

Replicant User's Guide

Audio Damage, Inc.

Release 2.0



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Introduction

Thank you for purchasing Audio Damage's Replicant, our delay-based plug-in for slicing, dicing, and looping your drum loops and other rhythmic audio. Replicant creates everything from simple delay and panning effects to stutters, automated filter sweeps and unpredictable random audio mangling.

You're probably much more interested in playing with Replicant than reading about it, but there are some subtleties of its operation which bear written explanation. This manual assumes you are familiar with at least the basics of using audio plug-ins and digital audio workstation (DAW) software or other software which hosts plug-ins. This manual provides explanations of all of Replicant's controls, how they operate and interact, and how you can use a hardware MIDI controller to control Replicant.

New in Version 2.0

Version 2.0 expands Replicant's audio-chopping repertoire with a new Stutter feature which slices audio into small chunks, creating a variety of glitchy and tonal effects. There are also several utilitarian features and enhancements:

- A new, resizable 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

Replicant 2 has a different name and internal identifier than version 1. This means that you can install Replicant 2 alongside whatever version you are currently using, and continue to use the older version in your existing projects. Version 2 cannot be directly substituted in existing projects and cannot read preset files created by version 1.

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

System Requirements

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

Replicant 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, etc¹. Obviously you'll also need a computer capable of running one of these applications.

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

Installation

To install Replicant, double-click the Replicant 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 `Replicant 2.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/` .

¹ Product names are copyrighted by their respective owners.

Operation

Replicant is essentially a tempo-based delay effect. The primary feature that distinguishes Replicant from standard delays is its notion of *beat triggers*, or simply *triggers*. Replicant divides each measure into 16 slices; each slice has a trigger. If a slice's trigger fires, Replicant loops and repeats some amount of audio of that slice. (In contrast, a standard delay loops and repeats all of the audio which passes through it.) Replicant has controls which determine how long the repeated audio segment is and how many times it is repeated. Replicant also has controls for filtering, panning, reversing and distorting the looped audio, creating rhythmic timbres not present in the original signal. Replicant can automatically create random variations of its own actions, and you can randomize all of its parameters at once with the click of a single button.

Replicant can be used in a mono, stereo, or mono-to-stereo context. In a mono context, the panning controls have no effect. In a stereo context, no summing of the input channels happens, and the panning effects are created by adjusting the levels of the two output signals with respect to each other (rather like the balance knob found on most stereos). In a mono-to-stereo context the panning effects move the mono output signal back and forth between the two output channels.

Replicant is useful as either an insert effect or a send/return effect. The **FX MODE** switches (described in greater detail below) allow you to choose different combinations of the unprocessed and processed signals.

Controls

Replicant's controls are arranged in several functional groups with the following headers: Repeater, Stutter, Selector, Panner, Filter, and Output. We'll describe each of the controls in each section.

1. Selector

The Selector, at the center of Replicant's window, includes several controls and indicators which affect how Replicant decides to repeat some portion of the incoming audio, relative to the beginning of each measure.

Trigger Buttons

Replicant has 16 circular buttons, arranged in a ring, called trigger buttons. Each trigger button represents a 16th note beat, so together they represent one measure of music. The topmost button corresponds to the beginning of the measure. As your music plays, a circle moves from one trigger to the next. Replicant doesn't do anything if your host program's transport isn't playing or recording, so this indicator doesn't move unless your host is playing or recording.

Each section is both a switch that you can turn on or off by clicking it with the mouse, and an indicator that changes when the trigger is active. If you turn a trigger button on by clicking it, it turns bright blue. If the trigger is active (i.e. Replicant is repeating audio), it turns yellow.

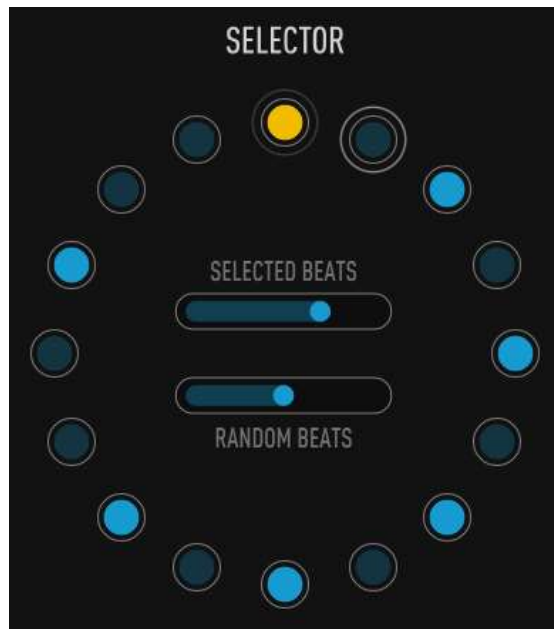
Probability Sliders

Inside the ring of trigger buttons are two sliders that control the likelihood that Replicant will begin repeating the audio on a given beat. Change their settings by clicking and dragging horizontally.

The upper slider, the **SELECTED BEATS** slider, determines the likelihood that Replicant will repeat the 16th-note beats whose trigger switches are on. Replicant is more likely to repeat these beats the farther to the right that you set this slider. If this slider is set all the way to the right, Replicant will always repeat beats whose trigger switches are on. If this slider is set all the way to the left, Replicant will not repeat any beats at all (unless beats are chosen based on the setting of the **RANDOM BEATS** slider, described next). If this slider is set somewhere near the middle, about half of the beats chosen with the trigger switches will repeat.

The lower slider, the **RANDOM BEATS** slider, determines how likely it is that any of the 16th-note beats in a measure will be selected for repetition, regardless of whether their trigger switches are on or off. If this slider is set all the way to the left, Replicant will not randomly repeat any beats. If this slider is set all the way to the right, Replicant will repeat every beat. If this slider is set somewhere in the middle, Replicant will randomly repeat beats about half of the time, regardless of the state of the trigger switches. When a beat has been randomly triggered, its trigger button turns a dim yellow.

In a sense, these sliders have complementary roles. Since the **SELECTED BEATS** slider only controls the probability of repetition of beats whose trigger switches are turned on, in general it has the effect of *reducing* the number of beats that are repeated. On the other hand, the **RANDOM BEATS** slider affects the probability that any beats will be repeated and hence generally has the effect of *increasing* the number of repeated beats.



2. Repeater

The controls at the left end of Replicant's window determine the length of the audio segments that Replicant repeats, and how many times it repeats them.

Loop Controls

The **LOOP SIZE** knob controls the length of the audio segments that Replicant repeats. Clicking and dragging upwards on the knob increases the length of the segments. The segment length can range from $1/128^{\text{th}}$ of a measure to a full measure. The letter 'D' denotes dotted values.

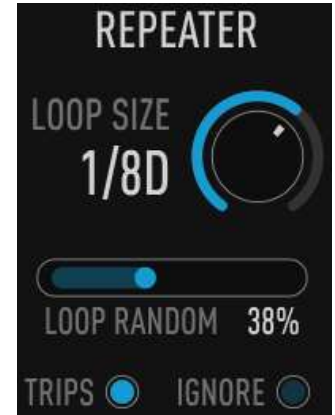
If the **TRIPS** (short for triplets) switch is turned on, then Replicant can choose segment lengths in triplet time values. This switch affects both the time values available when changing the **LOOP SIZE** control and the time values that Replicant chooses randomly. If this switch is not turned on, the lengths of the repeated audio segments are restricted to even note values and dotted values. Triplet values are denoted by the letter 'T'.

The **LOOP RANDOM** slider introduces random variations of the segment length. If this slider is positioned at its far left, it has no effect and the segments will always be the length set by the **LOOP SIZE** knob. As you move the slider to the right, the lengths of the segments become more varied. Note that Replicant does not change the length of a segment once it starts repeating it.

Repeat Controls

The **REPEATS** knob controls how many times Replicant repeats a segment of audio. The minimum setting is zero, meaning that Replicant plays a triggered segment only once. Dragging upwards on this control increases the number of times Replicant that repeats, with a maximum setting of 15 repetitions.

The **RPT RANDOM** slider causes Replicant to randomly vary the number of times it repeats. If this slider is set to its far left, it has no effect and the number of repetitions is entirely controlled by the **REPEATS** knob. As you move this slider to the right, the number of times that Replicant repeats any segment of audio will become more unpredictable, although it will not play any segment more than 16 times.



It is worth mentioning that the combination of a long **LOOP SIZE** setting and a high **REPEATS** setting will cause Replicant to churn away merrily on the same segment of audio for quite some time—as long as 16 measures.

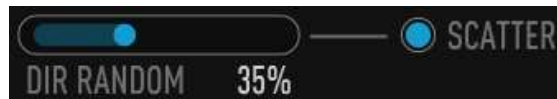
The **IGNORE** switch also affects how Replicant chooses beats for repetition. This switch determines what happens if Replicant is currently repeating and a new beat is selected for repetition (either because its trigger switch is on or because it is chosen randomly because the **RANDOM BEATS** slider is set higher than 0%). If the **IGNORE** button is engaged, Replicant ignores the new beat trigger and continues playing the audio it is repeating. Conversely, if the **IGNORE** button is off, Replicant stops playing the repeated audio it is currently playing and begins playing and repeating the newly selected beat.

Whether the **IGNORE** button has any effect depends on the settings of the **LOOP SIZE** and **REPEATS** controls. For example, if the **LOOP SIZE** is 1/64 and the **REPEATS** is 2, then the same thing happens regardless of whether **IGNORE** is on or off because Replicant will be finished playing two repetitions of 1/64th of a measure by the time it reaches the next triggered beat (since the beat triggers can occur at most every 1/16th of a measure). On the other hand, if the loop size is 1/4 the **IGNORE** button does have an effect, since it always takes more than 1/16th of a measure to repeat 1/4th of a measure.

Direction Controls

The **DIR RANDOM** slider and the **SCATTER** button cause Replicant to play repeated audio backwards. The **DIR RANDOM** slider determines how likely it is that audio will be played backwards. If the slider is at the far left, Replicant will never play backwards. The further that the slider is moved to the right, the more likely it is that Replicant will play backwards.

The **SCATTER** switches let you choose one of two different backwards-playback modes. If the **SCATTER** switch is off, every repetition of a repeated beat will be played in the same direction, either forwards or backwards. The likelihood that the repetitions of a beat will be played backwards is set by the **DIR RANDOM** slider. If the **SCATTER** switch is illuminated, Replicant will possibly reverse playback direction with each repetition of any repeated beat. The **DIR RANDOM** slider sets the probability that the direction will reverse. If the slider is set to the far right, the playback direction reverses with each repetition, so the repeated audio first plays forwards, then backwards, then forwards, etc.



3. Stutter

The group of controls labeled Stutter further subdivide the chunks of audio chosen by the Selector and Repeater controls. The resulting segments of audio are often so short that they're heard as beeps, buzzes, and other pitched noises that bear little resemblance to the original signal.

The **DIVISION** knob sets the divisor, that is, the fraction of the audio chunk that will be repeated. The available values are powers of two, that is, two, four, eight, 16, etc. on up to 128. Since the duration of the original chunk is set by the **LOOP SIZE** knob, the final length of the repeated slice of audio is equal to the **LOOP SIZE** divided by the **DIVISION**. For example, if the **LOOP SIZE** is 1/8 and the **DIVISION** is four, the audio slice will be equal to the duration of a 1/32 note. That audio slice will be played four times within that duration. The **REPEATS** knob sets how many times the audio slice will be played again. Continuing the example, if **REPEATS** is five, the 1/32nd-sized slice of sound will be played 24 times: four times for the initial triggering followed by five repetitions of four.

Since the **LOOP SIZE** ranges from full measure down to a 1/128th note, and since the **DIVISION** parameter goes from 2 to 128, it follows that Replicant produces audio slices ranging in length from half a measure down to the equivalent of a 1/16384th note, if there were such a thing. The result can sound like anything from a short loop of audio to a high-pitched tone—or a tone so high that it's above the range of human hearing. For example, at a tempo of 120bpm, a 1/4096 note is only a little more than 1/10,000 of a second long. Our ears don't perceive something that happens 10,000 times per second as discrete events; instead we hear a high-pitched tone with a frequency of 10,000Hz. It is also entirely possible, depending on the signal you're running through Replicant, that there is nothing but silence within the first fraction of the audio present when the Stutter effect is triggered. This means that at some combinations of extreme settings, there's a good chance that you won't hear anything at all.

The **LENGTH** knob acts like a gate that silences part of each repetition of the audio slice. This knob can be set from 1% to 100%. At 100%, the gate is on all the time and has no effect. As you rotate the knob counter-clockwise, the gate starts to silence part of the audio slice. If the **LENGTH** knob is set to 50%, the second half of the slice is silenced each time it is played. Since the gate duration can be as short as 1%, you may not hear anything at all at low settings of the **LENGTH** knob, depending on your input material and the length of audio slices (determined by the **DIVISION** knob and the **LOOP SIZE** knob, as described previously).



The **PITCH** knob changes the pitch of the audio slice as it repeats. Each time the slice is played the rate at which it plays is increased or decreased slightly, causing its pitch to rise or fall with each repetition. If the knob is set to its center position the pitch of the audio slice is not changed. If you move the knob clockwise, the pitch rises; if you move the knob anti-clockwise, the pitch falls.

The Stutter effect doesn't necessarily happen every time Replicant repeats a 1/16th segment of audio. Whether the subdivision controlled by the Stutter controls happens is determined randomly, with a probability set by the **STR RANDOM** slider. If the **STR RANDOM** is set all the way to the left, the Stutter effect never happens (and the settings of the controls are irrelevant). Moving the slider to the right increases the likelihood that the Stutter effect will kick in any time Replicant triggers. If you set the slider all the way to the right, the effect will happen every time.

4. Filters

Replicant has two 2-pole filters (four if used in a stereo context), one low-pass filter and one high-pass filter. These filters can be adjusted to alter the timbre of the looped audio. 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 graph-like filter controls set the corner frequencies and resonance values of the corresponding filter. Dragging the white circle left and right changes the filter's frequency and dragging it up and down changes the resonance. Since the filters have complementary frequency responses, the controls in some sense operate opposite from one another. A low-pass filter attenuates signals above its cutoff frequency, passing lower-frequency signals; whereas a high-pass filter attenuates signals below its cutoff frequency, passing higher-frequency signals. As you move the **LOW-PASS** filter control's circle to the right, the corner frequency of the low-pass filter increases, allowing more of the signal to pass. On the other hand, as you move the **HIGH-PASS** filter control's circle to the right, the corner frequency of the high-pass filter increases, allowing *less* of the signal to pass. The low-pass filter has a frequency range of 40 to 20,000Hz and the high-pass filter has a range of 10 to 10,000Hz.



These filters are connected in series, i.e. the looped audio signal passes first through the low-pass filter and then through the high-pass filter. If you set the frequency of the low-pass filter to less than the frequency of the high-pass filter, you'll hear little or no output signal.

Moving the white circles vertically changes the resonance of the filters. Increasing the resonance of a filter causes it to accentuate the frequency components of a signal near the filter's corner frequency. This makes the filter sound more "electronic" and at high values creates a whistling sound.

5. Panner

Replicant includes an automatic panning section which moves the repeating audio back and forth in the stereo field. The auto-panner is controlled by three knobs and a switch.

The **POSITION** control sets the initial stereo placement of the looped audio. If the position is set to **CTR** (center), the audio is placed at the center of the stereo field. Turning the knob left or right moves the processed audio in the same direction.

The **SPEED** knob controls the speed at which that the auto-panner moves the looped audio. If this knob is placed at the center position, the auto-panner has no effect. If you turn this slider to the right, the looped audio moves to the right with each repetition, and moves to the left if you move the knob the other way. The further you move the knob (in either direction) the faster the auto-panner moves.

The **WIDTH** knob adjusts the overall effect of the auto-panner. Clicking and dragging the knob upwards increases the distance the audio appears to move from the center. If **WIDTH** is set to zero, the auto-panner has no effect.

The **PAN WRAP** buttons control how the panner operates when it reaches one side of the stereo field or the other. If the **PAN WRAP** button is turned off, the panner changes direction when it reaches either side; that is, it bounces, or reflects, from one side to the other. This panning style is similar to a ping-pong stereo delay. If the **PAN WRAP** button is illuminated, the panner jumps to the other side when it reaches either side and continues in the same direction.

If Replicant is inserted in a mono-in/mono-out context in your host program, the panning controls have no effect.

When the **FILTER STATIC** button is turned on, the filters operate at the frequencies you set with their controls. When the button is not engaged, the filters are automatically modulated or swept as the looped audio repeats. The first time the audio is played back the filters



are set to their highest and lowest frequency settings, respectively (i.e. the low-pass filter is set to 20kHz and the high-pass filter is set to 10Hz), and the audio is passed without alteration by the filters. On subsequent repetitions of the looped audio the filter frequencies are moved toward the frequencies set with the filter controls. On the last repetition of the audio the filter frequencies reach the values set by the controls. In other words, the filters open fully for the first repetition of the audio, and close to the frequencies set by the controls as the audio repeats. This can be used to impart a changing timbre to the repeated audio to make it more distinct from the original.

6. Output Controls

The controls in this section affect how the repeated audio is mixed with the incoming audio. There is also a bit-reduction control and buttons for randomizing Replicant's parameters.

Level Controls

The **VOLUME** knob controls the volume (loudness) of the looped and filtered audio signal. Turning this knob up makes the processed signal get louder. It has a range of -40dB (quite a lot of attenuation) to +6dB (a modest amount of boost). You can use this slider to compensate for the loudness changes created by the resonant filters and/or the bit-depth reducer. This control does not affect the unprocessed signal.

The **DECAY** knob determines how much, if any, the looped audio diminishes in loudness each time it is played. If the **DECAY** knob is turned all the way anti-clockwise, the looped audio is played back with the same loudness with each repetition. If you turn the knob up the looped audio becomes quieter each time it repeats. At the maximum position the audio usually fades out altogether before you hear the last repetition. You can use this control to make Replicant sound more like a traditional delay effect. This control has a range of 0dB (no decay) to -6dB per repetition.

Bit Reducer

The **BITS** knob controls a bit-depth reducer applied to the looped audio. Turning this knob to the left effectively reduces the number of bits used to represent the audio signal. This creates "lo-fi" effects associated with older hardware samplers, hand-held electronic games, etc. The bit-depth reducer affects the signal before it reaches the filters, so you can use the low-pass filter to reduce the high frequencies and remove some of the edge created by bit-depth reduction. (Alternatively, you can use the



high-pass filter to remove the lower frequencies, accentuating the edge.) Note that at very low settings the bit-depth reducer can increase the amplitude of the signal substantially. Please exercise caution and use the volume slider to compensate.

Randomize Buttons

Clicking the **RAND ALL** button sets most of Replicant's parameters to randomly chosen values. Click this button when you want to create an effect with Replicant that you might not come up with by yourself. The **FX MODE** and **BITS** parameters are excluded from randomization to reduce the chance that Replicant will create unexpectedly loud output signals. The **RAND HOLD** button is also not changed randomly.

The **RAND HOLD** button, when turned on, causes Replicant to use the same series of randomly generated events for each measure, based on the settings of all parameters at the beginning of the measure. This means that Replicant will generate the same pattern of repeated audio loops until you change any of the controls that are affected by randomly chosen values—essentially all controls other than the filter controls, the panning controls, and the output controls. The **RAND HOLD** button is checked only at the beginning of each measure. As a result, you may find it most effective to turn the button on, listen to Replicant's output and decide whether or not you find it interesting, and if not turn the button off and back on again as Replicant's position indicator moves past the beginning of the next measure (i.e., the top of the dial). This will cause Replicant to generate a new series of random events which will be preserved until you toggle the **RAND HOLD** button again.

Effects Mode

The **FX MODE** pop-up menu chooses different signal-mixing configurations. The different configurations control how Replicant mixes the processed signal with the incoming signal to form its output signal, and are appropriate for the different ways in which a plug-in can be inserted in the signal paths in your host software.



- The **MIX** mode mixes the input signal with the output signal in equal amounts. This mode is appropriate when you're using Replicant as an insert effect on one channel of your host software's mixer, and you want to hear both the original signal and the processed signal mixed together.
- The **DUCK** mode silences the input signal when it is playing back looped audio, and passes the input signal without alteration otherwise. This mode is useful when you're using Replicant as an insert effect, and you want to hear the original signal and the processed signal but not both at once.
- The **SEND** mode does not pass any of the unprocessed input signal to Replicant's output. You hear only the looped audio. This mode is useful when you're using Replicant as a send effect in your host's mixer, sending one or more channels to it and mixing its output with the other signals.

Manual Triggers and MIDI Triggering

The stack of buttons in the Selector labeled Manual lets you slice and repeat audio on the fly. Clicking one of the buttons labeled 1/1 through 1/128 has the same effect as if the **LOOP SIZE** is set to the same length as the button, and Replicant triggers itself.

Replicant can also be triggered by MIDI note messages, which are mapped to the manual trigger buttons. The top-most button corresponds to MIDI note C2.

Replicant will keep repeating as long as you hold down one of the Manual buttons or the corresponding MIDI key. MIDI triggering overrides Replicant's own triggering, but is affected by the various randomization sliders.

Presets

Replicant comes with a selection of presets to illustrate its capabilities and provide you with starting points for creating your own audio mayhem. You can flip through the presets by clicking the arrows to the left of the preset name near the top of Replicant's window.

You can also click the name itself to invoke a popup menu with several handy features. The menu lists all the factory-installed presets. There is a Save As command for saving your settings in individual files. If you place these files in Replicant's own folder (located at `C:\ProgramData\Audio Damage\Replicant\Presets\User on Windows`, `/Library/Application Support/Audio Damage/Replicant/Presets/User on OS X`), your presets will appear on this menu.

There are also commands for copying the current settings to the system clipboard, and pasting 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.

And Finally...

Thanks again for purchasing Replicant. 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 if you have any questions or comments.

