

# Replicant User's Guide

Audio Damage, Inc.

Release 1.0



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## **Credits**

Software Design and Construction, Documentation

Chris Randall

Adam Schabtach

Field Testing

Wade Alin

Chad Beckwith

Steve Hamann

Anu Kirk

Henry Stamerjohann

Made Possible By

Tracie Bork

Lisa Randall

Fuzzy Logic

Alex

Chica

Fatty

Pablo

Widget

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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.

## System Requirements

To use Replicant, you'll need a Steinberg VST-compatible host application which conforms to the VST 2.0 specifications, and a computer capable of running it. For the AudioUnit version of Replicant, you'll need an application capable of hosting AudioUnit plug-ins, and a computer capable of running it. Replicant requires tempo and synchronization information from its host program; most contemporary, commercial digital audio sequencers provide this but many special-purpose plug-in hosts do not. The following specifications represent minimum requirements.

For use with Microsoft Windows:

- Windows XP
- 512 MB RAM
- Pentium III 600 MHz CPU
- High Color S-VGA Display

For use with Apple Macintosh:

- Mac OS X version 10.3.9 or newer
- 512 MB RAM
- Motorola G4 or Intel CPU
- Display capable of "thousands of colors"

## Installation

Double-click the Replicant Installer icon, and follow the instructions. During the installation process the installer will ask you to enter your registration code. Your registration code uniquely identifies your purchase, and you will need it if you need to reinstall your plug-in (for example, after upgrading to a new computer). Keep a copy of the code in a safe location and please don't share it with your friends. We're delighted if you like our products so much that you want to share them, but please ask your friends to buy their own copy so that we can keep making new products.

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/`, and your AudioUnits folder, which is located at `/Library/Audio/Plug-Ins/Components/`. To un-install from Windows, use the included un-installer application.

## 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



## 1. The Big Dial

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

### 1A. Trigger Ring

The outermost ring is the trigger ring, designated 1A in the screenshot above. The ring is divided into 16 sections; each section is both a switch that you can turn on or off by clicking it with the mouse, and also an indicator that becomes brighter when the trigger is active. You can also turn several switches on or off in succession by clicking on a switch and dragging the mouse pointer onto other switches.

The trigger ring represents one measure of music, so each section represents a 16<sup>th</sup> note beat. The topmost right-hand section corresponds to the beginning of the measure. A small indicator inside the ring revolves in sync with your host program's transport. 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.

## 1B, 1C. Opportunity Sliders

Inside the trigger ring are two arc-shaped sliders, the **OPPORTUNITY** sliders. These two sliders control the likelihood that Replicant will begin repeating the audio on a given beat. Change their settings by clicking and dragging within the arcs.

The upper slider, the **SELECTED BEATS** slider, determines the likelihood that Replicant will repeat the 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** opportunity slider, determines how likely it is that any of the 16<sup>th</sup>-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.

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. Repetition Controls

The knobs and switch in the upper-left region of Replicant's window determine the length of the audio segments that Replicant repeats, and how many times it repeats them.

### 2A. Length Controls

The **LENGTH** knob controls the length of the audio segments that Replicant repeats. Turning the knob clockwise increases the length. The segment length can range from 1/128<sup>th</sup> of a measure to a full measure.

The **RAND** knob introduces random variations of the segment length. If this knob is turned fully counter-clockwise, it has no effect and the segments will always be the length set by the length knob. As you rotate this knob clockwise, the lengths of the segments become more varied. Note that Replicant does not change the length of a segment once it starts repeating it.

If the **TRIPLETS** switch below the **LENGTH** knob is turned on, then Replicant can choose segment lengths in triplet time values. This switch affects both the time values available when rotating the **LENGTH** knob 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.

The current segment length, as set by the **LENGTH** knob and the **TRIPLETS** switch, is displayed above the **LENGTH** knob. Note that this display does not reflect the affect of the **RAND** knob.

## 2B. Repeat Controls

The **REPEATS** knob controls how many times Replicant repeats a segment of audio. The farther you rotate this knob clockwise, the more times Replicant repeats, with a maximum setting of 16 repetitions.

The **RAND** knob causes Replicant to randomly vary the number of times it repeats. If this knob is rotated fully counter-clockwise, it has no effect and the number of repetitions is entirely controlled by the **REPEATS** knob. As you rotate this knob clockwise, the number of times that Replicant repeats any segment of audio will become more unpredictable, although it will not repeat any segment more than 16 times.

The display above the **REPEATS** knob shows its current setting. This display does not reflect the effect of the **RAND** knob's setting.

It is worth mentioning that the combination of a long **LENGTH** 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.

## 2C. Sequence Mode Buttons

The **SEQ MODE** buttons also affect how Replicant chooses beats for repetition. These buttons determine 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 **RETRIG** button is engaged, Replicant stops playing the repeated audio it is currently playing and begins playing and repeating the newly selected beat. If the **IGNORE** button is engaged, Replicant ignores the new beat trigger and continues playing the audio it is repeating.

Whether or not the **SEQ MODE** buttons have any effect depends on the settings of the **LENGTH** and **REPEATS** knobs. For example, if the **LENGTH** is  $1/64$  and the **REPEATS** is 2, then the same thing happens regardless of how the **SEQ MODE** buttons are set because Replicant will be finished playing two repetitions of  $1/64^{\text{th}}$  of a measure by the time it reaches the next triggered beat (since the beat triggers can occur at most every  $1/16^{\text{th}}$  of a measure). On the other hand, if the length is  $1/4$  the seq mode buttons do have an effect, since it always takes more than  $1/16^{\text{th}}$  of a measure to repeat  $1/4^{\text{th}}$  of a measure.

## 2D. Direction Controls

The **DIR MODE** buttons and the **DIR RAND** knob cause Replicant to play repeated audio backwards. The **DIR RAND** knob determines how likely it is that audio will be played backwards. If the knob is rotated fully counter-clockwise, Replicant will never play backwards. The further that the knob is rotated clockwise, the more likely it is that Replicant will play backwards.

The **DIR MODE** switches let you choose one of two different backwards-playback modes. If the **CONSTANT** switch is depressed, every repetition of a particular 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 RAND** knob. If the **SCATTER** switch is depressed, Replicant will possibly reverse playback direction with each repetition of any repeated beat. The likelihood that the direction reverses is set by the **DIR RAND** knob. If the knob is rotated fully clockwise, the playback direction reverses with each repetition, so the repeated audio first plays forwards, then backwards, then forwards, etc.

## 3. 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 **LPF** and **HPF** knobs set the corner frequencies of the corresponding filter. Since the filters have complementary frequency responses, the knobs 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 rotate the **LPF** filter control clockwise, the corner frequency of the low-pass filter increases, allowing more of the signal to pass. On the other hand, as you rotate the **HPF** filter control clockwise, the corner frequency of the high-pass filter

increases, allowing less of the signal to pass. The current values of the filters are shown in the numeric display above the knobs. 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.

The knobs labeled **RES** control 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.

When the **STATIC** button is depressed, the filters operate at the frequencies you set with the **LPF** and **HPF** knobs. 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 **LPF** and **HPF** knobs. On the last repetition of the audio the filter frequencies reach the values set by the knobs. In other words, the filters open fully for the first repetition of the audio, and close to the frequencies set by the knobs 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.

## 4. Panning

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 pair of buttons.

The **WIDTH** knob controls the overall effect of the auto-panner. The further this knob is rotated clockwise, the greater the distance the audio appears to move from the center. If this knob is rotated fully counter-clockwise, the auto-panner has no effect.

The **POSITION** knob controls the initial stereo placement of the looped audio. If this knob is turned to its center 12 o'clock position, the audio is placed at the center of the stereo field. Turn it clockwise to move the audio to the right, counter-clockwise to move it to the left.

The **DIR/SPD** knob controls the direction that the auto-panner moves the looped audio and the speed with which it moves. If this knob is turned to its center 12 o'clock position, the auto-panner has no effect. If you

turn this knob clockwise, the looped audio moves to the right with each repetition, and moves to the left if you turn this knob counter-clockwise. The further you turn the knob (in either direction) the faster the auto-panner moves.

The **PAN STYLE** buttons control how the panner operates when it reaches one side of the stereo field or the other. If the **REFLECT** button is depressed, 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 **WRAP** button is depressed, the panner jumps to the other side when it reaches either side and continues in the same direction.

As an example, if you turn the **POSITION** knob fully clockwise and turn the **DIR/SPD** knob somewhat counterclockwise from its center position, the looped audio will start at the right side of the stereo field and move towards the left. If the number of repetitions (set by the **REPEATS** knob) is sufficient, the looped audio will reach the left side of the stereo field. If the **REFLECT** button is depressed the audio will move back towards the right; if the **WRAP** button is depressed the audio will jump back to the right side. The **WIDTH** knob controls the overall width of the movement.

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

## 5. 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.

### 5A. Randomize Buttons

Clicking the **RAND** 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 knobs, 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.

## 5B. Effects Mode

The **FX MODE** buttons choose 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.

## 5C. Bit Reducer

The **BITS** knob controls a bit-depth reducer applied to the looped audio. Rotating this knob counter-clockwise 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 knob to compensate.

## 5D. Level Controls

The **VOLUME** knob controls the volume (loudness) of the looped and filtered audio signal. Rotating this knob clockwise 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 knob to compensate for the loudness changes created by the resonant filters and/or the bit-depth reducer. The unprocessed signal is not affected by this control.

The **DECAY** knob determines how much, if any, the looped audio diminishes in loudness each time it is played. If the **DECAY** knob is rotated fully counter-clockwise, the looped audio is played back with the same loudness with each repetition. If you rotate the knob clockwise from this position, the looped audio becomes quieter each time it repeats. At the fully clockwise 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.

## MIDI Controllers

The VST version of Replicant responds to MIDI continuous controller messages. You can use hardware MIDI controllers, such as MIDI slider boxes or the knobs found on some MIDI keyboards, to adjust Replicant's parameters.

The VST version of Replicant has a simple "MIDI Learn" mode for assigning its knobs to MIDI controllers. To assign a knob to a MIDI controller:

1. Hold down the `SHIFT` and `CTRL` keys on your PC's keyboard, or `SHIFT` and `CMD` keys if you're using a Mac, and click once on the knob. A white box will be drawn around the control to indicate that it is ready to learn which MIDI controller it will be assigned to.
2. Move the MIDI controller to send a continuous controller message—turn the knob, press the button, move the slider, whatever is appropriate.
3. The white square will disappear. Now the knob will move when you manipulate the MIDI controller.

Replicant waits until it has received two consecutive continuous controller messages with the same controller number before it makes an assignment. This filters out extraneous data sent by some MIDI controllers. If you are assigning a button or switch on a MIDI controller, you may have to press or move the switch twice before Replicant recognizes the controller and assigns it to the desired knob.

- To assign a different MIDI controller to a control, repeat the same procedure using a different controller.

- To cancel MIDI Learn mode without assigning a controller, hold down the SHIFT and CTRL keys (SHIFT and CMD keys on a Mac) and click in any empty area in Replicant's window (i.e., don't click on another control). The white box will disappear.
- To remove a MIDI controller assignment from a control, SHIFT and CTRL keys, (SHIFT and CMD keys on a Mac) click on the control once so that the white box appears, then click again on the same control.

Replicant's MIDI controller assignments are stored with the plug-in's preset data. If you use MIDI controllers frequently, you may find it helpful to store a template preset that contains the controller assignments that you usually use. Use this template preset as a starting point when making new presets so that you do not have to reassign the MIDI controllers every time.

The AudioUnit version does not provide the same MIDI assignment features as the VST version. Almost all AudioUnit hosts provide their own mechanism for assigning MIDI controllers to parameters, so it would be redundant to implement MIDI controller assignments in the plug-in itself. Consult the documentation for your AudioUnit host to learn how to use its MIDI features.

## **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 [support@audiodamage.com](mailto:support@audiodamage.com) if you have any questions or comments.