



The Dragonfly Reverb/RML Labs User Manual

By Dell Krauchi

Updated from the original text by Michael Willis

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The References Section

At the conclusion of this text, is a "References Section" that "...does what it is 'posed to do." These references are noted by "*numerical superscripts*" – and which are to be differentiated from the "*alphabetical superscripts*", which were later employed in the "Basic" and "Advanced" dials sections. This differentiation was implemented in order to maintain the distinction between the "*reference data*" and the "*application data*". I do hope that this will make sense later? This point is important and therefore, *should be remembered!*

Preamble

The information as provided here in this present text is derived *from four on-line texts* by the author and developer of one of the latest iterations of the Freeverb3 Reverb, namely Michael Willis¹.

The original Freeverb3 reverb was provided in five different versions namely, Freeverb, Hibiki, ProG, NVerb, and STRev. Michael has not only renamed these five reverbs but has also combined two-of-the-five into one of his iterations. The new name are, the Dragonfly Early Reflections, the Dragonfly Plate Reverb, the Dragonfly Room Reverb, and the Dragonfly Hall Reverb.

Following is a listing of the FreeVerb3 iterations along with Michael's updated implementations and where the various FreeVerb3 algorithms were employed:

FreeVerb3	Dragonfly
Freeverb	Early Reflections Room Hall
Hibiki	Hall
NVerb	Plate
ProG	Room
STRev	Plate

As can be observed from the above, Michal has combined the NVerb and STRev algorithms into one – the Dragonfly Plate, as-well-as implementing the Freeverb3 algorithm into the Early Reflections, Room and Hall iterations.

The On-Line Texts

Michael made provision for on-line versions of the User Manuals² – one text for each of the four aforementioned plug-ins.

As I personally prefer *local* copies of any-and-all such documentation, I decided to develop *off-line versions* of each of these texts. During this development process, I noticed that there was, what I will refer to as, "*a degree of commonality*" in each of the above four plug-ins and therefore, I felt it appropriate to combine these four texts into one. I have also updated those texts as needs required. I have provided the original text in the "*References Section*"² at the conclusion of this text.

The User Interface and RML Labs

User interface elements that are common to all four plug-ins will be discussed first, followed by information pertaining to each of the plug-ins individually.

It is important to note that this documentation – though applicable to all other application usages, will be entirely focused on the use of each of these plug-ins within the RML Labs line of software products, namely, Software Audio Workshop and Software Audio Console.

The Dragonfly Reverbs and Studio Reverb

For those that have upgrade to the 64-bit versions of SAW and SAC, it was later discovered that the 32-bit version of Studio Reverb – for whatever reason, would not be upgraded to 64-bit. Though this situation proved to be somewhat disappointing to some, with the availability of the Dragonfly Reverbs – I do sincerely believe that such disappointments can be either *diminished* or even *eliminated* altogether! I guess we will just have *to wait and see*?

A Bit of History

The Dragonfly plug-ins are an iteration of a plug-in called "FreeVerb3VST"³. From what I have been able to ascertain, FreeVerb3VST is an iteration of "freeverb" – an Opcode version of Jezar's Freeverb^{4,5}. FreeVerb3VST was originally developed by Teru Kamogashira⁵ in 2007.

The original source code was provided in "*open source*" – thereby making such code available to others such as that provided by Mr. Kamogashira. Mr. Kamogashira's algorithms were also made "*public*" and were implemented in versions provided by Elements VST⁶ and ElephantDSP⁷. A host of "*other*" developers also incorporated the algorithms from many of Mr. Kamogashira's original source code.

- Note: If anyone would care to perform some research on their own, it might be somewhat *surprising* to discover just how many other developer's have implemented both Jezar's and Mr. Kamogashira's algorithms into their finished products!

Elements VST also developed a port of the plug-in for native RML Labs usage – the Dragonfly Hall reverb⁸. At the time of writing however, the plug-in – seemingly as the direct result of licensing issues, has a number of minor bugs and which at present, is no longer being developed.

Information specific to Michael's Dragonfly versions will now be considered next.

Reverb "Type" versus Reverb "Preset"



It must be understood at the outset that the provision of a particular reverb type or reverb preset are first, *subjective*, and second, *suggestive* – and therefore, such designations should only be considered in context as to how each type of preset or reverb preset may actually "*sound*", or the resultant *affect* that that type or preset has on the resultant output.

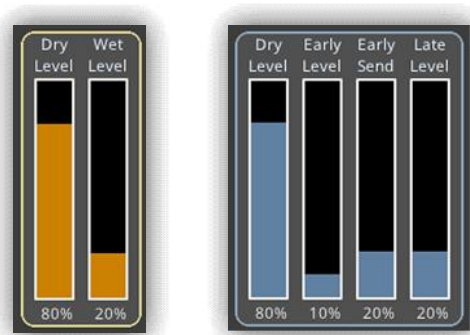
The Elements

The four Dragonfly reverbs consist of *various elements* – the specifics of each of these elements will be considered next. These various types of elements are as follows:

- 1. Sliders
- 2. Dials
- 3. Browser
- 4. Reverb Type
- 5. Spectrogram

We will now consider each of these five elements in turn.

The Slider Elements



The slider control elements located on the left are employed in the Early Reflections and Plate reverbs, with the slider control elements located on the right being employed in the Room and Hall reverbs. Each of these various control elements will now be considered in turn.

The Early Reflections and Plate Sliders

Slider	Reverb	Purpose
Dry Level	Early Plate	To control the level of the input signal <i>prior</i> to that signal being sent to the output
Wet Level	Early Plate	To control the level of the reverb signal <i>after</i> that signal was sent to the output

- Observation: For the Early Reflections and Plate reverbs, the Dry and Wet levels *operate as expected* – that is, the output of the Dry and Wet controls *are combined* to form the reverb's output stage.

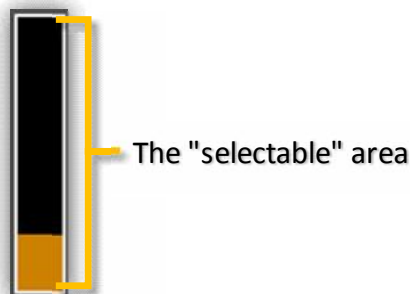
The Room and Hall Sliders

Slider	Reverb	Purpose
Dry Level	Room Hall	Determines the level of the input signal prior to that signal being sent directly to the reverb's output
Early Level	Room Hall	Determines the level of the early reflection signal in the reverb's output
Early Send	Room Hall	Determines the level of the early reflection signal mixed into the input to the late reverberation algorithm
Late Level	Room Hall	Determines the level of the late reverberation signal in the reverb's output

- Observation: For the Room and Hall reverbs, the output of the Dry, Early, and Late controls *are combined to form the reverb's final output signal*. Thus, the Dry, Early, and Late sliders then would have an *accumulative effect* on the reverbs final output.

The Slider Elements: Usage

- It is important to understand that the sliders were designed to *function independently* of a given preset or reverb type.
- This *independency* was implemented purposefully in order to allow for levels to be configured amongst the individual sliders that remained constant regardless of the reverb type or reverb preset that had been previously selected – thus allowing the end-user to explore the final output of the various presets without the positioning of the sliders affecting that final output.
- The positions of each of the sliders can be initiated *in one of two ways*, 1) by a select-drag operation, or 2) by a select operation in the *selectable* area of a given slider.



The Dial Elements

The dial elements control the various available parameters for a given reverb plug-in – such as size, width, diffusion, and so on. There are *two types* of dial elements employed in the reverbs namely, Basic and Advanced.



Though information as to the reasons for what this basic/advanced distinction is was never provided – it could be *surmised* that such distinctions would refer to *the overall affect* that that particular dial configuration would have on the resultant output.

Following are explanations for each type of dial and their *proposed* affect on the resultant output signal.

- Observation: Those *proposed* affects that are similar to a particular dial type will be combined for the sake of simplicity.

The Dial Elements: Usage

1. Shift-select: Resets the dial to the default configuration for the currently selected preset.
 - Note: This option *is not applicable* to the Dragonfly Early Reflections plug-in.
2. Control- select: Invokes a "*fine-tune*" control of the specified control.
 - Note: This option *is applicable* to all plug-ins.

The Parameter Designations



The text located in "*square brackets []*" as noted below, refer to *the effective parameter designation* [meters, percentage, and so on] for that given reverb parameter. These effective parameter designations are displayed just below the respective dial...as shown in the image above.

- Note: Please remember that the "*alphabetical superscripts*" refer to further information with regards to that parameter being referenced. Please refer to the "*Observations*" section below.

The Basic Dials

Type	Reverb	Description
Size	Early	Determines the size of the simulated space [m]
	Room Hall	Determines the length of the reverb's internal delay lines ^A [m]
Width	Early Plate	Determines the output stereo width [%]
	Room Hall	Determines the Width control sets the output stereo width ^B [%]
Predelay	Plate	Determines the Delay before the onset of the reverberation [ms]
	Room Hall	Determines the Delay before the onset of the late reverberation ^C [ms]
Decay	Plate Room Hall	Determines the length of time for the late reverberation to decrease by 60Db [sec]
Dampen	Plate	Determines the amount of the low pass filter that will be applied to the reverb algorithm's feedback loop ^D [Hz]

Observations

^AIncreasing the Size parameter generally leads to a smoother, less resonant output however it can also increase the reverb's attack time and make individual early reflections more audible. Decreasing the Size parameter generally has the opposite effect, decreasing the reverb's attack time and making individual early reflections less audible although it can increase the presence of metallic resonances.

In physical terms, the Size control corresponds to the largest dimension of an imaginary space. When the size is small, the "*walls*" of this space are closer together and the resultant reflection density increases. When the size is large, that reflection density decreases.

^BThis configuration applies to both the early reflections and the late reverberation.

^COnly the late reverberation is delayed. Early reflections are always output immediately. You can see this by performing the following:

1. Set Early Level to 100% and Late Level to 0%.
 - Observe on the spectrogram that changing the Predelay does not move the early reflections.
2. Set Early Level to 0% and Late Level to 100%.
 - Observe on the spectrogram that changing the Predelay moves the late reverberation.

^DFor further information on "*dampening*", please see the provided link in the "References Section"⁹

The Advanced Dials

- Note: Please remember that the "*alphabetical superscripts*" refer to further information with regards to that specific parameter being referenced. Please refer to the "*Observations*" section below.

Type	Reverb	Description
Diffuse	Room Hall	Adjusts the coefficients of the allpass filters in the late reverberation algorithm ^A [%]
Spin	Room	Rate of modulated chorus effect on the late reverberation ^B [Hz]
Low Cut	Room	Determines the high pass filter frequency applied to the input signal before it is processed by the early reflection and late reverberation algorithms [Hz]
	Hall	Determines the cutoff frequency of the reverb's high pass filter which is then applied to both the early reflections and the late reverberations [Hz]
High Cut	Early Plate	Determines the amount of the low pass filter applied to the output signal after processing the reverb algorithm [Hz]
	Room	Determines the amount of the low pass filter frequency applied to the input signal before it is processed by the early reflection and late reverberation algorithms [Hz]
	Hall	Determines the cutoff frequency of the reverb's low pass filter, applied to both the early reflections and late reverberation [Hz]
Low Boost	Room	Increases the decay time for a band of low frequencies ^F [%]
Boost Freq	Room	Determines the approximate maximum frequency band that is to be boosted [Hz]
Low Cross	Hall	Short for Low Crossover ^G [Hz]
High Cross	Hall	Short for High Crossover ^H [Hz]
Low Mult	Hall	Short for Low Multiplier ^I [0.0x]
High Mult	Hall	Short for High Multiplier ^J [0.0x]

Observations

^ADiffuse enables the user to balance echo density against unpleasant colouration so that the result enhances rather than detracts from the audio input signal.

- Note: For further information on "*diffusion*" please see the provided link in the "References Section"¹⁰

A challenge that the designers of early digital reverbs faced was generating a realistic number of early reflections or echo density. One solution to this problem was to use allpass filter networks. Although successful in increasing echo density, the downside of allpass filter networks is that they have a tendency to resonate, particularly when the input signal is impulsive. This means that there is a tradeoff between echo density and colouration.

In general, low echo density or diffusion settings increase the perception of discrete echoes. In the case of transient-rich sounds this can lead to "machine-gun-like" effects in which individual echoes are heard. For sustained sounds, this is less of an issue. Increasing the Diffusion setting makes individual echoes less perceptible and generally leads to a smoother, more lush reverb sound however it also can introduce metallic resonances which can be noticeable but depend to a large extent on the nature of the input signal.

To better understand the effects of the Diffuse control, perform the following:

1. Launch a track with clear percussive sounds.
2. Decreasing the Diffuse value will result in fewer, more discrete reflections in the late reverberation.
3. When set at very low values the late reverberation has an almost "shattering" sound to it.
4. A higher Diffuse setting results in the late reverberation having a smoother and richer sound.

^BPlease note that higher Spin values can lead to an audible "wobble" particularly in real instruments such as acoustic guitar or piano and can also cause noise on pure tones. This effect tends to be less noticeable on speech.

^CIn most cases, values from 1-2 Hz are appropriate. Typically, these values should be smaller for small rooms and chambers, however it is always best to set the parameters according to the musical context. Higher Spin values can lead to an audible "wobble" particularly in real instruments such as acoustic guitar or piano and can also cause noise on pure tones. This effect tends to be less noticeable on speech.

^DIf this is set to 0%, the following Spin and Wander dials will have no effect.

^ETo better understand the effects of Spin and Wander, perform the following:

1. Set a large room size, a long delay, Modulation to 100%, and Wander to 0%.
2. Then play an abrupt sound such as a percussion hit or a chord on piano or guitar.
 - You should notice that the reverb tail pans alternately left and right in the stereo field at the rate set by Spin control.
 - There are multiple layers to the late reverberation, but these multiple layers are all synchronized in the stereo space when Wander is set to 0 ms.
3. Next, increase the Wander setting, which will make the layers spread out in the stereo space.
 - The layers all still spin at the same rate, but at any given time each one has its own location in the stereo field.

^FThe boost feature does not have a significant effect with a short decay time of less than 1s.

^GLow Crossover is simply the threshold below which the Low Multiplier parameter affects the low frequency component of the late reverberation.

^HHigh Crossover is simply the threshold in Hz above which the High Multiplier parameter affects the high frequency component of the late reverberation.

^IMultiplies the decay time below the Low Crossover frequency and which only applies only to the late reverberation signal. The Crossover and Multiplier parameters work together to determine the characteristics of the late reverberation.

For example, with Decay set to 2.0s, High Crossover set to 5 kHz, and High Multiplier set to 0.8 X, frequencies above 5kHz will generally have a decay time of $2.0s \times 0.8 = 1.6s$.

- Note that the crossover frequency is not a hard boundary, so the decay time will be ramped near the threshold. The same applies to the Low Crossover and Low Multiplier parameters.

For example, with Decay set to 2.0s, Low Crossover set to 1 kHz and Low Multiplier set to 1.5, frequencies under 1 kHz will have a decay time of $2.0s \times 1.5 = 3.0s$.

^JMultiplies the decay time of frequencies above the High Crossover frequency. Applies only to the late reverberation signal.

To continue...

The above text hopefully covers all of the relevant information with regards to the Basic and Advanced dial elements. Information on the Preset Browser element will be considered next.

The Preset Browser Element



The Preset Browser element is only available with the Plate, Room and Hall reverbs. The Preset Browser makes provision for various presets – thus the name, with each preset determining the reverb type and the positioning of the dials.

Type	Description of Presets
Dragonfly Plate Reverb	Various Plate and Tank algorithms
Dragonfly Room Reverb	Various Room, Hall, and Effect algorithms
Dragonfly Hall Reverb	Various Room, Studio, and Hall algorithms

About the Sliders

Please remember that the sliders function independently of a given preset and that this functionality was implemented purposefully to allow for levels to be configured amongst the individual sliders that remained constant regardless of the reverb type or reverb preset that had been previously selected. This allows the end-user to explore the final output of the various presets without the positioning of the sliders affecting that final output.

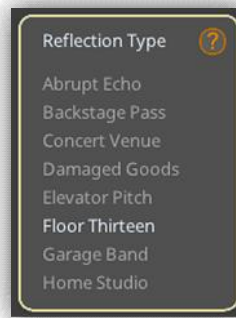
The Reverb Type Element



The Reverb Type element is only available with the Early Reflections and Plate reverbs. This section makes provision for early reflection and plate reverb algorithms.

The Early Reflections reverb provides eight reflection algorithms, whilst the Plate reverb provides three different plate reverb algorithms.

About the Early Reflections Reverb



These eight menu options provide a selection of different reflection patterns that are available. It is important to understand that these menu selections *are not presets*, in that these menu selections do not make any alterations to the actual dial configurations. *Good or bad thing? Not sure!!*

Each reflection pattern provides a different specification of echo delays and gain levels for each of the left and right channels. The provided designations are primarily meant to be *memorable* – and such designations should be considered as only vaguely related to how each reflection pattern actually "sounds".

- Observation: The "Concert Venue" menu selection is the reflection pattern that is employed in both the Dragonfly Hall reverb and the Dragonfly Room reverb – however, with both reverbs not currently providing a means of being able to select that particular reflection type.

About the Plate Reverb



About the algorithms...

1. The Simple reverb algorithm is a thin plate algorithm – which is a derivative of the CCRMA¹¹ Nrev¹² reverb algorithm.
 - The Simple reverb algorithm has a sparse tail and some slight early reflections.
2. The Nested reverb algorithm is a thick plate algorithm– which is a modification of the Simple Allpass algorithm with a dense tail and no early reflections.
3. The Tank reverb algorithm is based on the reverb effect described in Jon Dattorro's AES article¹³.

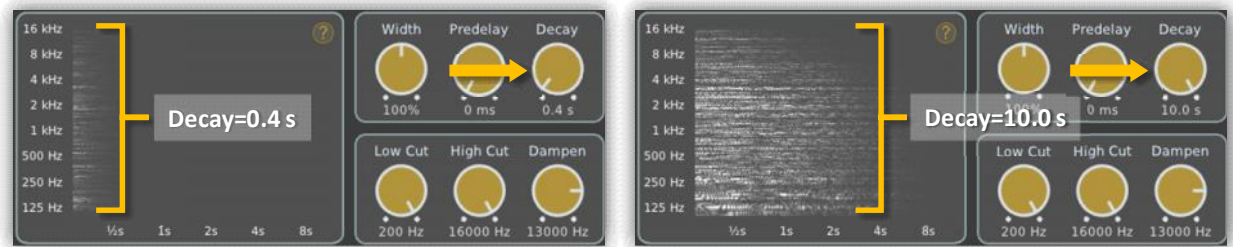
Observation

Although the selection of a preset will automatically select one of the three Reverb Types, selecting another algorithm after selecting one of the available presets, provides the end-user with the opportunity of observing just how the alternative algorithm sounds with a given selected preset dial configuration.

The Spectrogram Element



With the exception of the Early Reflections reverb plug-in, the spectrograph element was included to provide a overall "*graphical image*" of precisely how the various reverb parameters affect the plug-in's final output. For example,

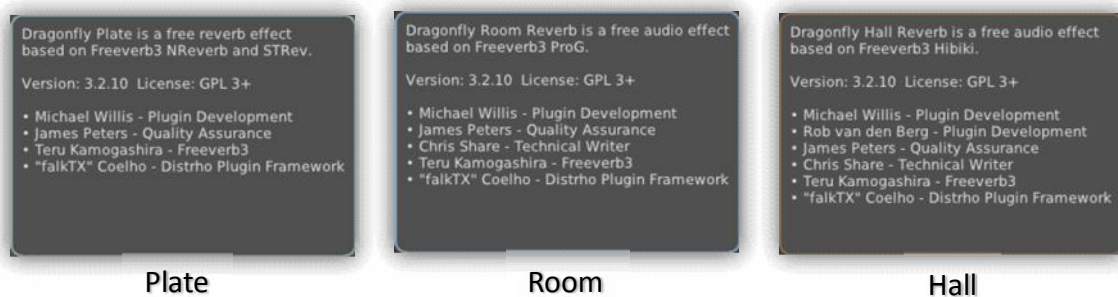


As can be observed in the above images, the graphical depictions between these two configurations *are indeed visually distinct!*

The spectrogram is rendered by simulating a burst of white noise through the reverb algorithm with the current settings, and then processing that output with a fast Fourier¹⁴ transform algorithm.

Lastly, upon selection of the question mark symbol, "?" – a dialogue will be displayed listing the 1) associated plugin name, 2) the version, 3) the licensing information, and 4) the credits information.

- Note: Please make note of the "talkTX" Coelho – Distrho Plugin Framework¹⁵ – as this framework has been implemented in a host of other such *developments*.



About Preset Management

If there is one *potential* drawback to each of the Dragonfly plug-ins – is *the apparent lack of any form of preset management*. In short – *there is none!*

Though *other* iterations of the Dragonfly reverb did provide some means of preset management, the iterations as provided by Michael Willis – *do not*.

RML labs to the rescue...

This being said, SAW and SAC, *thankfully*... due entirely to Bob's foresight, these applications do provide a means of being able to preserve the current state of a given plug-in configuration namely,

4. Within a session [SAW and SAC]
5. Within a Scene [SAC only]
6. Via the Plug-in Options Icon [SAW and SAC]



Of the three, the most practical – for our purposes here, *would be the latter*, via the plug-in Options Icon.



As stated in the User Manuals¹⁶:

Load SAWStudio Presets

This option loads presets for the filter that were previously saved with the Save Presets option.

Save SAWStudio Presets

For VST plug-ins, this option saves presets for the plug-in. A folder is created under the SAWStudio main folder called VST_Presets and preset files (.vsp files) are placed in separate folders for each plug-in using the plug-in's name as a folder name.

Load SAC Presets

This option loads presets for the filter that were previously saved with the Save SAC Presets option.

Save SAC Presets

For DirectX plug-ins, this option saves presets for the filter. A folder is created under the SAC main folder called DirectX_Presets and preset files (.dpx) are placed in separate folders for each filter using the filter's name as a folder name.

About the Early Reflections Plug-in

Lastly, for whatever reason, the Early Reflections plug-in does not permit the saving of presets *in anyway whatsoever* – *not even when employing scenes!* Thus, the only available means of preset selection is via the Reverb Type menu options. *Good or bad thing? Again, not too sure!!*

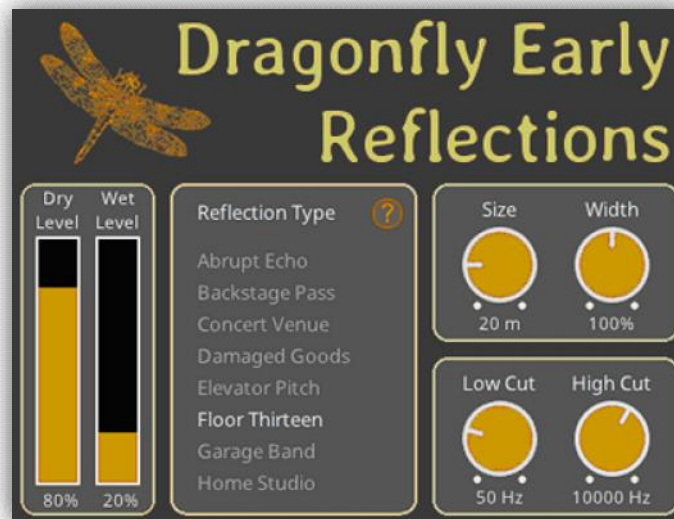
To continue...

This section covered – in some detail, the more common features of each of the four plug-ins. In this next section, details specific to each of the four plug-ins will be considered in turn.

An Important Note

As noted previously, though the original texts dealt with each of the various elements *within each text*, it was thought more prudent to deal with each of the individual elements "*globally*". This point is important and therefore, *should be remembered*. Links to the original texts will be provided in the "*References Section*" at the conclusion of this text².

The Dragonfly Early Reflections Plug-in



Introduction

The Dragonfly Early Reflections reverb plug-in is a free stereo-to-stereo reverb effect based on Moorer's¹⁷ early reflection model as implemented in Freeverb3VST. This stereo-to-stereo reverb effect is the same algorithm employed in the Dragonfly Hall and the Dragonfly Room plug-ins – however, without any late reverberation algorithms.

The Early Reflections reverb plug-in makes provision for the following:

1. Dry and Wet Levels
2. Eight Reflection Types
3. Size and Width controls
4. Low Cut and High Cut controls

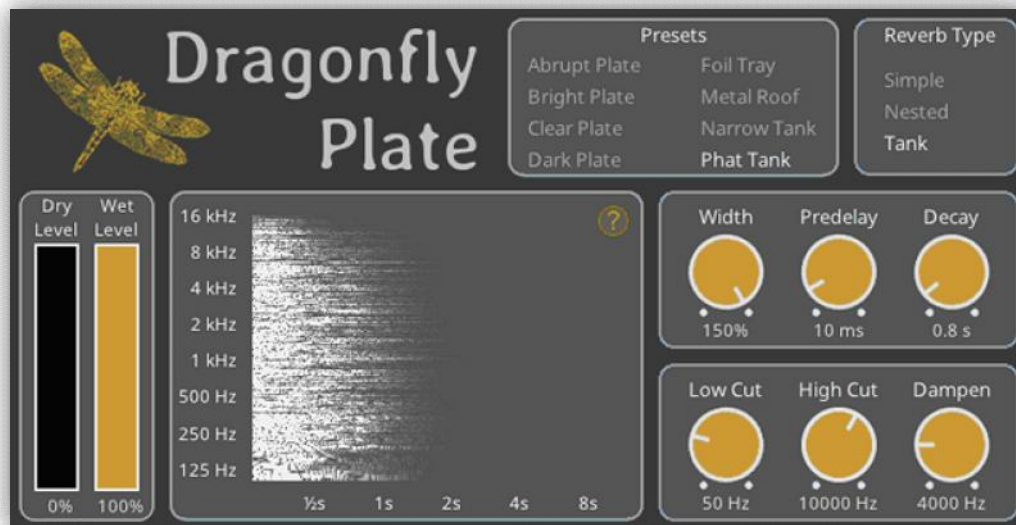
Usages: Suggestions

To begin with, reflections are *"...sound energy that strikes any room boundary surface and then strikes another surface and so on until the reflection losses energy and is reduced to below audibility"*.

▪ Note: For an excellent introduction to reverb reflections, see the *"References Section"*^{20, 21}

1. To provide a realistic sense of space – especially to acoustic instrument [...wind, stings, and so on]
2. To make an instrument appear to be farther away – by reducing the output level and increase the reverb's early reflections level.

The Dragonfly Plate Reverb Plug-in



Introduction

The Dragonfly Plate reverb plug-in is a free mono-to-stereo reverb plugin based on the NVerb¹⁸ and STRev¹⁹ reverb algorithms from the Freeverb3VST implementation.

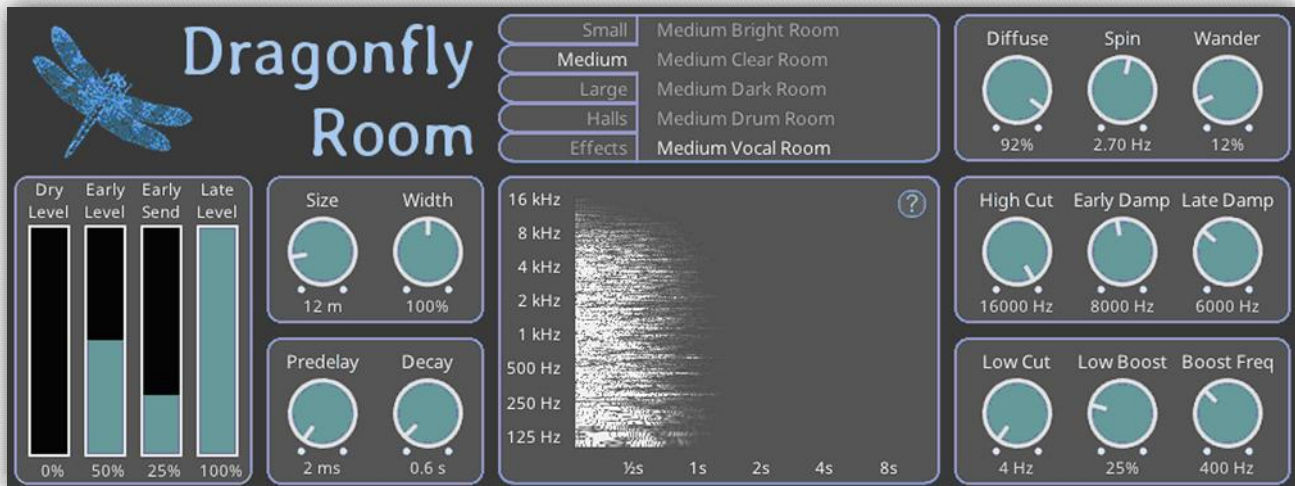
The Plate reverb plug-in makes provision for the following:

1. Dry and Wet Levels
2. A 7x5 Spectrograph
3. Eight Presets
4. Three Reverb Types
5. Width, Predelay and Decay controls
6. Low Cut, High Cut and Dampen controls

Usages: Suggestions

1. Vocals
2. Percussive instruments
3. For adding perceived brightness to an instrument
4. When you are not at all too concerned with creating a space that necessarily sounds "real"
5. As a great creative effect

The Dragonfly Room Reverb Plug-in



Introduction

The Dragonfly Room Reverb plug-in is a free stereo-to-stereo reverb effect. It has several different room presets, as well as a small number of hall presets and effects presets. The Dragonfly Room Reverb plug-in is based on the ProG Reverb²² from Freeverb3VST, which uses Moorer's early reflection model and an implementation of Jon Dattorro's Progenitor Reverb algorithm²³.

The Room reverb plug-in makes provision for the following:

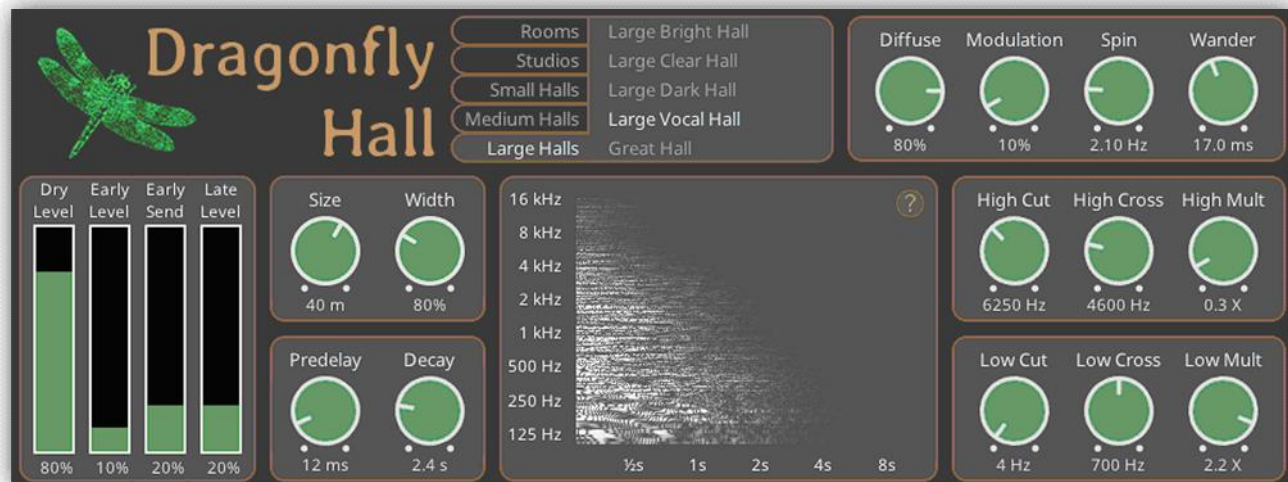
1. Dry Level, Early Level, Send Level and Late Level controls
2. Size and Width controls
3. Predelay and Decay controls
4. A 7x5 Spectrograph
5. Thirty presets in five categories
6. Diffuse, Spin and Wander controls
7. High Cut, Early Damp and Late Damp controls
8. Low Cut, Low Boost and Boost Frequency controls

Usages: Suggestions

Personally, I prefer the room reverb for my acoustic guitars – the nylon-strung and the steel-strung. I prefer not to depend on reverb to "*make me sound better than I really am*" – rather, I tend to employ reverb to simply take the "*dryness*" out of the instrument. Thus, the use of a room reverb allows me to do just that! And the Dragonfly Room Reverb is *an absolutely excellent choice!*

- Note: Room reverbs are closely related to hall reverbs in that both reverbs are designed to simulate the natural sound of acoustic spaces. The main difference between the room and the hall reverbs is that – obviously, the rooms *are smaller spaces* – which means that sounds travel much faster through such rooms and that the decay is always *quicker*.
1. When it comes to instruments that are recorded with really close microphone positioning, the room reverb can be an excellent right choice in order to add some realism the end result. The instruments which can benefit from processing with room reverb are definitely guitars and drums. Furthermore, room reverbs tend to give the impression that the instrument is played in a real acoustic space.
 2. Room reverbs can also be employed as a substitute for slap or echo delay effects

The Dragonfly Hall Reverb Plug-in



Introduction

The Dragonfly Hall Reverb is a free stereo-to-stereo reverb effect. It is primarily intended for use as a concert hall reverb. It also has numerous smaller presets representing rooms, studios, and chambers. It is based on the Hibiki Reverb algorithm²⁴ from Freeverb3VST, which uses Moorer's early reflection model and a modified FDN allpass Zita reverb²⁵.

The Room reverb plug-in makes provision for the following:

1. Dry Level, Early Level, Send Level and Late Level controls
2. Size and Width controls
3. Predelay and Decay controls
4. A 7x5 Spectrograph
5. Thirty presets in five categories
6. Diffuse, Modulation, Spin and Wander controls
7. High Cut, High Cross and High Mult controls
8. Low Cut, Low Cross and Low Mult controls

Usages: Suggestions

1. The hall reverb is primarily designed with the goal of taking the sound and expanding that sound into something long, lush, and majestic
2. Take full advantage of a hall reverb to add an ethereal and classical feel to pianos and other non-rhythmic instruments and arrangements
3. Hall reverbs are generally not recommended for percussion instruments – due entirely to the fact that the sharp transients are not necessarily *compatible* with such algorithms, not to mention the increased energy in the lows, which will tend blur everything pretty easily.

To continue...

The above information concludes the necessary documentation of the specifics of each of the Dragonfly Reverb plug-ins – *in-and-of-themselves*.

What will be considered next is 1) my personal "*take*" on each of the plug-ins, and 2) information relevant to the plug-ins and RML Labs.

About the Reverbs – My personal "Take"

From my current research [10/13/2023], I have concluded that 1) the choice of one reverb implementation over another is entirely-and-completely *subjective*, and 2) that the current iterations of the Dragonfly Reverb are all that anyone *really-an-truly* requires. "A bold statement!" – you say?

All that I *can* say is "The proof is in the pudding!" And what is this so-called "pudding"? The original source code – if available! Maybe...just maybe, Teru Kamogashira was more involved in overall reverb development *than we care to believe*?

In short, I sincerely believe that Mr. Teru Kamogashira's reverb algorithms are all that anyone *really-an-truly* requires – even in their original design implementations. You simply have to 1) know what you want and/or are looking for, and 2) know if you are willing to put in the required time, effort and even capitol to meet that objective.

- Note: If anyone is curious to find out more about Mr. Kamogashira, perform a search on the 'Net using the text "Teru Kamogashira reverb" for the search criteria – and see what you get. I hope that you will be as surprised as I was?

RML Labs Installation Procedure

The plug-ins consist of four files, namely 1) the DragonflyEarlyReflections-vst.dll, 2) the DragonflyHallReverb-vst.dll, 3) the DragonflyPlateReverb-vst.dll, and 4) the DragonflyRoomReverb-vst.dll.

What I would like to offer to the RML Forum-folks is "*the ways-and-means*" if you like – of installing the plug-ins for your current scenario. All that is required is to know the location of the VST_PlugIns folder for your particular configuration.

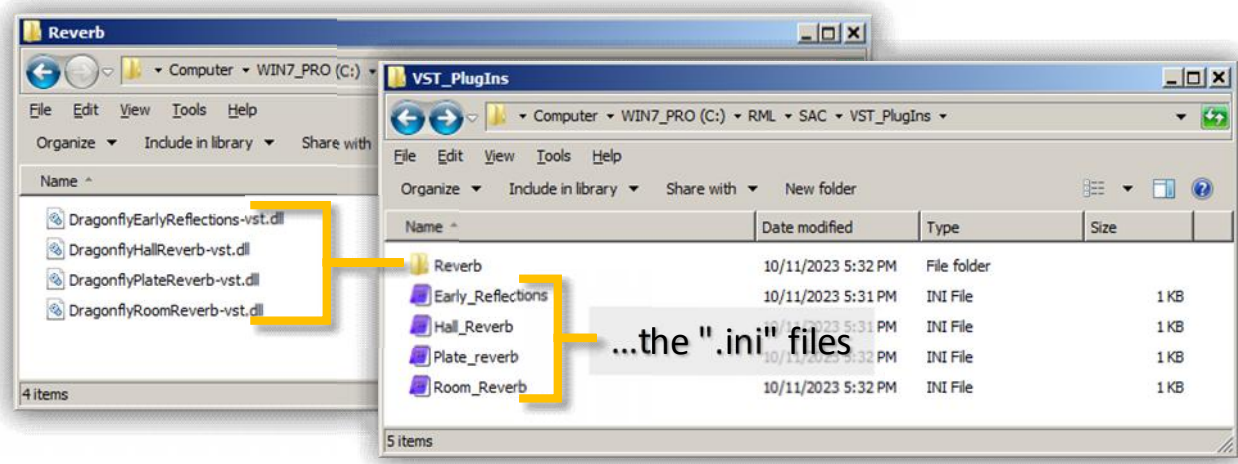
- If you happen to be at all familiar with "*scripting*", I could simply provide you with the "*install script*" and you could deal with the updating of the data paths yourself – if your would prefer.

A few points-of-interest however...

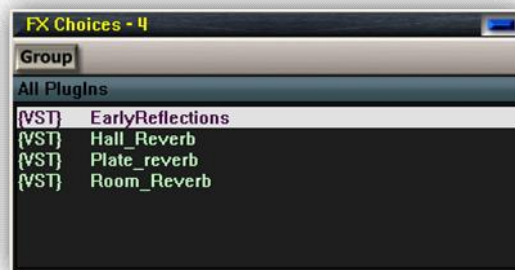
To begin with, I am a staunch *believer* in the ".ini method".

- As I have stated in an earlier text entitled, "VST Plugins Installation and Usage"²⁶, the .ini method, permits *more efficient launching* of the host application – as-well-as a number of other practicable benefits.

Thus, the installation folder-structure for my personal-and-proposed environment would be as follows:



Following is what the above appears in SAC – or SAW, for that matter:



The File and .ini Paths

Here are the associated data paths:

File	C:\RML\SAC\VST_PlugIns\Reverb\name_of_plug_in.dll C:\RML\SAW\VST_PlugIns\Reverb\name_of_plug_in.dll
.ini	C:\RML\SAC\VST_PlugIns\chosen .ini filename

Provisions

I can provide those that wish it, with all of the necessary data to install the four plug-ins in your particular set-up. As noted above, all that is required is to know the location of the VST_PlugIns folder for your particular configuration.

About the Plug-in Presets

As noted previously, the Dragonfly plug-ins do not provide *any direct means* of storing presets. Thus, alternative means are employed. A few things then...

4. Thankfully the plug-in presets are not SAW/SAC specific – that is, plug-in presets created/developed in SAW can be deployed in SAC – and vice-versa! *Thanks, Bob!*
5. Also, it was discovered that the VST Presets are not "*path-specific*" – as-is the actual plug-ins themselves.
 - Thus, all that is required is to install the VST presets in their respective VST_Presets folder, and you are..."*Good to go!*"

The VST_Presets Folder

I have taken the liberty of creating stored preset data for the Plate, Room and Hall reverb plug-ins. This data is stored in sub-folders specific to either the "reverb type" – for the Plate, or the "reverb algorithm" – for the Room and Hall. I have also added a few presets of my own. The particulars of this preset data is located in a text entitled, "Reverb Presets Listing".²⁷

About the Reverb Presets Listing

With regards to the Dragonfly Plate Reverb – as noted previously, that the selection of a "Preset" will automatically determine which of the three available Reverb Types is selected, that upon selecting another algorithm, that selecting any of the other available presets will provide the end-user with the opportunity of observing just how that selected *alternative* algorithm will sound with a given "Reverb Type". I do hope that this makes sense? For example:

1. Selecting the Abrupt Plate presets, automatically selects the "Nested" reverb type
2. Selecting the Foil Tray preset, automatically selects the "Simple" reverb type
3. While the Foil Tray preset, select the "Nested" reverb type
4. Observation: The spectrograph display and the dial configuration are updated to reflect both the preset and the reverb type now selected
5. This process can be repeated for each and every Preset/reverb Type combination

In light of the above however, I have created presets based on each of the three Reverb "*types*" – storing these presets in their respective folders. For example,

Root Folder	Simple Folder	Nested Folder	Tank Folder
Abrupt Plate	Abrupt Plate	Abrupt Plate	Abrupt Plate
Bright Plate	Bright Plate	Bright Plate	Bright Plate
Clear Plate	Clear Plate	Clear Plate	Clear Plate
...and so on	...and so on	...and so on	...and so on

Further information on the above can be found in the text entitled, "Reverb Presets Listing".²⁷

Now, with regards to the Dragonfly Room and Hall Reverbs, the following information is provided:

- Note: For further information see, "Reverb Presets Listing".²⁷
- 1. In the root of the VST_Presets folder are three folders.
- 2. In the root of the VST_Presets\Hall_Reverb folder are six folders – each with six presets, and one preset.
- 3. In the root of the VST_Presets\Plate_Reverb folder are three folders – each with eight presets, and eleven presets.
- 4. In the root of the VST_Presets\Room_Reverb folder are six folders – each with six presets, and one preset.

Storing User Presets

When creating/developing your own presets, these presets will – by default, be stored in the root of the [name_Reverb] folder.

- For example, presets created/developed with the Hal Reverb will be stored in the VST_Presets\Hall_Reverb folder.

I suggest that a sub-folder be created within this root folder to store user created/developed presets – much the same as that done with the "New" folder. I do hope that this suggestion makes sense?

Dependencies

The four plug-ins require no further support data – other than the four plug-in themselves. "...Vondervule!!!"

Installers

I can provide the necessary "*installers*" for those that wish in the form of "*scripts*" for the installation of 1) the plug-ins, 2) the presets, or 3) both. Again, and as noted, all that is required is the path to the VST_PlugIns folder. So, let me know...Thanks!!



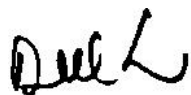
In closing...

I do sincerely believe that the introduction of the Dragonfly reverbs will add to the overall functionality of the RML Lab line of software products. This "*overall functionality*" might be particularly applicable in place of the Studio Reverb – in order to complement the 64-bit versions of SAW and SAC.

As a staunch believer in Bob and his "*work*" – I want to do all that I am able with the gifts and abilities provided – to support Bob in his efforts. Without him – such efforts *would truly be in vain!* 

I hope that some will find that above information to be of some practicable use.

Sincerely,

A handwritten signature in black ink, appearing to be "Duke" followed by a stylized flourish.

Date: October 16, 2023

The References Section

Please note, I prefer to have the "links" lunch in their own Window. Understand, this is "*lunch in their own Window*" is done deliberately in order that the *calling* document is not "*exited*" – with such exiting being very common. The reason for my mentioning this point is that some believe such actions *to be security concerns* – though in al my 30+ years of working with computers – I have never had any *known* issues with doing so.

- ¹Michael Willis: [\[Link\]](#)
- ²The original texts: [\[Link\]](#)
- ³FreeVerb3VST: [\[Link\]](#)
- ⁴Jezar's Freeverb [\[Link\]](#)
- ⁵An interesting update [2021]: [\[Link\]](#)
- ⁵Teru Kamogashira: [\[Link\]](#)
- ⁶Elements VST: [\[Link\]](#)
- ⁷ElephantDSP: [\[Link\]](#)
- ⁸Elements VST/RML Labs version: [\[Link\]](#)
- ⁹Dampening: [\[Link\]](#)
- ¹⁰Diffusion: [\[Link\]](#)
- ¹¹CCRMA: [\[Link\]](#)
- ¹²Nrev: [\[Link\]](#)
- ¹³Jon Dattorro's AES article: [\[Link\]](#) [in PDF format]
- ¹⁴The Fourier transform algorithm: [\[Link\]](#) [in PDF format]
- ¹⁵DISTRHO Plugin Framework: [\[Link\]](#)
- ¹⁶User Manuals
 - Software Audio WorkShop [SAW], page 192: [\[Link\]](#) [in PDF format]
 - Software Audio Console [SAC], page 102: [\[Link\]](#) [in PDF format]
- ¹⁷Moorer's early reflection model: [\[Link\]](#)
- ¹⁸NVerb: [\[Link\]](#)
- ¹⁹STRev: [\[Link\]](#)
- ²⁰Early Reflections Vs Reverb - Why Do They Matter?: [\[Link\]](#)
- ²¹Early Reflections: [\[Link\]](#)
- ²²ProG Reverb: [\[Link\]](#)
- ²³Jon Dattorro's Progenitor Reverb algorithm: [\[Link\]](#)
- ²⁴The Hibiki Reverb algorithm: [\[Link\]](#)
- ²⁵A modified FDN allpass Zita reverb: [\[Link\]](#)
- ²⁶VST Plugins Installation and Usage: [\[Link\]](#)
- ²⁷Reverb Presets Listing: [\[Link\]](#)