Oxford Reverb Plug-in Manual

Sonnox Reverb Plug-in Operation Manual

1. Introduction.

The Oxford Reverb plug-in is a highly flexible artificial reverberation generator, designed to complement existing Sonnox Oxford applications in providing the professional user with highest technical and sonic performance coupled with high levels of artistic and creative facility.

By avoiding fixed algorithms and providing user control of all parameters including comprehensive equalisation functions, the Sonnox Oxford Reverb allows the professional engineer the powerful facility to build virtual spaces freely depending on artistic need, ranging from dry reflection ambiences, room and hall simulations, sound effects, all the way to wide open reverberant spaces with a very large range of possible texture and spatial character.

2. Supported Platforms.

Digidesign Pro Tools (TDM and LE)
VST
Audio Units

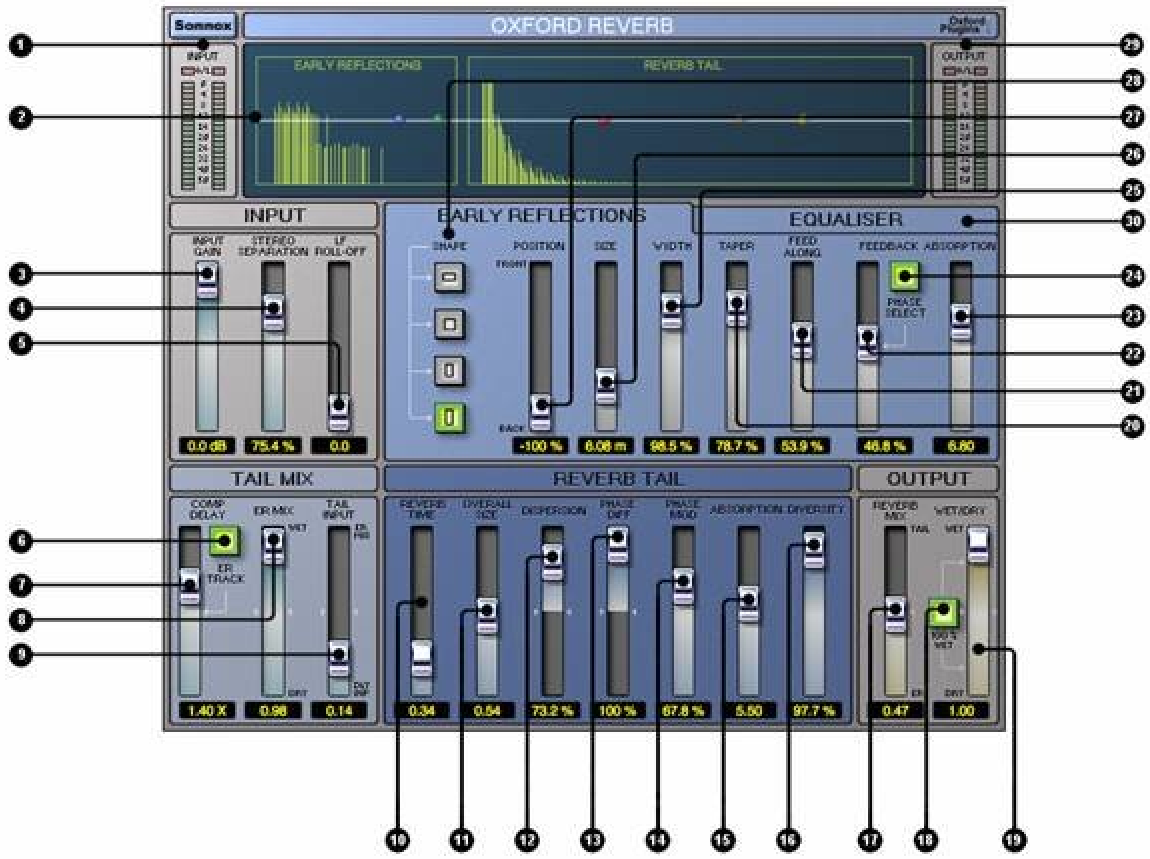
See supplement for platform specific data.

3. Revision History

- 1st April 2007 - Generic Sonnox version

4. Control Functions.

The control functions are arranged in operational sections, comprising of early reflection settings, reverb tail settings and contribution mixing functions. Mixing functions are conveniently split into separate sections, for internal signal contribution to the reverb tail section and overall level control and mixing functions. A separate Equalisation settings page is accessible from the Early Reflections area of the GUI.



4.1. Early reflections.

Shape (28).

Selects the overall shape of the early reflection space. Four basic space shapes are provided to allow the application of appropriate overall character to the reverberation.

Position (27).

Controls the relative back to front placement of the listening position within the virtual room simulation.

Size (26).

Sets the overall size of the simulated space, as measured between front and back walls. Room shapes remain in proportion with this size.

Width (25).

Controls the stereo separation of the room reflections depending on their particular direction within the stereo field. Normal position placement occurs with the control at minimum setting. Increasing the setting provides wider separation. Increasing settings beyond 100% produces ultra-wide separation, often useful when adding spatial effects to single mono tracks.

Taper (20).
Controls the loudness level of the reflections depending on their relative path lengths. I.e. longer delays are progressively reduced in level because the sound will have travelled further. Increasing the taper control will proportionally increase the relative contribution from long path lengths in relation to short paths. At maximum setting all paths lengths will have equal level contribution.

Feed along (21).
Controls the amount of re-injection of distributed sound within the simulated space. Greater re-injection will result in greater reflection density and echo complexity and cause the reflections to continue over a longer period of time.

Feedback (22).
Controls the proportion of the reflected signal that is re-circulated within the room simulation. Increasing feedback will result in longer reflection duration (room reverb time) and greater room mode frequency response effects (boominess).

Feedback phase selector (24).
Modifies the phase relationship of the ***Feedback*** variable. Modified phase (preferred on position) will result in softer reflections over time and produce greater modal and spatial dispersion, synonymous with natural rooms containing objects that disperse reflections and tend to break up room behaviour. Normal phase (off position) will result in harder reflections and greater modal frequency behaviour.

Absorption (23).
Controls the high frequency roll-off that naturally occurs over time due to absorption. Higher settings (greater absorption) relate to spaces containing soft furnishings and wall coverings, low settings (less absorption) relate to empty spaces with hard reflective surfaces etc.

4.2. Reverb tail.

Reverb Tail input mixing.

Facility is provided to drive the input of the reverb tail processor with a combination of signals comprising of; untreated input signal, delay compensated input signal and the output of the early reflections processing. Two levels of cross fade control are provided for this mixing function, so that relative contributions can be varied freely without disturbing overall levels.

Delay Comp (7).
Sets the timing of the delay compensated input contribution to the reverb tail processing.

With ***ER Track*** selected the delay compensated input signal tracks the notional size of the early reflection processing section. The available control is from zero to 2 times the early reflection ***Size*** setting, with mid position (1) representing the normalised time alignment setting.

With ***ER Track*** unselected, the ***Delay Comp*** control is uncoupled from the early reflection ***Size*** setting and provides an independent delay up to a maximum of 30 meters.

ER Mix (8).
Provides a cross fade between the untreated input signal and the output of the early reflections processor.

Tail Input (9).
Provides a cross fade between a delay compensated versions of the input signal provided by the ***Delay Comp*** control and the mixed signal resulting from the ***ER Mix*** stage.

Please note that a combination of the input signal and delayed signal together can cause unwanted frequency combing effects when the ***ER Size*** is set for smaller spaces. It is therefore best to arrange the ***ER Mix*** and ***Tail Input*** controls to predominately use **either** a mix of the ER and the input, **or** the ER and the delayed input when simulating smaller spaces.

Reverb tail effect modification.

All parameters of the reverb tail section are fully compensated, so that they may be adjusted in isolation without mutual interaction with other control settings. This means that settings such as ***reverb time*** or ***roll-off*** will produce constant results even if other factors such as ***dispersion*** or ***total size*** are varied.

Reverb Time (10).
Sets the overall reverberation time in seconds as referred to a decay of –60dB ref the input stimulus.

Overall Size (11).
Sets the overall size of the delays within the reverb tail section, providing the means to modify the character of the reverb independently of reverb time and absorption parameters. Larger size settings generally provide the greatest impression of space but result in slower density build up in the short term. Shorter size settings produce faster density build up over time, but exhibit greater tonal artefacts in the longer term.

Dispersion (12).
Controls the rate and character of the build up of dispersion behaviour, complexity and sonic texture over time. At mid position (0) no extra dispersion is added. Positive values cause increasing dispersion and complexity over time. Negative values also cause increasing dispersion but it is modified to produce greater differential dispersion between left and right signals.

Phase Diff (13).
This operates in conjunction with the ***Dispersion*** setting to control the build up of phase difference between left and right stereo signals. The greater the setting, the faster phase differences will build up over time, and cause a widening and deepening of the stereo sound field.
Positive values will create a build up of left and right difference, which is largely limited within the same absolute polarity across the sound field as the original programme signal. This is most useful for producing a natural reverb sound fields that spread between the confines of the stereo speaker width.
Negative values produce a wider range of phase dispersion that includes components that have inverse polarity with respect to input programme and left and right outputs. This is useful for producing sound fields that seem to extend beyond the stereo speakers to produce an enhanced sense of immersion within the simulated space.

Phase Mod (14).
Controls the application of internal phase modulation to the reverb algorithm. This adds a very slight variance to the reverb character over time, which enhances realism and presence under many conditions.

Absorption (15).
Controls the high frequency absorption effect within the reverb section. Higher value settings produce greater overall HF roll-off and faster relative absorption over time, synonymous with natural spaces containing a variety of absorption materials such as wall coverings, curtains or furnishings etc.

Diversity (16).
This provides statistical front centre weighting to the reverb tail, which is often required to anchor the reverb effect to centre stage of stereo sound field mixes. Centre weighting is greatest with the diversity control in minimum position where the reverb image will seem narrowest. In maximum position no centre weighting occurs and the reverb image is therefore equally spread across the sound stage, producing the greatest spatial diversity and the widest perceived image.

4.3. Reverb Equalisation section.

The Equalisation section comprises of 5 bands with the upper and lower sections selectable between Band pass, shelving and 12dB/octave filtering functions. The EQ processing proceeds the reverb processing and therefore the dry signal remains unaffected by Equalisation settings.

In selector (1).
Toggles the EQ of the associated section in and out for comparison purposes.

Gain control (2).
Controls the effective gain of the EQ curve from –20dB to +20dB

Band Pass (3), Filter (4) and Shelf selectors (5).
Selects these additional functions for LF and HF sections.

Numeric setting display (6).
Numerical displays are provided for all parameter settings. Manual changes can also be achieved by typing values directly into these fields.

Q control (7).
Allows continuous control of the Q value for sections performing band pass function.

Frequency control (8).
Provides continuous control of the centre frequency for band pass functions and turnover frequency for shelving and filtering functions.

Equalisation display area (9).
An interactive frequency response display is superimposed on the reverb display area when Equalisation is active.
Colour coded grab points on the graph provide full mouse drag control.
Lateral movement controls frequency and Gain is adjusted by vertical movement.
Pressing the Alt key prior to dragging the control point provides Q control.
Sections can be switched in or out by clicking on the drag point whilst holding down the ‘Apple’ key.

For convenience and clarity a separate colour coded curve displays the response contribution of each particular section to the overall response. Drag points for disabled EQ sections (i.e. those selected Out) remain visible in grey relief for illustration purposes and to allow changes to be achieved prior to applying the associated section.

4.4. Overall controls.

Graphic Display (2).
Displays an illustration of the action of both ER and reverb tail sections and additionally displays an interactive graph of the equalisation response settings.

Equalisation Access tab (30).
Clicking in this area flips between Early Reflection and Equalisation setting GUIs.

Input controls.

Input Gain (3).
Controls the overall input level and reverb gain.

Input Meters (1).
Displays the peak input level to the reverb processing after the ***Input Gain*** control.

Stereo separation (4).
Controls the degree of left and right signal mixing at the ***input*** of the entire reverberation processing. At minimum setting the internal input to the reverb is equivalent to a mono mix.

LF Roll-off (5).
Provides the means to reduce the level of LF programme entering the reverb processing. The control is continuously variable from minimum position where no LF roll-off occurs to maximum LF cut at highest setting. The response of the input signal at the ***Wet/Dry mix*** stage is unaffected.

Output controls.

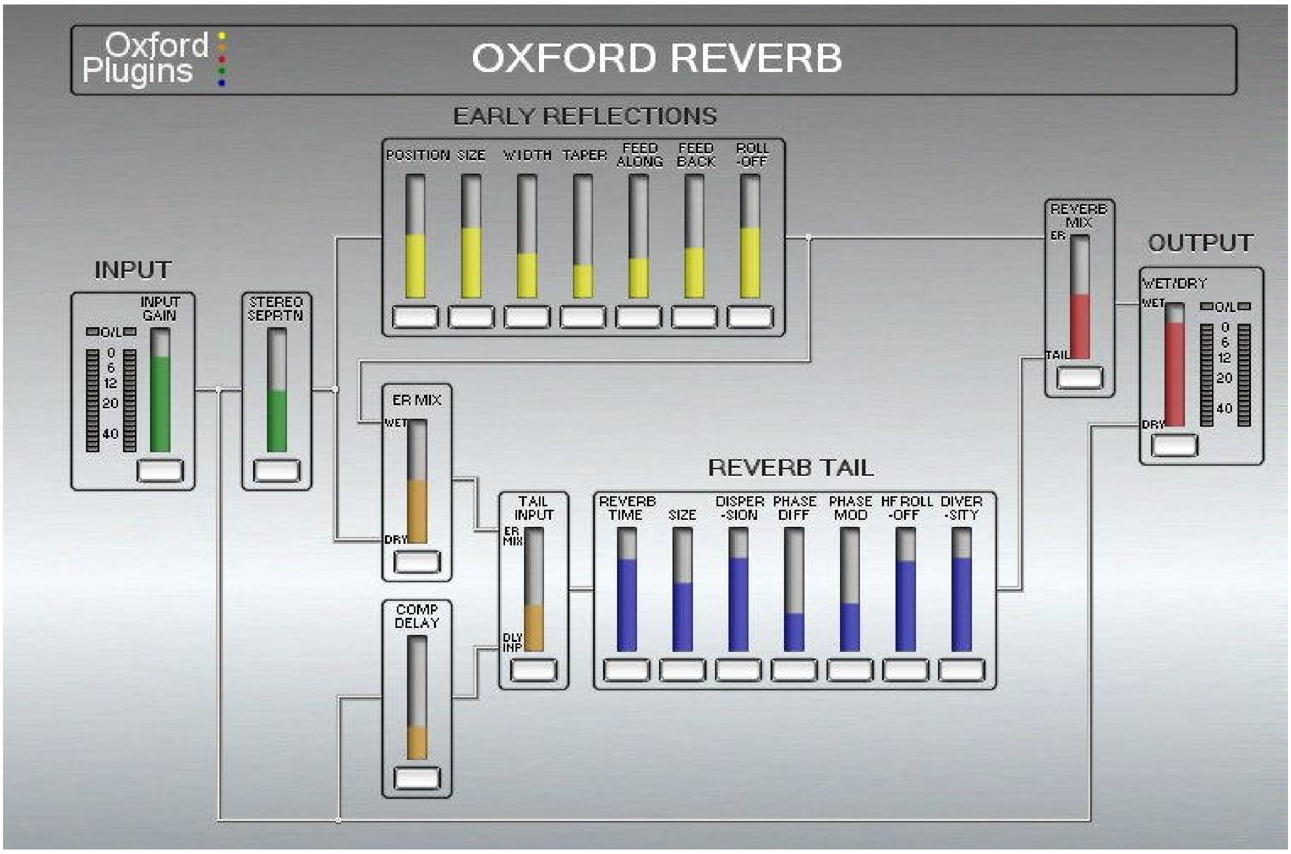
Reverb Mix (17).
Provides a cross fade between the early reflections and reverb tail for the final output.

Wet/Dry mix (19).
Provides a cross fade between the input signal and the output of the whole reverberation processing.

100% Wet selector (18).
Forces the output to reverb only. This is convenient when used in mixing applications where the reverb commonly forms part of an auxiliary mix where the dry signal is present on the main mix buss.

Output Meters (29).
Displays the peak output level from the reverb plug-in.

The following diagram illustrates the overall signal flow within the application:



5. Reverb principles.

Artificial reverberation models tend to fall into two main categories, which can be described as convolution and reflection simulation modelling. Both processes seek to achieve a degree of realism and virtual space by modelling room characteristics. The convolution model achieves this by recording the actual impulse response (due to reflections and dispersion) of existing spaces and imposing the resulting transfer characteristic on to the programme to reproduce the character of the space. However this model does not lend itself easily to the user interaction required for the artistic creation of reverberation effects that are commonly needed in production. Another important factor is that the user cannot readily simplify a convolution to avoid conflicts that often occur between the recorded ambience and the simulated reverb.

The Sonnox Oxford Reverb belongs to the reflection simulation model as this allows the wide and varied user control intended from this device, in the pursuit of a high degree of artistic interaction and creative freedom.

6. Operation.

Generally speaking simulation models employ two sections to generate spatial effects. The first section produces the early reflections that we use to perceive the dimensional space of environments and a reverb tail section is used to produce the longer term diffuse tails that occur in real environments, when the reflection complexity has become so dense that it is no longer possible to discern discrete events.

It is the combination of the effects of these two sections that create the impression of space, environmental timbre and texture. One useful way to regard this is that the early reflections create a kind of ‘wire frame’ model that we lock on to in order to fix the dimension of the space and the reverb tail forms the ‘plaster’ that fills in the model and gives the space volume and long term character.

6.1. Adjustment procedure.

The Sonnox Oxford reverb provides for a very large degree of parameter control so that the professional user has the facility to produce reverberation ranging from subtle ambience and dry spaces all the way up to making dramatic sound effects. To get this degree of user facility a significant number of controls need to be present on the GUI panel. Although this may seem daunting initially, with experience the nature of the controls and the sonic effects they produce should quickly become self-evident. The best method to gain this experience is to simply operate it, taking note of the effect that results from varying control parameters. Indeed, it is intentional in the design of this application that the user should interact with it freely in order to create exemplary results in the normal course of its daily use, which uniquely match the artistic requirements of the particular production in progress at the time.

It is fully appreciated that during the modification of an existing set-up or the building of a new sound from scratch, the dividing line between something that is just ‘ok’ and something that is exactly ‘perfect’ is often very subtle and subject to the artistic requirements of the production and the environment in which it has been recorded or produced. The finer detail of the set-up procedure should therefore remain at the sole discretion of the user and should not be limited by existing set-ups or any particular doctrine.

6.2. Realistic room simulation example.

Most realistic room space simulations will consist of a mixture of appropriate early reflections and reverb tail. However the control set provided in the Sonnox Oxford reverb allows many ways to achieve a wide range of artistic effects that will suit a great many situations, many of which may involve almost completely opposing approaches. Experimentation is the key to mastering these and therefore the following procedures should be viewed as initial guidelines for familiarisation purposes only.

6.2.1. Early Reflection set up.

A good method to achieve the correct balance is to listen to the early reflections first by setting the ***Reverb Mix*** control to ***ER*** position and adjusting the ***Wet/Dry*** setting for a comfortable mix.

- Start with a neutral setting with ***Width*** and ***Taper*** in mid position, ***Feed along*** and ***Feedback*** at minimum and ***Roll-off*** at minimum (most HF content).
- It should now be possible to perceive the space changing with the ***Size*** control. Set this somewhere appropriate initially.
- Go through the ***Shape*** settings noting the difference and decide on one that most suits what you are after.
- At this point the ***Feed Along*** setting can be increased, noting the effect it has on overall complexity in the reflections and the timbre of the space. For realistic spaces, settings around the mid position are often best, but experimentation of the full range is encouraged.
- Listening carefully to the resulting reflections, adjust the ***Feedback*** with the ***Phase*** is set to ***On*** (default), to introduce some reiteration into the space, noting that the space becomes more resonant and the reflections more diffuse. Without feedback the reflections will end abruptly when the reflections are finished. This is useful for creating dry spaces often appropriate for percussion tracks. However for realistic spaces an amount of feedback is required to produce a more natural dispersion and timbre. Too much feedback will result in ringing effects, which can be particularly intrusive for smaller spaces.
- To give the space a realistic absorption and frequency response character, start increasing the ***Roll off*** control to tailor the HF response caused by the reflections over time. There is no fixed rule for what works best as creative freedom should take precedence, however generally speaking larger spaces require greater absorption settings than small spaces, since a major cause of absorption in real spaces is the distance the sound travels in the air.
- The ***Width*** and ***Taper*** controls can now be adjusted to make an appropriate stereo spread and reflection character to the simulation. Some interplay between the ***Feed along*** and the ***Taper control*** may be required to arrive at the best overall sound character, as both can give the effect of increasing the prominence of the reflections.
- At this point it is worth adjusting the ***Position*** slider to form a placement for the listening position in the virtual space. It should be possible to perceive the effect of entering the space as the setting moves off the back wall (minimum setting) into the virtual space. It is important to bear in mind that the primary reflection from the back wall can get quite fast in smaller spaces if the position is too far forwards, so although the simulation may sound correct when 100% wet, frequency combing effects may occur when it eventually gets combined with the dry signal in a mix. Generally speaking simulations with the source and destination at the back wall (minimum setting) will always survive the addition of the dry signal, but under some circumstances forward settings may not. Therefore it is safest to start with the position at minimum initially and make the adjustment whilst using the reverb in a mix situation.

- Finally it's a good idea to run through all the settings, making final adjustments by offsetting one parameter against another in order to get precisely the result that sounds best with the programme. Remembering that often very small changes can make the difference between something stunningly good or just average!

At this point you should have an early reflection sound that produces a realistic perception of space, but may lack long-term reverberation and complexity.

Some additional important points regarding the Sonnox Oxford early reflections processing:

- It is sometimes useful to use an early reflection model on it's own (without any reverb tail) where significant environmental reverberation already exists on the recorded track to be treated. In this case the recorded reverb can often be included within the simulated space without conflict, giving the perception that the track was actually recorded in stereo.
- The perception of large spaces can be alternatively constructed with relatively small ***Size*** settings by the application of large amounts of ***Feed along*** and ***Feedback***. Whilst such sounds may produce less faithful emulations of real spaces, great sound effects and very dense general ambiences may be generated this way.
- Moderate duration early reflections built using fairly small ***Size*** settings and large amounts of ***Feed along*** with no feedback can be very useful for percussion ambiences, since they end abruptly and thus avoid creating intrusive 'hubbub' from reverb run on.
- The effect of very large spaces with long reverb tails can be constructed with the early reflection processing alone by using large ***Size*** settings, moderate ***Feed along*** and large amounts of ***Feedback***. Although such spaces will be less diffuse than reverb tail models (because they always contain cyclic reflections), they are still very useful for creating the impression of extremely large spaces and generating rich sound effects.
- The ***Stereo separation*** control mixes left and right signals together at the input of the processing. This is useful where the virtual space is required to be fixed regardless of input programme panning. But where the programme is a viable stereo source (either panned or natural) better placement within the reverb sound field will be achieved with higher separation settings.

6.2.2. Reverb tail set up.

The major difference between the early reflection processing and the reverb tail is that the latter contains no geometrically based dimensional information. Being constructed of mutually unrelated terms, it is designed to generate almost characterless spectral diffusion and spatial dispersion. Therefore its main purpose is to reiterate the sonic character and spatial cues provided by the input programme and the early reflection processing, with the minimum of disturbance throughout its decay period.

However nuances in the way this is achieved play important roles in the resulting texture, timbre and spatial quality we perceive in the reverberation effect. Rather than providing the user with either a fixed model or a limited selection of algorithms, the Sonnox Oxford reverb offers full control over the parameters that most affect the sonic character of the reverb tail. This provides the user with the maximum creative facility.

Tail Mix Section.

The first thing is to decide what drives the reverb tail section.

Generally there is a mixture of two approaches to driving the reverb tail section we can consider. Either we want to carry the character of ***the early reflections*** into the reverb tail. Or we want to just add reverberation to the input signal so that the character of the ***input programme*** is carried into the reverb tail.

In practice we almost always need a mixture of both of these depending on the desired result.

The ***Tail Mix*** section of the GUI controls this function by providing the ability to mix, the output of the early reflections processing with the input signal and a delayed version of the input signal. Therefore it is possible to create a mixture of all three signals, any combination, or just a single source.

The delayed input signal controlled by the ***Delay Comp*** function, is normally set in ***ER Track*** mode so that the input drive to the reverb tail largely coincides with the initial output signals from the early reflection section. The following is a suggested way to set up the reverb tail.

- Set the ***ER Mix*** control to ***Dry*** position, the ***Tail Input*** control to ***DLYINP*** position and the ***Comp Delay*** to middle position. This ensures that the input drive to the tail section is the compensated version of the input signal. This is a good starting point as it is the character of the input that we need to address first.

- Set the ***Reverb Mix*** to central position so that we hear an equal contribution from the early and reverb tail signals. This is useful because we are initially concerned with making the overall reverb tail match the timing requirements of the early reflection sound we have already made.

- ***Set Overall Size, Dispersion*** and ***Phase Diff*** controls to middle position. Set ***Phase Mod*** and ***Absorption*** to minimum position and ***Diversity*** to maximum position. This is a neutral starting point where the effect of controls are most easily heard when we get to adjust them.

- By increasing the ***Reverb Time*** control the tail can heard to extend to the period set on the control. Set this to something that matches the sound you are aiming for. At the moment the tail will sound rather grainy and its stereo image will be largely in the centre of the sound field.

- Moving the ***Dispersion*** control in the positive direction will result in increased complexity and smoothness in the longer term. The higher the setting the faster the complexity builds over time. Set this somewhere that provides the required effect, bearing in mind that real spaces take a period of time to build complexity, especially if they are large and reflective.

- Adjust the ***Phase Diff*** control and note that the tail image begins to spread across the stereo field. The higher the setting the quicker the spread will occur over time. Generally speaking large settings are better in mix situations because they produce a wide sound field quickly. However for very large spaces or sound effects a slower spread from middle to sides can often produce a more realistic effect. The included set up 'far away' is a good illustration of this. It is also worth experimenting with negative settings noting that the spatial effects build into far wider and more diverse stereo sound fields. Negative settings are often more effective when you are aiming for greater perceived immersion within the simulated space.

- Increasing the ***Phase Mod*** control will provide a degree of variance for the above settings (as though you were moving the Phase Diff control slowly). This provides a larger degree of realism to the reverb tail because it prevents it from becoming spatially static. It keeps our attention on the reverberation because it changes subtly over time – much like in real spaces where natural movement of the air or objects within the space continually modify its characteristics.

- To give the space a realistic high frequency profile over time ***Absorption*** should be applied in the same manner as in the early reflection settings. In general, larger spaces require greater absorption, however some larger spaces can reflect considerable HF from the back extremities of the spaces. It is important to bear in mind that allowing a large HF content in the reverb tail may accentuate unnaturally strident or harsh sounds, particularly if there are sustained HF components in the programme or there is prominent resonance in the early reflection stages.

- The overall spread of the reverb can be adjusted using the ***Diversity*** control. Reducing this control adds statistical weighting to the centre image, which is often needed to anchor the sound field to centre stage. It is important to consider the intended speaker layout whilst setting this control since a large degree of left to right mixing occurs acoustically in the reproduction room. It is particularly important to remember that what appears a natural setting for this control will vary considerably between headphone and speaker listening methods!

<u>Blending early reflections and reverb tail.</u>

Blending the early and late portions of the reverb is basically a matter of taste and suitability to the programme and mix.

- Adjust the ***Reverb Mix*** control to fine-tune the contribution from the sections. Generally speaking the application of more late reverb tail energy will result in a softer and more diffuse reverberation at the expense of spatial realism.

- The effort now is to decide what proportion of the early reflection mix will be included in the reverb tail input. This is particularly crucial since the whole long-term character of the reverb is affected. Advancing the ***Tail Input*** control away from ***DLY INP*** towards the ***ER Mix*** direction will progressively allow more signal drive from the early reflection mix stages into the tail section. Generally speaking there is normally a need for some ER signal in the reverb tail, however this is not a 'rule' and the amounts required are most often quite small. Too much early reflection drive to the tail may cause unwanted ringing or boominess from the ER section to become intrusive in the longer term. Too little drive may make the tail lack character. It is all a question of settings, programme source parameters and artistic taste. Experimentation is everything.

- Throughout the blending process it is a good idea to go back periodically and adjust the reverb tail ***Overall Size*** parameter in order to get the best timbral blending between the sections. The overall size parameter can be adjusted all the way from what sounds like a 'cymbal resonating' to a wide open space - without affecting the decay time, so there is great deal of latitude in what can be achieved. In general there is a trend for larger early reflection spaces to most suit larger LR overall sizes, because they exhibit a slower build up of complexity. However this is not a rule, in practice very subtle changes in the overall size can result in exemplary realism when resonance within ER and LR sections complement each other.
- Application of ***HF Roll-off*** should only be attempted **after** an overall reverberation sound has been achieved, as low frequency spatial cues are very important to our perception of natural spaces. In the event that the reverb produces excess LF energy (particularly if the simulation space is very small), or an effect is desired which favours only HF programme content, ***HF Roll-off*** can be applied with discretion depending on the overall requirement of the programme.

Some additional important points regarding the Sonnox Oxford reverb tail processing:

- Since the reverb tail is essentially neutral containing no dimensional character, it can be used by itself with **very low reverb times** to produce general ambiences and 'characterless' early reflections. In particular, with small to moderate ***Overall Size*** settings, effects ranging from 'boomy' drum rooms to vocal double tracking and multiplications can be achieved.
- If the programme consists of a stereo source that already contains significant environmental reflection, the Reverb Tail section can be used on its own to simply adopt the character of the original recording and extend the natural reverb within the recorded space
- The reverb tail processing consists of two separate sections for left and right signals, which under some conditions can perform entirely independently. If the reverb tail processing is used on its own with stereo panned sources (without any early reflection contribution), care should be taken to ensure that ***Stereo Separation*** and ***Diversity*** controls are **not** both set to maximum, as this could result in a left or right only reverb signal if the source is panned hard to either side.

6.3. Equalisation.

Equalisation of the reverb signal contribution is included to affect changes in the overall character of the simulation, either in response to artistic need or to enhance the realism of real space simulations.
Almost all real environments exhibit complex frequency response characters that are generated by the reflection timing of the room spaces and objects within the area. The actual perceived frequency response is highly dependant on the position of the sound sources and the listener within the space.

Much of the most complex frequency response character is generated by the early reflections processing within the reverb application, but because simulation models have a reduced quantity of reflection nodes in comparison to real spaces, much of the overall resonance and tonal character may be absent from the total simulation.
Whilst the clean, unobtrusive nature and reduced tonal interference of the simulation reverb often blends more effectively in music production, post production and Foley situations often require an accentuated realism and much of this is provided by the overall frequency character of the spaces. Indeed this partially explains the success of convolution reverbs in the post production field.

All of the set-up examples contained in the Post category are examples of combinational reverbs which use equalisation to enhance the realism of spaces by providing the resonance's and response aberrations one would associate with the simulated spaces.

6.3.1. Equalisation set up.

Because the response of the reverb section is more unpredictable and fragile than the EQ, it is generally better to achieve a convincing set-up for the main reverb before starting out on any equalisation.

Reverb EQ destined for music production.

For music production the role of the EQ is mainly that of subtle modification to the overall sound. This often entails reducing intrusive low frequencies, providing tonal matching within the mix or creating sound effects by accentuating reverberation within various registers of the musical ranges. Equalisation may also allow the reduction of unwanted artefacts due to the 'run-on' of resonances within the programme, particularly in percussive sounds.
As an artistic tool equalisation can be used to create a wide variety of effects limited only by the engineer's imagination and experimentation is definitely to be encouraged.

Reverb EQ destined for post production.

For post production effects and simulation of real spaces the EQ serves to accentuate or even insert tonal aberrations that we associate with particular spaces. Often we don't notice these aberrations when we are actually in the spaces, but when adding simulations to dry sounds in a post production environment their absence can be a real limitation to effectiveness. There is no hard and fast way to achieve successful results, as there are several possible approaches to the problem. The following are presented as helpful hints.

- The major room node responses should be obtained using the appropriate room shape and size within the early reflection set-up stage. It is important that these match the overall space characteristic even if the frequency characteristics are significantly different – because we will use the EQ to modify these later.
- Odd shaped or complex spaces may be initially created using the a combination of reverb tail and delay comp to simulate late reflections from distant areas of the space, i.e. L –shaped spaces, rooms with several distinct areas etc. Reducing the overall size of the late reverb setting can produce a wide range of resonances that suit smaller spaces.
- Most rooms have a dominant resonance at lower frequencies and several resonances of lesser gains in the lower and upper mid ranges. The smaller the space the higher the frequency these are likely to be. They may be very large reaching 10dB or even 20dB and they may have high Q values in the 7 to 12 range. Experimentation will reveal whether the EQ matches natural expectations in the space.
- Higher mid frequency resonances and dips are normally associated with near surfaces, for instance a nearby wall or door. These reflection effects can be initially created using the position control in the early reflection settings and added to, modified or accentuated with EQ if required. For high Q resonances of this type, quite small gain values are often most appropriate.
- Overall gentle response changes often accompany smaller rooms that contain large amounts of soft furnishings (i.e. living rooms etc.). This effect can often be accentuated by the addition of LF boosting with lower Q values between 0.5 and 1.5, or by introducing a band pass low Q cut in the mid ranges.
- Very large spaces may exhibit a reverberation that focuses mainly in the mid ranges. A combination of high absorption settings and LF roll-off can often simulate this effect. A small rise of around 1 or 2dB in the mid ranges may also be appropriate.
- There is a high degree of response interplay between the resonances produced in the reverb and the EQ. Very often extremely small changes to reverb size settings and EQ centre frequencies can produce very significant changes in the overall perception of the space. It is definitely worth experimenting with this when reaching the final phases of producing a sound.

7. Copyright and acknowledgements

Platform Specific Supplement

1. Available Applications.

Digidesign Pro Tools (TDM and LE)
VST
Audio Units

2. System Requirements.

For latest System requirements, please see www.sonnoxplugins.com

Pro Tools

- Approved Digidesign CPU and configuration
- Pro Tools HD or Mix system (TDM version).
- Pro Tools LE system (LE version)
- iLok USB Key

VST Native

- Windows XP with a VST compliant host application (eg Nuendo, Cubase, Ableton Live, etc)
- 800x600 minimum display
- iLok USB key, loaded with the appropriate authorisations.

Audio Units

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- Approved Apple CPU and OS X 10.4 or higher.
- Audio Unit Host application.
- iLok USB key required.

3. Installation and Authorisation.

All versions
You will need to authorize your software by transferring the asset for your product to your iLok before use.

CD purchases: you can do this by following the instructions on the inlay card supplied with your CD.

Online purchases: you can do this by following the instructions sent in your order confirmation email after purchase.

3.1. Pro Tools (Macintosh)

Double click the installer icon for your product to begin. Follow the onscreen prompts.

The installer will search for the 'DAE:Plugins' folder (OS9), or '/Library/Application Support/Digidesign/Plug-Ins' folder (OSX). If found, the plugin will be installed to this location; otherwise, an error will be reported.

You will need your authorised iLok plugged into a free USB port on your machine at all times when using the plug-in.

3.2. Pro Tools (Windows)

Begin installation using the setup menu (CD purchases), or double click the installer icon for your product. Follow the onscreen prompts.

The installer will place your plugins into ‘<X>:\Program Files\Common Files\Digidesign\DAE\Plug-Ins\’, where <X> is the drive containing your Windows directory.

You will need your authorised iLok plugged into a free USB port on your machine at all times when using the plug-in.

3.3. VST Native (Windows)

Double click the installer icon for your product to begin, and follow the onscreen instructions.

When the plugins are installed, the setup program will attempt to detect your shared ‘VSTPlugins’ directory. However, you may also select another location if desired. The default installation location is **…\VstPlugins\Native\Sony.**

3.4. Audio Units (Macintosh)

Double click the installer icon for your product to begin. Follow the onscreen prompts.

You will need your authorised iLok plugged into a free USB port on your machine at all times when using the plug-in.

4. Preset Manager (VST).

4.1. Onboard Presets Manager.

The Sonnox Oxford Reverb version for VST Native comes equipped with its own on-board Presets Manager, which is displayed at the top of the plugin window, as if it were created by the host. The reasoning behind this is to allow increased portability of your Sonnox Oxford Reverb presets across all the host applications that support VST, while also providing a consistent and versatile interface. While most host platforms allow creation and loading of presets, these host-created preset files are not portable between different platforms. With the new presets manager for Oxford plugins, you can create a named preset on one platform and load it on a different platform.

On Windows XP, the default directory for the factory presets provided with the Sonnox Oxford Reverb is located at:

C:\Program Files\Sony\Oxford Plugins\Presets*Native*\Oxford Reverb

On Mac OS-X systems, the default directory for the factory presets provided with the Sonnox Oxford Reverb is located at:

/Library/Application Support/Sony/Oxford Plug-Ins/Presets/*Native*/Oxford Reverb

…and the presets are also written to the user-domain equivalent (in case more than one user requires private presets) at:

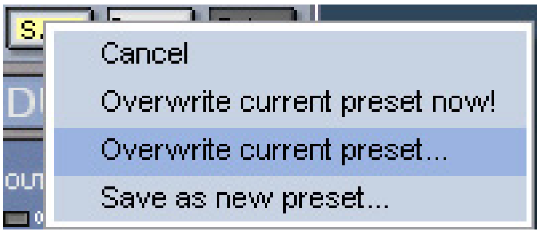
/Users/username/Library/Application Support/Sony/Oxford Plug-Ins/Presets/*Native*/Oxford Reverb

…see section below “Organising Presets for Multiple Users” for more information on this.

It is recommended that you create a sub-directory within this factory preset directory to store your own presets. You can do this when you save your first preset, or by using a window browser in WinXP. If you wish, you can re-organise the factory presets along with your own presets into any hierarchical directory structure that reflects the way you work. It is recommended that you adopt a convention to help you navigate more intuitively, such as giving directory names all upper case letters. Either way, when you click the “**Load**” button of the presets manager, you will be presented with an alphabetically-sorted hierarchical menu of the available presets that reflects the directory structure you have chosen, and you can navigate the menu to choose which one to load. Once a preset is loaded, its name will appear in the large text display window in the middle to remind you where the current settings originated.

The **Load Next** and **Load Prev** buttons, labelled as “**+**” and “**-**”, will step forwards or backwards through the hierarchy of presets, loading them. This allows quick comparisons, or quick stepping. Successive clicking of the load next button will step through every preset in every directory beneath the current directory (see “Browse” below for selecting the current directory.)

The “**Save**” button allows you to create a new preset from the current settings of the plugin, and allows you to select where in the directory structure you wish to save it. The name of the preset is the same as the file name you give it. Clicking on the save button brings up a menu allowing you options either to overwrite the current preset now, overwrite the current preset with a query request, or create a new preset:

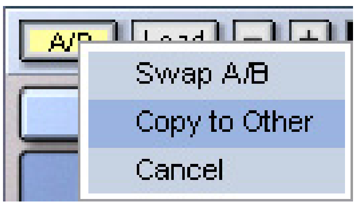


The “**Browse**” button allows you to set the current directory to look in for presets. By default this will be the factory presets directory, but you can temporarily change it to anywhere you want. The current directory is regarded as the top of the directory structure, so when “Load” is clicked, the menu presented will include every preset in every subdirectory beneath the current directory.

The “**Delete**” button allows you to delete a preset. By default, the factory presets are created as read only files, thereby preventing accidental deletions of factory presets.

The **“A/B”** button allows you to compare two sets of settings with a single click. Whenever this button is clicked, the current settings are saved into a backup store, and the contents of the backup store moved to the current settings. Initially, the backup store is loaded with the default state of the plugin on start-up, so use of the A/B button will compare whatever plugin settings you have created to the default settings, which will usually be equivalent to comparing the audio with and without the plugin affecting the sound. However, if you switch to the default settings and change them, this is what the other settings will be swapped or compared against. Thus the A/B button allows you to quickly compare the audio with and with out the plugin, or compare one setting against another.

The “**A/B**” button also has a menu beneath it that is accessed by clicking on the A/B button and holding the click for half a second. This submenu allows you to copy the current settings over into the backup store so that you can sync the two together before making some changes for careful comparison of sounds:



The displayed **Preset Name** is fully linked into the VST program name so that saving and restoring the project on the host platform will save and restore the preset name. When a project is restored, the preset manager will attempt to find the preset name given to it in the preset directories so that “+” and “-” will work from that point on.

By default, the displayed **Preset Name** will include a path down from the current directory so that you can tell which sub directory a preset comes from. You can turn this option off using the main plugin menu option "Display Preset Path Names". You may wish to do this, for example, if you have deeply nested directories of presets, and there is not enough room on the plugin's display to fit both the path and the name.

The **Preset Name** displays a "*" at the end if the settings have been altered in anyway over the original loaded settings.

4.2. Organising Presets with Multiple users.

If multiple users will be using the plugins installed on a single computer, then the best idea is to copy the factory presets into a place belonging to the individual user, and set the root directory of the presets manager to point to this new directory. This root directory will be saved uniquely for each user, so usage by other users will not disturb the preferences of an individual user. Personal presets can then be made in a subdirectory of the root directory. This way, each user has their own copy of the factory presets, and their own private presets.

5. Output Lock Button (VST).

The output lock button is available initially on VST Reverb plugins of version v1.1.2 or greater.

The purpose of the lock button is to allow you to lock the wet/dry balance as you desire, and then step through the presets without the presets changing wet/dry balance or turning on the 100% wet button. This enables you to hear different presets with the wet/dry balance you are actually working with, and thus greatly speeds up finding the best preset for the given material.

The lock button works by preventing the wet/dry parameters from being loaded into the DSP, and applies only to preset loads initiated by the onboard Preset Manager (i.e. "Load", "A/B", "+" and "–"). Parameter automation, or preset loads initiated by the host will override the lock button. This is so that project loads will sound the same as when you left them.