ArtsAcoustic Reverb Manual

Version 1.6

Thank you for choosing an ArtsAcoustic product. We have been putting a lot of research, heart and passion into this product and we hope that you greatly enjoy it as much as we do.

Contents

Introduction

If you are an experienced user of music software you want – for sure – to start right away and not work your way through a lengthy manual. Nevertheless you should risk a glance into the whole manual in depth.

Being longtime users of native reverb plugins ourselves, we can imagine how your first session with the ArtsAcoustic Reverb might otherwise look like (because we would do it just the same way): At first you would turn Diffusion, Room Size and Room Width to the maximum right. And isn't this, because most native reverbs sound absolutely unacceptable with low diffusion or room size settings? At exactly this point we would like to pick you up. This manual will introduce to you the flexible ways of the ArtsAcoustic Reverb, which make a lot of wonderful exceptions to your overall sound and use of this plugin. And this is why you might want to read this manual.

Philosophy of the ArtsAcoustic Reverb

When using the ArtsAcoustic Reverb for the first time, you will easily notice the philosophy behind the plugin. Its starting point is you, the user. Our greatest point of attention was making the plugin most flexible and at the same time as effective as it can be, thus allowing the user to reach best results with any production in the shortest time possible.

To this, some important factors contribute:

- **Sound**: the reverb always sounds as best as possible, independent of your adjustments.

- **Look & Feel**: a clearly structured, functional and yet optically pleasant interface.

- **Features**: anything is possible, but the number of parameters is clear and comprehensible.

- **Editing**: something actually happens, when a control is moved. A control that does not change anything perceivable is not useful in a reverb, if you ask us. The controls of the ArtsAcoustic Reverb work like you expect them to.

- **Joy**: the sum of these four factors equals the most important of them all: Fun at work.

System requirements

- This software is a plugin for Microsoft Windows / Mac OS X (Universal Binary). You will need a host software where you can run it in. It cannot be run as a stand-alone application.

- The plugin relies on the VST™ (Virtual Studio Technology) specification by Steinberg™ (Windows and Mac) or the Audio Unit Standard by Apple (Mac only). It can only be run in a host that supports at least one of these standard architectures.

- The plugin supports 32 and 64 bit hosts.

- Please refer to your host's manual to assure that your host software supports either the VST-Technology or the Audio Unit Standard.

Windows	Macintosh
Required: • Pentium / Athlon 1,2 GHz • 1 GB RAM • Windows XP • Windows MME compatible audio hardware • VST2 compatible Host • Display Resolution 1024 x 768 pixels	Required: • Macintosh with any Intel Processor • 2 GB RAM • OS X Version 10.6.8 • CoreAudio compatible audio hardware • VST2 or AU compatible Host • Display Resolution 1024 x 768 pixels
Recommended: • Pentium / Athlon 2.0 GHz or faster • 4 GB RAM • Windows 7 • Display Resolution 1152 x 864 pixels • ASIO compatible sound card recommended	Recommended: • Macintosh with fast Intel Processor • 4GB RAM • OS X Version 10.7 or above • Display Resolution 1400 x 900 pixels

Installation

This section will assist you with installing the ArtsAcoustic Reverb on a Windows and Macintosh system.

Installation (Windows)

Double-click the installer to start the installation.

Step 1 – Welcome
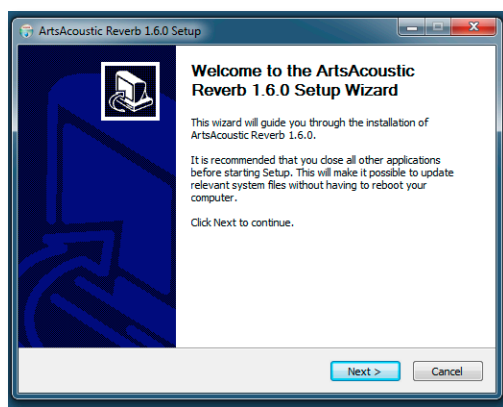
Click Next> to continue.

Step 2 – License Agreement
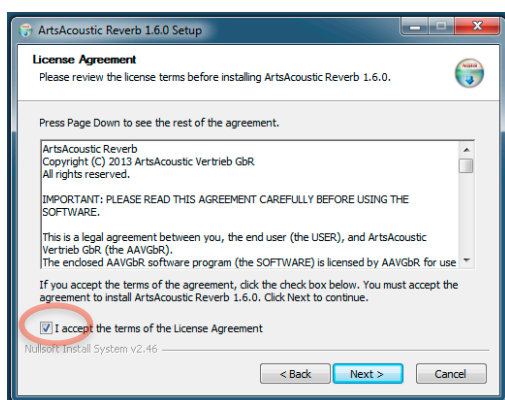
Please read the license agreement and click the checkbox if you agree to the terms.
Click Next> to continue.

Step 3 – Destination Folder
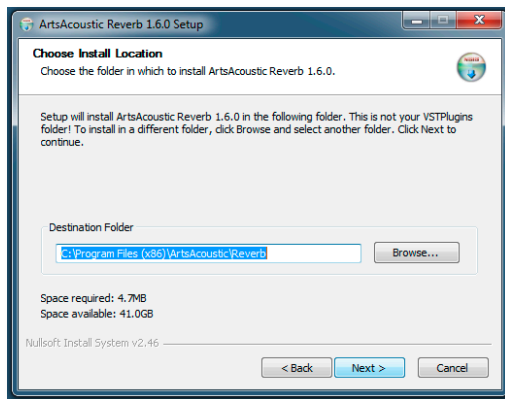
ArtsAcoustic Reverb will be installed into the Destination Folder. To choose another location, click Browse and select a folder.

Click Next> to continue.

Step 4 – VSTPlugins Folder
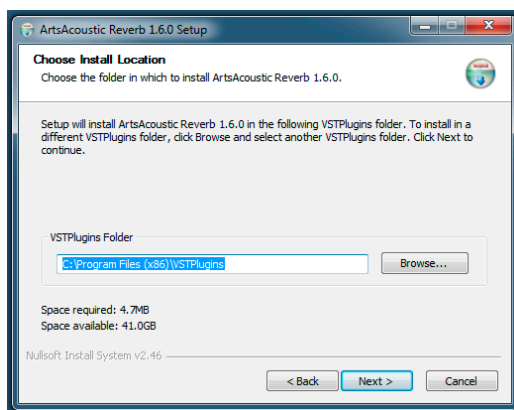
The VST part of the plugin will be installed in the VSTPlugins Folder. To choose another location, click Browse and select a folder.
Click Next> to continue.

Step 5 – User Preset Folder
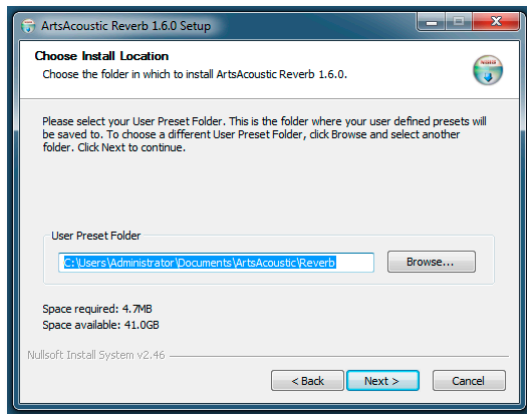
ArtsAcoustic Reverb User Presets will be saved in the User Preset Folder. To choose another than the default location, click Browse and select a folder. You can change the User Preset Folder at any time afterwards within the plugin setup window (see page 25).

Click Next> to continue.

Step 6 – Start menu Folder
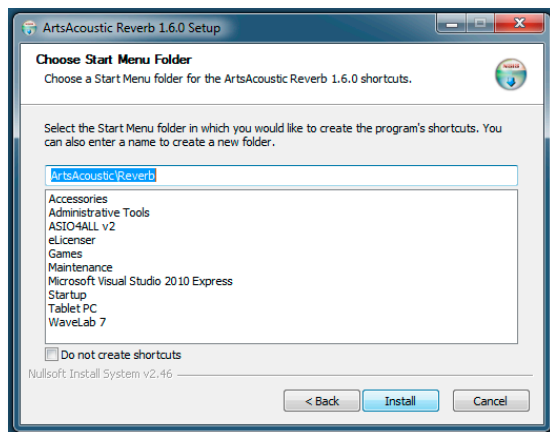
Click Install to continue.

Installation (Mac)

Double-click the installer package icon to start the installation.

Step 1 – Install/Uninstall
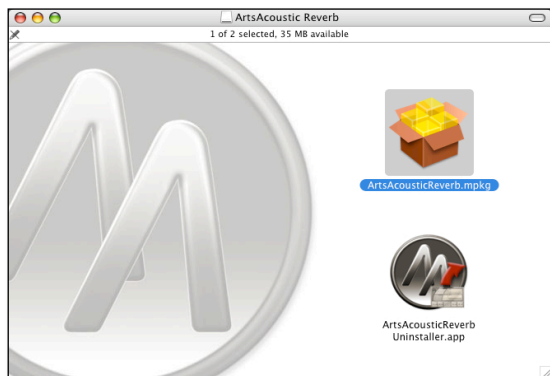
Choose what you want to do: you can either install the actual version or uninstall an older version by double-clicking on the corresponding icon.

Step 2 – Introduction
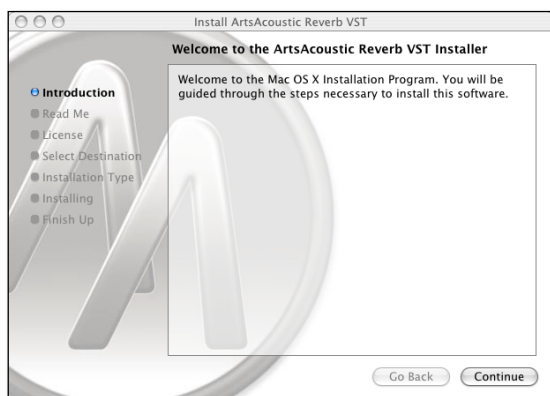
Click 'Continue' to continue.

Step 3 – Read Me
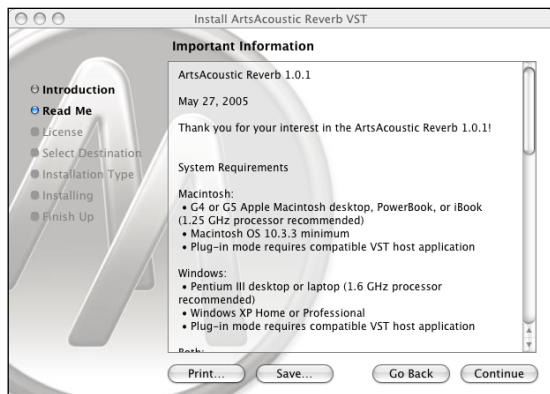
Here you can read latest information about the actual version.

Click 'Continue' to continue.

Step 4 – License
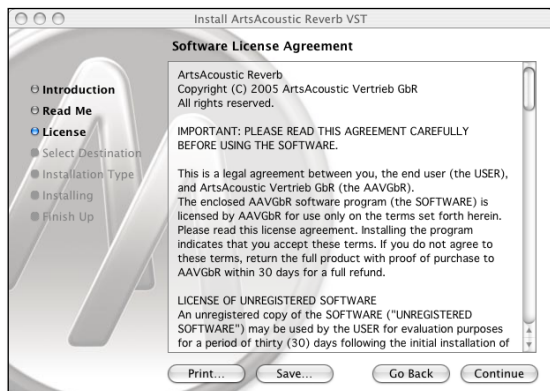
Click 'Continue' to continue and 'Accept' in the following dialog, if you agree to the terms.

Step 5 – Select Destination
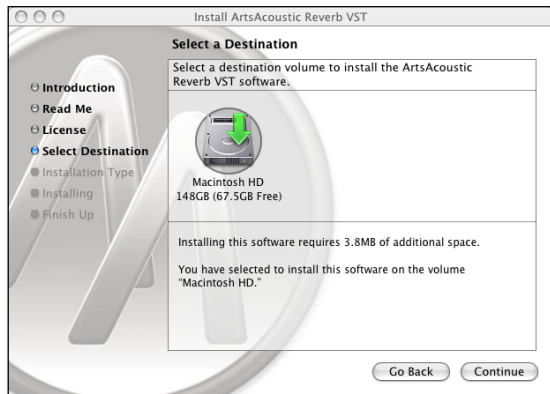
Click on the "Select Destination…" button to acces this page. In most cases, you can only select the system drive as destination.
Click 'Continue' to continue.

Step 6 – Installation Type
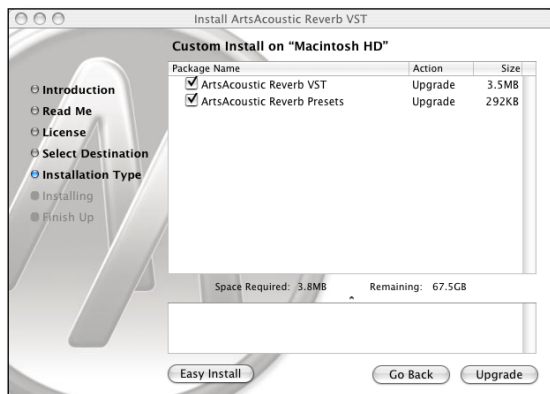
If you want to individually select the components to be installed click 'Customize'. Here you can choose if you want to install the AU and/or VST version of the ArtsAcoustic Reverb and the Factory Presets.

Step 7 – Finish Installation
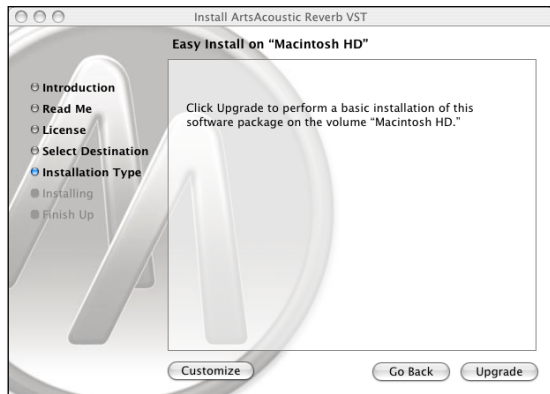
If you are performing a new installation click 'Install'. Otherwise click 'Upgrade' for upgrading an existing installation.

Copy protection

The plugin has to be activated using a serial number. The serial number has been sent to you with your delivery notification email.

Open the file including your serial number which is attached to the delivery notification email and copy the complete content of that file into your clipboard by selecting the complete content and pressing Ctrl+C (Windows) or Cmd+C (Mac).

Insert the ArtsAcoustic Reverb into your preferred host. In case the ArtsAcoustic reverb finds a valid serial number in the current clipboard, it will register the ArtsAcoustic Reverb without any further actions on your side.

Otherwise you will be asked to enter a valid serial number when starting the ArtsAcoustic Reverb:
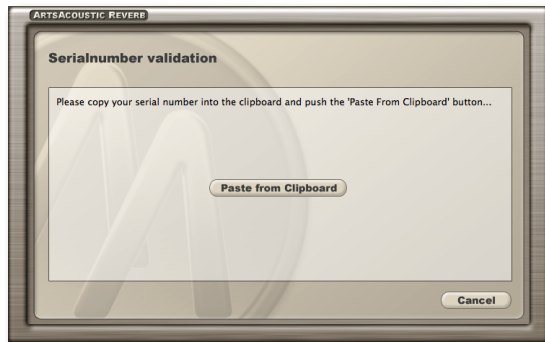
Retry to copy the complete serial number to the clipboard (see above) and press the button "Paste from Clipboard". This will register the ArtsAcoustic Reverb if the serial number is valid.

In case the serial number is not valid, the ArtsAcoustic Reverb will not process any sample data. You will be asked again when opening the ArtsAcoustic Reverb until you enter a valid serial number. Please contact ArtsAcoustic support if you have problems to enter your serial number.

Uninstallation

- On Windows use the system tools to uninstall the plugin.
- On Mac OS X use either the uninstaller provided within the installer package (see page 10). There is also a copy of the Uninstaller located in '/Library/Application Support/ ArtsAcoustic/Reverb/ ArtsAcousticReverb_Uninstaller.app.

Using the Editor

The Main View

When you open the plugin you will find yourself in the Main View, showing up the editor. Now let's get familiar with its configuration and displays. Take your time and have a go at everything. Try to experiment a bit! Don't worry, there is no virtual room in your computer that collapses at wrong settings.

The Level Display

In the upper left you will see the ArtsAcoustic Logo, which at the same time serves as a level meter. If a signal is fed into the input, it is shown on the left side of the logo. On the right side the level of the output signal is displayed. Clipping is indicated when the scales reach orange level.

The ArtsAcoustic Reverb's Level Display, indicating clipping at the input

> The input display is independent of the position of the "Dry" control. That way you can easily recognize possible input clipping, even when the dry input signal is not added to the reverb. See page 42 for more details.

The Editor's Fader Groups

Right beside the logo you will find the faders for **Time Design**. With these you can handle the parameters that influence the reverberation envelope.

Located below are the faders for **Room Design**, which you use to define the characteristics of the room.
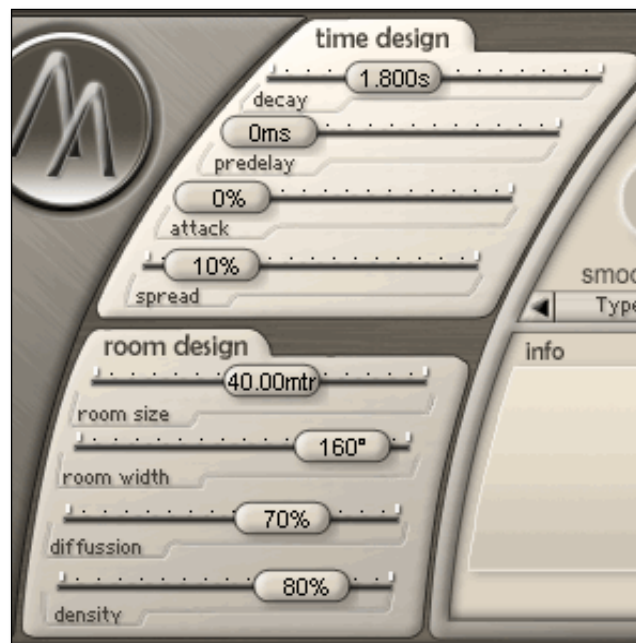
All faders can be operated by dragging them with your mouse. The current values are shown directly in the respective fader button.

To fine-tune settings, use one of the following alternatives:

• hold the 'shift' key while dragging the button to achieve a higher resolution

• use your mouse wheel, if your mouse has one and your system supports that function

• use the Float-Editing Window by double or right clicking on the button (see page 23)

The Editor's Knob Groups

Level, EQ, Damping, Echo, Modulation and **Quality** can be controlled by turning the knobs in this section:

By default the knobs operate in linear mode. In linear mode you can change a value by clicking a knob and dragging upwards (to increase the value) or downwards (to decrease the value). The current value is displayed below the knob.

In Circular Mode, you use the mouse pointer as if you were turning a real knob. By clockwise turning you increase the parameter value; by anticlockwise turning you decrease it.

The knob mode can be changed on the setup page (see page 25).

> In Linear Mode the knobs do not respond to a click itself. You have to move the mouse to actually change a value. This is done to prevent an accidental adjustment. The knob then does not jump to a wrong value. This behavior is very handy when fine tuning parameters.

The Damping Fader

For the 3-band-damping there is an additional **Split Fader** to adjust the crossover frequencies of the bands. Either you adjust every crossover frequency on its own by moving the respective button, or both frequencies at once, by dragging the area between the two buttons to the left or to the right. For technical reasons the Split Fader does not support the mousewheel.
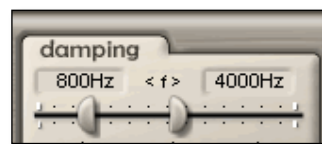
The Editor's Displays

The **Info Window** shows information about all actions you currently perform in the editor. Often you get additional information about the parameter you presently edit.
The plugin editor also supports mouseover functionality: when moving the mouse over a slider or knob, its value will be displayed in the Info Window.
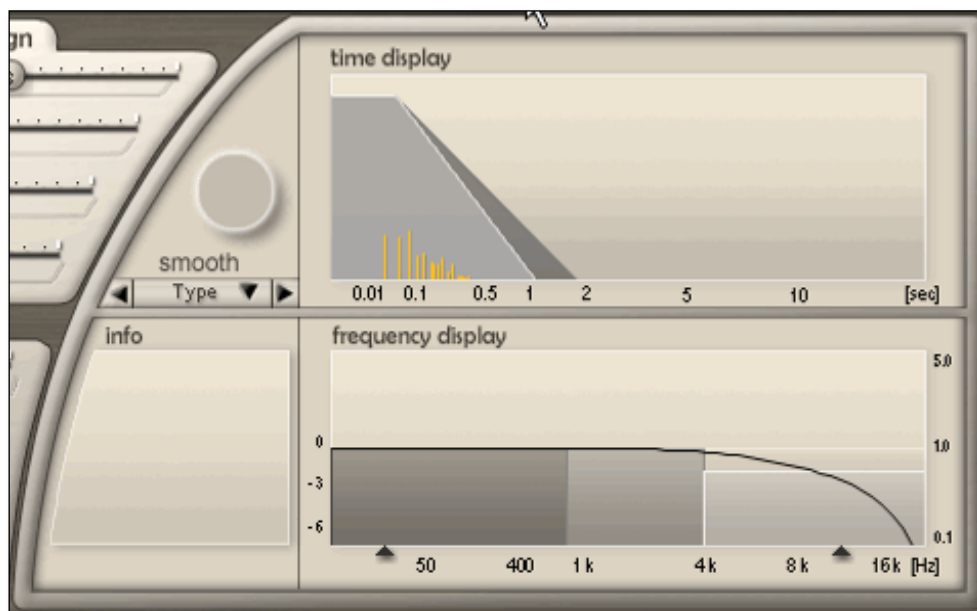
In the **Type Window** above you can select the reverb type, by either opening the drop down menu using the downward arrow symbol, or stepping gradually through the types by using the left and right arrow symbols. The currently chosen type is shown in text and also as a little symbol.

The **Time Display** shows the reverb tail as a time curve. The grey area symbolizes the envelope of the diffuse reverberation, the yellow vertical lines indicate the position and volume of the early reflections. You can adjust the reverberation time by dragging the mouse pointer directly in the Time Display.

The reverb's time curve diagram in the Time Display is logarithmic. Shorter reverberation times can be displayed more precisely this way. Please don´t be confused: when you adjust for example the pre-delay, it seems that also the length of the reverberation tail changes – but this is only graphically, because the more the reverberation tail moves to the right, the smaller the time units get in the graphic display. The length of the actual heard reverberation tail of course will not change at all.

The **Frequency Display** gives you control over all frequency-related settings of the reverb. The three frequency bands of the diffuse reverberation are displayed as bars. In the vertical direction you can see the relation to the reverberation time, in the horizontal direction you see the frequency. You can edit the bands by dragging the representing bar around. To move a bar in only one direction, you can grip it with the mouse pointer on the upper or a side edge (the mouse pointer will change accordingly while moving over the respective area).

Additionally the Equalizer is displayed as a curve in the Frequency Display. You can adjust the cutoff frequency of the high pass filter by using the left triangle symbol on the bottom of the Frequency Display. Accordingly, use the right triangle to adjust the cutoff frequency of the low pass filter.

The Taskbar

The Taskbar is the upper row in the plugin window as shown above. Here, you find:

- The **Preset Management Button** (with the yellow folder icon), that opens a dropdown menu with the following options:

    o *Load Preset:* opens a file browser dialog to select a preset to load

    o *Save Preset As:* opens a file browser dialog to let you navigate to the location where you want to save your preset

    o *Refresh:* rescans the preset folders to reflect changes made in explorer/finder.

    o *Factory:* lets you choose preset from the factory preset library. This presets are organized in several sub categories for convenient browsing. The currently active preset and the path to it will be highlighted by a small dot.

    o *User:* lets you choose a preset from the user preset library, which will contain the presets created by yourself. Those presets are physically stored on your hard disk at the location specified by the 'user preset folder' setting (see page 25). The menu will reflect the hierarchy of this folder's structure, including subfolders, which allows you to organize your presets into specific categories. The currently active preset and the path to it will be highlighted by a small dot.

- The **Preset Name Text Field**. To change the name of the current preset, just click into the text field and enter a new name, confirming with enter or by clicking outside the text field. If you want to cancel the operation and return to the previous name, press ESC.

- two buttons to quickly access the previous (left arrow button) or the next preset (right arrow button) in the preset list. The preset list consists of all factory and all user presets in all categories.

- The **Bit Depth Button** to toggle between 32 and 64 Bit precision mode. Note that this affects only the audio processing quality and has nothing to do with the host's or system's architecture.

- Two buttons for toggling between the **Main View** and the **Setup View**,

- The **Preset Modify Indicator / Quick Save Button** (with the disk symbol)

How to Save a Preset

Once you have made changes to a setting, the Preset Modify Indicator will turn slightly red. If you want to store the preset in the user preset library, follow these instructions:

- First of all, give it a good name that lets you remember the use of your preset later.
- The name editing is simple: Click on the current name in the Taskbar (in the upper image it is named „Init Program"). The name will be highlighted which means that you now can type in a new name.
- Hit the enter key, or click in an empty area of the plugin to end your input.
- Now click on the yellow folder icon and choose „Save Preset As" from the dropdown menu.
- The save dialog pops up. This will be a common save dialog of your operating system.
- Select the location where you want to save this preset. As a default, the dialog will show up at the user preset folder location, but you are free to choose any other location.
- We recommend always to store presets in the user preset folder. Otherwise, the preset will not show up in the user preset library.
- Click save.

To be cross platform compatible as far as possible, and compatible to other hosts on the same platform, we do not recommend to use the preset manager provided by your host software, as some hosts (such as e.g. LogicPro) use their own format for storage, as they might not be compatible to other hosts, even though it might work within that particular host. The AAR preset manager uses an own format that is compatible to all platforms, hosts and to future versions. To be safe in compatibility issues, you should use the build in preset manager of the AAR as described above.

Once you have saved more than one user preset into the user preset folder, it is a good idea to organize and categorize them within subfolders. As an example, you might have a look how we did it with the factory presets. You can create as much subfolders within the user preset folder as you want.

To easily step through all the presets, use the left or right arrow buttons beside the name bar. This will work even through subfolders.
To recall a specific preset directly, just click on the the yellow folder icon, it will show you the user presets in a tree structure, allowing you to choose them in random order.

The refresh option updates the tree structure, if user presets are not showing up correctly, for example when you manually copied them outside of the AAR.

> The factory presets cannot be overwritten. You can use the user presets folder instead to save changes you made to a factory preset.

Autoload Preset

If you save a preset called "autoload" into the root of your user presets folder, it will be loaded as initial settings when you open a new instance of the ArtsAcoustic Reverb.

Quick Save

For very intuitive and instant saving you can use the Quick Save Button, which is located left to the name bar (with the diskette symbol). Once you edit a parameter, it will turn slightly red, indicating that you made changes to the preset. If you click on that red indicated symbol, it will instantly save the current setting by overwriting the reference you loaded previously. However, if you loaded a factory preset file before editing (not a user preset!), the save dialog will pop up, just as if you choose "Save Preset As" from the drop down menu. This is because factory presets of the ArtsAcoustic Reverb cannot be overwritten.

> When using factory presets, we suggest you to enter a new preset name in the plugin's name bar before you click the quick save symbol, unless you want to use the original preset's name. Otherwise, if you loaded and edited a factory preset, the original name will be used once you save it without giving a new name.

Bit Depth Setting

This switch determines the calculation precision of the ArtsAcoustic Reverb. 32 Bit is a good precision, but 64 Bit is much more accurate, thus leading into a more detailed and finer sound. However, CPU load will increase in 64 Bit Mode. The Bit Depth Setting is stored with each preset, but you can make it global by set the ignore option on the setup page (see page 26).

The Float Editing Window

Every parameter can be changed directly in the editor by using the mouse. But to give you even better control over the adjusting of parameters, there is the Float Editing Window. You open it either by double-clicking, or by right-clicking a fader or a knob. Now, an additional window will open, which is not graphically connected to the editor. It can be moved around on your desktop freely and will not disappear when you click in the background (hence called "Float Editing Window").
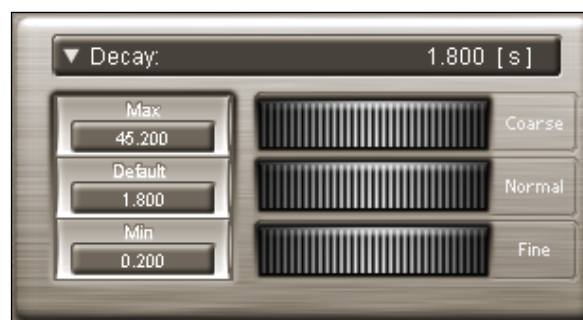
In the Float Editing Window you will see three big wheels that you can drag to the left or to the right to make adjustments. The upper wheel (**Coarse**) will change the parameter roughly and in big steps. Use it to quickly reach the intended range of value.

The wheel in the middle (**Normal**) will change the parameter with the same accuracy as in the editor. Use this to adjust a desired value quickly and with adequate precision.

The lowest wheel (**Fine**) will change a parameter very precisely. Use it when you want to define a intended value very accurately or just want to change nuances.

In the upper bar the name of the parameter and the respective value are displayed. You can also enter a new value here by using your keyboard. Just click on the displayed value. It will then be highlighted and you can enter a new value. Finish your input by pressing enter.

The three buttons on the left side can be used to quickly activate several standard settings of the parameter. Click "**Max**" to choose the maximum value of the parameter, „**Default**" for the standard value or "**Min**" to choose the smallest possible value of the parameter.

To the left of the parameter name you see a downwards arrow. If you click on it, a dropdown menu opens which lets you choose a different parameter to edit in the Float Editing Window.

Setup and Preferences

The Setup View

In the Setup View you can:

- specify your user preset folder, where you want to save your own created user presets on your hard drive,

- set the Knob Mode (linear or circular),

- enable or disable the Mousewheel and make options to its behavior,

- enable or disable the Level Meter,

- set the mode how the Dry / Wet Levels are handled when loading presets,

- set the mode how the 32 / 64 bit audio processing mode is handled when loading presets,

- see the Version Number of the plugin.

The User Preset Folder

To change the location of the user preset folder, click on the yellow folder icon. An common file dialog of your operating system will pop up, allowing you to freely select or create another folder. If the selected destination folder is not empty, for example if you moved your existing user preset folder or copied one from elsewhere, the preset browser will reflect the content of the selected folder instantly. However, it's only possible to select one user preset folder at a time. If you want to switch between several libraries, we recommend you to merge them into one folder using your system's file browser and select this folder as user preset folder.

The user preset folder will show up as a default in the preset load or save file browser dialogs. However, once you selected another folder within those dialogs, for example to save a preset into a subfolder, you will find yourself in this folder the next time you open a file browser dialog. Unless you unload the plugin in the host and reload it again, you will always be taken to the last chosen subfolder.

> This "remembering behavior" works only within the user preset folder. Outside this folder the plugin will forget all locations you have been to load or save a preset. Instead, it will always take you back to the user preset folder. We did this to prevent you from accidentally saving to a directory that you maybe won't remember at a later time. We recommend saving all presets within the preset folder, as otherwise they wouldn't show up in the preset menu.

Knob Mode

To change the Knob Mode, simply click one of the radio group buttons. The change will be instantly applied, no need to reload the plugin.

There are two Knob Modes to choose from:

- **Linear Mode**: By default the knobs operate in Linear Mode. In Linear Mode you can change a value by clicking a knob and dragging upwards (to increase the value) or downwards (to decrease the value).

- **Circular Mode**: In Circular Mode, you use the mouse pointer as if you were turning a real knob. Turn it clockwise to increase the parameter value and anticlockwise to decrease it. The farer you drag the mouse away from the knob while turning the knob, the finer the adjustments are.

> The faders in the Time or Room Design section will always work horizontal. Only the knobs will change according the mode you specify here.

Mousewheel Options

To enable, disable or change the mousewheel behavior, you can edit the mousewheel parameters. By default, using the mousewheel to edit parameters will do it in coarse mode. Pressing the SHIFT key while using the mousewheel will switch into fine mode.

Use the **Flip SHIFT** option to reverse this behavior and set the fine mode as default.

Level Meter Option

You can disable the level meter here.

Ignore Dry / Wet Level on Preset Load

When stepping through presets, it can be very handy to leave your current Dry / Wet Level settings untouched instead loading the values stored in the presets. With this option you can decide to ignore the Dry / Wet Level settings on preset load.

Ignore Bit Depth on Preset Load

With this switch you decide to ignore the 32 / 64 Bit precision settings when stepping through the presets. This way you can set the Bit Depth globally for all presets. However, to achieve a really permanent Bit Depth setting, that even will remembered on a new instance of the plugin, you'll have to store your desired Bit Depth in the Autoload preset (see page 22).

The Reverb Parameters in Depth

In this chapter, after a short overview tour, we would like to describe the individual parameters at length and give you some background information and tips regarding their importance in everyday studio use. We tried our best to write it down comprehensible and coherent. But if you get stuck anyway, just try around a little, just play with the parameters. Learning by doing is our slogan, because all theory cannot replace a little practical experience. On the other hand, we don't want to neglect theory completely, even the most curious user should be able to quench his thirst for knowledge.

Overview

The most important feature of the ArtsAcoustic Reverb – besides its excellent sound attributes – is its remarkable flexibility, despite its concise number of parameters. We call it ourselves the "Job Verb", because you can easily use it for almost any purposes in a fast yet effective way.

Welcome to a short tour of the most important parameters:

Reverberation times can be adjusted separately for three frequency bands: bass, middle and treble. The reverberation times for the three bands are defined as relation to the overall reverberation time (**Decay**). By using this so called *frequency-dependent absorption* you can already create a variety of different reverbs, from dull and thumping to cold and sharp. The frequency corners of the bands can be freely adjusted. As an experienced producer it might be important for you to know, that the ArtsAcoustic Reverb will perform a *roll-off-absorption* in the bass and treble band*,* if the ratio is set to the minimal value of 0.1*.* The *roll-off-absorption* uses different types of filters to simulate absorption, thus the reverb tail will sound slightly different.

Beside its three band absorption, the ArtsAcoustic Reverb comes with some more features to create the most different kinds of rooms. The word "room" we often will use here, is completely independent of any spatial dimensions – from a cat's toilet to a meteor crater. Starting from one of the thirteen basic room characteristics of the ArtsAcoustic Reverb, the so called **Reverb Types**, you can easily define the attributes of the room you want to create, using the parameters **Room Size**, **Diffusion** and **Room Width**. Thus you can influence the effect of reverberation on the signal you want to reverberate and the overall impression in the mix as well.

Especially with these parameters, don't be influenced too much by your bad experiences with some other reverb plugins, using only the maximum settings. By using the room attributes you can for example directly influence the depth of your mix, just by using a bigger or smaller sounding reverberation, making it more direct or indirect or broadening it or narrowing it down. Especially with diffusion, the reverb does not sound worse at all on lower settings. Depending on the signal and the style of music it might even sound better.

The same applies in a similar way for the **Density**. A smaller density e.g. on a side stick will lead to a grainy reverb tail. But now try to withdraw the density on vocals a little, and you will notice how transparent and unobtrusive the reverb tail will become instantly!

You can influence the diffuse reverberation buildup behavior by using **Attack** and **Spread**. With **Spread** you define how long the diffuse reverb will stay fixed before decaying. The real reverberation time will not be changed by this, but the 'felt time' will indeed. The function **Attack** defines, if and how strongly the diffuse reverb will rise during the spread phase.

The **Modulation** function has a great effect on many signals. It provides an effect to differentiate the reverb tail perfectly from the dry signal, eliminate eventually given resonances, making it sound smooth, spatial and homogenous. With acoustic instruments like piano or guitar you should use it carefully though. Otherwise they might lose their naturalness – the piano for example may sound out-of-tune, honky-tonk-like.

To make the reverb tail livelier, you can make it die away echo-like by using **Echo Int**. The speed of these echo resonations is defined with **Echo Size**. Besides creating sound-effects, you can also use this function to make a long reverb tail more transparent, so it fits unobtrusively in the mix.

The **Quality** parameter provides three options: Ultra, Hi and Low. Those quality levels represent the internal sample rates which the ArtsAcoustic Reverb uses, independently from the sample rate used in your project. To match the sample rate of your project, the signal will, if necessary, be sample rate converted in best quality possible.

You should now have a good overview, a perfect starting point to begin using the ArtsAcoustic Reverb in your projects. However, if you want to dive in deeper and want to know more background knowledge about reverbs and the ArtsAcoustic Reverb in particular, you should read on this manual – we believe you won't regret it!

The Time Design Parameters

Time Design means all parameters that relate to the shape of the reverberation envelope. With the exception of Predelay, they all have something in common: They all deal with the temporal buildup and reduction of energy. But where is the connection between reverberation and energy? Imagine a sound source as a battery, namely a provider of energy. If you connect the battery to an engine, it will start turning, just as a sound source will make a room start resonating. If you turn the battery off, the engine will continue to turn for a short while. And a room reacts in the same way: It resonates for a while, which makes up as reverberation. Now, there are engines that turn for a long time, because they have bearings with extremely low friction and others that stop instantly. Thus, friction is the parameter that defines how long an engine will continue to turn, meaning how fast it releases the energy it has derived from the battery. In acoustics this parameter is not called friction, but *absorption (damping)*. Absorption occurs when sound beams are reflected by an absorbing material. So a sound beam loses energy with every reflection, thus it becomes quieter. This explains the different reverberation decay times in rooms of different damping.

Decay

The parameter **Decay** (reverberation time) defines, how long the reverberation tail should decay. It is displayed in seconds. Reverberation time is standardized internationally and most commonly called *T60*. The value 60 indicates its definition: reverberation time T60 is the time it took for the level of the reverb tail to sink by 60dB.

Reverberation time is one of the most important parameters with reverbs, because it is the one to be heard easiest. But you should be aware of the fact, that the length of the reverb tail does not correspond to the size of the room. In fact, it just defines how fast the energy brought into the room by a sound source deflagrates. Perhaps you have noticed it yourself when redecorating your home: an empty living room instantly has a longer reverberation time as the same room furnished.

Frequency-dependent Absorption (Damping)

In most cases strength of absorption differs for different frequencies. The reason for this are specific characteristics of the sound-reflecting material. In many cases, more energy is absorbed with high frequencies, for example by curtains or carpeting. So, in a room with many curtains and wall-to-wall carpeting, high frequencies in the reverberation tail will decay faster than deep ones. The result is an acoustic impression of a dull and relatively dry room.

The frequency-dependent absorption of the ArtsAcoustic Reverb helps to very flexibly simulate different materials and their impact on the sound characteristics, because absorption can be adjusted for the three frequency bands: bass, middle and treble. The crossover frequencies of the bands can be defined with the split fader or the frequency window, as described on page 18.

You can define the absorption capacity for every band in a proportion (**Ratio**) to the global reverberation time (**Decay**). If this sounds confusing at first, let us give an example: Let's assume you want to arrange a dull room, which has a decay of one second. Then you assume this room is furnished with so many curtains, that the high frequencies in the reverberation tail decay twice as fast as the other frequencies. Twice as fast means half of the time, thus 0.5. So you set the **Hi Ratio** on 0.5 and the high frequencies die out in 0.5 times of the global reverberation time (**Decay**).

Example 1: a dull room
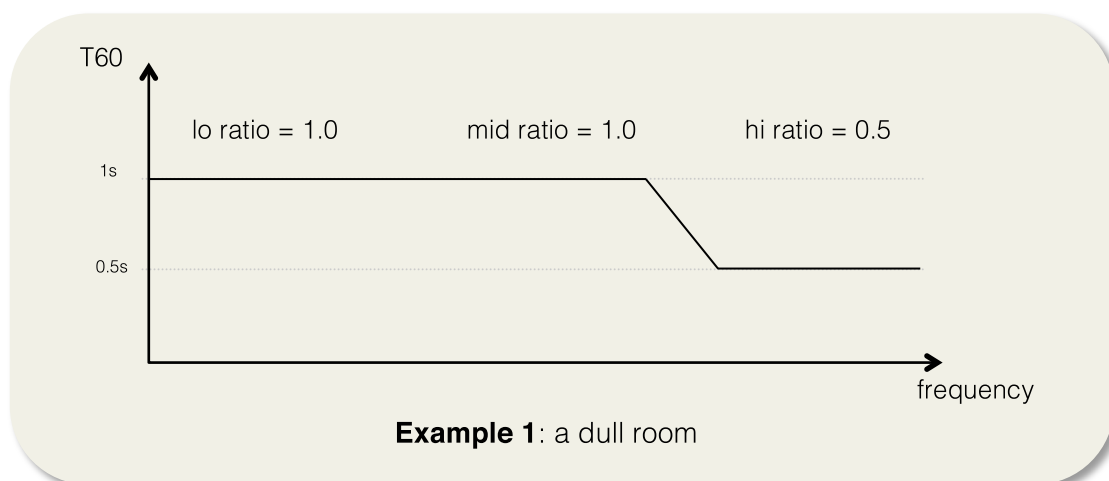
Now you might want to simulate a bigger room with more fullness and warmth. To achieve this, you can have the deep frequencies decay a bit longer than the rest. Let's assume deep frequencies should decay 1.2 times longer, so you set **Lo Ratio** to 1.2. If global reverberation time for example is set to 2 seconds, now the deep frequencies will die out in 2.4 seconds. For high frequencies we choose the same value as in Example 1.

Example 2: a warm, dull room
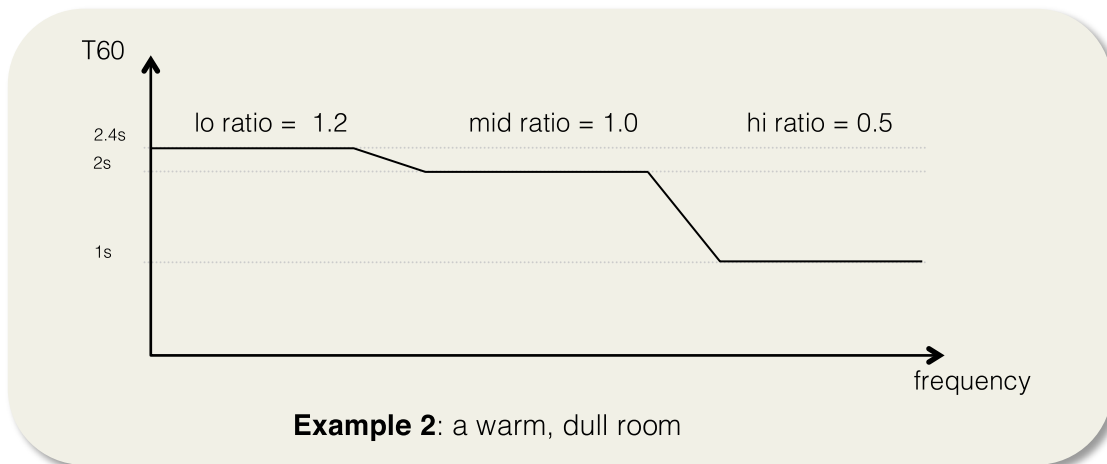
A third example: A room with marble walls, that sounds pointed and cool. So you set Decay to 0.6 seconds, Lo Ratio to 0.6, Mid Ratio to 2.0, Hi Ratio to 0.9 and the crossover frequencies to 1300 Hz and 6000 Hz. Do you notice the difference to the examples before? Below 1300 Hz the reverberation decays in 0,36 seconds, between 1300 and 6000 Hz in 1.2 seconds and above 6000 Hz in 0.54 seconds.

Example 3: a bright, pointed room
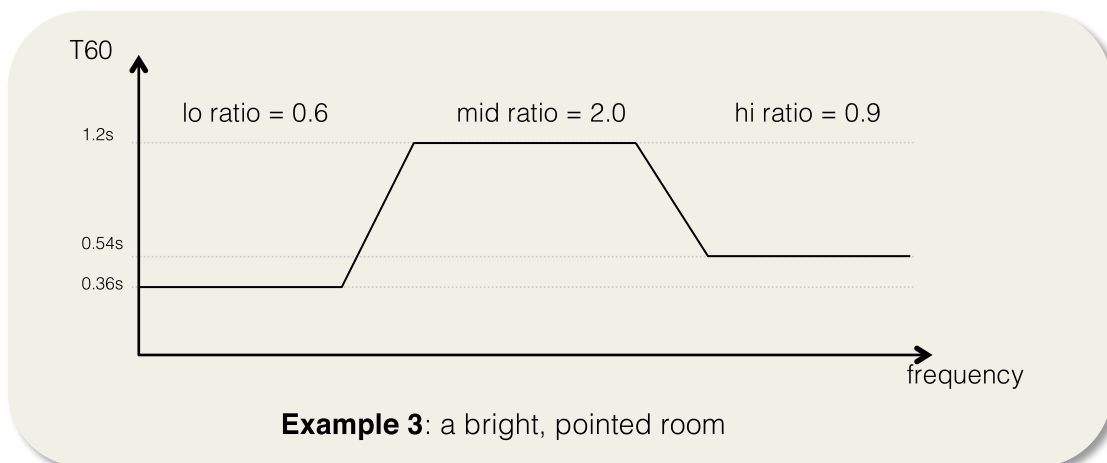
As we work with ratios to the global reverberation time (Decay) there can be longer or shorter reverberation tails as defined with Decay. For example, when all three ratios are set on 5.0, this results in a reverb tail five times longer. This can be useful when you need a reverb tail that is longer than 45 seconds or shorter than 0.2 seconds.

When Hi or Lo Ratio is set on the minimum value of 0.05, the AAR will perform a so called Roll-Off-Absorption. In this, the reverberation will not be computed in the three bands, but the absorption will be realized by high or low pass filters in the feedback paths. The behavior of the decay is thereby changed very clearly (see diagram next page).

Example 4: Roll-Off-Absorption
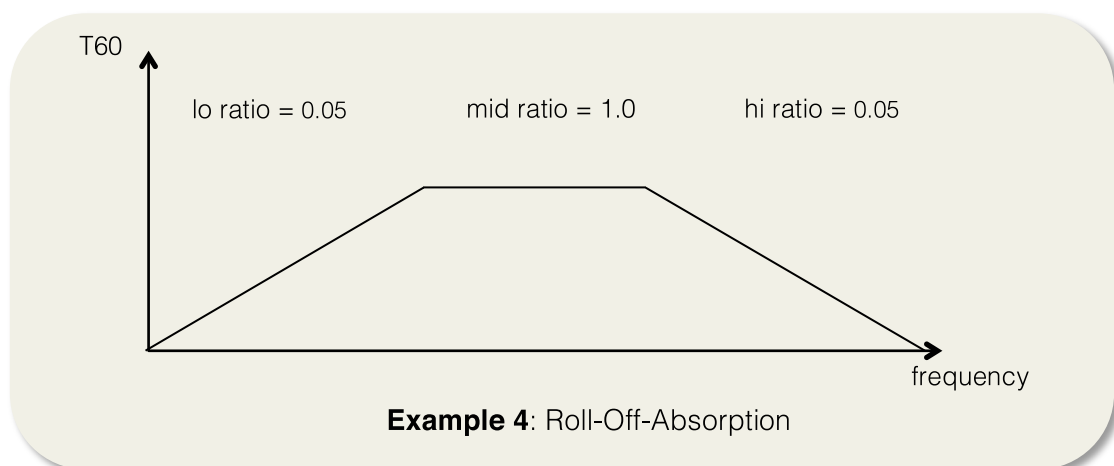
The Predelay

By using **Predelay** parameter, you can delay the complete reverberation by a specific amount of time. Predelay originates in the fact, that when you make a recording in a room, the time between the first reflection and the sound source is defined by the distance between sound source and microphone. For instance, when the mic is very close to the sound source, the difference between direct sound and first reflection is relatively big. If the mic is further away, this difference is significantly smaller. For the reverb sound design, the Predelay is a very important parameter – it defines how far the hearer is away from the sound source. Using several reverberation rooms in one production, you can thus achieve more depth by moving the sound sources closer or further away from the microphone. Realistic Predelay values are in a range from 0 ms (mic distance same as wall distance) to 200 ms (mic is very close to the sound source, but in a huge arena). But also with a greater delays, the Predelay is can be used as a great effect. For example the beginning of the reverb tail can be delayed by a musical value, maybe an eight note, resulting in an interesting effect, especially with percussion sounds.
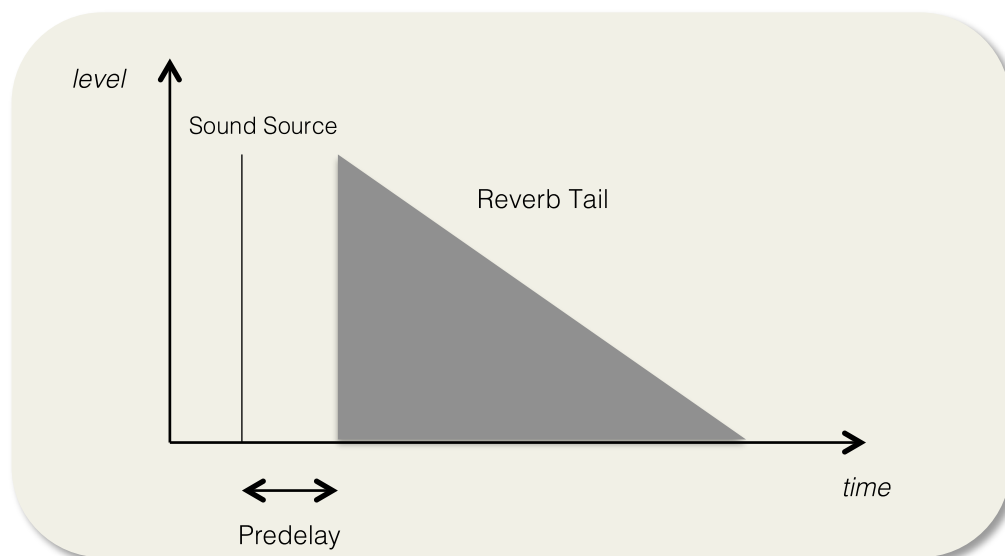
Attack and Spread

The parameters **Attack** and **Spread** have an effect on the build-up of the reverberation. To understand what this initial part of reverberation means, we use our example of battery and engine: If you connect battery and engine, the engine will take – according to its specific build – a shorter or longer time until it has reached its desired momentum. With rooms it is just the same: diffuse reverberation takes some time to build up. The time until this happens varies from room to room. In addition, with reverberation there is the possibility of a non-linear decay. Often this decaying phase is described by energy time curves. For example many rooms have a high energy contingent in their initial reverberation phase, which is retained for an instant and then quickly declines.

Working with the ArtsAcoustic Reverb you can use the parameters Attack and Spread to shape the energy time curve in the build-up phase of the reverberation. Both parameters are connected, which you can see best in the Time Display: Spread defines the length of the retaining phase, whereas Attack is used to set the degree of swelling during this phase. When Attack is set to 100% you will hear a clear swelling, at 0% the diffuse reverberation is quickly build up and is sustained for a moment, depending on the setting of Spread.

Adjustable build-up shape; Example with various Attack Levels at 50% Spread
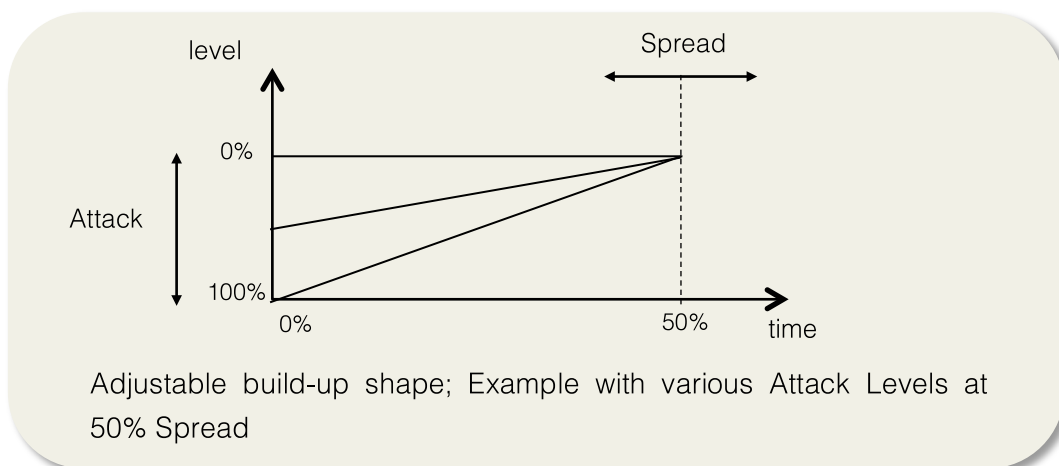
Admittedly the theoretical background of the initial part of reverberation is not really uncomplicated. But we want to encourage you to try out the two parameters. Just pay attention to the change in the interaction between reverberation and original signal:

- By enlarging Spread and leaving Attack on 0%, you enhance the energy of the reverberation tail in its starting phase. Thus you influence the felt reverberation time without changing the real reverb time. The reverberation sounds stronger and baggier, the starting phase resembles a significantly longer reverberation, but can also seem a bit sludgy.

- With some well-dosed Attack you give the reverberation a spatiality, a corpus which makes it seem softer and more plastic. The reverberation tail is more emphasized and less merged with the original signal.

- Without any Attack and Spread the reverberation becomes the most unobtrusive. It decays instantly and thus merges with the original signal, which nevertheless remains transparent and firm.

- With extreme settings of Attack and Spread you can also generate completely artificial, non-linear reverberation tails. Sometimes this might be desired, for example in sound design or in pop music productions.

Please notice that Attack and Spread only influence the diffuse reverberation. The first reflections will not or only slightly be influenced. Thus changes in Attack and Spread will become very easily audible, when Diffusion is very high (more on this later). Furthermore also Room Size and Echo can influence the impact of Attack and Spread.

The Room Design parameters

Room Design means all parameters that relate to shape, furnishing and size of a room. Contrary to the Time Design parameters, they do not focus on the decay behavior, but on the arrangement of the reflections. For that reason the Room Design parameters have the strongest – but not exclusively – effect on the first reflections.

But what influences the arrangement of reflections in a room? When you are a live musician, you might know the phenomenon that everything sounds sludgy and unpleasant in the sound check, but no longer in the concert itself. The room has not changed, except for the fact that now, people are standing in front of the stage (and we hope, it's a lot of people!). The audience in this case has a drastic acoustic effect: Firstly it dampens the room, which leads to a shorter reverberation time. And secondly the sound is no longer strongly, but more diffusely reflected from the floor, which becomes noticeable in a more homogenous reverberation. The reverb's sound and its effect on our perception seem to be strongly dependent from the way how a room is constructed and what's inside. Using the Room Design parameters you can quite comfortably affect this. Let's have a closer look on them!

Room Size

It is often falsely assumed, that there is a connection between room size and reverberation time. But think of a comparison between a basement garage and a cinema hall. Both can be of exactly the same size, but the reverberation time would nonetheless be extremely different. How *big* a room *sounds*, vitally depends on the structure of the early reflections. If they arrive very soon and in close frequency, our human brain assumes a small room. If there are strong reflections that arrive later, a bigger room will be assumed. Besides the reflections, the timbre of the reverberation plays an important role, too: a tiny coop sounds nasal and tight, a big storehouse on the other hand sounds open and wide. And also the build-up of the diffuse reverberation is connected to the room size. The smaller the room, the faster the reverb builds up.

By using the parameter **Room Size** you can adjust the virtual size of the room. The information given in meters should give you an approximate impression of the size of the diagonal of the room simulated. In the Time Display you can see how the first reflections will change, when you adjust the Room Size. Please also pay attention on how the build-up of the diffuse reverberation and the timbre of the reverb change!

Room Width

Imagine standing in a long narrow tunnel and listening to the reverberation after you clapped your hands. Imagine the reverberation once when you look in the direction of the entrance or exit of the tunnel, and a second time, when you turn around by 90 degrees and face a tunnel wall.

This effect can be achieved with the parameter **Room Width**. Smaller values result in a narrow and spatially long-scaled reverberation, big values will end up with a wide and open reverberation. At 0 degrees the reverberation is completely mono, at 180 degrees it is completely stereo – thus entirely uncorrelated.

> ⓘ Unlike some other Reverb generators, the AAR generates the Room Width not with panorama controls at the output, but engages far more deeply its algorithm. Furthermore, when working with big values it does not use antiphases, as many others do. So even with maximum Room Width the reverb stays 100% mono compatible.

Diffusion

Diffusion in an acoustic sense is the degree of dispersion of the spreading sound waves after being reflected. Aha. So let's try to imagine it with an example: You take a ball and throw it straight against a wall – it surely will bounce back and hit you in the head. Now you take a jet of water and also point it straight against the same wall. You will also get hit, but the water will also splash in all other directions besides your head. This – admittedly far-fetched – example should explain to you, how a diffuse reflection works. A sound beam is dispersed in all (or at least many) directions, depending of the structure of the wall's surface. The returning sound does still sound similar to the original signal (compare the water example), but will be a lot more diffuse and indirect. With a hard reflection the reflected sound is a lot more precise and more concrete. If a reflection is hard or diffuse depends on the material and the object that is reflecting. When it has a big, smooth surface, the reflection will be hard. The more the surface is structured, the more angles and relief it has, the more diffuse the reflection gets.

Transferred on a complete room this means: the more objects are in it and the more complex their surfaces are structured, the less single reflections will be audible.

| Hard Reflection | Diffuse Reflection |
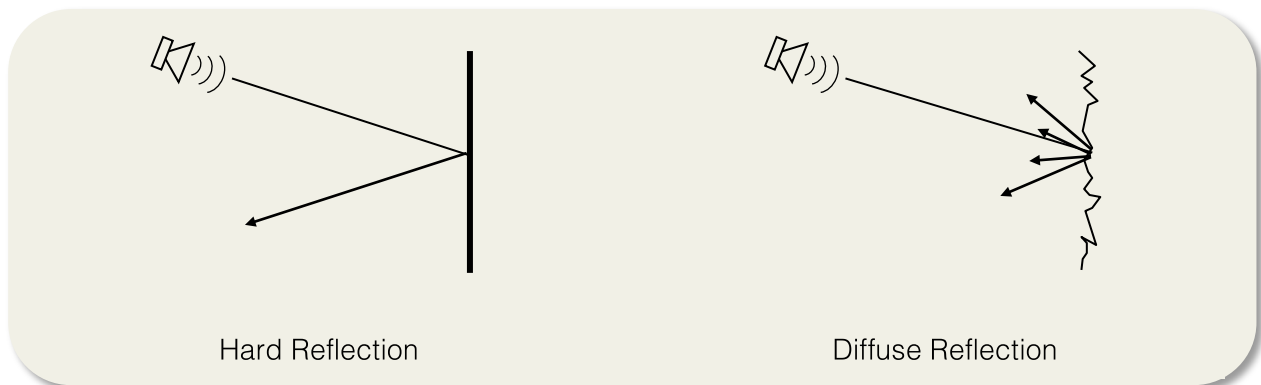
Just the same does the parameter **Diffusion** work in the ArtsAcoustic Reverb. If Diffusion is set to a low value, the early reflections become clearly audible, at higher values on the other hand, they will disappear in the diffuse reverberation. The diffuse reverberation itself will not change at different values of Diffusion. This may sound contradictory at first, but diffuse reverberation only is diffuse reverberation when it really is diffuse – meaning: no single reflections are audible.

Use Diffusion to influence the spatiality in your mix. Why? Well, it is a known fact, that the first reflections generate our impression of a room. A less diffuse room with clear first reflections will sound more spatial than a diffuse room with little distinct reflections – because your brain notices the reverberation itself and not the walls and objects that generate it. Perhaps you should try the following: take a short drum sequence and reverberate it with the ArtsAcoustic Reverb in a way, that only the reverb signal is audible. Then change the Diffusion and you will hear this effect: the diffuse reverberation sounds more far away and more indirect than the non-diffuse reverb. Together with the original signal you will hear how the less diffuse reverb will merge more with the original signal, because our brain connects the room and the signal by using the early reflections!

If you want, imagine the distinction or merging of the reverberation tail with this example:
A drummer is playing in front of the open doors of a big church. You hear him very close and clear, just as the reverberation, that comes from the back through the doors of the church. But you can clearly distinguish between the drum and the reverberation. Now put the drum in the middle of the church but stay in the doorway and listen. You will notice how drum and reverberation overlap and merge with each other.

Density

Using **Density** you can adjust the number of computed reflections per second. The difference between Density and Diffusion is the following: Whereas Diffusion mainly focuses on the first build-up of the reverberation, Density is influencing the complete reverberation. In a natural room, the number of reflections generally strives for infinity, even in a lesser diffuse room. Only the time until then is differing and depending on the Diffusion. With little diffusion you will hear single and distinguishing reflections in the beginning, but later on only a homogenous reverberation. At a low Density on the other hand you will hear single reflections during the complete reverberation!

But why do we need adjustable Density then? Well, a natural room is not always the one most suitable for your production. Besides the simulation of a room, artificial reverberation should also serve as an effect to upgrade your mix, or refining or drastically changing a sound's character. Especially with complex productions in which many signals will be mixed together, a dense reverberation can sound dominant or mushy. Use the Density parameter to make the reverberation more light and airy (smaller values) or more strong and full (bigger values). When you use very small values, the reverberation tail will get resonant and grainy, what may be very interesting for more experimental, electronic or even vintage productions.

The Density parameter influences the diffuse reverberation as well as the early reflections. The impact of Density is graphically shown in the Time Display via the transparency of the reverb tail.

The ArtsAcoustic Reverb has to compute a bit less with low Density settings. So a positive side effect can be a slightly lower CPU load.

Room Type

With **Room Type** you have the possibility to choose between thirteen different basic types of reverberation. Besides the pattern of the early reflections, also the timbre of the diffuse reverberation and the spatiality will change. Even if the names suggest you special purposes of the different Room Types, we like to point out, that you can generate small, medium, big, dampened, smooth, cold, warm rooms, or any other reverb that you can think of with *every* Room Type. By giving you a selection of Room Types we just define some basic characteristics, for example if a reverberation should sound soft, hard, nasal or open. Therefore the icons have only a symbolic value – they do not represent the layout of the respective room.
Ok, let's take a tour on the thirteen Reverb Types:

- **Smooth**: As the name already indicates this type is soft and baggy. You can use it for many purposes.

- **Small**: This type generates a smaller, a little nasal reflection pattern and is suited for small rooms, like a car, or a kitchen. But it could even be a small concert hall or a little arena.

- **Large**: This type sounds very neutral and has clear early reflections. Therefore it fits perfectly for bigger rooms and halls. It is a good choice for vocals and melody instruments, even for orchestras. But also smaller room sizes for drums and percussions can be generated.

- **Medium**: A compact type with a defined spatial reverberation. Well suited for the simulation of clubs, stages, bigger living rooms or to reverberate percussive signals

- **Strong**: A very versatile type with strong early reflections.

- **Fast**: when you need a fast build-up of reverberation, this type is the best for you. It has very few early reflections and thus sounds a little unnatural. Therefore it is best suited for the legendary plate reverbs.

- **Open**: This type has neutral sound characteristics and a balanced spatiality so you can generate musical rooms of all sizes.

- **Wide**: This type has very discrete Early Reflections - in fact, only one per side. The diffuse reverb is dense and widely uncorrelated and builds up very fast. Use it for gentle reverb clouds, plates, ambience and also generic reverberation situations.

- **Slap back**: A slap back reverb is a quiet common reverb type, now also possible with the ArtsAcoustic Reverb. It has a strong late reflection, that can be used to simulate a back wall of a bigger room, but also for 'grooving' reverbs. Use Spread to adjust the volume, Room Size for the delay time, and Diffusion for the clarity of the slap back reflection. See also the factory presets to get an idea how to use it!

- **Dense**: This Room Type has very much and diffuse Early Reflections, without being obtrusive. It's perfect for shaped or inverse reverbs, but also for rich, dense and gluing tails.

- **Impact**: This type features a more natural and well balanced room impression than the Fast type. It can be used for punchy rooms, clubs or smaller halls.

- **Light**: A very modest and smooth type with unobtrusive random reflections. Perfect if you want a more artificial but pleasant and fluffy reverb, or for modeling a plate.

- **Resonant**: We put as much work into this type as in any other type, because we did not intend this type to sound cheap. Try it on modern cinematic drums or when designing sounds. Tune the reverb by adjusting the Room Size parameter. It's a little beast!

Other parameters

Level

The two knobs **Dry** and **Wet** can be used to control the level of the unprocessed input signal and the pure reverb signal. The display is in dB, its level ranges from -∞ dB (no signal) up to +6 dB (amplification by 6 dB). In the default settings and in all factory presets, Dry is set to -∞ dB and Wet to 0 dB.

In case you want to use the reverb as a send effect, as in common multitrack productions, where several tracks simultaneously send to one reverb instance, then the Dry control should be turned to the maximum left (-∞ dB).
In case you want to use it as an insert effect, for example as a reverb that applies to the whole mix of a stereo recording, the Dry control should be set to 0 dB. Then rise the Wet level until the balance of the mix is right.

Quick Mute

Hold down the Alt-Key on your keyboard and click on the Dry or Wet control to quickly mute or unmute each of the signal paths. This can be very handy when comparing Dry against Wet signals without needing to bypass the plugin or turn down the level knobs.

Clipping

If you see clipping at the output (the orange section in the right level display is then flashing), you should adjust Dry and Wet until the clipping disappears.
And if you see clipping at the input (left level display) you should turn down all signals that are sending into the reverb until clipping disappears.

> The input display is independent of the position of the "Dry" control. That way you can easily recognize possible input clipping, even when the dry input signal is not added to the reverb.

EQ

With the built-in equalizer of the ArtsAcoustic Reverb you can perform the most common filtering tasks needed with artificial reverberation. We thought for a long time, what type of filter would make the most sense to give you. In our opinion the most frequent thoughts in a production are "treble off" or "bass off". So the ArtsAcoustic Reverb has the two features **Lo Cut** and **Hi Cut**.

With Lo Cut you adjust the frequency of a 2-pole high pass filter, which lowers frequencies below the selected cutoff frequency by 12 dB per octave. If the control is turned to the maximum left, the filter will be turned completely off and thus does not use any CPU load.

Accordingly, with Hi Cut you adjust the frequency of a 2-pole low pass, that lowers frequencies above the selected cutoff frequency by 12 dB per octave. If the control is turned to the maximum right, the filter will be completely turned off and thus does not use any CPU load.

The effect of both filters is graphically displayed in the Frequency Display. Both filters only influence the reverb signal, meaning only the wet signal. The dry signal is not affected.

As we said, we think this EQ is sufficient for most eventualities. Should this not be case once, just use another external equalizer of your choice.

Echo

Many real rooms have opposing parallel walls, between which the sound is reflected back and forth. Or an arrangement of the walls, that produces closed reflection drafts, similar perhaps to a billiard ball that bounces back several times from the cushion and then returns to its starting point.
As a result, periodic echoes occur. If you have shorter echo times, this is called a *fluttering echo.* This can sound resonant and fluttery and occurs most often in smaller spaces. In very spacious or open places like in the mountains, an echo-like effect may also occur, when the early reflections arrive one after the other and very clearly distinguished, or when the reverberator is very far away, for example an edge of a forest in some distance.

Anyway, you can use the echo effect in the ArtsAcoustic Reverb to generate all kind of echoes, from fluttering echoes up to big majestic ones, that generate the impression of size. Whatever you do, echoes will always bring some life into your reverberation tail.

Use the **Echo Intensity** control to adjust – as the name indicates – the intensity of your echo. This defines how strong the echo effect will be perceived. This intensity is shown in the Time Display by a decaying reverb tail in a more or less wave pattern:
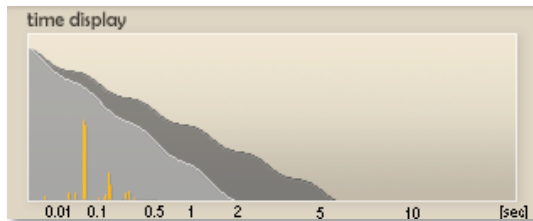
| Slight Echo Intensity | Strong Echo Intensity |
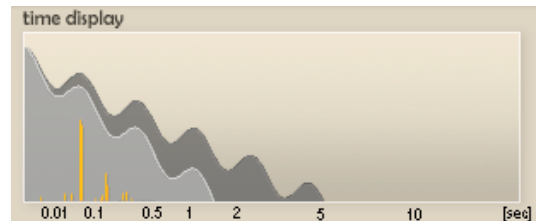
The **Echo Size** control adjusts the size of the echo in milliseconds. Echoes below 200 milliseconds act fluttery, which may not always be nice but nevertheless intended, for example in the case of a postproduction, in sound design or for Lo-Fi reverberations. With bigger echoes you can make a long reverberation tail more transparent or livelier, but also generate a big room like an arena or even infinite space. So just try to experiment a little with these two controls!
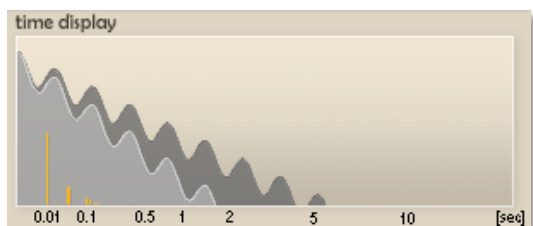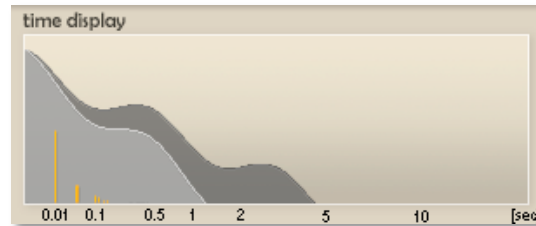
| Small Echo Size | Large Echo Size |

⚠ Please bear in mind that the impact of an echo in some cases needs a longer reverb tail to develop. For example if you set an Echo Size of 600 ms, the Decay must at least set to a 2 second length for the effect to become audible.

⚠ The characteristics of the echo effect is also dependent on the parameters Attack, Spread, Room Type and Room Size. In the Time Display, these dependencies are not displayed, which might lead to a slight deviation between the graphic display and the sound heard. Additionally with long drawn-out signals you will hear the echo less clearly as with short percussive signals.

Modulation

Fluctuation in pressure, moisture or temperature can lead to slight frequency variations in natural reverberation. Those variations can cause a quiet pleasant discoloration in the reverberation as it results in a rich sounding reverb that differentiates nicely from the original signal.

A digitally computed reverb very often makes a brittle, biting or sterile impression, especially with signals that are non-pitch modulated, sterile or rigid themselves, for example a bright saw tooth signal from a synthesizer or an aggressive saxophone-tone.

The reason for this are the resonances that generally occur, but especially with digital reverbs. These resonances can be heard as a metallic coloration or by a "droning" on specific tones in the reverb tail. A frequently used trick is it, to blur these resonances a bit by modulating their frequencies. With this, you achieve a still neutral, but warm and naturally sounding reverberation, but the modulation has to be adjusted very carefully and moderately. But also with a stronger modulation, the effect is by no means a reverb that sounds bad – it will just not sound very natural, but nevertheless aesthetic, warm and pleasant to the human ear.

Using the **Modulation** control you can adjust a frequency-dependent detuning in your reverb signal. In this you are free to use naturally sounding values or more extreme ones. This modulation will finally lead to a softer, more homogenous and full impression of the reverberation, without becoming obtrusive. It is more distinguished from the original signal, so the reverb tail can be clearly identified and set apart from the original signal (without getting louder). Naturally sounding values vary from 0% to 10%. Above 10% you can use modulation as a very nice effect that leads to a convincing reverb signal in multiple applications. Values higher than 50% sound very extreme on tonal systems but can very well be used on percussive signals.

> You should handle Modulation carefully when reverberating acoustic instruments like piano or acoustic guitar, because the result can easily sound out-of-tune. The same applies to classical music recordings and everywhere else, where an especially natural reverb is intended. In these cases you should use values between 0 and 10% for the modulation.

Quality

The **Quality** control determines the internal computing precision of the ArtsAcoustic Reverb. This affects the internal sampling rate which is used to calculate the reverberation. There are three settings available:

With **Low** Quality, the Reverb will work with 22.05 kHz, with **Hi** Quality, it's 44.1 kHz. The ArtsAcoustic Reverb 1.6 introduced a third, the **Ultra** Quality Level, which works internally in 96 kHz. The sound quality, but also the CPU load will increase with higher quality levels. Besides the pure sound quality, also the timbre of the reverb can be noticeably changed! Ultra Quality sounds best in terms of Hi-Fi, but also uses most CPU performance. The Hi Quality Level will suffice for most productions. Low Quality is a good choice, if you want to achieve a vintage or Lo-Fi sound, or if you are low on CPU power.

The Quality setting can be switched to any level at any time, so you can compare the influence of the computing precision 'on the fly'.

In fact, half the sample rate needs half the computing power. However, the CPU load is not completely reduced by 50%, because the reverb is also occupied with some different tasks which do not affect the computing precision. So the decrease in CPU load varies from system to system and ranges around 60% of the CPU load engaged in full precision.

The ArtsAcoustic Reverb internally uses always the selected sample rate, independent of the incoming signal of your production. If necessary, the signal will be sample rate converted to match the internal sample rate with the one of your project. The conversion will be done automatically in the best quality possible. Your advantage: even with a 192 kHz production you will not have additional CPU load..

Background Knowledge

Introduction

With this manual we would like to encourage you to start experimenting with the parameters of the ArtsAcoustic Reverb. Therefore – especially with a reverb – it might be convenient to understand how exactly these parameters work, on what they base upon and what can be achieved using them. Unlike plugins like EQs or compressors which mostly have very distinct parameters, there is no strict principle with reverb generators that defines what a Diffusion or a Room Size control should accomplish. What means diffusion by the way? How does the size of a room influence the reverberation? Perhaps it might be useful to take a look at some theoretical aspects of room acoustics. But don't worry, we tried to write as comprehensible as possible – and you don't have to do any arithmetics either!

What is reverberation?

Reverberation is a phenomenon in room acoustics, present in any place where objects that reflect sound are arranged in a way that they build an open or closed room. This can be rooms in buildings, like living rooms, offices, lobbies, concert halls or parking garages, but just as well open constructions like courtyards, arenas or stadia. In nature you may find caves, forests or mountains that create reverberation. Thus reverberation is a natural phenomenon that accompanies us in almost every daily-life-situation and is quasi omnipresent. Our sense of hearing is used to reverberation, it even needs it to gain important information of our surroundings and to localize other sound sources.

The development of reverberation can be illustrated with the reflection model used in geometric room acoustics. Similar to beams of light in optics, the dispersion of sound in rooms is shown by using so called sound beams. These can be reflected by reflective materials. Like in optics the angle of incidence equals the angle of deflection.
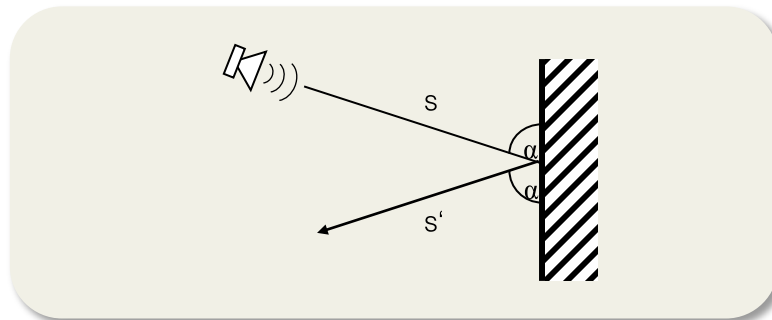
Reflection on a reverberant wall

In normal rooms a sound beam is reflected several times. Besides the losses through spreading in the room, the sound beam also loses some intensity with every process of reflection. So with a growing number of reflections, the sound intensity draws nearer to zero. This phenomenon is called absorption. It is usually dependent on frequency, for example high frequencies will decay faster than low frequencies.

The tracing of a sound beam, also called ray tracing, is shown in the following figure for a rectangular room.
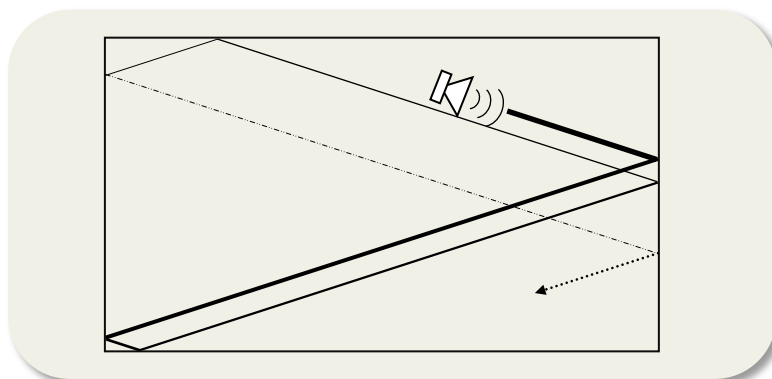
Multiple reflection in a rectangular room. The decline in sound intensity is shown by thinning lines.

Normally a sound source is sending an infinite number of sound beams in different directions, often in a spherical or hemispherical shape, as indicated in the drawing. The overlapping of many reflected sound beams on one position in the room adds up to what we perceive as reverberation. In this, the reverberation time is the time, in which the measured level at a certain position in the room has dropped by a predefined value. Using the most common definition of reverberation time, this value is 60 dB. Thus, reverberation time is commonly called T_{60}.

Reverberation Buildup

The exact time curve of reverberation is explained by the so called room impulse response. It can be measured by giving a preferably short loudspeaker impulse into a room and recording the response of the room on this impulse. This can be shown in a diagram:
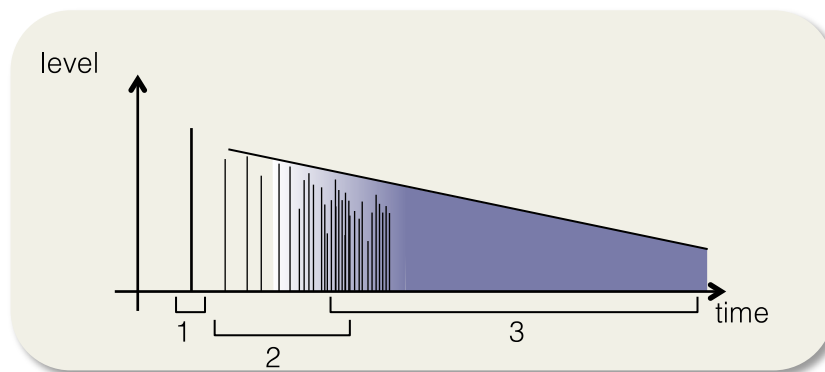
Qualitative time curve diagram of reverberation, divided in direct sound (1), early reflections (2) and diffuse reverberation (3).

In this diagram you can distinguish between three important areas. Firstly the direct sound, followed by the early reflections and lastly the diffuse reverberation. This subdivision occurs in all real rooms in a different specification.

Early Reflections

As the name already indicates, the early reflections are those that reach the recipient's ear directly after the direct sound. They are perceived as clear echoes, can be easily located and contribute to the acoustic impression of a room. Depending on the time of their arrival and their density, the early reflections lead to the impression of a big or a small room.

In some cases early reflections are subdivided into first and late (diffuse) early reflections. Here it is taken into consideration, that the first early reflections are clearer, stronger and more distinguishable. The late, diffuse early reflections are weaker, no longer clearly distinguishable and represent the transition into diffuse reverberation.

Diffuse Reverberation

Diffuse reverberation is characterized by a high density of reflections in which no single reflections can be perceived. Because of the high number of reflections, it is hardly describable by the geometric model of room acoustics. Thus the statistic room model is used. It defines a room as an energy storage, that accumulates energy derived from a sound source. After the source is turned off the energy is dispensed slowly, like a condenser dispenses its charge. The sound pressure level L is sinking linear, the sound pressure p exponentially (the level L is a logarithmic value). Contrary to the early reflections, the diffuse reverberation is evenly distributed throughout the room and has no specific direction of origin.

Now you basically have learned how reverberation builds up and what it is composed of. In the course of this book, we will make some further theoretical excursions to deepen and broaden your knowledge, but now we should mentally relax a bit and take a look into the practical use of the ArtsAcoustic Reverb.

A note on convoluting and generating

As an up-to-date user you will probably ask yourself: why might I need an algorithmic reverb generator, when I also can reproduce the most expensive reverb-systems, the best concert halls and the spaciest effects by using a convolution reverb?

But what exactly is the difference between a convolution reverb and a reverb *generator*? Every reverb-algorithms have one thing in common: They are based on more or less complex filter structures. A reverb *generator* is a system that *generates* a reverberation itself, using appropriate, mostly recursive filter structures (echoes). Therefore it is called reverb *generator*. A convolution reverb on the other hand is a system, which impresses an audio signal with a prerecorded, or predefined reverb impulse response, by using a mathematical convoluting operation. You may say it just reproduces. Whereas a convolution reverb can very exactly emulate a real room, the reverb generator pretends a reverberation to the human ear, which must not correspond to a real room. Thus it is possible to generate reverb tails that sound even *better* than real rooms.

Accordingly, the developer of a reverb generator must be good in the art of deception, whereas with a convolution reverb, just the mathematical operation of convoluting has to be executed. From the reverb developer's view a convolution reverb is comparable to the playback of a violin concert from CD, whereas the reverb *generator* plays the violin itself.

But still, why is a reverb generator superior to a convolution reverb? When you are used to working with very expensive non-convolution hardware reverb generators, you will know the answer: you reach your goal faster and you can adjust the reverb to your production more effectively. With convolution reverbs it is the other way around – the production has to be adjusted to the convolution preset, because you can just slightly change it. If you work with reverbs more intensively, you will notice that it is not sufficient in most cases to just change reverberation time. For a well-done mix far more factors of an artificial reverb play an important role, for example Room Size, Diffusion, Density, Room Width, and so on. None of these parameters can be edited with a convolution reverb.

Second, there are parameters that cannot exist in convolution reverbs, due to mathematical reasons. Most prominent example is the modulation, but also dynamic effects cannot be reproduced by convolution. That's why most people say that convolution sounds static and cold.

A third important aspect is the processor load. With the ArtsAcoustic Reverb it is widely constant and, measured by the quality of its output, surprisingly low. With a convolution reverb it can be extremely high, depending on the reverberation time. A 15 second reverb, as it might be demanded in a production, cannot be done with an acceptable CPU load. But with a reverb *generator* this is completely different: no matter if the reverb is decaying for 1, 10 or 40 seconds, the processor load will not change.

Nevertheless, convolution reverbs have made enormous progress in the last years. They are almost latency free and optimized for low CPU usage. And we won't negate that there are tasks in which convolution might has its benefits. However, we believe, as many other users, too, that convolution still cannot *replace* algorithmic reverbs, both have a justifiable coexistence in the world of reverb.

Finish

If you managed to read the manual to this point, you should now be well equipped to use the ArtsAcoustic Reverb on a professional basis. And secondly we will have reached our goal of writing a comprehensive, coherent, informative and perhaps also entertaining guidebook. We hope that both has come true and wish you a lot of fun while working with the ArtsAcoustic Reverb.

Your ArtsAcoustic Team

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If you have any questions or requests, please visit us on our support page on our website:

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Appendix - Factory Presets

Following you can find a list of all available factory presets. The factory presets are split up into input and room defined categories.

Category – "input defined"

Subcategory	Preset Name	Your Comment
for drums		
for bassdrum		
	techno bassdrum	
for percussion		
	deep gong long	
	orch.perc.reflective 01	
for percussion		
	woodperc. hall 01	
	woodperc. hall 02	
	woodperc. hall 03	
	woodperc. hall 04	
	woodperc. hall 05	
	woodperc. hall 06	
	woodperc. room 01	
	woodperc. room 02	
	woodperc. room 03	
	woodperc. room 04	
	woodperc. room 05	
	woodperc.reflective room	
for snare		
	nonlinear snare room 01	
	nonlinear snare room 02	
	nonlinear snare room 03	
	nonlinear snare room 04	
	nonlinear snare room 05	
	nonlinear snare room 06	
	nonlinear snare room 07	
	nonlinear snare room 08	
	snare room 01	
	snare room 02	
	snare room 03	
	snare room 04	
	snare room 05	
	snare room 06	
	snare room 07	
	snare room 08	

Subcategory	Preset Name	Your Comment
for guitar		
for acoustic guitar		
	ac.git. arena open	
	ac.git. concert hall 01	
	ac.git. concert hall 02	
	ac.git. concert hall 03	
	ac.git. concert rm.small	
	ac.git. concert room.big	
	ac.git. plate 01	
	ac.git. plate 02	
	classic git. hall 01	
	classic git. hall 02	
	classic git. hall 03	
for orchestra		
for brass		
	brass sect. arena open	
	brass sect. studio hall	
	brass sect.big room	
	brass sect.direct room	
	brass sect.james last	
	brass sect.nlnr 01	
	brass sect.nlnr 02	
	brass sect.nlnr 03	
	trumpet_trombone_big	
	trumpet_trombone_hall	
	trumpet_trombone_real	
for ensemble strings		
	classic ensemble 01	
	classic ensemble 02	
	full strings generic 01	
	full strings generic 02	
	leg.sect. big room 01	
	leg.sect. big room 02	
	leg__viol_sect__generic_	
	pizz open	
	slow strings chamber 01	
	slow strings chamber 02	
	slow strings large hall	
	spic.strings big	
for harp		
	generic harp	
	harp hall	
	wide harp hall	
for orchestra sum		

Subcategory	Preset Name	Your Comment
	classic orch.sum 01	
	classic orch.sum 02	
	classic orch.sum 03	
	classic orch.sum 04	
	pop orch.sum 01	
	pop orch.sum 02	
	pop orch.sum 03	
	pop orch.sum 04	
for solo sax		
	sax sol dir. ambience 01	
	sax sol dir. ambience 02	
	sax sol dir. deep hall	
	sax sol dir. garage	
	sax sol dir. loneley	
	sax solo dir. room 01	
	sax solo dir. room 02	
	sax solo room 01	
	sax solo room 02	
	sax solo room 03	
	sax solo room 04	
	sax solo room 05	
	sax solo slap back 01	
	sax solo slap back 02	
	sax solo slap back 03	
for solo strings		
	classic sol.violin	
	loneley violin	
	loneley violine	
	sol.violin cncrt. hall	
	sol.violin dreamin`	
	sol.violin generic	
	sol.violin hall 01	
	sol.violin outdoor	
	sol.violin studio hall	
	sol.violin vanessa	
	violin chamb.reflective	
	violin room reflective	
for timpani		
	timpani big hall	
	timpani generic	
	timpani roll big hall	
	timpani roll	
for wood		

Subcategory	Preset Name	Your Comment
	flute real hall 01	
	flute real hall 02	
	flute real room 01	
	flute real room 02	
	flute reflective hall 01	
	flute reflective room 01	
	flute reflective room 02	
	oboe hall	
	oboe room	
	oboe wide hall	
for piano		
for acoustic piano		
	classic piano 01	
	classic piano 02	
	intim piano	
	piano room	
for electric piano		
	dream rhodes	
	dx7 ballad	
	suitcase room	
for postproduction		
for large and huge spaces		
	airport	
	church	
	corridor	
	hockey hall	
	parking garage	
	tunnel	
for small and medium spaces		
	bathroom	
	conference room	
	indoor pool	
	large office	
	living room	
	office	
	small room	
for transport		
	empty bus	
	small car	
	train	
	transporter	
for synth		
for bright synth		

Subcategory	Preset Name	Your Comment
	bright synth generic 01	
	bright synth generic 02	
	bright synth generic 03	
	nonlinear bright 01	
	nonlinear roll off	
	synth absorbing plate	
for pad		
	long and deep 01	
	pad 01	
for synth lead		
	ambient dense long	
	ambient fluttered long	
	ambient generic	
	kitaro lead generic	
	synth absorb. reflective	
	synth ambient long 01	
	synth early reflect 01	
	synth early reflect 02	
	synth early reflect 03	
	synth early reflect 04	
	synth reflective long	
	tangerine lead basic	
	the greek long	
	vangelis cs80 lead	
for vocals		
	fem.vox generic 01	
	fem.vox generic 02	
	fem.vox generic 03	
	fem.vox generic 04	
	fem.vox generic 05	
	fem.vox generic 06	
	fem.vox generic 07	
	fem.vox hall 01	
	fem.vox hall 02	
	fem.vox hall 03	
	fem.vox hall 04	
	fem.vox hall 05	
	fem.vox hall 06	
	fem.vox room 01	
	fem.vox room 02	
	fem.vox room 03	
	fem.vox room 04	
	male vox hall 01	
	male vox hall 02	
	male vox hall 03	

Subcategory	Preset Name	Your Comment
	male vox hall 04	
	male vox hall 05	
	male vox hall 06	
	male vox hall 07	
	male vox hall 08	
	male vox hall 09	

Category – "room defined"

Subcategory	Preset Name	Your Comment
ambience		
	large ambience	
	medium ambience	
	small ambience	
big spaces		
	cathedral	
	church	
	forest	
	parking garage	
chambers		
	echo chamber	
	large chamber	
	medium chamber	
	small chamber	
	string chamber	
fx reverbs		
	big echo reverb	
	endless reverb	
	freeze	
	mono spring reverb	
	small speakers	
	stereo spring reverb	
gated reverb		
	large gated reverb	
	medium gated reverb	
	small gated reverb	
halls		
	bright hall	
	concert hall	
	large hall	

Subcategory	Preset Name	Your Comment
	long and bright hall	
	medium hall	
	small hall	
	stage hall	
	universal hall	
	warm hall	
plates		
	large plate	
	medium plate	
	small plate	
resonators		
	boig reso	
	long reso	
	reso 01	
	steel reso	
	steel spring	
reverse reverbs		
	large reverse reverb	
	medium reverse reverb	
	reverse ambience	
	small reverse reverb	
rooms		
	large room	
	large studio room	
	medium room	
	medium studio room	
	resonant room	
	small room	
	small studio room	
	stage room	
	very small & close room	
	very small room	
	very small studio room	

Category – "new v1.5"

Subcategory	Preset Name	Your Comment
input defined		
for drums		
	direct drumambience reflective	
	drumset bigroom 01	
	drumset bigroom 02	
	drumset bigroom 03	
	drumset bigroom 04	
	drumset bigroom 05	
	drumset bigroom 06	
	drumset overheads	
	drumset room mics	
	hifi drumset ambience reflective	
	hifi drumset room artificial reflective	
	marimba big room	
	natural drumset studio ambience medium	
	natural drumset studio ambience short	
	natural drumset studio direct room medium	
	natural drumset studio direct room short	
	natural drumset studio room larger	
	natural drumset studio room medium	
\ for snare		
	80s snare studio big boom 0.4sec	
	80s snare studio big boom 0.8sec	
	80s snare studio big boom 3sec	
	80s snare studio direct room medium 1.5sec	
	80s snare studio direct room medium 1sec	
	piccolo snare room big	
	piccolo snare room long+wide	
	piccolo snare room long	
	piccolo snare room short	
	piccolo snare room short02	
for guitar		
	jazzguitar big room	
	nylon bossanova room short	
	nylon guitar room	
	slap back gutar room reserved	
for orchestra		
	classical horn section	
	classical horns	
	english horn 1.2sec	
	loneley flute solo	

Subcategory	Preset Name	Your Comment
	modulated woodwinds section room	
	oboe large hall	
	piccolo flute hall	
	short sax room	
	string section hall medium	
	violine hall medium	
for piano		
	d.foster dx piano hall	
	piano movie ballad intimate medium	
	piano movie ballad intimate	
for vocals		
	dry fem vox slapback	
	invers fem vox0.6sec	
	male vox rockn roll slapback	
	male vox short room	
other		
	accordeon room short	
	sitar reverb medium	
other		
	Lex 224 attempt 01	
	Lex 224 attempt 02	
room defined		
	big hall modulated	
	dreamy 3.3 sec	
	generic 3.3 sec	
	generic dense hall 3,4 sec	
	generic hughe hall	
	generic piano hall medium	
	huge and warm	
	huge full orchestra hall	
	huge vangelis cs80	
	neutral room 1.3sec	
	vangelis superroomy 02	
	vangelis superroomy	
	warm and long generic	
slapback		
	100 bpm 1_8 light slapback	
	100 bpm 1_8 medium slapback	
	100 bpm 1_8 reflect slapback	
	100 bpm 1_8 strong slapback	
	100 bpm slapback pattern	
	110 bpm 1_8 light slapback	
	110 bpm 1_8 medium slapback	
	110 bpm 1_8 reflect slapback	

Subcategory	Preset Name	Your Comment
	110 bpm 1_8 strong slapback	
	110 bpm slapback pattern	
	120 bpm 1_8 light slapback	
	120 bpm 1_8 medium slapback	
	120 bpm 1_8 reflect slapback	
	120 bpm 1_8 strong slapback	
	120 bpm slapback pattern	
	90 bpm 1_8 light slapback	
	90 bpm 1_8 medium slapback	
	90 bpm 1_8 reflect slapback	
	90 bpm 1_8 strong slapback	
	90 bpm slapback pattern	
	concrete backyard	
	large slapback hall	
	medium slapback hall	
	wooden slapback room	

Category – "new v1.6"

Subcategory	Preset Name	Your Comment
input defined		
for bass		
	fingered bass ambience	
for drums		
\ for claps		
	artificial clap room 01	
	artificial clap room 02	
	artificial clap room 03	
\ for drumset		
	full drumset room mic big	
	full drumset room mic medium (far)	
	full drumset room mic medium	
	full drumset room mic small	
	showdown drums	
	warm drum ambience	
\ for percussion		
	percussion short plate	
	percussive ambience	

Subcategory	Preset Name	Your Comment
\ for snare		
	deep 80s snare room 01	
	deep 80s snare room 02	
	reflective snare room	
	short piccolo snare ambience	
for guitar		
	nylon guitar recording room	
	western rhythm room	
for orchestra		
	classic orch.sum 05	
	dramatic film oriental solo echohall	
	full orchestra reflective	
	oriental solo flute hall	
	pop brass section room	
	solo tenor sax big plate	
	string section medium hall	
for piano		
	classical piano 03	
	piano big recording booth	
	piano drama hall (alive)	
	piano empty stage	
	piano generic ambience	
	piano medium room	
	piano small empty barstage	
for synth		
	big generic beauty	
	blade runner cs80	
	breathing rhodes	
	dark sequence	
	perc synth reflective hall	
	rich stack	
for vocals		
	220 vocal ambience	
	big bright vocal room	
	decent vocal verb	
	female pop voice big 80s room	
	female pop voice big room	
	female speech ambience	
	female voice slapback ambience	

Subcategory	Preset Name	Your Comment
	generic short vocal ambience	
	huge vocal hall	
	male pop voice big 80s room	
	male speech ambience	
	male speech medium room	
	pop vocal nonelinear	
	solo female opera hall	
room defined		
church		
	bach at notre dame	
	big church	
	small church	
fx reverbs		
	in the bottle	
	metal tank	
halls		
	subtle small hall 01	
	subtle small hall 02	
	theater	
outdoor		
	the popes mass oration	
rooms		
	natural medium room	
	subtle large room 01	
	subtle large room 02	
	wooden mallett room 01	
	wooden mallett room 02	
slapback		
	reflective slapback	