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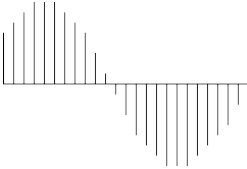
Venue rights may apply when you sell, lend, hire or give away sampled Impulse Responses from real acoustic spaces. Consult the owner of the venue when you intend to do so.



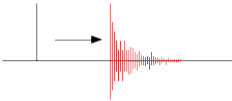
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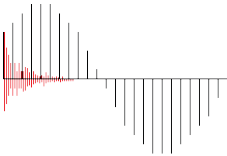
A sampled waveform is nothing but a bunch of clicks:



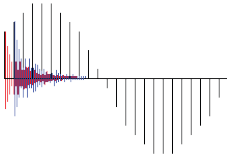
So let's sample one click and its response from a room:



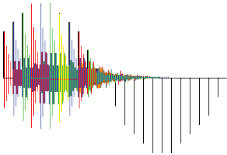
And apply the response to the first click in the sampled waveform:



Copy the same response again (a bit louder) after the waveform's second click:



And proceed to do so for each sample in the sampled stream:



Each sample gets its own scaled reverb tail, and the waveform now sounds as if it was played back in the room.

1

Introduction

1. Welcome.

Altiverb has come a long way since it premiered as the first real-time convolution reverb plug-in in 2001. Audio Ease is glad to welcome you to Altiverb version 7, and to the Altiverb Impulse Response Library. Together they are the state of the art of reverb based on real spaces.

2. What is Altiverb and how does it work ?

Altiverb makes your audio sound as if it was played back somewhere else, adding the acoustics of existing spaces to your own recordings or to your live audio.

Take a look at the illustration on the left. The shortest impulse in digital audio is a single sample 'spike'. That's just one loud sample, surrounded by silence. Playback of this spike in a church would create a reverb tail, a **response** very similar to that of a hand clap. We call the spike's reverb tail the impulse response of the church, and we make a recording of it.

Think of a sampled waveform as a stream of these spikes. The fact that one is louder than the next creates a waveform, but the spikes are almost identical: only differing in their loudness. Now extend every spike in the waveform with the full church impulse response recording, effectively giving each sample its own reverb tail, and it will sound as if the waveform was played back in the church. The process of extending each tiny sample with a scaled impulse response ('IR') is called convolution.

Altiverb™ is a convolution engine that comes with a vast library of Impulse Responses recorded in real acoustic spaces around the world. It lets you combine your input sound with any of these acoustic fingerprints, and it allows you to make your own samples of acoustic spaces.

2

About the documentation

This user guide covers the functions and controls of Altiverb 7.

Some topics concerning Altiverb™ outdate quicker than others, or are of interest to a small subset of Altiverb users. These topics are available at www.audioease.com/av7manuals. You'll find topics there such as how to make your own samples of acoustic spaces, the specifics of using Altiverb 7 with Nuendo, or how the TDM version of Altiverb 7 XL works.

Chapter 3 shows Altiverb at a glance, chapter 4 and 5 introduce you to Altiverb's channel configurations and the concept of **direct sound**. Chapter 6 is the reference part of the manual, describing every control and function in detail.

pictures about preferences gated verb positioner snapshots import info waveform waterfall eq-curve
 50 100 540 1.1k 6k 20k

reverb time 6.1m
 bright size

I/O in out mix
 EQ bass treble gain
 DAMPING low mid high
 TIME pre delay attack

test load sound on parameter change
 direct early tail reverb IR
 color tail IR mod speed output

altiverb
 Sampled Acoustics Processor

3

Altiverb at a glance

Basic operation

Insert an Altiverb into your song. Play back your audio through it. Maybe turn the 'mix' knob a bit and it should already sound as if it is played back somewhere else. Select another acoustic environment by clicking the name or the picture of the room. This will bring up a browser window that lets you search and select spaces. The samples of spaces that you can choose are called impulse responses or short: IRs.

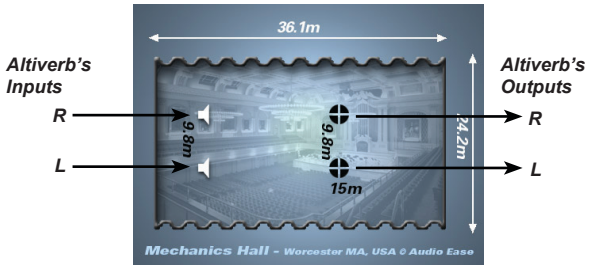
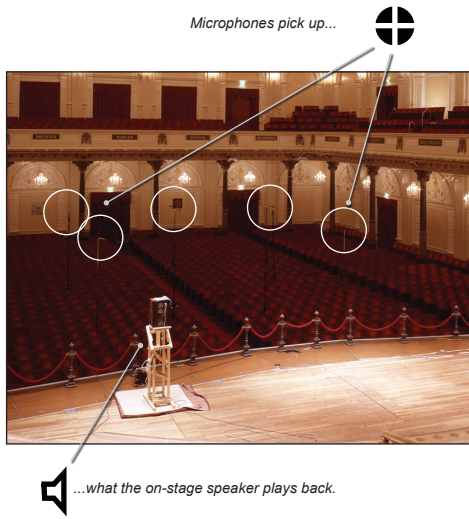
About the knobs

All parameters controlled by turning knobs can be increased by clicking on them and dragging upward, or to the right. The parameter value will be displayed while you are adjusting. Double click a knob, and you can type in a value. You can hold down modifier keys such as **Alt** while operating a knob for extra precision, or to restore to default. Which modifiers depend on what host application you use www.audioease.com/av7manuals lists the modifiers for your host.



switch EQ section
on and off

touch to expose the EQ
section's drawer with
more EQ controls



Think of Altiverb as an echo chamber. You feed your audio to the speaker(s) in the chamber, place some microphones in there, and get back the reverberated audio into the mixing board. The input of Altiverb goes to the speakers, the output of Altiverb is what the microphones produce.

4

Altiverb's channel configurations

Think of Altiverb as an echo chamber. You feed your audio to the speaker(s) in the chamber, place some microphones in there, and get back the reverberated audio into the mixing board. The input of Altiverb goes to the speakers, the output of Altiverb is what the microphones produce.

The illustrations on the left show an impulse response recording session, and a resulting configuration in Altiverb. The lower diagram is a bird's eye view of the type that is visible in the Altiverb interface. The bird's eye view displays a stereo to stereo impulse response: stereo material is played back on stage via a left-stage and right-stage speaker. Stereo audio is then picked up in the room by two microphones.

Audio Ease Impulse Responses (IRs) come in the following configurations, visible in the **Browser**:

Altiverb Regular:

- 1 in, 1 out (IR was made using 1 stage speaker position and 1 mic)
- 1 in, 2 out (IR was made using a central stage speaker and 2 microphones)
- 2 in, 2 out (IR was made using left & right speaker positions and 2 microphones)

Altiverb XL adds:

- 1 in, 4 out (IR was made using a central stage speaker and 4 microphones)
 - 2 in, 4 out (IR was made using left & right speaker positions and 4 microphones)
-

The number of outputs of Altiverb corresponds to the number of outputs of a mixer-channel or aux.

In a mixer channel with stereo output, two types of impulse responses are available: mono input: your audio is played back through a single speaker on stage, or stereo input, your audio is played back through two speakers on stage.

Mono input impulse responses use less processing power than stereo-input impulse responses. You can hear the positions of the speakers best if you turn on the direct signal in the **time** tab. Refer to page 13 for more info on the direct signal.

The dry signal passed by the **mix** control is never touched, which means that even when the input is mixed to mono before it hits the impulse response, the dry signal remains stereo.

Altiverb XL:

In tracks consisting of 5 or 5.1 channels, the **Center** control becomes available in the I/O section's drawer. (page 26)

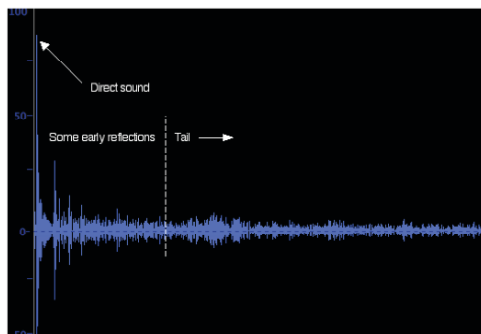
Center outputs a delayed sum of the rear channels into the center channel to fix possible gaps. It is intended for post production usage to prevent dry dialogue in the center channel, or gaps in the reverb image in wide theater setups. For all musical purposes the recommended setting is all the way down (no **center**), as quadraphonic reverb (L R Ls Rs) has so far produced superior results to 5 or 5.1 channel reverb.

The **lfe** control (for the dot-1, or sub woofer content channel) is much like the **center** control described above. The only difference is that apart from creating lfe reverb, the **lfe** control also governs the amount of lfe content that is input to Altiverb.

5

The Direct Sound

When a microphone listens to a speaker, there is a straight path from speaker to microphone called the *direct sound*. Next come reflections from walls and objects in the room, together called reverb. All of it is in the Altiverb Impulse Responses.



However, often you don't want the direct sound. Often Altiverb receives a send from a track while the track itself goes into the mix bus as well. In that mix bus Altiverb's direct sound can clash with the track's dry sound.

Therefore in Altiverb 7 the direct sound is switched off by default. The impulse responses then sound as if the speaker is facing away from the microphones.

If you switch on the direct sound (p. 28) you can better hear the position of the speaker on stage, which is why the stage positioning feature (p. 20) switches *direct sound* on by default.

The image shows the Altiverb 7 software interface with various controls and views labeled with page numbers. The interface is dark-themed and features a central 3D scene of a building (Disney Hall) with a reverb time control knob at the top. Below the knob are several sections: 'pictures' with a list of locations, 'preferences', 'stage-positioning', 'snapshots', 'IR import', 'waveform view', 'EQ curve', 'EQ', 'DAMPING', and 'TIME'. Each section contains specific controls like knobs, buttons, and graphs. The 'EQ' section has three frequency sliders (bass, mid, high). The 'DAMPING' section has three sliders (low, mid, high). The 'TIME' section has three sliders (pre-delay, attack, and an unlabeled one). The 'IO' section has three buttons (in, out, mix). The 'size' control has two buttons (bright, size). The 'altiverb' logo is at the bottom right.

Page 25 Reverb time

Page 16 Room selection

Page 19 Picture controls

Page 19 preferences

Page 20 reverb gate

Page 20 stage-positioning

Page 21 Snapshots

Page 21 IR import

Page 23 IR info view

Page 23 waveform view

Page 25 Waterfall view

Page 25 EQ curve

Page 19 about preferences

Page 20 gain verb positioner snapshots import

Page 21 this waveform waterfall eq-curve

Page 23 50 100 540 1.0k 20k

Page 25 EQ

Page 25 EQ bass treble

Page 27 EQ section

Page 28 Damping section

Page 28 (pre-delay) times and direct sound

Page 26 I/O section

Page 26 size

Page 26 Bright

Page 26 size

Page 26 I/O section

Page 27 EQ section

Page 28 Damping section

Page 28 (pre-delay) times and direct sound

altiverb
Spatial Reverb Processor

altiverb
Spatial Reverb Processor

6

Altiverb reference

This chapter discusses each user interface control of Altiverb in detail.

All parameters controlled by turning knobs can be increased by clicking on them and dragging upward, or to the right. The parameter value will be displayed while you are adjusting. Double click a knob, and you can type in a value. You can hold down modifier keys such as **Alt** while operating a knob for extra precision, or to restore to default. Which modifiers depend on what host application you use. Look up your host application at audioease.com/av7manuals to find specifics about that.

We start off with the heart of Altiverb 7: the **browser**, so go ahead and click on the picture or the impulse response name (**Disney Hall** on page left) and read on.

The Browser

Bring up the browser by clicking on the impulse response name or on the picture of the room.

In the side bar on the left the 4 main functions of the browser are available:

- **news** - see which IRs or Altiverb updates you don't have yet, and download and install them.
- **IRs** - search for and select impulse responses (IRs)
- **presets** - select and save presets (p. 18)
- **similar** - find IRs that sound similar to the current choice

The Browser - selecting impulse responses

news : stay up-to-date : get IRs you don't have yet.

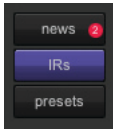
IRs : browse the IR library

presets : browse the preset library

The screenshot shows the Altiverb Browser interface. On the left is a sidebar with buttons for 'news', 'IR's', 'presets', 'A-Z', and 'similar'. The main area displays a grid of room impulse responses (IRs) with photos and names like 'Beaufort House', 'Concertgebouw', 'Disney Hall', etc. A search bar at the top right contains '<Type here>'. Below the grid, there are controls for stereo and mono recording setups, including distance sliders (e.g., 5.85m, 10.1m) and heart icons for favorites. A 'similar' button is also visible at the bottom left of the main area.

Annotations with arrows point to various parts of the interface:

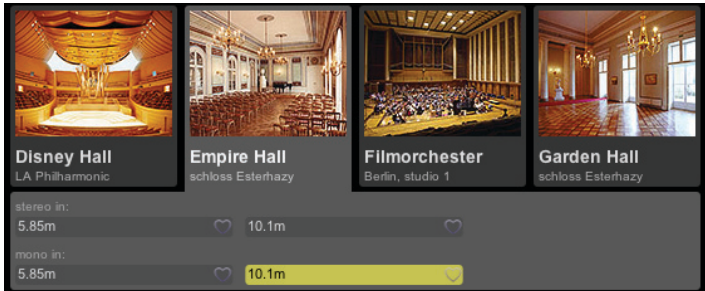
- page back and forward
- Go to the top IR level
- The current IR category
- keyword searches like: "bed room" "brick studio", "los angeles"
- display order of results, i.e. alphabetical or size.
- lists similar sounding IRs
- (single) click on a picture to select the default recording setup of a room
- (single) click to select other recording setups in the room
- click to add this recording setup to your favorites
- resize browser



To select an impulse response make sure, in the top left, the **IRs** button is highlighted as shown on the left.

You can now select impulse responses (room acoustics). Select a room by (single) clicking on it.

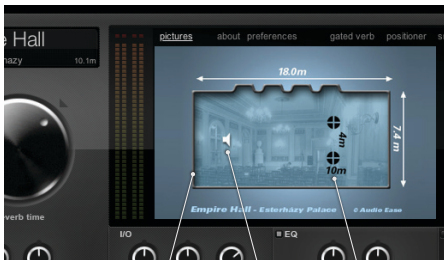
Below the selected room (**Empire Hall**) a lighter grey area appears.:



In the grey area four speaker-microphone configurations in the **Empire Hall** are available. The chosen speaker-microphone configuration is highlighted in green:

mono input (center stage speaker), microphones set up at 10.1 meter.

A more detailed description of the speaker-microphone configuration is available in the left-screen of Altiverb's main window. If you hover the mouse over the room picture a next button appears. You can click that until you see the birds-eye-view of the configuration:



room's outline
as seen from above

speaker

microphones

The Browser - selecting and saving presets

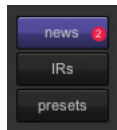


In the browser, when you press the **presets** button, you can browse the audio ease presets.

You can also save or recall your own (in the user folder). In your user folder you can save, recall delete and rename presets.

The presets that are saved here are global. They are stored in a folder determined by the preferences panel (p. 19) and are available in other sessions or even other host applications. You can share presets by copying files in the user presets folder determined by the preferences panel. In some host applications the Audio Ease presets are also available in the host's preset menu.

The Browser - News

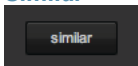


Audio Ease regularly posts new impulse responses, and sometimes updates to Altiverb. The Browser's **news** page indicates how many new items are available to you and describes them briefly.

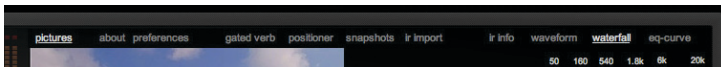
When you click the **news** button an overview is displayed of items that you do not have yet. You can choose to install some or all of them and start using them right away.

The first time you download a new impulse response Altiverb will ask for your download authentication, normally your email address. The address is sent encrypted to the Audio Ease server and is only used to verify you are an Altiverb owner and therefore allowed to download IRs.

Similar



When the **similar** button is pressed in the Browser, a number of similar sounding alternatives to the current IR are suggested. This can be helpful finding your way through the IR library. When an IR is close, but it's not quite the thing yet, use **similar**.



Along the top of Altiverb are clickable text items. The following will discuss them from left to right .

Pictures

Clicking the text **pictures** will switch the left half of Altiverb's main display to the picture viewer. There are a number of pictures associated with the selected impulse response. When you hover the mouse pointer above the picture more controls appear:

- vr** - brings up a surround picture of the room. Click zoom to make the VR interactive.
- previous next** - moves through all visuals associated with the current IR.
- config** - shows a birds-eye view of the chosen IRs speaker-microphone configuration
- zoom** - pops out the current visual and displays it in a resizable separate window

About

Apart from listing the makers of Altiverb clicking **about** shows the current CPU usage, buffer sizes and version number of Altiverb.

Preferences

Check online for updates

Every once in a while Altiverb asks the Audio Ease server to check whether there is something new for you. Typically free IR downloads. If it finds something it will put a little red circle in the browser's **news** button showing the amount of new items. When you click the **news** button you'll see the items. If you do not want this, uncheck this box.

Reset all parameters to default on IR change

When you select a new IR, all knobs will jump to their default positions. If you do not want this, uncheck this box.

Play test sound on parameter change

Altiverb has built in sounds that you can trigger to test the selected reverb. If you want to trigger the last played test sound each time you change a parameter, check this box. More about test sounds is on page 26

Set current IR as default.

If you like an impulse response a lot, you may want it to be the default IR whenever you insert a new Altiverb. First select your favorite IR and then click this button to make it the default.

IR Folders

Impulse responses can be located in several positions on your system. There are three folders that Altiverb scans for IRs, all three of them categories in the impulse response browser.

Audio Ease should contain the impulse responses made by Audio Ease.

User contains everything you made yourself or you received from other users. It is the location that drag&drop IRs (p. 21) will end up in.

third party This spot is meant for libraries made by other manufacturers.

Preset folder

You can see or change here where your presets are stored.

Gated Verb

Clicking the text **gated verb** will bring up the gate controls. A reverb gate creates a sudden cut-off of the reverb tail. You can set the time after which the gate closes in milliseconds. Because gates are used mostly as a musical effect you may want to set the time after which the gate closes in relation to the song's tempo. Select **beats** and a note value to do this.

Positioner



Puts your audio in a particular spot on the 'stage' of the sampled room in a convincing, physically correct way. (on/off button is at the top left)

Think of Altiverb as an echo chamber. You feed your audio to the speaker(s) in the chamber, place some microphones in there, and get back the reverberated audio into the mixing board. The input of Altiverb goes to the speakers, the output of Altiverb is what the microphones produce.

Starting with the basic rule above, it follows that it also matters where the speakers are in the echo chamber. You can triple the distance between the microphones and the speakers by pushing the speakers all the way to the back of the stage. Triple the width between the speakers themselves by dragging them apart. Halve the original distance from the microphones to the speakers by dragging the speakers all the way to the front.

Stereo link edit

This control in the top right of the **positioner** mirrors the speaker placement in the center stage line. When a mono input impulse response is selected just one speaker will be displayed.

By engaging the **positioner** you are controlling the timing and loudness of the direct sound. Because of this, while the **positioner** is on, **direct** in the **time** tab is switched on and its controls are unavailable as they are managed by **positioner**.

At www.audioease.com/av7manuals you'll find a tutorial on how to use this feature for proper orchestral instruments positioning.

Snapshots - instance based presets that switch using automation.

To get to the **Snapshots** controls click the **Snapshots** text along the top of Altiverb's interface.

Snapshots are presets that are private to an instance of Altiverb. Another Altiverb in the same session contains different snapshots. Snapshots are saved with the session. Snapshots can be switched using automation. The **automation preset index** parameter does that.

Snapshots are an inheritance of older versions of Altiverb and no longer a necessity in Altiverb 7. This is because in the mean time Altiverb 7 has become a total-recall plug-in, meaning that its entire state can be automated without the use of snapshots.

To fill (store) a snapshot just click on an empty one. The current setting will be stored. The default name is the name of the impulse response, but you can change that by double clicking on the name.

Empty a snapshot by pressing the **clear** button at the bottom of the snapshot area. Then click on the cross of the snapshot you wish to empty.

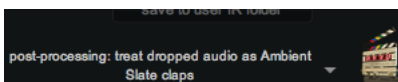
Recalling a snapshot can be done by clicking an occupied snapshot.

Recalling a snapshot using automation: Arm your host for automation recording and click a snapshot at the proper times. If you want to draw an automation point the parameter to look for in your host's automation is called **automation preset index**.

IR import - create your own impulse responses or add from other sources.

To get to the IR import controls click the IR import text along the top of Altiverb's interface. It is easy to create your own impulse responses, you can drag and drop recordings from the tracks of your host onto Altiverb (selected hosts), or right from the operating system, or from Snapper. There are example movies at www.audioease.com/av7manuals to illustrate exactly what the workflow is. It will be briefly discussed here.

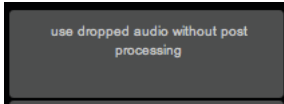
In short the workflow is as follows: you tell Altiverb what type recording you are dropping on it: a starter pistol, a sweep recording, maybe a piano chord. Then you drop the audio. You will hear the result right away. If you like it click the **save to user IR folder** button to save the result. Now let's look at it a bit more in detail:



So first you select what type of recordings you want to create impulse responses from. Click on the text shown on the left.

You'll see a popup menu that will be described on the next pages item by item.

No processing



Select this if the audio you are dropping is a finished impulse response, or if you want to experiment using other audio. Special effects can be achieved by using audio such as piano chords, breaking glass, spoken word, or drum rhythms. Select this item, drop the

audio and listen to the result. Whenever you like an impulse response do not forget to save it using the **save to User IR folder** button

The enhance knob

Using audio like piano or voice normally results in material that sounds too dull. You need to really boost high frequencies. This is what the turning knob is for. It is a special type EQ called **Enhance**.

What happens when you use a piano chord as an IR and then sing through Altiverb, is much like what happens when, in lighting, you want to use a blue and a red translucent filter to create a purple one. It does become purple, but it also becomes rather dark. In audio, the piano has a 'pink' distribution of frequencies. Pink means the high frequencies roll off at a certain very natural rate. The voice is 'pink' as well. Convolute them, which is a multiplication in the frequency domain, and you will see the roll-off slope is twice as steep. Very unnatural. To make up for that you can use the enhance knob which is a pink-to-white EQ and can bring back the high frequencies.

Quality speaker



from www.audioease.com/sampling you can download sound files that contain a sweep tone. They are meant to be played back in a room of which you want to capture the reverb in an impulse response.

Microphones should be used to record the playing

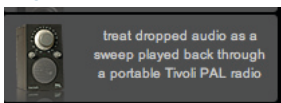
back of the sweep tone in the room. The resulting recording can be dropped onto Altiverb. When this **quality speaker** option is selected The sweeptone will be calculated out of the recording and you will hear the resulting reverb right away. Altiverb will assume that you have used a quality speaker to play back the audio and will not attempt to make up for any frequency deficiencies of the speaker.

There are many advantages of using the audio ease method of creating impulse responses.

- The sweep is not equal loudness throughout, its level is higher where most speakers can take it and where the ear is more sensitive, resulting in less noise.
- The Altiverb sweep method is immune to clock differences between playback and recording gear. Altiverb is unique in this respect. You can safely use one recorder to play back the sweep and another to record. You can playback and record at vastly or slightly differing samplers, it is all no problem to Altiverb.
- Third and fifth harmonic distortion, happening in a speaker that gets overloaded, sounds like a reflection of the sweep that started earlier than the sweep itself. In the result that will be cut off and will not affect the result.
- All reverb tails eventually dive into noise. At that point Altiverb needs to figure out how to fade out the tail. Audio Ease's extensive experience has resulted in the best fading algorithms, carefully taking into account the exact shape and onset of both reverb and noise.

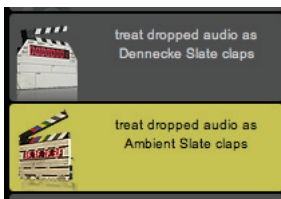
Many of the ground breaking technology improvements that have led to the quality of the Altiverb IR library are available to you, in Altiverb's 7 drag and drop sweep method.

Tivoli PAL



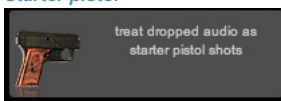
You play back a sweep much like described under **quality speaker**, but this time through a Tivoli PAL portable battery powered radio. The Tivoli PAL radio is small, surprisingly wide-band, portable, available for over a decade now, and you can plug your iPod or other playback device right into its back. For making quick Impulse responses intended for treating voices it can be ideal. However, the EQ curve of the Tivoli speaker goes up and down like nothing else, so to iron that out, choose this option.

Slates



If you need to match audio from the set and the only thing you can find to make an impulse response from is the slate clap, you can cut it out drop it onto Altiverb and make an IR out of it. Audio Ease has sampled the characteristics of the two most common slates (clapper boards). The Denecke and the Ambient. If the results come out too noisy you can use the Browser's **similar** function (p. 18) to suggest impulse responses from the Altiverb IR library that come close.

Starter pistol



A six millimeter caliber Flobert starter pistol can be used to make impulse responses. Use hearing protection when you use these and don't try to carry a starter pistol into a public space without telling everybody first. Because a starter pistol is loud the resulting signal to noise ratio is second only to the sweep method.

IR info

To get to the IR Info click the **IR info** text along the top of Altiverb's interface.

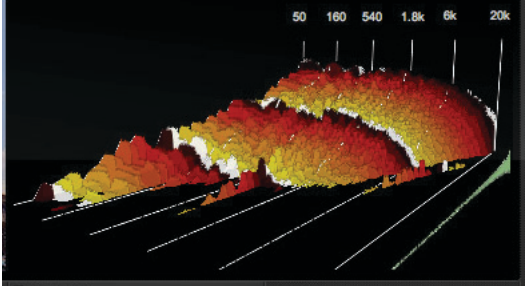
It can contain IR length, room information, anecdotes, recording dates, gear and the engineer's names.

Waveform

Waveform view shows the waveforms of each of the channels of the current impulse response. Next to the waveforms the **Speaker>Microphone** indication is printed. **R>L** therefore means: This is what the **Left** microphone recorded when the **Right** speaker emitted the impulse. C means center.

Waterfall

To get to the Waterfall diagram click the **Waterfall** text along the top of Altiverb's interface.



The waterfall shows the reverb's frequency content through time. The vertical axis (pointing upward) is the decibel axis. The color scheme (beginning briefly with white, quickly moving through blue, and slowly through red and yellow) is repeated every full second of the reverb tail to indicate time.

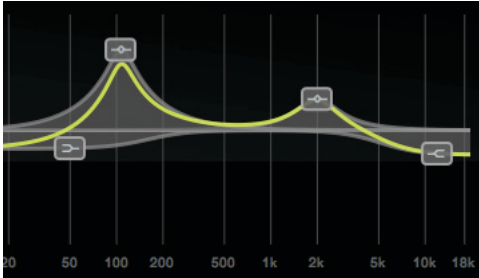
A regular waveform is plotted next to, and time aligned with, the waterfall to give a clearer picture of the reverb's overall amplitude through time.

From this display you will notice immediately that in real-life a room's high frequencies decay quicker than its low frequencies.

Resonances can be seen as well as the effects of the damping, eq, decay, and the various gain parameters. When zoomed in to the first half second of the reverb, the **pre-delay** parameter can be clearly seen.

You can control and spin the waterfall by hovering your mouse over it and selecting from the view-tools that appear.

EQ curve



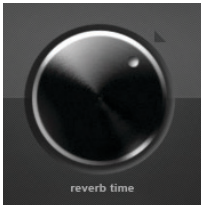
Four filters are available to EQ the reverberated output of Altiverb (not the dry output of Altiverb). You can access them via the turning knobs in the EQ panel (p. 27) or you can use the interactive EQ curve that appears when you click the **EQ-curve** text at the top of the Altiverb window.



Drag the parametric band up and down and left to right. Hold down CTRL and drag left and right to make the peak narrower or broader.

That concludes the clickable text along the top of Altiverb's main window. Next, again from left to right, we will look at all the turning knobs and drawers.

Reverb Time



Use this to lengthen or shorten the reverb tail.

It applies an exponential gain curve to the impulse response that either increases gain as time progresses (lengthening) or decreases the gain (shortening). By lengthening the reverb time you are raising the level of the softest part of the reverb tail.

Please note that that may reveal resolution and signal-to-noise inaccuracies of the impulse response recording.

Bright

Real spaces often contain less high frequencies than algorithmic (synthetic) reverbs. Sometimes you need that extra sparkling brightness in a reverb tail that is just hard to obtain from the real world. And it often cannot be achieved with EQ, because what's not there can't be turned up either.

This is where **bright** comes in.

Bright adds an entire algorithmic synthetic reverb on top of the real-world impulse response. It tailors the reverb tail exactly to the IR, following length, slope and early reflections closely, so that it connects and the result does not fall apart in two sounds. By turning up **bright** you dial in more of the synthetic reverb and thus more high frequencies.

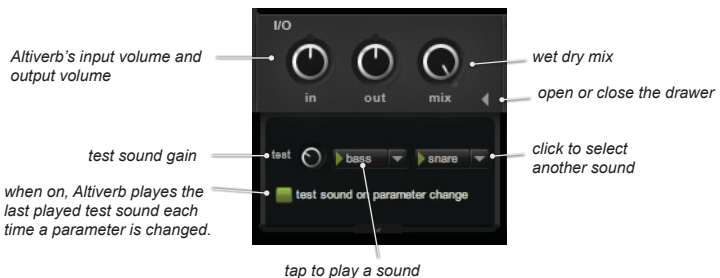
With a bit of **bright** on top of the IR there is some more high frequency content in the tail that you can then start to enhance via **EQ** or **high damp** if desired.

(Room) Size

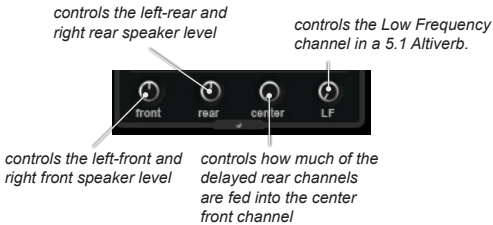
Makes the selected room (impulse response) smaller (turn counter clockwise), or larger (turn clockwise). It transposes room modes and resonances, tightens or spreads early reflections, and shortens or lengthens the reverb tail.

I/O - in, out, mix, test sounds

The I/O section offers gain controls for in- and output, the mix between dry and reverberated (wet) audio, and the I/O drawer offers test sounds (and surround controls in Altiverb XL).



The I/O drawer looks different in Altiverb XL when a surround Altiverb is inserted. The following knobs are added:



Center (Altiverb XL)

Outputs a delayed sum of the rear channel into the center channel to fix possible gaps. Intended for post production usage to prevent dry dialogue in the center channel, or gaps in the reverb image in wide theater setups. For all musical purposes the recommended setting is all the way down (no center bleed).

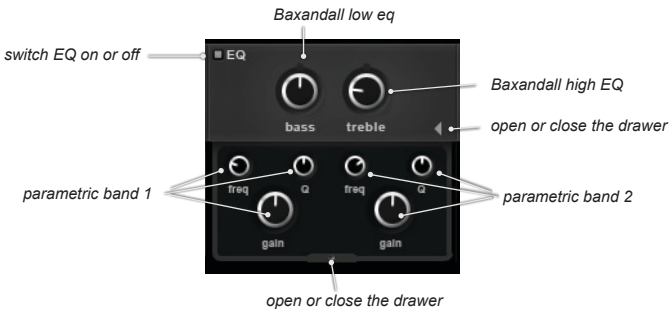
LFE (Sub Woofer) (Altiverb XL)

Outputs a delayed sum of the rear channel into the LFE channel to allow for reverb in the sub woofer. Intended for post production special effects usage. For all musical purposes the recommended setting is all the way down (no LFE).

EQ

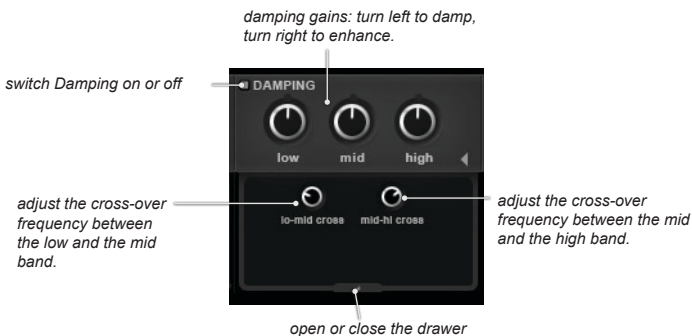
The equalizer works on the wet signal only.

The bass and treble bands are Baxandall eq's, designed to not shift phase more than 180 degrees, which effectively means that combing or cancellation effects are unlikely when the eq'd signal is mixed with the dry signal.



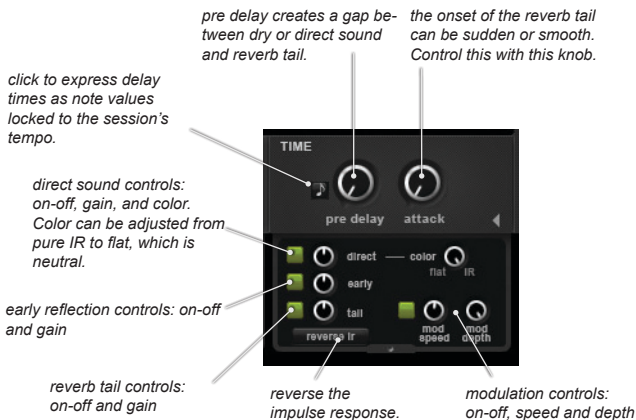
Damping

Control the reverb length of three separate and adjustable frequency bands. Shortening is damping, lengthening is enhancing.



Time

The time tab controls the pre-delay and attack, and the three time-stages of a reverb: the first: direct sound (p. 13), the second: early reflections, the third: the tail.



The drawer of the time tab also holds the modulation parameters.

Modulation chaotically scatters audio into Altiverb. It has several results of which we give two examples here:

- When the same snare drum comes in twice, the reverb will sound different nonetheless.
 - Flute notes will be slightly dispersed such that the reverb tail is not entirely statically the same note. In reality when you blow a flute note into a church the reverb will only have the frequencies contained in the flute tone. Algorithmic synthetic reverb however disperses the tone and makes it more cloudy. Therefore synthetic reverb is often more forgiving for false notes than convolution reverb. The modulation parameter fixes that. Think of modulation as the movement of the early reflections, a subtle chorusing of the foremost first reflections off the walls.
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7

Altiverb and High Sample Rates

Audio Ease Impulse Responses are released at samplerates of 48 kHz or 44.1 KHz. 96 kHz versions of Audio Ease Impulse Responses have not been released because no valuable data has been found to return from walls and ceilings in the highest octave (24 kHz - 48 kHz).

Altiverb can be used in projects running at the following 'high' sample rates: 88.2 kHz, 96 kHz. Altiverb XL adds 176.4 kHz, 352.8 kHz and 384 kHz. Running the reverb engine at these sample rates would place an extremely heavy load on the processor. There is no quality advantage of running the reverb engine at 96 kHz when a 48 kHz Impulse Response is selected. In such a case it makes sense to keep the reverb engine running at 48 kHz, so processor load stays at a reasonable level.

An Example

When a 48 kHz impulse response is used in a 96 kHz project, the reverb engine will run at 48 kHz, while the dry sound will stay at 96 kHz. The sample rate conversions performed are of very high quality and are extremely accurate. They introduce a slight delay (typically 64 samples) into the signal path. The exact amount of delay is displayed in the **Info Screen** (p. 19).

It is possible that 96 kHz impulse responses will eventually become available. With a 96 kHz impulse response being used in a 96 kHz project, none of the sample rate conversions described above would need to be performed. The reverb engine will run at 96 kHz, resulting in heavier processor load, but true 96 kHz processing.

Required buffersizes

The sample rate converters can only function when your hardware buffer size is set to 256, 512, 1024, 2048, 4096, 8192, or 16384 samples. If such a buffer size is not available, Altiverb will warn you that it will run its reverb engine at a high sample rate, resulting in higher processor load.
