

# Kombinat User's Guide

Audio Damage, Inc.

Release 3.0

The screenshot displays the Kombinat TRI software interface, a digital audio workstation (DAW) plugin. The interface is dark-themed with orange and red accents. At the top, the title "KOMBINAT TRI" is on the left, "08 - Loop Warmer" is in the center, and "AUDIODAMAGE" is on the right. Below the title, there is a "CROSSOVER" section with a frequency response graph and two frequency sliders: "HIGH FREQ: 0.05kHz" and "LOW FREQ: 596Hz". The main interface is divided into three columns: "LOW", "MID", and "HIGH". Each column has a power button and a status indicator (e.g., "TUBE CLIP", "NERD RAGE", "DEGRADE"). The "LOW" column includes controls for DRIVE, BITE, MIX, and LOW GAIN (-04dB). The "MID" column includes controls for THRESH, DECAY, GAIN, and MID GAIN (-23dB). The "HIGH" column includes controls for RATE, BITS, ERROR, and HIGH GAIN (+04dB). To the right of these columns are two main sections: "ENGINE MODE" (MULTIBAND) and "FILTER MODE" (NOTCH). Below these are various control knobs and sliders for AMOUNT (-72dB), FEEDBACK, ATTACK (013), DECAY (023), KOMPRESSOR (0.36), MIX (95%), INPUT (-03dB), and OUTPUT (-04dB). At the bottom left, the version "VERSION 1.0.001" is displayed.

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# Introduction

Thank you for purchasing Kombinat, Audio Damage's multi-destruction toolbox. Kombinat is named with the Russian term for a conglomeration, as it is not a single effect, but rather a group of effects that work towards a defined end. This plug-in includes a set of crossover filters (otherwise known as a DJ EQ or "band killer"), three distortion engines, a lowpass filter, and a compressor. Each effect can be used individually, but they combine to give Kombinat a distinct sound, not entirely unlike accidentally dropping a piece of sheet metal into a paper shredder.

Kombinat works on any given signal is dependent on several factors; these include, in no particular order, how hot the input signal is and how much of the frequency spectrum it occupies, how much gain the input knob is sending to the various effects, how much gain the crossover bands are adding or removing, and how hard the compressor is working. Kombinat comes with 80 presets, but it is worth remembering that Kombinat is extremely input-dependent, and these presets are not meant to describe how the plug-in should be used in any particular context; rather, they are merely starting ideas.

You'll find that the sound of the unit can be drastically changed on almost any preset merely by changing the setting of the input knob, and we recommend some experimentation in this regard. All the gain knobs will boost the signal's loudness, up to 7dB per knob, so it is possible to heavily overload the individual distortion engines, the filter, and the compressor.

Finally, you should remember that at high levels of gain, Kombinat is somewhat unpredictable. This is by design; the filter can be overdriven to the point of breaking up, the individual distortion engines can be overdriven in to strange territory, and the compressor can be overloaded to the point where it is also a distortion engine.

All of these factors come in to play to create a plug-in that is essentially unique in every context. Unlike a traditional filter or EQ, which will generally only remove things from your sound, or a traditional distortion-based effect, which will generally only color what already exists, Kombinat can (and will) add its own personality in each instance. It is almost instrument-like in this regard, and rather than just programming it, we suggest you actually think about playing it.

## New in Version 3.0

Version 3.0 of Kombinat, known as Kombinat Tri, adds a number of features and enhancements to its predecessor:

- Numerous filter types, for a total of twelve
- An output mix control
- A selection of presets from Kombinat and Kombinat Dva, some all-new presets to take advantage of the new features, and a selection of Designer presets from Ken Flux Pierce and Don Gunn
- A new user interface, appropriate to contemporary display technologies
- VST 3 and AAX compatibility
- A cross-platform XML-based preset file system
- Built with up-to-date code libraries for better host compatibility and future-proofing

Kombinat Tri has a different name and internal identifier than previous versions. This means that you can install Kombinat Tri alongside whatever version you are currently using, and continue to use the older version in your existing projects. Kombinat Tri cannot be directly substituted in existing projects and cannot read preset files created by previous versions.

Also, direct MIDI control assignment has been removed. Host DAWs have progressed considerably since Kombinat's last major revision and it's now appropriate to leave MIDI mapping up to them.

## System Requirements

Kombinat is provided as 32- and 64-bit VST2 and VST3, and 64-bit AAX plug-ins for Windows. On OSX, Kombinat is provided as Universal Binary Audio Unit, VST2, VST3 and AAX plug-ins.

Kombinat is a plug-in, not a standalone application. To use it, you'll need a host application such as Ableton Live, Steinberg Cubase, Apple Logic, Avid ProTools, etc<sup>1</sup>. Obviously you'll also need a computer capable of running one of these applications.

We support the use of Kombinat under Microsoft Windows 8 or newer, and Apple OS X version 10.8 or newer.

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<sup>1</sup> Product names are copyrighted by their respective owners.

# Installation

To install Kombinat, double-click the Kombinat Installer icon, and follow the instructions. You can choose which plug-in formats to install and, for some formats, the plug-in destination folder.

To un-install from OS X, simply delete the plug-in from your VST folder, which is usually located at `/Library/Audio/Plug-Ins/VST/Audio Damage`, and your Audio Units folder, which is located at `/Library/Audio/Plug-Ins/Components/`. To un-install from Windows, delete the file named `Kombinat Tri.dll` from your VST folder(s). The presets are stored in separate files which you can also delete, although they occupy very little space. On OS X, they're in `/Library/Application Support/Audio Damage` . On Windows, they're in the hidden folder `C:/Program Data/Audio Damage/` .

# Operation

Kombinat can be used in either a stereo or mono context in your host DAW software. If you use a stereo input, the left and right channel separation of the input signal is preserved in the output signal. Kombinat is meant to be used as an insert effect but there's no reason you can't use it as a send/return effect if doing so suits you.

Here is a screenshot of Kombinat, followed by detailed descriptions of its controls:



## Crossover

The Crossover section of Kombinat is a DJ-style 3-band equalizer. It splits the incoming signal into three frequency ranges: high (treble), middle, and low (bass). The **CROSSOVER** control, at the upper right of the window, changes the frequencies of the filters in the crossover network which divide the incoming signal into separate frequency ranges, as well as the level (loudness) of each frequency band. The three shaded regions represent the frequency ranges and gains of the three filters. If an engine has been turned off, its band is shown in grey rather than orange. You can set the dividing points between the three frequency ranges by simply clicking near their vertical edges and dragging horizontally. The exact frequencies are displayed in the upper-right corner of the control, should you be curious.



The height of each region controls the level (loudness) of the frequency bands. Click and drag vertically near the top edge of a band to increase and decrease its gain. There is also a handy Gain knob for each band at the bottom of Kombinat's window. The horizontal grey line near the top of the control represents 0dB, or unity gain.

## Distortion Engines

The heart of Kombinat is its three distortion processors, which we call *engines*. Each engine can operate as one of 13 different types, each of which mangles signals in a different manner.

The routing of signals through the engines depends on the mode switch in the upper right of Kombinat's window. In Multiband mode, each engine operates on its corresponding band of frequencies, and the engines operate in parallel. The HIGH engine processes the high frequencies, the LOW engine processes the low frequencies, and the MID engine processes the mid-range frequencies. The outputs of the three engines are added together; this mixed signal is then sent to the output filter.



## ENGINE MODE SERIES

In Series mode, the engines are connected in series, with the output of the top engine connected to the input of the middle engine and the output of the middle engine connected to the input of the bottom engine. In Series mode, the three outputs of the crossover filters are added together; the crossover operates more or less like a three-band parametric equalizer. The signal filtered by the crossover enters the HIGH engine, passes through the MID engine, leaves from the LOW engine, and then makes its way to the output filter. Simply click the mode indicator to switch back and forth between the two modes.

Each engine has the same complement of controls. There is a circular on/off switch that acts as a “kill” switch for each frequency band. If the engine’s switch is off (greyed out rather than white), the band is completely silenced. Click the switches to turn them on and off.

Each engine has a **GAIN** knob that sets the level of the corresponding crossover frequency band, in the same manner as dragging vertically on that control. You can click the control while holding down the CMD key on an OSX computer, or the CTRL key on a PC, to set the band to unity gain.

There is a popup menu at the top of each engine’s pane to choose which distortion type the engine employs. Each type has one to three parameters which are controlled by the three knobs below the popup menu. Click and drag vertically on the knobs to change the parameter values. The engine types operate as follows:

**THRU:** This is actually not a distortion type as such, but essentially a bypass switch for the engine. If the engine type is set to **THRU**, the signal passes through the engine without alteration. Choose **THRU** in Multiband mode if you want a band of frequencies to be left unscathed by its engine, and choose **THRU** in Series mode if you find that you don’t need all three engines to create the effect you’re looking for. The **THRU** engine type obviously has no parameters.

**FUZZ:** The **FUZZ** engine type is derived from Audio Damage’s wildly popular freeware fuzz pedal plug-in, Fuzz Plus. It is based on a mathematical model of a fuzz pedal near to the hearts of many guitarists. If you’ve enjoyed using Fuzz Plus but have yearned for a multi-band version, now you have it.

**FUZZ** has a single knob labeled **AMT** (short for Amount) which increases the signal level and hence the amount of distortion. The **FUZZ** type is perhaps most interesting at



lower settings of the **AMT** knob, where it imparts a somewhat grainy distortion to signals regardless of their level. At high **AMT** settings the fuzz and **SATURATE** types are mostly indistinguishable.

**SATURATE:** The **SATURATE** type simulates the distortion created by overloading a transistor-based gain circuit such as a pre-amp. At low signal levels the **SATURATE** type has no effect. As the signal level increases the top and bottom of the signal wave are flattened, creating a bright-sounding distorted signal.

**SATURATE** has a single knob labeled **AMT** which increases the signal level and hence the amount of distortion.

**DISTORT:** The **DISTORT** type, short for distortion (you probably guessed that one), distorts the signal at both its peaks (like the **SATURATE** type) and at very small values near zero. This zero-crossing distortion imparts a sort of gate-like effect that is typical of some contemporary boutique guitar pedals.

**DISTORT** has two knobs labeled **AMT** and **GAIN**. **AMT** acts as a “mix” knob, varying the amount of the original signal and the distorted signal. Turning up the amt knob increases the distortion. The **GAIN** knob changes the level of the signal before it is distorted. Generally speaking, turning up the gain will also increase the distortion.

**CLIP:** The **CLIP** type simply clips off the peaks of the signal. The level at which the signal is clipped can be set independently for the positive and negative peaks of the signal. Since audio signals are usually not symmetric, clipping the positive half of the signal can sound different than clipping the negative half. Even if the signal happens to be symmetric, clipping only one half will sound different than clipping both halves. Some diode-based guitar pedals exhibit asymmetric clipping behavior in which the positive or negative half of the signal is clipped more than the other half.

The **CLIP** type has three knobs: **GAIN**, **LO**, and **HI**. **GAIN** simply changes the signal level before it is clipped. **LO** sets the clipping point for the negative half of the signal, and **HI** sets the clipping point for the positive half. Both of these knobs set the clipping point relative to zero; that is, as you turn them up, the clipping level moves *away* from zero. This means that if you leave them both at zero, you won’t hear anything at all from this engine because both the positive and the negative halves of the signal wave

|           |
|-----------|
| THRU      |
| FUZZ      |
| SATURATE  |
| DISTORT   |
| CLIP      |
| WARP      |
| DEGRADE   |
| ✓ RINGMOD |
| X NOISE   |
| OCTAVER   |
| WAVY      |
| RECTIFY   |
| TUBE CLIP |
| NERD RAGE |

are chopped off at zero. If you turn them both all the way up you won't hear much of any effect because the clipping levels are both set beyond the peaks of the wave. (You will hear clipping nonetheless if you crank up the signal enough with the gain knob.)

**WARP:** The **WARP** type, technically speaking, distorts the signal by using a sinusoid as a non-linear transfer function. In less technical terms, it makes odd noises by wrapping the signal around a sine wave. It creates harsh distortion that can sound like hard clipping, or add metallic-sounding overtones somewhat like ring modulation.

**WARP** has a single knob, **FREQ**, which varies the frequency of the sine wave, and hence varies the timbre of the distorted signal.

**DEGRADE:** The **DEGRADE** engine type applies several different forms of digital signal destruction. **DEGRADE** creates the popular "lo-fi" sample-rate reduction and bit-crusher digital effects we've all come to know and love despite having 24-bit audio converters and 64-bit signal-processing math readily available to us.

**DEGRADE** has three knobs. The first knob, **RATE**, controls a sample-rate reducer. As you turn this knob up, the signal is resampled at a lower rate than your host's current sampling rate. If this knob is turned all the way anti-clockwise, the resampling process has no effect on the signal. As you turn the knob up, the signal is sampled at a lower rate. If you turn this knob all the way clockwise, the signal is sampled at 1/100<sup>th</sup> of your host's sampling frequency (e.g., 441Hz if you use the usual sampling frequency of 44100Hz). You may find that the **RATE** knob has the most noticeable effect when used in the high-frequency-band processing engine, since higher frequencies will be affected first by lowering the sampling rate.

The second knob, **BITS**, controls a bit-depth reduction or "bit-crushing" process. If you leave the knob turned fully anti-clockwise, the signal is passed with full resolution. (Kombinat uses 32 bits to represent signals internally, but your host software may use 16, 24, or 32 bits.) As you rotate the knob, the number of bits used to represent the signal first drops to 16, and then decreases all the way to one as you turn the knob fully clockwise.

The third knob, **ERROR**, is an Audio Damage original. It introduces errors in the bits used to represent the signal. The knob controls how long the errors persist, and hence how much they damage the audio. If the knob is rotated fully anti-clockwise, no errors

are added to the signal. As you rotate the knob, progressively more persistent errors are added to the signal, creating digital-sounding noise. The **BITS** and **ERROR** knobs are somewhat complementary in that the effect of the **ERROR** function is less noticeable at high settings of the **BITS** knob.

**RINGMOD:** The **RINGMOD** engine type is a ring modulator. Ring modulators are familiar to many users of synthesizers and guitar effects; they produce “clangorous” or inharmonic tones by multiplying the input signal with the output of a built-in oscillator. Ring modulation is actually a form of amplitude modulation; “ring” refers to the arrangement of diodes in analog circuits originally used to create the effect.

**RINGMOD** has three knobs. The first knob, **AMT**, controls the amount that the incoming signal is modulated (affected) by the oscillator. Turning this knob up increases the overall intensity of the effect. The second knob, **FREQ**, controls the frequency of the oscillator. Rotating this knob changes the timbre or tone of the effect. The third knob, **SHAPE**, varies the shape of the oscillator’s wave. At its fully anti-clockwise position, the wave has a smooth sinusoidal shape. As you turn the **SHAPE** knob up, the shape becomes more and more squared off. Turning the knob up makes the effect brighter and more digital-sounding.

**X NOISE:** The **X NOISE** engine multiplies the input signal with filtered white noise. Applied lightly, this adds a subtle amount of distortion to the signal. Applied heavily, it more or less turns the signal into noise, modulated in amplitude by the original signal.

**X NOISE** has three knobs. . The first knob, **AMT**, controls the amount that the incoming signal is modulated (affected) by the noise signal. Turning this knob up increases the overall intensity of the effect. The second knob, **FREQ**, controls the center frequency of a bandpass filter which changes the tone of the noise, and hence the tone of the overall effect. The third knob, **Q**, adjusts the resonance of the filter; higher settings make the filter narrower.

**OCTAVER:** The **OCTAVER** engine uses the same methods found in guitar effects pedals to generate signals one octave above and below the input signal. On simple signals these methods are fairly effective and produce distinct pitch-shifted replicas of the original. On more complex signals they don’t work terribly well as pitch shifters, but do produce interesting distortion effects with a tonal center one octave above/below the input signal.

The three knobs are level controls. **DRY** sets the level of the unchanged signal. **1/2** sets the level of the octave-down signal, and **2/1** sets the level of the octave-up signal.

**WAVY: WAVY** is similar to the **WARP** engine. (The **WARP** engine was present in version 1.0 of Kombinat, and hence is still present in version 2.0 for backwards compatibility.) Like **WARP**, **WAVY** uses a sine wave to create a non-linear transfer function, although it is applied in a different manner. There is a **FREQ** knob to control the frequency of the sine wave, and hence the tone of the effect. **WAVY** also has an **AMT** knob to control the intensity of the effect.

**RECTIFY: RECTIFY** mostly affects the negative half of the signal's waveform, by either reducing its amplitude or flipping it over to make it a positive signal. The **SLOPE** knob is the main control for **RECTIFY**. If the **SLOPE** knob is rotated fully anti-clockwise, the input signal is passed without change. As you rotate the knob towards the 12:00 position, the lower half of the waveform is flattened out, distorting the signal. As you rotate the slope knob further, the lower half of the waveform is increasingly reflected upwards.

The **ROUND** knob smoothes the transitional area where **RECTIFY** starts affecting the negative half of the waveform. Turning up **ROUND** makes the transition smoother (more rounded) and hence makes the distortion somewhat less buzzy.

**TUBE CLIP: The TUBE CLIP** engine applies asymmetric distortion to the signal in a manner similar to vacuum-tube-based circuits. The **DRIVE** knob acts as an input gain control; turning it up increases the signal level and hence how much the signal is distorted. The **BITE** knob makes the distortion shape sharper, creating a brighter or harsher distortion tone. The **MIX** knob blends the input signal and the distorted signal. As you rotate the **MIX** knob clockwise you'll hear less of the clean signal and more of the distorted signal.

**NERD RAGE: Part** distortion effect and part short delay, Nerd Rage grabs short pieces of the input signal and plays them back in reverse.

**NERD RAGE** has three knobs. The **THRESH** knob, short for Threshold, is a sort of tuning knob which controls how much of the signal is recorded for later playback. The **DECAY** knob controls how rapidly the recorded signal fades out when being played back. The **GAIN** knob is a level control; turning it clockwise makes Nerd Rage's output louder.

Historical note: if you happen to be a user of Audio Damage's venerated Master Destructo plug-in, you'll recognize the **CLIP**, **WARP**, and **DEGRADE** engine types. These engine types were lifted directly from Master Destructo (although the **ERROR** parameter in **DEGRADE** is a new invention).

## **Filter**

After the signals emerge from the three engines, they pass through a filter. The filter has three controls: **FREQUENCY**, **RESONANCE**, and **FILTER MODE**.

Kombinat's filter comes in a variety of flavors, chosen with the **FILTER MODE** popup menu. The type names give you a general idea of the filter's response, following the usual conventions for synthesizer filters. That is, "LP", "BP", "HP" stand for Low Pass, Band Pass and High Pass respectively, and the number of "poles" (either two, three, or four) generally describes the steepness or intensity of the filter's response. That said, some of the filters have unusual characteristics which we'll describe here.

- 2 POLE LP, 2 POLE HP – plain-vanilla 2-pole filters. If you're looking for somewhat milder-sounding filters, these are your best bet.
- 3 POLE LP – this filter started life as an emulation of the filter in the TB-303, and has some of its squelchy sound.
- 4 POLE LP – Audio Damage's own 4-pole low-pass filter. Loosely based on the famous Moog filter, this is the one to use for overtly electronic-sounding filter effects.
- 4 POLE HP – a high-pass filter with a steeper cutoff slope than its 2-pole counterpart. If you want to kill the bass in your sound, this will do the job.
- LP20, HP20 – emulations of the low-pass and high-pass filters found in the Korg MS-20 analog synthesizer. These filters have more personality than the 2 POLE LP and 2 POLE HP modes.
- 4 POLE BP – a bandpass filter which lops off the high and low frequencies, allowing what's left in the middle to continue onwards.
- NOTCH – this filter removes a narrow range of frequencies. The width of that range is influenced by the Resonance knob; a higher setting makes the range narrower.
- 914 BP – the bandpass filter from Audio Damage's 914 filter bank plugin. An accurate recreation of the filters in Moog filter bank modules, this is a bandpass filter with distinctive phase response characteristics.
- FILTERPOD – the filter from one of Audio Damage's first products, Filterpod. It's essentially a low-pass filter with an odd hump near its cutoff frequency, and some unusual resonance and overdrive characteristics.
- BYPASS – this choice simply turns off the filter altogether, letting the signal pass unaltered.

The **FREQUENCY** knob sets the operating or corner frequency of the filter. You probably guessed that, didn't you? This control has a range of 40Hz to 20KHz.



The **RESONANCE** knob has different effects depending on the filter type, but in general turning it up causes the filter to emphasize or boost frequencies around the frequency set with the **FREQUENCY** knob.

Some of the filter types can self-oscillate at high resonance, resulting in a tone with the pitch determined by the setting of the frequency knob. This is not common in software-based filters, and may surprise you the first time you hear it.

## **Kompressor**

The compressor in Kombinat only has one control; thus, it is fairly obvious how to use it. If you want more of the compression effect, simply turn the knob up. This will have the effect of evening out the signal coming out of the filter, so that the parts of the signal that would be low in volume are much more apparent, and nearly as loud as the loudest parts of the signal. This will also add a couple dB of level to the overall signal, and make it a bit more "knocky." When you send the compressor extremely high-level signals, it begins to operate in an unpredictable manner, and will add distortion to the signal.



For the technically inclined, the compressor is always on, the attack is always 5ms, the release is always 50ms, and the ratio is always 1000:1. At the left-most setting, the threshold is 0dB. When the knob is completely clockwise, the threshold is -30dB, and the input and output gains are raised to compensate.

## **Feedback**

Kombinat has an internal feedback path that can route its output signal back into the input, mixing it with the usual incoming signal. This can intensify Kombinat's distortion and create ringing oscillations and other unpredictable effects. It's a somewhat experimental feature; while you might not find it useful all the time, it's worth trying now and then just to see what happens.

The **AMOUNT** knob changes the amount of the output that gets fed back; the numeric display shows this amount. The feedback path is also controlled by an envelope follower that responds to the level of the plug-in's input signal (before the feedback signal is added). This envelope follower *reduces* the gain of the feedback path when the



input signal is small, reducing Kombinat's tendency to oscillate continuously at high settings of the **AMOUNT** slider. The envelope follower has two numerical controls which adjust how rapidly it responds to changes in the input signal. The **ATTACK** control changes how quickly it increases the feedback signal as the input signal increases, and the **DECAY** control sets how quickly it responds as the input signal decreases. Click and drag vertically on the numerical controls to change their values. The controls respond to where you click them, and will change by whichever digit you click on when you start dragging.

## Levels and Mix

The **INPUT** and **OUTPUT** level controls provide overall gain control of the signals entering and leaving the plug-in. The **INPUT** control has a range of -40 to +6dB; the **OUTPUT** control has a range of -60 to +6dB. Since many of Kombinat's engine types operate in part by boosting signals to high levels, you may find the **OUTPUT** level control handy for keeping things under some semblance of sanity. Also, since the effects created by the engines are all very much dependent on the level of the signals they process, you may find that simply changing the **INPUT** gain can radically alter what you hear coming out of Kombinat.



The **MIX** knob blends Kombinat's output with the original input signal. The amount of processed signal is expressed as a percentage; for example, 100% indicates that you're hearing only the processed signal and 50% indicates that you're hearing an equal blend of the input signal and the processed signal.

## Meters

There are several vertical meters in the top right area of Kombinat's window. From left to right, these meters reflect the following signal levels: the signals entering the plug-in, the signals entering each of the three engines, the amount of gain reduction applied by the Kompressor, and the signals leaving the plug in.



The orange level meters for the engines display different levels depending on the setting of the mode switch. In Multi mode the meters reflect the levels of the signals for the three separate frequency bands, since the three outputs of the crossover are sent individually to the three engines. If you kill a band altogether with its on switch, you'll see the corresponding engine's meter stay at zero. In Series mode, generally speaking, all three meters will be active since the signal passes through all three engines.

## **Automation**

All of Kombinat's parameters can be automated using your host's automation features. Consult your host's documentation for information on how to use these features.

## **And Finally...**

Thanks again for purchasing Kombinat. We make every effort to ensure your satisfaction with our products, and want you to be happy with your purchase. Please write [info@audiodamage.com](mailto:info@audiodamage.com) if you have any questions or comments.