COMP FET-76

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Special Thanks

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Thank you for purchasing Arturia's Comp FET-76!

This manual covers the features and operation of the Comp FET-76.

Be sure to register your software as soon as possible! When you purchased Comp FET-76 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 FET-76

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 FET-76 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 most famous FET compressor unit that ever existed, the Urei 1176, carefully reproducing the behavior of 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 that unit first launched.

Comp FET-76 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 FET-76 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 FET-76 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, a compressor 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 of the FET-76

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.

The Comp FET-76 is modeled after one of the most famous "FET" compressors ever produced. FET stands for "Field Effect Transistor" and while its theory of operation is beyond the scope of this guide, the key takeaway is that this technology is capable of handling *really* fast attack times. It can also induce some "color" and distortion to the sound that many engineers find very pleasing. This makes it an ideal tool for sculpting instruments with fast attack transients like drums, guitars and vocals.

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.

FET-76 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.
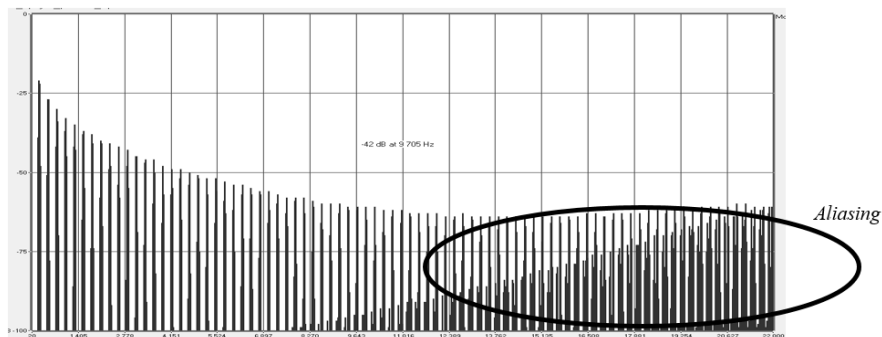
Linear Frequency spectrum of a well known software synthesizer

TAE®'s software algorithms result in spot-on emulation of analogue hardware. This is why Comp FET-76 offers unparalleled sound quality, as do all of Arturia's virtual synthesizers and plug-ins.
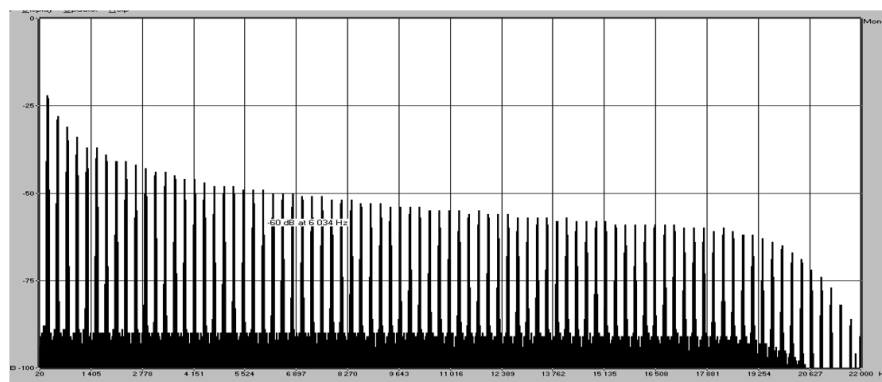
Linear frequency spectrum of an oscillator modeled with TAE®

1.5. Arturia's approach to Comp FET-76

Our goal was to accurately model the sound of the most famous FET compressor in the world, commonly known as the "1176." 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 hardware while making it more useful in a modern context.

The 1176 was meant to be a "true peak limiter" with a very fast attack (up to 20 microseconds) and lots of makeup gain after the compression (up to 45 dB). We have captured this in all of its detail and we hope you will hear the subtle nuances of the original hardware coming through our plug-in.

Arturia Comp FET-76

The original hardware was famous for having a small number of controls and we have maintained that simplicity and look in our plug-in. We have large knobs for setting Input and Output level, small knobs for setting Attack and Release times and a column of buttons to set the compression ratio (including a dedicated button for the famous "all buttons in" trick that resulted in a hyper-compressed output). Like the original hardware, Comp FET-76 has a large VU meter with various metering modes to help you see what is going on with your signal.

Finally, there is a large "mix" knob that was not 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 has 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 with High Pass and Low Pass filters, a Time Warp function, a Compression Range knob and a button that enables listening the side chain signal. We will cover all this 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 FET-76 plug-in works on computers equipped with Windows 7 or later and macOS 10.10 or later. You can use the Comp FET-76 as an Audio Unit, AAX, VST2 or VST3 plug-in (64-bit only).

2.1. Activate the Arturia Comp FET-76 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. COMP FET-76 OVERVIEW

3.1. Working with plug-ins

Comp FET-76 comes in VST2, VST3, AU and AAX plug-in formats for use in all major digital audio workstations (DAW) including Ableton Live, Logic, Cubase, Pro Tools and others. Unlike a hardware compressor, you can load as many instances of Comp FET-76 as you find useful. Comp FET-76 has two other big advantages over hardware:

- You can automate many of Comp FET-76 parameters using your DAW's automation system.
- Your settings will be saved with your project so you can pick up exactly where you left off the next time you open a session.

3.2. When to use the Comp FET-76

The key takeaway for Comp FET-76 is that it is **big** and **bold**. While it is possible to make this compressor to sound very transparent and clear, this is usually not how it is used in practice. For decades, engineers have pushed the original hardware aggressively to add life and excitement to a track and we believe that this is where it really shines.

The Main FET-76 Compressor Controls

One of the most important characteristics of FET compressors is that they are capable of handling really fast attack times while simultaneously adding pleasing "color" to the sound. Just like the original hardware, Comp FET-76 sends incoming signals through an Input amplifier that immediately adds a big—and usually very positive—impact on the "color" of the sound. From there, the signal is routed to the FET that does the actual compression. The blazing fast attack time (down to 20 microseconds, or 0.2 milliseconds) and powerful Class A amplifier (capable of adding 45 dB of make-up gain to a signal) really give engineers a wide latitude to push, pull and mold signals in extreme and exciting ways.

When pushed hard, distortion levels can increase adding even more excitement to grungy electric guitars and bass. This combined with higher compression ratios can result in a popular "squeezed" or "smashed" sound that is very popular when used on drum overhead or drum room microphones. Hard compression on vocals adds a bright and "in-your-face" presence that has been popular in rock music for decades.

3.3. Advanced Mode

Comp FET-76 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 (are set at values different than the default ones) and that panel is closed, the double arrow button has a point next to it, indicating that those parameters are "active".

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

3.4. Understanding the Comp FET-76 Signal Flow

The Comp FET-76 is what's called a "feedback compressor". This means that the detection signal comes already from the Gain Reduction circuit. The signal flow is 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, some of them taking advantage of Mid/Side signal encoding.
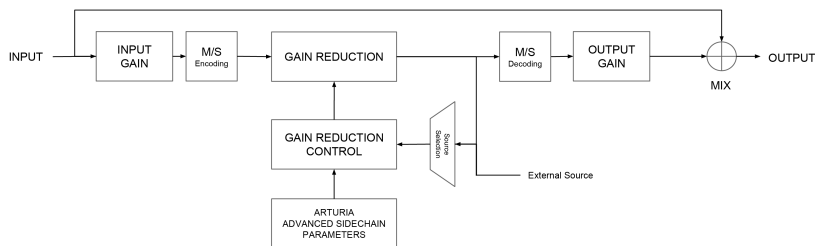
Comp FET-76 Signal Flow

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 FET-76's output. The "Mix" knob on the front panel lets you blend this unprocessed signal with the compressed signal.

If you are using Comp FET-76 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 FET-76 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 signal is routed on to the emulated FET gain reduction circuitry. This is the heart of the circuit and where the actual compression takes place. This is controlled by the Gain Reduction Control circuit.

If you are working with a stereo signal, the next stage is the M/S decoding block.

After passing through the Gain Reduction circuit, the signal is split into two more paths:

1. The main path goes on to the M/S decoding block. This is where your signal is converted back into a regular stereo signal.
2. The second path (known as the "feedback" path) is sent back through a Source Selector switch to the Gain Reduction Control circuitry. The Source Selector also receives the external side-chain signal.

The Gain Reduction Control module receives the detection signal (selected from the internal feedback or the external side-chain signal) and also signals from the Advanced Side-Chain Parameters, in order to determine how the Gain Reduction circuit will work on the main signal path.

After the M/S decoding block, the main signal (processed audio) proceeds to the Output Gain block. Make-up gain is applied to compensate for any reduction in volume that may have happened at the Gain Reduction stage.

Finally, the main signal reaches the 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 FET-76. 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 FET-76

3.5.1. Compression Basics

To get an idea of Comp FET-76'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 FET-76 as an insert in that track and open the Comp FET-76 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 turn the Input clockwise. You will notice that the Output knob automatically turns counter-clockwise to compensate. This is because the two knobs are linked by default (there is a "Link" enable/disable switch between the Input and Output knobs). You can switch the Link function off if you would like to adjust the Input knob independently of the Output knob, but for the moment, let's keep both Input and Output linked;
- Keep raising the Input until the VU Meter needle starts moving regularly to the left. 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 Off, compression circuit is bypassed, and you'll hear the original unprocessed audio;
- Now let's try some different compression ratios to hear how they affect the sound. The default option is 4, which means a 4:1 ratio. Change it to 12 for a more dramatic 12:1 compression. Now try pressing the "All" button for the famous "all buttons in" hyper-compression effect (you may need to reduce the Input level as "All" mode can be loud). Choose which option you feel is the best to go;

Comp FET-76 used in a drum track

- Now slowly adjust the Attack and Release knobs while listening to the attack and decay of your transients. As you play with settings, hopefully you will hear the loud transients of your sounds being softened, hardened or otherwise shaped. You may notice that some settings will sound very natural and pleasing whereas others may sound unnatural. Over time, engineers develop a feeling for this and can dial in a great sound in seconds.

3.5.2. More advanced compression methods

Now that you have a feeling for the Comp FET-76 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 go ahead and try the 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;

- 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 works, even though it is only being applied to the detection path of the signal.

4. COMP FET-76 CONTROL PANEL

The Comp FET-76 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 and External, while in Stereo mode we can also choose how detection is performed (stereo, dual mono or M/S) and how it affects compression.

Comp FET-76 inserted in a mono track. Notice the absence of the Detection Mode selection control knob

We will look deeper into this when we reach the Advanced Side-Chain Control [p.24] entry.

4.2. Main Control Panel

The Comp FET-76 Graphical User Interface reproduces all the controls present in the emulated hardware unit, as well as a couple of extras added by Arturia to complement the feature list. 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 FET-76 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. Input

The Input knob is of great importance, since it is going to influence the behavior of the unit in terms of processing. The knob adjusts the audio input level.

Range goes from -48 dB up to O dB. By default, the knob is positioned at -48 dB, which means the unit is not applying any gain and there will be only a minimal amount of compression, depending on the detection signal.

The Comp FET-76 doesn't have a Threshold control. Threshold changes according to the chosen compression ratio. This is because, although we can define the compression ratio (among the available choices) the compressor is still program dependent. This means that it reacts differently according to the audio that feeds the circuit.

> ♪: To better find the right compression settings, first define the desired Ratio, and then slowly raise the Input value. Since Input and Output are tied (linked), you may notice a decrease in the resulting volume when compression starts to be applied. If you want, you may raise the Output volume to compensate.

Since the unit has some coloring induced, it still has some impact in the sound, even if it's not applying any compression.

4.2.2. Link

The Link switch connects the Output control to the Input control. It is a toggle switch, which is On by default. The control is labeled with a picture of a chain.

When Link is On, each time we move the Input control, the Output control moves in the opposite direction. Since the compressor is program dependent, we may be tempted to drive the signal really hot. This way we can drive Input (and compression) like crazy without risking overloading the audio chain.

We can always move the Output independently, since the link only works from the Input to the Output, and not the other way. Therefore, after we find the ideal Input level to achieve the desired compression, we can then check for the right Output gain without changing the Input.

If we turn Off this control, both Input and Output can be changed independently of each other.

Comp FET-76 Input and Output controls at the default position. We may see the Link switch in the bottom, between the two knobs

4.2.3. Output

This control is also often called Make-Up Gain, especially in modern units. Compressors reduce the volume of the louder parts of the audio, which will lower the overall volume. This is exactly what we use a compressor for. Since we don't have parts too loud anymore, we can then raise the overall volume, which will make the lower volume parts more audible. This is achieved with the Output control.

Range goes from -48 dB to O dB. By default, the Output knob is set to O dB, compensating the default position of the Input knob (-48 dB).

The original hardware has a very distinctive sound even when it is not compressing. In fact, sometimes it was used simply as a gain amplifier, taking advantage of the good amplification circuit, and its coloring. We can also simulate this behavior through the use of the Compression Range control [p.28].

4.2.4. 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, and our goals regarding compression. 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.

If we want to use the Comp FET-76 as a limiter, we would use a Ratio of 20, and use a fast attack (no need to go to the fastest positions). When using the unit for limiting purposes, we can also take advantage of the "look-ahead [p.26]" feature made possible with the Time Warp control in the Advanced Mode.

Comp FET-76, like its hardware counterpart, is capable of very, very fast Attack times. When adjusting the Attack, you should keep that in mind. Since attack time values in the Comp FET-76 may vary according with the audio being processed, they are expressed as figures, where 1 is the slowest, and 7 is the fastest.

By default, the Attack time is positioned at 5.

Comp FET-76 Attack and Release controls in their default positions

4.2.5. 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 when audio signal reaches the threshold level, 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 Release is a time parameter, it can be faster or slower (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.

It's important to mention that the Comp FET-76 features the special ability of vary its release time based on program material. After a transient, it releases quickly to avoid level drops, but if there is a continued state of heavy compression, the Comp FET-76 will exhibit a longer release to reduce pumping.

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 FET-76 can be also very fast, just as they were in the hardware counterpart. Like Attack times, they are expressed as figures, where 1 is the slowest, and 7 is the fastest.

By default, the Release time is positioned at the middle (4).

4.2.6. Ratio

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

Ratio is the relation between the incoming audio power and the resulting audio output power, after compression. That's why it may also be called Compression Ratio. This is perhaps the most important parameter in the compressor. The values of the compression are displayed as numbers which express ratios. So, if we define a value of 4, that means a compressor ratio of 4:1. Translating the ratio into real life values, what it says is that when the audio exceeds the threshold by 4 dB the compressor will reduce the volume to just 1 dB. As this is an emulation of an analog unit, and the emulated compression circuit adapts (reacts differently) to the audio the feeds it, these values are meant to be mere reference values, since they will vary according to the audio levels. Instead, we should wait the compression ratio to start softly, and raise gradually as the volume raises above the threshold.

That's why we say that Comp FET-76 is "program dependent". It means the compression curve is directly related to the audio input. The higher the audio level, the more it is compressed. Although this isn't controllable, the results are usually very "musical", and that's why the old program dependent compressors (like the tube compressors of which one unit is also emulated in this bundle) are still highly regarded. So, the compression effect will come up gradually, instead of suddenly, as the audio goes more and more over the threshold.

Yes, we actually have a threshold. It isn't controllable, but it exists. It varies according to the ratio chosen, as we will explain.

Back to the compression ratio: 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.

Usually, a gentle value is desirable (no more than 4:1 and usually even less). But this also depends on the type of music, the instrument and the results that we want to achieve, and also the kind of compressor we are using. Some drum instruments commonly use higher compression ratios, for example, and that, coupled with the way the Comp FET-76 works, makes it a tool especially tailored for that kind of job.
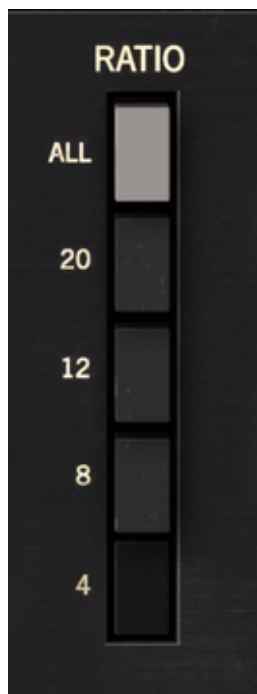
*Comp FET-76 Ratio control
set to a ratio of 4:1*

Compression range goes from 4 (4:1, meaning the original audio power will be reduced by a factor of 4) up to 20 (where the compressor will act in practice as a limiter, since it has also a fast attack). Usually, 4 and 8 are the most used for vocals and instruments, while 12 is more used for drums. 20 is mostly used for limiting, and All is a special case. By default, Ratio button 4 is pressed, which means a 4:1 compression ratio.

Threshold is defined by the Ratio. The higher the ratio, the higher the threshold (meaning that compression starts at a higher level). Ratio also influences the compression curve, which will be harder (closer to the behavior of a limiter) at higher ratios.

The All button is a special case, where all the ratios are activated at the same time. The original units didn't have this button but they allowed to press more than one ratio button (or **all** ratio buttons) at the same time. It happens users found that and liked the effect. It creates a very flat compressor response, together with some added distortion. Applied to drums, the effect is a smashed dynamic range with added partials, creating a huge sound. Applied to guitars and bass, it creates a distorted, grungy effect. Try it.

Another special case is the "No button", where the unit will not apply any compression, being used just as an amplifier, taking advantage of its pleasant coloring and saturation. This may also be achieved, using the Compression Range control [p.28] in the Advanced Mode. By setting that control to a value of 0 dB we null the compression, therefore leaving just the gain circuit active.

4.2.7. Threshold

The threshold is one of the most important controls in a compressor unit. As it happens with many similarly important controllers, what it does is deceptively simple: It just tells the compressor when to start working (compressing).

The FET-76 has a threshold, but it hasn't a threshold control. The unit is program dependent, which means compression varies according to the volume of the incoming audio. Threshold is tied to the ratio. The higher the ratio, the higher the threshold. The difference between them is around 6 dB. Compression curve is also influenced by the ratio, which means:

- Lower ratios - softer compression curve - lower threshold;
- Higher ratios - harder compression curve - higher threshold.

As the input level is turned up, a corresponding decrease in output level may be required. This is where enters the Link parameter.

4.2.8. 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.


The VU Meter, showing channel selector

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 Reduction. 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 the VU Meter will display 0 VU when it is fed with a peak level of -18 dBFS.

When in Gain Reduction 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).
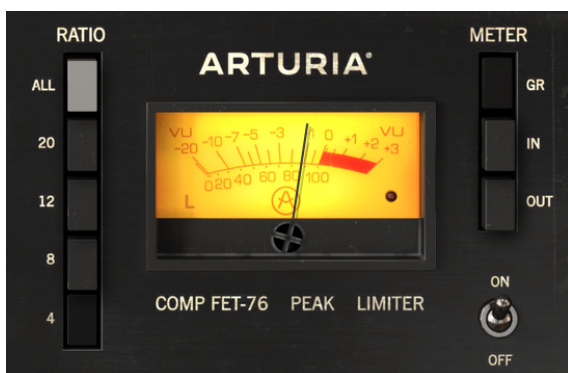
Comp FET-76 VU Meter, set to Gain Reduction. Notice the letter L in the lower left corner and the clipping LED indicator in the lower right corner.

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 bottom right corner of the Meter. Every time audio reaches clipping, the "LED" lights on with a bright red color.

4.2.9. Power Switch

This switch, when turned Off, makes the audio bypass the compression circuit. We can still monitor it visually through the VU Meter, though. 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 power switch only turns Off (bypasses) the compression circuit, but the plug-in remains active. By default, the switch is On (unit is active).

4.2.10. 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.

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.

4.3. 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 FET-76 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.

The original hardware only allowed the internal signal to be used as side-chain (detection). However, in Comp FET-76, we have both Internal and External sources. 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.

The source selector is a toggle switch. Each time we click it changes position. As it is in the Internal position by default, clicking it will change source to External. Clicking again will change source back to Internal.

Since threshold is controlled by Input when source is Internal, we need another Input level control when we are using an external signal. And we have it.

It is located below the Source switch, and is labeled SC Gain. By default, this is positioned at 0 dB, which means that the external signal will feed compression at its original power. We can change it in a range that goes from -24 dB up to +24 dB, as it happens with the main Input control.

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 FET-76 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 optionally encoding the audio signal in Mid/Side mode. This would seem strange, considering that none of the standard controls in the Comp FET-76 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 two 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 Only, and Mid Only options.

Comp FET-76 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 two 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 second 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).

> ♪: 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 patch, 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 FET-76 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 switch above the main controls. When turned On, the small red "LED" light next to the switch will be lighted. By default, it is 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 is applied. 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.

Placing the control at O dB (no compression) is equivalent to the "no button" option in the original hardware, which allows to use the Comp FET-96 merely as an amplifier, taking advantage of its pleasant coloring and saturation.

Comp FET-76 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 FET-76 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 FET-76 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.
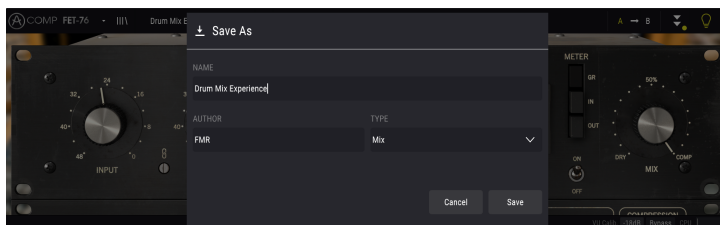
5.1.3. Import...

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 **.f76x** 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 FET-76 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 *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 <u>from</u> the currently selected snapshot <u>to</u> 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 presets.

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.

You have a detailed explanation of all the features in this Advanced Mode 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.

Ratio: Defines the degree of compression applied to the signal once it has reached the threshold.   VU Calib.   -18dB   Bypass   CPU

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 FET-76 has one big VU meter in the middle-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 FET-76 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 FET-76. 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.
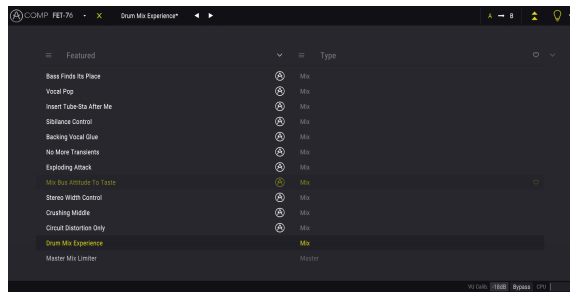
When you click on the library symbol, you will see a screen with all the Presets you have saved. You can sort the list by several different criteria, to make it easier to find the right preset. There are two columns. The first one lists the Presets by Name or by "Featured". Featured are presets that 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.
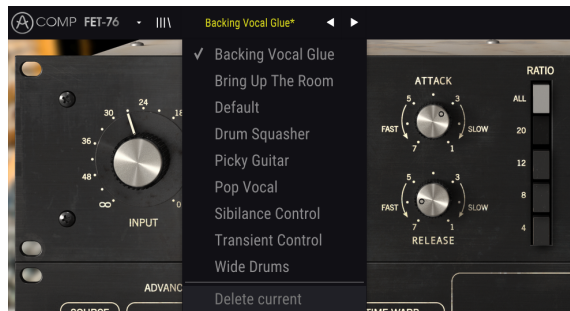
Preparing to delete a Preset from the Comp FET-76 library

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 and features you have at your disposal to process sound in your DAW using the Comp FET-76 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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The right of support for the previous or inferior version of the software expires upon the installation of an upgrade or update.

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