

IGNITE AMPS

engineering for the moshpit

THE ANVIL

AUDIO PLUG-IN

USER MANUAL

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Introduction

The Anvil is a digital emulation of a three channels tube preamplifier for guitar. It has been developed to accurately model its real hardware counterpart, designed by Andy Zeugs.

The Anvil has three completely independent channels, with different signal paths and separate tonestack controls, to maximize its versatility.

The Clean channel is inspired by the classic Californian circuits and provides crystal clear tones even at high gain settings.

The Rhythm channel has a hot-rodded British character, varying from mild crunch to hi-gain distortion.

The Lead channel provides super-tight metal tones, retaining accuracy and responsiveness even at very high gain settings.

Every single component on the signal path of the real analog circuit has been took into account and modeled in the best way possible to match the original sound, keeping an eye to CPU performances and real-time playability at the same time.

The Anvil is meant to be used as a guitar preamplifier for live playing and jamming, tracking or mixing inside hosts capable of VST, VST3 or AU Plug-Ins support.

Minimum System requirements

Windows:

Windows 7 or above (32/64 bit)
Intel Pentium 4 or AMD Athlon XP

Mac:

OSX 10.7 or above
Intel processor with SSE2 instructions support

Installation

To install The Anvil Plug-In, just follow the instructions below, according to the platform and plug-in format you want to use.

Windows VST:

Copy the file **Anvil.dll** into your VST Plug-Ins folder (for example C:\Program Files\Steinberg\VST).

Windows VST3:

Copy the file **Anvil.vst3** into your VST3 Plug-Ins folder (for example C:\Program Files\Steinberg\VST3).

Mac OSX VST:

Copy the bundle **Anvil.vst** into the path: /Library/Audio/Plug-Ins/VST/

Mac OSX VST3:

Copy the bundle **Anvil.vst3** into the path: /Library/Audio/Plug-Ins/VST3/

Mac OSX AU:

Copy the bundle **Anvil.component** into the path: /Library/Audio/Plug-Ins/Components/

For Windows VST/VST3 format, we provide separate x86 (32 bit) and x64 (64 bit) binaries, so make sure to choose the right one according to your operative system and plug-in host specifications.

Keep in mind that x64 binaries will not run on 32 bit environments, while x86 binaries will most likely run on 64 bit environments, although we do not recommend such usage for performance and stability reasons.

We strongly advice the Windows user against putting both x86 and x64 versions in the host VST/VST3 folder(s), as it may cause one of the versions to not be recognized as a plug-in.

Mac plug-ins (VST/VST3/AU) are compiled in Universal Binary format for Intel processors, containing both 32 bit and 64 bit code in the same bundle, which means that the user doesn't need to care about choosing x86 or x64 version, as the system will handle that automatically.

After that, you should (re)start your favourite VST/VST3/AU host, making sure it re-scans your Plug-Ins folder(s) to recognize The Anvil as a new “Effect” Plug-In (please note that some hosts may not re-scan the plug-in folder automatically at every start-up, so you may need to do it manually. Refer to your host’s manual for instructions).

If everything is right, you should now see The Anvil entry into the “Effect” Plug-Ins list of your host.

Main Features

- Ignite Amps 3rd generation triode modeling engine
- Three channels: clean, rhythm and lead, each with fully separated controls
- Mono / Stereo processing support
- Selectable oversampling rate (up to 8x)
- Global input / output level controls
- Double precision (64 bit) floating point mathematical model
- Fully automatable controls
- Ignite Amps proprietary preset management system with bank file import/export functions

The Anvil Circuit Diagram

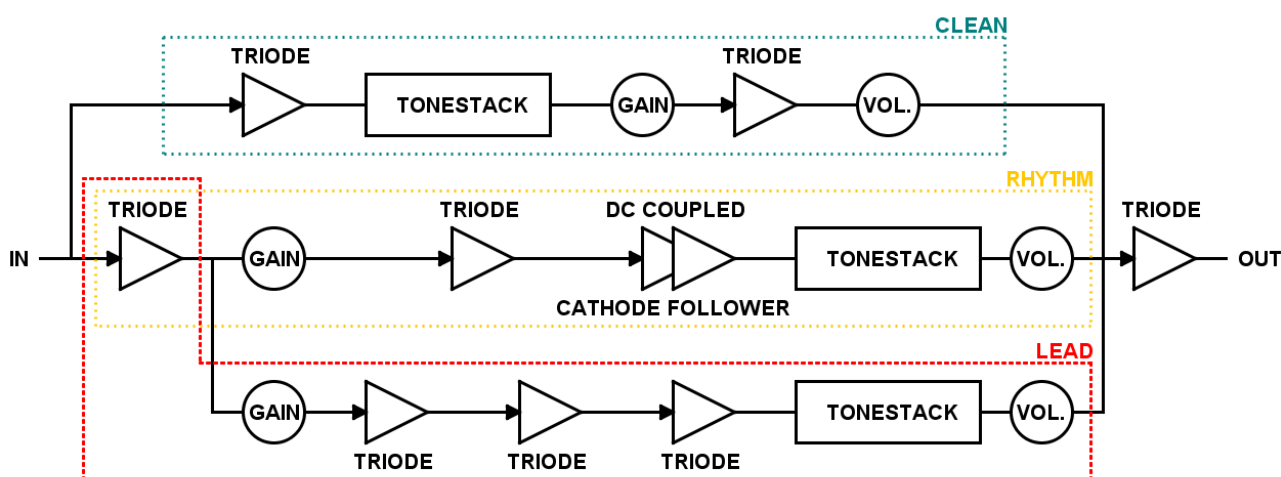


Fig. 1 - The Anvil Circuit Diagram

Graphic User Interface



Fig. 2 – The Anvil GUI

As you can see from the screenshots (fig.2), we decided to make The Anvil as similar as possible to the real hardware, in order to make the user experience easier, giving the chance to tweak the controls of the plug-in like one would do when having the real rack preamplifier in front of him.

The GUI is composed by a **header**, containing the Presets Management System plus other convenient functions, the **main view**, containing the amplifier controls and a **footer**, placed at the bottom of the interface, containing the global controls of the plug-in.

Main View Controls



Fig. 3 – The Anvil Main View

In the front panel of The Anvil (fig.3) you'll find all the controls you're used to see in every classic guitar (pre)amplifier:

- [1] **Channel Leds:** lets you choose the channel you want to use. Just click on the led to switch to that channel.
- [2] **Gain:** controls the amount of gain / saturation of your sound. In Clean mode, it influences the overall perceived output volume more than in Rhythm and Lead mode, where it controls mostly the amount of distortion.
- [3] **Bass / Mid / Treble:** the classic tonestack controls. Like in real amplifiers, every control influences the tonal response of the others involved in the circuit.
- [4] **Volume:** controls the output of the single channels. It is really important to check the circuit diagram of The Anvil (fig.1) to understand that it is not the last element of the signal path, since there is another gain stage right after it. This means that it doesn't control just the output volume, but also the amount of signal driving the last stage of the circuit. Therefore, when cranked up to high values, it may overdrive it, giving more saturation and compression when needed. It also influences the tonestack controls [3] response to a small degree.
- [5] **Clean Bright:** controls the picking attack, making the sound brighter or darker/softer depending on your needs.
- [6] **Rhythm Bright:** controls the picking attack, making the sound brighter or darker / softer depending on your needs. The bright switch may help you to saturate the upper register of your tone, adding even and odd harmonics to enrich the sound and feel.
- [7] **Lead Bright:** it controls the attack and picking response of the Lead channel and it can be really useful to increase definition of the tone. In this channel only, the bright control effect is dependent on the Lead gain control [2] setting. If you set the gain to the maximum value, the bright capacitor will be bypassed, so, switching it on and off won't make any difference to the final sound.
It's worth noting that in most of the modern hi-gain amplifiers, this control is always active and not switchable. Switching it off (default) will result in a more balanced tone for the full gain control excursion with a mellower attack.

- [8] **Shape:** controls the saturation behaviour of the Lead channel. When switched on (lever up) the overall gain will increase and the high-frequency roll off will be reduced, making the distortion more aggressive and saturated.
- [9] **Presence:** controls the response of the higher frequencies on the Lead channel. In most hi-gain amplifiers, presence controls are filters acting in the feedback loop between the power amp and the phase inverter stage. In The Anvil instead, the Presence control acts as an additional tonestack control, passive and not feedbacked.
- [10] **Power:** controls the status of the plug-in. When switched off (lever down) the plug-in will be bypassed.

Header controls

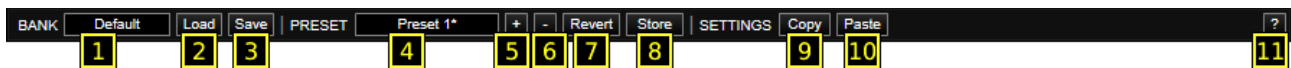


Fig. 4 – The Anvil Header

In the The Anvil header section ([fig.4](#)), you'll find controls for the Ignite Amps proprietary Preset Management System and other useful features:

- [11] **Bank:** lets you change the name of the current bank. A bank is a group of presets which can be imported or exported to file, in order to save or recall settings and eventually share them with other The Anvil users, or just move them from one DAW to another. Clicking on this control, will enable text editing, so just type in the new name and hit Enter to update.
- [12] **Load:** lets you load a previously saved bank (using the Save [3] control) from a file. Clicking on this button will open your OS file manager to select the desired bank file. Once the file is chosen, all the presets contained in the bank will be available on the Preset Selector [4] and the first one will be automatically loaded.
Please note that when loading a new bank, all the previous bank settings will be discarded, unless you saved them on a file.
- [13] **Save:** lets you save the current bank on file. Clicking on this button will open your OS file manager to select the path and the name of the file in which the bank will be stored. Once the file is chosen, all the presets contained in the current bank will be saved on the selected storage device and made available for future loading via the Load [2] control.
This is the only control that persists bank data on disk. Any other function of the Preset Management System will act on the plug-in memory, so no changes will be saved on file unless you use this control explicitly.
- [14] **Preset Selector:** lets you switch between presets contained in the current bank. Clicking on this control will open a popup menu showing all the available presets. Selecting a preset will immediately update the plug-in settings to the ones stored into it. Additionally, when the mouse cursor is over this control, a button labeled “**E**” (as “Edit”) will appear on the right side: by clicking on it you can edit the name of the current preset through a dialog box. Once a preset is loaded, as soon as you edit one of the plug-ins settings, an **asterisk** (“*”) will appear next to the preset name, in order to remind you that the settings for that preset are changed. You can revert the settings back using the Revert [7] function or permanently update them using the Store [8] function.
- [15] **Add Preset:** lets you add a new preset to the current bank. Clicking on this button will create and load a new preset with a default name (“Preset <N>”), using the current plug-in settings. You can change the preset name by clicking 2 times on the Preset Selector [4].

- [16] **Remove Preset:** lets you remove a preset from the current bank. Clicking on this button will erase the current preset and load the settings of the previous one on the list (or the next one, in case the removed preset was the first of the bank).
There is no undo function, so use this control carefully.
- [17] **Revert:** lets you revert the selected preset settings to the original state. Clicking on this button will discard all the current plug-in settings and reload the last saved ones. This control is enabled only when a preset has been changed from its saved state.
- [18] **Store:** lets you store the selected preset settings as its original state. Clicking on this button will save all the current plug-in settings and mark them as the last saved state, meaning that every successive use of the Revert [7] function, will recall these settings. This control is enabled only when a preset has been changed from its original state and will be disabled as soon as you click it (you'll also notice the asterisk next to the preset name disappear).
- [19] **Copy:** lets you copy the current preset settings on the plug-in's clipboard. You can then use the Paste [10] function to reload them. The cool thing about this control, is that the plug-in's clipboard is shared among different The Anvil instances, so you can conveniently copy and paste settings from one to another, without having to explicitly save and load the bank.
Please note that as soon as all the instances of The Anvil are removed from the project, the clipboard data will be lost.
- [20] **Paste:** lets you load the preset settings available on the plug-in's clipboard. You can then use the Copy [9] function to store them. The cool thing about this control, is that the plug-in's clipboard is shared among different The Anvil instances, so you can conveniently copy and paste settings from one to another, without having to explicitly save and load the bank.
Please note that as soon as all the instances of The Anvil are removed from the project, the clipboard data will be lost.
- [21] **About:** clicking on this button will show up all the The Anvil additional information. Just click on whichever area of the plug-in graphic interface to make it disappear.

Footer Controls



Fig. 5 – The Anvil Footer

In the The Anvil footer section (fig.5), you'll find controls to manage the plug-in to suit your system and mixing environment at best:

- [1] **Input level:** it is a simple way to adjust the amount of guitar signal going through the virtual circuit. It is really important not to underestimate this control, since it is the key to have The Anvil react correctly to your guitar and playing. In fact, we can safely say that this is the most important control to get the best out of The Anvil.

What's the correct way to use it?

Let's start from your guitar signal: as you know, when you play, the pickup output going to your sound-card input will be transformed to a digital signal by the AD converter of your audio interface. The first thing you should keep in mind, is that the converter has a maximum headroom that should never be exceeded. If your signal goes over this maximum threshold, it will be clipped. A clipped signal means less dynamics and the introduction of digital distortion.

So, the first thing you need to make sure of, is to never clip the AD converter (if you are clipping it, the clipping led indicator featured in most audio interface will light on, warning you

that your input signal is too hot, so you need to lower the preamplifier control until the problem disappears).

On the other hand, an important thing to keep in mind, is that the higher the input signal (within the aforementioned headroom limit), the more accurate the AD conversion will be, keeping also the signal-to-noise ratio at the highest possible value. This means that, in order to get the best out of your sound-card, you need to keep the input signal as high as possible right before reaching the clipping threshold.

Ok, cool story, but when does the input level control comes into play?

Once your signal is converted to digital, it will be represented as a series of numbers that you can see as voltage values. These voltages can have a maximum and minimum value of 1.0 and -1.0 respectively. Supposing your input signal is peaking at its higher possible value right before the clipping threshold of the converter, it will be represented as 1.0 inside your host and The Anvil will react to it like if you're sending a 1.0V signal to its input stage.

Why is it so important to know these details? Because if your guitar pickup has a maximum output voltage higher than 1V (or 2V peak-to-peak), like many modern active pickups have, you'll need to adjust the input signal that's being sent to The Anvil. That's where the Input Level control comes into play. You need to tweak it to compensate the voltage scaling/normalization made by your AD converter.

The Input level control applies a scaling factor to the input signal. For example, if your pickup has a maximum output of 1.5V (so 3V peak-to-peak), you'll need to set the control at 1.5x. By doing this, your input will be multiplied by 1.5, so The Anvil will not be fed with a 1.0V maximum signal, instead, it'll get a $1.0V \times 1.5 = 1.5V$ maximum signal, which is the correct value to match your pickup specifications.

If you are using a single coil and its maximum output value is, let's say, 0.5V, you'll need to lower the input level by setting the control to 0.5x. This will make the Emissary react like the input signal is 0.5V, or $1V \times 0.5$. Remember that the sound-card input level is meant to be always set so that you use the full AD converter headroom. Signal level adjustments, to pair The Anvil with your guitar pickups, need to be made after the AD conversion, using the Input Level control.

Please note that these concepts applies only when The Anvil is the first plug-in of your virtual guitar chain. If you are using another digital effect before The Anvil, we suggest you to keep the input level control at half (default).

- [2] **Oversampling:** lets you choose the internal processing sample rate of the plug-in. The available options are 2x, 4x or 8x. This means that if your host is set up to process at 44100Hz sample rate, by selecting 4x oversampling, for example, The Anvil will process your signal at $44100 \times 4 = 176400$ samples per second. Oversampling is needed to avoid digital artifacts (aliasing) and improve the accuracy and musicality of the plug-in.

Obviously, the higher the oversampling, the higher the CPU usage.

In our experience and tests, we've found 4x oversampling to be the best compromise for accurate processing and good performance, but we've decided to add other two options to help users with slower machines to run the plug-in without CPU overloading (2x) or run the plug-in at its full potential when having a powerful system at disposal (8x).

Keep in mind that the sound difference between these three modes is not going to be night and day, so, for mixing purpose, you will hardly need to rework the mix settings when switching between different oversampling values. A good practice would be to run the plug-in at 4x or 2x during mixing and switch it to 8x right before rendering your project. This will avoid CPU usage problems when using multiple plug-ins in mixing phase and still give you full processing quality once your tracks are exported.

- [3] **Routing:** lets the user select the processing mode of the plug-in (Mono or Stereo). It is extremely important to note that a complete stereo separation, and thus a correct stereo image preservation, is only possible when The Anvil is placed on a stereo bus and fed with a stereo signal with left and right components panned at 100%. Feeding The Anvil with two tracks panned at less than 100% left and right, will not preserve the correct stereo separation of the tracks at the output. Stereo Mode will obviously double the CPU load of the plug-in, as the two audio channels are being implicitly processed by two separated instances

of The Anvil.

- [4] **Output:** lets you change the overall output level of the plug-in. Unlike the Volume controls located in the front panel, this control is completely linear and doesn't affect the dynamic behaviour of the plug-in in any way.

Tips for “digital” guitarists

- Always use the high impedance (Hi-Z) input of your sound-card (when featured). This will ensure less noise and signal loss. Most real (pre)amplifiers and stomp boxes, have an input impedance of 1MegaOhm, so it would be a good idea to get a sound-card with 1MegaOhm input impedance to use Ignite Amps simulators at their best.
- As mentioned above, make always sure to have the highest input signal before the AD conversion, avoiding clipping.
- Amp sims and stomp box simulators are not noisy, they do not add noise. In fact, they're a lot less noisy than real hardwares. If you have noise issues, check your guitar electronic circuit, cables and sound-card settings.
- In almost all cases, amp sims and stomp box simulators don't introduce noticeable latency. The Anvil doesn't introduce any noticeable latency. If you're experiencing latency issues, check your sound-card settings (specifically reduce the “Input Buffer Size”).
- The Anvil is a tube preamplifier simulator, so it needs a power amplifier simulator and a cabinet simulator to be placed after it in order to sound like a real mic'd tube amplifier, so make sure to place one (and only one!) of them right after it.
- We strongly recommend to use our **TPA-1 Tube Power Amplifier** plug-in and our **NadIR Zero Latency Convolver** plug-in for cabinet simulation, which are freely downloadable from our [official site](#).

Acknowledgments

Ignite Amps wants to thank [Andy Zeugs](#) once again, for inspiring this work, helping us with his tests and opinions and providing tracks processed by the real hardware as a reference during the development of the plug-in.

Thanks to all the musicians interested in the Ignite Amps project, trusting us into taking care of their sound. You know who you are.

Thanks to You too, for downloading and trying The Anvil and for reading the f***ing manual! :-)

Sincerely
The Ignite Amps Crew

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