USER MANUAL

Phaser BI-TRON

ARTURIA

_The sound explorers

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Thank you for purchasing Arturia's Phaser BI-TRON...!

This manual covers the features and operation of the Phaser BI-TRON.

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

Special Messages

Specifications Subject to Change:

The information contained in this manual is believed to be correct at the time of printing. However, Arturia reserves the right to change or modify any of the specifications or features without notice or obligation.

IMPORTANT:

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

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

Introduction

Congratulations on your purchase of Arturia's Phaser BI-TRON...!

Arturia's passion for synthesizers and sonic purity has given demanding musicians the best software instruments for professional audio production.

Arturia also has a growing expertise in the audio field, and in 2017 launched the AudioFuse, a pro studio quality audio interface that features two proprietary DiscretePRO® microphone preamplifiers and a set of top-notch AD/DA converters. This line was recently expanded with the launch of the AudioFuse Studio and the AudioFuse 8Pre. Arturia has also been busy making effect plug-ins, launching in 2018 the first Arturia effects bundle, which included the Pre 1973, the Pre TridA, and the Pre V76.

Other bundles followed, dedicated to compressors, filters, delays, and reverbs. With the launching of these new effects, this time dedicated to modulation, Arturia consolidates its position as a leader in audio effect plug-ins.

The ARTURIA Phaser BI-TRON is one of the new modulation effects plug-ins included in the FX Collection, and benefits from decades of experience in recreating the most iconic tools of the past.

ARTURIA has a passion for excellence and accuracy. This led us to conduct an extensive analysis of every aspect of one of the most sought-after phaser units of the past. But, as has been usual and became a fundamental characteristic in all of our plug-ins, we didn't just model the sound and behavior of this unique unit, we also added several features that were unimaginable in the days the original was being manufactured.

Phaser BI-TRON runs as a plug-in in all major formats inside your DAW.

The Arturia team

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1. WELCOME

1.1. What is a modulation effect?

Modulation effects work by modifying the sound in a certain way, usually by means of modulation controlled by a Low-Frequency Oscillator (LFO). For example, they can add one or more slightly delayed versions of the sound to itself, while modulating the pitch of those versions over time.

We can obtain three main effect types with modulation: chorus, flanging, and phase shifting. Of these three, chorus is perhaps the most sought-after one, since it allows to create "richer" versions of the sound. Chorus effect works by taking the audio signal and mixing it with one or more delayed, pitch-modulated copies of itself. The pitch of the added voices is modulated by an LFO, which makes the overall effect similar to that of the flanger, except with longer delays and less modulation.

Flanger is an effect similar to the Chorus, produced by mixing two identical signals, with one signal delayed by a small and gradually changing amount of time and modulated through an LFO, which produces a characteristic undulating (sweeping) effect, but with a sound resembling the result of a comb filtering. Speeding up the LFO accentuates the modulation effect. As we said, the effect is similar to the Chorus, but here we use shorter delays for the delayed signal.

The flanger effect can be controlled by other sources than the LFO. Also, part of the signal is usually fed-back into the input, producing a resonance effect. The phase of the feedback signal can also be inverted, to achieve further variations of the flanger effect. Flangers usually make great use of feedback to receive more processing. This accentuates the notches and resonances, resulting in the harsh, metallic timbre that is one noticeable characteristic of flangers.

The Phaser (phase-shifter) is another modulation effect, with results somehow similar to Flanger. It is produced by splitting the audio signal in two paths, one being treated by all-pass filters, which preserve the amplitude of the original signal but alter its phase. Here, we use no delayed signal. The absence of delays is the main difference between phase-shifters and the other modulation effects. After the all-pass filtering, the two paths are mixed again, and the frequencies that are out of phase will cancel each other, producing the phaser's characteristic "whoosh" sweeping effect.

So, the phaser works by canceling bands of frequencies to obtain the desired effect (which is something we already observe in the flanger, by the way). Again, no delay is used in this effect, which differentiates it from the other two.

Modulation effects can create a huge range of sonorities, and the results may be perceived as a fuller, richer sound. No wonder they have been used extensively since they appeared. Also, they have been somehow an obligatory addition to almost any synthesizer and electronic keyboard manufactured since the eighties.

1.2. What about the Phaser BI-TRON?

The Arturia Phaser BI-TRON is part of a new set of effects, proposing three new iconic vintage modulation effect units.

The original unit this plug-in is modeled on is one of the most popular analog phaser pedals that appeared during the seventies. Released in 1974, it was a sophisticated dual phaser device, combining two independent six-stage phase-shifting circuits with multiple ways of being controlled. This means it is capable of quite some powerful phasing effects, and more powerful than two individual phaser units combined, due to the interactions made possible by its dual engine configuration. It was also the first phaser to include a feedback control for deeper phasing.

The unit features two independent low-frequency oscillators, and can be controlled through pedals or other external inputs. Besides this, the fact that it has 2 independent circuits allows for true stereo, which was another factor that contributed to it being selected as the phaser unit to be emulated.

Among it's famous users we can find names like Stevie Wonder, Grateful Dead, Smashing Pumpkins, and Lee Scratch Perry (dub).

The unique design of this phaser adds to its appeal, and today the available units may reach far more expensive prices than most of the other vintage guitar pedals.

But that's not all. As usual, Arturia Phaser BI-TRON come with an additional "pedal", which can be selected as an alternate source of modulation. The pedal has a manual control and an envelope follower. Other advanced features are an hi-pass filter and the possibility to control the number of poles of the all-pass filter independently for each of the two circuits (from 2 to 12).

Finally, there's the possibility to phase-reverse the output of the phaser.

1.3. Where can we use a phaser unit like this?

The phaser effect is characterized by a sweeping and wavering effect (the flanger effect may also be described with the same adjectives, but the phaser is usually more spacey). This is caused by the comb-filtering. This kind of effect became more or less a trademark for electric guitars.

Other instruments that took this effect with great prominence were the clavinet and the electric pianos. As we already said about the flanger, flanger and phaser became to the electric piano and clavinet what the rotary speaker is to the electric organ.

So, obviously any kind of electric guitar sounds are good candidates for the use of this effect. Soloing is where it may shine the most, but also riffs, especially where the notes are more sustained, can use it to enrich and give movement the sound. As we said, the phaser effect sounds usually more "spacey" than flanger, but both effects are often combined.

Pianos (mostly electric, but also acoustic) are other good candidates to the use of flanger. Some of you may remember the great electric piano accompaniment played by Dennis DeYoung in the song Babe, from the Styx album Cornerstone.

Other good candidates for the phaser effect are synthesizers (of course) especially when playing pad sounds, strings, brass, and polyphonic ensemble sounds in general. Everybody may remember the great use of the phaser by Jean-Michel Jarre, applied to the string sounds of the Eminent (especially in the Oxygen and Equinoxe albums). From then on, string machines and phasers became a serious case of successful association.

2. ACTIVATION AND FIRST START

The Arturia Phaser BI-TRON plug-in works on computers equipped with:

Windows 7 or later and macOS 10.10 or later.

You can use the Phaser BI-TRON plug-in as an Audio Unit, AAX, VST2 or VST3 plug-in (64-bit only).

2.1. Activate the Arturia Phaser BI-TRON license

Once the software has been installed, the next step should be to activate your license, so that you can use it without limitations.

This is a simple process that involves a different software program: the Arturia Software Center.

2.1.1. The Arturia Software Center (ASC)

If you have not already installed the ASC, go to this web page:

https://www.arturia.com/support/updates&manuals

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

Follow the installation instructions and then:

- 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

That's all there is to it!

2.2. Working with plug-ins

The Arturia Phaser BI-TRON can be used in all major digital audio workstations (DAWs), including Live, Logic, Cubase, Pro Tools and others, as it comes in all the main plug-in formats. Unlike what happens with hardware, you can load as many instances of the effect as you find useful. Phaser BI-TRON has two other big advantages over hardware:

- You can automate numerous parameters using your DAW's automation system;
- Your settings and current plug-in state will become recorded in your project, and you can pick up exactly where you left off the next time you open it.

3. PHASER BI-TRON OVERVIEW

3.1. Arturia's Phaser BI-TRON plug-in

Our goal was to give the users the experience of a great tool from the past. But although we have worked to be faithful to the unit sound, appearance and workflow, it wouldn't be an Arturia plug-in without the addition of some extra features to enrich the user experience.

We kept most of the original unit layout. As is usual with the effect plug-ins produced by Arturia, the Graphical User Interface (GUI) has a Main panel and an Advanced panel. But here we added a third panel, the Pedal, which also plays a very important role in controlling the unit.

The Main panel has the main phaser controls, with a few knobs and buttons. It follows closely the control panel of the original unit, with the controls for both engines clearly divided and separated. A routing control in the lower middle of this panel is where we define how the two phaser engines interact. We will explain all of these in detail in the Control Panel chapter [p.13].

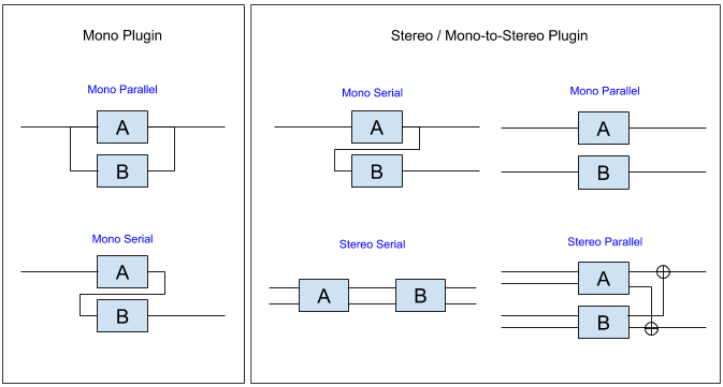
The pedal includes two extra controls for the phasers. One is a manual control, and acts exactly like what should be expected from a pedal. The other is an audio Envelope Follower, and again acts as expected on this kind of modulators.

Finally, the Advanced control panel includes a few extras, like a control for number of poles of the All-Pass filters (which can go from two-poles up to twelve-poles), a Dry/Wet mix control, switches to invert the right side polarity of the LFOs (all of these in double, one for each phaser circuit), and a Hi-Pass Filter to shape the audio input.

We will take a detailed look at all of these controls, and will explain all of them in detail in the Control Panel chapter [p.13]. Now, it's time to check out how it works and how it sounds. Let's go!

3.2. Understanding the Phaser BI-TRON Signal Flow

The Phaser BI-TRON plug-in is a unit capable of quite complex routings. It is a double circuit phaser, to start with, which means that we have the signal split between two channels. These two channels may interact in several ways. The following diagrams illustrate all the possible routings the audio signal can follow:

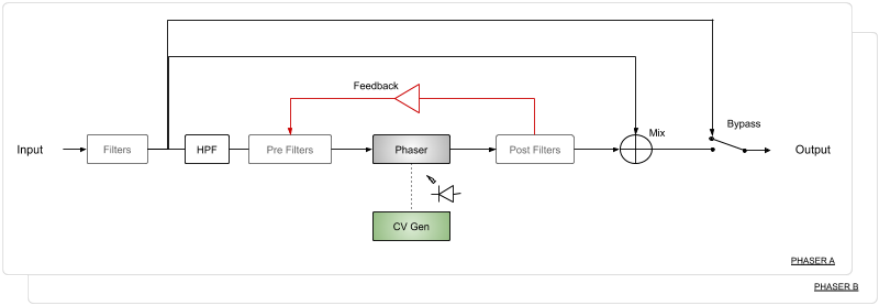


Independently of the routing, the signal follows always the same path inside each of the two phaser engines (labeled as Phasor A and Phasor B, like in the original hardware unit).

After entering the unit, the signal is pre-filtered. Then it is split in two. One part is the dry path, which is routed directly to the output, when bypass is activated. Otherwise, this part will not be output.

After this split, another split occurs. This time, the dry signal is routed to the mix controls, where it will be mixed with the Wet (processed) signal.

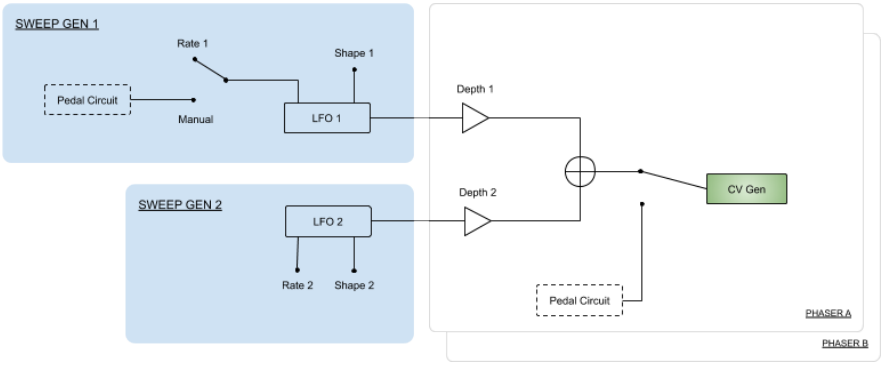
The other part of the signal is routed through the engines, according to the chosen routing (pictured in the diagram above). Inside each engine the signal starts to be be filtered (again) this time by an Hi-Pass filter. This filter will cutoff the lowest regions of the signal. This way, if we are processing, for example a bass guitar or a kick, the lowest part of the signal will not have its phase affected. This may be handy because messing with the phase may remove some "punch" on the attack.



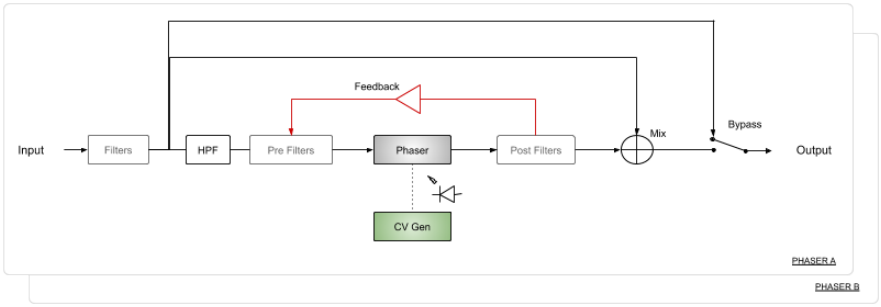
After this stage, the processed signal advances to the next step, which is another pre-filter, preparing it for the main Phaser filtering. This phaser stage is where all the controls play a role. Usually, phasers use LFOs (the Sweep Generators 1 and 2), but here we also have the choice of a manual control through the Pedal and also through an Envelope Follower. The following diagram illustrates the way the CV Gen signal is generated from a combination of different sources: Sweep Generator 1 & 2, and Pedal. The LFOs are represented by the Depth 1 and Depth 2 controls.

When the Pedal is activated, it overrides the other controls. The Pedal can control both Sweep Gen 1 rate and/or generates a CV signal to directly pilot the Phasers.

Also, remember that, although we are describing one circuit, all we are saying is doubled in the other circuit, since this is a double-circuit phaser. That's why we have a Phaser B rectangle behind the Phaser A.



After the phasing stage, the signal is filtered once more, after which the processed signal can be re-injected (fed-back) in the Phaser circuit. This is controlled by the feedback control in each Phasor panel.



Despite being fed-back or not, the signal travels to the Mix stage, where it will be mixed with the Dry signal. This mix is controlled by the Mix knob present in the advanced panel of each engine.

This final mix will then be routed to the plug-in Output, where it will may routed directly to the output or cross-mixed to the output of the other engine (please check the routing diagram for the possible routings). If the engines are routed in parallel, the cross-mix will occur. If the routing of the engines is in series, then the output of the second engine will be the final output.

When plug-in is bypassed, the input signal (the Dry signal path) is routed directly to the output. This is the signal heard when we press the Power button or the Bypass button in the Lower Toolbar.

This is the complete signal flow of the Phaser BI-TRON. Study the circuit, spend some time with the controls, and we're sure you'll gain a deep understanding of how this chorus processor works, and enjoy all its amazing sonic capabilities. The following section will definitely give you some help.

3.3. Getting hands-on with Phaser BI-TRON

3.3.1. Phaser Basics

To get an idea of the Phaser BI-TRON's capabilities, we suggest you try the following:

- Load a stereo clip into an audio track in your DAW (some strings track, an electric piano lick or a melodic sequence, are the ideal for this). Whatever you choose, make sure that the rhythm is not too fast;
- Load an instance of Phaser BI-TRON as an insert in that track. Open the Phaser BI-TRON window;
- Ensure the Default preset is loaded. This will mean that all settings are positioned in their initial values;
- Begin playback. You will listen the well known phaser effect in action. To check how strong this effect is, activate and deactivate bypass. This is a great and fast way to check how the effect is processing your audio;
- Now, it's probably better to put the sweeps in sync. Phaser is one of those effects that provide great results when in sync with the musical tempo. Press the small eight-note button next to each Rate knob, and choose a sync value that pleases you. A long value usually works better. Let's pick 2 (2 whole-notes, or two 4/4 bars);
- You'll now notice that the phaser "wavering" goes up and down in sync with the musical tempo. This is much nicer;
- Try different values for Depth 1 and Depth 2, with some differences between the two engines. You will notice that the stereo imaging increases when you use values that differ substantially from one engine to the other. Lets put Depth 1 value at the maximum in Phasor A and Depth 2 at the maximum in Phasor B;
- Now pick a different routing in the routing section in the lower part of the panel, between the two "Phasor" panels. The default is Stereo serial. Try other options to see how the effect changes, like for example Stereo Parallel;
- Try the feedback control. Depending on the music material, you may notice some increase in the phasing effect. Remember that feedback is not very common in a Phaser. Actually, the hardware unit that is emulated here was the first phaser unit featuring feedback;
- Now let's check the pedal control. Pedal provides control of the Sweep Generator 1 rate, as well as the frequency sweep of both engines. To better check the effect of the Pedal, we will turn Off Phasor B. Press the On/Off button to turn Phasor B Off;
- Since Phasor B is turned Off, only Phasor A is active. The phaser effect decreased;
- Press the switch to change Sweep Gen 1 Rate controlled by the Pedal. You'll notice that the phasing effect becomes really slow. Although the pedal is at 0% it still modulates (very slowly) the Sweep Gen, and since the Phasor A engine is still being controlled by the Sweep Generator, we still have a slow effect;
- Turn the Sweep switch in the Phasor section to the pedal position. Now, the phaser effect becomes static, and sounds like a notch filtering. There's only a very subtle processing in the sound. You can check this by pressing Bypass On and Off. Click and play with the pedal (drag up or drag down). You're now controlling the sweeping of the phasing effect with the Pedal;
- Now we will check the Envelope Generator. We will use the internal source. Since we are using just engine one, we will use the other as input for the Envelope Generator. To select that, click the space at the right of SRC and select "Input Phasor B";

- If the signal has not enough power, you can use the Comp and Input controls. Comp defines the threshold for the compressor to act. It levels the audio. Turn it to the left until you see the orange graph more or less steady. Input increases or decreases the detection of the input signal by the envelope follower. Turn it to the right until you listen the phaser acting as you want it to act;

- You can also delay the action of Envelope Generator. Try it, and see for yourself if the results please you;

- And that's pretty much it in what concerns standard controls. This unit has a lot of potential by just using the standard controls. But there's more we can do. Please read below;

3.3.2. Advanced methods of using the phaser

Now that you have a feeling for the Phaser BI-TRON basics, let's go a little deeper:

- Click the double downward facing arrows to open the "Advanced" panel. Alternatively, you can simply click the PHASER BI-TRON title;
- This panel has some extra options - from left to right, we have a Hi-Pass Filter and two symmetrical sections, labeled A and B. These control each of the two phaser engines;
- In each of these sections, we have controls for the number of poles, two LFO right-side invert switches and a Dry/Wet mixer knob;
- Lets check the Hi-Pass filter. This is handy to leave the low regions of the audio out of the phasing processing. We may want that if we are processing a bass or a kick drum, since messing with the phases may alter the attack, removing the desired "punch". It may also "sweeten" the phasing in a string section. If you are using a string sound playing chords you may try to filter everything below 1 kHz;
- Now try the poles control. This may change drastically the phasing effect. The original has a fixed 6-pole filter, but here we can go from 2 up to 12. Change it while the audio is playing. You'll be surprised;
- The R.INV. switches invert the right side of the LFOs for each of the Phasor units. When used together with, for example, a ramp waveform on the LFO, we can obtain some very interesting stereo effects (by inverting one of the sides of the ramp, we will have an ascending sweep in one side while we have a descending sweep in the other side). These may not be suitable for everyday tasks, but sometimes may lead to good results;
- Mix is a Dry/Wet control. At 100% only the processed signal is output. At 0% only the Dry signal is present. For better results, a value around 50% is desired;

These are just some very simple examples of what you can do with Phaser BI-TRON. It offers more than you could imagine by just the looks. Phasers may be very effective when used with the right musical material. As always, use your imagination, and try to find other creative and interesting ways of using the tool.

4. PHASER BI-TRON CONTROL PANEL

The Phaser BI-TRON plug-in can be used in Mono, Stereo or Mono-to-Stereo configurations, independently of the source material.

The Mono configuration is automatically loaded when we use the plug-in with mono tracks. When inserted in stereo tracks, the Stereo configuration is automatically loaded as well. When the plug-in is instantiated as Mono-to-Stereo, as in Pro Tools for example, there is also a different configuration.

> ♪: Not all DAWs are able to work with mono tracks, in which case you will not be able to use the mono configuration. The same applies to the mono-to-stereo configuration.

4.1. Channel Configuration (Mono/Stereo/Mono-to-Stereo)

The difference between the different configurations consists in the following:

When instantiated in stereo channels, the plug-in loads in full mode, featuring four possible routing configurations - two mono and two stereo.

When instantiated in mono channels, the plug-in doesn't have the stereo routing options, since they only act in stereo signals. It also doesn't have the Right Invert (R.INV.) switches for the right side of the LFOs in the Advanced Panel, since these work by inverting the right side of the signal, so they only be relevant in stereo or mono-to-stereo.

Phaser BI-TRON in mono configuration

When instantiated as mono-to-stereo, we have the exact same routing options we have in full stereo mode, but they act differently, since the input is mono.

4.2. Main Control Panel

The Phaser BI-TRON Graphical User Interface may be regarded as simple, given the capabilities of the original unit, which control panel it follows closely. The Main control panel is where the main phaser controls are located, and is the one that opens by default when we launch the plug-in.

At the side of the Main panel, we have the Pedal. The original phaser units were usually controlled by pedals, and we kept that control here to house the Manual control and the Envelope Follower control.

But Arturia also included some extra features. These are located in a second panel, the Advanced control panel, that opens when we click the double arrow button (the Advanced Mode button) in the Upper Toolbar. Alternatively, you can simply click the "PHASER BI-TRON" title. That will also open the Advanced panel.

As is the case with the previous effects bundles, as well as with all current Arturia plug-ins, this GUI also has an Upper Toolbar and a Lower Toolbar. The Lower Toolbar is very important for the use of the Arturia plug-ins, as it allows the Undo and Redo functions, lists the editing history, allows you to put the plug-in in Bypass (which doubles the Power button in the Main control panel), and measures CPU consumption.

Of course, the Upper Toolbar is very important as well, since it is where we access the main menus, perform important tasks like loading and saving presets and banks of presets, and where we can select a preset and see the name of the current preset in use. The toolbars and their features are covered in detail in the User Interface chapter [p.26].

We will now have a look at all the controls available, explaining what they do, what are their ranges, and how to interpret the numbers.

Notice that each time we click a control (knob or button), or simply hover the mouse over it, the Lower Toolbar displays the parameter name at the lower left, and a brief tip of what it does. Also, a small pop-up box appears at the right side of the control displaying the current parameter value. This changes every time we move that control, updating the parameter value in real time. These values aren't always of the same type.

Now, let's take a look at each control in Main Control Panel.

4.2.1. Power

Power button turns off the plug-in. In practice, it works as a bypass button, and has the exact same effect as clicking Bypass in the Lower Toolbar.

4.2.2. Sweep Gen 1 / Sweep Gen 2

These sections are where we have the Low-Frequency Oscillators. The name Sweep Generator comes from the fact that the phase-shift sweeping may also be controlled by a Foot Pedal.

The sections are clearly marked by a white frame that surrounds it. On the left we have Sweep Gen 1 and on the right we have Sweep Gen 2.

The two sections are very similar, therefore many of the controls present in one are also present in the other.

Sweep Generators 1 and 2. Rate knob 1 is in sync mode

4.2.2.1. Rate

Rate is where we control the frequency of the LFO. In the original, we only had absolute rates, but here we also have the possibility to run the LFOs in sync with the host. To put the Rate in sync with the host musical tempo, you need to turn on the little black button with the musical eight-note figure. When turned On, the button will lit. If turned Off it will remain black, and the rate values are expresses in Hz, ranging from 0.200 Hz up to 20.0 Hz. Default value is 0.653 Hz.

When in sync, the rates are displayed in musical values, ranging from 8 (eight whole-notes or eight 4/4 bars) to 1/64 (a 64th note). By default, the sync value is 1/2D, meaning a dotted half-note.

4.2.2.2. Shape

Shape is another control present in the Sweep Generator sections. The original unit allowed to choose between a sine wave and a square wave. For the plug-in version, we decided to add a third option - a ramp (ascending saw) wave. The default is the sine wave.

4.2.2.3. Rate Control (Manual/Pedal) switch

This control switch is only present in the Sweep Generator 1 section. It allows the LFO rate to be controlled by the Pedal, instead of the Rate knob. When the switch is in the Pedal position, the Pedal section takes control of the rate of the LFO, overriding the Rate knob.

By default, the switch is in the Manual position (Rate knob controls the LFO rate).

4.2.3. Phasor A / Phasor B

These sections are the main control sections for the phaser circuits. Just as with the Sweep Generator sections, we have one for each engine, this time name A and B. Phasor A is located in the left part of the control panel, and Phasor B is located in the right part. Again as was the case with the Sweep Generator sections, each section is clearly marked by a white frame that surrounds it.

We have several controls inside the sections. Let's look at each of them:

Phasor A and Phasor B sections, with the Routing section in the middle

4.2.3.1. Depth 1 and Depth 2

The Depth controls, together with the Feedback control, determine how deep the phasing effect sounds. We can look at them as effect intensity controls.

The presence of two Depth controls is another new feature introduced by Arturia in this section. The original unit had each engine controlled by just one LFO. Therefore, Sweep Gen 1 controlled Phasor A while Sweep Gen 2 controlled Phasor B. Here, we may have each engine controlled simultaneously by the two LFOs. That's why we have two Depth control knobs.

Depth 1 controls the modulation intensity from Sweep Gen 1. Remember that the LFO frequency of this generator may be controlled by the Pedal, instead of the Rate knob.

Depth 2 controls the modulation intensity from Sweep Gen 2.

The range of both Depth controls goes from 1.00 to 10.00, and defaults to 5.50.

4.2.3.2. Feedback

The feedback control is something not commonly seen in a phaser, especially a vintage phaser unit like the one being emulated here. In fact, this was the first phaser unit to feature feedback to achieve a deeper phasing effect.

Feedback adds to the Depth control, changing the intensity of the phasing effect. When feedback is at O, we get the normal sweeping phase effect due to the cancellations. When the feedback value is raised, it causes positive peaks in the frequency response in between the cancellations.

This increases the definition and emphasis of the phasing effect. This is particularly important when we are using very slow phasing rates.

Another interesting effect is caused when feedback is at its maximum. At full feedback, it will pick out the individual notes and harmonics of a chord as it sweeps.

Feedback control range goes from O.OO to 1O.O. By default, feedback is turned Off (value is O.OO).

4.2.3.3. Sweep Switch

This switch is where you select the input source to control the phase-shifting sweep. In the original, the switch for Phasor B had an extra position, to allow it to be controlled also by Sweep Generator 1, instead of Sweep Generator 2. But since we have the two Depth controls in each Phasor (which means, in practice, that we already have the option to choose which Sweep Generator controls which Phasor, with the added flexibility of having both Sweep Gens controlling both engines, and with different intensities), the Sweep Switches in the Arturia BI-TRON are similar

Both switches have three positions: Gen, Pedal and Gen + Pedal (labeled just with a "+"). When Gen is selected, the Sweep is controlled according to the intensity of both Depth 1 and Depth 2, together with the Feedback.

When Pedal is selected, and the Pedal is in the Manual mode, it only varies the phase when it is being moved. When it's not moving, the effect is fixed according to the pedal position. If Pedal is in Envelope Follower mode, the sweeping will be controlled by the volume contour of the audio, which means that the phase-shifting will not vary in a regular way.

The third (Gen + Pedal) position, which is labeled "+", will make the LFO to sweep around a center frequency controlled by the pedal.

By using different Sweep Switch combinations for both engines, some interesting phase-shifting combinations can be achieved.

Phasor B Sweep switches

4.2.3.4. Sweep Norm/Rev Switch

In Phasor B, the Sweep has a second switch, labeled Norm/Rev. This switch inverts the polarity of the sweep for Phasor B.

This will be more effective when both engines are using the same or very similar settings. When both engines are in sync to each other (in the original this was achieved by choosing the same source for both engines, like for example Sweep Gen 1), the Reverse switch will make the sweep of Phasor B to go downwards when the sweep of Phasor A go upwards, and vice-versa. This was a good method to achieve a real stereo effect with the phaser.

Here, we may use it to achieve other interesting effects, for example by slightly varying the intensity of Depth 1 and Depth 2 on each engine, and/or the Feedback intensity applied to each.

Notice that this switch works differently from the ones in the Advanced panel, because those reverse only the right signal LFO polarity, while the Red switch in the Main panel reverses the LFO polarity for left and right signals.

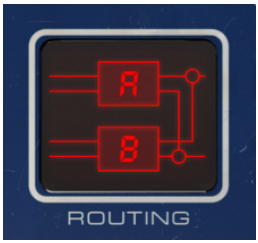
Taking advantage of the differences above, another interesting use for this switch could be using it together with the Phasor B R.INV switches in the Advanced Panel. Since those switches allow to invert only the right side of the LFO, by toggling the red switch in the Main panel, by inverting both sides with the red switch, you will end with an inverted left side, instead of the right side. So, toggling On and Off the red switch in the Main panel while the R.INV. switches in the Advanced panel are turned On may lead to some fun stereo phasing effects.

4.2.3.5. On/Off switch

This switch turns each engine On and Off. By default, both engines are On, but with this we can quickly turn each one Off. In the original unit this was a foot-controlled switch.

4.2.4. Routing

Routing is where we define the travel path of the processed signal. There are different configurations for Mono, Mono-to-Stereo and Stereo. In fact, this is what differentiate each version.



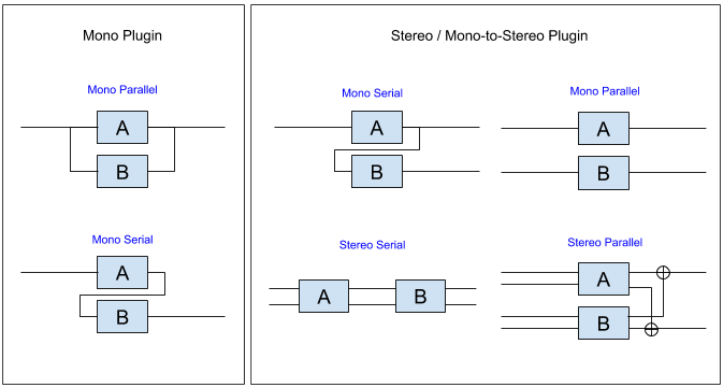
When instantiated in Mono mode, the phaser only has two routing options, labeled Mono Parallel and Mono Serial. The labels pretty much explain the way it works. In parallel routing, the mono signal is split and routed through the two phaser engines, after what it is mixed again. In serial, the mono signal is routed through Phasor A and then through Phasor B.

The Stereo mode routings (which apply to stereo and mono-to-stereo) are a little more complex. We have two variants: Mono and Stereo, each with Serial and Parallel routings. In Mono Serial mode, the signal is routed through Phasor A, and then split, with one half being routed through Phasor B while the other proceeds to the rest of the circuit.

In Mono Parallel (which we can think of as double mono), the two signals remain separated, one routed through Phasor A and the other routed through Phasor B.

Stereo routings are where the real fun begins. In serial mode, the stereo signal (both channels) is routed through Phasor A, and then through Phasor B, therefore receiving double processing. On Stereo Parallel, the two signals are routed through Phasor A and through Phasor B, and then cross-mixed (the right output signal of Phasor A is mixed with the right output signal of Phasor B, and vice-versa for left output signals). This way, the stereo signal is processed through one phaser engine, and then mixed with the signal processed by the other phaser engine.

By default, the Serial configuration is the one selected in both Mono, Mono-to-Stereo, and Stereo modes.



Routing signal-flow diagram

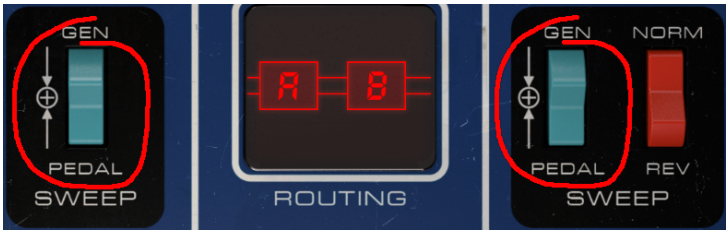
♪: If you want the signal to be processed by just one engine, you simply need to turn Off the other engine, using the On/Off switch in each of the Phasor sections of the control panel.

4.3. Pedal

The Pedal is a controller that can be activated to control the Sweep Gen 1 frequency (instead of the LFO), as well as to control the phase-shift sweeping of any of the two phaser engines (independently).

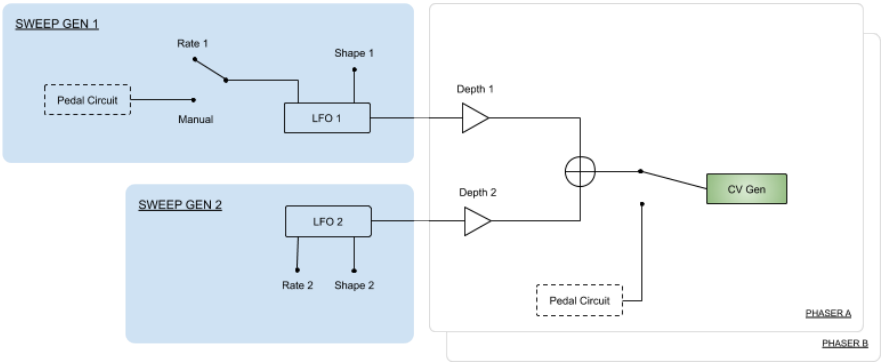
The switch that activates the Pedal controller in the Sweep Gen 1 section

To make it control the frequency, the Rate Ctrl switch must be in the Pedal position, as illustrated above. When in the Manual position, the LFO takes control of the Sweep Gen Rate.



The switches that activate the Pedal controller in the two Phasor sections

To make the Pedal control the sweep of the phase-shifting of each engine, the respective Sweep switch must be in the Pedal position. When the switch is in the Gen position, the sweep is controlled by the Depth knobs.



Pedal signal-flow diagram

4.3.1. Manual

The Pedal works manually (like as if it was a true foot pedal) or as an Envelope Follower. Each mode is activated through the respective switch in the lower part of the Pedal, labeled Pedal Mode. When a switch is On, the red LED lights On. The left switch activates the Manual switch, while the right switch activates the Envelope Follower mode.

The manual pedal is a very simple control (like the real foot-pedal). We drag it up to increase the modulation value, drag it down to decrease the modulation value, and that's it. It can also be automated.

4.3.2. Envelope

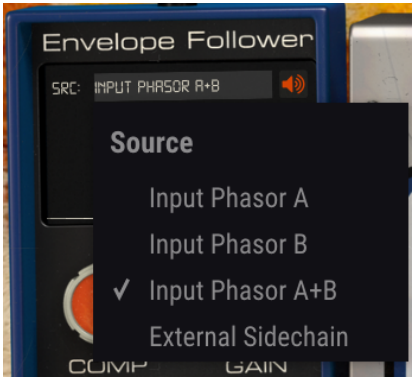
This pedal envelope follower is a little more fun. As an envelope follower, it reacts to audio level, and that way may control the phaser sweep.

The "SRC" is where we select the audio source control signal. When "Input Phasor A" is selected, the input signal of Phasor A (mono) is the source for the envelope follower. If the input signal is stereo, the source will be the left channel.

When "Input Phasor B" is selected, the input signal of Phasor B (mono) is the source for the envelope follower. If the input signal is stereo, the source will be the right channel.

When "Input Phasor A+B" is selected, the input signal of both engines is selected. They will be summed, and the summed contour will then be applied. If the plug-in is instantiated in a mono channel, this will have no effect, since the signal will be the same, anyway.

External Sidechain selects an external signal as the source for the Envelope Follower. Please refer to your host manual to check how to configure side-chain, as each host behaves differently.



Envelope Follower source menu

We have five controls for the Envelope Follower. The first is a Compressor, which compresses the envelope generated by the source signal (the white curve in the graphic display) before using the contour as a modulator. The control actually acts as a threshold for a fixed compression ratio, and its range goes from -60 dB up to 0 dB, and defaults to Off.

Input acts as a sensitivity control for the envelope follower. When we raise this control, the sensitivity also raises, therefore we will have higher values for the envelope. By default, it is set to 0 dB, which means it will not affect the original signal level. Its range goes from -36 dB up to 36 dB.

Att changes the detection Attack time of the Envelope Follower. Its range goes from 0.001 second (one millisecond) up to 5.00 seconds. The default Attack time is 0.020 (twenty milliseconds).

Rel changes the detection Release time of the Envelope Follower. Its range goes from 0.001 second (one millisecond) up to 5.00 seconds. The default Release time is 0.020 (twenty milliseconds).

Delay applies a delay time to the Envelope Follower action, by delaying the modulation signal. Its range goes from Off (no delay) up to 2000 milliseconds (two seconds). The default is 0.00 (no delay). As it happens with the Sweep Gen Rate knobs, this control also has a sync button (labeled with the same eight-note musical figure). This allows the delay to be in sync with the host tempo. When in sync, the delay values are displayed in musical values, and the range goes from 1/32 (32nd note) up to 1 (a whole-note or a full 4/4 bar). When delay is in sync, there will always be a delay. Default is 1/4 (a quarter-note).

4.4. Advanced Mode Control Panel

The Advanced Mode Control Panel is accessed by clicking the Advanced Mode (double arrow) button in the Upper Toolbar. You can also access it by clicking the "PHASER BI-TRON" label. This control panel contains very important additions that bring extra power and flexibility to the processor.

In the case of Phaser BI-TRON, this panel features a Hi-Pass Filter, and several controls for each of the phaser units: a Poles changer control, two LFO right-channel polarity invert switches (one for each LFO), and a Mix Dry/Wet control. These bring even more independence and flexibility to each of the two phaser engines.

4.4.1. Hi-Pass Filter

This is a 12dB/oct high-pass filter. When you're modulating an audio track with a chorus/flanger/phaser, you may not want your low end to modulate (like for example if you want to keep your bass and kick drum steady and precise). That's where the Hi-Pass Filter plays a role. By filtering out the low regions of the sound at the input of the unit, only the high frequencies will be modulated.

By default, the filter is Off.

4.4.2. Phasor Poles A / B

This control selects how many poles are going to be used by the All-Pass filters. The values vary between two and twelve poles, with the default being six poles. The more poles used, the narrower the bandwidths and the more intense the comb filtering effect will be.

♪: The original unit filters had six poles. This is also the default value for these controls.

4.4.3. Mix

Mix is a Dry/Wet control. We have one control for each of the two engines, which means we can have different Dry/Wet mixes in each engine. Default is 50%, but range goes from 0% (Dry signal only) to 100% (Wet signal only).

♪: By using different Dry/Wet values for each engine, some interesting results can be achieved.

4.4.4. R.INV. (Right Invert) 1/2

The R.INV. buttons allow to choose to invert the right channel polarity of each (or both) of the LFOs. So we have these switches to right invert (R.INV.) LFO 1 and right invert (R.INV.) LFO 2 for Phasor A and Phasor B in the advanced panel. By inverting one of the sides of the LFO while using, for example, a ramp waveform, you can get interesting stereo effects.

This is true even if the original signal input is mono (by using Phaser BI-TRON in a mono-to-stereo configuration), but will not be available on the Mono version of the plug-in.

5. USER INTERFACE

The Phaser BI-TRON User Interface has a Main Control Panel, an Advanced Mode Control Panel, and toolbars in the top and bottom of the window.

It is still a very simple User Interface. That will always be the main focus of every Arturia product: to unleash your creativity while remaining easy to use.

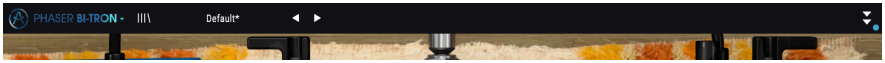
We already looked at the control panels. Now it's time to look at the toolbars.

5.1. The Upper Toolbar

The plug-in GUI (Graphical User Interface) has the usual Arturia toolbar that runs across the top edge, with the Arturia logo / plug-in name on the left (the colored part), followed by the Library button and the Preset name, with arrows to navigate through the different presets stored in the library.

After this, we have the button that gives access to the Advanced Mode control panel (a double arrow).

A dot is added next to this double arrow button whenever the Advanced Mode is active (i.e., when there are parameters set to non-default values) if that panel is not visible.



This upper toolbar, which is common to all current Arturia plug-ins, gives access to many important functions.

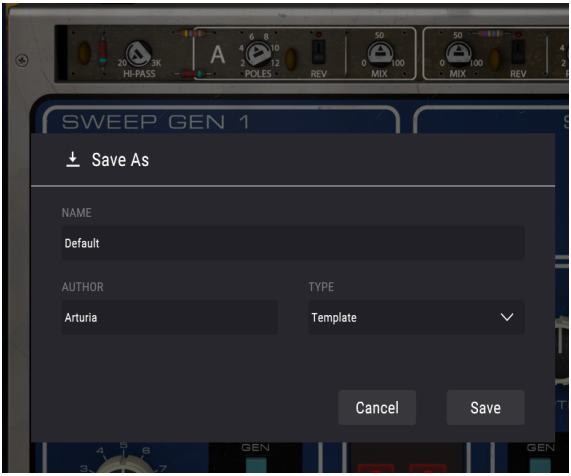
These can be found by clicking on the Arturia Phaser BI-TRON button at the top left-hand corner of the plug-in window. Since these options are also common to all current Arturia plug-ins, they may be already familiar to you:

5.1.1. Save Preset

This option will overwrite the active preset with any changes you have made, so if you want to keep the source preset also, use the Save As option instead. See the next section for information about this.

5.1.2. Save Preset As...

If you select this option, you are presented with a window where you can enter information about the preset. In addition to naming it, you can enter the Author name, and select a Type. You can even create your own Type by entering custom names in the Type field. This information can be read by the preset browser and is useful when searching for the preset later.



5.1.3. Import...

This command lets you import a preset file, which can be either a single preset or an entire bank of presets. Both types are stored in **.bitx** format.

After selecting this option the default path to these files will appear in the window, but you can navigate to whichever folder you are using to store presets.

5.1.4. Export Menu

You can export presets in two ways: as a single preset, and 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 with the import preset menu option.
- **Export Bank:** This option can be used to export an entire bank of presets from the plug-in, which is useful for backing up or sharing presets.

5.1.5. Resize Window options

The Phaser BI-TRON 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 might want to reduce the interface size so it doesn't dominate the display. On a larger screen or a second monitor, you can increase the size to get a better view of the controls. The controls work the same at any zoom level, but they can be harder to see at the smaller magnification values, or when using high resolution monitors (like HD monitors or higher). The higher the resolution, the bigger the size that should be used.

5.1.6. Help

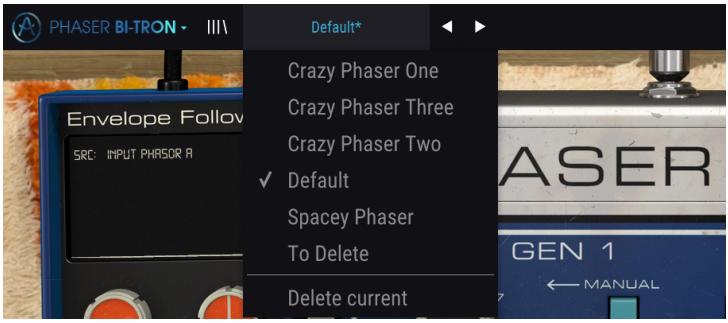
The Help section in this menu allows direct access to the User Manual (the document you are reading), as well as to the FAQ (Frequently Asked Questions).

5.1.7. Preset Selection

The Preset browser [p.31] can be opened by clicking the library symbol on the toolbar. The filter, name field and left / right arrows in the toolbar all assist with preset selection.

Selecting a preset is performed by clicking the preset name field in the Upper Toolbar. That action will open a list with all the presets available. The currently selected preset is marked with a √. Then simply place the mouse over the name of the preset you want to select (the preset name will be highlighted), and click it.

Alternatively, you may use the Preset Forward and Backward arrows (the arrows at the right of the preset name field) to navigate through all the presets.



5.2. Advanced Mode (Double Arrow) Button

This button opens the Advanced Mode control panel. This is where the controls are located for the extra features Arturia added to expand the possibilities regularly found on these units.

When the Advanced Mode panel is opened, the arrows point up. When the panel is closed, the arrows point down.

When there are parameters active in the Advanced Mode panel (edited or set to values different than the defaults), and that panel is not visible (i.e., closed), the double arrow button (pointing down) has a dot next to it to call your attention to those parameters. To check them, click the button to open the Advanced Mode control panel.

There's a detailed explanation of all the features in this Advanced Mode in the Advanced Control Panel [p.24] section of the Control Panel chapter.

5.3. The Lower Toolbar

When you hover the mouse over a parameter control, you will see a readout showing that parameter name and a brief description of it in the left part of the lower toolbar.

Also, you will notice that a small popup window will show up at the side of the parameter control, displaying the current value of the parameter. This will also show the value changes when you move the control (edit the parameter). This is handy, because you don't need to touch the parameter control to read the current value, and also you may keep looking at the parameter while you read the value changes.

At the right-hand side of the lower toolbar are several small windows and buttons. These are very important features, so let's take a closer look.

5.3.1. Output Gain

The Output Gain allows to boost or attenuate the overall volume output gain of the plug-in. By default it will be at O.OO dB (neutral position), but we can attenuate the output by -12 dB or boost it up by 12 dB.

5.3.2. Panic

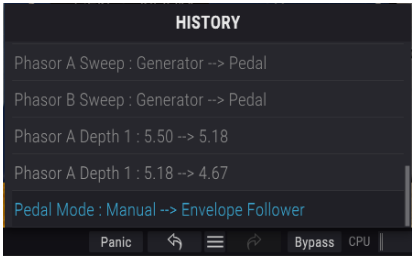
The Panic button, when pressed, turns off the audio to stop any stuck sound, this way preventing damage for your ears or speakers.

5.3.3. Undo

The Undo button is a curved arrow pointing to the left. This button reverts the last edit you performed. If it is clicked repeatedly it will revert the parameter changes in the order they were performed in the session, from the latest ones to the earliest ones.

5.3.4. History

This button lists all the parameter changes performed in the current session.



5.3.5. Redo

The Redo button is a curved arrow pointing to the right. This button works exactly the opposite way of the Undo button. It will reinstate the last undone edit. If it is clicked repeatedly it will reinstate the parameter changes in the order they were undone (the latest undone ones first).

5.3.6. Bypass

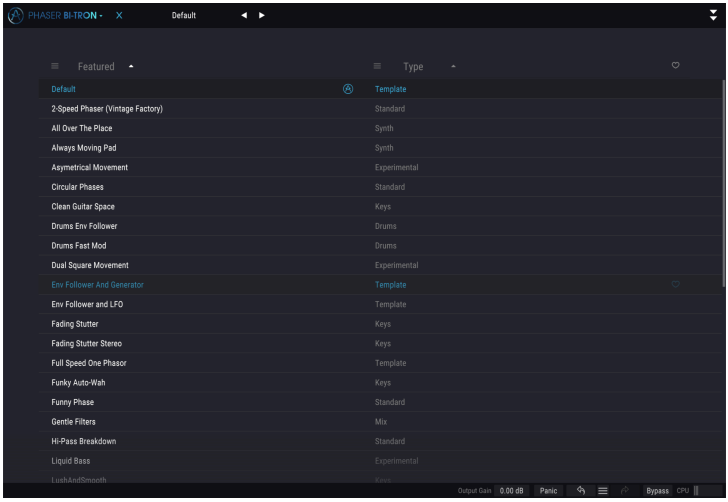
This one is obvious. Activating the bypass option will completely disable the Phaser BI-TRON plug-in. This action may also be performed by the Power switch.

5.3.7. CPU meter

The CPU meter is used to monitor how much of your computer's CPU is being used by the plug-in. If you stress your computer too much, the global performance of your system and the audio may suffer.

5.4. The Preset browser

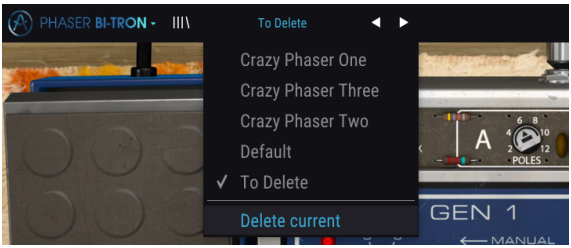
The preset browser enables you to search, load and manage preset configurations in Phaser BI-TRON. Although this looks and is based on the usual Arturia Preset Browser, it is simpler, and even easier to work with. You access the preset browser by clicking on the library symbol next to the Arturia logo/plug-in name on the left.



When you click on the library symbol, you will see a screen with all the Presets you have saved. You can sort the list by several different criteria to make it easier to find the right preset. There are two columns: The first one can list the Presets by Name or by "Featured". The Featured presets were selected as important by Arturia. The second one lists the Presets by Type or by Designer.

There is only one attribute visible, which is the one you select by clicking the column title. By default, Type is the attribute selected. When you select the Designer attribute the list changes, and that attribute replaces the Type field in the second column.

If you want to delete a preset, first select it in the browser list. Next, click in the name field at the top to open the list of presets. Then choose the option "Delete current" at the bottom of the list, and confirm the action in the pop-up window.



5.5. Fine-tuning parameters

Usually, to change values in the plug-in controls, just click on the corresponding control and drag the mouse up or down. If the controls are switches, simply click them to toggle On or Off.

If you want finer editing values, you can use Ctrl+Drag (Cmd+Drag for macOS). Alternatively, you can Right-Click and Drag. With this technique the values change more slowly, which enables you to edit the values with greater precision.

5.6. Resetting your controls

Double-clicking a control changes it automatically to the default value.

And that's it. We just finished describing all the controls you have at your disposal to process sound in your DAW using the Phaser BI-TRON plug-in. We hope you'll enjoy your new plug-in (and the results you get with it!) as much as we enjoyed making it.

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