



## Bionic Sustain Resynthesis

At the heart of **ADAPTIVERB** lies the BIONIC SUSTAIN RESYNTHESIZER, a new type of reverb free of any *harshness* or *graininess*, which has no inherent resonant frequencies of its own, and that blends with the source excellently by nature. Built using an AI technique similar to that used to enable self-driving cars to avoid collisions, it *synthesizes* a reverb tail using a network of hundreds of oscillators that *learn* to re-create just the pitched/harmonic parts of the input sound. Thus, noise and transients don't enter the reverb, making for organic tails even when working with otherwise difficult material like the master bus or field recordings.



## Pitch Processing and Synthesis Parameters

As if that weren't cool enough, we've built in controls for tweaking these oscillators, for timbral manipulation from subtle to...*quite dramatic*.

SIMPLIFY reduces the number of oscillators the Bionic Sustain Synth uses from hundreds right down to one at the slider's maximum value. The result is a simplification of the timbre that has a distinct "flavor" somewhat similar to that of additive synthesizers. SIMPLIFY does not introduce the typical "warbliness" of additive synthesizers, though, due to the unique design of the resynthesis engine

used. SIMPLIFY loves being automated, and works really well for creating ambient sounds.

RICHNESS introduces harmonics of a specified interval into the SUSTAIN SYNTH's sound, similar to how you might add a pitch shifter in front of or in the feedback loop of a reverb. However, instead of adding pitch shifted copies of the sound in, RICHNESS works by causing oscillators to excite other oscillators that are at or close to the interval specified with INTERVAL, or in other words: *\*existing\** harmonics at this interval are reinforced and no new oscillators are added. This makes for a much more harmonic, organic and transparent sound, and avoids adding pitch shifting artifacts into the effect.

INTERVAL specifies the RICHNESS interval. Available settings are -12, -5, +7 and +12 semitones, as well as a DETUNE setting (10 cents).

PITCH RANDOMIZE adds random pitch modulation to the oscillators, adding an ensemble style shimmer with a very nice characteristic.

## Ray Tracing Reverb

**ADAPTIVERB** also features an advanced RAY TRACING REVERB module, which creates a very dense and perfectly diffuse reverb, with a beautifully smooth and full sound. Ray tracing reverb works by simulating the paths soundwaves take from a virtual sound source to a virtual listening position in a 3D room model. ADAPTIVERB's AI-based implementation simulates the effects of 16,000 such paths, without explicitly computing individual reflections. The reverb created is linear ("white") across all frequencies – perfect for diffusion of the sound pre-filtered by the SUSTAIN RESYNTH, as well as for post-filtering using the HARMONIC CONTOUR FILTER. ADAPTIVERB's REVERB section also provides a traditional allpass-filter based reverb, and can be fed by the output of the BIONIC SUSTAIN SYNTH, directly from the input section, or a mixture of both – for maximum flexibility.



## Harmonic Contour Filter, a.k.a The HCF

The unique HARMONIC CONTOUR FILTER post-processes the output of the preceding sections. Its primary purpose is to remove those pitched parts from the reverb tail that would clash with the input, for example when the source track had a chord-change, or that would create “mud” or obscure the source too much, limiting the amount of reverb that can be successfully used in a mix. The HCF also enables automatically adapting the tail to blend perfectly with the source, or, when applied with negative amounts, suppressing commonalities between the input and the reverb, to “fill just the gaps”. The HCF also features a HOLD function, that allows “freezing” the current filtering effect, so you can

apply the timbral/tonal characteristics of one source to the reverb of another, for cross-filtering effects similar to those created with convolution (minus the temporal evolution). And finally, the HCF can be used to selectively conform the reverb tail to a specific set of pitches, under control of a virtual keyboard. See below for more information on these powerful features.



## HCF Keyboard Mode

Switching the HCF to KEYBOARD MODE allows conforming the reverb to a user-defined set of pitches, under control of a small on-screen keyboard that features 5 snapshots for chord storage and automation. Simply select which pitches are "allowed", and the entire effect path will conform. Pitch conforming can be done using precision filtering or pitch quantization, removing all unwanted harmonics or shifting them to allowed pitches, respectively. Both methods can be used to process the dry signal, too, by setting REVERB SOURCE and REVERB MIX to minimum values, for very cool sounding effects.



## Cross-Filtering With HCF HOLD

Use the HCF HOLD mode to create voice-colored reverbs, guitar flavored delays or other cross-filtering effects. Simply play a sound into the plug-in, and activate the HCF's HOLD function when you hear the timbre you'd like to impart onto ADAPTIVERB's effect path. Then, swap the input signal and cross-filter away! The HCF will extract or remove all components from the input or reverb that are not similar to the HOLD snapshot you took in terms of pitch. This source separation (a.k.a. *De-Mixing*) based similarity filtering engine is so precise that you can even use it to remove static sounds like hum, single notes or chords from your audio. A very powerful tool for sound design.



## Create Drones, Pads & Ambience with FREEZE

Using the input FREEZE it takes just seconds to create stunningly organic, evolving drones, pads and ambient textures, that play even without input and are stored with the preset – effectively turning ADAPTIVERB into a unique ambient texture synthesizer. Unlike other "infinite reverb" type functions that simply recycle the contents of the reverb, in ADAPTIVERB, the actual *input signal before the reverb* is captured, and resynthesized in a seamless manner that does not sound looped and is free of warbling artifacts typically associated with such functionality. Because of this, all plugin parameters stay active during FREEZE, for your sonic texture sculpturing enjoyment. There are actually two freezers

running in parallel, one at the input of the BIONIC SUSTAIN RESYNTHESIZER, and one at the "direct input" of the REVERB section. They have slight differences in terms of sound and what part of the input they capture, and you can mix between both using the REVERB SOURCE parameter. You can, of course, still get a more classic frozen reverb flavor, too, by setting SUSTAIN or the Ray Tracing REVERB's SIZE parameter to maximum.