



PANTHEON™ VST REVERB PLUG-IN

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HISTORY

In 1971 Lexicon released the first Digital Audio product ever to the world, a simple delay line called the Delta-T 101. Since this time Lexicon has been at the forefront of digital audio. In the late 1970's after finishing his Ph.D. in Physics, Dr. David Griesinger developed one of the first digital reverberation devices. The product eventually became the Lexicon 224 reverberator. The 224 was just the beginning of a long line of Lexicon reverberation devices including the PCM60, PCM70, M480L and 960L. Over 80 percent of platinum recordings and major film releases take advantage of Lexicon processing. David Griesinger is a physicist interested in sound - the sound of music. He is particularly interested in translating subjective impressions of sounds into the physics of sound propagation, and the psychoacoustics of sound perception. He has found that although it is wonderful to discover ways to improve the quality of a reproduced sound, it is far more useful and powerful to understand exactly how the improvement was achieved. Now Lexicon's Principal Scientist, Dr. Griesinger is involved in all of Lexicon's reverb algorithms, which take advantage of his extensive research into both the acoustic properties of spaces as well as psycho-acoustics or the human brain's perception of sound.

THE PANTHEON REVERB

The Lexicon Pantheon reverb plug-in combines world-class Lexicon reverb with a simple, yet powerful interface to create an indispensable tool for your recording system.

The Lexicon Pantheon reverb plug-in features a wide range of reverb types including Hall, Chamber, Room, Plate, Ambience, and Custom. A full complement of user adjustable parameters is available, including: Room Size, RT 60 (decay time), Pre-Delay, Damping, Diffusion, Spread, Bass Boost and Frequency, Delay and Regeneration, Independent Left and Right Echo Time and Level, Wet/Dry Mix and Output Level.

Whether mixing for music, film/TV, or multimedia, the set of 35 factory presets in the Lexicon Pantheon Reverb will cover your needs. Presets ranging from Vocal, Instrument and Drums, to Live Sound and Special Effects make it easy to add that "Lexicon Sound" to your projects.

USING REVERB

Music recorded in a typical studio sounds lifeless. In a performance space the music is enhanced by reverberation, but even in an ideal space capturing that reverberation can be difficult. Lexicon reverberators solve this problem by enabling you to generate exactly the reverberance that your recordings call for. The Pantheon Reverb Plug-in is designed to create, through software, the acoustics of any real or conceivable space.

REVERBERATION AND REALITY

The acoustics of a given space are defined by its reflected energy – that is, the way sound is reflected and re-reflected from each surface. This is affected by the dimensions of the space, the complexity or flatness of the surfaces, the frequency characteristics of each surface's energy absorption, and the distance and direction of each surface to the listener. In addition, in large spaces there is a high-frequency roll-off caused by the sounds passage through air.

It is, in principle, possible to model the reflected energy pattern in a specific space, either real or imagined, and to reproduce this pattern as closely as possible. Alternatively, one could measure the reflection pattern from a specific source point in a real space to a specific receiver position, and reproduce this pattern. One might expect this technique would yield the most accurate sonic representations of halls and rooms.

Alas, the illusion of reality is not so easily achieved. First, real spaces are themselves a compromise. Large rooms tend to provide a sense of blend and distance to music, but provide little warmth and envelopment, and often can make the sound colored or muddy. Small rooms can provide envelopment, but often the sound can be too clear and present.

Our solution has been to study the physics and the neurology of human hearing, to discover the mechanisms by which reflected energy patterns create the useful perceptions of distance and envelopment, and to discover how to recreate these perceptions without compromising clarity. Using knowledge of these mechanisms we can create reverberation algorithms that can give the desired acoustic impressions – rooms that sound plausibly real, but that give the recording engineer complete control over the sense of distance and the sense of envelopment. These rooms seem real, but they are not. They are designed and adjusted by the engineer to the specific needs of the recording.

COMPUTER MINIMUM REQUIREMENTS

Powerful software for audio recording requires a powerful computer with the right operating system software, processor, memory, and hard drive space. Most currently sold computers already meet these requirements, or can be upgraded to be compatible with the Lexicon Pantheon Plug-in. As with all such systems, adding more RAM than the minimum will allow you to do more processing and improve performance.

SYSTEM REQUIREMENTS FOR PC

- Pentium® III 500 MHz or AMD K7 processor , or better
(*Pentium 4/Athlon™ 1 GHz or faster recommended*)
- Windows® XP Home or XP Professional
- 128 MB RAM (512 MB recommended)
- 100 MB of available hard disk space
- Steinberg Cubase LE, SE, SL, or SX

SYSTEM REQUIREMENTS FOR MAC®

- PowerMac®, G4 Processor (*450 MHz or faster*)
- Mac OS X version 10.2.8 or higher
- 256 MB RAM minimum (*512MB recommended*)
- 100 MB of available hard disk space
- Steinberg Cubase LE, SE, SL, or SX

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PANTHEON NAVIGATION

SELECTING A PRESET

Pantheon comes complete with 35 factory presets to choose from. These presets are designed for a variety of reverb applications such as placing the sound into a hall, chamber or room, vocal plates, or for adding just a touch of ambience to your project. To select presets, do the following:

1. Click the arrow to the right of the **Preset** field in the Pantheon's plug in window.
2. Click on your desired preset and it will now become active.

EDITING AND SAVING A PRESET

Once a preset is selected, use Pantheon's sliders and knobs to adjust the individual parameters to the desired settings. If Pantheon is inserted in line with a track, set the reverb **Level** slider to 0dB and control the ratio of reverb to dry signal using the reverb **Mix** slider. If Pantheon is inserted in an auxiliary bus, set the reverb **Mix** slider to 100% and the reverb **Level** slider to 0dB. Control the ratio of reverb to dry signal using the auxiliary send and return controls in your recording application.

Once a preset has been edited to your liking, you can save the changes as a User preset. To store changes and create a User preset, select the **Save** function in the Pantheon's plug-in window.



DESCRIPTION OF PARAMETERS

REVERB TYPE

The type parameter gives six selections of reverb types including:

Hall, Chamber, Room, Plate, Ambience, and Custom.

Hall is a hall effect with gradual build-up, well suited to complex sounds like orchestral music. Its reverberators avoid the buildup of tinny, grainy, metallic colorations.

Chamber is a complex miniature-space effect resembling an echo chamber at its smaller settings and, at its larger ones, a small performance space with a more rapid build-up of reflection density than Hall.

Room is a very useful tool for adding a room sound to recorded music or speech, making it easy to match a studio recording of dialog to a typical room environment. It can be used to simulate the ambience of very small rooms without the colorations often found in actual spaces of that size.

Plate mimics the sound of classic, metal, reverb plates with high initial diffusion and a relatively bright, colored sound. For this reason, they are designed to be heard as part of the music, mellowing and thickening the initial sound itself. The Plate sound is what most people associate with the classic PCM60 reverb. It is especially useful for vocals in all types of popular music.

Ambience generates the strong reflections that appear in the first few hundred milliseconds of the reverberation process. These early reflections become part of the direct sound without coloring it, giving it better blend and a definite position in space and conveying the impression of a hall surrounding you while the music is playing. It lends warmth, spaciousness and depth to a performance.

Custom is an effect suited to achieve unnatural or special application reverbs where a wide parameter range is needed.

PRE-DELAY

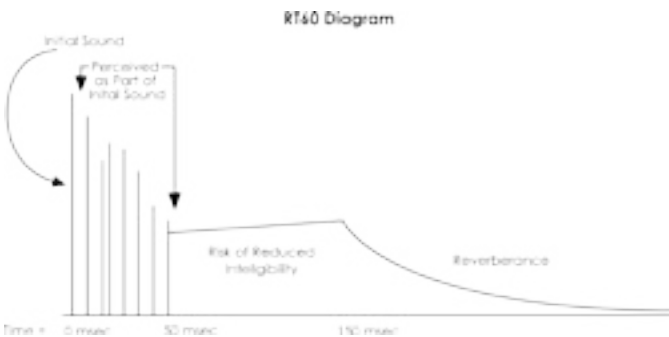
Pre-Delay controls the amount of delay time that precedes the initial sound from the reverb. This parameter is used to place the reverberated signal in time with respect to the unprocessed signal. Natural settings for this are based on the size of the environment and range from 0 to 19 milliseconds. Fine adjustment of this parameter with respect to the tempo of the song or dramatic timing of the piece can help set the feel of the reverb within the mix.

ROOM SIZE

Room Size is a scale factor that alters the length of most of the reverb's delay elements. This control is calibrated in units that approximate the longest dimension of the reverberant "space" in meters. In practice, perception of room size is also strongly determined by Spread. The Room Size parameter strongly affects the overall timbre of the reverberation. Values less than 25 have noticeable "small room" coloration unless the Diffusion parameter is also reduced. For the most neutral halls and chamber sounds, set Size to around 30 to 40 meters, and finely adjust the apparent size with the Spread parameter.

RT60

RT60 is the reverberation time. RT60 is the basic control for setting the duration in seconds of the reverberant tail for the current room size. The perceived decay time will also be affected by Damping and Bass Boost. In general, as the size of the space increases the RT60 will also increase. RT60 should be set to a value of about 1.2 seconds or less for small rooms and up to 2.4 seconds or so for halls. Interesting, unnatural spaces and nonlinear reverbs can be created by setting the RT60 unusually low with respect to the size parameter.



DAMPING

In real rooms, the timbre of the reverberant tail becomes darker over time due to the air's absorption of high-frequency sound energy. The Damping control models that behavior with even greater range of control than could be achieved in any physical space. Setting the cutoff frequency in the Damping parameter within a range between 2 kHz to 6 kHz is the most natural sounding with larger spaces needing a lower damping cutoff frequency. Damping set to high frequency settings gives unnatural reverb decay. For specialized reverbs with high end sizzle, such as plate reverbs, settings higher than 7 kHz are often used. When you set the cutoff to very low frequencies, the duration of the reverb will be much shorter than the value shown by the RT60 parameter.

MIX

Mix is the ratio of Wet (reverberated) signal to Dry (direct, unprocessed) signal. Each of Lexicon's factory programs are typically shipped at 100% wet, and we recommend controlling the mix within the recording software's console, rather than with the Mix parameter. However, the parameter can be used to adjust the wet/dry ratio when the effect is used "in line" and no direct dry signal is sent around the effect. The situation that needs to be avoided is when two direct signals interfere with each other, with a possible slight delay, resulting in severe comb filtering. This can happen when there is both direct path for the signal around the effect and the mix control is set to a point other than 100% wet.

LEVEL

Level is the output level control of the reverb. Like the Mix parameter each of Lexicon's factory programs are typically shipped at full level. We recommend that the level of the Reverb is set by the send and return levels of the software's console. However, for cases where effects are chained together and intermediate level control is needed, this parameter can be used.

REGEN (REGENERATION)

Regen (Regeneration) sets the regeneration amount for energy to be fed back into the input diffusion section. The combination of Delay and Regeneration will create a feedback path used to create layered diffusion density. This is rarely used in larger reverb simulations, but often used in plate reverb simulations and some small room and ambience simulations. Regeneration can be fed back in phase (1% to 100%) or out of phase (-1 to -100%). Even small amounts of Regeneration can greatly affect the overall reverb sound so it should be used sparingly with values less than 30% except for special effects.

DELAY

Delay sets the delay time for energy to be fed back into the input diffusion section. The combination of Delay and Regeneration will create a feedback path used to create layered diffusion density. This is rarely used in larger reverb simulations, but often used in plate reverb simulations and some small room and ambience simulations. Except for creating special effects, Delay settings in the range of 7-15 milliseconds are the most useful.

ECHO LEVEL LEFT/RIGHT

In many real spaces, distinct reflections and echoes are an important part of the sound. Although many natural-sounding environments use little or no echo there are some cases where they can be used to help define the size of the space or to give a slapback or doubling of the diffused sound. The echo signals are fed from the diffusion section to the left and right output with independent control of the left and right echo levels. These levels, when used, should be set to lower than the original signal with values in the range from -6 dB to -24 dB the most useful.

ECHO TIME LEFT/RIGHT

For natural echo sounds, the setting of the echo time is very dependent on the size of the reverberating space. For slapback settings used to enhance the original sound, set the echo time in the range of 60 to 85 milliseconds. The left and right echoes should be set exactly the same or at least 10 milliseconds apart from each other to avoid any comb filter coloration.

SPREAD

Spread works to control the profile of initial reverberant-energy growth. Spread stretches or compresses the energy contour in time to make reflections closer together or further apart. Spread will change the feel of the reverberant space and gives the user some latitude to fit the reverb to the source material. It may be advisable to use a moderately low value for spread to create a bit of space around the original signal. For non-percussive, single instrument reverb settings higher values of Spread can add a perceived widening and thickening to the material.

DIFFUSION

Diffusion models the effect of irregular wall surfaces in a room by changing echo density. Very low values produce sharp, discrete, early reflections. Higher values produce groups of reflections that are smoother but less articulated. This is an important parameter to adjust to create a natural feel to the reverb. Higher Diffusion settings are common for the most natural-sounding environments. Lower settings are useful only on specialized reverbs where the source material is not percussive such as vocals and horns.

BASS BOOST

Bass Boost controls the low frequency reverberation time relative to the RT60 parameter. If, for example, Bass Boost is set to 2.0X and RT60 is set to 1 second, the effective low frequency is extended to 2 seconds. For natural-sounding results, use settings of 1.5X or less. For longer RT60 settings and larger room sizes the maximum effective value for the BassRT parameter is scaled back to avoid instability. BassRT values less than 1.0X produce a low frequency RT that is shorter than RT60 which can be used to create reverbs without low rumble. This can be desirable for fitting a reverberated track such as vocals within a desired frequency range for the final mix.

BASS FREQ (FREQUENCY)

Bass Freq sets the frequency at which the transition between RT60 and Bass Boost takes place. Values in the range of 200 Hz to 400 Hz works best for natural-sounding reverb. Except for special effects, there is seldom a need for this parameter to exceed 500 Hz.

PRESET LIST

Number	Preset Name	Description
01	Large Hall	A large, orchestral hall with a smooth envelopment and natural decay
02	Medium Hall	A natural-sounding, 38 meter hall with a moderate decay
03	Small Hall	A natural-sounding, small hall with a bright attack and long deep end decay
04	Deep Blue Hall	A large, diffuse hall with a bright attack and long deep end decay
05	Kick Drum Hall	A big arena, kick drum sound with quick, initial energy and presence followed by smooth decay
06	Concert Hall	A large, smooth, dark, and lush hall with maximum diffusion and a 2.5 second reverb tail
07	Vocal Hall	This medium-sized hall has a clear reverb decay that doesn't get in the way of the vocal source. This is also a good reverb for piano.
08	Choir Hall	A medium-sized hall with lots of initial reflections to build up presence for multi-voiced material such as a vocal choir.
09	Echo Hall	The late echoes in this hall give a scattered and loose feel to the source material.
10	Snare Chamber	An ideal reverb for snare drums with maximum diffusion and spread. Adjust the length of the reverb tail by changing room size.
11	Vocal Slap	A nonlinear reverb with an 80 millisecond slapback echo and a 130 Hz bass-boosted decay tail
12	Hit Vocal	An excellent, vocal reverb that makes lead vocal tracks stand out
13	Vocal Spread	A vocal reverb with medium decay time and a reverb tail that has the low frequencies attenuated to fit the track into a tight frequency spectrum in the mix
14	Large Chamber	A large, smooth sounding, reverberant space with a tight set of reflections and medium decay
15	Soft Chamber	A soft sounding chamber that builds quickly with a medium decay
16	Wide Chamber	A larger, spacious sound with a staggered density increase and a nice, defining echo group
17	Small Chamber	A small, tight chamber
18	Double Chamber	A small chamber with an added dimension from a distant echo
19	Wide Vox	Closely-placed delays double the source material
20	Large Room	A large room with a moderate decay time
21	Medium Room	A nice, general purpose, high definition, listening room
22	Small Room	A natural sounding, small room reverb
23	Lead Vocal Room	A medium-sized room with echoes at 65 milliseconds to make vocals and individual, non-percussive instruments punch through the mix.
24	Guitar Room	A very small space that can be used to add body to acoustic instruments
25	Tiled Room	A very small, bright room
26	Bright Ambience	Adds ambience without losing frequency content of the original material
27	Slight Ambience	This is used to slightly open up the sound giving a reverberated feel to the source material. It works well with a wide variety of sources.
28	Mid Ambience	Ambience with a little extra presence
29	Large Plate	An old standard, large, bright and very diffuse plate reverb
30	Medium Plate	A rather large plate with a medium decay time
31	Vocal Plate	A thin plate with very little low end reverberation
32	Small Plate	A small, tight, plate reverb
33	Stadium PA Echo	A special effect sound
34	Nonlinear 200ms	An unnaturally, quickly-decaying 200 millisecond reverb. Good for getting a gated drum type sound without the abrupt closing gate tail.
35	Nonlinear 120ms	A unnaturally, quickly-decaying 120 millisecond reverb.

Lexicon^{PRO}

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