confused with the main Morph knob!

- **Parity**: This changes the proportion of odd-numbered and even-numbered harmonics in the series, which have significantly different tonalities. With the Parity knob, you can dial in a mixture from all odd harmonics to all even harmonics, with any proportion in between.

- **Partials**: This control sets the number of partials in the harmonic series. The setting ranges from 1.00 (a sine wave) to 512, with a default at 256.

> Experiment with this setting! You will discover that there are a lot of useful possibilities at both very small numbers (less than 64) and really large numbers (256 and higher), with the lower numbers having more identifiable components and the higher numbers offering a lot of treble "sheen".

- **Coarse**: Adjusts the tuning of the oscillators in semitones. Range: 24 semitones (2 octaves) up or down.

- **Fine**: Allows fine-tuning of the oscillators in cents. Range: ±1 semitone (100 cents).

7.5.4. Simpler

*In this example, the Start point, Play range, and Loop
range (with Loop Fade) are all easy to see.*

The Simpler Engine is a streamlined sample playback engine that creates interesting textures with a lot of sonic character. Its samples are organized in the following categories: Drone, Field, Foley, Impact, Instrument, Noise, Pad, and SFX.

The Visualizer is an essential part of working with the Simpler Engine, as it allows easy interaction with how a sample plays back.

Under the Visualizer on the left are a series of playback snapshots, from as few as one to as many as six. Click these to see how each has a different set of parameter settings. Depending on the Preset, these different snapshots might play in a round-robin order as notes are played, to give them variation and a less static character, or might play different samples when selected.

There are three buttons below the Visualizer on the right:

- **Key**: When this is disabled, the keyboard will trigger samples without pitch shifting, i.e. always playing the same pitch. When enabled, the sample is played back at a pitch determined by the key being played. This option is global, and affects the different sample slots of the Preset.

- **Snap**: This helps you find zero crossing points when dragging the various sample markers, to help avoid clicks or pops at start or loop points. This option is global, and affects the different sample slots of the Preset.

- **Loop**: When enabled, the sample will contain a loop, which brings up two loop control parameters and adds loop controls to the Visualizer.

On the Visualizer, you can easily change the start and end position of the sample playback by moving the vertical markers with the arrows on top.

Likewise, when Loop is ON, you can easily change the start and end position of the loop by moving the vertical markers with the arrows at the bottom. The loop region is shaded in light grey so it's easy to see.

Below the Visualizer are Simpler's other parameters:

- **Start**: Sets the sample start position based on the Play head start position. In the picture above, the Play range has been restricted so the first part of the sample doesn't play back, and the Start point for playback is the black vertical line just after that.

- **Playback**: Lets you choose between Normal and Reverse, which plays the sample backwards.

- **Loop Dir** (direction): Lets you choose between Forward and Backward & Forward. This lets you repeat a sound as it loops, or create a loop that smoothly runs back and forth for more realistic sustain.

- **Loop Fade**: Sets the crossfade of the loop, to further smooth out transitions. In the picture above, the Loop Fades are shown as grey ramps on either side of the Loop markers.

- **FM**: Sets the amount of Frequency Modulation, just like in the Granular [p.67] synth.

- **Coarse**: Adjusts the tuning of the oscillators in semitones. Range: 24 semitones (2 octaves) up or down.

- **Fine**: Allows fine-tuning of the oscillators in cents. Range: ±1 semitone (100 cents).
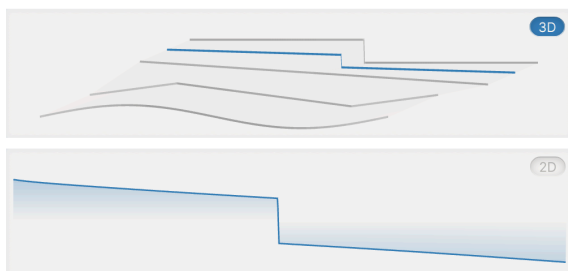
7.5.5. Wavetable

Wavetable

Wavetable synthesis offers a lot of interesting options that an ordinary oscillator can't deliver. First developed in the early years of digital synthesis as a way of creating complex and lively sounds from tiny amounts of sample memory, it has remained popular to the present day because of its unique tonality.

A *wavetable* is made up of several stored samples, each one of a single wave cycle. They can be slightly or radically different from one another. The stored waves are then placed at different points in a "table" that can be scanned as a note plays. As the table moves past one stored wave and goes to the next, the waveforms in between are calculated in real time, creating a smooth shift from one stored waveshape to the next one.

Because the wavetable can be scanned forward or backward using modulation, knob movements in real time, or Macros, the Wavetable Engine can produce a wide variety of radically evolving sounds.

The Wavetable Engine type contains a window that shows the wavetables in 2D or 3D, toggled by the button in the upper right corner.

Here is a very simple wavetable. It has only four waves: a sine, triangle, falling sawtooth, and square. If we set the position of our wave to be halfway between the sawtooth and the square, it will look like this in the 3D and 2D views:

A snapshot of a wave in a wavetable in 3D (top) and 2D (bottom)

In 3D, the current wave (the blue line) can be seen clearly as an "in-between" shape between the two waveforms on either side of it. The 2D display shows a "straight on" view of the blue waveform as it might look on an oscilloscope.

> **i** That example was chosen for simple clarity, and it might not seem like it would produce a very exciting sound – but it's actually the exact sort of variation you'd get from an analog synthesizer with a variable waveshape, from sine to square. This ability to scan between four "simple" waves was the basis for some of the best synth sounds of the 1960s and 1970s!

As you try various Presets, you'll see that there are all kinds of wavetables available, from very simple to highly complex. Watch how even a simple wave in 2D changes as you play with the various controls.

- **Position**: Scans through the currently selected wavetable. This can also be done manually, by clicking and dragging the colored waveform back and forth in the Visualizer. It may be helpful to switch between the 2D and 3D renderings of the waveforms to gain a better idea of what you're hearing.

- **FM**: Adds Frequency Modulation to the wavetable.

- **Phase Distortion**: Phase distortion is a method of warping a source waveform by a modulator wave. As the Phase Distortion is turned up, the amplitude positions within the source waveform are shifted in time, creating a warping of the sound.

- **Wavefolding**: Wavefolding "folds over" the high and low parts of the waveform, creating a much more complex wave.

- **Detune**: Sets the amount of detuning between unison voices. Range: 0.00 to 100.00 cents (1 semitone). The default value is 3.00 cents.

- **Coarse**: Adjusts the tuning of the oscillators in semitones. Range: 24 semitones (2 octaves) up or down.

- **Fine**: Allows fine-tuning of the oscillators in cents. Range: ±1 semitone (100 cents).

7.6. The Filter

Each of the two Layers has its own Filter for adjusting the frequency content of the sound created by the Engines.
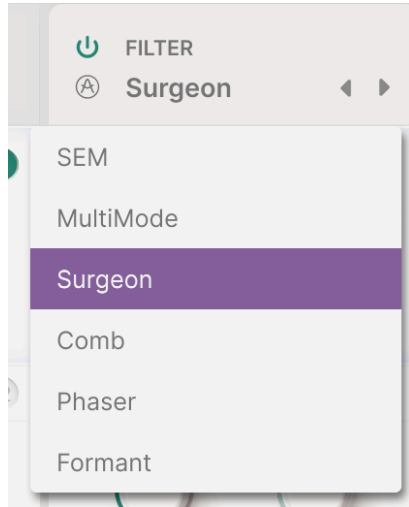
Filter Types menu

Note the power button icon, allowing you to bypass the Filters for either or both Layers.

There are six types, selected by a drop-down menu (Click on the type name at the top) and explained in detail below.

7.6.1. SEM

SEM

This Filter is based on the famous Oberheim state-variable filter circuit used in the iconic Synthesizer Expander Module (SEM). It has a gentle 12 dB/octave slope and a distinctive character.

- **Cutoff**: Sets the filter cutoff frequency, between 20 Hz and 20 kHz.

- **Resonance**: Sets the filter resonance or emphasis of the filter

- **Mode**: opens a pop-up menu to select Low Pass, Notch, Band Pass, or High Pass mode.

7.6.2. MultiMode

MultiMode

This analog filter model is unique to Arturia. It has a more pronounced 24 dB/octave slope, and its controls are identical to those on the SEM:

- **Cutoff**: Sets the filter cutoff frequency, between 20 Hz and 20 kHz.

- **Resonance**: Sets the filter resonance or emphasis of the filter

- **Mode**: opens a pop-up menu to select Low Pass, Notch, Band Pass, or High Pass mode.

7.6.3. Surgeon

Surgeon

This is an extremely steep filter (64 dB/octave) with several Modes available.

- **Cutoff**: Sets the filter cutoff frequency, between 20 Hz and 20 kHz.

- **Width**: Sets the bandwidth and depth of the filter effect when in notch or band pass mode. Higher values give a shallower, broader effect, and lower values produce a steep and narrow peak or notch. This control is greyed out and has no effect in low pass or high pass mode.

- **Mode**: opens a pop-up menu to select Low Pass, Notch, Band Pass, or High Pass mode.

7.6.4. Comb

Comb

A *comb filter* is created by adding a delayed version of the input signal to itself, which results in a series of reinforced and cancelled harmonics that are heard as peaks and notches in the frequency response. The most common application for a comb filter is the *flanger*, which modulates the delay time to cause the peaks and notches to move. (This can be easily done here by modulating the Frequency control.) The Comb filter also includes a switch to send the delayed signal back to the input (feedback) or directly to the output (feedforward).

- **Frequency**: Sets the frequency range of the peaks and notches. Higher frequencies result from shorter delay times.

- **Gain**: Emphasizes the strength of the peaks and notches.

- **Mode**: Clicking this button opens a pop-up menu of various filter modes:
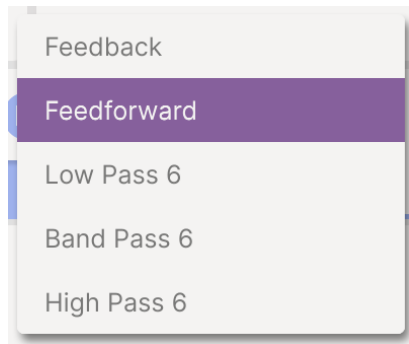
Comb

The choice of Mode will produce radically different tonalities depending on the other settings. Choices include:

- **Feedback**: The delayed signal is fed back into the comb filter's input.
- **Feedforward**: The delayed signal is fed back into the comb filter's input.
- **Low Pass 6**, **Band Pass 6**, and **High Pass 6**: A 6 dB/octave filter is applied to the delayed signal before feedback to the input.
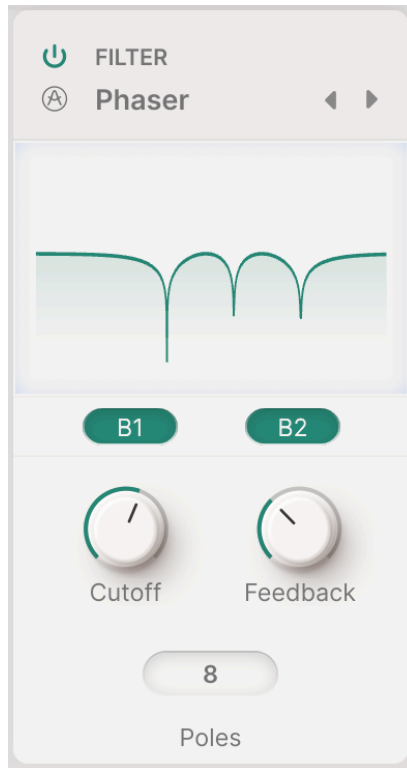

Comb

Clicking on the gear icon reveals sliders for three other parameters:

- **KBD**: Adds adjustable keyboard tracking to the delay.
- **All-Pass**: Allows you to tweak the all-pass filter within the modeled circuit.
- **Damping**: Adds a damping effect that can dramatically change the tone, emphasizing high or low frequencies.

> ℹ️ All-Pass and Damping are only available in the 6 dB/octave filtered Modes.

7.6.5. Phaser


Phaser

A phaser uses a set of all-pass filters on an input signal. These filters don't change the input's frequency content, but they do alter its phase, resulting in a series of peaks and notches like those of a comb filter but with a very different, almost "liquid" sonic character. As with the Comb Filter, modulate the Cutoff to create movement in the frequency peaks and notches.

- **Cutoff**: Sets the frequency range of the peaks and notches.

- **Feedback**: Emphasizes the strength of the peaks and notches.

- **Poles** buttons: Select the number of *poles* (all pass filters) in the phaser. Each pair of poles produces one frequency notch, so the choice of 4, 6, or 8 poles gives you 1, 2, or 3 notches. This has a drastic effect on timbre, and is worth experimenting with carefully.

> i There is a much more powerful Phaser [p.79] in the Layer FX [p.82] discussed later on.

7.6.6. Formant
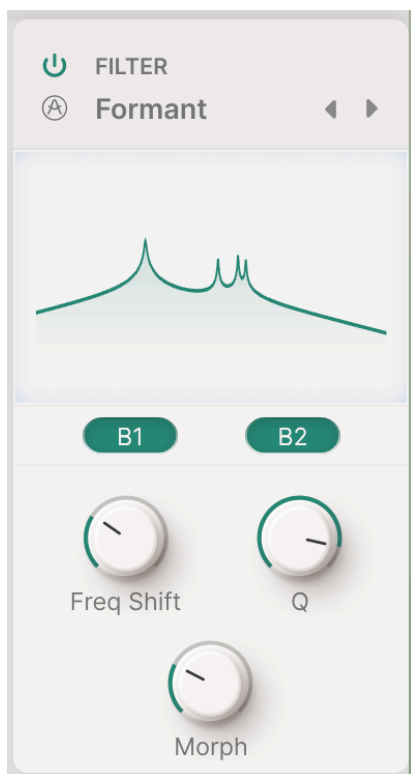
Formant

Human voices are recognizable as male, female, young, old, etc., thanks to fixed frequencies called *formants*. The Formant filter allows you to generate and modify a wide range of "vowel" sounds and then apply them to the input signal.

- **Freq Shift**: Sets the frequency range of the formant effect.

- **Q**: Emphasizes the strength of the resonant peaks.

- **Morph**: Shifts between different vowel sounds. This is a fun control to modulate!

8. THE FX PANEL

Clicking the **FX** button on the Upper Toolbar opens the FX Panel, where you can program and control the many different audio effects available in Augmented.
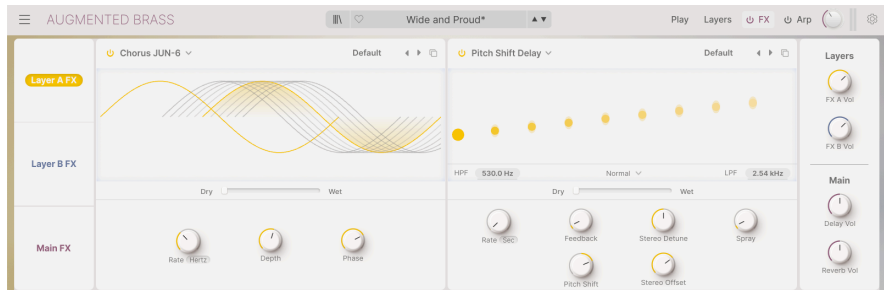
The FX Panel, shown here in Augmented BRASS

There are two kinds of FX available in Augmented, and the three buttons on the left side of the panel select which ones are visible for editing.

Layer FX

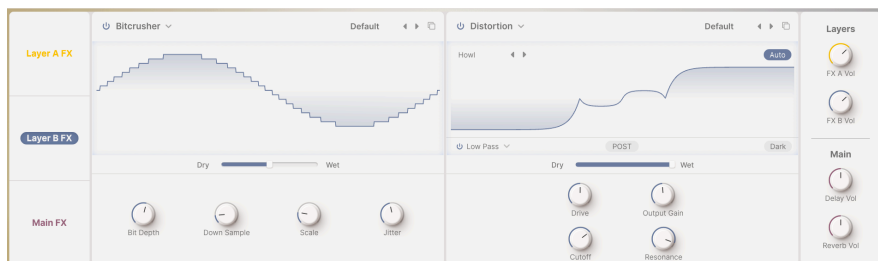The **Layer FX** can be placed on any Layer, in a chain of two FX. There are 16 different Layer FX types.
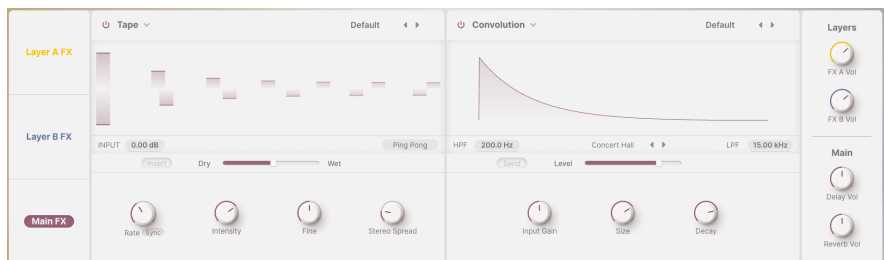
Main FX

The **Main FX** are placed on the entire Preset's output. They include three types of Delay and two types of Reverb.

8.1. Layer FX

Layer FX

Each Layer has two FX slots, letting you insert one of 16 Effects into each slot, for 1 or 2 separate effects per Layer. FX A is linked to Layer A, and FX B is linked to Layer B. They have their own Volume knobs at the far right of the Panel.

Each of the Layer FX has a pull-down menu of Presets at the top right corner. This is also where you can store your own settings as an FX Preset.

The **Copy icon** pops up a window to let you copy this FX with all of its settings to any of the other three Layer FX slots.

Nearly all Layer FX have a **Dry/Wet** mix slider under the Visualizer.

A Layer FX can be bypassed with the power button icon at the top left corner of its window. Alternatively, if you're sure you don't need anything in a particular slot, you can select **None** from the pop-up menu of available effects:
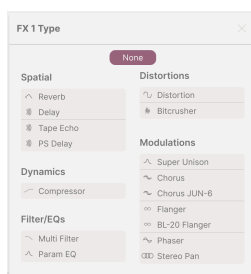
Of course, even though "none" might sometimes be the right choice for a certain preset, it's not very much fun. So let's learn about your 16 other options: the Layer FX.

8.1.1. Reverb
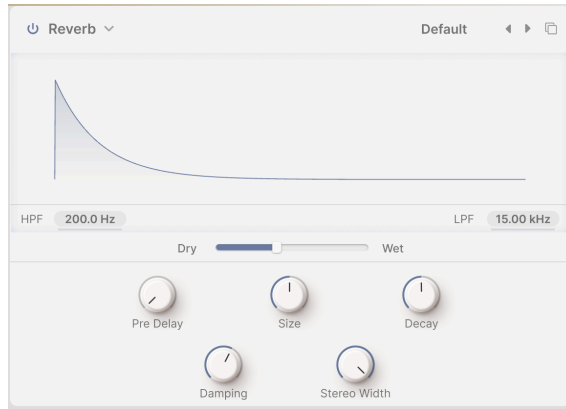
Reverb (or *reverberation*) is the sound of a space – a recording studio, a concert hall, a stairwell, a tiled bathroom, the inside of an empty oil tanker, you name it. There's a Main FX Reverb, of course, but sometimes it will be handy to put a little space on your Layers.

Directly under the Visualizer are two displays for two types of input filtering: High Pass (HPF) and Low Pass (LPF). The filters are always active. To change their cutoff frequency, drag up or down on the displays.

- **HPF** rolls off the low frequencies of the input before it hits the reverb. This takes out low-end mud and makes the reverb brighter-sounding. Like any high-pass filter, this one has a cutoff frequency setting: 30 Hz to 10000 Hz. The default is 200 Hz.

- **LPF** rolls off the high frequencies of the input before it hits the reverb. This softens the overall sound and removes overly tinny treble effects. Its cutoff frequency ranges from 100 Hz to 20000 Hz.

- **Dry/Wet** is the blend of dry signal with the reverb output. (0.00% to 100%)

- **Pre Delay** is how long it takes for the first reflected sound to come back to our ears. Longer predelays imply a larger space. (0.00 to 0.20 seconds)

- **Size** is the overall size of the space, a general sense of how open it is. (0.100 to 1.90)

- **Decay** is how long the reverb takes to decay to silence. It interacts with Size to define the shape of the ambience. (0.00 to 0.925)

- **Damping** is how quickly high-frequency sounds roll off before low-frequency sounds in the space. More damping implies a space full of objects or materials that absorb highs first: carpets, ornate wood, even people. Less damping implies a more 'ringy' space with concrete or tile walls. (0.00 to 1.00)

- **Stereo Width** controls the width of the output stereo mix.

8.1.2. Digital Delay
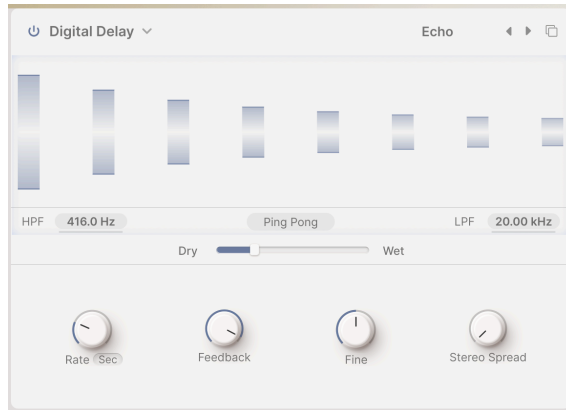
Delay is a generic term for any effect that makes a copy of an input sound and repeats it a short time later. There are three delay Layer FX in Augmented, and this first one is a good-sounding digital delay for all kinds of applications.

- **HPF** and **LPF** control two filters that shape the tone of the delayed sound. Darker echoes die away with less 'clutter' in the audio, and brighter echoes carry a lingering sense of presence. Click and drag to set HPF from 20 Hz to 10000 Hz and LPF from 250 Hz to 20000 Hz.

- The **PingPong** button activates an effect where echoes alternate between the left and right sides of the stereo field. This effect is easy to overuse, and can cause listener fatigue, but when combined with very subtle echoes it can produce a beautiful sense of extra space.

- **Rate** is the time between echoes. It can be set without sync or with different types of sync:
    - **Time** in milliseconds (2 ms to 2 seconds)
    - **Sync Straight**, **Sync Triplets**, or **Sync Dotted** (1/32 bar to 8 bars)

- **Feedback** is how much of the delayed sound gets fed back to the input. This produces repeating echoes that fade away, rather than a single delayed copy of the input sound (called *slapback*, useful for some cases). High feedback settings lead to longer trails of echo. (0.00 to 1.00)

- **Fine** adds subtle changes to delay times for a greater sense of liveness and thick character. This control works even with sync echoes, and has a range of ±50 millisecons.

- **Stereo Spread** controls how much the echoes spread out in the stereo soundstage, from full mono to massive panning. (0.00 to 1.00)

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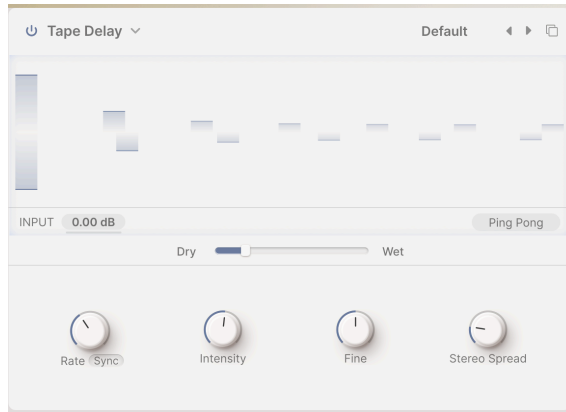
Tape Delay (or *tape echo*) is a type of delay that's characteristic of early tape-based delay machines such as the Maestro Echoplex and Roland Space Echo. Input sounds are recorded to a loop of tape with one or more playback heads to create the echoes. Because tape loops can be unstable and shift in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

- **Input** is an adjustment of the input gain, not only to make the sound louder or softer, but to gently saturate the tape and produce a warm character at higher settings. (-12 dB to +12 dB)

- The **PingPong** button activates an effect where echoes alternate between the left and right sides of the stereo field. As with the Digital Delay effect, be careful not to overuse this function.

- **Rate** is the time between echoes, which has a narrower range than the Delay FX because of the limitations of tape. It can be set without sync (Time) or with different types of sync: Straight, Triplets, and Dotted. (10 ms to 1 second, or 1/32 bar to 8 bars)

- **Intensity** is another word for feedback – the intensity and persistence of the echoes. The parameter ranges from 0.00 (slapback) to 1.20. Settings above 1.00 will cause the echoes to be louder than the input. This phenomenon is called *self-oscillation* (or *runaway*) and leads to an ever-increasing audio level that will eventually overload, then distort, then clip... and will keep getting louder until it eventually destroys your headphones, your speakers, and your ears. Please use it responsibly and be ready to turn it down.

- **Fine** is a fine-tuning of the basic Rate. Sometimes, having a time just slightly off other synchronized effects can give a sense of richness to the overall sound. (-50 to +50 ms)

- **Stereo Spread** provides a sense of spaciousness by having one side of the stereo image have a slightly different delay time than the other. (0.00 to 0.20)

8.1.4. Pitch Shift Delay
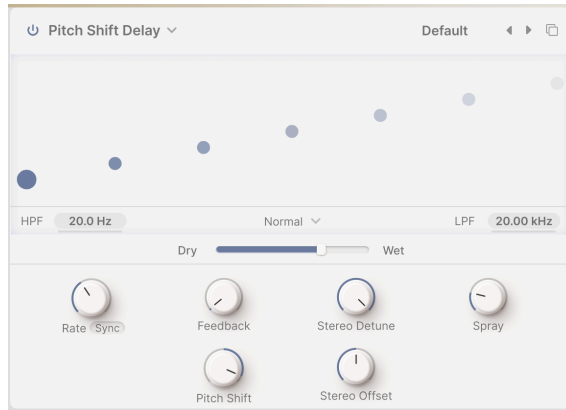
Pitch Shift Delay is a classic effect dating back to the early years of digital audio processing, popularized by the Eventide Harmonizer. It works like a conventional delay, but in addition to being fed back to create echoes, the delayed audio signals are subjected to a pitch shift, either up or down.

- **HPF** and **LPF** control two filters that shape the tone of the delayed sound. Darker echoes die away with less 'clutter' in the audio, and brighter echoes carry a lingering sense of presence. Click and drag to set HPF from 20 Hz to 10000 Hz and LPF from 250 Hz to 20000 Hz.

- **Delay Mode** is a dropdown menu under the Visualizer that allows you to harmonize the feedback echoes an octave up or down in addition to whatever pitch shift you have set. The Normal setting adds no extra octaves.

- **Rate** is the time between echoes. It can be set without sync or with different types of sync: Straight, Triplets, and Dotted. (2 ms to 2 seconds, or 1/32 bar to 8 bars)

- **Feedback** is how much of the delayed sound gets fed back to the input. Settings range from 0.00 (slapback) to 1.00 (infinite repeats without runaway).

- **Stereo Detune** controls how different the left and right channels' pitches are. (-100 to +100 cents, where 100 cents equals one semitone)

- **Spray** sets up a 'scattering' effect across the soundstage for each successive echo, with slightly randomized echo times. It's especially noticeable at higher amounts of pitch shift. (0.00 to 500 ms)

- **Pitch Shift** is the base amount that echoes are shifted by. As they repeat, they will be shifted repeatedly, producing an endless spiral upward or downward in pitch. Very subtle amounts can produce a feeling of anticipation (up) or relaxation (down); larger amounts can produce strange, inharmonic results or smoother and more musical 'boom' or 'shimmer' (try setting it to octaves). Pitch shift can be set to 24 semitones (2 octaves) up or down.

- **Stereo Offset** is a positive or negative time difference between the left and right Time settings. This produces a realistic widening of the sound due to a psychoacoustic phenomenon called the *Haas Effect*. (-20 to +20 ms)

8.1.5. Compressor

The **Compressor** is used to control the dynamic range of a sound: it reduces the difference between the softest and loudest levels a sound can have.

Audio that goes above a certain **Threshold** is automatically turned down a bit; the amount it's turned down is the **Ratio**. Ratio of what? If a sound would have gone 6 dB above the threshold but the compressor only lets it rise 2 dB, that's a 3:1 ratio. If a sound would have gone 20 dB above the threshold but it can only go up 1 dB, that's a 20:1 ratio.

While this does lower dynamic range, it also lowers the overall level of the signal. The compressor can then add *make-up gain* to bring the average level of the signal up to where it was before the processing. The loudest sounds stay about where they were, but the softest ones are all louder.

Sometimes it's practically or musically useful for compression to not start or end immediately when a signal passes the threshold. For instance, it might be nice to let the snappy attack of a drum come through before the compressor controls the rest of its sound, or to have the compressor not turn on and off rapidly as new notes are played. In these cases, the compressor will have controls for **Attack** and **Release** to delay the onset or finish of compression.

It can be useful to blend the dry sound with the compressed sound, making the compression an added effect rather than a 100% control of dynamics. This effect is called *parallel compression*, and you can make use of it with the **Dry/Wet** slider.

- The **Make-up** button turns on an automatic makeup gain function that can be handy for getting levels under control quickly.

- **Threshold** controls the level at which compression begins. (-60 to +20 dB)

- **Ratio** The ratio of uncompressed to compressed level changes. (1.00 to 100)

> At 1.00, no compression occurs. Most of the range of the **Ratio** knob happens between 1.00 and 20.0; this covers everything from very light and musical to more forceful compression. Above 20, compression becomes *limiting*, where the idea is to prevent a signal from never going above a certain amount. Hard limiting can have a strong effect on the sound, which might or might not be useful. The top of the range is 100 to 1, which is effectively *brickwall limiting*, where no signal is ever allowed to go above a certain level. This is sometimes used in digital mastering to prevent clipping.

- **Output Gain** controls how much gain will be added or removed from the output. (-36 to +36 dB)

- **Attack** controls the onset of the compression. (0.010 to 1000 ms)

- **Release** controls how quickly the compression 'lets go' of the audio. (1.00 to 2000 ms)

> ℹ️ At any given time, the amount of Gain Reduction is shown by a meter on the right of the display. For this meter, 0 is at the *top* of the range and the meter reads *downward* with more gain reduction. In the screenshot above, the meter shows about 5 dB of gain reduction.

8.1.6. Multi Filter
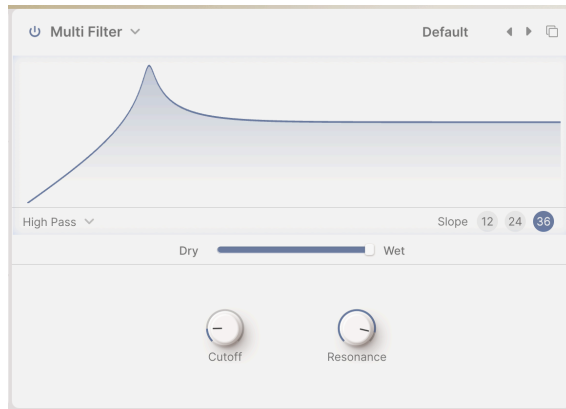
Sometimes it's nice to have an extra filter handy for tweaking your tone before it gets to the output. The **Multi Filter** FX gives you three to choose from!

- The **Mode** dropdown menu selects the filter type: Low Pass, Band Pass, or High Pass.

- The **Slope** buttons select the filter slope: 12, 24, or 36 dB/octave.

- **Cutoff**: sets the cutoff frequency from 20.0 Hz to 20000 Hz.

- **Resonance**: sets the resonance of the filter. (0.500 to 15.0)

8.1.7. Parametric EQ
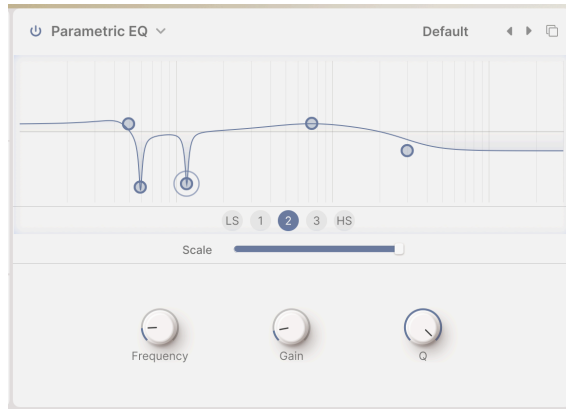
A **Parametric Equalizer** lets you sculpt your sound very precisely, as opposed to the very broad tonal strokes you get from a graphic equalizer or the tone controls on a guitar or amp. It can be used to gently or surgically boost or cut certain frequencies to alter a track's overall sound or remove problem frequencies.

Each of the five bands has its own controls for the center frequency (**Frequency**), amount of boost or cut (**Gain**), and bandwidth (**Q**). These can be dialed in on the knobs for the selected band. Frequency and gain for each band can also be set by clicking and dragging the mouse.

- **Bands** buttons: Selects the band being adjusted. The Parametric EQ has five bands: **LS** (a *low shelf*, where every frequency below the set one is raised or lowered by a certain amount), three *peaking* bands with full control over all parameters, and **HS** (a *high shelf* that works in the same way as the low shelf).

- **Scale**: Rather than Dry/Wet mix, this FX type has a Scale control for the overall effect.

- **Frequency** sets the center frequency of each band: 50.0-500 Hz for LS, 40.0-20000 Hz for the three peaking bands, and 1000-10000 Hz for HS.

- **Gain** sets the amount of boost or cut. (-15.0 to 15.0 dB)

- **Q** sets the bandwidth of the peak or steepness of the shelf. (0.100 to 2.00 for LS and HS, 0.100 to 15.0 for the three peaking bands)

> ℹ In the screenshot above, the Parametric EQ has been set to gently boost the lows, tightly notch out hum at 60 and 120 Hz, provide a broad bump in the upper mids, and significantly reduce the highs.

8.1.8. Distortion

Distortion offers the most options of any Layer FX type. It might seem strange to you that all this effort should be put into a 'fuzzbox', but electronic musicians have known for years that there are many different kinds of signal distortion, each with its unique sonic signature – and they can transform sounds in ways ranging from subtle warmth to all-out audio destruction!

This effect can be supplemented by a multimode filter that can be applied either before (**Pre**) or after (**Post**) the distortion.

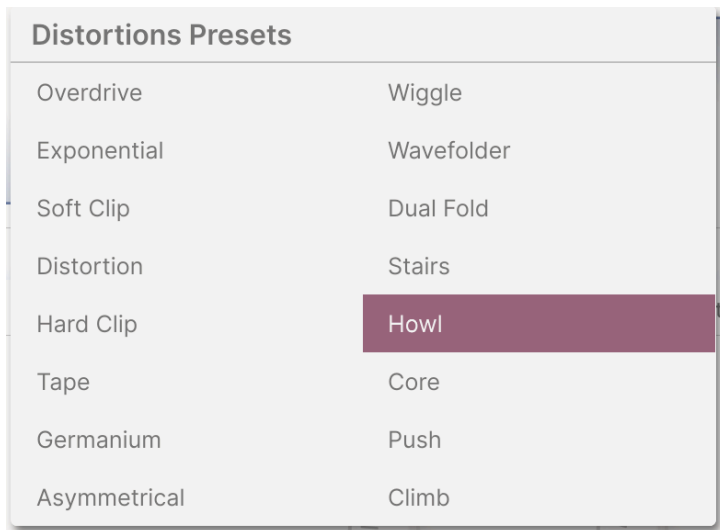Nearly all of the FX parameters are common to all 16 distortion types.

- At the top right of the Visualizer is the **Auto** button, which engages automatic gain compensation to prevent *unintended* overload peaks. (Yes, those happen, even when you're using distortion.)

- The Filter has a power (bypass) button and a **Mode** drop-down to set Low Pass, High Pass, or Band Pass.

- The **Pre/Post** button controls whether the filtering takes place before or after the distortion.

- **Dark** tames the extreme high-end content that some of the distortion types can produce.

- **Drive** controls the amount of overdrive pushing the input signal through the processor. It has a very wide range, from slight saturation to massive boost. (0.00 to 48.0 dB)

- **Tone**: This knob is only available in the **Overdrive** type, and is displayed next to Drive. It adjusts the frequency response of the overdrive from mellow to bright. (0.00 to 1.00)

- **Output Gain** sets the output gain of the distorted sound, either lower (to prevent clipping) or higher (to add power) than the input level. (-24.0 to 3.00 dB)

- **Cutoff** sets the filter cutoff frequency. (20.0-20000 Hz)

- **Resonance** controls the filter's resonant peak. (0.500 to 15.0)

These controls are grayed out when the Filter is bypassed.

A pop-up menu lets you select from among 16 different types of distortion. Their gain structure (output vs. input) will be represented graphically in the Visualizer, so you can "see" how changing the Drive amount alters the sound.

Distortions Presets

Overdrive	Wiggle
Exponential	Wavefolder
Soft Clip	Dual Fold
Distortion	Stairs
Hard Clip	**Howl**
Tape	Core
Germanium	Push
Asymmetrical	Climb

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

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

Want to know how all these funky shapes sound? Try them for yourself!

8.1.9. Bitcrusher

A bitcrusher does what it sounds like: it crushes bits! This FX simulates the 'dirty' audio of old digital converters, whose bit depth and sample rate were limited by the power of current processors. It gives you anything from a slight lo-fi haze to utter destruction of your precious sound.

- **Bit Depth** sets the resolution of the output from 16 bits (CD quality) down to 1.5 bits (barely recognizable as audio).

- **Down Sample** sets the ratio by which the instrument's internal sample rate is divided, from 1.00 x (highest quality) to 80.0 x (trashed). The more downsampling, the more *aliasing* affects the sound, with inharmonic frequencies 'folding down' below the highest frequency the bitcrusher can deliver.

- **Scale** lets you increase the precision of the bit crushing for lower-level signals. This can help remove the digital crud you *don't* want and help you hear the digital crud you *do* want.

- **Jitter** adds uncertainty to the clock precision for the downsampling. This produces a subtle form of signal distortion that pro audio engineers have been trying to remove since the invention of digital audio. Now you can put it right back in again if you want!

8.1.10. Super Unison

The Super Unison effect is inspired by the Super Saw waveform pioneered on Roland's JP-8000 synthesizer and copied many times after that. It uses delays to create slightly time and pitch shifted copies of a signal that combine with the original to create huge sounds.

- **HPF** and **LPF** control two filters that shape the tone of the copied voices. This can tailor the final sound to create less 'clutter' in the audio from too much bass buildup or treble sparkle. (HP Freq 10 Hz to 2000 Hz, LP Freq 250 Hz to 20000 Hz)

- **Voices**: the number of pairs of added voices, one above and one below the original. (1 to 8 pairs – 8 can be overkill, so start with 2 or 3)

- **Detune**: the amount of detuning between voices. (0 to 100%)

- **Rate** is the speed of the LFO that varies the delay time. (0.00 to 1.00 Hz)

- **Stereo Width** is the amount of stereo spread in the cluster of voices. (0.00 to 1.00)

8.1.11. Chorus

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

- The **Stereo** button chooses whether or not the delay voices are output on the far left and right sides of the stereo field.

- The **Voices** click/drag button choose whether the dry signal is followed by one, two, or three delayed copies. This is an important setting, because the overall power of the chorus effect needs to be adjusted to the preset and the song. Sometimes one voice is all you need for a tiny bit of thickening or vibrato, but three voices can be overwhelming. (Of course, getting overwhelmed can be fun, too.)

- **Rate** controls the speed of the LFO, which is the most important parameter when adjusting the sound of the chorus. Several famous chorus pedals have had nothing more than a Rate control! (0.1 to 5.0 Hz)

- **Feedback**, as the name implies, feeds back some of the delayed signal to be delayed again. This creates a noticeable metallic 'ringing' tone that makes the chorus sound more like a flanger. (0.00 to 0.900)

- **Delay** is the length of the basic delay, which is modulated by the LFO and spread out by the Depth knob. It changes the character of the sound, and is a relatively recent addition to chorus pedal designs. (0.600 to 20.0 ms)

- **Depth** controls the relative spacing of the delayed voices, with longer delays leading to thicker, more detuned sounds. (0.00 to 10.0 ms)

8.1.12. Chorus JUN-6
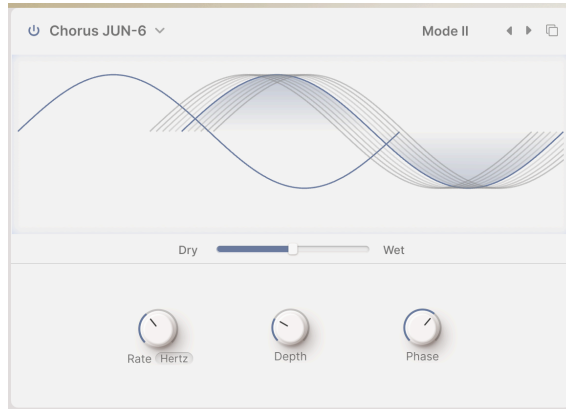
One of the most famous chorus effects is the one built into the Roland JUNO-6 synthesizer and its successors. Designed to thicken the sound of the single VCO, this 2-voice stereo chorus' controls were kept extremely simple: just three buttons for three presets, I, II, and I+II. This version provides a bit more control while saving the rich timbre of the original.

- **Rate** is the speed of the LFO that varies the delay time. (0.05 to 15 Hz)

- **Depth** is the amount of variance in the set delay time. (0.00 to 10.0 ms)

- **Phase** allows the phase of one voice to be offset from the other by up to 180º. The two voices are sent to the left and right sides of the stereo field for a wider effect.

> Note that if a stereo patch where Phase is turned all the way up is mixed to mono, the two sides will cancel each other out and the chorus will disappear – a common and annoying discovery for guitarists whose stereo chorus pedals always worked this way!

8.1.12.1. Flanger

The **Flanger** is the most intense of the time/modulation effects. It originally came from audio engineers gently pressing on the flange (rim) of a moving tape reel to slow down the playback a tiny bit. When combined with the original sound, this effect produced *comb filtering*, a set of regularly spaced notches in the frequency response that look like the teeth of a comb. Varying the pressure on the flange would cause the notches to move, producing the effect we hear as flanging. Later, analog delays controlled by an LFO were used to create the same sort of effect.

- The **Mono/Stereo** button, under the center of the Visualizer, chooses whether or not the delay voices are output on the far left and right sides of the stereo field.

- The **LFO Waveform** buttons, on the left below the Visualizer, change the LFO waveform from a sine to a triangle, producing a dramatically different flange.

- The **Feedback Polarity** buttons, on the right below the visualizer, let you choose to invert the polarity of the feedback, producing two different tonal spectra.

- **Rate** is the speed of the LFO that varies the delay time. It can be set without sync or with different types of sync. (0.010 to 10 Hz, or 1/32 bar to 8 bars)

- **Delay** is the length of the basic delay, which is modulated by the LFO and spread out by the Depth knob. Flanger delays are the shortest of any modulation pedal – longer delays become chorus, then echo. Originally called *Manual* on early flangers, this parameter sets the overall tonality of the flange from bright to dark. (0.001 to 10.0 ms)

- **Feedback** controls the amount of delayed sound fed back into the input to be delayed again. Unlike chorus, where feedback is an unusual added control that's best used sparingly, Feedback on a flanger is essential to creating its distinctive resonant timbre. (0.00 to 0.990)

- **HP Freq** and **LP Freq** control two filters that shape the tone of the delayed sound. This control, unusual on a flanger, allows the effect to focus on a particular tonal range or to ignore extreme lows and highs. (HP Freq 30 Hz to 800 Hz, LP Freq 1000 Hz to 20000 Hz)

- **Depth** is the amount of variance in the set delay time. (0.00 to 10.0 ms)

8.1.13. BL-20 Flanger

The **BL-20 Flanger** is based on the sound of Arturia's Flanger BL-20 plug-in, which is in turn based on the sound of a rare but beautiful-sounding hardware flanger from the 1970s. It doesn't provide all of the BL-20's capabilities, but it still sounds amazing!

- The **Wide** button flips the LFO modulation in the right channel, making the flange sound wider and more three-dimensional... but beware of summing the two sides to mono, or the flanging will cancel itself out!

- The **Mono Input** button sums the input signal to mono, which can produce a more focused tonality on some sounds.

- **Rate** is the speed of the LFO that varies the delay time. It can be set without sync or with different types of sync (0.017 to 5.00 Hz, or 1/32 bar to 8 bars).

- **Feedback** controls the amount of delayed sound fed back into the input to be delayed again. Unlike chorus, where feedback is an unusual added control that's best used sparingly, Feedback on a flanger is essential to creating its distinctive resonant timbre. (0.00 to 100%)

- **Delay** sets the delay time of the flanger. (0.00 to 1.00)

- **Depth** sets how much the internal LFO modulates the delay time. (0.00 to 1.00)

8.1.14. Phaser

The **Phaser** is not a time-delay effect, although it can sound like one. The dry signal is mixed with copies of itself that have been sent through a set of *all-pass filters*. Why would anyone need a filter that doesn't filter anything? Because another property of filtering is that regardless of what frequencies you do or don't remove, filters introduce a *phase shift* with respect to the original input. Each pair of these filters (called *poles* or *stages*) will create a notch in the frequency spectrum, whose relative movement to other notches can be varied with an LFO. The resulting effect has many fewer notches than flanging, and a much different sonic character.

- **Rate** is the speed of the LFO that varies the delay time. It can be set without sync or with different types of sync (0.10 to 10 Hz, or 1/32 bar to 8 bars).

- **Feedback** controls how much of the phase-shifted audio is fed back into the input to be phased again, intensifying the effect and giving it a resonant character. (0.00 to 0.990)

- **Amount** sets the depth of the LFO's modulation control. Turn it down for a more subtle movement and up for more dramatic effects. (0.00 to 1.00)

- **Frequency** varies the overall position of the cluster of notch filters. Best heard with Stereo turned down, Frequency causes the overall tonality of the phasing to go from fairly dark to quite bright. (30 to 15000 Hz)

- **N Poles** controls how many poles the circuit will have. Each two poles adds another notch to the frequency response, letting you design simpler or more dramatic sounds. (2 to 12, for 1 to 6 notches)

- **Stereo** spreads out the effect with a slight time delay between the left and right sides. It can go from very slight spread to a ping-pong effect. (0.00 to 180)

8.1.15. Stereo Pan
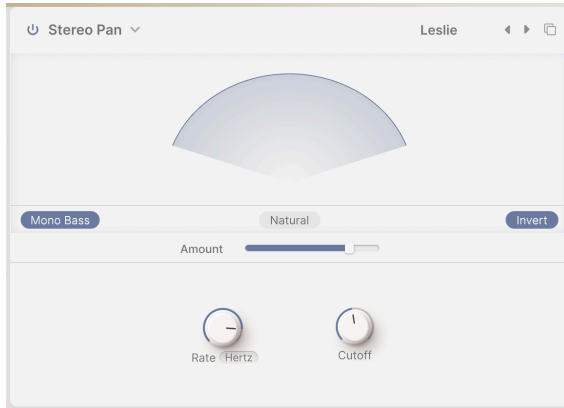
Stereo Pan lets you automatically control and move the stereo position of each voice, to provide motion and breadth.

- **Amount**: Rather than wet/dry mix, this FX type has an Amount control to control the width of the panning effect. (0.00% to 100%)

- The **Natural** button lets you choose a different kind of pan motion. Either this or the default (**Linear**) setting might sound better with any particular Preset. Use your ears!

- The **Invert** button inverts the output of the LFO set by the Rate control. Experiment with this as you create your stereo soundfield.

- **Rate** controls the movement of sounds in the stereo field. It can be set without sync or with different types of sync (0.100 to 20.0 Hz, or 1/32 bar to 8 bars)

- **Mono Bass** and **Cutoff**: Sometimes, autopanning very low sounds can cause a mix to feel seasick and unbalanced. Clicking Mono Bass keeps low frequencies centered, and Cutoff controls the highest frequency that's mono. (50.0 to 200 Hz)

8.2. Main FX
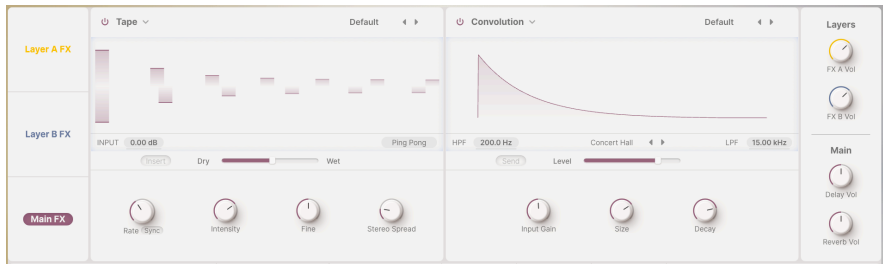
Main FX

The Main FX stage is the final piece of Augmented's audio chain before output. These affect both Layers globally. There are three types of Delay to choose from, followed by two types of Reverb.

All Main FX share these controls:

- **Power Button** enables/disables the effect.

- **Type** pop-up menu to choose the type of effect.

- **Preset** dropdown menu and scroll buttons.

Main FX also have an **Insert/Send** button, which allows you to create an FX Send to the main mix rather than running the audio through the FX directly. This gives you more control over the blend of the effects in the final sound.

- In Insert mode, the **Dry/Wet Mix** slider sets the blend of dry signal with the effect.

- In Send mode, the slider becomes an FX Send **Level** control.
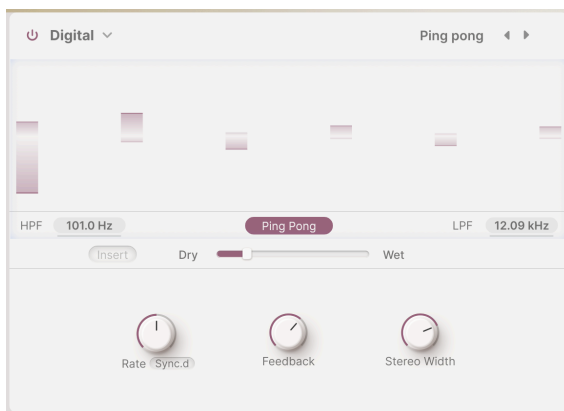
> ℹ Remember that certain parameters for these FX can be changed interactively by dragging on their Visualizer graphics, as with the corresponding Layer FX.

8.2.1. Delay

The three Main Delay algorithms are nearly identical to those in the Layer FX with corresponding names. We'll repeat their parameter sets here for convenience.

8.2.1.1. Digital

- **HPF** and **LPF** control two filters that shape the tone of the delayed sound. Darker echoes die away with less 'clutter' in the audio, and brighter echoes carry a lingering sense of presence. Click and drag to set HPF from 20 Hz to 10000 Hz and LPF from 250 Hz to 20000 Hz.

- The **PingPong** button activates an effect where echoes alternate between the left and right sides of the stereo field. This effect is easy to overuse, and can cause listener fatigue, but when combined with very subtle echoes it can produce a beautiful sense of extra space.

- **Rate** is the time between echoes. It can be set without sync or with different types of sync:

    ◦ **Time** in milliseconds (2 ms to 2 seconds)
    ◦ **Sync Straight**, **Sync Triplets**, or **Sync Dotted** (1/32 bar to 8 bars)

- **Feedback** is how much of the delayed sound gets fed back to the input. This produces repeating echoes that fade away, rather than a single delayed copy of the input sound (called *slapback*, useful for some cases). High feedback settings lead to longer trails of echo. (0.00 to 1.00)

- **Stereo Spread** controls how much the echoes spread out in the stereo soundstage, from full mono to massive panning. (0.00 to 1.00)
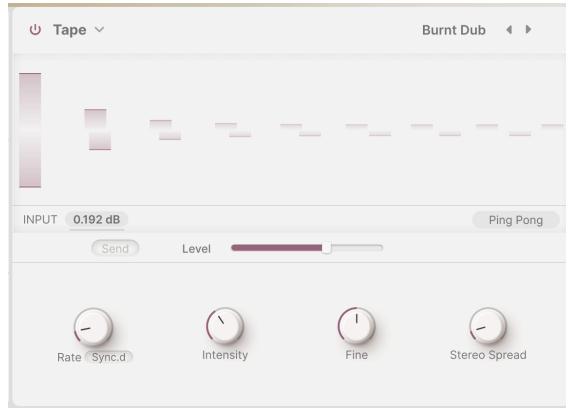
8.2.1.2. Pitch Shift

- **HPF** and **LPF** control two filters that shape the tone of the delayed sound. Darker echoes die away with less 'clutter' in the audio, and brighter echoes carry a lingering sense of presence. Click and drag to set HPF from 20 Hz to 10000 Hz and LPF from 250 Hz to 20000 Hz.

- **Rate** is the time between echoes. It can be set without sync or with different types of sync: Straight, Triplets, and Dotted. (2 ms to 2 seconds, or 1/32 bar to 8 bars)

- **Feedback** is how much of the delayed sound gets fed back to the input. Settings range from 0.00 (slapback) to 1.00 (infinite repeats without runaway).

- **Stereo Detune** controls how different the left and right channels' pitches are. (-100 to +100 cents, where 100 cents equals one semitone)

- **Spray** sets up a 'scattering' effect across the soundstage for each successive echo, with slightly randomized echo times. It's especially noticeable at higher amounts of pitch shift. (0.00 to 500 ms)

- **Pitch Shift** is the base amount that echoes are shifted by. As they repeat, they will be shifted repeatedly, producing an endless spiral upward or downward in pitch. Very subtle amounts can produce a feeling of anticipation (up) or relaxation (down); larger amounts can produce strange, inharmonic results or smoother and more musical 'boom' or 'shimmer' (try setting it to octaves). Pitch shift can be set to 24 semitones (2 octaves) up or down.

- **Stereo Offset** is a positive or negative time difference between the left and right Time settings. This produces a realistic widening of the sound due to a psychoacoustic phenomenon called the *Haas Effect*. (-20 to +20 ms)

> The Pitch Shift Delay in the Main FX has no Delay Mode selector.

8.2.1.3. Tape

- **Input** is an adjustment of the input gain, not only to make the sound louder or softer, but to gently saturate the tape and produce a warm character at higher settings. (-12 dB to +12 dB)

- The **PingPong** button activates an effect where echoes alternate between the left and right sides of the stereo field. As with the Digital Delay effect, be careful not to overuse this function.

- **Rate** is the time between echoes, which has a narrower range than the Delay FX because of the limitations of tape. It can be set without sync (Time) or with different types of sync: Straight, Triplets, and Dotted. (10 ms to 1 second, or 1/32 bar to 8 bars)

- **Intensity** is another word for feedback – the intensity and persistence of the echoes. The parameter ranges from 0.00 (slapback) to 1.20. Settings above 1.00 will cause the echoes to be louder than the input. This phenomenon is called *self-oscillation* (or *runaway*) and leads to an ever-increasing audio level that will eventually overload, then distort, then clip... and will keep getting louder until it eventually destroys your headphones, your speakers, and your ears. Please use it responsibly and be ready to turn it down.

- **Fine** is a fine-tuning of the basic Rate. Sometimes, having a time just slightly off other synchronized effects can give a sense of richness to the overall sound. (-50 to +50 ms)

- **Stereo Spread** provides a sense of spaciousness by having one side of the stereo image have a slightly different delay time than the other. (0.00 to 0.20)

8.2.2. Reverb

There are two very different Reverb algorithms available for the Main FX. One is the Digital Reverb, which is functionally identical to the Layer FX Reverb; the other is a Convolution Reverb to produce uniquely realistic environments as well as otherworldly spaces.

8.2.2.1. Digital

The Main FX Digital Reverb, like the Layer FX Reverb, is an *algorithmic* reverb. That means that reverb sounds are calculated based on the mathematics of sound waves in acoustic spaces. With a wide range of parameter tweaks, this reverb type can produce everything from cramped closets to enormous cathedrals.

While the controls are rearranged, the parameters and their ranges are identical to those in the Layer FX Reverb:

- **HPF** rolls off the low frequencies of the input before it hits the reverb. This takes out low-end mud and makes the reverb brighter-sounding. Range 30 Hz to 10000 Hz, default 200 Hz.

- **LPF** rolls off the high frequencies of the input before it hits the reverb. This softens the overall sound and removes overly tinny treble effects. Range 100 Hz to 20000 Hz, default 15000 Hz.

- **Pre Delay** is how long it takes for the first reflected sound to come back to our ears. Longer predelays imply a larger space. (0.00 to 0.20 seconds)

- **Size** is the overall size of the space, a general sense of how open it is. (0.100 to 1.90)

- **Decay** is how long the reverb takes to decay to silence. It interacts with Size to define the shape of the ambience. (0.00 to 0.925)

- **Damping** is how quickly high-frequency sounds roll off before low-frequency sounds in the space. More damping implies a space full of objects or materials that absorb highs first: carpets, ornate wood, even people. Less damping implies a more 'ringy' space with concrete or tile walls. (0.00 to 1.00)

> ℹ The Main FX Digital Reverb has no Stereo Width control.
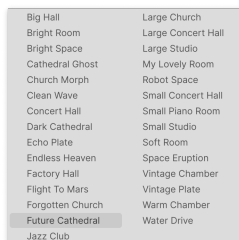
8.2.2.2. Convolution

The Main FX Convolution Reverb is another animal entirely. The idea of *convolution* is remarkably simple: you create a well-understood sound (such as a starter pistol shot, a burst of white noise, or a sine wave sweeping up in frequency) in an acoustic space, record it, then mathematically remove the original sound.

What's left is an *impulse response*: a sonic "fingerprint" of the space itself, which can be applied to any input signal to place it in that space. Pretty cool, huh?

The parameters are slightly different than those of the Digital Reverb, with different ranges:

- **HPF** and **LPF** control two filters that shape the tone of the delayed sound. Darker echoes die away with less 'clutter' in the audio, and brighter echoes carry a lingering sense of presence. Click and drag to set HPF from 30 Hz to 10000 Hz and LPF from 100 Hz to 20000 Hz.

- **Input Gain** controls the level of the signal into the reverb for optimal performance. (–24 dB to +24 dB)

- **Size** is the overall size of the space. (0.300 to 2.00)

- **Decay** is how long the reverb takes to decay to silence. (0.00 to 1.00)

The real magic of the Convolution Reverb happens when you choose your simulated space. Under the Visualizer you will find a **Room** name and scroll arrows. Click the Room name to open a pop-up menu with a list of 29 available rooms for you to play with:
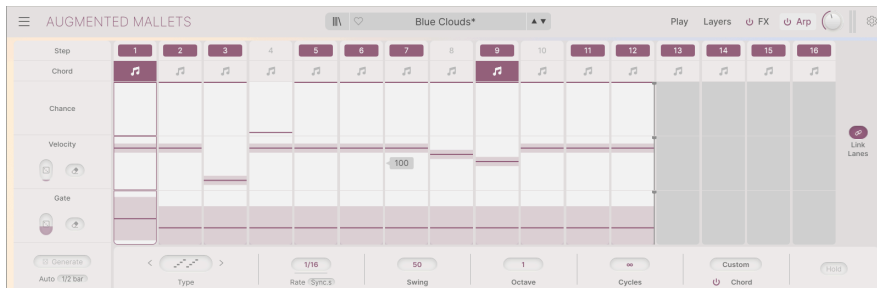

Convolution Reverb list

Setting up a convolution reverb is as simple as choosing your Room and tweaking the parameters to taste. You'll find a lot of inspiration here, whether you're in a space that's shockingly real... or a space that's totally *unreal*!
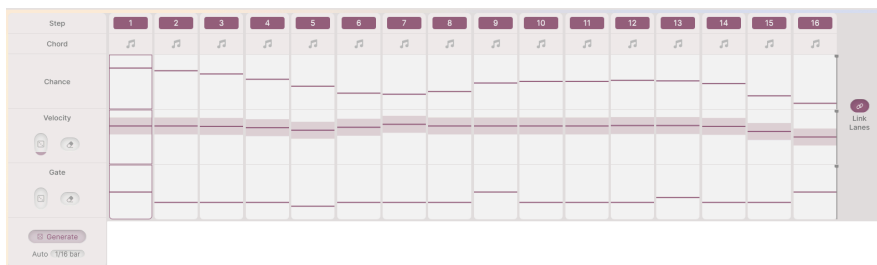
9. THE ARPEGGIATOR PANEL

Clicking the **Arp** button in the Upper Toolbar opens the Arpeggiator Panel.

The Arpeggiator Panel, shown here in Augmented MALLETS

The Augmented Arpeggiator can operate just like the ones in many synthesizers, but its added features give it scope and creative breadth beyond the usual functions. Take control of pattern lengths, chord triggering and chord shapes, unusual timings, chance, randomization, and more!

9.1. Step Controls

The Step Controls set the behavior of the Arpeggiator when it plays. There are up to 16 steps available in the arpeggiation, and each one has values for the following parameters:

- **Step**: Chooses whether the corresponding step is active or silent. Click a numbered box to activate or deactivate that step.

- **Chord**: Any step selected in this row will play a chord when it's reached. It can be the notes you're holding, or a preselected chord shape created with the Chord Select pop-up.

- **Chance Bars**: Set the chance of a note playing on each step.

- **Velocity Bars**: Set the velocity of the note sounded at each step.

- **Gate Bars**: Set the gate length or "window" for each step. Gate lengths range from 5% of the step length (a very short pulse) through 100% (the note holds for the entire step) to 400% (the note holds for four steps). This allows for complex legato behavior in interesting ways.

On the left panel are three controls to control overall behavior of the Velocity and Gate steps:

- **Randomize**: Adds random variation to Velocity or Gate. Drag up or down on the dice icon to control the amount of variation, which will be displayed as a shaded bar above and below the set value in each step.

- **Reset**: Clicking this icon will reset the Velocity or Gate row to its default state – Velocity 100, Gate 50%.

- **Generate**: Clicking this button forces a new set of randomized values depending on the settings of the Randomize sliders.

- **Auto**: Clicking this button opens a pop-up menu for how long it takes between new randomizations. The range is from 1/16 Bar to 8 Bars, or Off.

To the right of the step displays is the **Link Lanes** icon. It links the lengths of the Chance, Velocity, and Gate rows to the same number of steps.

When Link Lanes is turned off, the Chance, Velocity, and Gate rows can have different step lengths (set with the vertical black bars at right, which can be dragged by clicking on the black square at the top of the bar):
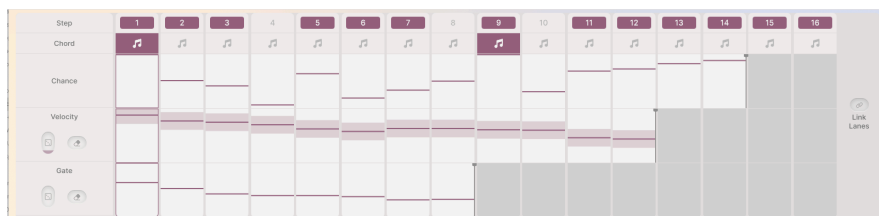
Turning off Link Lanes - Chance, Velocity, and Gate have different step lengths

9.2. Playback Controls
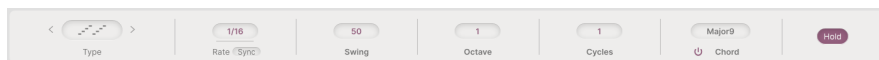
On the bottom of the Arpeggiator Panel, you can select how the chosen notes and Step settings will play back.

- **Type**: How the arpeggiator processes held keys: Up, Down, Up/Down Exc, Up/ Down In, Random, or As played.

> For decades, hardware synth arpeggiators handled "Up And Down" in one of two ways: Up/Down Exclusive (where a C Major triad would play C E G E C E G E C) or Up/Down Inclusive (where a C Major triad would play C E G G E C C E G G E C). Wars have been fought over which version was "correct"... but here you have *both* options, so you don't have to take sides!

- **Sync Rate**: Note length (division) for each step, set by clock tempo or host bars/beats.

- **Rate Type**: A drop-down menu selects whether the Arpeggiator free-runs at a certain BPM, or syncs to tempo with Straight, Dotted, or Triplet options. Drag up or down to adjust the Arpeggiator tempo or Sync division. The Sync All setting lets you scroll through all possible values, from 1/96 Bar to 3/4 Bar.

- **Swing**: Delays alternating notes to give a swinging feel to rhythms. Ranges from 50 (no swing) to 75 (very heavy swing); when experimenting with Swing, try 67 as a good starting point.

- **Octave**: Determines the octave range of the arpeggiated notes. (1 to 4 octaves)

- **Cycles**: Lets you set the arpeggiation to play for only a certain number of cycles before stopping. You can set it to 1, 2, 3, 4, 6, or 8 cycles, or infinity (the usual behavior, with no stops). This lets you create and generate short "mini-sequences". The sequence will restart only when you release all keys and then play new ones.

- **Chord** and **Chord Select**: These controls allow you to set a particular chord shape to be played whenever the Arpeggiator reaches a step with the Chord icon selected. When the **Chord** button is on, the selected chord will play rather than what keys you're holding. Click on **Chord Select** to pop up a menu where you can choose from 11 common chord shapes or design your own.
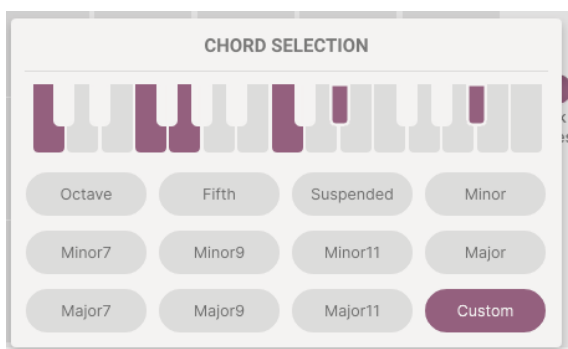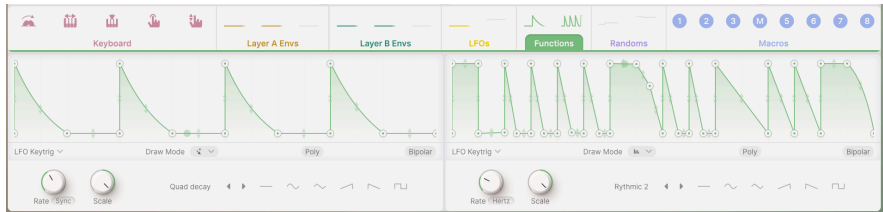

- **Hold**: As the name suggests, clicking this button holds the note or notes played after you release the keys.

> ℹ Note that the Hold button works even if the Arpeggiator is turned off; it acts as a sort of "sustain pedal" button.

10. THE MODULATION STRIP

The Modulation Strip

Augmented offers a huge number of modulation options, which can be accessed in the **Modulation Strip**. Whenever you're working in the Layers Panel [p.60], FX Panel [p.81], or Arpeggiator Panel [p.107], the Modulation Strip will always occupy the bottom half of the interface window.

> ℹ The Modulation Strip appears under all of these Panels because they all can be controlled by various modulation functions. Having the Modulation Strip always handy makes it easy to assign and adjust modulations without having to constantly keep switching back and forth between panels.

We'll start by explaining how to set up a modulation routing. Then we'll go through the Modulation Strip and discuss the modulators provided there:

- **Keyboard**
- **Envelopes**
- **LFOs** (Low Frequency Oscillators)
- **Functions**
- **Randoms**
- **Macros**

10.1. Assigning Modulations

Before we discuss all of the modulation sources available in Augmented, let's learn how to use them.

Modulation is the control of one function by another. There are many types of modulation in electronic music; for now, we are discussing how control sources alter the behavior of synthesizer components. The Pitch Bend wheel modulates oscillator frequencies; the Morph knob modulates Layer blending; etc.

Augmented uses a universal modulation system that does assignments the same way all across the instrument. That way, when you learn to set up a modulation, you won't find yourself having to re-learn the process in another part of Augmented.

10.1.1. Starting with Modulation Sources

The top of the Modulation Strip shows a set of tabs with animated graphics to show what the various modulators are currently generating. Click on a tab to show its functions.

The Modulation Strip includes the following control sources:

- **Keyboard**:
    - Mod Wheel
    - Keyboard Tracking
    - Velocity
    - Aftertouch
    - MPE Slide
- **Envelopes**:
    - Layer A Part 1
    - Layer A Part 2
    - Layer A Filter
    - Layer B Part 1
    - Layer B Part 2
    - Layer B Filter
- **LFOs**:
    - LFO 1
    - LFO 2
- **Functions**:
    - Function 1
    - Function 2
- **Randoms**:
    - Random 1
    - Random 2
- **Macros**:
    - Color (1)
    - Time (2)
    - Motion (3)
    - MORPH (M)
   - FX A (5)
    - FX B (6)
    - Delay (7)
    - Reverb (8)

When you hover the mouse over any one of these sources, the cursor becomes a hand, the source icon turns into an icon of four arrows, and a menu of its current destinations (if any) pops up, each with an on/off button and negative/positive modulation amount slider:
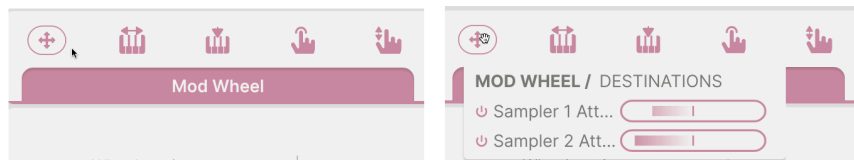
*Mouse over the modulation source to see a list of its destinations*

Click the icon to drag it, and the name of the modulation source follows your cursor.

Find the destination that you want to modulate, and drop the name there. Under the control, a dial will appear that shows the color of the modulation tab and a positive or negative amount of modulation:
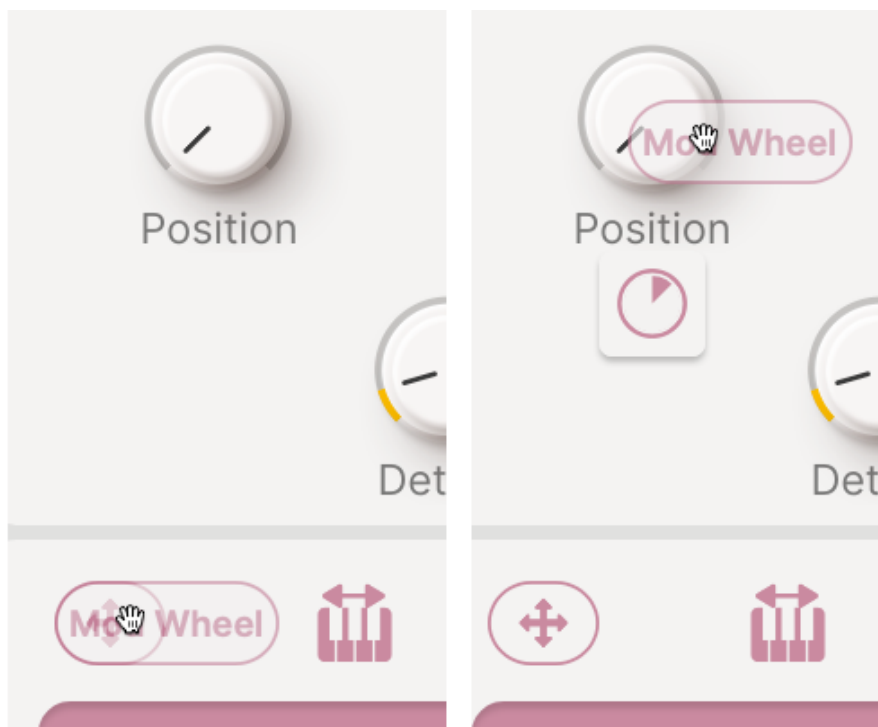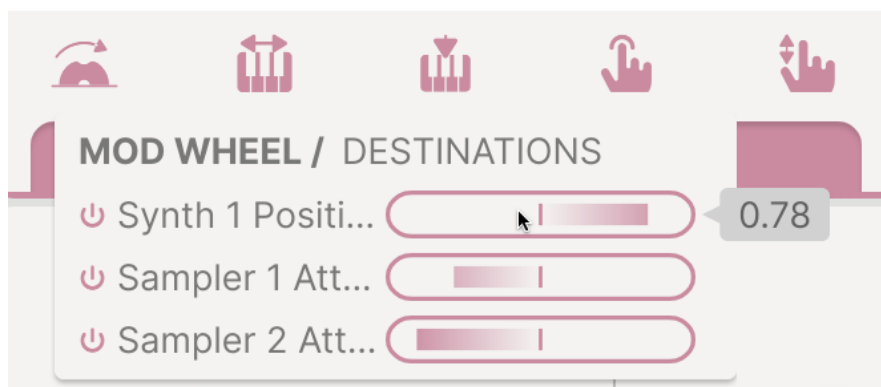

Drag the source to the destination and drop it to show a modulation dial

Hover over the dial to show the precise source and amount, and drag the dial to change the amount:
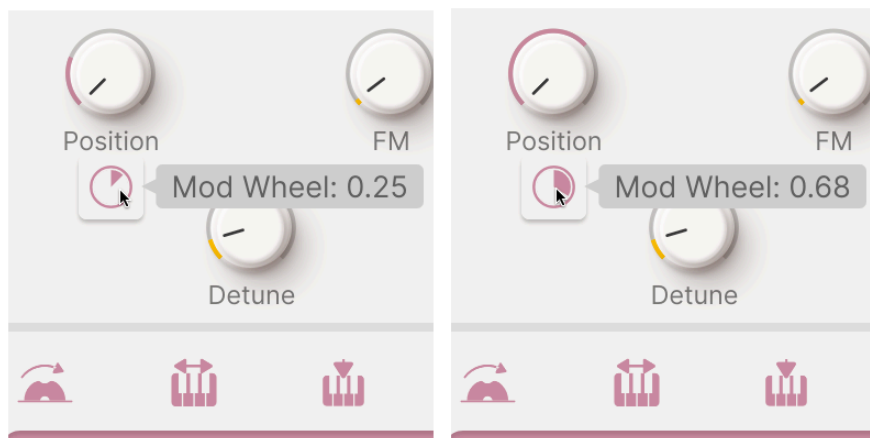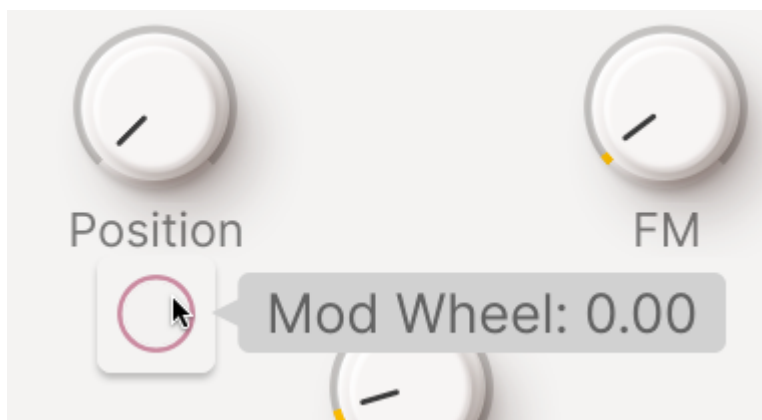
Change the modulation amount by dragging the dial

You can also change the modulation amount at the source, by clicking and dragging the amount slider for that destination:

Change the modulation amount by dragging the slider

To remove a modulation, double click it. The amount will be set to 0.00, the dial will be empty... and when you mouse away, it will vanish.

Double click to remove a modulation

Hovering over any destination will show the dials for all of its modulation sources, each of which can be adjusted as needed. Up to 8 sources can be placed on a single destination!
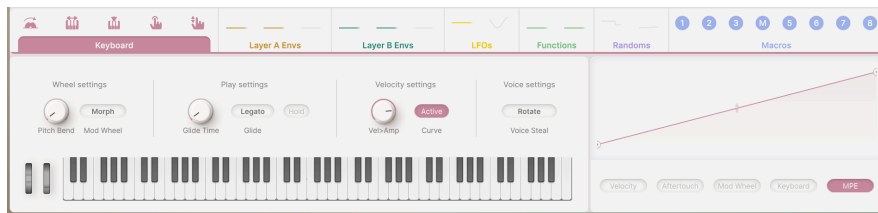

Up to eight sources can be easily viewed on a single destination!

Now that we know how to set up these modulations, let's look at the various Modulation Strip tabs in detail.

10.2. Keyboard tab

Some of the most common modulations you'll want to perform are linked to the keyboard and its functions.


The Modulation Strip's Keyboard tab

The **Keyboard** tab lets you set response curves for five common keyboard modulations: **Velocity**, **Aftertouch**, **Modulation Wheel**, **Keyboard Tracking**, and **MPE Slide**. There are also several general performance settings.

10.2.1. Keyboard Response Curves

Often we'll think of modulation as being *linear* – the Mod Wheel amount is zero at the bottom, all the way on at the top, and smoothly goes from one to the other as you move the wheel. However, there are many occasions when we might want to make the control respond in a different way. Rather than a linear response, it might be handy to have a **response curve** that you can define yourself.

The Keyboard tab has a window showing a response curve, and five buttons to choose which of the five available modulation parameters you're working with.

When you first select a parameter, you'll see a straight line from 0 to maximum:
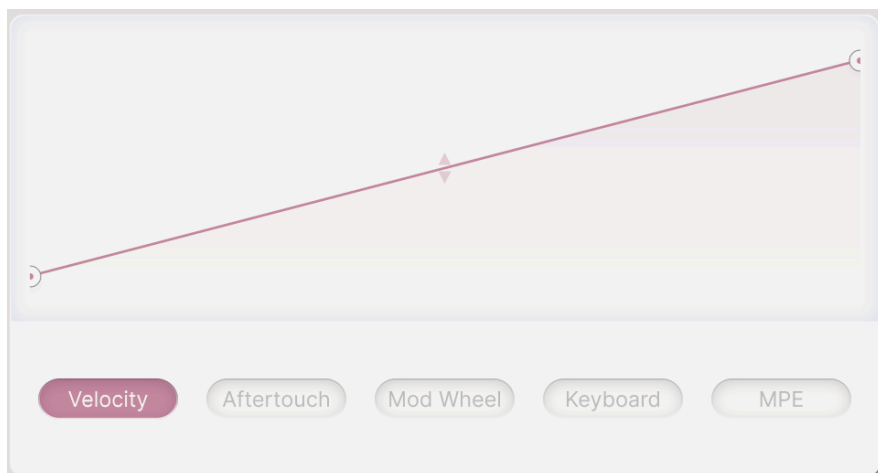
A simple linear response

The two circles at the ends are the start and finish of the curve. You can drag them up and down to change the lower and upper limits of the response, for example making the line end somewhere below the maximum, or even move the start above the end for an inverted control response, where the *higher* you turn the control, the *lower* the output:
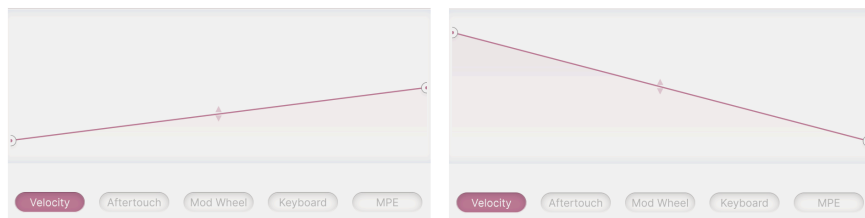
Left: a scaled-down linear response. Right: an inverted response.

If you want to create something more complex than a line, you can click on it to add a *breakpoint*. You can then drag this breakpoint around to set its position, perhaps creating a way to have the line reach maximum value early:


Add a breakpoint for a bent line.

Click again to add another breakpoint for a more complex curve. You can set a maximum of two breakpoints plus the two endpoints. Right-click to remove a breakpoint.

> ℹ NOTE: The endpoints can be moved vertically but not removed. After all, a modulation signal has to start and end *somewhere*, right?

The line segments in between the breakpoints have up/down arrow pairs at their midpoints. Hover your mouse over them until you get an up/down arrow cursor. then click and drag up or down to turn the line into a curve. Double-click to reset the curve to a straight line.
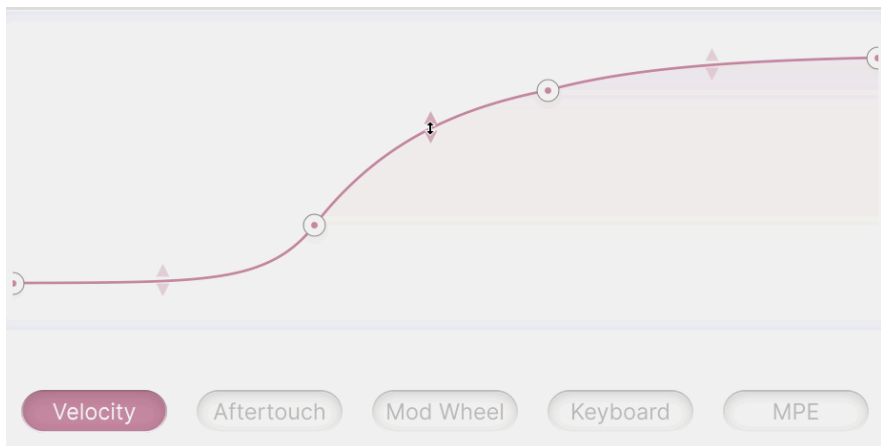
The two-headed arrow cursor lets you curve lines.

This process lets you quickly tailor the response of a controller to be more useful and flexible. Here are some example curves for each of the five Keyboard parameters.

10.2.1.1. Velocity

A tailored response curve for Velocity

Velocity is a fancy word for how hard you hit the keys when you play. A strictly linear velocity response might not feel comfortable or realistic, so a elocity response curve can improve the keyboard feel. In this example, the velocity curve has been set to get louder more quickly at lower velocities, then slowly level out to a maximum output value that is slightly below the full range of MIDI velocity. You might use this to tame the response of a keyboard whose behavior at higher velocities isn't very smooth.

10.2.1.2. Aftertouch
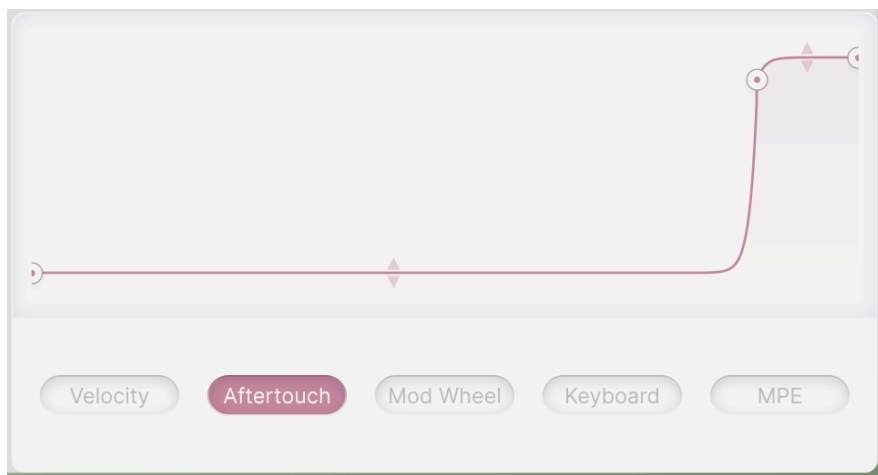
A tailored response curve for Aftertouch

Aftertouch, also called *pressure*, is how hard you press into the keybed after playing a note. Not all keyboards have aftertouch sensors under the keys, but those that do add an important performance nuance that many keyboardists rely on. However, keyboards' aftertouch response can vary widely from product to product, so getting a certain keyboard to play the way you want it to can be quite challenging – until you create a response curve for it. Here, an overly-sensitive aftertouch response has been "dumbed down" to something more like an on/off switch: there is no response until the player presses hard, then it rises quickly to maximum just a bit before it would normally get there.

10.2.1.3. Mod Wheel
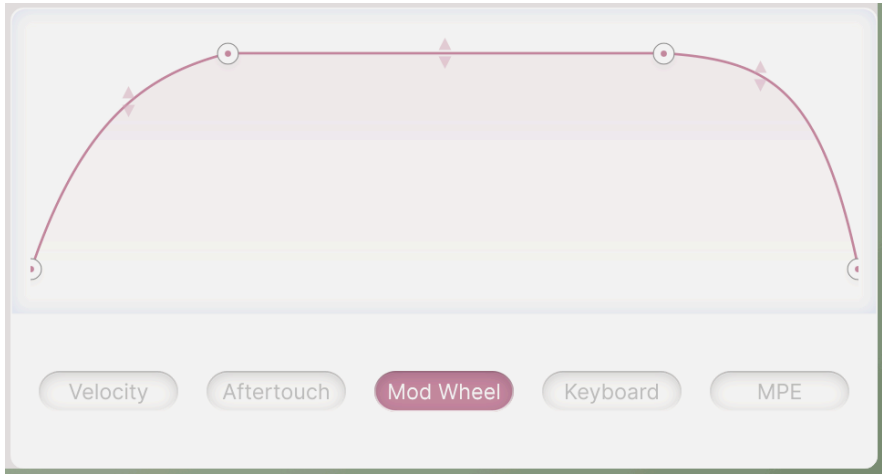
A tailored response curve for Mod Wheel

The *Modulation Wheel* is the one hands-on controller that's closest to your hands when you play. It's good for gradual or set-and-forget modulations that aren't appropriate for the keyboard. Augmented has MIDI Mod Wheel data (Control Change 1) as an assignable source. In this example, the curve goes slowly from zero to near maximum, then through a "dead zone" where the wheel doesn't change anything, and then a decrease back down to zero. This way, one movement of the wheel from bottom to top will sweep the sound in and out of a "zone" of heavy modulation.

10.2.1.4. Keyboard Tracking
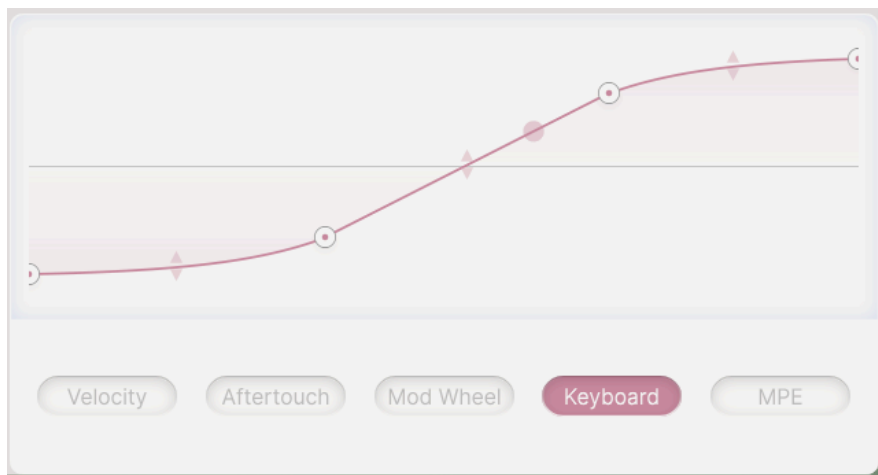
A tailored response curve for Keyboard Tracking

Keyboard tracking is how a modulation responds to whether the note you're playing is high or low. This is most common in adding brightness to notes that are higher on the keyboard. When keyboard tracking is 100%, then a self-oscillating VCF's resonant tone will be pitch-accurate as you play. This curve gives you the opportunity to finely tailor how your modulation is affected across the keyboard – in this case, more change in the middle of the keyboard and less at the top and bottom ends.

> ℹ️ Note that this tracking curve is *bipolar*, with values below and above zero, instead of zero to maximum (*unipolar*). Many of the modulators in Augmented allow for the option of bipolar control where it's useful.

10.2.1.5. MPE Slide
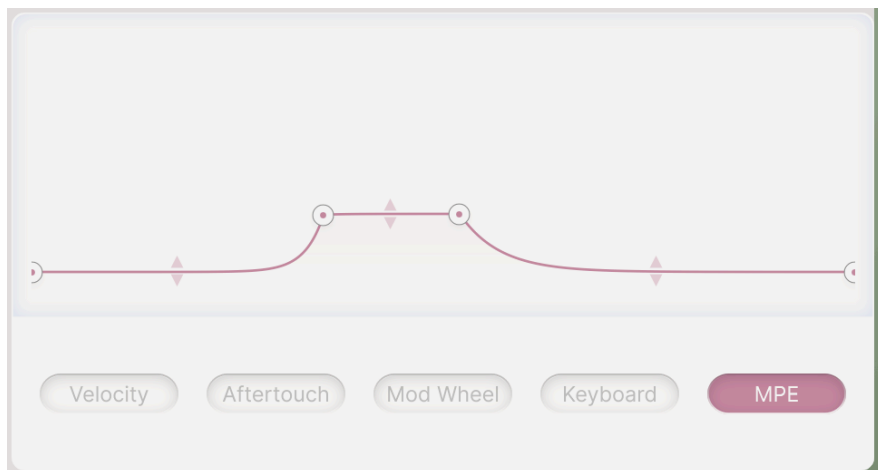
A tailored response curve for MPE Slide

MIDI Polyphonic Expression (MPE) is an exciting development in keyboard expressiveness that has become very popular recently. In very simple terms, MPE allows the player multiple dimensions of finger movement to affect a sound. In addition to velocity and aftertouch, MPE keyboards might sense *release velocity* (how quickly you release a key), or side-to-side movement for pitch bend. The fifth MPE parameter is sometimes called *Slide*, and it is created by vertical movement on the key, such as sliding your finger up and down on a key surface or rocking the key back and forth while holding it down. Slide is usually assigned to MIDI Controller 74 (Filter Cutoff). How a controller generates Slide information will be wildly different between instruments, and a response curve is often vital to keep the results predictable. In this case, the curve is designed to greatly restrict the range and level of Slide data, for use with a controller whose Slide response is extremely touch-sensitive.

10.2.2. Keyboard Performance settings
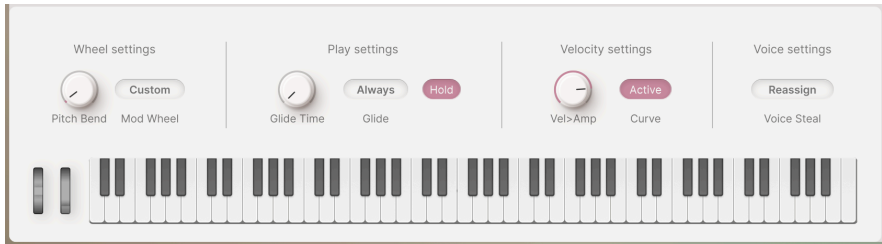
The Keyboard tab also groups together several of the most common keyboard and performance parameters for easy access.

10.2.2.1. Wheel settings

- **Pitch Bend**: Determines the pitch-bend range in semitones, up to ±36 semitones (3 octaves).
- **Mod Wheel Mode**: this button pops up a choice of three Mod Wheel destinations:
  - **Morph** assigns the Mod Wheel to the Morph knob
  - **Vibrato** assigns the Mod Wheel to the Vibrato [p.125] LFO.
  - **Custom** is the Mod Wheel routing you've set up via MIDI Learn [p.40] in the Side Panel's MIDI Settings Tab.

> ℹ The Mod Wheel Mode button on the Lower Toolbar switches between Morph and Custom.

10.2.2.2. Play settings

- **Glide Time**: Sets the amount of glide time between notes, from 0 to 10 seconds.
- The **Glide** button chooses between two ways in which Glide is triggered:
  - **Always**: Glide always happens if the Glide Time is above zero.
  - **Legato**: Glide only happens to notes played without fully releasing all keys.
- **Hold**: sustains all notes played, acting in the same fashion as a sustain pedal.

10.2.2.3. Velocity settings

- **Vel > Amp**: Sets the amount that Velocity controls the output level of both Layers.
- **Curve**: When engaged, the Velocity response curve [p.117] is applied to Vel > Amp.

10.2.2.4. Voice settings

- **Voice Steal**: Determines how voices are reallocated if more keys are pressed than the Polyphony setting allows.
  - ◦ **Reassign**: The voice that was triggered earliest is reassigned to the next keypress when needed.
  - ◦ **Rotate**: Every new note played triggers the next available voice, even if the voice limit has not been reached.

10.3. Envelopes tab

The Modulation Strip, set to the Envelopes tab (Layer B)

Each Layer has a set of three Envelopes with identical features and functions. While they can be routed to modulate any number of parameters, they default to controlling the amplitude of the two Parts of the Layer, and the Cutoff Frequency of the Layer's Filter.

The four stages of each Envelope are the familiar ADSR type:

- **Attack** sets the attack time from 0 to 20 seconds.
- **Decay** sets the decay time from 1 millisecond to 20 seconds.
- **Sustain** sets the sustain level while a key is held, from 0.00 to 1.00.
- **Release** sets the release time from 1 millisecond to 20 seconds.

The **Release Link** icon between the Sustain and Release knobs will make the Release stage mimic the settings for the Decay stage, including its time and curve. This type of envelope control was used in several famous vintage synthesizers, including the Minimoog.

Each stage has the option of a curved rather than linear progression. Click and drag the double arrow graphic up or down to change the shape from exponential to logarithmic; double-click to reset it to linear.

> ℹ️ Remember that double-clicking most parameters will reset them to their default values. You should memorize this handy shortcut immediately!

- **Time Multi** multiplies or divides the envelope times by a factor of 0.10 up to 10.00 (default is 1.00). Click the value and drag up or down to set it.

- **Vel > Time** adjusts the sensitivity of the attack and decay stages based on playing velocity. Turn it up to obtain faster attack and decay times when playing at higher velocities. Values run from 0.00 to 1.00 (default is 0.00).

The Filter Envelope has a **Poly** button which determines its triggering behavior. Polyphonic triggering means that each note you play gets its own iondependent envelope, while monophonic triggering means that every note you play retriggers a single envelope, which won't complete its cycle until all notes are released. This is analogous to single vs. multiple triggering on early synthesizers and string machines.

> When an envelope is triggered, a dot will move along the visualizer envelope from start to finish, so you can see as well as hear how an envelope's effect on a sound changes over time.

10.4. LFOs tab

The Modulation Strip showing the LFOs tab

Augmented's LFOs tab contains two LFOs (Low Frequency Oscillators) with identical function sets. They can be used for a variety of repeating control signals.

On the left under the Visualizer is a dropdown menu of **Trigger Modes**:

- **Env** turns the LFO into a single-cycle envelope triggered when you press a key.
- **LFO** is conventional free-running LFO behavior.
- **LFO Keytrig** causes the LFO to retrigger with every keypress.

The **Phase** control changes the phase of the waveform with respect to the cycle start. For example, the Square wave starts high and goes low, but changing the phase by 180º changes that to starting low and going high. The control has a full range of 0º to 360º.

Clicking the **Bipolar** button causes the LFO to send values alternating above and below 0 (the start/endpoint). Otherwise the LFO is *unipolar*, only sending values above 0. The shading of the Visualizer background subtly indicates whether unipolar or bipolar behavior is selected.

Envelope and LFO Keytrig behavior can be *monophonic* (any keypress causes the LFO to retrigger for all notes already held down) or *polyphonic* (new keypresses don't affect currently held notes). Select polyphonic triggering with the **Poly** button.

These two modes also include a **Fade** control for how quickly the LFO takes full effect after the keypress. It can be set from 1 ms to 10 seconds.

The **Rate** knob sets the LFO rate. A drop-down menu lets you select how (or if) the LFO is synchronized to your DAW:

- **Hertz**: cycles per second, not tied to any sync clock. The rate range is 0.010 Hz (one cycle per 100 seconds) to 200 Hz.
- **Sync**: time divisions indicated in bars and beats, from 8/1 dotted to 1/32 triplet.
- **Sync Straight**: time divisions indicated in note lengths, from 8 whole notes to 1/32 note.
- **Sync Triplets**: as above but in triplet values.
- **Sync Dotted**: as above but in dotted values.

10.4.1. Vibrato and Tremolo

Augmented also has two highly simplified LFOs that can handle common and basic tasks without wasting one of the full-featured LFOs.

Vibrato is a dedicated LFO that modulates the **Fine** pitch parameter on any or all Parts.

Tremolo is a dedicated LFO that modulates the **Volume** slider parameter on all four Parts.

Both can be assigned to any or all Parts in both Layers, and both offer only a sine waveform and no tempo sync for their rates.


- **Fade**: Applies an adjustable fade-in each time a voice is triggered. Range: 1 ms to 10 seconds.

- **Rate**: Sets the speed of the Vibrato or Tremolo in Hz. Range: 0.010 Hz (one cycle per 100 seconds) to 200 Hz.

- **Depth**: Sets the amount of the Vibrato or Tremolo.

- When the **Poly** button is pressed, each voice gets its own independent Vibrato or Tremolo wave cycle start, as opposed to retriggering for all held notes whenever a new note is played.

- The **Retrig** button lets you choose to restart the phase of the LFO with every keypress, or let it run without retriggering.

When Vibrato is enabled, hovering over any of the Fine knobs will display this special Vibrato flag:
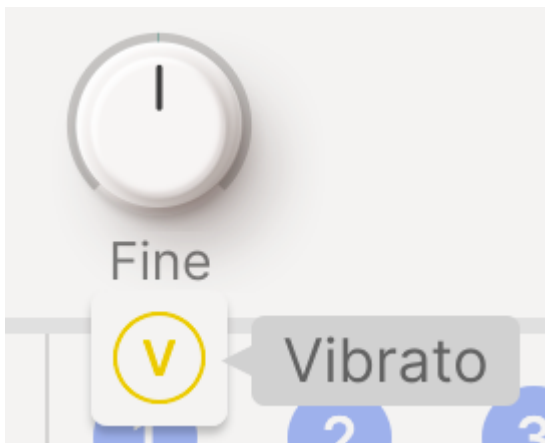
The V indicates that Vibrato is active on the Mod Wheel

A similar "T" flag exists for Tremolo modulation of the Volume sliders.

10.5. Functions tab

Augmented has two Functions available as modulation sources. These are nearly identical to the LFOs in their range of parameters, but have a user-defined waveshape that can be extremely complex.
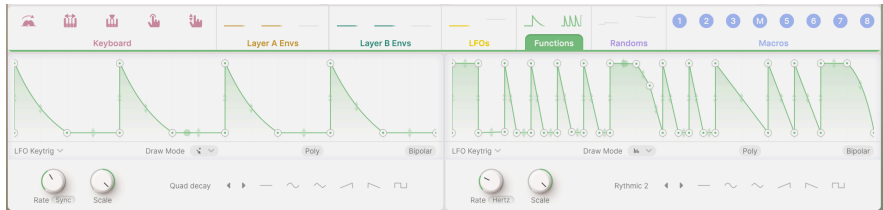
The Modulation Strip, set to the Functions tab

On the left under the Visualizer is a dropdown menu of **Trigger Modes**:

- **Env** turns the Function into a single-cycle envelope triggered when you press a key.
- **LFO** is conventional free-running LFO behavior.
- **LFO Keytrig** causes the Function to retrigger with every keypress.

Clicking the **Bipolar** button causes the LFO to send *bipolar* control values, which can have values above and below O (the start/endpoint). Otherwise the LFO is *unipolar*, with values only above O. The position of a horizontal O reference line, and shading of the Visualizer background, both indicate whether unipolar or bipolar behavior is selected.

The **Trigger Mode** buttons are identical to those on the LFO:

- **Env** turns the FUN into a single-cycle envelope triggered when you press a key.
- **LFO** is conventional free-running LFO behavior.
- **Key Trig** causes the FUN to retrigger with every keypress.

Envelope and LFO Keytrig behavior can be *monophonic* (any keypress causes the LFO to retrigger for all notes already held down) or *polyphonic* (new keypresses don't affect currently held notes). Select polyphonic triggering with the **Poly** button.

Rate: sets the rate at which the FUN cycles. As with the LFO, a drop-down menu lets you select how (or if) the Function is synchronized to your DAW:

- **Hertz**: cycles per second, not tied to any sync clock. The rate range is O.O1O Hz (one cycle per 1OO seconds) to 2OO Hz.
- **Sync**: time divisions indicated in bars and beats, from 8/1 dotted to 1/32 triplet.
- **Sync Straight**: time divisions indicated in note lengths, from 8 whole notes to 1/32 note.
- **Sync Triplets**: as above but in triplet values.
- **Sync Dotted**: as above but in dotted values.

Scale: lets you quickly scale the Function to an appropriate amplitude. It ranges from –1.OO to 1.OO (the default), and turning the knob will make the curve grow, shrink, or invert. (Modulate it for some real craziness!)

10.5.1. The Function Visualizer

The **Function Visualizer** is a graphical representation of the Function's behavior. The waveform or envelope shape can be changed directly with the mouse according to various Draw Modes, and individual stages can be altered at will. It is essentially a more advanced version of the Response Curve visualizer in the Keyboard [p.115] tab.
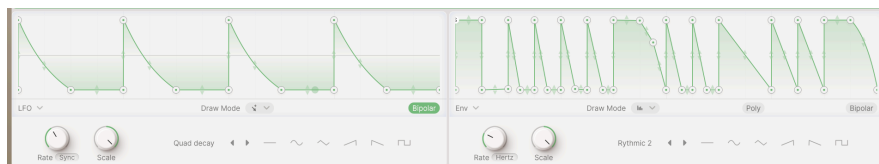
The Function can be shaped to taste using the mouse. Click and drag any of the white *breakpoints* to move it and reshape the wave; click anywhere on the curve to add another breakpoint. Right click on a breakpoint to delete it.

> ℹ Up to 64 breakpoints can be specified. All of them can be moved vertically or horizontally, with two limitations: the first breakpoint is locked to the start of the Function (the left edge of the display) and you can't move one breakpoint past another one in time (forward or backward).

A pair of vertical arrows appears in the middle of the curve between each pair of breakpoints; click and drag up and down to reshape the curve itself.

You can click and drag the Level and Time values for a point, if you wish to make precise settings. Note that the first and last points will always be at the same level so the waveform or envelope starts and stops at the same place.

When you select **Env** mode, one stage is designated as Sustain and is shown with an **S** in its breakpoint.

The **Draw Mode** buttons let you quickly choose between four ways of drawing the Function curve:
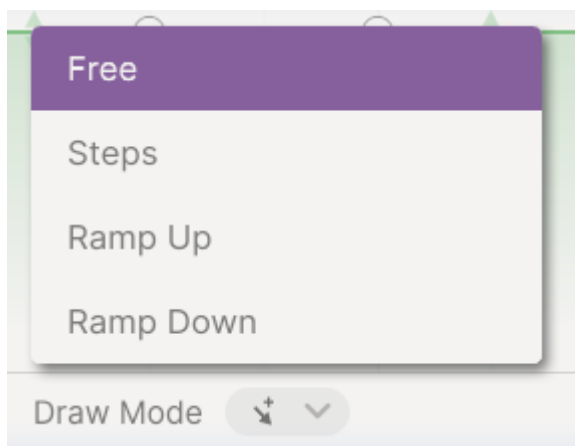
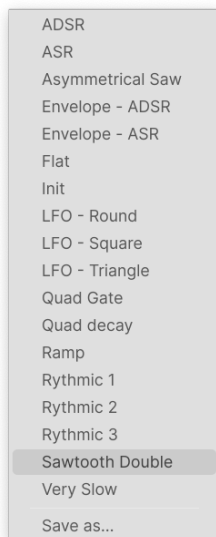The first button operates as described above; the other three buttons let you quickly draw in periodic waveforms, with 16 levels per cycle, simply by drawing a line from left to right with the cursor. Your choices are square (Steps), upward sawtooth (Ramp Up), or downward sawtooth (Ramp Down). This is a great way to create rhythmic pulses or other shapes that follow your song's tempo.

Once that's done, you can return to the first Draw Mode and edit each step by hand as usual.

If you want inspiration, check out the pop-up menu of preset Function shapes under the Visualizer:

ADSR
ASR
Asymmetrical Saw
Envelope - ADSR
Envelope - ASR
Flat
Init
LFO - Round
LFO - Square
LFO - Triangle
Quad Gate
Quad decay
Ramp
Rythmic 1
Rythmic 2
Rythmic 3
Sawtooth Double
Very Slow

Save as...

This menu also gives you the option of saving a curve you've created for later use in other Presets.

There are also left and right scroll arrows for quickly viewing the preset shapes, and a row of six basic shapes that can be selected with a click.

10.6. Randoms tab

The Modulation Strip, set to the Randoms tab

There are many applications where adding a bit of random variation can spice up a sound. The Random Modulator is designed to help you do that easily. It has a very wide rate range like the other modulators, making it capable of generating "noise" control signals in the audio range.

Augmented comes with two Random modulators. Each Randomizer works as one of two Modes, selected with the **Mode** button:

- **Turing** is named for the code-breaking mathematician Alan Turing. It creates "controlled chaos" as a modulation output.
- **Sample & Hold**: This is the common randomizer based on Sample and Hold that will be familiar to most electronic musicians.

The following controls are identical for the two Modes:

The **Trigger Mode** buttons are identical to those we've seen on the LFOs and Functions:

- **Env** turns the Random into a single-cycle envelope triggered when you press a key.
- **LFO** is conventional free-running LFO behavior.
- **LFO Keytrig** causes the RND to retrigger with every keypress.

The **Poly** button creates new cycles for each note played. When it's turned off, the Random will retrigger on every keypress.

> **i** NOTE: In Turing mode, legato playing will not retrigger, even with the **Poly** button activated.

Rate: sets the rate at which the RND cycles. As with the LFO and FUN, a drop-down menu lets you select how (or if) the RND is synchronized to your DAW:

- **Hertz**: cycles per second, not tied to any sync clock. The rate range is 0.010 Hz (one cycle per 100 seconds) to 200 Hz.
- **Sync**: time divisions indicated in bars and beats, from 8/1 dotted to 1/32 triplet.
- **Sync Straight**: time divisions indicated in note lengths, from 8 whole notes to 1/32 note.
- **Sync Triplets**: as above but in triplet values.
- **Sync Dotted**: as above but in dotted values.

Scale: Sets the overall modulation output of the Random.

Turing Mode has controls for:

- **Length**: Sets the length of the sequence of modulation peaks. The longer the sequence, the more variation you'll get.

- **Flip**: Adjusts the probability of modulation peaks being inverted.

Sample & Hold Mode has a control called **Smooth**, which smooths the transitions between the modulation peaks. Setting Smooth to O will create the familiar random waveform with abrupt level changes.

10.7. Macros tab
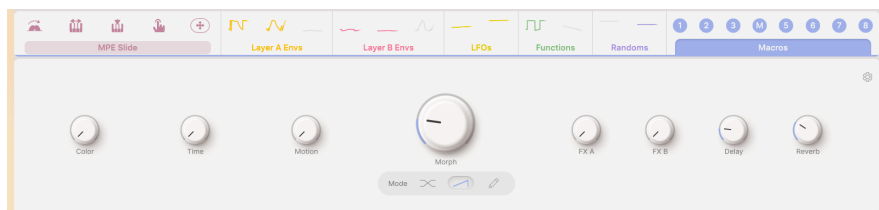
The Modulation Strip, set to the Macros tab

Macros are a way for you to simultaneously control multiple interacting parameters in Augmented with a single knob. The Play Panel [p.54] has eight MIDI-mappable knobs, four for the Layers (Sound) and four for the FX.

These knobs are completely mappable and assignable to whatever destinations you might require. However, the Macros tab adds some extra functionality that makes them more flexible than "just another eight knobs to turn".

From left to right in the Macros tab and on the screen, the knobs are:

- **Color (1)**
- **Time (2)**
- **Motion (3)**
- **Morph (M)**
- **FX A (5)**
- **FX B (6)**
- **Delay (7)**
- **Reverb (8)**

10.7.1. Macros Settings

Clicking on the gear icon at top right in the Macros tab opens the Macros Settings panel, where you'll find tools for customizing and fine-tuning the Macro knobs and their functions in ways that a simple modulation assignment can't match.

For all of the Macro knobs other than Morph, the Settings panel looks like this:
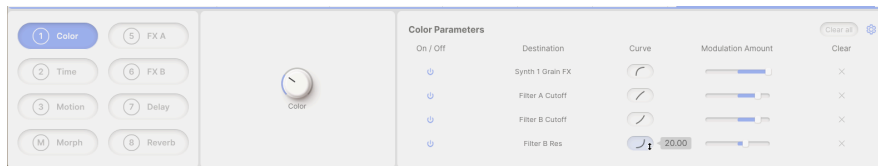
Macro Settings for all knobs other than Morph

The panel reproduces all of the information contained in the Macro knob's pop-up menu, spread out in a form that is easier to work with (and won't vanish if you accidentally mouse away).

Each parameter has an **On / Off** switch, the name of the **Destination**, a **Curve** control, a **Modulation Amount** slider, and a **Clear** (X) icon. Up to eight parameters can be listed, and the list becomes scrollable if there are more than four.

Of particular interest here is the Curve button. Click and drag up and down to change the response curve of the knob for that parameter from logarithmic to linear to exponential. Between this and the bipolar Modulation Amount slider, it's straightforward to create a set of modulations that move in a precise coordinated manner with one turn of the knob.

10.7.2. Morph Settings

The Morph knob Settings take this customization to an even higher level:
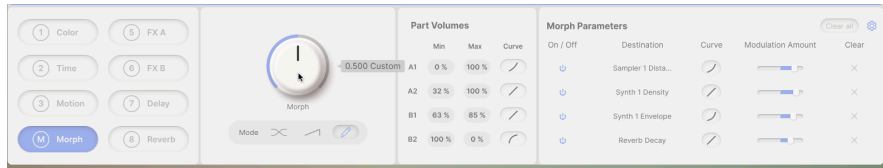
Macro Settings for the Morph knob

In addition to all of the Macro Settings available to the other Macro knobs, Morph has perhaps the most dramatic function in the entire Augmented architecture: the ability to gradually mix, blend, and fade elements of the various Parts and Layers in a controlled manner, as well as change the values of multiple modulation destinations. No other control can create so much fascinating sonic movement and change as the Morph knob!

There are three Morph Modes, selected by the buttons under the Morph knob:

- **Crossover**: This is an equal-power crossfade from 100% Layer A to 100% Layer B over the travel of the knob.
- **Additive**: This keeps Layer A at the same level while gradually adding Layer B over the travel of the knob.
- **Custom**: Each of the four Parts changes volume in its own way over the travel of the knob.

When the Custom Mode is selected, the **Part Volumes** panel lets you specify how each of them changes when the Morph knob turns. Each Part can have its own volume levels for Min (Morph knob all the way to the left) and Max (Morph knob all the way to the right), and a separate Curve for each travel.

This lets you design a Morph where two Parts get louder at different rates, one gets softer, and one varies only slightly, all with carefully specified limits and response curves. All of the elements in motion at once, creating magic with a turn of a knob... the essence of Augmented.

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