comp VCA-65

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Special Thanks

DIRECTION

Frédéric BRUN   Kevin MOLCARD

DEVELOPMENT

Nicolo COMIN	Simon CONAN	Florian MARIN	Vincent TRAVAGLINI
Corentin COMTE	Matthieu COUROUBLE	François REME	

DESIGN

Martin DUTASTA   Shaun ELWOOD   Morgan PERRIER

BETA TESTERS

Chuck CAPSIS	Neil HESTER	Paolo NEGRI	Bernd WALDSTADT
Marco CORREIA "Koshdukai"	Jay JANSSEN	William "Wheeliemix" ROBERTSON	Chuck ZWICKY
	Luca LEFEVRE		
Dwight DAVIES	Terry MARSDEN	Fernando M RODRIGUES	

MANUAL

Fernando M RODRIGUES (Author)	Minoru KOIKE	Charlotte METAIS	Holger STEINBRINK
	Vincent LE HEN	Jose RENDON	Jack VAN

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Thank you for purchasing Arturia's Comp VCA-65!

This manual covers the features and operation of the Comp VCA-65.

Be sure to register your software as soon as possible! When you purchased Comp VCA-65 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 Comp VCA-65 *

Since the late 1990s, Arturia has received acclaim from players and reviewers alike for designing state-of-the art software emulations of the venerable analog synthesizers from the 1960s to the 1980s. From the Modular V, back in 2004, to Origin, a modular system that was introduced in 2010, to the Matrix 12 V (2015), the Synclavier V (2016), and most recently the Buchla Easel V, the DX7 V and, last but not the least, Pigments, our first original software synthesizer, 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. The audio software was another field where Arturia already made its entrance, launching in 2018 the first Arturia effects bundle: 3 PreAmps You'll Actually Use, which included the 1973-Pre, the TridA-Pre, and the V76-Pre.

With the launching of a new effects bundle, Arturia consolidates its position as a leader in the audio software, as well as the audio hardware market.

The ARTURIA Comp VCA-65 is one of the three emulations included in the current bundle, and benefits of over a decade 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 the dbx Model 165A hardware and its electrical circuits. Not only have we faithfully modeled the sound and behavior of this unique compressor, we have added many features that were unimaginable in the days the Model 165A was being manufactured.

Comp VCA-65 runs as a plug-in in all major formats inside your DAW.

DISCLAIMER: All manufacturer and product names mentioned in this manual are trademarks of their respective owners, which are in no way associated or affiliated with Arturia. The trademarks of other manufacturers eventually mentioned were used solely to identify the products of those manufacturers whose features and sound were studied during Comp VCA-65 development. All names of equipment inventors and manufacturers have been included for illustrative and educational purposes only and do not suggest any affiliation or endorsement of Comp VCA-65 by any equipment inventor or manufacturer.

The Arturia team

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1. WELCOME

1.1. What is a compressor?

A compressor is an audio processing device that has been used by recording, mixing and broadcast engineers for many decades to reduce the dynamic range of signals. This device evens out ("compresses") the level differences between the loudest and quietest sections of a recording to avoid excessive peaks. By bringing down the loudest parts of a recording, compressors allow engineers to boost the entire processed signal without worrying about the loudest parts overloading a recording. The net result is a higher average loudness level in a recording.

There are many reasons to use a compressor. For example, it can be used to protect a recording (and our ears) from excessive peaks that can sound distorted and can potentially damage our speakers (or our hearing). Also, reducing the loudest parts of a recording can make for a far more pleasing listening experience. This is because listeners can turn up the music and hear the softer parts without fear of earache when the louder parts come. This is especially true in music with dynamic instruments that can produce sudden loud peaks like a drum kit or the human voice. Compressors can even be used creatively, to shape and contour sounds in pleasing ways. This flexibility is what makes compressors one of the most popular tools in a recording engineer's toolkit.

Main Compressor controls

1.2. What are the different types of compressors?

Historically, there have been several major categories of compressors, among them Tube, FET and VCA. Each of these has a different sonic signature due to the electronics used to create the compression effect. Arturia has chosen to emulate a top model from each of the above categories to make sure that users have all the sonic options at their fingertips.

VCA compressors are the most modern of the analog compressors. These compressors were also the first to introduce most of the controls we are now used to see on a compressor unit, like Threshold, Ratio, Attack and Release. Yet, one of the most important characteristics of the compressor emulated here is that its circuit included a true RMS level detection, instead of the peak detection that was usually seen until then. RMS detection works closer to the way the human hearing works.

The fact that VCA compressors rely on solid state or integrated circuits allows them to sound much more precise, transparent and faithful (although preserving an inherent slight coloration given by their circuits). Parameters usually perform exactly the way they are supposed to, which gives the user a higher degree of control.

1.3. Where are compressors commonly used?

Compressors are flexible studio tools and are used everyday to...

- Reduce overly dynamic audio sources to help them "sit" better in a mix.
- To raise the average loudness level of a recording so that the quiet parts are easier to hear.
- To "glue" a final stereo mix together and add cohesion to all the separate tracks.
- To sculpt the attack transients of percussive sounds to make them more (or less) "present" and "punchy".
- To lengthen the release time of percussive acoustic instruments (like piano or guitar) making them sound bigger.
- To even out the varying intensity of the individual drum hits or guitar chords. When pushed to extreme settings on guitars, this creates the famous "wall-of-sound" effect heard in rock music.
- To "limit" a signal and ensure that it never exceeds a set loudness limit.

VCA-65 set to act as a Limiter

1.4. Arturia's secret ingredient: TAE®

TAE® (True Analog Emulation) is Arturia's outstanding technology dedicated to the digital reproduction of analogue circuits used in vintage synthesizers.
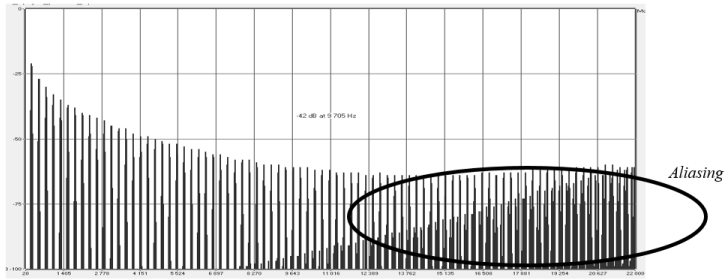
Linear Frequency spectrum of a well known software synthesizer

TAE®'s software algorithms result in spot-on emulation of analogue hardware. This is why 1973-Pre offers an unparalleled quality of sound, as do all of Arturia's virtual synthesizers and plug-ins.
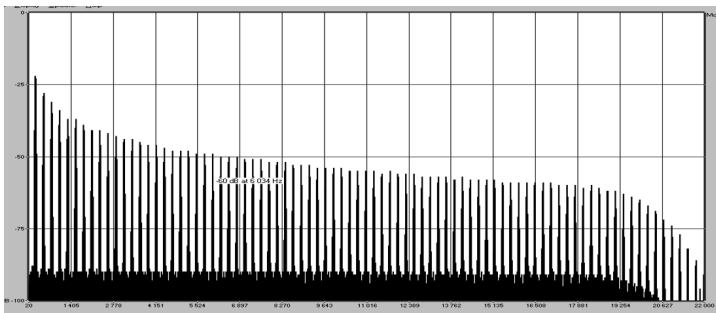
Linear frequency spectrum of an oscillator modeled with TAE®

1.5. Arturia's approach to Comp VCA-65

Our goal was to accurately model the sound of this famous vintage compressor unit, the successor to the first and most successful VCA compressor ever. Of course, being an Arturia product, it was not enough to simply model the vintage hardware and call it done. We wanted to push the envelope, so we also added some tasteful new features that honor the original while making it more useful in a modern context.

The unit emulated here was an evolution of that first VCA compressor. It's no surprise that it shared most of the characteristics that made its predecessor famous, while introducing some welcomed new features, like a soft compression curve, an Auto Mode which allows Attack and Release parameters to be dependent on the program material, and even a rough Peak Limiter.

The VCA compressor path can be manipulated by several controllers, each one changing a specific parameter.

Arturia Comp VCA-65

Comp VCA-65 features prominently the Threshold and Compression controls, as well as the Attack and Release controls. In the middle of these we have a button for Auto Attack/ Release, which makes them program dependent, as in the older compressors. We also have the Output Gain (where we compensate for volume loss due to compression), and the Limiter (a feature added in a later revision of the hardware, and also in the plug-in version by Arturia). This allows the Comp VCA-65 to act as a rough but yet useful limiter.

Finally, there is a "Mix" knob that wasn't found on the original hardware. This is an Arturia addition that allows to set a blend between the compressed and uncompressed sound, and opens up a lot of creative sound-sweetening possibilities.

Besides the classic features and small improvements mentioned above, Arturia also included several more substantial features. These appear in a separate "Advanced" panel that opens below the main panel. Here, you will find things like Advanced Side-Chain Control, a single-band EQ for the side-chain signal with High-Pass and Low-Pass filters, a Time Warp function, a Compression Range knob to limit the gain reduction, and a button that enables listening the side-chain signal alone. We will cover all of these in depth later in this guide.

Now, it's time to check how it sounds. Let's go!

2. ACTIVATION AND FIRST START

The Arturia Comp VCA-65 plug-in works on computers equipped with Windows 7 or later and macOS 10.10 or later. You can use the Comp VCA-65 as an Audio Unit, AAX, VST2 or VST3 plug-in (64-bit only).

2.1. Activate the Arturia Comp VCA-65 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: Arturia Updates & Manuals.

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

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!

3.1. Working with plug-ins

Comp VCA-65 comes in VST2, VST3, AU and AAX plug-in formats for use in all major digital audio workstations (DAW) including Live, Logic, Cubase, Pro Tools and others. Unlike a hardware compressor, you can load as many instances of Comp VCA-65 as you find useful. Comp VCA-65 has two other big advantages over hardware:

- You can automate many of Comp VCA-65 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.

3.2. When to use the Comp VCA-65

As we said already, VCA compressors are the most modern type of hardware compressors, and are based on a Voltage Control Amplifier. This kind of devices appear also in synthesizers, as well as in mixing consoles, where they perform different tasks, usually related to amplifying the signal.

The main reason to use a VCA compressor is its precision and transparency. It also gives the user much more control than its predecessors. Another difference happening in the case of the currently modeled compressor is that the analysis is done on the RMS signal (and not the peak signal, as it was usually the case before). RMS measure works much to the way the human earing works, meaning that very fast transients are not regarded as affecting the overall volume. Because of this, the level of compression is also much more stable, which allows a much more precise control of the audio results.

The VCA compressor path can be manipulated by several controllers, each one changing a specific parameter. It was with the VCA compressors that the controls we are now used to see in a compressor unit made their appearance. Usually, we have controllers for the Threshold (the volume level above which compression starts to be applied), Ratio (the amount of compression applied, which is expressed as a ratio In/Out), Attack and Release.

The Main VCA Compressor controls

The Comp VCA-65 exhibits another unique characteristic: It features a special soft compression curve. In fact, in the hardware it was modeled after, it was introduced a special kind of compression curve that led to a sweeter transition between compressed and uncompressed signal - which the manufacturer called "Over Easy Compression". This consists in a special soft compression curve that we nowadays call "soft knee", so we can classify it as a "soft knee" compressor. On modern compressors, we are used to define the knee, but that wasn't the case in yesteryears.

3.3. Advanced Mode

Comp VCA-65 has some advanced features that can be revealed by clicking the Advanced Mode button (the double arrow in the Upper Toolbar). This opens a second panel directly below the main panel where you will find things like Advanced Side Chain Control, Time Warp, a single band Equalizer (with additional High and Low-Pass Filters), a Compression Range control, and a Listen button. None of these features were available on the original hardware but we have included them here as we feel they are very useful for modern music makers.

Please note that, when the Advanced Mode parameters have been changed (have values different than the default ones) and that panel is closed, the double arrow button has a point next to it, indicating there are parameters edited in that panel.

We will take a detailed look at all of these things in the Control Panel chapter [p.13].

3.4. Understanding the Comp VCA-65 Signal Flow

To better understand what happens in Comp VCA-65 let's take a look at a signal as it flows through the product. The paths are a little more complex than what could be expected, due to the Advanced Mode features, especially those related to the Advanced Side-Chain Control. This allows for several special detection modes, many of them taking advantage of Mid/Side signal encoding.
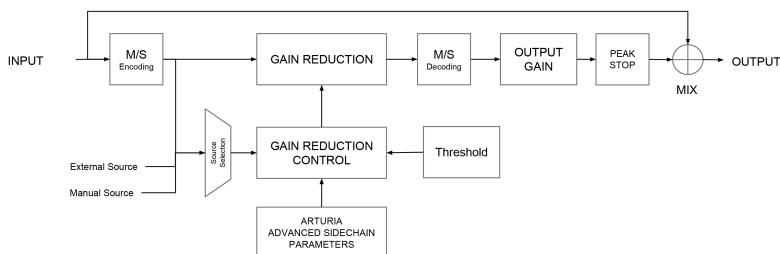
As the signal enters the plug-in, it is immediately split in two paths:

1. The "main" signal path. The signal on this path is compressed and processed.
2. The "bypass" path. The signal on this path is sent without any processing to a mixer just before the VCA-65's output. The "Mix" knob on the front panel allows to blend this unprocessed signal with the compressed signal.

If you are using Comp VCA-65 on a stereo track, the first stop on the main signal path is the optional M/S encoder. M/S stands for "Mid/Side" and is a way of processing audio where only the "Mid" channel (the center of the stereo image) or "Side" channel (the edges of the stereo field) is processed. This is described in detail later [p.26] in the manual. Note that the Detection Mode control knob is only available on stereo signals and is bypassed when using a mono version of the plug-in.

> ♪: M/S requires a stereo signal to work. If VCA-65 is instantiated on a mono track, M/S encoding and decoding stages are bypassed and the Detection Mode control knob is hidden in the advanced panel.

After this stage, the "main" signal is split again into two other parallel paths:

1. The first (main) path goes to the emulated VCA Gain Reduction circuitry. This is the heart of the circuit and where the actual compression takes place. This system is controlled by the Gain Reduction Control circuit, activated by the Threshold control.
2. The second path (known as the "detection" path) is sent through a source selector switch to the Gain Reduction Control circuitry. The source selector module receives the detection signal and also signals from External Source (traditional Side-Chain) and Manual Source, and routes them to the Gain Reduction Control circuit, which will be processed by the Advanced Side-Chain Parameters in order to determine how that circuit will work on the signal.

After compression, the next stage is the M/S decoding block. This is where the signal is converted from M/S back into a regular stereo signal.

Next step is the Output Gain. Here, make-up gain is applied to compensate for any reduction in volume that may have happened at the Gain Reduction stage. There is also a rough Limiter (Peak Stop) that prevents clipping.

Finally, the audio signal passes through the final Mix stage, where it can be mixed with the original (bypassed) audio, before sending everything to the plug-in output.

This is the complete signal flow of the Comp VCA-65. It may seem a bit overwhelming, but spend some time with it and we're sure you'll gain a deep understanding of how the compressor works.

3.5. Getting hands-on with Comp VCA-65

3.5.1. Compression Basics

To get an idea of Comp VCA-65's capabilities, we suggest you try the following:

- Load a stereo clip into an audio track in your DAW (drum or vocal tracks are ideal for this);
- Load an instance of Comp VCA-65 as an insert in that track. Open the Comp VCA-65 window;
- Ensure the Default preset is loaded. This will mean that all settings are positioned to provide a neutral sound;
- Begin playback. The clip should sound exactly as it was recorded. You can verify this by clicking the Bypass button in the lower Toolbar and comparing what you hear (they should sound the same);
- Now let's try some processing, just to check the main features of the Comp VCA-65. First of all, raise the Compression Value to Infinity;
- Click the Auto button between Attack and Release. This will put these two controls in auto mode, where they will respond at a variable rate according to the audio being processed;
- Start turning the Threshold knob to the left, to reduce the Threshold level. Do this until you see that in the Compression indicator lights above, the red "LED" starts turning On more or less frequently;
- Observe what happens on the VU meter: The needle starts to move backwards. This means that compression is now being applied to the peaks of your audio. You may check the amount of Gain Reduction quickly by turning the System Bypass switch On and Off. When it is On, compression circuit is bypassed, and you'll hear the original uncompressed audio;

Comp VCA-65 used in a drum track

- Now lower the Compression value until you hear results that are satisfactory to you. Usually, a compression ratio around 4:1 is enough for most uses, but some material may ask for more, and other may demand a more subtle ratio. Don't forget to check frequently how the uncompressed audio sounds, by clicking the System Bypass button;
- You can now try to set manually the Attack and Release values. To do that, turn the Auto button Off, and find a value that you find satisfactory. You can always turn Auto on again, to check if your manual settings sound as good, better or worse than the Auto settings;
- Once you achieved a good compressed sound, it's time to use the Output Gain, to compensate for the volume loss due to compression. Always check with System Bypass how the original audio sounds.
- Now use the Limiter, by turning it to the left. Increase Gain a little and compensate with the Limiter. Don't forget that results may vary, depending on what kind of audio you are trying this on (vocals, drums, guitar, piano, etc.).

3.5.2. More advanced compression methods

Now that you have a feeling for the Comp VCA-65 basics, let's continue on and go a little deeper.

- Click the double downward facing arrows to open the "Advanced" mode;
- Let's use the Advanced Side-Chain Control. We will not use an external signal, but will simply try out the different Detection Mode settings. By default, the control is positioned in the *Linked* position, but you may try other positions, while the track is playing. Notice how the sound changes, sometimes drastically, especially when you choose the different Mid/Side positions. This effect can produce some fantastic results when used on stereo tracks;

> ♪: Remember that the Detection Mode control knob is only visible when working in stereo. If you are not seeing that option, it is because you are working on a mono signal.

- Now click the Listen button and apply some EQ to the analysis signal using the controls in the Band Equalizer section. Don't be afraid of extreme settings here! For example, if the original audio has a strong bass component, the bass energy can have a major influence on the compressor as it works. By attenuating some of the bass, you may end up with a better compressed sound;
- When you are done adjusting the Side-Chain EQ, switch off the Listen button and try switching EQ on and off as the track plays. You should notice that the EQ may have a big influence in the way compression work, even though it is only being applied to the detection path of the signal.

4. COMP VCA-65 CONTROL PANEL

The Comp VCA-65 plug-in can be used in Mono or Stereo channels.

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.

4.1. Channel Configuration (Mono/Stereo)

The plug-in has different configurations for Mono and Stereo versions. The differences between the two versions consist in the presence of certain additional features in the stereo version, which are located in the Advanced Mode Control Panel. These are related with the Advanced Side-Chain Control section. When inserted in mono channels, the plug-in only shows the Source and Time Warp controls in that section (Mode Selection control knob is removed).

The Advanced Side-Chain Control section is where we control how the plug-in performs detection to trigger compression. In Mono mode we can simply select the Source, choosing between Internal, External and Manual, while in Stereo mode we have also a selector that changes how detection is performed and how it affects compression.

Comp VCA-65 inserted in a mono track. Notice the absence of the Detection Mode selection control

We will look deeper into this when we reach the Advanced Side-Chain Control [p.23] entry.

4.2. Main Control Panel

The Comp VCA-65 Graphical User Interface offers most of the controls we are used to in a modern compressor. Those are located in the Main Control Panel, which is the one that opens by default when we launch the plug-in.

Besides these, Arturia included several advanced features, not present in the original unit, and some even unimaginable when it was launched. These new features are located in a second panel, the Advanced Mode Control Panel, that opens when we click the double arrow button (the Advanced Mode button) in the Upper Toolbar.

As was the case with the first effects bundle, this Arturia plug-in bundle also has an Upper Toolbar and a Lower Toolbar. The Lower Toolbar is very important for the use of the Compressors, as it displays the parameter name and current value when we point the mouse to a parameter control, allows to calibrate the VU Meter, allows to put the plug-in in Bypass (we also have a bypass control in the Main Control Panel but it works in a different way), and measures CPU consumption.

Of course, the Upper Toolbar is very important as well, since it is where we access the main menus, perform several important tasks, like load and save 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 the User Interface chapter [p.29].

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.

Comp VCA-65 Main Control Panel

Beware that each time we click a control (knob or button), the Lower Toolbar displays the parameter name and 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.

We may also have tips displayed (if the light bulb in the Upper Toolbar is lit). In this case, the Lower Toolbar also displays a short description of each parameter next to its value, and there is an area highlighted in the VU Meter that suggests the ideal range of gain reduction the original preset should be used on to achieve the best results.

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

4.2.1. Threshold

The Threshold is one of the most important controls in a Compressor. This is where we define the level around which the Compressor section starts to reduce the Gain. The behavior of the Threshold depends a lot on the knee (also known as Compressor Curve) used. Modern Compressors many times present a definable knee, but that wasn't the case in the old units modeled by Arturia, where usually the knee was a built-in characteristic, and very dependent on the type of compressor.

In the case of the Comp VCA-65, since it models the old dbx Model 165A, it features the same Compressor Curve (knee) of that unit, which was a very soft one, originating the name "Over Easy Compressor" given by the manufacturer. This means that the unit starts compressing way below the Threshold, but in a very subtle way, increasing the Compressor Ratio gradually, and reaching the maximum level of compression way after the Threshold.

This allows for a very subtle and musical compression, but requires a good understanding of this characteristic to better use it.

The way this parameter works is always influenced by the "compressor knee" or "compressor curve" in use.

Comp VCA-65 Threshold control defined to start at -3 dB

The Threshold may be put as low as -40 dB (meaning almost any audio will be compressed) all the way up to +20 dB (which will mean basically no compression). A good range usually varies from -10 dB to 0 dB, but it depends much on the kind of material we are compressing. Ideally, the threshold should be just above the average signal level. By default, the Threshold is positioned at +20 dB, which we can consider a "neutral" position.

Another important aspect is how detection works. In Comp VCA-65, detection works using RMS (Root Mean Squared) mode. When using this kind of detection, the Threshold responds to sharp transients in much the same way as the human hear, meaning loud but short transients aren't perceived as being as high volume as more prolonged sounds at exactly the same level. This allows to achieve a more natural behavior during compression.

> ♪: To better find the right Threshold, put the control at the highest value possible, define a very short attack and release time, set the Compressor control to a very high compression ratio, and then start lowering the Threshold until you hear it starting to kick in during louder passages. Then start reducing the compression ratio to a more sensible value, and increasing the start and release times.

When the level detected is above the defined Threshold value, the Above "LED" (red light) in the upper part of the Control Panel is On (Compression is active). When the level is below the Threshold, the Below "LED" (green light) is On (Compression is inactive). In the transition, the middle "LED" will momentarily turn On.

4.2.2. Compression

Together with Threshold, and complemented with Attack and Release, this is where we mainly act to find the best settings for the compressor.

This is the parameter which defines how much compression (level and dynamic reduction) is applied to the audio when the detected level exceeds the Threshold. Like it happens with Threshold, the way this parameter acts is also influenced by the "compressor knee". With a hard knee of 100%, basically all frequencies above the Threshold will be compressed the same way. As we saw, that's not the case in the Comp VCA-65, which features a very gentle knee. Therefore, the compression effect appears gradually, starting still below the defined Threshold, and the maximum compression effect is only reached way beyond that same Threshold level.

Compression level is expressed as a ratio. The right value is the compressed level, while the left value is the original. When we see a compression ratio of 4:1, it means that an original value of +12 dB will become reduced to just +3 dB, after compression is applied.

A gentle value is desirable (no more than 4:1 and usually even less). This also depends on the type of music, the instrument and the results that we want to achieve. Some drum instruments commonly use higher compression ratios, for example.

Comp VCA-65
Compression control set
to a ratio of 2:1

Usually, it is better to start with a very small compressor ratio, and raise it when you feel the need to do so. Remember that Attack and Release times are also important to take into account. As the compression curve in Comp VCA-65 is very gentle, this means it starts below and reaches the maximum compression way above the Threshold.

Compression range goes from 1 (1:1, meaning no compression) up to Infinite (where the compressor will act in practice as a limiter, if we define a very fast attack). Values over 10:1 are used only in extreme cases. By default, Compression is positioned at 1, which means no compression.

The tip we gave for the Threshold is a good way to start trying the Compression parameter, as it allows to define with reasonable precision the average signal level, and we can start from there to achieve a good compression ratio.

4.2.3. Attack

The Attack time is a very important control in a compressor. It is with this parameter that we define how much time the compression takes to happen when the threshold value is reached. Manipulating this parameter can completely change the character of a sound. Very fast attack times cause the compressor to squash the signal. On the other hand, very long attack times will let almost all transients to pass through, which, in the worst case scenario, can deceive completely the goal we wanted to achieve by using compression in the first place.

So, we have to define the Attack time according to the type of audio we are dealing with. Vocals don't deal with attack transients we usually want to preserve, therefore the attack time there may be shorter. On complete drum tracks, where we want to achieve the "pumping" effect, the attack time may also be positioned at a very short value (in this case with a higher compression ratio).

As a rule of thumb, observe this: Slow attacks and high ratios can reduce the sound of unwanted transients, like a guitar pick, and at the same time will allow the decaying tale to last longer. Fast attacks and lower ratios are good to allow a better overall volume, without destroying the sound character.

To use the Comp VCA-65 as a limiter, we would use a Threshold with a value near 0 dB, with the Compression Value set to Infinite, and the Attack time set to the minimum (very fast).

Attack times in the Comp VCA-65 are expressed as rates. Very fast attack times have a high rate (minimum is 400 dB/ms), while slow attack times have a low rate (1 dB/ms).

By default, the Attack time is positioned at the middle position (40 dB/ms).

4.2.4. Release

The Release parameter may be considered as the inseparable partner of the Attack. As the first controls the time it takes for compression to start when Threshold is reached, the second tells the Compressor how much it should take to bring the signal back to the original value after the Threshold level is no longer reached.

As we can see, all these parameters are linked to each other. Attack and Release act like segments of an envelope, which is triggered by Threshold, and which sustain level is defined by the Compression Ratio. In this case, the envelope is inverted, which means the sustain level is lower than the original level.

Since it is a time parameter, it can be very fast, or very slow (just like Attack). The effect the release may have varies, depending on the type of audio we are dealing with (again, like what happens with the Attack parameter). Usually, release times are slower than attack times, to avoid sudden changes in dynamics, since these would be more audible in this segment.

Very much what we said for the Attack can be applied to the Release. Remember this is an envelope. Think in terms of the original sound and what results you want to achieve, then draw the envelope contour accordingly.

Release times in the Comp VCA-65 are also also expressed as rates. Just like with the Attack parameter, fast release times have a high rate (minimum is 400 dB/ms), while slow release times have a low rate (1 dB/ms).

By default, the Release time is positioned at the middle position (400 dB/ms).

Attack and Release control knobs. In the middle, we can see the Auto button turned On

4.2.5. Auto

The original hardware model had a nice feature that Arturia reproduced in this emulation: Auto Attack/Release. As was very much implied on what we wrote previously, there is no "right" way to set the Attack and Release controls.

When the Auto switch is On (Auto Mode), the Auto Att/Rel "LED" will be On (green light), and the unit will automatically adjust its Attack and Release.

This is program dependent, which means it varies according to the audio. For special effects and certain signal situations, it is often desirable to set fixed attack and release rates. That's what Manual mode is for. But for vocals and acoustic instruments, Auto Mode may be handy. It may also be a good starting point when defining manual Attack and Release rates.

Since in Auto Mode the unit has a variable attack rate, and since it is coupled with RMS detection, it may achieve a smoother compression than manual mode in certain circumstances, especially in what concerns vocals.

4.2.6. Output Gain

This control is also often called Make-Up Gain, especially in modern units. Because, by nature, compressors reduce the overall volume level, we need to raise the final output volume, in order to compensate for that reduction.

Range goes from -20 dB to +20 dB. By default, the Output Gain is set to 0 dB.

4.2.7. Limiter

This is a new feature introduced in a later revision of the original hardware model. It is a rough but effective limiter intended to control the maximum peak levels at the output of the unit without messing with any other control.

When used, the Limiter can prevent the Compressor to distort, allowing for more extreme settings. Every time the Limiter is activated, the red "LED" light next to it will turn on.

By default, the control is positioned at the maximum position, which is +24 dB. This is the maximum level achieved by the compressor, so, it means the Limit will never be activated.

Range goes from -2 dB up to the mentioned +24 dB.

4.2.8. Mix

A technique often used in production is what's called Parallel Compression. This is useful to allow compression of the audio signal while also preserving intact all the transient characteristics of the audio. The basic concept is having a way to preserve the original audio, while also processing it through compression. For this, we need to have a channel that "passes the audio through". while on another channel we have the audio sent to the compression path.

This is what can be achieved with the Mix parameter, an add-on introduced by Arturia in all the units of the Compressor Bundle.

The Mix knob is set by default to Comp, which means the processed signal only. We can turn it all the way down to Dry (fully uncompressed, original audio) or anything in between. Values are displayed in percentage, where 100% is fully processed signal, and 0% is fully unprocessed audio.

4.2.9. VU Meter

The VU Meter is very important to give us visual references. It doesn't replace our ears, but certainly gives them some help. In the original, the meter already have several modes.

In the Compressor collection, Arturia improved the Meters by allowing the user to choose to monitor the Input Level, the Output Level or the Gain Change (Reduction) Level. By default, they are set to Gain Change. Besides this, we also have the possibility to calibrate the VU Meter sensitivity using the tool in the Lower Toolbar. We have three options: -18 dB, -14 dB, and -8 dB. By default, the selected sensitivity is -18 dB. This means that Meter will display 0 VU when it is fed with a peak level of -18 dBFS.


Comp VCA-65 Meter, showing the Gain Change

When in Gain Change Mode (the default mode) the Meter is calibrated so it shows 0 dB as rest position (no Gain Reduction). This reproduces the behavior of the hardware unit.

Since the VU Meter only measures one channel, Left channel is selected by default (indicated by the L letter in the lower left corner of the Meter). If we change the Detection Mode to one of the Mid/Side modes, the measured channel changes automatically to Middle (the letter in the lower left corner changes to an M).

If we click over that letter, we can change the selected channel to the Right channel (if Detection Mode is in one of the Left/Right modes), or to Side channel (if Detection Mode is in one of the Mid/Side modes).
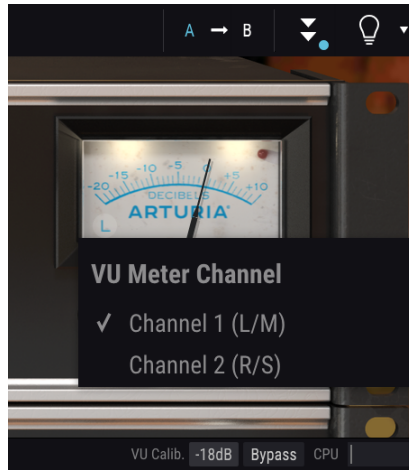
Comp VCA-65 VU Meter, showing channel selector. In the bottom, we can see the Lower Toolbar, where we can adjust the meter sensitivity.

Another handy functionality built in the VU Meter by Arturia is a clipping warning indicator. This is a small red "LED" light positioned in the top right corner of the Meter. Every time audio reaches clipping, the "LED" lights on with a bright red color.

4.2.10. System Bypass

This button makes the audio bypass the compression circuit. We can still monitor it visually through the VU Meter. This is useful to quickly turn Off compression while listening to audio, this way comparing audibly and visually both signals.

It differs from the button in the Lower Toolbar in the way that one turns Off the plug-in completely (the GUI changes color, becoming darker). The System Bypass button only turns Off (bypasses) the compression circuit, but the plug-in remains active.

4.3. Advanced Mode Control Panel

The Advanced Mode Control Panel is accessed by clicking the Advanced Mode (double arrow) button in the Upper Toolbar. This extra Control Panel is common to all three Compressors, and with very similar features. These are very important add-ons, that bring a lot of extra power and flexibility to the Compressors.

Comp VCA-65 Advanced Mode Control Panel

4.3.1. Advanced Side-Chain Control

Side-Chain is the signal used to control the compression applied to the audio. It can be that very same audio (most of the time it's what happens), but it can also be an external signal, coming from another track.

This external signal is what is usually meant when we commonly talk about side-chain. This may be used to achieve control of separated instruments (for example balancing the mix between the kick drum and the bass), or to achieve (another) special effect called "pumping".

For this, we need to be able to feed an external signal into the signal path (usually another mix track), to be used as source by the detection path, and this way be able to trigger compression.

In Comp VCA-65, we have both Internal and External sources, and even a third alternative (Manual). This is controlled in a section of the Advanced Mode Control Panel called Advanced Side-Chain Control.

4.3.1.1. Source

This is the first part, where we select what source will be used to feed the Threshold and trigger the Compression circuit. As default, Internal is selected. This is the usual way, where it's the signal to be compressed that is going to be analyzed and will trigger Compression when it goes over the Threshold.

External is the second option. In this option, an external signal is fed into the detection circuit. This is the usual external Side-Chain signal. When this button is pressed, the external signal is the one used for detection.

Manual is a third mode, which is exclusive to Comp VCA-65 (not present in the other two Compressors). When this button is lit, and each time we press the Manual square button, it sends a full scale detection signal (a sine wave) to the detection circuit, this way triggering compression. Manual can also be triggered through MIDI or data recorded in the DAW.

Since this is done manually, that's the reason this mode is called Manual. To better control the amount of compression, this full scale level may be attenuated using the Compression Range control at the right of the panel.

By default, the Compression Range control is at Full position, which means that each time we press Manual the max level of gain reduction (as defined by the compression ratio) will be reached. By lower that value, we can limit the gain reduction to a lower amount.

4.3.1.2. Detection Mode

The Detection Mode selection control appears only when the plug-in is inserted in a stereo track/bus. When inserted in mono tracks, Comp VCA-65 doesn't show these controls (since they cannot operate with mono signals).

This is where things start to really become "advanced" in the Advanced Side-Chain section. When we described the Signal Flow [p.9] of the unit, we mentioned that the first operation performed is encoding the audio signal in Mid/Side mode. This would seem strange, considering that none of the standard controls in the Comp VCA-65 was ready to use a M/S signal.

Well, here lies the reason for that Mid/Side encoding, and where we can take advantage of it. Mid/Side mode [p.26] is a special audio encoding mode where the Mid channel is the center of a stereo image, while the Side channel is the edges of that same image.

In this advanced Detection Mode we have three options for Stereo (Left/Right) mode, and four other options for Mid/Side mode - now you can see why this is really "advanced". For Stereo (Left/Right) we have Linked, Dual, and Reversed options. For Mid/Side, we have Side to Mid, Mid to Side, Side Only, and Mid Only options.

Comp VCA-65 Advanced Side-Chain Control Section (as it appears in stereo tracks)

The default option is Linked (Left/Right mode). This works with the Stereo Left/Right signal, and detection is performed using the max level between both channels, applying the same compression to both channels. This is the standard way and how a compressor should be used when dealing with stereo signals.

Next option is Dual. In this option, the Stereo signal is treated as dual mono channels. Detection is performed independently in Left and Right channels and compression is applied accordingly to each channel also. This may be good to balance the volume between the two channels, when they are very different, but may affect perceived channel separation.

Reversed. Again, both channels are treated independently (dual mono) for detection and compression. However, this time compression is applied to the channel opposite to the one where detection is performed. Therefore, Left channel detection will trigger Right channel compression and vice-versa. Again, this may be useful to balance the mix between two channels which are very different, but this time allowing panned elements to "answer" to each other.

Mid/Side mode has four options. Mid Only is the first one. Detection and compression will be performed only on the Mid Channel. This may be useful to increase the width and presence of sided elements, like the room ambiance of drum overhead tracks (because the side elements will be left alone).

Side Only is the next option. In this one, only the Side Channel is used for detection and compression. This will have the opposite effect of the previous option, increasing the presence of the centered elements of the mix (making it more mono compatible).

Side > Mid is similar to the Reversed option in Stereo mode. Here, the Side Channel is used for detection and the Mid Channel will be compressed accordingly.

Mid > Side is a variation of the above, this time using the Mid Channel for detection, and compressing the Side Channel.

> ♪: Advanced Detection Mode needs two channels. Therefore, this control is absent (it doesn't exist) when the plug-in is instantiated in Mono tracks.

4.3.1.3. Mid/Side Mode

Mid/Side mode is a highly effective way of making adjustments to the spacialization of a mix or master. This is done by analyzing phase coherence between left and right channels and letting the processor work only on the "middle" or "edges" of a stereo field, instead of the entire f field.

In Mid/Side, the Mid channel is the center of the stereo image, while the Side channel is the edges of that same image.

When we make adjustments in the Mid channel, this is perceived in the centered image of the stereo spectrum (we can think of it as the mono compatible image). For example, a boost in the Mid channel will make the sound more "mono" (both channels will sound more equal).

On the other hand, when we make adjustments in the Side channel, this will have an impact on the width of the stereo image, and a boost in this channel will be perceived as a more spacious (wider) stereo sound.

4.3.1.4. Time Warp

This is where we can set the much talked "look-ahead" mode of detection, by applying negative values (Snap).

We can also perform the exact opposite effect, and delay the detection by applying positive values (Loose). This may allow some faster attack transients to "escape" detection, and sound unaffected by compression.

By default, this control is positioned at 0, which means it will have no effect on detection. Snap time (look-ahead) may go up to 5 milliseconds (-5.00) while Loose time may go up to 10 milliseconds (10.00).

4.3.2. Side-Chain Equalizer

Modern compressors offer the possibility to sculpt the sound by manipulating some frequencies (boost/cut high frequencies, for example) prior to detection, This way, we can avoid some compression artifacts these frequencies could cause.

To do this, we need to route the sound through an EQ before it enters the detection circuit. This is why the EQ is positioned first in the detection path, right after the sound splits between main signal and detection signal.

The EQ included in these compressors is a very simple EQ (semi-parametric), with a single band featuring adjustable Gain and Frequency, complemented with a Low-Pass Filter and a High-Pass Filter. This is exactly what's needed for the intended role.

The Comp VCA-65 Equalizer

The High Pass Filter has a fixed slope of -12dB/Octave, and a selectable continuous frequency ranging from 20 Hz to 1.2 kHz. By default it is Off (the knob has an extra position at the far left that turns the filter Off).

The Low Pass Filter has also a fixed slope of -12dB/Octave, and a selectable continuous frequency ranging from 3 kHz to 20 kHz); By default it is also Off (the knob has an extra position at the far right that turns the filter Off).

The EQ band has two controls: one for the Frequency and another for the Gain (frequency range is fixed). Frequency control goes from 30 Hz to 16 kHz, and defaults to around 700 Hz. Gain goes from -12 dB to +12 dB, and defaults to 0. The bandwidth is variable, and dependent on the gain applied - the more gain is applied, the narrower will become the bandwidth.

The entire EQ section can be turned On or Off by clicking the button switch bellow the main controls. When the EQ is turned On, the the green "LED" light next to the button switch will turn On. By default, the EQ section is turned Off.

> ♪: If you set the EQ to frequencies in the region between 4 kHz and 8 kHz, you can make the unit act like a de-esser.

4.3.3. Compression Range

This control works in conjunction with the Compression Ratio.

What it does is limiting the amount of gain reduction applied, acting in practice as a Gain Reduction Limiter. The higher the value, the less gain reduction. At O dB the Compression Ratio is 1:1 (no compression).

By default, it is positioned at -100 dB (full compression). The value can be increased by any value up to O dB.

Comp VCA-65 Full Compression Range and Listen controls

4.3.4. Listen

This button enables listening to the Side-Chain signal. It is a good way to listen to the effect induced when we apply some EQ to the detection signal, and to determine how Compression will be applied when some frequencies are boosted or cut due to equalization of the detection signal.

5. USER INTERFACE

The Comp VCA-65 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 look at the control panels. Now, it's time to look at the toolbars.
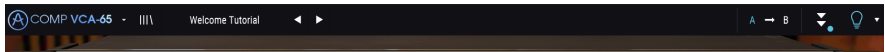
5.1. The Upper Toolbar

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.

Then, we have the right part of the toolbar, which presents a very important new feature - an A/B button.

After this, we have the button that gives access to the Advanced Mode control panel (a double arrow). This double arrow button is added with a point next to it every time the Advanced Mode is in action (when there are parameters set to values different than the default ones) and that panel is not visible.

The Advanced Mode panel is common to all three compressors, and features important add-on features that greatly expand the functionality found on the original units.

Next, we have another very important button, one that was introduced in Pigments. It's the Sound Design Tips button. It has the form of a light bulb, and when selected it displays tips built in the presets by their creators to guide the user in the manipulation of the different parameters.

The Upper Toolbar

As we saw, this upper toolbar, which is common to all current Arturia plug-ins, gives access to many important functions.

These options can be found by clicking on the Arturia Comp VCA-65 button at the top left-hand corner of the plug-in window. Since these options are also common to all current Arturia current plug-ins, they may be already familiar to you:

5.1.1. Save

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 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 respective place. This information can be read by the preset browser and is useful for searching the preset later.
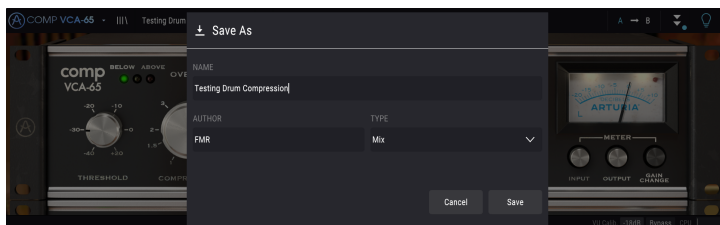
5.1.3. Import...

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 **.65ax** 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 sounds from the instrument, which is useful for backing up or sharing presets.

### 5.1.5. Resize Window options

The Comp VCA-65 window can be resized from 60% 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. Preset Selection

The Preset browser [p.35] 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 a *v*. Then, you just need to place the mouse over the name of the preset you want to select (that 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.
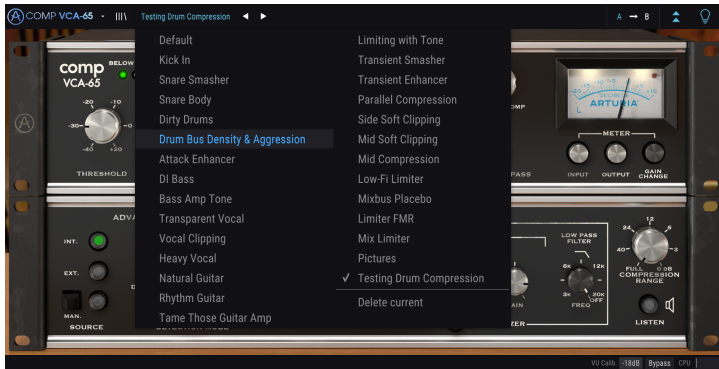
5.2. A/B Button

The A/B button is a new feature introduced with the current version of Arturia plug-ins. This button allows to compare between two distinct snapshots of the current preset, like for example the currently edited version, with all the changes you made, and the stored version. The snapshot in use is the highlighted one. This is great to perform some changes in a preset, and check if those really match what you want and are an improvement when compared to the original settings.

All presets may have a snapshot A and a snapshot B (these can be a completely different settings configuration, a variation of the main preset, an edited preset or just the current state of the plug-in). You can copy the settings of the A snapshot into B and vice-versa. When a preset is loaded, the settings are the same for both A and B snapshot. Therefore, if you start editing the preset when in snapshot A, snapshot B will preserve the original settings until you save the changes. This way both the original preset and the edited version can always be recalled for comparison.

♪: If you want to copy the settings on A to B or vice-versa, select the snapshot you want to copy from (the source) and click over the arrow. This will make the settings of that snapshot to be copied over the other snapshot. Notice that the arrow is always pointing from the currently selected snapshot to the other one: **Source -> Destination**

Another interesting and very handy feature of the A/B button is the possibility to have two presets loaded simultaneously, and compare between them. When you load a preset having this button for example in position A, the preset loads in position A (position B assumes the same settings). However, if you change to position B and load another preset, this will not overwrite the settings in position A, which will keep the previous loaded settings. You can then change between position A and position B and compare both settings.

When you save a preset only the settings for the currently selected snapshot are stored. Therefore, if you save the preset with the B snapshot selected, the settings of the B snapshot are the ones saved. If you save the preset with the A snapshot selected, the settings of that snapshot are the ones stored in the preset.

The same way, when you edit settings for the currently loaded instance of the plug-in, and you save the project in your DAW, next time you load that project, both A and B snapshots will have the same settings, reflecting the saved state of the plug-in.

♪: If you want to save both snapshots of a preset, you will need to save two presets. To do this, select snapshot A, and in the Arturia sub-menu choose "Save As..." and save the Preset, giving it a name. Then select snapshot B and do the same thing, giving it a different name.

5.3. Advanced Mode (Double Arrow) Button

This button opens the Advanced Mode control panel. This is where are located the controls for the extra features added by Arturia, to expand the possibilities found on the original units. This extra control panel is common to all three compressors.

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 default ones), and that panel is not visible (is closed), the double arrow button (pointing down) has a dot next to it, to call user's attention to those parameters. To check them, click the button to open the Advanced Mode control panel.

As it happens with the Main Control Panel, you have a detailed explanation of all the features in this Advanced Mode control panel in the Control Panel chapter [p.13].

5.4. Sound Design Tips

Pigments was Arturia's first plug-in to offer this feature, and we dare to say it will revolutionize the way users look at presets.

The Sound Design Tips feature identifies parameters the preset creator defined as the most relevant while developing the selected preset, and which are the best for the user to edit. When On, a brief explanation of each parameter (tip) will also be displayed in the left-hand side of the lower toolbar.

Select any Factory preset and position the cursor over the light bulb in the upper toolbar, right after the Advanced Mode button. This is the Sound Design Tips button. It will darken the User Interface, leaving lighted the selected parameters.

Each Factory preset has defined a preferred parameter, and the corresponding Meter range. The preferred parameter is the one that should be set first when adjusting the selected preset for optimum results. The Meter range is an indicator of the kind of gain reduction the preset was programmed for.

If you click the little arrow at the right of the button, you will access a menu that has an "(Advanced) Edit Tips" option. Selecting that option will allow you to mark your own preferred controllers. Each marked controller will show a small "light bulb" when that option is selected, and a "cogwheel" appears next to the Sound Tips button.

5.5. The Lower Toolbar

When you are changing a parameter, you will see a readout showing the value or state of whatever control you are modifying at the left-hand side of the lower toolbar. It will also display the current value of a parameter when you place the mouse pointer over that parameter control in the control panel. This is handy, because you don't need to touch the parameter control to read the current value.

Finally, when the Sound Design Tips button is On, you will see an additional brief explanation about the selected parameter.

The Lower Toolbar

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 at them:

5.5.1. VU Calib.

The Comp Tube-STA has one VU meter at the top-right of the control panel. By clicking the value at the right of the "VU Calib." label, you can access a menu where you can calibrate its response. By default, it is calibrated for -18dBu but you can change this to -14dBu or -8dBu.

5.5.2. Bypass

This one is obvious. Activating the bypass option will completely disable Comp VCA-65 plug-in.

5.5.3. 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.

5.6. The Preset browser

The preset browser enables you to search, load and manage preset configurations in Comp VCA-65. 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.
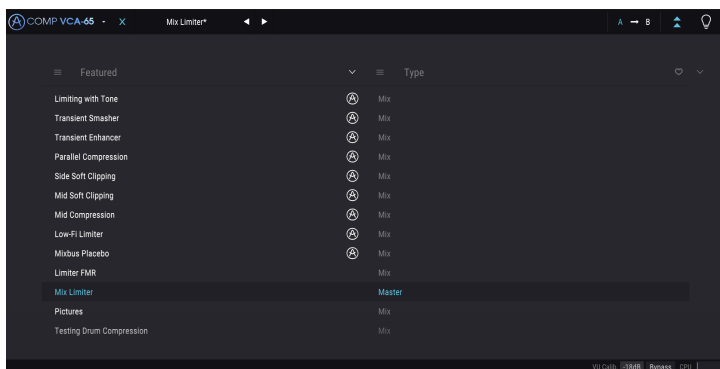
When you click on the library symbol, you will see a screen with all the Presets you have saved. You can sort the list by several different criteria, to make it easier to find the right preset. There are two columns. The first one lists the Presets by Name or by "Featured". Featured are presets that were classified as important by Arturia. The second one lists the Presets by Type, Designer, or Bank.

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 appears in the second column, in the place where the Type field was before.

If you want to delete a preset, you may do that by selecting it, and then, by clicking in the name field, choose the option "Delete current" that's in the bottom of the list.
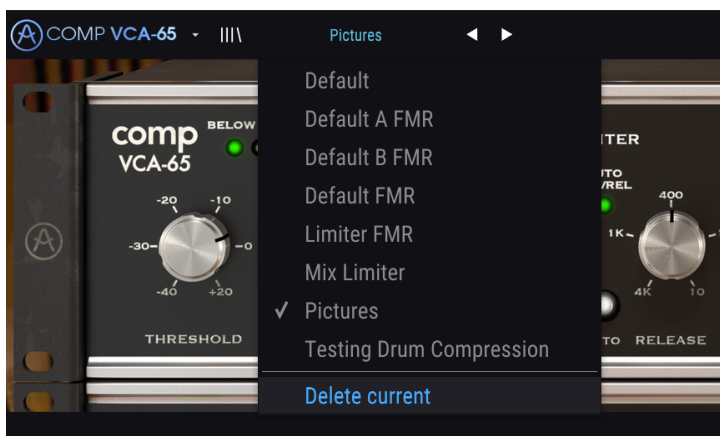
Preparing to delete a Preset from the Comp VCA-65 library

5.7. Some Final Words

Some final words to mention something very important. Usually, to change values in the plug-in controls, we click on the corresponding control and drag the mouse up or down. If the controls are switches, we simply click them to toggle On or Off. If we want finer editing values, we can use Ctrl+Drag (Cmd+Drag on macOS). Alternatively, we can mouse Right-Click and Drag. Using this key combination, the values change in a slower way, which allow us to get more precise values easily.

Double-clicking a control changes it automatically to the default value. This also works with Alt+Click (Opt+Click on macOS).

And that's it. We just finished describing all the controls you have at your disposal to process sound in your DAW using the Comp VCA-65 plug-in. We hope you'll enjoy your new plug-in and the results you get when using it, as much as we enjoyed making it.

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