

Reverberation Plug-ins add ambience or reverb to a sound. So what is reverb exactly?

"Multiple echoes produced by sound reflecting randomly off of surfaces in an enclosed space accumulate to form an aural image known as ambience, or reverb. While echo is a literal replication, ambience is the acoustic context of a sound. It reveals itself as the sound calls forth the immanent properties of the surrounding air and the surfaces that enclose it."¹

There are three basic effects that it provides:²

- 1) **Life** - To make sound more "live" and "smooth" by adding sounds caused by reflections from the walls of a room. This makes the sound more like what you hear in "real life".
- 2) **Space** - To increase the spaciousness of sounds. A good well-designed stereo reverb, like the TrueVerb, also adds a spatial effect making even mono sounds fill the space between stereo speakers. It adds a room effect that is has a wide stereoism. This allows mixes with little stereoism to have a wide and spacious effect.
- 3) **Distance** To place a sound in an acoustic space with a certain distance from the listener. Unlike most reverberation units on the market, the TrueVerb uses virtual reality techniques to place sounds convincingly within the actual space of a virtual room with good acoustics. You can adjust many characteristics of the room such as its size and reverberation time for almost any musical or dramatic requirement, and uniquely, you can also adjust where the sound is within the room by using TrueVerb's unique distance control.

TrueVerb Room Emulator and Reverb

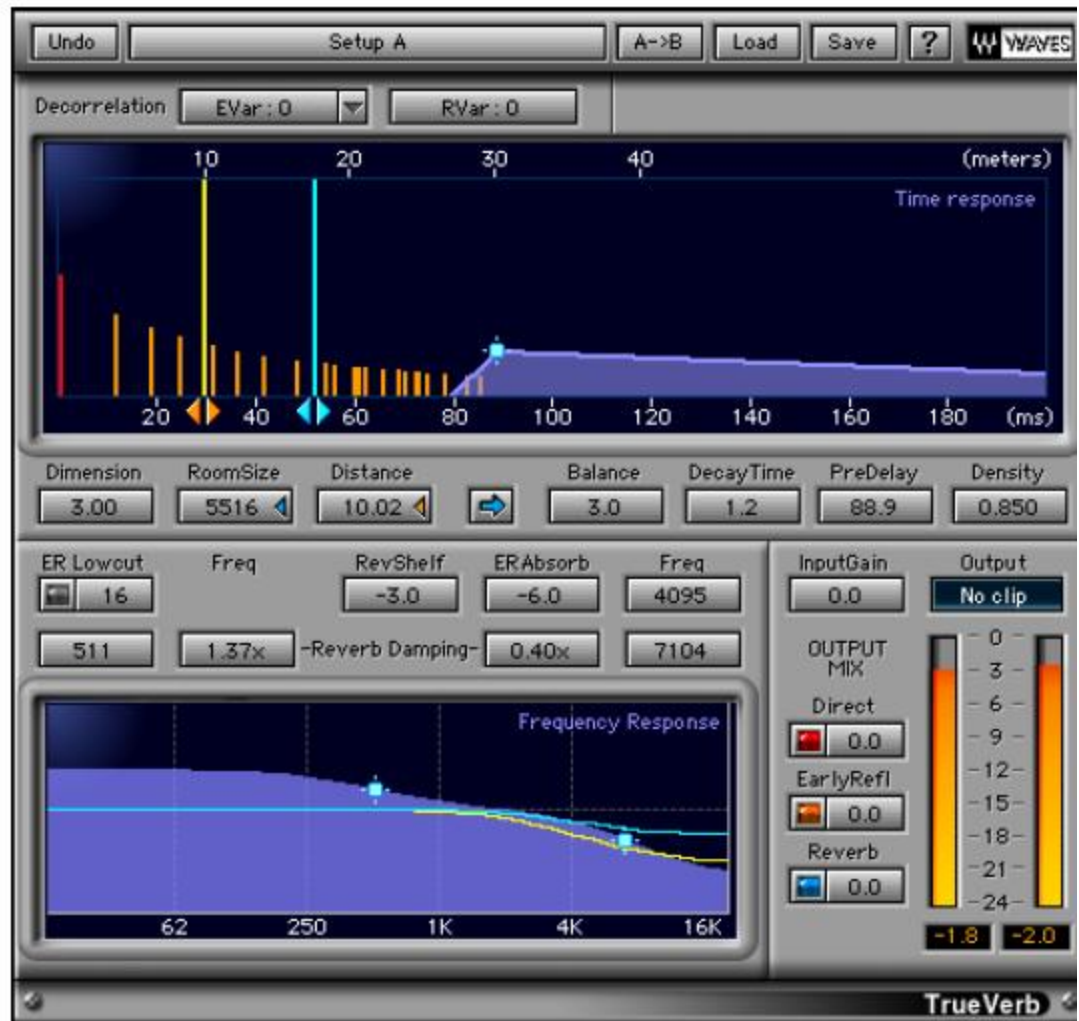
Specs: WAVES plug-in

Two main modes:

- 1) "Thru" - for true distance processing
 - a) Everything goes through it
 - b) You don't "mix" the sound of TrueVerb with the original b/c everything goes through
- 2) Traditional "Send"

Definitions:

TrueVerb generates the virtual space by using two algorithms. The first is the Early Reflections, which generates multiple reflections in the first 100ms (one-tenth of a second) or so. The second is the Reverb, with many reflections, increasingly dense. By putting them together, a virtual room can be created. Some controls work on both algorithms, some separately.



¹ Albin Zak. "Ambience," from *The Poetics of Rock: Cutting Tracks, Making Records*. Los Angeles: Los Angeles: University of California Press, p. 76.

² All of this information comes directly out of the, *TrueVerb Room Emulator and Reverb User Manual*.

Direct means the input signal, unchanged except in level.

EarlyRef means the early reflections, affected by the ERAbsorb control, the Distance, DecayTime, and the Balance.

Direct - This is the original sound, arriving straight to the listener without any reflections from room boundaries. Because it is the sound arriving in a straight path from the original source, and so arrives first. The direct sound establishes the basic directional positioning of sounds within the stereo image. In the TrueVerb, there is no delay in the direct sound.

Early Reflections - These sounds arrive at the listener after being reflected maybe once or twice from parts of the room, such as walls, ceilings and floor. They arrive later than the direct sound, often in a range from 5 to 100 milliseconds (thousandths of a second). The early reflections give your brain the information about the size of a room, and for the sense of distance of sounds in a room. They have an important role in determining the general character and sound of the room. The TrueVerb's Time Response graph shows the timing and level of the first 21 early reflections.

Reverberation - After the early reflections, sounds reflect many times from parts of the room. There are so many they combine to form a continuous sound called reverberation, which decays slowly. This reverberation is subjectively different to early reflections, and adds a bloom and warmth to the sound, and also fills in gaps between sounds in a pleasant way. The time taken for the reverberation to die away is called DecayTime. In TrueVerb DecayTime marks the time by which Reverberation level falls 60dB. Decay time ranges from about 0.2 seconds for a small domestic room with plenty of carpets and soft furnishing to maybe 6 seconds for a grand cathedral.

Reverb means the output of the reverb processor, affected by the RevShelf, the Reverb Damping, DecayTime, and Balance controls.

Time Response Controls

Distance - controls the perceived distance of the source. (This controls replaces the traditional "wet/dry" control). Measured in meters; controls the apparent distance from the listener to the input source. Automatically changes early reflections timing, and, if Link is on, also changes the reverb level and PreDelay. The yellow triangles are a reminder that you can also change Distance by dragging the marker in the Time Response graph. (When Link is off, Distance controls the Room level.)

DecayTime - is the total 'reverb time' of the room you create, affecting the early reflections and reverberation. Measured in seconds (standard -60dB reference); determines the rate at which the early reflections and reverb fade away.

RoomSize - controls the size of the room in cubic meters. For example, 8000 could be a room 20x20x20 (in meters), or 20x40x10. The blue triangles are a reminder that you can also change Room Size by dragging the marker in the Time Response graph.

Dimension - controls the pattern of the Early Reflections to simulate a 1 to 4 dimensional space. Changes the 'character' of the Early Reflections to simulate an 'N' dimensional space; for example, a value of 2.0 will generate a pattern of early reflections that a 2 dimensional object might give; a value of 3.0 would correspond to a 3 dimensional room, and 4 will be a virtual 4 dimensional space. ***Dimension does not affect the Reverb at all in tone, density, or diffusion.***

Balance - controls the balance between the Reverb and the Direct+EarlyReflections levels. Positive values increase Reverb and decrease Direct+ EarlyReflections; negative does the opposite. When Link is on, the 0.0dB position represents the natural Balance between EarlyReflections and Reverb, given the rest of the controls settings. In this case changes of Balance will be around this reference point. When Link is off the 0.0dB position results in equal levels for the EarlyReflections.

Link - Toggle button between Distance and Balance controls, which links the Reverb, Room, and PreDelay together. When on, the Reverb and PreDelay match the level of the last reflection in the Room. When off, PreDelay can be manually set, and the Reverb level can be changed ('unmatched' to Room).

PreDelay - is the time before the Reverb begins, allowing the early reflections to 'reach' your ear first, much like in a true room. Measured in milliseconds (ms); controls the delay time before the reverb begins. When **Link is on**, the PreDelay is set internally, and no user adjustments can be made to it. When Link is off, you can freely adjust the PreDelay.

Density controls the initial buildup of reflections in the Reverb. Ranges from 0.000 to 1.000; optimum smoothness at 0.850. Controls the density of the initial 'buildup' of reflections in the Reverb; higher values have higher density. Percussive sounds usually sound better with higher density values.

Frequency Response Graph

Damping includes HF and LF (high/low frequencies) character of the Reverb itself. The HF and LF include adjustable Frequency controls (HD Freq and LD Freq) and DampRatio controls.

Reverb damping is actually a collection of four controls, which are unlabeled on the interface. The controls are listed below, from left to right on the interface. The frequency response of the Reverb's decay is controlled by them, and is shown on the graph as the blue area. Two small crosshair cursors (+) on the blue Reverb curve let you control both Freq and Ratio of either LF or HF.

LF Damp is measured in Hz; sets the corner frequency of the Low Frequency Damping Ratio (LF Ratio).

LF Ratio Controls the decay time of low frequencies in the Reverb section, relative to the DecayTime value. For example, a 'warm' room may have a value slightly above 1.00x; a room with better intelligibility usually has a value below 1.00x.

HF Ratio Controls the decay time of high frequencies in the Reverb section relative to the DecayTime value. For example, most halls might have settings between 0.25x and 0.50x. The higher the HF Ratio setting, the brighter the sound of the Reverb.

HF Damp Measured in Hz; sets the corner frequency of the High Frequency Damping Ratio (HF Ratio).

RevShelf is an input high frequency shelving filter that affects only the input to the Reverb section. Measured in dB; shown by the light blue line in the graph. A. The Freq sets the corner frequency for both the Shelf and the ERAbsorb.

ERAbsorb is an output HF filter for the Early Reflections. Measured in dB; EarlyReflections Absorption is shown by the yellow line in the graph. Affects only the Early Reflections, simulating the absorption characteristics of a real room's surfaces. For example, a dull room, with lots of fabric or carpeting, would have a very low value.

Freq Measured in Hz; sets the 'corner frequency' of both the RevShelf and the ERAbsorb controls.

The Freq control sets the frequencies for the RevShelf and the ERAbsorb.

Input/Output Section

InputGain A full-range control, from 0.0 to silence (- infinity), adjusting the input level

Direct On/off toggle, with Direct level gain control

EarlyRefl On/off toggle, with Early Reflection level gain control

Reverb On/off toggle, with Reverb level gain control.

VU meters TrueVerb's stereo output level is shown on the VU meters; below each meter is a numeric infinite peak-hold, showing the highest value until reset. These peak hold values are sample-accurate. Above the meters is a clip indicator that will turn red and show the word 'clip' if a single sample is at full value (0.0dBFS). To reset the peak values, click directly on the meters, to reset the clip box, click directly on the clip box.

Renaissance Reverberator³

Specs: WAVE plug-in

Emulates vintage gear while providing innovative flexibility

Offers a reverb "tail" that does not have early reflections or any associated controls.



Reverb Type

[Hall 1 • Hall 2 • Room • Chamber • Church • Plate 1 • Plate 2 • Reverse • Gated • Non-Linear • EchoVerb • ResoVerb] In the top center of the interface is the Reverb Type Control, which actually controls both reverb and early reflection behavior on a global scale. Each type, such as Hall, Room, Plate, etc., will profoundly change the sound. In a way, it's really changing the engine at the heart of the reverb. The Type can be changed at any time but with predictably large shifts in the sound.

Decorelation - ranges from Variation 0 to Variation 6, it controls the amount of correlation between the two channels (left and right) within the early reflections. The effect is subtle but can be very import in fine-tuning the color of a sound. You can simply cycle through the variations by repeatedly clicking on the button.

Reverb Properties Controls

Pre-delay - Ranges from -160.0 to +160.0ms (milliseconds). This is the typical pre-delay control, which offsets the reverb tail by delaying the signal that is sent to the reverb tail generator. We have an extra feature that allows for a negative pre-delay value, which actually delays the direct signal (dry).

Time - Ranges from 0.1 to 20.0s (seconds). This sets the standard reverb decay time of the "tail". Size Ranges from 1.0 to 100.0 Controls various and different parameters, depending on the Reverb Type that is selected. These could include early reflection spacing, reverb tail dimension, and more.

³ All of this information comes directly from the *Renaissance Reverb User's Manual*.

Diffusion - Ranges from 0.0 to 100.0. Serves as a balance control between direct and early reflections for feeding the reverb tail. When equal to 0.0, diffusion is at its lowest, as the direct signal is feeding the reverb tail; when equal to 100.0, diffusion is highest, as the early reflections are used to feed the reverb tail.

Decay - Ranges from 0.0 to "Linear." This makes the reverb tail behave in a non-linear fashion, varying from linear at the top to the most non-linear (shortest) at the bottom. All types and presets can have a nonlinear (i.e., "gated reverb") sound simply by lowering the value of the Decay control, assuming you have the Reverb Time long enough to be gated (such as more than 1 second, we recommend 3 as a good starting point).

Reverb Controls

Early Reflections - Ranges from 0.0 to off; it controls output level of early reflections.

Reverb - Ranges from 0.0 to off; it controls output level of reverb tail

Wet/Dry - Ranges from 0 to 100; it controls balance between the dry and the wet signal (early reflections + reverb tail).

Gain - Ranges from -24.0 to 0.0; it controls input gain, calibrated in dB.

Damping Controls

Low Frequency - Ranges from 16 to 1600 Hz; Controls the "knee" of where the low frequency damping begins.

Low Frequency Ratio - Ranges from 0.10 to 2.00 (multiplication factor); Controls the progressive frequency response of the reverb's low range.

High Frequency - Ranges from 1000 to 2100 Hz; Controls the "knee" of where the high frequency damping begins.

High Frequency Ratio - Ranges from 0.10 to 2.00 (multiplication factor); Controls the progressive frequency response of the reverb's high range.

EQ Controls

Low Frequency - Ranges from 16 to 1600 Hz; it controls the "knee" of the reverb low equalization, which is "pre" to the early reflections and reverb.

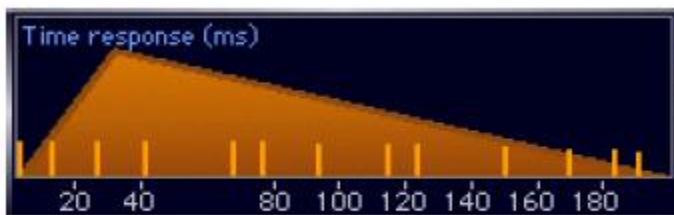
Low Gain - Ranges from -24.0 to + 12.0; this is a simple gain control of the shelving EQ. When equal to -24.0, the filter becomes a cut filter.

High Frequency - Ranges from 1000 to 2100 Hz; it controls the "knee" of the reverb high equalization, which is "pre" to the early reflections and reverb.

High Gain - Ranges from -24.0 to + 12.0; this is a simple gain control of the shelving EQ. When equal to -24.0, the filter becomes a cut filter.

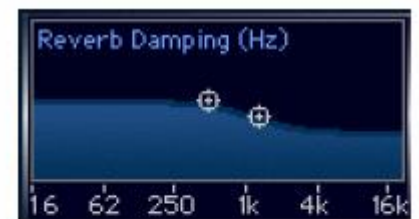
Graph Displays

The two graphs to the right show the damping and EQ settings; the markers may be dragged.

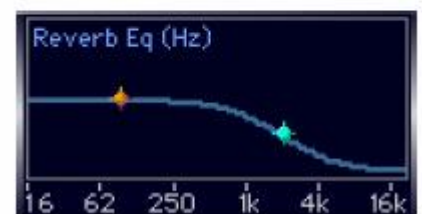


Time Response

The time response graph shows the early reflection spacing by the small orange lines and the reverb tail by the solid orange triangular shape.



Reverb Damping



Reverb EQ