

# Discord User's Guide

Audio Damage, Inc.

Release 4.0

The screenshot displays the Discord4/3-Audio software interface. At the top, the title bar reads "Discord4/3-Audio" and the main header shows the "DISCORD4 AUDIODAMAGE" logo. The interface is organized into several sections:

- MODE:** Includes buttons for "VINTAGE P1", "MODERN P2", "GRANULAR G2", "LINK R TO L", and "MIDI SHIFT".
- LEFT CHANNEL:** Features a "SEMI" knob set to 1200 and a "RIGHT" channel knob set to -1965.
- SHIFTER:** Controls for LFO 1 and LFO 2, with parameters for SIZE (31), PERIOD (20), and CHAOS (0.16).
- DELAY:** Controls for LFO 1 and LFO 2, with parameters for TIME (1/8), REGEN (-63.7dB), and X-REGEN (-71.0dB). A "SYNC" button is present.
- FILTER:** Two filter response graphs for LFO 1 and LFO 2.
- REVERB:** Controls for SIZE, DAMP, MIX, and FREEZE.
- PANORAMA:** Controls for LEFT and RIGHT.
- Bottom Section:** Includes an "INPUT" level meter (-14.9dB), two "LFO" sections (LFO 1 and LFO 2) with "SYNC" buttons and parameters for RATE, SHAPE, SKEW, and WARP, and "MIX" (56%) and "OUTPUT" (-12.6dB) meters.

31 January 2018

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## **Credits**

Software Design and Construction, Documentation

Chris Randall  
Adam Schabtach

Field Testing

Eric Beam  
Simon-Claudius Wystrach  
Steve Hamman  
Jeff Laity  
Ken Flux Pierce  
Christian Puffer  
Joshua Schnable

Made Possible By

Elle  
Tracie

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# Introduction

Thank you for purchasing Discord4, the newest version of Audio Damage's best-selling Discord series of pitch-shifting based effect plug-ins. A pair of three-algorithm pitch shifting blocks combine with a warm, "vintage" style, true-stereo, tempo-synced delay and a stereo reverb to give you a multi-effect with an extremely broad palette of unique and usable special effects. From subtle ADT and chorusing, shimmering glissandos, to mad-house granular destruction and saturated feedback, Discord4 is a sound designer's best friend, and an excellent addition to the Discord family of effects.

## New in Version 4.0

Version 4.0 improves Discord in many ways:

- A new reverb processor
- Refinements to the granular processor, providing overall improvements to the sound quality and a more useful Chaos control
- Redesigned LFOs with a variety of shaping controls and animated displays
- Output panorama controls for adjusting the stereo width of Discord's output
- A completely new, resizable user interface, appropriate to contemporary display technologies
- Discord is now compatible with AAX and VST3 hosts
- Presets use a cross-platform XML-based file format
- Discord is built with up-to-date code libraries for better host compatibility and future-proofing

Discord version 4 has a different name and internal identifier than previous versions. This means that you can install version 4 alongside whatever version you are currently using and continue to use the older version in your existing projects. Version 4 cannot be directly substituted in existing projects and cannot read preset files created by earlier versions.

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

# System Requirements

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

Discord 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 assume that you are familiar with using plug-ins with your host. If you have general questions about using plug-ins with your host, please refer to its documentation.

We support the use of Discord under Microsoft Windows 8 or newer, and Apple OS X version 10.9 or newer.

## Installation

To install Discord, double-click the Discord 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 `Discord4.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/`.

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

## Operation

Discord is a digital pitch-shifter, delay and reverb plug-in. The P1 algorithm, "Vintage," is modeled after a particular vintage unit which is still highly desired for its vocal-doubling abilities and chorusing effects. P2, "Clean," is a more modern shifting algorithm, with a sound that emphasizes bell-like harmonics at more extreme settings. The G2 algorithm, "Granular," provides a very smooth pitch shift within 5 semitones of the original program material, but is easily capable of far more extreme sound-effects style shifting and chaotic behavior than P1 or P2.

The signal path of Discord4 expands on the general design of digital pitch-shifting delays of the early 1980s. The input signal passes first through the pitch shifters, then the delays, then adjustable-width filters, and then the reverb. The output of the reverb is fed back to the pitch shifters, for accumulating pitch-shifting effects and reverberant washes of sound. The pitch shifters have an accurate range of one octave sharp or flat, but Discord's controls allow a range of three octaves up or down for creating special effects.

Discord is a true stereo processor. If used in a stereo context (for example, as an insert on a stereo channel in your DAW's mixer), the left and right channels are processed independently with no summing. If you use the plug-in in a mono context, the incoming signal is routed to both the left and right processors and their outputs are added together.

Discord uses knobs for most of its controls. Click and drag either vertically or horizontally to manipulate the knobs. Double-clicking a knob will return it to its default value, which will usually be the parameter's most neutral setting.

There are independent right- and left-channel controls for the pitch shifters, delays, and filters. The controls for the left channel are in the upper half of Discord's window. If you turn on the **LINK R TO L** switch, the left and right controls are linked together so that you can adjust both channel parameters simultaneously.

The following screen shot shows Discord's user interface. The controls are described in the following paragraphs.



## 1. Pitch Shifters

The mode switches at the left of Discord's window chooses one of three modes of operation for Discord's pitch shifters. These modes are:

- **P1, Vintage:** this mode is a careful reproduction of hardware pitch shifters from yesteryear. P1 is also the pitch shifting algorithm used in the earliest versions of Discord.
- **P2, Clean:** this mode is similar to P1 but usually produces a cleaner shifted sound than P1, particularly at smaller shifting intervals. At larger intervals it can take on an interesting metallic quality that is useful for special effects.
- **G2, Granular:** this mode is derived from a signal-processing technique called *granular synthesis*. Granular synthesis involves chopping a sound into short segments, called *grains*, and playing them back at different rates to vary the perceived pitch of the sound. Discord 4's granular processors are tailored for pitch-shifting applications but can create unusual effects ranging from a subtle tremolo to a pointillist spattering of sound.

The large numeric controls labeled **LEFT** and **RIGHT** controls change the amount that the pitch of the incoming signal is raised or lowered. The value in the display indicates the amount of pitch shift, expressed in cents or hundredths of a semitone. A positive shift amount increases (or sharpens) the pitch of the signal, while a negative amount decreases (or flattens) it. For example, a shift value of +1200 raises the signal's pitch by one octave, and a value of -700 lowers it a fifth. The **SHIFT** controls have a range of  $\pm 3600$ . You can change the shift amount by clicking and dragging up and down on the controls, or double-click them to type in a value. If you click the switch labeled **SEMI**, the shift intervals will be snapped to the nearest semitone as you drag up and down on the control.

When mode P1 or P2 is active, the **BUFFER** controls vary the size of the delay buffers used to create the pitch-shifting effect. Changing the buffer size allows you to tailor Discord's shifting process to work well with your source material. Larger buffers will generally create a smoother-sounding pitch shift but may blur the attack transients of drums and other sharp sounds.



When mode G2 is active, the **SIZE** and **PERIOD** knobs adjust Discord's granular processors. The **SIZE** control sets the length of each sound grain, in milliseconds (thousands of a second). The **PERIOD** control sets the spacing between the beginning of one grain and the next, also in milliseconds. Each control can have a dramatic influence on Discord's sound. Try adjusting both controls to produce a smooth shifting sound or special effects. If the size setting is about the same as or less than the period setting, the grains will no longer overlap, and you'll hear them as separate sounds. As you increase the period the grains will overlap and Discord's output will become smoother.

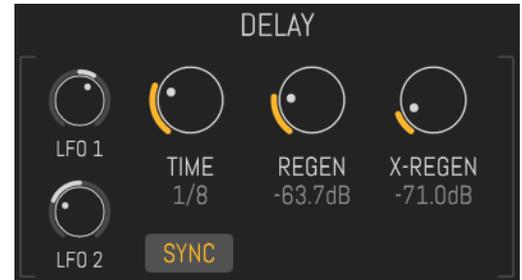
The **CHAOS** control applies a variable amount of randomization to the granular process. Turning the knob up increases the amount of randomization. The chaos control randomly varies the interval, and pitch of the sound grains. As a side-effect it also creates panning effects since the left and right granular processors are randomized independently.

The small knobs labeled **LFO 1** and **LFO 2** control how much the LFOs (described in detail later) change the pitch-shift amounts. If the knobs are left at their center position the LFOs have no influence on the pitch shifters. Turn the knob clockwise to cause the corresponding LFO to raise the shift amount; turn it anti-clockwise to cause it to lower the shift amount.

## 2. Delays

The **TIME** knobs change the amount that the pitch-shifted signals are delayed in relation to the original (dry) signal. Each delay has a range of 0 to 2000 msec, or two seconds.

The delay controls operate either in units of time or in metrical units, that is, fractions of a beat. Click on the **SYNC** switch to switch between the two modes.



If the **SYNC** mode is active, Discord uses the current tempo reported by your host to calculate its delay time. In this mode the delay time control sets the delay length in metrical units. The range of values is  $1/32^{\text{nd}}$  to  $2/1$  (two measures), with dotted and triplet times available. Triplet values are denoted with a "T" after the beat fraction, and dotted values are denoted with a "D". For example, "1/8D" indicates a delay time with a dotted eighth note feel. Discord will track tempo changes, saving you from having to adjust its delay time by hand when you change the tempo of your song.

Short delay times can enhance a chorusing or doubling effect created with small amounts of pitch shifting. If you set the left and right delay times to slightly different values, Discord will produce a wide stereo chorus. Long delay times create familiar echo effects. In conjunction with pitch shifting and feedback, long delays produce echoes that ascend or descend in pitch.

The **REGEN** knob controls the regeneration level, that is, the amount of the output signal which is fed back into the pitch shifter. Note that the feedback path goes through the delay lines, the filters and the reverb before returning to the pitch shifter. Extreme rising and falling pitch effects can be obtained with longer feedback times when the pitch shift amount is set to a value other than zero. The plug-in will self-oscillate at higher feedback settings, creating interesting noise effects.

The **X-REGEN** knob controls a second feedback path. As you turn this knob up, some of the signal is fed to the input of the other channel. For example, if you move the right-channel **X-REGEN** knob, the right channel output signal is fed back into the input of the left channel. This cross-channel feedback can be used to create delay effects that bounce back and forth, thicker chorusing, more complex pitch-shift effects, etc.

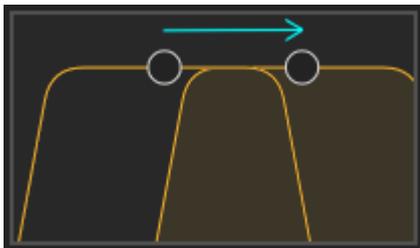
The small knobs labeled **LFO 1** and **LFO 2** control how much the LFOs (described in detail later) change the delay times. If the knobs are left at their center position the LFOs have no influence on the delay times. Turn the knob clockwise to cause the corresponding LFO to increase the delay time; turn it anti-clockwise to cause it to decrease the delay time.

If you use an LFO (or automation, or a MIDI controller) to modulate the delay time, you will hear a change in pitch also. This is separate from the pitch change created by the pitch shifter, and an inherent side-effect of dynamically changing the time of a delay. (Delay effects of lesser quality than Discord make nasty clicking sounds rather than altering the pitch of the delayed signal, which is why you may not have noticed that changing delay times affect pitch.)

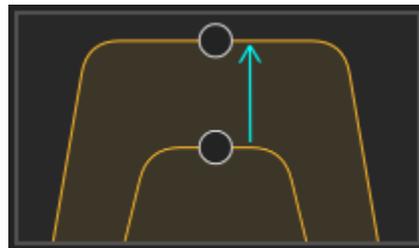
### 3. Filters

Discord has low-pass and high-pass filters which come after the delay lines in the signal chain. These filters can be adjusted to alter the timbre of the pitch-shifted and delayed signal. For instance, you can use the low-pass filter to create a “darker” sound, or the high-pass filter to create a “thinner” sound.

The filters are controlled in tandem with the graph-like controls labeled, appropriately enough, **FILTER**. Since the filter controls change the low- and high-pass filters simultaneously the filters act like a band-pass filter with a variable width. Dragging the white circle in the control changes the corner frequencies of both filters. Dragging up and down moves the corner frequencies farther apart and closer together; dragging left and right moves the frequencies in the same direction. As you pull the white dot downwards, the filters move together and allow only a narrow band of frequencies to pass through. You can then move the dot left and right to hear that band move up and down in frequency.



Moving the white dot horizontally changes the filter frequencies in the same direction, moving the frequency pass-band higher and lower



Moving the white dot vertically moves the filter frequencies together and apart, making the frequency pass-band narrower and wider

The behavior of the filters is easier to hear than to describe in words. If you play with the filter controls a little while running a signal with broad frequency content (like a bright synth pad or a drum loop with cymbals)

through Discord, you'll hear their effect. It may be helpful to set the **MIX** knob to the far right so that you hear only the processed signal.

The small knobs labeled **LFO 1** and **LFO 2** control how much the LFOs (described in detail later) change the filter frequencies. If the knobs are left at their center position the LFOs have no influence on the filters. Turn the knob clockwise to cause the corresponding LFO to raise the filter frequency; turn it anti-clockwise to cause it to lower the frequency.

## 4. Reverb

After the filters, the signal passes through Discord's reverb. This reverb isn't intended to distinguish itself as a high-quality reverberation processor; for that goal, we'll point you towards our ADverb and Eos plug-ins. Instead, Discord offers this interesting twist: the reverb is part of the feedback path for the pitch-shifters and delays. Signals pass through the reverb as they recirculate, allowing you to smear sounds out into shimmering clouds.

The **SIZE** knob controls the apparent size of the simulated reverberant space. In other words, turning up the **SIZE** makes the reverb sound bigger. It also increases the decay time of the reverb sound.

The **COLOR** knob adjusts the tone of the reverb. Turning it up makes the reverb sound brighter.

The **MIX** knob adjusts the balance of the signal entering the reverb and the reverb's output. At its center position, you'll hear an equal amount of the input signal and the reverb. If you turn it all the way anti-clockwise you'll hear only the input signal, and if you turn it all the way clockwise you'll hear just the reverb. Bear in mind that in this context the input signal is the output of the pitch shifters, delays, and filters, *not* the signal originally entering the plug-in.

The **FREEZE** button is like an infinite-sustain button. If you turn on **FREEZE**, the sound currently present in the reverb will be sustained indefinitely, and the reverb's input signal will be turned off.



## 5. LFOs

Discord has two low-frequency oscillators (LFOs) that can be used to change, or modulate, the amount of pitch shifting, the delay times, and the frequencies of the filters. Hence the LFOs can be used to create vibrato or trill effects by changing the pitch, doubling and chorusing effects by changing the delay time, and tonal changes by changing the filter frequencies.



The **RATE** knob controls determine how fast the output of the LFO varies over time. They operate either in units of frequency (Hertz, or cycles per second), or in metrical units. The LFO's rate can be set from one cycle every 100 seconds (or 0.01 cycles per second, abbreviated 0.01 Hz) to 14 cycles every second (14 Hz). Click on the word **SYNC** to switch between the two modes.

The shape of the LFO's output is controlled with the **SHAPE**, **SKEW**, and **WARP** knobs. The **SHAPE** knob adjusts the basic shape of the signal, morphing it smoothly through four standard shapes: a double sine wave (i.e. a sine wave with twice the frequency set by the Rate knob), a sine wave, a triangle wave, and a square wave.

The **SKEW** knob adjusts the horizontal symmetry of the wave, and has a different effect depending on the wave's initial shape. For example, if the **SHAPE** knob is set to produce a triangle wave, the **SKEW** knob varies the wave from a downward-sloping ramp to a rising ramp. If the **SHAPE** is set to a square wave, the **SKEW** knob varies the duty cycle of the wave.

The **WARP** knob applies an adjustable curvature to the wave, changing its vertical symmetry. It can bend a triangle wave into a sharp spike and change a sine wave into a rounded pulse.

The effects of these three knobs are related, and it's far easier to understand what they do by seeing them in action than by reading a description. To that end, Discord's LFOs have animated displays. Try setting the **RATE** to about 1Hz, and set both **SKEW** and **WARP** to zero. Turn **SHAPE** all the way clockwise and you'll see a simple square wave. Turn **SHAPE** down slowly and you'll see the wave change into a triangle, then a sine, then a double sine. Set **SHAPE** back to 0.75 to get a triangle wave, then play with the **SKEW** and **WARP** knobs to explore their influence.

## 6. Panorama

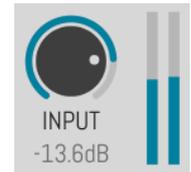
The knobs labeled **PANORAMA** position Discord's left and right output signals in the stereo field. At their default settings, as shown here, the output signals are panned all the way to the left and right. If you rotate them towards the center position, the signals move inwards from those extremes. You can set them both at the center position to produce a mono output, and you can rotate them further to swap the channels. Since Discord can effectively decorrelate the signals passing through it—particularly if the granular shifter is active—these knobs are handy for controlling the apparent width of Discord's output. You can also automate them to produce panning effects.



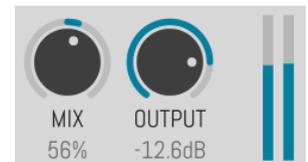
The Panorama knobs do not affect the original input signal, if it is present in Discord's output as set with the **MIX** knob (see below).

## 7. Master Controls

The **INPUT** knob controls the loudness of the signal entering Discord. Usually you'll leave this knob at its default setting of unity gain (0dB). You may want to decrease the level of the input signal by turning the knob anti-clockwise if you hear undesired distortion in Discord's output, particularly if you are using high feedback settings. Note that the level meters next to the knob display the total level of the input signal and the feedback signal; if these meters are consistently hitting the top of their scale, you probably want to turn down either the input level or the feedback levels, unless you're deliberately letting Discord run wild with feedback.



The **MIX** knob varies the relative amounts of the original (dry) signal and the processed (wet) signal in the plug-in's output. The **MIX** knob is bidirectional. At its center position equal amounts of the wet and dry signal are sent to the plug-in's output. As you rotate the knob to the right from the center position, the amount of wet signal increases and the amount of dry signal decreases. Rotating the knob left from the center has the opposite effect. If you rotate the knob to the extreme right or left position, the plug-in's output will have only the wet or dry signal, respectively. The value below the knob expresses the amount of wet signal in the output as a percentage.



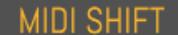
The **OUTPUT** knob controls the overall output level (volume) of the plug-in. As you rotate the knob clockwise the output becomes louder. The control has a range of -80dB, which turns the signal off for all practical purposes, to +3dB, to provide a small amount of boost for weak signals. In most cases you'll probably just leave this knob at its default setting of 0dB, or unity gain, but you can use it to quickly reduce the output level if Discord starts to get carried away with itself.

## 8. Master Switches

The **LINK R TO L** switch, when turned on, links the operation of each left-channel control to its counterpart on the right channel. When you manipulate a control on the left channel the corresponding control on the right channel will move also. Moving controls on the right channel does *not* affect the left channel. For example, you can use the left shift control to set the shift interval of both channels, then use the right shift control to detune the right channel relative to the left. Note that turning this switch on does not immediately change any of the plug-in's parameters, nor does it cause the channels to process audio any differently. You won't lose any of the plug-in's current settings when you turn this switch on or off. In other words, it's not the same as the channel-link control found on some stereo compressors. It merely provides a convenient way to set the parameters of both channels to the same values when you manipulate the left-channel controls.

A rectangular button with a dark grey background and the text "LINK R TO L" in a yellow, sans-serif font.

The **MIDI SHIFT** switch engages or disengages MIDI control of the shift amount. If the **MIDI SHIFT** switch is turned on, the **SHIFT** controls are disengaged and incoming MIDI note and pitch-bend messages set the shift interval. Pressing a note on your MIDI controller and/or manipulating the pitch bend wheel will set the pitch shifting effect accordingly, enabling you to play the pitch shifter as if it were an instrument. Middle C (MIDI note 60) sets the pitch shifter at zero, or no shifting. The range is three octaves below middle C to three octaves above middle C. The left and right pitch shifters are set to the same interval.

A rectangular button with a dark grey background and the text "MIDI SHIFT" in a yellow, sans-serif font.

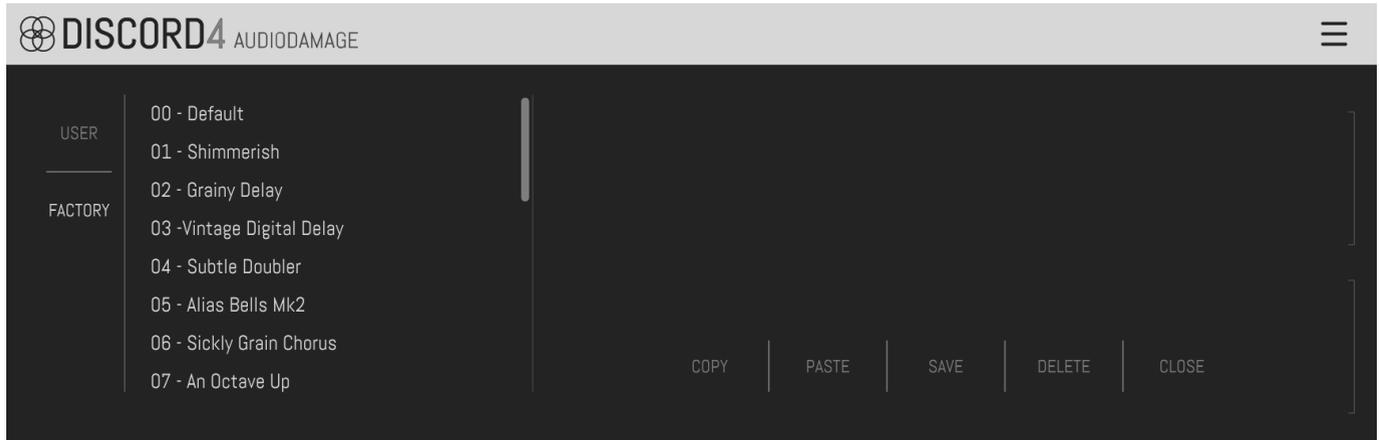
Note: Different hosts have different ways of allowing MIDI information to be routed to effects plug-ins. In some hosts, it is not possible to send MIDI information to effects plug-ins. Consult the documentation for your host if you are unsure about its MIDI routing capabilities.

## Automation

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

# Presets

Discord includes a number of built-in presets to serve as a demonstration of its capabilities and inspirations for your own creations. To access the presets, click the menu icon at the top-right corner of the window to invoke the preset browser. The scrolling list on the left shows the available presets; click one of the preset names to load its settings.



To save your own presets, click the **SAVE** button. You can save your presets anywhere you like, but if you place these files in Discord's own folder (located at C:\ProgramData\Audio Damage\Discord\Presets\ on Windows, /Library/Application Support/Audio Damage/Discord/Presets/ on OS X), your presets will appear in the scrolling list on the left when you click the **USER** button.

You can delete presets from the User list by clicking their name and then clicking the **DELETE** button.

The **COPY** and **PASTE** buttons copy the current settings to the system clipboard and paste settings from the clipboard. The settings are presented in a plain-text XML format so that you can exchange them online in forums, copy them between a Windows computer and a Macintosh, etc.

The **CLOSE** button closes the preset browser.

## **And Finally...**

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