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- **Systems Architecture, SDK, Host Integration, Cross-Platform Compatibility, Open-GL:** Denis Malygin
- **GUI Design, Procedural GUI Drawing Routines, Color System:** Andrew Souter
- **P-Link & Multi-Instance Inter-Plugin Communication Infrastructure & Implementation:** Denis Malygin
- **Optimization, SSE/AVX Vectorization:** Denis Malygin & Andrew Souter
- **2.0 Presets:** Andrew Souter, Simon Stockhausen, Deneb Pinjo, Ryn Manning, Sascha Dikiciyan, Robert Rich, Jack Hale
- **1.0 Presets:** Andrew Souter, Austin Noble, Deneb Pinjo, Denis Malygin, Douglas McGee, Jack Hale, Jens Agren, Jim Hurley, Josiah Christensen, and Wolfram Dettki
- **Manual:** Andrew Souter

Thanks

Many thanks to our beta team for helping us release bug-free software. Additional thanks to all of the great minds who have come before us as well as our contemporary peers who continue to help advance the art and science of digital audio signal processing. And finally, special thanks to our friends and families who are kind and forgiving enough to tolerate the level of obsessiveness necessary to make a product such as Breeze.

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Introduction

Welcome to 2CAudio

First, we would like to thank for your purchase and welcome you to the 2CAudio family. 2CAudio develops industry-leading audio plug-ins in VST, AU, and AAX formats. Its primary focus is on spatial processing, advanced creative effects, and other future-forward ideas. The 2CAudio corporate motto is: **Convergent Creative Precision**.

Convergent represents our understanding of the universal trend in knowledge and discovery that tells us that over time disparate segments of art, science, technology, and thought merge and become one, and therefore wisdom and progress in one discipline can often be successfully applied to another.

Creative represents our commitment to innovation, independent thought, and invention. We learn from the past, but we do not wish to limit ourselves to mere emulation and duplication. We seek not to emulate the great minds that have come before us, but rather to understand the questions they struggled with, and explore new solutions, ideas, and discoveries using the latest tools of our generation. Moreover, our products are designed to encourage these ideals in our users, and our largest reward is hearing of enhanced creativity that was inspired by our products.

Precision represents our obsessive commitment to rigorous scientific standards of technical and numerical accuracy. The words “Good Enough” are simply not in our vocabulary, and we strive for perfection in all areas of our endeavors.

2CAudio is passionate about both art and science and we consider them both invaluable leaves on the tree of knowledge.

2CAudio prides itself on active engagement with our customers and the market as a whole, and we are always open to your feedback. Our corporate vision is not immutable, and we attempt to mold and form our products to the needs of our customers. We value your input and thank you for providing it to us. We are always listening at info@2caudio.com

Technical support is provided via email at support@2caudio.com

To learn more about 2CAudio, please visit our website at www.2caudio.com

Welcome to Breeze

Congratulations on your purchase of Breeze 2.5. Breeze 2.5 is the first member of the next generation of our award-winning reverb family. We believe it is one of our best efforts to date! Not only does it sound absolutely sublime, but it is also now one of the most efficient reverbs on the market. It's more than twice as light, twice as pristine, simpler, prettier, and vastly more powerful. It's simply better. But don't take our word for it: just listen!

What's New in 2.5?

Breeze 2.5 offers next generation workflows for spatial mixing that enable it to be paired with Precedence to achieve new levels of realism in spatial mixing topics including unified stage positioning and depth placement:

PRECEDENCE LINK

- Link instances of Breeze with 2CAudio's Precedence product to create a unified acoustic space
- Establish a spatial environment with Breeze, and use Precedence to place individual tracks within this environment
- Automatically make very complex adjustments to internal Breeze DSP settings simply by changing position information in Precedence
- Automatically optimize psychoacoustic cues within Breeze to augment position established by Precedence
- Achieve never-before-heard levels of realism in depth and stage positioning

MULTI-INSTANCE EDITING

- Speed up your workflow!
- Manage many instances of Breeze within a single GUI window
- Eliminate the need to open and close GUI windows one at a time

EDIT GROUPS

- Organize and Group many instances of Breeze into edit Groups to manage complex sessions
- Allow some instances to work without Groups if desired

GLOBAL BROADCAST

- Make macro changes en masse to an entire group of 10s or 100s of instances!

- Apply preset and parameter changes to all instances within an Edit Group!
- Change the spatial mixing environment for an entire mix in a single click while maintaining relative track positions
- Allow individual variations for each track to enable micro management of individual track details when needed
- Allow Alg Randomize to create randomized preset variations for an entire group that remain part of the unified space.

SELECTION SYNC

- Use Precedence to visualize placement and position information for all tracks in an Edit Group simultaneously.
- Lock multi-instance selections to Precedence to allow Precedence to function as the command center for Multi-Instance mixing

DISTANCE LINK DSP MODE

- Distance Link DSP mode automatically adjusts hundreds of internal DSP values within the Breeze Alg in response to a changes to the single Distance parameter
- PreDelay, Direct/Reflected Energy Balance and many more parameters become responsive Distance which can be linked to Precedence
- A single Breeze Preset no longer represents a single

position within a space, but rather the entire space with an infinite variety of positions created within this space

- Effectively an Algorithmic equivalent of having infinitely many impulse responses of a given acoustic space

SUSPEND ON SILENCE (2.1)

- Disable processing when Breeze receives no input signal while maintaining tails
- Massive gains in efficiency in complex projects
- More CPU power for other effects and synths
- Lower electric bill, more polar bears

GUI & CHAMELEON COLOR

- Drastic User customization of GUI color preferences (2.1)
- 300+ Factory Color Themes
- 30 Different GUI sizes from tiny to 8K
- Light, Dark, Contrast Modes
- Variable Font Scaling
- Hi-DPI screen support

MISC

- New Filter Options (2.1)
- New Presets
- Massive Reduction in Memory Usage
- Minor Bug Fixes and Optimizations

What's New in 2.0?

Almost everything. Our existing algorithms were rebuilt completely from the ground up. Of course we kept the best parts of our original design, but we effectively rethought everything. We rebuilt Breeze using new techniques learned from the past 7 years of experience and countless hours of math and science RnD. Any techniques that remain from 1.0 have been vastly improved. Many new techniques that are completely unique to Breeze 2.0 have been added. Essentially the DSP core that make our reverbs sound as good as they do has been rewritten and taken to the next level. 15 seconds of listening to the demo will undeniably confirm this. At the same time we employed new optimization knowledge learned

working on our innovative product Kaleidoscope and Breeze 2 has now become one of the most efficient reverbs on the market!

EXTREME GAINS IN PERFORMANCE AND EFFICIENCY

- One of the fastest, most efficient reverbs on the market
- The renown 2CAudio sound without the CPU usage
- The first pro-audio software on the market to offer AVX-512 optimization
- Over twice as fast as Breeze 1 on average, often significantly more
- Render entire songs in seconds
- Load hundreds of simultaneous instances on modern CPUs

12 ALGORITHM MODES

- 9 completely new modes unlike anything else in other 2CAudio products
- Ultra dense Chamber and Hyper-Plate modes
- Slow building Hall modes
- Colored modes for interesting spectral effects
- 3 Classic modes that have been significantly improved

2 NEW MODULATION MODES PRODUCING ABSOLUTELY STUNNING RESULTS

- The most pristine tech specs on the market -- no modulation artifacts
- Pitch modulation for classic sounds as well as a more subtle modulation option

12 DAMP AND EQ FILTER TYPES

- 8 completely new to Breeze
- All enhanced beyond our previous designs

ALG RANDOMIZATION BUTTON

- Generate literally infinite variations of a single preset with one click

INTERACTIVE FREQUENCY DISPLAY

- Ultra intuitive adjustment of multiple filter parameters using X-Y mouse movement
- Double-size Freq Zoom View for fine tune control and numeric value entry
- More power and greater diversity for advanced users and preset designers

TIME DISPLAY

- Displays information about the characteristics of first 300ms of the time response
- Differentiates different preset types with clear visual aide
- Double-size Time Zoom View for extra detail and control

EVEN MORE PRISTINE SOUND

- Completely 64-bit double-precision process end-to-end
- Noise-floors approaching -300dB

ABSOLUTELY ZERO LATENCY

- Early energy can start exactly at zero samples
- Incredible sense of 3D spatial impression
- Intimate ambiances

COMPLETELY PROCEDURAL GUI

- Ultra fast plug-in load times even at huge GUI sizes
- No wasted disk space
- Perfectly crisp and anti-aliased images and text

RESIZABLE GUI

- 30 different GUI sizes starting with the original small size all the way to 4K
- Support of High DPI Screens

ADVANCED COLOR PREFERENCES SYSTEM

- Customize the look and feel of the GUI
- Change your vibe, get inspired
- Dark and Light GUI themes

System Requirements

Absolute Minimum Hardware Requirements: 1-core CPU with SSE3 support. 512MB of RAM. (Any Intel Core CPU or higher or equivalent AMD CPU)

Recommended Minimum Hardware: 4-core CPU with AVX1 or AVX2 support running at least at 2.0GHz. 2GB of RAM. (Intel Sandy-Bridge or later generation CPU or equivalent AMD CPU)

Best Possible Hardware (For Reference – NOT REQUIRED): multi-core CPU with AVX512 support running at least at 2.0GHz. These are new to the market in 2018 and 2CAudio is among the first if not THE first, to offer optimization for these machines. (iMac Pro, 2019 Mac Pro, Intel X-Series HEDT CPUs, Xeon W, Silver/Gold/Platinum Xeon SP). Easily

over one thousand instances are possible on such systems as a reference, which is obviously more than is needed in even the largest real world projects.

The Breeze algorithm benefits greatly from faster RAM and larger CPU cache size. In some cases, performance is in fact bound by these factors more than raw CPU clock speed. More recent processors with large caches are ideal, though certainly not required.

Supported Windows Operating Systems: Win 8 64 bit, Win 10 64 bit. Win 10 is recommended.

Supported Mac OS X Operating Systems: X.10 and higher including Yosemite (10), El Capitan (11), Sierra (12), High Sierra (13), Mojave (14) and higher. X.15 Catalina was announced as of writing this manual, and will be tested and validated.

Supported Hosts: Precedence is compatible with most known VST, AU, and AAX hosts so long as they conform to the plug-in format standard and work with the hardware and operating systems above. If unsure, please try the demo to verify compatibility with your system, and feel free to email us for additional information.

Installation & Authorization

Windows Installation (64bit)

To install the plug-in simply launch "setup.exe" and follow the instructions. You will have the option to install either or both the 64-bit VST version and/or the 64-bit AAX version.

Installation of the plug-in is subject to accepting the End-User License Agreement that you can read during installation.

Note: *In rare cases some users have reported that clicking on the installer application ("setup.exe") does not successfully launch the installer. The reason for this is generally that the installer has been downloaded to a network drive, a shared local drive, or is saved deep in the folder hierarchy of the users systems. In such cases Windows may block the launch of our installer for "security" reasons. If this occurs, simply temporarily move the installer folder to either your "Desktop" or to your "Program Files" folder and run the installer from this location. This will solve the issue. Upon successful installation you may move or delete the installer from this temporary location as desired.*

Mac OSX Installation (64bit)

To install the plug-in double-click on "Install 2C-Breeze.mpkg". A standard OSX Installer will launch. Follow the installer instructions. By default, VST, Audio Units, and AAX versions are installed. If you would like to install only one particular format, please follow the installer instructions on the readme page. Installation of the plug-in is subject to accepting the End-User License Agreement that you can read during installation.

Note: *Be sure to allow OSX to install apps downloaded "From Anywhere" by changing the preference found here:*

/ System Preferences / Security & Privacy / "Allow Apps Downloaded From" /

...to "From Anywhere".

Authorization

Upon loading the plug-in in your host application for the first time the plug-in will automatically display the Info page where you can authorize the product. To authorize the product you need to enter the serial number that you were provided when you purchased the product. The serial has the following form:

XXXXX-XXXXX-XXXXX-XXXXX-XXXX

You can always find your Serial Number in the “My Downloads” area of the Designer Sound Web Store, where you purchased the product:

<https://www.designersound.com/mydownloads>

To authorize Breeze 2.5, simply select your entire Serial Number from the link above using any web browser, and copy it to the Windows/OSX clipboard. Then simply click on the Serial Number field found on the INFO page of the Breeze 2.5 GUI. This will automatically paste your Serial Number from the clipboard, instantly authorizing Breeze.

As long as the plug-in remains unauthorized, it will not perform any audio processing. Once it has been successfully authorized, processing will begin and you may navigate to the Main or Browser Page to begin using the plug-in.

Note: *If clicking on the serial number field does not successfully authorize Breeze, please check that you have successfully copied by the serial number from the link above, by attempting to paste it into a third party text editor or email client. Be sure you have copied the Breeze 2 serial number, NOT the Breeze 1, or other product serial number. If are you certain all of this is correct and still can not authorize Breeze, please email support@2caudio.com*

Entering User Info

Above the Library Location field are found the “User Name & Info” fields. Please enter your name into the left field, and optionally any information you might like to include, such as a company name or website in the right field. If you create your own custom presets, this information will be saved into the presets. This information is also displayed on the Browser Page of the product GUI, and if you share your presets with others this is a good way to gain recognition and credit for your work.

File Management

Windows File Management

All Breeze-related program files and resources are saved in a folder named “/Program Files/2C-Audio/Breeze2” that is created by our installer.

User Presets are stored in “.../Program Files/2C-Audio/Breeze2/Presets/Full/User”.

The 32-bit VST shell, 64-bit VST shell, and 32-bit AAX shell, are saved in the hosts’ respective plug-in folders. These files serve to connect the hosts to the plug-ins and resources found in “.../Program Files/2C-Audio/Breeze2”. They do not contain any user data.

This information is really only needed when changing operating systems or upgrading to a new computer if you have created custom User Presets.

OSX File Management

The Breeze Audio Unit shell is installed here:

.../Library/Audio/Plug-Ins/Components/

The Breeze VST shell is installed here:

```
.../Library/Audio/Plug-Ins/VST/
```

The Breeze AAX shell is installed here:

```
.../Library/Application Support/Digidesign/Plug-Ins/
```

These files serve to connect the hosts to the plug-ins and resources found in “/Library/Application Support/2C-Audio/Breeze2/”. They do not contain any user data.

All supporting files, presets, and resources are installed here:

```
.../Library/Application Support/2C-Audio/Breeze2/
```

User Presets are stored in “.../Application Support/2C-Audio/Breeze2/Presets/Full/User/”.

This information is really only needed when changing operating systems or upgrading to a new computer if you have created custom User Presets.

Uninstalling

2CAudio installers do not create hidden files on your system. Windows users may use Windows' “Add/Remove Programs” feature or run the uninstaller included within Breeze's setup folder. To uninstall on OSX you simply have to delete the plug-in files and the associated resource files. The location of these files is described in the previous section. If you intend to reinstall Breeze again at any point in the future, and if you have created your own User Presets, be sure to back these up before deleting your installation.

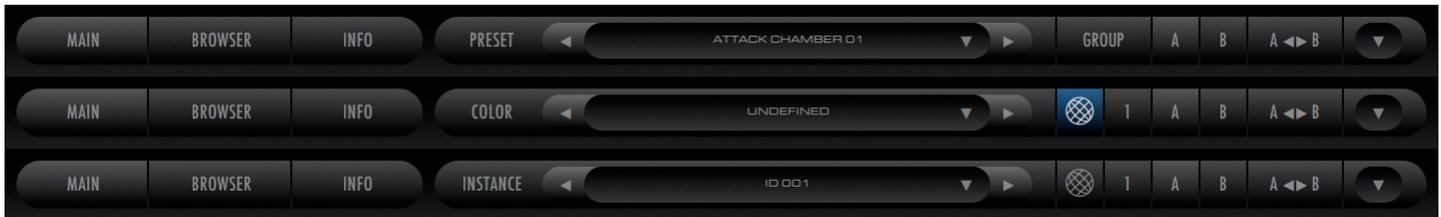
Manual Note

The Breeze 2.5 manual supplies information that at times may get somewhat technical. This information is provided for advanced users and preset designers who wish to have a more detailed understanding. It is not critical for the average user to fully comprehend all details discussed in this manual. During the first three months of its life there was no manual for Breeze 2.5, and this did not stop large numbers of customers from using it effectively with full enjoyment. Breeze is designed to be simple to use and allows you to quickly experiment with its controls to find new sounds. If you find a result that your perception tells you is good, it is good. The technical details and theory regarding why it may be good really don't ultimately matter in the context of music making. If it sounds good, it is good. Trust your ears. Breeze is an artist's tool, and what matters most is the inspiration and creativity Breeze helps augment. So, with that warning, let's get into the nitty-gritty details for those who would like to know more.

The GUI

The Navigation Bar

The Breeze GUI is segmented in three main pages: the Main Page, the Browser Page, and the Info Page. At the top of all three of these pages is found a common area called the Navigation Bar. This area has two functions: to allow navigation to the various GUI pages, and to handle global preset and file needs. The navigation bar is shown below.



Page Navigation

On the left side of the Navigation Bar is found the Page Navigation area. To switch the Main Page, click on Main. To switch to the Browser Page, click on Browser. To switch on the Info Page, click on Info. Any questions? We didn't think so.

File & Instance Actions Area

On the right side of the Navigation Bar is found the File & Instance Actions Area. Historically this area of the Navigation Bar was used exclusively to handle changes to the Preset state. For sake of convenience, its functionality has been expanded to allow you switch between three modes:

- **Preset (@ symbol)** : allows you to change, load and save Presets
- **Color (@ symbol)** : allows you to change, load and save Color Preferences from the Main page of the GUI so that you can easily browse color preferences while viewing them instantly
- **Instance (• symbol)** : allows you to view and change the currently selected Instance when using Multi-Edit Groups

The controls have the following functions:

- **Preset/Color/Instance Selector (@ @ •)** : changes the resource target for the next three controls, to allow this part of the Nav Bar to be used to change Presets, Color Preferences, or Instance Selection
- **Preset/Color/Instance Decrement ◀** : changes the Preset, Color Preference or Instance to the previous available item in the directory list
- **Preset/Color/Instance Increment ▶** : changes the Preset, Color Preference or Instance to the next available item in the directory list
- **Preset/Color/Instance Name and Menu Access ▼** : displays the name of the currently active Preset, currently active Color Preference, or selected Instance. A mouse-click in this areas accesses the list menu drop-down and allows a single Preset, or Color Preference to be selected from anywhere within the hierarchical directory, or the Selected Instance to be changed.

- **Note:** *when displaying presets, the name shown is the last loaded preset from existing factory or user presets. If you make changes to the preset settings, the preset name will not change automatically, and there will be some differences between the settings stored in the Active Preset name and the actual current settings. Note that host applications save all current settings exactly as they are, so your edits will be preserved. However if you return to a project at a later date you may see the Active Preset name displayed as one of the factory presets, and you may try to load this preset into another project to achieve the same sound without realizing that you have made substantial changes to the preset at an earlier date. Therefore, if you edit the preset substantially and you think you may like to use these settings at a later date in another project, it is a good idea to save the settings as your own custom User Preset.*
- **Group:** 2CAudio products such as Precedence and Breeze 2.5 are able to display data from and edit parameters of multiple instances of the plug-in from within a single GUI editor. To use Multi-Instance Editing features, an instance must be part of an Edit Group. By default, Multi-Instance Editing is turned off. To enable it, click on the Group button. Once Multi-Instance Editing is enabled the Group button will split into two buttons: Group Number, and Global Broadcast.
- **Group Number:** If Multi-Instance Editing is enabled, the Group Number button is displayed. Eight Edit Groups are available. Left and right mouse-clicks on the Group Number will increase/decrease the Group Number. Cycling through all options will return Group behavior to the disabled mode and hide the Group Number and Global Broadcast buttons. Control/Apple-Click on the Group Number will also disable group behavior. See the Multi-Instance Editing section of the manual for more details.
- **Global Broadcast:** If Multi-Instance Editing is enabled, the Global Broadcast button is displayed. Traditionally if a user is using multiple instances of a plug-in within a DAW, each instance is accessed by opening it from the DAW mixer or arrangement window and changes made from within the open GUI editor apply only to the instance that was opened. If changes need to be made to many instances, each instance must be opened and edited individually in a rather tedious and time-consuming process. Global Broadcast solves this by allowing the user to apply parameter changes to all members of the selected Group with a single command from within a single GUI editor. Changes may include changing single parameters, or may be macro actions such as changing complete presets. **If Broadcast is enabled, any change made within the current GUI editor is applied to ALL members of the Group.** If Group members are also using the Precedence Link feature, changes made while using Broadcast may result not-only in changes to tens or hundreds of instances of Precedence, but also in changes to all linked reverb instances as well. See the Multi-Instance Editing section of the manual for more details.
 - **Tip:** *Broadcast is an incredibly powerful feature. Changes made while Broadcast is enabled may potentially have effect on hundreds of plug-in instances! It allows a Group to behave like a unified space with global characteristics while still maintaining individual variations and discrete positions within the space defined for the Group.*
 - **Note:** *Due to its potential to change parameter settings of an entire mix with a single click, the Broadcast Button state, is intentionally made visually “loud” and hard to ignore when it is active. While becoming familiar with the power of the Broadcast feature, users may like to keep it in the Off state when not actively trying to make Multi-Instance changes for safe practice.*
- **Active State:** 2CAudio plug-ins store two independent sets of parameter settings: A and B. Clicking on the Active State button switches between them and allows them to be compared. This feature has several uses:

- Saving potential preset matches while browsing presets: if for example you are trying different presets in the Browser Page and you find a good candidate but you would like to try some others, you can quickly copy the candidate to the inactive State and continue browsing. When you find another one that you like, you can compare it to the previous candidate to decide which is better.
- Comparing changes made to presets with the original preset: you may use the same technique to check changes you are making to a preset by first copying the preset to the inactive State and then performing your edits and finally switching States again to compare the results.
- Blind listening tests: oftentimes engineers succumb to the weakness of using their eyes or minds more than their ears, and particular numerical values or aesthetic GUI settings are chosen over simple listening preference. Blind listening tests can cure this problem. This can be accomplished by saving two different presets in State A and State B, closing your eyes, and clicking an unknown number of times on the Active State button such that you no longer know if you are using State A or State B. At this point keep your eyes closed and listen critically while you slowly cycle back and forth between settings while comparing the results with your ears only. Once you have chosen the State that sounds the best, open your eyes and look at your selection. Repeat this process for confirmation if desired. This is a powerful technique.
- **Copy State:** Copies the settings of the Active State to the inactive state. For example if State A is active, the settings are copied to State B. This allows easy comparisons between states to be made as described above.
- **File Menu:** Accesses the file list menu drop-down and gives access to the following file operations:
 - **Replace Preset:** Saves the current preset state to the last loaded preset, overwriting it. This is useful for preset designers who may make incremental adjustments to their presets.
 - **Save Preset to My Presets:** saves the current plug-in state to the /User/My Presets folder and adds it to the preset list.
 - **Save Preset to Folder:** saves the current plug-in state to a different folder location other than the default User/My Presets/. By default, the file dialog points to the folder of the currently active host project file if this information is available. This is useful for archiving favorite presets together with host projects and for sharing a given preset with peers on either local or global networks.
 - **Load Preset:** loads a single preset file into the current plug-in state. This is useful for loading presets that were saved and/or shared with the “Save Preset to Folder” action.
 - **Import Preset to My Presets:** Copies a single preset to /User/My Presets/. This is useful to copy a single preset that perhaps someone shared on a web forum or other similar scenarios.
 - **Import Preset Expansion:** Copies and installs a commercial paid preset expansion
 - **ColorPref Preset (various options):** Allow all of the above operations for Color Preferences so that they may be edited, saved, shared etc. Probably overkill, (load/save would probably be sufficient here) but we have been known to over-engineer things.

The Main Page

Two Sections

Breeze's GUI is divided into three pages: the Main page, the Browser page, and the Info page. The Main page displays approximately 20 controls and GUI elements. Breeze's Main Page is conceptually separated into two sections: the Display Area, and the Controls Area. The Display Area features the Input and Output Meters, the Time Display and the Frequency Display. The Controls Area is home to the majority of Breeze's parameter controls.



Note: 2CAudio products have GUI theme and color variations. The interface may appear differently than as described in this manual. This document uses the Factory Skin, with the Dark Theme, and the Ocean Breeze or Forest Breeze color themes for screen shots.

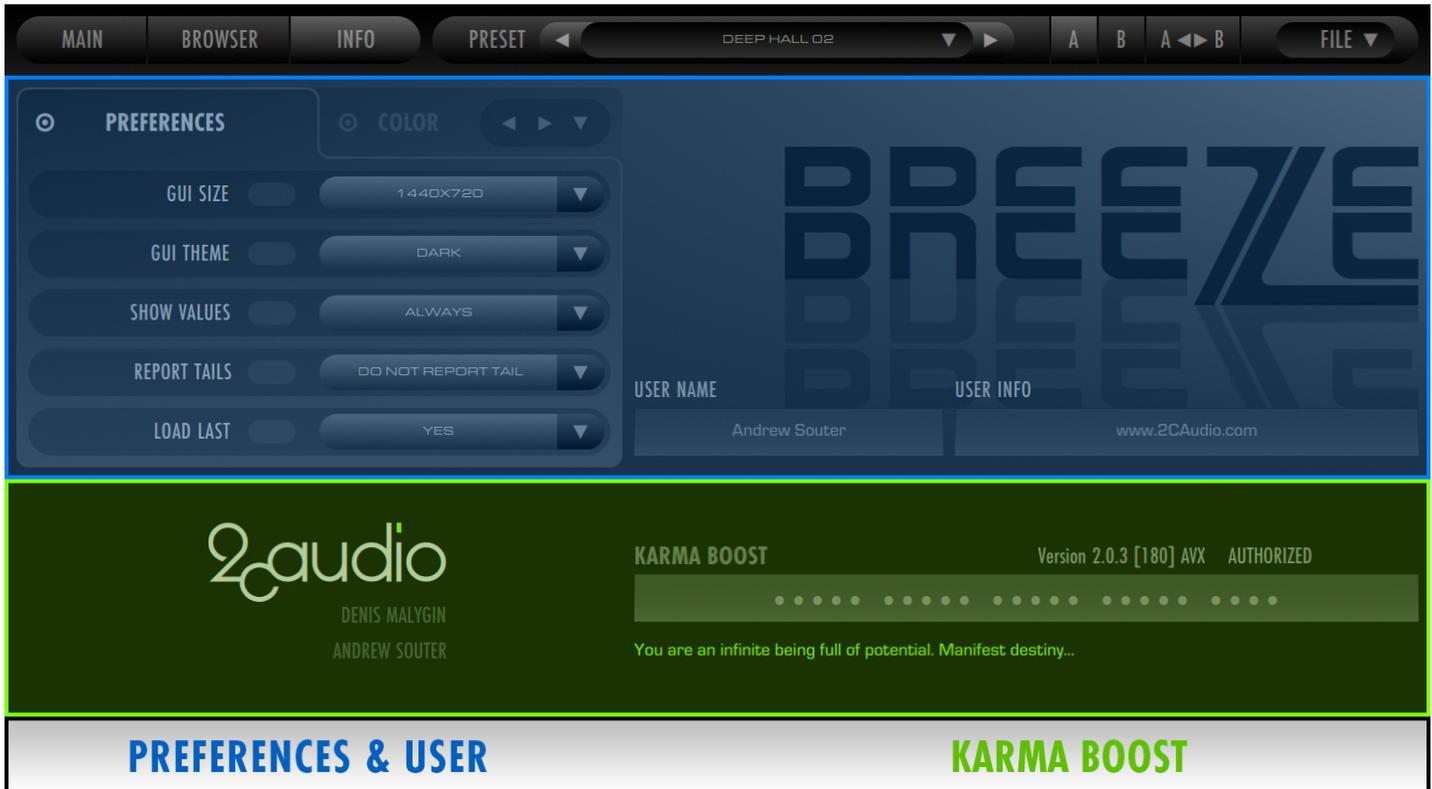
The Browser Page

The Browser Page is comprised of three main areas: The Folder Browser on the left, the Filter Browser on the right, and a Controls area encircling both.



The Info Page

The Info Page contains two main functional areas: the Preferences/Color & User Area and the Karma Boost Area. Preferences deal with general behavior of the plug-in and GUI. Color deals with user adjustable color settings. The User fields show User name and info. The Karma Boost area is used to authorize the product, and to display version number information and other important messages.



Mouse and Keyboard Interface Gestures

Mouse-Click Behaviors

- **Click-Drag:** selects a knob and changes its value at normal rate
- **Shift-Click-Drag:** selects a knob and changes its value at a slow, fine-tune rate
- **Control-Click (Win):** sets the knob value to the default value for the parameter
- **Command-Click (OSX):** sets the knob value to the default value for the parameter
- **Alt-Click:** creates a new variation using the same general parameter range
- **Double-Click:** opens the text-entry edit box for the selected knob or value box

Mouse-Wheel Behaviors

- On OSX it is possible to use the mouse wheel to change a knob value. To do so, click on the knob you want to control using the left mouse button, and then simply use mouse wheel.
- Holding down the Shift key on the keyboard while using the mouse wheel, will change the values at a slow, fine-tune rate

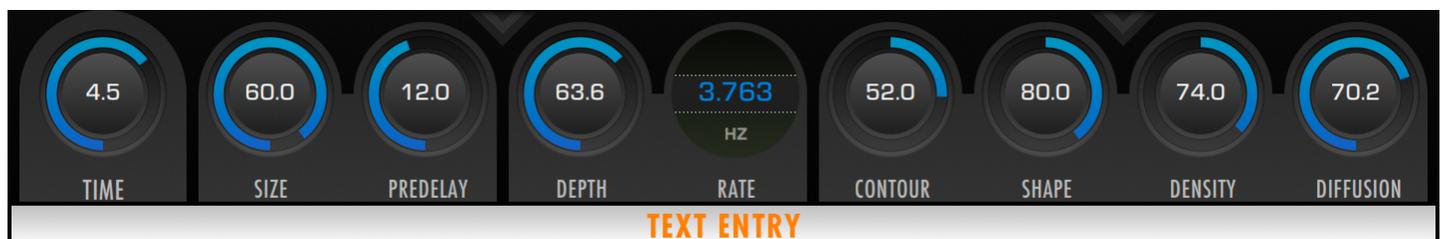
Keyboard Shortcuts

In some hosts you can use keyboard keys to change knob values and switch presets in the Preset Browser. To activate keyboard control, first click somewhere in the Preset Browser window or on the knob you wish to control. The keyboard shortcuts as follows:

- **Preset Browser Keyboard Shortcuts**
 - **Left / Right / Up / Down Arrow Keys:** moves preset selection one step in the respective direction
 - **Page-Up / Page-Down:** shifts the column display one step left or right
 - **Home:** Selects the first preset
 - **End:** Selects the last preset
- **Knob & Slider Keyboard Shortcuts**
 - **Up / Down Arrow Keys:** changes value by 1.0%
 - **Left / Right Arrow Keys:** changes value by 0.1% (fine tune)
- **Multi-Instance Editing Keyboard Shortcuts**
 - **Page-Up / Page-Down:** changes instance selection

Text Entry

Double-clicking on a control (knobs, sliders, and Mix control) opens the Text Entry mode for the control. Double precision floating point values may be entered with any desired decimal precision. The initial precision displayed in the text entry mode when first opening it is formatted to fit within the given text entry field. Full precision is stored in preset files and used in the DSP calculations. Parameter units (i.e. Seconds, Hertz, Decibels, etc.) are displayed below the text entry field.



Getting Started

Two Operation Modes

Breeze 2.5 has two different operation modes:

- **Standard:** instances are managed independently and often used on FX busses via Sends and parameters remain independent from one another
- **Link:** a novel distance-based mode that has been designed primarily with the idea of using many instances in parallel directly on track inserts as part of a unified virtual acoustic environment. The Mix control is replaced with a Distance control, and the entire Breeze algorithm updates appropriately depending on the Distance value, which may also be synched to a linked instance of 2CAudio's Precedence product.

We will discuss the Standard mode first. Link mode specifics are discussed later in the Precedence Link & Multi-Instance Edit Groups section of this manual.

Achieving “Send Mode” Behavior Using Standard Mode & Mix Lock

Reverb plug-ins are generally used in one of two ways in modern music production: as an insert directly on an audio or instrument track where the plug-in mix setting will be variable and is used to control the mix of the dry input signal and the wet reverb output, or on a separate send/bus where the mix setting is always set to 100% wet and the relative wet/dry mix levels are set by adjusting the send level on the audio or instrument track that is feeding into the send/bus.

All Breeze presets are saved for use as inserts on audio tracks, and the mix setting is an important part of the desired sound of the preset. This can be a source of great inspiration for musicians who are playing and composing directly into Breeze, as each preset is designed to elicit a different feeling or emotional environment. Professional mix engineers on the other hand, have traditionally liked to use reverb on a send/bus and generally want the Mix setting always to stay at 100% wet.

Breeze offers the best of both worlds: presets are saved for insert use on disk, but “Send Mode” behavior is also achievable. To achieve “Send Mode” behavior, simply set the Mix setting to 100%, and engage the Lock button connected to this control. It is now possible to browse all presets in “Send Mode” and the mix setting will never change. We consider this the best of both worlds. Welcome to the ultimate in flexibility.

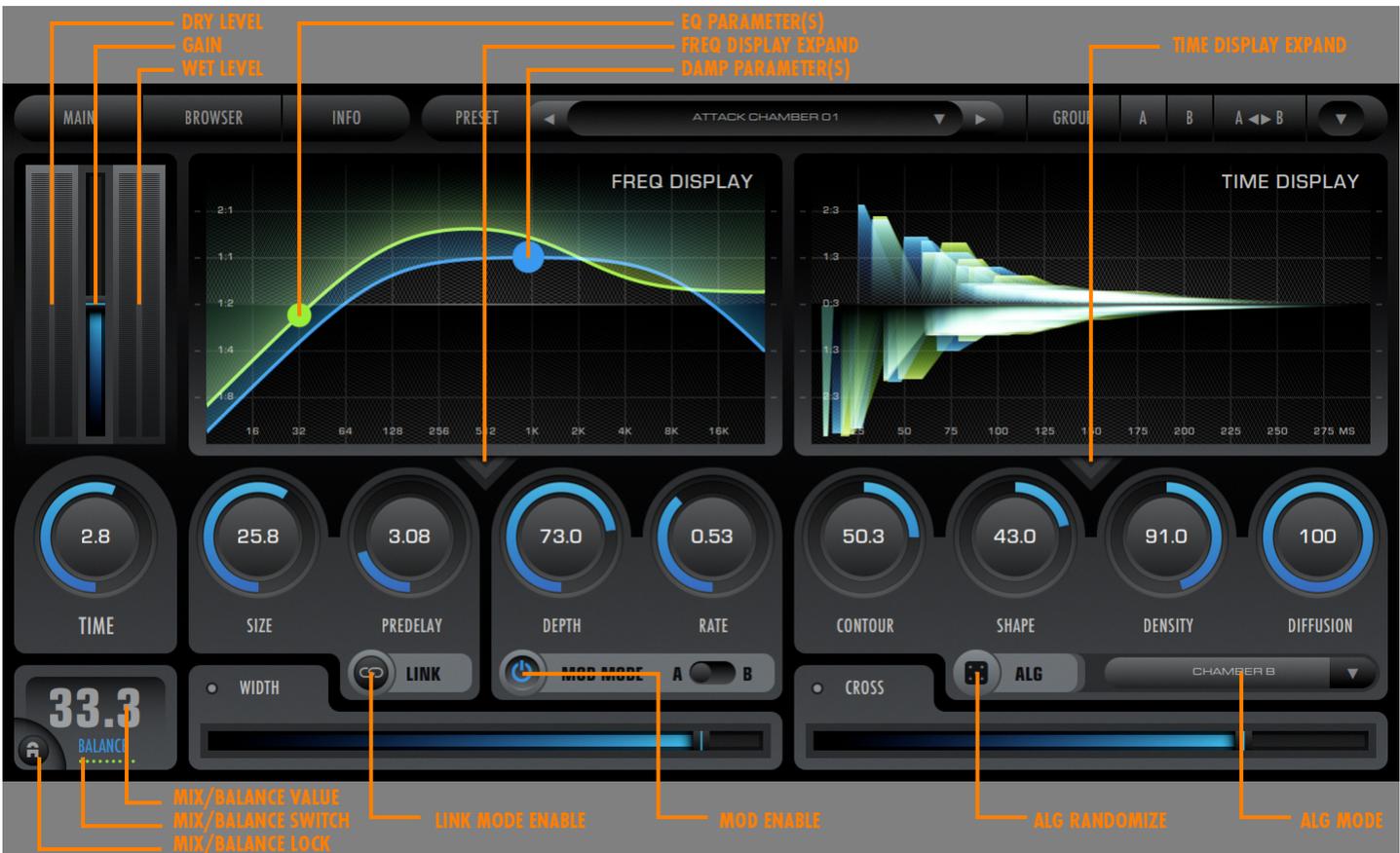
Tip: We have advocated migrating to the insert modality over the years, and Breeze 2.5 takes this many steps further with its Distance Link Mode, Precedence Link, Multi-Instance Edit Group, and related features. This system and workflow are highly valuable and worth investing the time to learn and apply in your workflow. Breeze 2.5 is ultra efficient on modern CPUs and using 10s or 100s of instances directly on tracks is no problem.



Main Page Parameters & GUI Details

Overview

As mentioned, Breeze's Main page displays approximately 20 controls and GUI elements. Most controls are clearly labeled. The few that do not have explicit labels are detailed below.



Displays

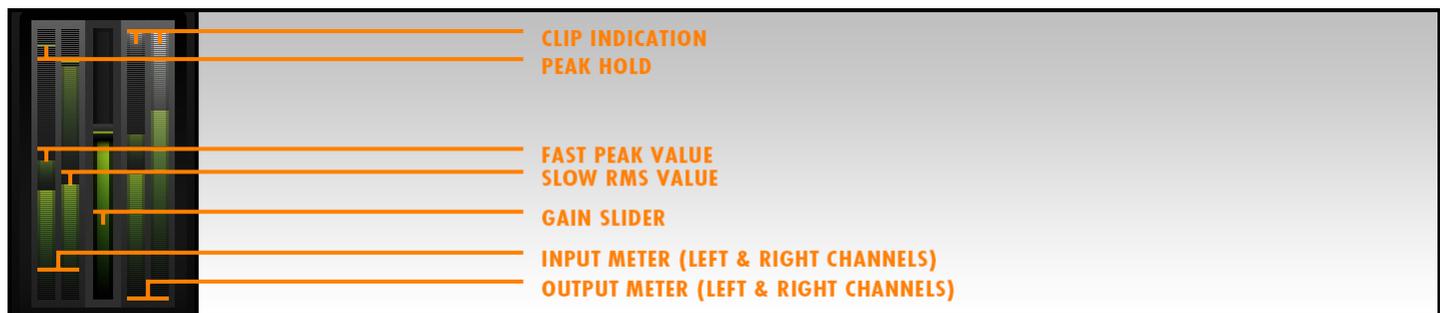
Meter

The Meter Display shows the input and output levels of the plugin and includes clip indicators that show when the signal exceeds 0dB. 50% of the meter range represents -12dB. The Gain Slider is positioned in-between the Input Meter and Output Meter. Three different values are shown for each meter:

- **Peak Hold:** displays the highest peak value in the last 4 seconds
- **Fast Peak Value:** shows the current peak value using fast meter ballistics
- **Slow RMS Value:** shows the RMS value using very slow meter ballistics

For reverb applications, the Peak Hold and Fast Peak values are not particularly meaningful. The RMS value is much more meaningful when attempting to match levels between the input and the output of the plugin. This should generally happen automatically in many cases, but use of extreme EQ or Damp settings can cause RMS differences, which can be adjusted by using the Gain slider.

The Clip Indicator is simply a matter of convention. Breeze 2 is a completely floating-point process, and levels exceeding 0dB at Input or Output and anywhere inside the Breeze 2 alg, are not innately a problem and cause absolutely zero distortion or negative effects so long as the final output of your DAW or host application is not clipping (does not exceed 0dB). Nonetheless it is a good policy to practice reasonable gain-staging inside your DAW in case other third party plugins have non-linearities that are dependent on signal gain.



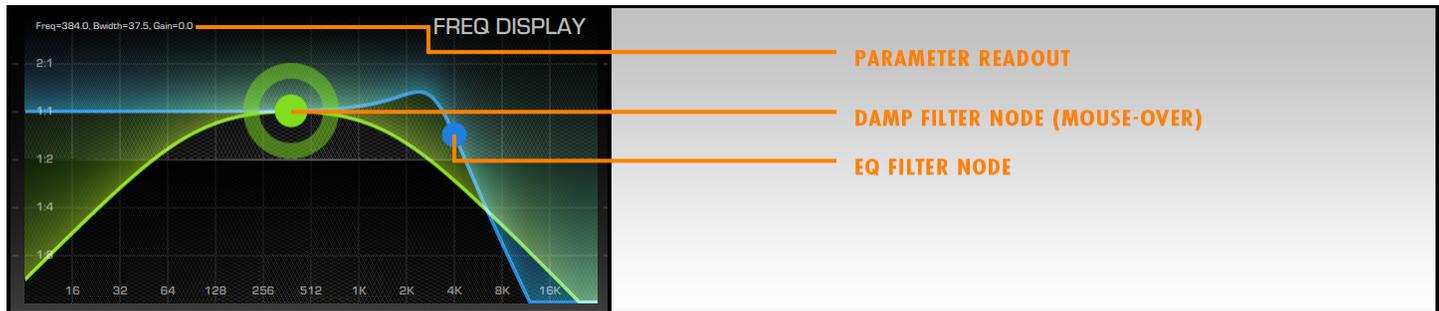
Frequency Display

The Frequency Display shows important information about the frequency characteristics of the current preset settings. The Frequency Scale Axis is shown along the bottom edge of the display and shows a range of 8Hz to 32KHz. Each grid line represents one octave. The Amplitude Axis is shown on the left and is measured in percent from 6.25% to 400% and shown as fraction equivalents ($1/16$, $1/8$, $1/4$, $1/2$, $1/1$, $2/1$, $4/1$). The Amplitude Axis has different meanings for EQ and Damp:

- **EQ:** amplitude represents the gain scaling factor for the particular frequency (i.e. the Filter Magnitude Response)
 - A value of 2:1 at 4K, means there is a 200% (+6dB) gain boost at this frequency
 - A value of 1:4 at 16K, means there is a 25% (-12dB) gain boost at this frequency
- **DAMP:** amplitude represents a scaling of the RT60 Decay Time set by the Time control
 - A value of 2:1 at 4K, means decay time is 4 seconds at this frequency if decay Time is 2.0 seconds ($2 * 2$)
 - A value of 1:4 at 16K, means decay time is 0.5 seconds at this frequency if decay Time is 2.0 seconds ($0.25 * 2$)

Don't worry too much about the math though. The process is highly intuitive, as you will find.

Damp and EQ thus each have an associated curve in the Frequency Display that shows the exact behavior of the given filter and gives a quick visual representation of what to expect from the given preset settings in terms of its “Frequency Dependent Damping” (a fancy way to say how long the reverb is at different frequencies), as well as its general EQ.



*TIP: The **DAMP** curve is a scale factor of DECAY TIME. The **EQ** curve is a scale factor of GAIN.*

The Damp and EQ curves both have a circle node on them. These can be selected and dragged horizontally and vertically. The Damp node is slightly bigger than EQ node and always matches the color of the other controls on the GUI. The selected curve displays a ring around its node. Each filter has up to 4 filter parameters which can be changed by dragging the given filter node in 4 different ways:

- **Horizontal X-Dragging:** changes the filter reference frequency
- **Vertical Y-Dragging:** usually changes the filters gain/scaling, but is dependent on the selected Filter Type
- **Alt-Key Horizontal X-Dragging:** changes the filter’s third parameter if available
- **Alt-Key Vertical Y-Dragging:** changes the filter’s fourth parameter if available

Numerical values for all four parameters are displayed in the Parameter Readout area while a Node is being dragged. Filter Types and their parameters are discussed in more detail in the Frequency Display Zoom View section. For the casual user, loading presets and using the standard horizontal and vertical dragging to adjust frequency and the secondary filter parameter -- usually gain -- may be all that is ever required.

Damp Explained

The Damp filter controls the relative frequency damping that is applied to the reverb. Damping is effectively a time-varying EQ process; it is achieved by placing a filter within the feedback loop of the algorithm. This means that as time progresses in the decay of the reverb tail, frequencies outside the pass-band of the selected filter type will become more and more attenuated. Dragging the curve lower increases the effect of the filter, as is represented in the Frequency Display. This will affect both how severely the frequencies are attenuated and how quickly this action takes place.

The most common use of damping is to use of damping is to force high frequency content to decay faster than low and mid-range frequencies. This behavior is common in real acoustic spaces because as sound bounces off of and is reflected by various surface materials, the spectrum of sound source is changed slightly at each reflection due to the absorption characteristics of the surface material. Most common building materials attenuate high frequencies to one degree or another. Furthermore, the air itself creates additional high frequency damping in real acoustic spaces. Thus if emulation of real acoustic spaces is the goal, some degree of high-frequency damping is usually appropriate. The following are some guidelines for using the Damp slider when using the Hi-Shelf or Hi-Cut modes:

- **Gentle High Frequency Damping**
 - Result in the high frequency content in the reverb tail being louder and lasting longer in the decay
 - Are a good choice to use for smaller spaces, such as rooms, chambers, plates, and ambience presets depending on taste
- **Significantly High Frequency Damping**

- Results in the high frequency content in the reverb tail being less loud and decaying more quickly
- Are a good choice to use for larger spaces, such as large halls, cathedrals, outdoor spaces, and similar presets depending on taste

Damping can also be used to force low frequencies to decay more rapidly than high frequencies by using the Lo Shelf or Lo Cut filter options. There are not too many real-world acoustic spaces that exhibit this behavior naturally. However, this can be useful in some modern styles of music such as dance, electronic, urban, pop, and other bass-heavy and groove-based styles of music. The general idea is that it allows a higher wet/dry mix of reverb to be used while not turning the mix into mud soup or undermining the pulsing syncopation of the groove. This can also be useful for special FX. The following are some guidelines for using the Damp slider when using Lo-Shelf or Lo-Cut modes:

- **Gentle Low Frequency Damping**
 - Result in the low frequency content in the reverb tail being louder and lasting longer in the decay
 - Can be used to subtly lesson low frequency build-up in the mix
- **Significantly Low Frequency Damping**
 - Can be useful for interesting special effects

Breeze 2's Tilt, Band Pass, and Cut Tilt filters can produce damping effects on both high and low frequencies simultaneously in various ways, and are an excellent area to explore for more advanced preset design when users would really like to sculpt exact frequency dependent damping profiles.

EQ Explained

The EQ filter controls the relative EQ that is applied to the reverb. EQ is not a time-varying process; it is achieved by placing a filter outside the feedback loop for the algorithm. This means that as time progresses in the decay of the reverb tail, there will be no additional accumulating changes to the frequency response. EQ is a static process and allows the overall tonal character to be altered without effecting damping.

To drive this point deeper, the EQ and Damp filters are exactly the same; the only difference is that Damp is inside the feedback loop and EQ is outside the feedback loop. The effects of Damping multiply over time; the effects of EQ are static over time. This is an important subtly to understand when designing custom presets. The question to ask yourself when choosing to increase either EQ or Damp is, do you want to increase the effect over time, or do you simply want to change the overall tonal balance?

The same general guidelines above also apply here to EQ, with the noted exception that EQ can generally be more drastic if needed without getting into obvious special effects territory.

Again Breeze 2's Tilt, Band Pass, and Cut Tilt filters can produce EQ effects on both high and low frequencies simultaneously in various ways, and are an excellent area to explore for more advanced preset design when users would really like to sculpt exact EQ profiles.

Tip: While becoming familiar with the effects of EQ and Damp it can be a useful experiment to create a preset that sets Damp to a given filter choice and slider value and disables EQ. Then copy this preset from the A preset state to the B preset state. Then switch to the B preset state and reverse the Damp and EQ settings such that Damp filter is now disabled and the EQ filter is set to the same filter choice and slider value as the Damp setting in the A preset state. Now switch back and forth between the A and B preset states while listening to a familiar sound source and note the differences. Try this same experiment with various filter types and slider values. This should allow you to quickly develop an intuitive understanding of the behavior and appropriate uses of each control.

Note: Double-clicking Frequency Nodes locks their position so that you are able to edit the other while not accidentally adjusting the first. Another double click on the locked Node will unlock it.

Time Display

The Time Display shows important information about the timing and density characteristics of the Primary and Secondary reflections in the early part of the impulse response created by Breeze 2's current settings. The Time Axis is shown along the bottom edge of the display and shows a range of 0.0 milliseconds to 300 milliseconds. This period of time contains the most relevant psychoacoustic spatial information that is used by the brain to determine the characteristics of the current space. Energy later in the tail is better represented as a completely diffuse statistical process where the only remaining perceptual cues are frequency-domain filter effects such as frequency-dependent damping and EQ. These frequency effects are better communicated by the filter curves shown in the Frequency Display; therefore the Time Display is free to focus its attention on this critical "early region" of the time response and communicate more relevant details that help users and preset designers gain better understanding of how changes to the time response in this first 300 milliseconds region can drastically effect the perception of the space.

The Time Display Amplitude Axis is bipolar and shown on the left and is measured in fractions from 0 to +/- 100% measured in thirds (+/- 0/3, 1/3, 2/3, 3/3). You can think of this as the relative gain of various reflections found within the early time region. The different colors represent the different spatial channels (Left, Right, etc.) and are superimposed on top of each other to create a futuristic and rather aesthetically pleasing info-art-graphic, which in some cases would look quite nice printed and hanging on the walls of the MOMA in our humble opinion. We're joking. Partially.

Reflections in the Time Display will morph between 1pixel vertical lines, representing a single specular reflection/delay/echo, to wider triangular and trapezoidal shapes representing increasing reflection density in these regions. In real physical spaces reflections are almost never perfectly "specular", a term meaning that a reflection is an exact copy of the source. In real spaces when a sound bounces off a surface, it is almost always undergoes some degree of diffusion and dispersion effects, which in a simplistic sense, spread the energy out over small ranges of time. The Time Display in Breeze represents this process.

Primary Reflections are the group of delays that have reflected off of one surface in the virtual model of the given space. They are the most distinct reflections found in the hypothetical impulse response of the given preset state. They are effectively the Early Reflections as named in other reverbs such as Aether. Their timings and relative amplitudes create the largest impression about the physical characteristics of the virtual space such as its size and dimensions as well as give cues about the positioning of the sound source within the space. Such academic detail is usually not overly relevant to music production however, and we suggest to simply adjust Breeze parameters and use the Alg Randomize button to simply find a pleasing Primary Reflections pattern that suits the given source sound. Size, Width, Contour, Shape and Density have the most impact on Primary Reflections.

Secondary Reflections are the group of delays that have reflected off of two surfaces in the virtual room model of the given space. There are generally a lot more of them than Primary Reflections. Secondary Reflections are the start of the Late Reflections or diffuse tail as found in other products such as Aether. The visual density of the Secondary Reflections area can inform you how quickly density will increase over time in the hypothetical impulse response of the given preset state. The increase of Density over time is called Diffusion, and Diffusion is indeed the parameter that controls this as you will see when looking at the Time Display and changing the Diffusion parameter value. Again this is a rather academic topic and for typical music making it is sufficient to set the Diffusion parameter value by ear.



Tip: Watching the Time Display while moving Breeze's knobs and sliders will help you quickly build an intuitive understanding of what Breeze's various parameters do and how they affect the sound.

Frequency Zoom Display

Breeze 2 focuses on maintaining simplicity of use and retains the general layout of version 1. The MAIN page of the GUI may be all that is needed for a large number of users. More advanced users and presets designers sometimes want more control however, and in Breeze 2 we have delivered that.

The Frequency Zoom Display shows a double-sized Frequency Display to allow finer mouse-control as well as drag-able and editable numerical values for all four Damp and EQ filter parameters. It also displays the Damp and EQ Filter Type menus as well as enable/disable buttons for both.

To access the Freq Zoom Display double click anywhere in the Freq Display on the MAIN page of the GUI (except directly over one of the filter curve nodes), or click on the Freq Display Expand button (downward facing triangle) directly below the Freq Display.

To return to the MAIN view, double click anywhere in the Freq Zoom Display (except directly over one of the filter curve nodes), or click on the Freq Display Close button (Up/Left facing arrow) in the lower right of the Freq Zoom Display.



Filter Types & Parameters

Breeze 2 offers a large list of Damp and EQ filter types. A filter type may have up to 4 parameters as previously discussed. Filter parameter 1 is always assigned to filter frequency and is specified in Hertz. Filter parameters 2, 3, and 4 assignments depend on the selected Filter Type, and they all use a relative bi-polar range of -100% to + 100%. These

numerical values are mapped to internal values in a manner designed to give reasonably consistent behavior across filter type selections; the numerical values do not have specific physical units or any innate absolute meaning.

Following is an enumeration of the Filter Type options and their parameters:

- **Hi Shelf I:** 1st order high shelving filter with adjustable frequency and gain
 - i) Frequency
 - ii) Gain
 - iii) Unused
 - iv) Unused
- **Hi Cut I:** 1st order high cut filter with adjustable frequency and reference gain
 - i) Frequency
 - ii) Gain
 - iii) Unused
 - iv) Unused
- **Hi Shelf II:** 2nd order high shelving filter with adjustable frequency, gain, bias, and Q
 - i) Frequency
 - ii) Gain
 - iii) Bias: changes the symmetry of the filter curve. 0% is a perfectly symmetric standard shelf filter.
 - iv) Q: changes the relative steepness of the slope of the filter curve at the reference frequency
- **Hi Cut II:** A 2nd order high cut filter with adjustable frequency, reference gain, and Q
 - i) Frequency
 - ii) Gain
 - iii) Unused
 - iv) Q: changes the relative steepness of the slope of the filter curve at the reference frequency
- **Hi Cut Tilt II:** A custom filter design specifically designed to be useful for reverb applications such as damping with adjustable frequency, reference gain, offset and tilt
 - i) Frequency
 - ii) Gain
 - iii) Offset: changes the width of area in which Tilt is active and positions the bump and dip created by Tilt
 - iv) Tilt: changes flatness of the pass-band of the filter and creates a bump and dip in the curve
- **Tilt I:** A specialized shelf filter that keeps the reference frequency at zero dB gain and anti-symmetrically boosts and cuts either side of the reference frequency. One side goes up and the other goes down or vice versa.
 - i) Frequency
 - ii) Gain
 - iii) Unused
 - iv) Unused
- **BandPass II:** A 2nd order Band-Pass filter with adjustable frequency, bandwidth, and reference gain
 - i) Frequency
 - ii) Bandwidth
 - iii) Unused
 - iv) Gain: can boost the peak gain
- **Lo Shelf I:** 1st order low shelving filter with adjustable frequency and gain
 - i) Frequency

- ii) Gain
- iii) Unused
- iv) Unused

- **Lo Cut I:** 1st order low cut filter with adjustable frequency and reference gain
 - i) Frequency
 - ii) Gain
 - iii) Unused
 - iv) Unused

- **Lo Shelf II:** 2nd order low shelving filter with adjustable frequency, gain, bias, and Q
 - v) Frequency
 - vi) Gain
 - vii) Bias: changes the symmetry of the filter curve. 0% is a perfectly symmetric standard shelf filter.
 - viii) Q: changes the relative steepness of the slope of the filter curve at the reference frequency

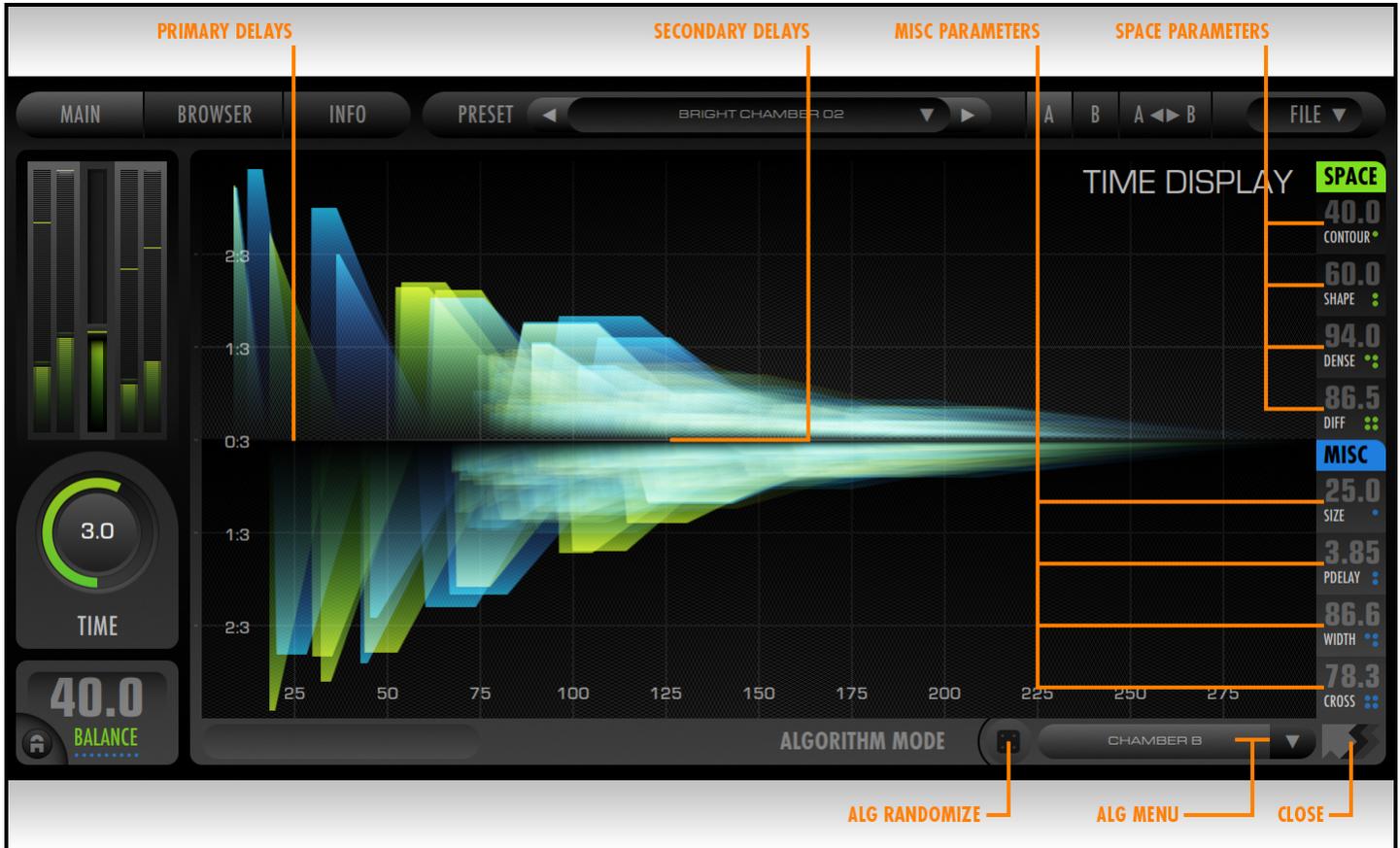
- **Lo Cut II:** 2nd order low cut filter with adjustable frequency, reference gain, and Q
 - i) Frequency
 - ii) Gain
 - iii) Unused
 - iv) Q: changes the relative steepness of the slope of the filter curve at the reference frequency

- **Lo Cut Tilt II:** A custom filter design specifically designed to be useful for reverb applications such as damping with adjustable frequency, reference gain, offset and tilt
 - i) Frequency
 - ii) Gain
 - iii) Offset: changes the width of area in which Tilt is active and positions the bump and dip created by Tilt
 - iv) Tilt: changes flatness of the pass-band of the filter and creates a bump and dip in the curve

Time Zoom Display

The Time Zoom Display shows a double-sized Time Display to show higher resolution detail of the first 300ms of the time response as well as offer drag-able and editable numerical values for all parameters that have an effect on it. These parameters, which are grouped into Space and Misc. groupings, are not additional parameters. They are simply repeated from the MAIN page for convenience. The Time Zoom Display also repeats the Alg Randomize and Alg Mode Menu controls for your convenience. Additional user-interactivity made be added in the future.

To access the Time Zoom Display double click anywhere in the Time Display on the MAIN page of the GUI (except directly over one of the filter curve nodes), or click on the Time Display Expand button (downward facing triangle) directly below the Time Display.



To return to the MAIN view, double click anywhere in the Time Zoom Display (except directly over one of the filter curve nodes), or click on the Time Display Close button (Up/Left facing arrow) in the lower right of the Time Zoom Display.

Knobs

Time

Time is measured in seconds (sec) and has a range of 0.125 sec to 32 sec. Time represents the amount of time it takes for the reverb energy to decrease by 60 dB. For this reason it is also called “RT60” by other companies.

Breeze 2 also offers a special “Infinite Time” mode. In this mode the reverb tail will extend (almost) forever, or at least until you stop it or change the settings. The Damp filter is still active in this mode as well, so frequencies outside the pass-band of the given setting will gradually decay, while those inside the pass-band will continue *ad infinitum*. To access this mode, simply turn the knob to maximum setting by moving it up or to the right.

Note: Time value represents the **reference** decay time for all frequencies. The actual decay time for specific frequencies is the product of the Damp Curve and the reference Time value. For example if Time is set to 3.0 seconds and a Hi Shelf Damp filter is used with a minimum gain value showing 50% (1:2) on the Damp Curve, the decay time at this frequency is 1.5 seconds ($3.0 * 0.5$). Some filter types can also boost decay times by up to 400% (4:1) in some frequency ranges.

Timing Controls

Breeze's Timing Controls consist of Size and Pre-Delay and provide a method to control the delay of the onset of the reverb as well as the overall average length of its delays.

Size

The Size control sets the general reference delay length, and thus the perceived size of the reverberant space. The Size control is measured in Meters and has a range of 1 to 80 Meters (MET). For the majority of natural sounding presets, the Size parameter should be set in conjunction with Time parameter and these controls should remain roughly proportional to one another. There are exceptions to this rule however. The effects of the Size control are represented in the Time Display by showing how the delay length distribution of the Primary and Secondary Reflections is affected by changes to the Size parameter.

- **Extremely Small Sizes (<10 Meters)**
 - Can be used for ambience presets with very short Time settings
 - Can produce some coloration, comb filtering, resonance, and “metallic” sound in some extreme cases if used with longer Time settings
 - Produce almost instantaneous density buildup
- **Small Sizes (10-20 Meters)**
 - Produce very fast density buildup
 - May have some minor “Small Room” coloration, but can generally avoid strong comb filtering and resonance
 - Are great to choices to use with the Chamber and Hyper-Plate Alg modes
- **Medium to Large Sizes (20-50 meters)**
 - Produce moderate to slow density buildup
 - Are generally ideal for most Hall and orchestral performance space presets
 - Are large enough to completely avoid any unwanted coloration
 - Are a good choice to use to emulate some classic hardware devices with Classic or Hall Alg Modes
- **Very Large Sizes (50-80 meters)**
 - Have slow density buildup and are more sparse
 - Can be used with high Density settings to customize the rate of density increase in the reverb tail over time
 - Can achieve the perception of discrete echoes in the early phase of the reverb tail, particularly when used with Classic Alg Mode

From these general guidelines, it can be seen that large sizes not only produce longer delays, but also lower density tails and slower density buildup. Because of these facts, it can sometimes be desirable to use an exaggerated Size setting when additional clarity, less density, or more “mix space” needs to be achieved in a dense musical project. It can also be particularly useful to use larger setting with positive Density and various Diffusion settings to customize the initial density and the rate of increasing density to perfectly match these characteristics to the needs of the source sound.

Tip: Changes to Size, Density and Diffusion also have a complex interaction with the selected Alg Mode, and characteristics of each can be balanced and offset to some extent by changes of another. Listening and experimentation is key when designing new presets.

Pre-Delay

Pre-Delay is measured in milliseconds (ms) and has a range of 0ms to 256ms. Pre-Delay represents the time period between the start of the dry input sound and the start of the first reflection in the reverb. For some Algorithm Modes it should be noted that even when this control is set to 0ms, the Breeze may still contain some degree of natural Pre-delay which is a function of the current Size and Shape settings. This can be considered to be the time it takes for the sound source to cross the shortest distance between reflecting surfaces present in the acoustic space. Pre-Delay should thus be considered as an additional pre-delay that is added to this pre-existing natural amount. The Time Display area will show the exact total realized pre-delay that results from the combination of current settings of Pre-Delay, Size, and Shape.

This feature can be useful to:

- Create "slap-back" presets
- Increase clarity and intelligibility by keeping some silence between the Dry or Early Ambience and the start of the LRs
- Model the effects of both the sound source and the listener being in the middle of an acoustic space far away from any reflecting surfaces: sounds which are close the listener generally have larger amounts of Pre-Delay

Note: *Breeze's Density control can also result in additional realized pre-delay when using negative Density values. It is best to consider the value of Pre-delay control, as "additional" pre-delay and not absolute pre-delay. The Time Display shows the actual realized Pre-Delay*

Tip: If you wish to have realized Pre-Delay be more exactly equal the knob value, use Hyper-Plate or Chamber Alg Modes as these modes have very little built-in pre-delay.

Tip: If you wish to create presets that emulate sounds that are far away from a listener such as an orchestral instrument in the back of the orchestra, Pre-Delay should be small.

Modulation

Unlike convolution reverbs, Breeze is not a static process, and no two instances of Breeze are ever exactly the same. The same is true in real world acoustical spaces as well: a building's acoustical character may vary slightly depending on several factors such as its current occupancy, and even more subtle things such as the current temperature and humidity. Thus, acoustic space itself is alive in the real world and is constantly shifting, morphing, and evolving to produce a complex array of potential impulse responses. A sampled impulse response of a real acoustic space can be quite accurate for that particular moment, but it tells only part of the story. It is like a picture of a lake, versus the lake itself. A lake in the real world is unlikely to spontaneously develop waves the size of those found in the ocean, but it is never quite as still as a picture either. Breeze's approach does not simply sample one static picture in time, but rather captures the complete subtlety of the dynamic chaotic processes found in life and it retains all the detail and organic feel of these processes.

The dynamic nature of the Breeze algorithm is accomplished in two ways. First, Breeze uses a proprietary spectral modulation technique. This special form of modulation does not produce any noticeable pitch effects and represents one of 2CAudio's trade secrets. This feature has no user-controllable parameters on the GUI; it is always on regardless of the current preset settings. Second, in addition to the intrinsic variance found at the very heart of the Breeze algorithm, Breeze also offers even more modulation possibilities to keep it from sounding dead and static. Two simple modulation controls are offered to invoke additional random LFO modulations. The Modulation Depth and Rate controls create a second type of musically-pleasing, randomly shifting resonances in the spectrum of the diffuse Late Reflections. The characteristics of this variety of modulation are generally more drastic than Breeze's proprietary spectral modulation, and this second form of modulation is more similar to the type of modulation schemes found in classic hardware devices and modern competitive products. This "user modulation" results in micro pitch bends and shifts in reverb tail and it is adjustable by taste via using two controls: Depth and Rate.

Mod Enable

The Mod Enable Button enables and disables modulation.

Note: Modulation can be a relatively CPU intensive process, particularly when using Mod Mode B. When modulation is disabled, the processing requirements are removed from the CPU. If user modulation is not needed for a particular preset, turning it off can result in substantial savings in CPU usage.

Mod Mode

Breeze 2.5 offers two different flavors of modulation called Mod Modes:

- **Mod Mode A**
 - Generally produces more subtle results, particularly at mid to large sizes
 - Can be more extreme at very small sizes
 - Is an excellent choice for Chamber and Hyper-Plate Alg Modes
 - Does not generally produce noticeable pitch-bend effects
 - Uses less CPU than Mod Mode B
- **Mod Mode B**
 - Generally produces more drastic results, particularly at mid to large sizes
 - Can be more subtle at very small sizes
 - Is an excellent choice for Hall Alg Modes, although Mod Mode A can be as well
 - Can produce noticeable pitch-bend effects at extreme mod depths and/or extreme sizes
 - Uses more CPU than Mod Mode A

Modulation Depth

The Modulation Depth parameter is measured in percent (%) and controls the degree to which various aspects of the Engine change over time.

- **Small values (<25%)**
 - Generally produce very natural results
 - Retain perfect clarity in the tails
 - Result in very little obvious pitch/frequency modulation and are thus a good choice for instruments such as piano where such modulation is easy to hear
- **Medium values (25% to 50%)**
 - Can result in a very subtle musically pleasing chorus-like sound which adds sweetness
 - Are a good choice to use for emulation of classic hardware when used with medium Modulation Periods
- **High values (50% to 75%)**
 - Can result in a stronger chorus-like sound which adds lushness and thickness
 - Work very well on sound sources such as synth pads, choirs, and ensemble sounds
- **Extreme values (>75%)**
 - Can result in more extreme chorus-like effects and obvious pitch modulation depending on Modulation Rate
 - Are usually best reserved for special FX use unless Modulation Rate is very slow

Tip: Mod Mode A can generally use more drastic Mod Depth values than Mod Mode B without getting into FX territory

Modulation Rate

The Modulation Rate parameter is measured in Hertz (Hz) and has a range of 0.0625hz to 16.0hz. Modulation Rate controls how fast the various modulated parameters inside Breeze's algorithm are changing.

- **Small values (<0.25hz)**
 - Can reduce noticeable pitch-bend artifacts and increase clarity in the reverb tails
 - Are a good choice to use to find a balance between artificial "sweetening" and more true-to-life responses
- **Medium value (0.25 to 4.0hz)**
 - Can result in a subtle musically pleasing chorus-like sound which adds lushness depending on Modulation Depth
 - Are a good choice to use for emulation of classic hardware when used with medium Modulation Depths
- **Large values (>4.0 Hz):**
 - Can create very lush chorus FX with moderate modulation depth
 - Are usually best reserved for Special FX presets, though they can be useful on non-pitched source sounds such as drums and percussion as well

Tip: Mod Mode A can generally use more drastic Mod Rate values than Mod Mode B without getting into FX territory

Space Controls

Breeze's Space Controls consist of Contour, Shape, Density, Diffusion, and Algorithm Mode. These parameters determine the nature of the space and its properties such as its abstract geometry and determine its complexity. These controls will have a large effect on the smoothness and timbre of the reverb.

Contour

The Contour control is a Bi-Polar control that is measured in percent and has a range of -100% to 100%. Contour controls the attack envelope characteristics of the Primary Reflections in the reverb tail. Negative Contour values result in a slower attack envelope where the delay gains will start at some minimum value and build to a maximum peak before the reverb tail begins its exponential decay. The smaller the Contour value is (i.e. the closer it is to -100%) the more pronounced and exaggerated this effect will be. When Contour is exactly 0%, all delay gains are statistically equal and no envelope is applied. When contour is positive, the effect of the attack envelope is reversed: the very first delay in the tail achieves maximum gain statistically, and subsequent delays in the early phase of the reverb tail have lower gains and fade out over time. The effect of the Contour control is represented in the Time Display. The exact effect of the Contour function depends on the selected Alg Mode.

- **Extreme negative values (close to -100%)**
 - Can be used to create something similar to a reverse reverb sound
 - Will result in less apparent Density in the reverb tail and can exaggerate a sense of "graininess" in the reverb tail.
- **Moderate negative values (-75% to -25%)**
 - Produce natural build-to-peak response in the reverb envelope
 - Are a good choice to use to model large concert hall behavior
 - Can be used to minimize the perception of Early Reflections when such reflections may be objectionable on instruments with fast transients
 - Can be used instead of additional Pre-Delay to find the optimal timing for the onset of the reverb

- **Medium values (-25% to 25%)**
 - Produce the most resulting "hold time" in the reverb envelope
 - Are a good choice to use to model small to medium size spaces such as rooms, chambers, and similar spaces
- **Moderate positive values (25% to 75%)**
 - Generally produce the smoothest exponentially decaying reverb tails with little apparent hold time
 - Are a good choice to use to model medium size spaces, and for plate emulation
 - Work well on drum and percussion sources in cases where strong Early Reflections are not desired
- **Extreme positive values (close to 100%)**
 - Can be used to create exaggerated group delays and cluster effects
 - Can result in "chunky", stepped, uneven reverb envelopes that can exaggerate the perception of space via strong echoes
 - Will result in less apparent Density in the reverb tail and can exaggerate a sense of "graininess" in the reverb tail.

Tip: Extreme Contour settings will have an effect on the timbre and smoothness of the reverb tail as well as the initial attack envelope. This fact can be used purposefully to achieve various textured effects in the reverb tail when desired.

Shape

The Shape control is a Bi-Polar control that is measured in percent and has a range of -100% to 100%. Shape is a complex parameter that adds some additional irregularity and variation to the delay lengths of Breeze's Reflections and therefore can increase the perceived complexity of the geometry of the acoustic space. Larger values produce greater variation in delay length, and thus more complex three-dimensional geometry. You may think of it as increasing the number of reflective surfaces in the acoustic space, or increasing the fractal tessellation of a three-dimensional cube if you prefer to be really brainy. The effects of the Shape control are represented in the Time Display by showing how the delay length distribution of the Primary Reflections is affected by changes to the Size parameter. The exact effect of the Shape function depends on the selected Alg Mode.

- **Medium to High Negative Values**
 - Represent complex room geometries with many reflecting surfaces and irregularities
 - Examples: concert halls with audience seating, natural spaces, small rooms that contain a lot of furniture, buildings with irregular architecture
 - Will produce the weakest emphasis on Size differences and will contain less natural Pre-Delay having the potential effect of making the space sound smaller than it is
 - Will produce the smoothest amplitude envelope in the tails
 - May exhibit some minor coloration at extreme values approaching -100%
- **Values Close to Zero**
 - Represent simple room geometries with fewer reflecting surfaces
 - Can conceptually be thought of as an empty cube at the minimum, though this is not completely accurate
 - Will produce the strongest emphasis on Size differences and will contain more natural Pre-Delay
 - Can, at very low values, produce noticeable ripples or clusters of delays in the beginning of the reverb tails that will smooth out over the decay of the tail. This can be especially noticeable at large Size settings or on sources with fast transients, and if this is objectionable for the given musical need it is recommended to raise the Shape value some until this effect is no longer perceivable.

- **Medium to High Positive Values**

- Can extend the Primary Reflections area allowing for a longer Primary Reflections period
- Allow for longer effective attack times as created by Contour
- Can produce a rougher amplitude envelope the start of the tail which can exaggerate the sense of spaciousness for sounds with weak transients

Size and Shape work together to create the illusion of physical dimensionality. Size determines the longest distance between any two exterior walls of the theoretical space, and Shape determines the smaller, finer architectural details of the interior of this space as well as the relative position of the source sound within the space. Together Size and Shape can affect the overall timbre of the reverberation.

Tip: If Size is set to a high value and Shape is set to and a fairly extreme negative value it is possible to achieve lower density and slower build up in the reverb tails without the obvious psychoacoustic characteristics of a large space such as an excessively large Pre-Delay or time between reflections in the initial build up. To some degree, strongly negative Shape values can reduce the perceived size of the acoustic space and the control works in opposition to the Size control. Strongly positive Shape values can do the opposite.

Density & Diffusion

Algorithmic reverbs are generally built with very complex structures comprised of delays and filters. An algorithmic reverb is not entirely dissimilar from a multi-tap delay, except for the fact that the number of delays is orders of magnitude larger for a reverb than a multi-tap delay. If one evaluates an impulse response of a reverb in the time domain, the total impulse response can simplistically be thought of a sum of all delays (if one disables or ignores the action of the filters). The total number of all delays over the entire impulse response could be simplistically considered Density (ignoring for sake of simplicity, spectral domain considerations). Generally speaking in most algorithmic reverb designs and all real acoustic spaces, instantaneous Density (i.e. the number of delays found in a short period of time such as 10ms) increases over time. Therefore if one evaluates an entire impulse response of such a system, which lasts one second, and slices this impulse response into one-hundred 10ms slices, the Density of each successive slice will almost always increase as time passes. In other words the number of delays found in each time slice will increase. The rate of the increase in Density over time is called Diffusion. Density and Diffusion are therefore two related concepts. Density can be considered as the total number of delays over the entire length of the impulse response. Diffusion is a measurement of the speed of the increase of delay density over time.

Tip: Density can also be considered as the starting density value in the impulse response, and Diffusion can be considered the rate at how fast density increases even more from this starting point.

Density

Density is measured in percent (%) and is represented by a Bi-Polar control that has a range of -100% to 100%. Density can simplistically be thought of as the relative total number of delays within a certain fixed period of time. Low Density values give fewer delays in some fixed period of time. High Density values give more delays within some fixed period of time. The effect of the Density control is represented in the Time Display by changing the width and the opacity of each Reflection.

- **The exact effect of Density is dependent on the selected Alg Mode.**

- Classic Modes are a lot less dense than all other modes
- Chamber, Hyper-Plate and Colored Modes can become so dense that all sense of individual reflections can be severely obscured or even completely lost and resulting behavior becomes more like a convolution reverb or real physical space
- Hall Modes are somewhere in-between these two extremes

- **Negative Values (Low Density)**

- Produce fewer delays within some fixed period of time

- Can be a good choice to use on source sounds that have slow transients such as strings and some vocals
- **Positive values (High Density)**
 - Produce more delays within some fixed period of time
 - Can be a good choice to use on source sounds that have fast transients such as drums and percussion

As mentioned earlier, in real spaces when a sound bounces off a surface, it is almost always undergoes some degree of diffusion and dispersion effects, which in a simplistic sense, spread the energy out over small ranges of time. The Time Display in Breeze represents this process. Therefore when we talk about the number of delays or reflections in a given time period this is only completely meaningful in the discrete sense when we are talking about artificial algorithmic reverb devices. There is nothing innately wrong with a reflection that is perfectly specular and is represented by a single impulse spike in an impulse response. Many classic devices have such behavior and it is possible to obtain with our Classic modes as well. It can sound quite nice on material without strong transients such as synth pads or even strings. The real world however, does not quite operate this way, and nor do Breeze 2's new Alg Modes. Hall, Chamber, Hyper-Plate and Colored modes all produce some degree of "time smear" of reflections. The Density control has an effect on the intensity of this process as well. More extreme values (farther away from zero) will exaggerate this effect more.

Tip: Size also has an effect on Density. Small Size settings by nature are denser than large Size settings in the time domain because there is less distance for a sound to travel before encountering a surface barrier to reflect off of. Small Size settings will result in an impulse response with a high number of delays per period of time. Small sizes also have an effect on the spectral density of a space. Small sizes tend to have stronger resonances and less flat frequency responses than larger spaces; they have less spectral density. They have much more peaks and valleys in the frequency response than large spaces. This side effect does not occur when using Breeze's Density control. If a large Size is used with a high Density setting the time domain representation may look similar to a that of a smaller space with a lower Density setting. Both may have a similar number of delays per period of time. The spectral domain representations will be significantly different however: the larger Size space will have a flatter frequency response.

Diffusion

Diffusion is measured in percent (%) and is a measurement of the increase of delay density over time. Conceptually it models the effect of irregular wall surface materials in a room by changing echo density over time. Very low values produce sharp, discrete reflections and a very slow increase in Density over time. A value of 0% will produce no increase in Density over time. Higher values produce a rapid increase in Density over time. The effect of the Diffusion control is represented in the Time Display by changing Secondary Reflections. At larger number of them represent higher Diffusion and in some Alg Modes they will become so numerous that the almost blend together into one unified field.

TIP: In Breeze 1.0 we recommended that this control be set to a medium to high value unless special FX were desired. This is no longer the case. The entire range of the Diffusion control can be used for natural sounding presets and the interaction between Density and Diffusion is now even more meaningful.

- **Low Values**
 - Produce less density build-up and less complex echo patterns
 - Can be useful on vocals and instruments with slow attacks and few transients
 - Can be used to create to create granular and multi-tap-delay-like Special FX when Size is large
 - Can be useful to exaggerate low density tails popularized to some degree by classic hardware devices
 - Can increase resonance at extremely low values if using Classic Alg Modes
- **Medium Values**
 - Are now the recommended default values to use if you are unsure

- **High Values**
 - Produce faster density build-up and more complex echo patterns
 - Can be useful on percussive instruments with fast attack transients such as drums, percussions, piano, keys, and guitar
 - Are a good choice when using the Hyper-Plate Alg Modes

Using Density & Diffusion together

Once Density and Diffusion is understood, it can be helpful to consider how different settings can work together. The following is a simple guide:

- **Low Density & Low Diffusion**
 - Produces the most sparse tails
 - Will achieve a degree of "graininess" in the tail that can be reminiscent of some vintage algorithms
- **Low Density & High Diffusion**
 - Can assist with increasing clarity by reducing the perception of early reflections which may confuse the dry signal
 - Will be sparse at the beginning of the impulse response, but will increase in density over some period of time
 - Will still build to maximum density over time, but will take longer to get to this point
- **High Density & Low Diffusion**
 - Can be used to balance initial Density with the Density later in the tail
 - Can approach the emulation of "constant density" algorithms when Diffusion approaches 0%.
- **High Density & High Diffusion**
 - Produce almost instantaneous white noise as an impulse response particularly when Size is also small
 - Will have very little build up and almost an immediate exponential decay
 - Is useful for Hyper-Plate and Chamber Alg Modes and can work well on drums and percussion

Algorithm Modes

Breeze 2 offers 12 different Algorithm Modes that can obtain quite diverse results.

- **Classic Low**
 - The most sparse of all Alg Modes
 - Works great with large sizes on synths and pads with minimal transients
 - Can be abused for delay FX
 - Will achieve a degree of "graininess" in the tail that can be reminiscent of some vintage algorithms which advertise low density tails
- **Classic Med**
 - Still very sparse Primary Reflections
 - Gains density moderately with high Diffusion
 - Sounds great with material without strong transients
 - Can leave more space in the mix and alleviate muddiness if the mix is already crowded with many musical elements
- **Classic High**

- Sparse Primary Reflections, but can gain density quickly with high Diffusion
- Can work very well on instruments with slow transients
- Can be nice on vocals
- **Hall A**
 - Achieves slower, smoother attack times than the Classic Modes
 - Remains fairly sparse but minimizes the perception of strong Primary Reflections
 - Best used at medium to larger sizes
- **Hall B**
 - Again achieves slower, smoother attack times than Classic Modes but with alternate geometry
 - Gains density moderately quickly with high Diffusion
 - Works well at reasonable sizes (i.e. a 5 Meter Hall is not considered “reasonable”, but 15 sounds fine)
 - Excellent choice on orchestral instruments
- **Hall C**
 - Again achieves slower, smoother attack times than Classic Modes but with different alternate geometry
 - Can gain density quickly with high Diffusion
 - Another excellent choice on orchestral instruments
 - The best Hall choice for orchestral instruments with faster transients
- **Chamber A**
 - An extremely dense mode which approaches convolution reverbs using impulse responses of real spaces
 - Excellent on drums and acoustic instruments with fast transients such acoustic guitar or piano
 - Quite diverse results are possible using various Size, Shape, and Contour settings making the Chamber modes highly versatile and capable even of being used in modern dense-hall-like contexts
- **Chamber B**
 - An even more extremely dense mode which approaches convolution reverbs using impulse responses of real spaces
 - Alternate geometry as compared to Chamber A, excellent on the same sources
 - Again quite diverse results are possible using various Size, Shape, and Contour settings making the Chamber modes highly versatile and capable even of being used in modern dense-hall-like contexts
- **Hyper-Plate A**
 - An extremely dense mode with dispersive behavior similar to what occurs in real physical plates
 - Best used with small to medium sizes
 - Excellent on synths, drums, pop-rock vocals and all things electronic
- **Hyper-Plate B**
 - An extremely dense mode with alternate dispersive behavior similar to what occurs in real physical plates
 - Best used with small to medium sizes
 - Even denser than Hyper-Plate A and using a different dispersive characteristic
 - Great on the same sources as Hyper-Plate A
- **Colored A**
 - Designed as an FX mode that intentionally adds coloration to the spectrum creating unique and novel character
 - Great on synths to give new excitement to common sounds
 - Cool on pads
 - Can work surprising well on drums and whatever else is thrown its way

- **Colored B**
 - A different variation on the Colored Mode concept
 - No rules here, use it as desired

Note: CPU usage is variable depending on Alg Mode. Classic Modes consume the least followed by Hall Modes followed by Colored. Chamber and Hyper-Plate modes consume the most.

Algorithm Randomize

The Algorithm Randomize “dice icon” button is an extremely powerful feature. Clicking on Algorithm Randomize will generate a completely new preset using the same general parameter values determined by the current parameter settings. This simple function allows users to create a literally infinite variety of preset variations to choose from. We have intentionally vastly over-engineered this feature so much that its randomization quality is most likely high enough for even for cryptography. Every human being that ever lived since the beginning of time could click on this button once per nanosecond for his or her entire lifetime and it would still not come even remotely close to exhausting the possible results. The power of this little treasure is quite immense. Some of its potential uses are:

- Quickly try new variations to find the best match of Primary Reflections with your source sound
- Create a set of multiple variations of the same general space to be used simultaneously on different tracks to place each instrument in its own position within the space

Note: Algorithm Randomize is not undoable. If you are happy with your current settings, but wish to explore more, be sure to either copy the current state to one of Breeze’s two A-B preset states in the Nav Bar, or save the current result as a new Preset before using Algorithm Randomize so that you can recall it later by reloading the preset.

Note: On rare occasions Algorithm Randomize can produce intra-channel Ambience and Primary Reflections that are more out-of-phase than in-phase, resulting in super-stereo effects. This can be quite nice in some contexts. If it is objectionable in the total context of the mix, simply click on Alg Randomize again to find a more suitable result that fits the needs of your mix better.

Mix Controls

Mix

The Mix control adjusts the relative balance between the wet and dry signals in the output of the plug-in. It is measured in percent (%).

- All Breeze presets are saved for use as inserts on audio tracks, and the mix setting is an important part of the desired sound of the preset. This can be a source of great inspiration for musicians who are playing and composing directly into Breeze, as each preset is designed to elicit a different feeling or emotional environment.
- Professional mix engineers on the other hand, generally like to use reverb on busses. For Send/Aux/Bus use, simply set the mix setting to 100% and lock this control as described below. It is now possible to browse all presets in "Send Mode". We consider this the best of both worlds.

Mix Lock

The Mix control can be locked by clicking on this button. When in the locked state the control will not respond to changes made by preset changes, automation, or user input.

- Setting the master Mix setting to 100% and engaging its Lock, will prevent the mix setting from changing when auditioning presets. This allows Breeze to behave in “Send Mode” as third party companies commonly call it.
- Mix Lock also locks the Mix Mode state

Mix Mode

Mix Mode is a very novel special feature that can optionally apply spatialization to the direct/dry signal. It has two states:

- **Mix:** the standard setting where no processing is applied to direct/dry signal and the Mix/Balance control simply mixes between the dry signal and the wet signal
- **Balance:** the special feature setting where a spatialization process is applied to the dry signal in a subtle manner to give it an instantaneous spatial impression and sense of audio source width. The Mix/Balance control then mixes between the instantaneous spatial impression (ambience or AMB for short) and the normal reverb engine (labeled LATE here).

Why would you want to apply spatialization to the Dry signal to begin with? Human hearing is binaural. Humans have two ears. The sound reaching both ears is almost never exactly the same. Even the direct sound is generally not the same in both ears, even for a perfectly centered source sound. An instrument that is captured with a mono microphone generally sounds a bit unnatural for example.

Balance mode can be extremely useful in the following circumstances:

- **Orchestral Instruments:** using Balance mode with the Hall or Chamber Alg Modes can help recess the source sound back into the sound-field making it feel more “glued” into the space instead of sounding like it is directly in front of you. It can add a sense of distance.
- **Mono Mic’ed Instruments:** using Balance mode with the Hall or Chamber Alg Modes on mono sources can transform them into sounding as if they were recorded with stereo microphones, enhancing the perception of realism and intimacy
- **Vocals:** using Balance mode with the Hall or Chamber Alg Modes on vocals allows a lead vocal to feel instantly spacious without having to be buried in reverb. Many pop, rock, and RnB styles of music these days benefit from having a fairly dry lead vocal. Using Balance allows you to gain width and spatial impression without muddying the mix with excessive reverb. Balance settings of 10-20% can be effective in this regard. Hyper-Plate Alg-Modes can be used here as well as long as Size is kept small.
- **Positioning:** using Balance mode with the Hall or Chamber Alg Modes on multiple instances loaded with the same preset will give each instrument track all their own unique exact position within the space. If more drastic variations are desired, a simple click on Alg-Randomize will create them.
- **Special FX:** using Balance mode with Colored and Hyper-Plate modes can create interesting filter FX that may be quite interesting on synths and in electronic music applications

Sliders

Gain

The Gain control controls the output gain of the sum of the wet and dry signals. It is measured in Decibels (dB) and has a range of $-\infty$ (muted) to +12dB. The default setting is 0dB and is represented by the center position of the slider. In most traditional algorithmic reverbs, both hardware and software, output gain is drastically affected by changing other reverb parameters such as Time, Size, Shape, Mix, and others. This makes it necessary to constantly adjust the Gain control in attempt to maintain unity gain between the input signal and the output. Breeze features an industry-first “Conservation of Energy” gain scheme that preserves the average (RMS) level of output signal regardless of parameter settings. Typically this is accurate within plus or minus 1dB! For all intents and purposes, it is generally no longer necessary to adjust the

Gain setting when auditioning or designing presets. Furthermore, maintaining unity gain greatly facilitates comparison of different presets and parameter settings and allows the user to easily choose the right parameter settings for the given source material. In other words, it is much easier to hear the subtle differences the Shape control, for example, has on the texture and timbre of the reverb, if when changing it the gain of the wet signal, and thus the perceived wet/dry mix, does not also change. This makes it much easier to isolate the effects of a single parameter and find the ideal setting to match the needs of the source sound. In summary, Breeze's Gain control is almost obsolete for 95% of most parameter settings and presets and the user is free to focus on more important parameters.

Tip: When using Breeze in a "Send" configuration where it is used on an Aux or FX bus instead of directly inserted on an audio track, it can be desirable to set the Gain to +6dB or +12dB. Breeze's Mix Lock button also locks the Gain setting and in this configuration, the Mix setting is set to 100% wet and the relative wet/dry mix of reverb is controlled by the gain settings of the sends that are feeding Breeze on the Aux or FX bus. Therefore, if gain is adjusted to +6 or + 12dB and locked in Breeze, it is possible to achieve greater front to back depth in the mix by having more variation in the relative wet/dry mix settings of audio tracks that are feeding into the shared Breeze instance. Doing this would allow effective mix settings of greater than 50% wet for some tracks for example. Send levels should be adjusted to taste.

Cross

The Cross parameter is measured in percent (%) and has a range of 0% to 100%. Cross is an important control to understand. It has a large effect on the spatialization of stereo inputs and deals directly with the topic of "respecting the source" in a spatial sense. The Cross parameter controls how much of the Left channel input will show up in the right channel output and vice versa. In other words, how much of the input signal is "crossed over" into the opposite channel. The Cross control allows you to customize the True-Stereo nature of the algorithm. In summary Cross will affect the degree to which the spatial characteristics of the input affect the spatial characteristics of the output.

- **Minimum value (0%)**
 - Input channels are fully separated and retain their original position
 - No channel mixing occurs
 - Represents "Dual Mono" behavior
- **Intermediate values (>0% and <100%)**
 - Represents some form of True Stereo behavior
 - Some output energy is reticulated into the opposite channel, and some is stays in the direct path
 - Are generally usually the best choice for most preset types
- **Maximum value (100%)**
 - Represents something like "Mono Sum" behavior in the gain perspective, but more like the classic "Figure 8" scheme used by various classic hardware devices in other ways
 - All output energy is reticulated into the opposite channel and no energy returns to the direct path
 - Note that the behavior is still true stereo even in this setting and Left and right Channel inputs will not produce exactly the same output

Width

Width is measured in percent (%) and has a range of 0% to 100%. Width controls the amount of stereo width that is added to the input signal by Breeze 2. In contrast to the width control of other product designs, which generally work via pre-processing or post-processing the signal before or after the actual processing block, Breeze's Width control actually

changes the behavior of algorithm inside the processing block. If an identical single-sample delta pulse was fed into both the left and right input channels of the Engine, the Width control would be responsible for controlling how similar the left and right channel outputs would be. For sake of simplicity, Width can also be considered to be the average correlation between the right and left channels of the impulse response of the reverb.

- **0%:** The resulting impulse response is effectively mono, and both Left and Right channels are identical
- **< 100%:** The resulting impulse response corresponds to decreased width that is less than what is natural
- **100%:** The resulting impulse response corresponds to natural stereo width as would occur normally in nature.

It should be noted that if the input signal is already a complex stereo signal, as it would be normally, a Width setting of 0% will NOT collapse the stereo image to mono. Width only affects left-right differences in the process itself, not the source. Thus the same process applied to different input sources, will still result in different outputs.

Link Mode & Multi-Instance Editing



Workflow Overview

Problem Statement

2CAudio has been an advocate of running many spatial processing and reverb engines in parallel directly on track inserts for at least a decade now. The benefits of this are explained on the product webpage for Precedence on our website, and reviewed in the end of its manual. The arguments against such workflows have historically been the excessive CPU usage requirements and the tedious burden of managing tens or even hundreds of instances across a complex project.

We solved the first issue in early 2018 with our “Sub-Zero Suspend On Silence” feature, which disables processing and removes the associated CPU burden from your system when there is no active input signal. Many composers like to auto-load massive virtual instrument templates so that they are able to have an entire orchestra and more available for instant playability. It is extremely rare that all instruments in such templates will be actively playing at the same time. Activity in such projects, and even more typical pop, rock, and electronic productions, is usually sparse in comparison to the track count. It would be ideal if only the instruments that are playing consumed CPU resources. This is what our “Suspend On Silence” feature accomplishes, allowing huge projects to be loaded with one instance of Precedence and one instance of Breeze 2 on each and every track if desired. If the project has 200 tracks, but the maximum number of tracks that play simultaneous is only 10, this feature saves approximately 95% of the CPU resources that would normally be consumed! Furthermore, if projects are left open for long periods of time such during a lunch break or overnight, CPU resources are not being consumed when there is no activity, and thus electricity consumption is also lower saving you money on your electric bill and keeping your studio from overheating.

TIP: It does NOT consume additional CPU resources simply to load many instances of Breeze 2. CPU load only increase when many instances are actively playing at the same time!

Breeze 2.5 now solves the second, convenience, issue as well by introducing Link Mode, Multi-Instance Editing, and Global Broadcast. We have made it exceptionally convenient to manage tens or hundreds of instances of Breeze 2 together with Linked instances of Precedence. Managing 100 instances is now roughly just as easy as managing one, and in some ways it is even easier than having to constantly interact with the DAW mixer.

TIP: Managing 100 instances of Breeze 2 is now just as convenient as managing one!

Possible Workflows

There are several distinct workflows possible with Precedence:

1. Single Independent Instances, Standard Mode
2. Single Independent Instances, Link Mode without Precedence
3. Single Independent Instances, using Precedence Link
4. Multi-Instance Editing, using Precedence Link
5. Multi-Instance Editing, without using Precedence

The first workflow is the traditional reverb workflow that has persisted in DAWs since their introduction. A small number of instances are loaded on FX bus channels and fed signal via using Sends. The Standard DSP mode can be used for such needs, which utilizes a traditional wet/dry Mix control in percent as described earlier in the manual. All parameters are isolated and update only the associated behavior of the changed parameter. (i.e. changing Mix does not affect Pre-Delay or other aspects of the DSP.) For some styles of music this is an acceptable way to work. It is perfectly fine to work with Breeze in this manner if desired. We can do much better however, when truly authentic spatialization within a virtual acoustic environment is the goal.

The second workflow removes the shared reverb instance(s) from the send bus(es), and instead moves them directly to track inserts. We enable the Link Mode DSP behavior. In this mode the Mix parameter is replaced with a Distance parameter, and changing Distance not only changes the wet/dry balance, but also updates almost the entire Breeze algorithm to augment the sense of moving elements deeper into the sound stage. This takes the guesswork out of manually adjusting things such as Pre-Delay and many other more complex parameters to establish the correct distance psychoacoustic cues.

The third workflow pairs each instance of Breeze 2 with a Linked instance of 2CAudio Precedence, using the Link Mode DSP, and Precedence Link. Inter-plugin communication is established between each instance of Precedence and Breeze so that adjusting parameters in either plugin updates both linked plug-ins automatically. The pair is Linked so that Precedence and Breeze synergistically function as a cohesive process, creating a unified spatialization process. Each track has two plugins on it, and to change parameters on any track the Precedence and/or Breeze GUI editor for each track still must be opened. This workflow works best when a limited number of tracks will use Precedence and Breeze, and other tracks may continue to use traditional methods and/or third party spatialization tools.

The fourth workflow allows many instances of Breeze 2 to each share a single GUI Editor. Instance selection can be changed within the single GUI window so that it becomes possible to change settings for many instances of the Breeze without having to open and close each instance's GUI window. This can be a real time-saver in complex sessions. Additionally in this workflow we combine Multi-Instance Editing with Precedence Link. Precedence functions as the "command center" to facilitate instance selection from its Position Display. A single GUI editor of Precedence can control the DSP of many instances of Precedence AND many linked instances of Breeze 2. We can even enable Selection Sync in Breeze so that we can open a single Breeze 2 GUI editor along side Precedence and the entire Breeze 2 GUI will update in sync to the instance selection made within Precedence, allowing us to make ultra fast edits to many instances of both Precedence and Breeze, for ALL parameters on both GUIs, not only those parameters directly related to Precedence Link.

To further explain the fourth workflow, Precedence shows the position of many instances of simultaneously from within a single GUI. Not only are multiple instances shown simultaneously within the Precedence Position Display, but instance

selection can also be made within the Position display and changes to ANY parameters on the GUI will apply to the selected instance, which does not need to be the instance that was opened in the host. Linked Breeze instances will follow the section made in Precedence, allowing fast edits to additional reverb-specific parameters in Breeze.

For example a rock song may have a lead vocal, guitar, bass, and drums. Each track has an instance of Precedence and Breeze, and all four instances join an Edit Group 1 (explained below). If we open the Precedence and Breeze instances that are on the lead vocal, not only do we see the lead vocal in Precedence, but we also see the position of the guitar, bass, and drums instances well. We can freely move the position of all 4 instances from within the same GUI. If we change the position of the Lead Vocal instance, it will update DSP settings in both Precedence, and the linked Breeze instance. You will notice the Breeze GUI will update in response to changes in made in Precedence! Furthermore, if we select the guitar instance, ALL parameters on the GUI now display the parameter values for this Guitar (selected) Instance, NOT the Vocal (host) Instance. You will notice the open Breeze GUI window changes automatically to its Guitar instance as well. If we change position of Guitar instance in Precedence, we change both the settings of both the Precedence and the Breeze instance on the Guitar track, even though we originally opened the GUI editor window from the Guitar track. The Breeze GUI window does not even need to be opened and changes will still be made to linked instances via Precedence.

It is also technically possible, as a fifth option, to use Multi-Instance Editing within Breeze without Precedence. Instance selections can be made within Breeze via the Instance Menu. This may be faster than having to navigate back to the DAW mixer and opening another instance's GUI editor. Generally speaking however, we find Multi-Instance Editing to be most powerful when used together with Precedence, where it functions as the instance management command center as well as performing its own DSP tasks.

There is one final masterstroke: Global Broadcast. Global Broadcast allows you to make macro changes to all members of an Edit Group. If you have 100 instances of Precedence and Breeze 2 loaded, all part of Edit Group 1, and you find the particular preset you are using in Breeze has a slightly too long decay time, you simply enable Global Broadcast and change Reverb Time in Breeze. When Global Broadcast is enabled, the changes do not only apply to the Selected Instance within the Multi-Edit Group, but rather ALL members of the Group. **You can change parameter values for hundreds of instances with a single mouse-action! You can even change entire presets using Broadcast!** This allows the entire Edit Group, which may potentially consist of tens or hundreds of instances, to behave a like a single instance that is shared on a Send Bus! Editing 100 instances is just as fast and convenient at editing one! There is a very big difference however, in that the position data for every instance in the Edit Group is not part of the standard preset data, and therefore when changing presets, you can change the "global environment" aspects as a group, but the position data will remain specific to each instance! Additionally, each instance will automatically have its own subtle variation of the general preset so that no two instances are ever exactly the same, augmenting realism! Welcome to the next generation of spatial processing!

Tip: Precedence Link combined with Multi-Edit Groups and Global Broadcast represents the next generation in spatial processing both in workflow and in sonic results!

Link Mode

Breeze 2.5 has two different operation modes. The Link Button switches between these two modes:

- **Standard Mode** (Link Disabled): instances are managed independently and often used on FX busses via Sends and parameters remain independent from one another
- **Link Mode** (Link Enabled): a novel distance-based mode that has been designed primarily with the idea of using many instances in parallel directly on track inserts as part of a unified virtual acoustic environment. The Mix

control is replaced with a Distance control, and the entire Breeze algorithm updates appropriately depending on the Distance value, which may also be synched to a linked instance of 2CAudio's Precedence product.

When the Link Mode is enabled, two separate but related behaviors are changed in Breeze:

- **Distance Link DSP Mode** is activated
- **Precedence Link Mode** is enabled (but not automatically active)

*Note: It is possible to use Distance Link DSP Mode without Precedence. In order for Precedence Link to be active, there must be an **Instance Name Match** with an instance of Precedence. If no **Instance Name Match** is found, Breeze is NOT linked to Precedence, but it remains possible to use the Distance Link DSP Mode in Breeze, and simply control its position-related parameters manually within Breeze.*

Tip: The state of the Link Mode Button is NOT affected when changing presets. It is possible to browse presets in either mode without causing changes to the Link Mode state. Position-related parameters also do not change when changing presets as discussed in detail below.

Distance Link DSP Mode

Overview

The Distance Link DSP mode is a special operation mode where the entire Breeze 2 algorithm is retuned, making it optimized for and responsive to changes to the Distance parameter. The traditional Mix parameter is replaced with a Distance parameter and changes to it not only effect wet/dry balance, but also effectively cause the entire algorithm to update appropriately to augment the sense of distance and depth created by the algorithm.

In a real physical acoustic space if impulse responses are taken at different locations within the space, or the microphone position is kept static but the sound source changes position, the resulting impulse responses are never the same. Each position has its own unique impulse responses and embedded within these impulse responses are psychoacoustic cues that help establish distance, depth and positional cues. In the traditional music mixing method of using a shared reverb instance on a FX Bus, the impulse response is effectively identical for all instruments in the mix and the only variable is wet/dry mix as controlled by the gain values on each send that is feeding the shared reverb instance on the FX bus. This is rather crude approximation. It is improved quite significantly by using a tool such as Precedence on all track inserts, but even then, ideally many aspects of the reverb's internal "secret sauce" should change and update in response to position information.

This is what the Distance Link DSP mode achieves. The simple act of changing the Distance parameter will produce an infinite variety of impulse responses from Breeze; all with the proper "secret sauce" DSP changes that help establish depth in the mix depending on the Distance value. Moreover, we use "impulse response" here loosely; the entire process is actually algorithmic and variable with time due to modulation as would occur in the real world. Thus we have an infinite set of positions within the same general space, where each of them is already itself an infinitely variable time-varying process!

Tip: Distance Link DSP Mode effectively creates an infinitely time-varying Algorithmic Multiple Impulse Responses system. It is designed to be used when inserting Breeze directly on track inserts, not on shared busses.

Distance Link DSP Mode Additional Parameters

When using the Distance Link DSP Mode, a few additional expert parameters are available on the Main page of the GUI as well as on the "Big Time View" of the GUI:

- **Mix Mode**
- **PD Adjust**
- **DR Adjust**
- **Angle**
- **P-Mode**

Mix Mode

On the lower right of the Main Page of the GUI when in Link Mode, you will find a switch GUI element. This is the same functionality that is achieved by the clicking on the Mix/Balance label in the Standard Mode.

- **Left Position = Mix Mode:** In this mode no additional processing is applied to the direct sound. It remains dry, and is mixed unaltered with the wet output of the full Breeze engine.
- **Right Position = Balance Mode:** In this mode additional spatial processing is applied to the direct sound. The direct sound itself is also spatially enhanced, augmenting its sense of depth. This “enhanced direct energy” result is mixed with the wet output of the full Breeze engine.

Tip: The Balance Mode can be particularly effective with the Breeze Chamber Alg Modes on all source types including transient material such as drums. It can also work quite well on orchestral instruments with slower attacks such as a string ensembles when using the Breeze Hall Alg Modes.

PD Adjust

Pre-Delay Adjust replaces the normal Pre-Delay parameter found on the Main Page of the GUI when using Link Mode. In the Standard Mode Pre-Delay is always simply set exactly the value the user specifies via the Pre-Delay parameter. In Link Mode, an appropriate Pre-Delay is set for the user according the current Distance and Size parameter values and a few other things. This takes the guesswork out the process automatically, simplifying the life the user.

PD Adjust is offered to appease preset designers, tweakers, and control freaks (we mean all of this as a compliment of course) to have additional control over the exact mapping of Distance to realized Pre-Delay.

- Positive values cause Pre-Delay to become larger faster with respect to increases in Distance.
- Negative values cause Pre-Delay to stay smaller longer with respect to increases in Distance.

As an example, if a particular preset has strong negative Contour values, and strong positive Shape values it will typically have quite a slow attack envelope. Such settings may benefit from having lower values of PD Adjust to keep the total time it takes to reach the peak of impulse response a little shorter.

DR Adjust

Direct Reflected Adjust provides advanced users and preset designers the ability modify exactly how the Distance parameter changes the energy balance between Direct energy and Reflected energy. In simplistic terms this can be thought of as remapping a particular Distance value to a given wet/dry mix value. It should be noted that 50% Distance in the Link Mode does not typically create the same result as 50% Mix in the Standard Mode. The Distance mapping is done in a manner that maximizes the useful range of the parameter, and achieves the most useful results possible when paired with Precedence. The default value is our starting recommendation, but DR Adjust allows this to be further customized to user taste:

- Positive values cause the signal to become “weter” faster, at smaller Distance values.
- Negative values cause the signal to stay “drier” longer with respect to increases in Distance.

In real physical spaces changes to the Direct to Reflected Energy Ratio with respect to Distance would also depend on various properties of the enclosed acoustic space such as its size, geometry, and building materials; thus there is no exact universal formula that can be applied. As such we offer advanced users the ability to customize this behavior some as desired.

Note: In general, this is an advanced parameter that can normally be left as is found in presets.

Angle

Like Distance, Angle is also a parameter found in Precedence. It is provided with Breeze as well as a matter of convenience so that the value can be changed in either location depending on which GUI editor is currently being used. Angle does introduce some “secret sauce” changes within Breeze as well, though the more prominent effects come from a Linked instance of Precedence in this case.

Precedence Alg-Mode

Like Distance and Angle, Precedence Alg-Mode is also a parameter found in Precedence. It is provided on the Breeze GUI as well as a matter of convenience so that the value can be changed in either location depending on which GUI editor is currently being used. Precedence Alg Mode does introduce some “secret sauce” changes within Breeze as well. Each mode causes some variation to the resulting Breeze DSP algorithms, which are modified a bit to achieve the best possible paring with the current Precedence mode.

Precedence Link

Overview

The Precedence Link feature establishes inter-plugin communication between Precedence and 2CAudio reverb engines such as Breeze 2. This allows parameter updates in Precedence to be communicated to the reverb engine, which automatically updates its own parameter values and complex set of internal DSP settings to reflect changes made to the position established in Precedence. Parameters that are specifically related to position such as Angle and Distance, as well as the Precedence Algorithm Mode, and a few others are communicated to and from the reverb engine in a bi-directional manner. These parameters are shown on the reverb engine GUI as well and can be edited either in Precedence or in the reverb for maximum convenience. They will remain synched regardless of where they are edited.

Breeze 2 is responsible for establishing a global virtual acoustic environment. Precedence is responsible for positioning objects within this virtual acoustic environment. Precedence supplies the vast majority of the lateral azimuth positioning via its Angle parameter. The duty of Distance and depth placement is shared between Precedence and the reverb engine. As mentioned in the Loss Parameter section of the manual, Precedence produces loss to gain and high frequency energy and introduces other sophisticated distance cues. In an open environment with no reflecting surfaces such as being suspended in the middle of the sky, or in the middle of a very large anechoic chamber, these would be the only cues available to perceive distance. When experiencing sound in an enclosed environment however, such as a concert hall, room, chamber, church, or other enclosed location where music heard 99.9% of the time, additional cues help establish distance, and these cues are generally more relevant to music production.

In an enclosed environment such as a concert hall, other very important distance cues occur:

- Direct vs. Reflected energy balance, i.e. Wet-Dry Mix in traditional audio engineering reverb terminology
- Initial Time Gap, i.e. Pre-Delay in traditional audio engineering reverb terminology
- Additional sophisticated distance-based changes can occur as well, such as changes to the envelope contour, the relative balance between discrete early reflections versus diffuse late reflections energy, and more

In the music production context these cues are often more useful than extreme gain and high frequency loss. Mix engineers have long used reverb mix levels to intuitively establish front-to-back depth and distance placement in the mix.

TIP: Sounds that are close to the listener generally have more direct energy and less reflected energy, while distant sounds have less direct energy and more reflected energy, i.e. they have a higher Wet-Dry Mix setting.

Using pre-delay properly to help establish distance and depth, however remains a mostly misunderstood black-art, even though the general rule is simple:

TIP: Sounds that are close to the listener generally have more pre-delay, and distant sounds have less pre-delay.

The more sophisticated changes are even more esoteric and generally known only by algorithmic reverb designers and psychoacoustic research scientists. They are certainly not the type of details musicians enjoy thinking about while working on music production, yet when properly established they do an excellent job of augmenting the sense of distance and depth.

All of these cues are very important to the perception of distance and depth within the type of enclosed environments where music is normally experienced. They are the domain of the reverb engine, and should be consistent with other characteristics of the global environment such as its current size and geometry. In a truly authentic virtual acoustic model, changes to Distance would ideally result both in changes to the local psychoacoustic cues created by Precedence, as well as those heavily influenced by the enclosed environment as created by the reverb engine. Ideally this would all be automatic so that musicians are free to think about more important things such as making music. **Welcome to Precedence Link!** This is exactly what it offers.

TIP: When using Precedence Link, Breeze 2 tracks changes to position within Precedence and its internal DSP settings are readjusted completely to intelligently compliment settings in Precedence. Distance cues are supplied both by Precedence and by the reverb engine in synergistic manner consistent with acoustic reality. The process is completely automatic and transparent to users allowing them to focus on the music.

TIP: Precedence Link becomes even more powerful when combined with Multi-Instance Editing and Global Broadcast.

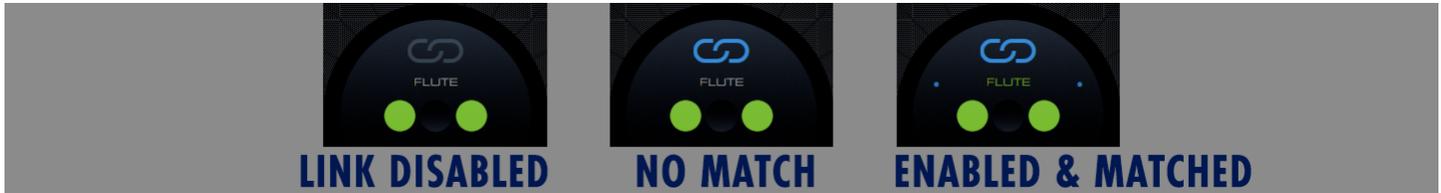
Precedence Link Setup

To setup Precedence Link three easy steps are required:

1. Instantiate Precedence and a Precedence-aware reverb engine such as Breeze 2.5, directly on a track as inserts, with Precedence coming **BEFORE** the reverb
2. If it is not already enabled, click on the Link Button in Precedence to enable Link Mode in Precedence. It should be enabled already by default.
3. Click on the Link button in Breeze to switch to its Link Mode, turning on Distance Link DSP Mode, and enabling Precedence Link
4. Check the instance name/ID matches in the instances of Precedence and Breeze 2 that you wish to Link.

Names will be auto-populated with "ID 001, ID 002, ID 003..." as they are instantiated in the DAW. Double-clicking on the name field will allow you to change the names to something more meaningful such as Flute, Lead Vocal, Acoustic Guitar, Bass Synth, or whatever you like. When there is a successful name match, the name text will become colorized and two small colored circle-dots will surround the name, indicating a successful link is established. If a link becomes inactive for some reason, such as a name change in only one of the linked plug-ins, the name formatting will revert to the non-linked format allowing you to easily identify this condition.

In Precedence the possible Precedence Link states look like this:



In Breeze the possible Precedence Link states look like this:



Names will be auto-populated with “ID 001, ID 002, ID 003...” as they are instantiated in the DAW. Double-clicking on the name field will allow you to change the names to something more meaningful such as Flute, Double Bass, Lead Vocal, Acoustic Guitar, Bass Synth, or whatever you like. When there is a successful name match, the name text will become colorized and two small colored circle-dots will surround the name, indicating a successful link is established. If a link becomes inactive for some reason, such as a name change in only one of the linked plug-ins, the name formatting will revert to the non-linked format allowing you to easily identify this condition.

Note: At the moment Instance Names must be entered twice: once in Precedence and once in Breeze. If a name is changed in either plug-in, it must be manually changed in the other previously linked plug-in as well if you wish to keep the Link Active.

Tip: Names can be copy-pasted from the host DAW’s track names.

Tip: Name Match is case insensitive. These match: “flute” = “Flute” = “FLUTE”.

Tip: When using Multi-Instance Edit Groups (see below) we recommend renaming instances during setup and using Selection Sync between Precedence and Breeze to make Breeze instance selection follow Precedence. Open both GUIs of a linked pair of Precedence and Breeze side-by-side. Rename the instance name in BOTH Precedence and Breeze, change the selection in Precedence to select the instance you wish to rename (Breeze will follow), and repeat the process until all the instances are renamed.

Multi-Instance Edit Groups

Multi-Instance Editing Overview

Multi-Instance Editing allows a single GUI editor to effectively be shared by many instances of the plug-in, showing data from many instances and allowing parameter changes to be made to any or all instances within the current Edit Group. When using Multi-Instance Edit Groups, parameters on the GUI apply to the Selected Instance, which may or may not be the instance that was opened from the host (i.e. the Host Instance).

Multi-Instance Editing is most convenient when using Breeze together with Precedence, where the Position Display in Precedence will show the current position of all instances within the Edit Group, and simply clicking on any instance shown within the Position Display can change the instance selection. Instance selection in Breeze can be made to follow

selections in Precedence using Selection Sync, as explained below. Instance List Panels are also available in Breeze and Precedence and instance selection change be changed in this way was well, even without using Precedence.

For sake of illustration, let's consider a simple example: you have two tracks, Guitar and Bass, and they are part of the same Edit Group. If you open the Guitar instance from the host mixer, you will see not only the Guitar instance in the Instance List, but also the Bass instance. As a matter of convention, when you open any GUI editor, the Selected Instance will always be initialized to the instance that was opened from the host (i.e. the Host Instance). If you open the Guitar track instance, the Guitar instance will be selected and all parameters on the GUI will belong to the Guitar instance. If you make any edits to any parameter they will apply to the Guitar instance because that is what is currently selected. So far, this is the standard way of working with plug-ins.

If you change the selection from the Guitar Instance to the Bass instance however, the GUI will now display the parameters from the Bass instance even though the Guitar instance is what was opened from the DAW. If you change parameters while the Bass instance is selected, you are editing the Bass instance parameter data, NOT the Guitar instance, even though the Guitar Instance GUI Editor is what was opened from the Host.

The primary workflow of Multi-Instance editing involves using Precedence with its Position Display as a "control center" to manage many instances. This workflow is described in more detail in the Precedence manual.

In absence of Precedence, Multi-Instance editing can also be a simple matter of ergonomics and convenience, since it is generally much faster to change instance selection within a Breeze Edit Group than it is to close the current instance GUI, navigate to the host DAW's mixer, open another GUI editor for the desired instance, and potentially reposition the GUI window every time you want to make a quick parameter change.

Global-Broadcast also depends on Multi-Instance Edit Groups, and has tremendous value in reverb applications.

To facilitate the learning process of becoming familiar with the concept of Multi-Instance Editing, the Host Instance name (ie the instance the you opened from your DAW host's mixer) is also displayed on the Info page of the GUI in case you somehow become confused.

Tip: All parameters on the GUI follow the current instance selection. All parameters for any and all members of the Group can change from within a single GUI window simply by changing the Selected Instance. Any instance within the Edit Group can be opened from the DAW mixer, and it can be used to edit ANY or ALL group members.

Tip: An Edit Group may have tens or even hundreds of instances within it. Parameter data for all instances in the group is exceptionally fast to access and extremely simple to edit!

Changing Instance Selection

Instance selection may be changed in four ways:

- Clicking on any non-selected instance within the Precedence Position Display and using Selection Sync in Breeze
- Opening the Instance List from the menu button to the right of the Instance Name field in Breeze.
- Opening the Instance List or using the previous/next buttons from the Nav Bar, by switching the resource info area of the Nav Bar to Instance mode (This area can be used to show Presets, Color Preferences, or Instance.)
- **Using Keyboard Shortcuts Page-Up, and Page-Down will cycle through all available instances**

Tip: We advise you to practice using the keyboard shortcuts! One hand can use the shortcuts and the other can remain on the mouse for edits, enabling a lightning fast editing workflow!

Note: Some hosts may intercept Key-Commands or use said key-commands for their own actions. Consult your host to see if they can be disabled or reassigned if desired.

Edit Groups

To use Multi-Instance Editing, instances must be part of an Edit Group. Breeze offers 8 edit groups, as well as the ability to disable Multi-Instance Edit Groups and use Breeze in the traditional single independent instance workflow. These modes can be used at the same time: i.e. some instances can be part of an Edit Group while others can continue to be used independently. For simple to medium complexity projects a single Multi-Instance Edit Group may be sufficient for the entire mix. For complex projects multiple Edit Groups are offered to allow users to create different sub-mixes within large projects, where it may be desirable to group similar elements into Edit Groups instead of showing the contents of the full mix within a single Multi-Instance Editor. A few examples include, but are certainly not limited to, the following:

- Modern Scoring and Film, TV, or Game Mixing
 - Orchestra Group
 - Synth Group
 - Ambience and FX Group
 - Dialog Group
- Modern Orchestra
 - Strings Group
 - Brass Group
 - Woodwinds Group
 - Percussion Group
 - Choir Group
 - Non-Traditional Element Group
- Electronic Music
 - Synths Group
 - Drums Group
 - Real Instruments & Vocals Group
 - FX Group
- Grouping by Linked Reverb
 - Breeze 2 Group
 - B2 Group
 - Aether Group
 - 3rd Party Verb on Send Group

There are many other ways to use Groups. We recommend to start with using only one group to become familiar with the Multi-Instance Editing and Precedence Link workflow first, and then as your needs expand perhaps consider using multiple Edit Groups if and when needed.

Setup

To enable Multi-Instance Editing:

1. Instantiate Breeze and click on the Group button in the Nav Bar. The button will split into two buttons:
 - a. Global Broadcast
 - b. Group Number: right and left mouse click on the Group Number button will cycle through the eight available groups. Choose one.
2. Instantiate additional instances of Breeze and join the same Group Number.
3. Optionally, but recommended, double click on the Instance Name field to rename the instances from the default "ID 001, ID 002..." names to meaningful track names.

Note: *The maximum number of instances per Edit Group is 256.*

Selection Sync

When using Precedence Link to establish inter-plugin communication between Precedence and a linked Precedence Aware reverb engine such as Breeze 2, it is possible to keep the Multi-Instance Edit Selection synced between

Precedence and the reverb. When using this feature, the Precedence GUI may be kept open alongside the reverb GUI, and instance selection for both can be made from the Precedence Position Display. The selection will be automatically changed in the reverb engine when a new selection is made in Precedence. This allows an ultra fast editing workflow that is dramatically more convenient than having to open many instances from the Host. Selection is synched in both directions, so selection changes are possible from the reverb GUI as well, but we find it more convenient to use Precedence as the “command center” for Multi-Instance selection do the instance visualization found in its Position Display. See the Precedence manual for additional details.

Tip: Simply make a selection from Precedence, and in one click all parameters for both Precedence AND the linked reverb engine will be instantly shown and editable for the newly selected instance.

Limitations

Almost any and every possible user action can be made from any instance and operate on any other instance within an Edit Group. There are a few exceptions:

- **Changes to Edit Group Membership must be done to/from the Host Instance.** *If you wish to change the Guitar track from Group 1, to Group 2, you must open the Guitar track’s GUI from the DAW mixer. You cannot change Group membership if the Selected Instance is not currently equal to the Host Instance. (i.e. you can not open the GUI editor from the Bass instance in the DAW, change Multi-Edit Selection to Guitar, and then attempt to change the Group Number of the Guitar track. You must open the Guitar track editor if you wish to change the Group Number for the Guitar)*
- **Changes to Color Preferences and Color Preference Presets must likewise be done while the Selected Instance is equal to the Host Instance.**

Do to these limitations these actions are blocked from user changes until the Selected Instance is returned to being the Host Instance. As a reminder, if the Selected Instance is NOT the Host Instance, the Host Instance Node is shown as a colorized object in the Position Display, while all other instances are gray scale. The disabled state of the Group Number and color Preference colors are shown in the same color, as a reminder that if you wish to use them, you simply need to first click on the colorized Host Instance node in the Position Display (or equivalently, change the Selected Instance back to the Host Instance via the Multi-Instance List Menus.)

There is one other limitation:

- **For Selection Sync to work between Precedence and Linked Reverbs, the GUI editors for the Linked Pair must be opened.** *If you have Group 1 that consists of Guitar and Bass, and both tracks have Precedence and a linked Breeze 2 instance, you must open the GUI editors from the same track to use Multi-Instance Selection Sync. It does not matter which track they are opened from, but they must be the same track. You cannot open the Precedence GUI editor from the Guitar track, and the Breeze editor from the Bass editor if you wish to use Selection Sync.*

Global Broadcast

Rational

Dealing with many instances of a plugin can be tedious historically. Multi-Instance Editing makes it much easier already, but often it would be convenient to be able to change a parameter or two, or an entire preset en-masse for an entire Edit Group. This is what Global Broadcast accomplishes.

Tip: When Global Broadcast is on, any changes made to individual parameters, or even changes to all parameters via preset change are applied not just to the Selected Instance, but also to the entire Edit Group!

Global Broadcast within Breeze is extremely valuable. Breeze establishes a virtual acoustic space, and Precedence positions elements within this space. In this paradigm many instances of the same general Breeze preset are loaded across all tracks. Each instance has built-in variations, but the entire set of many instances remains part of a unified whole. Users establish a relative spatial mix with the space created by Breeze via position information from Precedence, and use Precedence Link to communicate this information to the reverb instances, creating additional per-instance variations in the Breeze instances.

This level of realism is simply not possible with a single shared instance on a Send Buss. It is comparable to the difference between having one impulse response of one exact point in a concert hall versus hundreds taken at many different locations! The first method applies this single impulse response to every instrument in the mix, inevitably conveying that each instrument has originated from the same point with the environment. The second method allows each instrument to occupy its own unique space within the environment. In the case of Precedence and its linked reverb engine, we are not dealing with hundreds of impulse responses however; the variation is infinite, and time varying in an organic manner as well!

Once a relative spatial mix has been established however, it could also be desirable to make global changes to the environment. Perhaps we would like to hear how the mix sounds transported from Boston Hall to an LA Scoring Stage. Global Broadcast allows users to browse reverb presets to find the perfect environment for our mix. The relative spatial positions will remain intact, but the mix will be transported into a new virtual acoustic space! We can change our Hall to a Chamber or anything else imaginable. The environment changes just as easily as if it were a single instance on a send buss, but it is NOT just a single instance we are dealing with. We may have tens or hundreds, each with its own variable position, and its own innate random variations.

Tip: Global Broadcast makes managing many instances just as fast and convenient as managing one instance on a bus!

Tip: Global Broadcast allows you to change the positioning rules and macro aspects of the virtual acoustic environment, while retaining relative positions and automatically introducing variations in each and every instance even if they happen to have the same position.

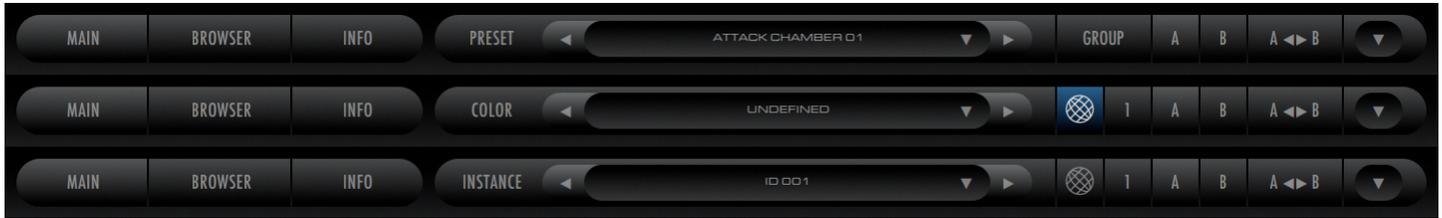
The Global Broadcast method does not enforce sync to be maintained between Edit Group members. You are free to turn on Global Broadcast, make a preset change, cascading the changes to all instances in the Edit Group, then disable Global Broadcast, and finally make any per-instance adjustments you might like! You will end up with an Edit Group that is mostly similar, but may have some important per-instance variations to further optimize specific tracks with special needs. In the Breeze this could mean slightly adjusting the reverb gain level for specific tracks, or changing the EQ filter for specific tracks, or any other possibility.

Tip: Breeze Alg-Randomize can even be used with Global Broadcast to introduce a new random behavior for all instances in the Edit Group! Even without doing this, there are already innate differences between instances, but these features allow even larger mutations within the Edit Group.

Setup

To use Global Broadcast, click on its button in the Nav Bar to the left of the Group Number. When it is enabled, the button will be strongly colorized in a manner that is intentionally visually loud and hard to ignore. This is a reminder that you may potentially be making changes to tens or even hundreds of instances.

Note: With great power comes great responsibility. Use Global Broadcast carefully. It is potentially possible to change many aspects of an entire mix with a single click.



Limitations

Almost every possible parameter can be changed via the Global Broadcast method. The only exceptions are the parameters that deal with position data and Precedence settings.

- **Angle** is intentionally blocked because it is part of position and the entire goal of the pairing of Precedence and Breeze is to establish different positions for all elements in the mix. Changing all instances to have the same Angle value would not generally be useful and it would be too easy to accidentally reset carefully crafted position values for an entire mix.
- **Distance** is intentionally blocked for the same reason.
- **Precedence Alg-Mode** is also intentionally blocked for the same reason.

Tip: Position information is safe with regard to changing Presets while Global Broadcast is active. When changing presets, Angle and Distance values are ignored automatically if using Edit Groups; thus they are not subject to Global Broadcast.

Browser Page Parameters & GUI Details

The Preset Browser

The preset browser page displays up to 120 world-class, professionally designed factory presets that are only a single click away and load instantly. When we say instantly, we really mean it--there is no waiting for an impulse response to load from your hard-drive or carpal-tunnel-inducing repetitive scanning through nested sub-folders like as is common in competitive products. A quick scan through these presets will allow you to quickly find exactly the right sound you need for your application.

Breeze 2.5 ships with over 480 factory presets. 4 Additional Preset Expansions are also available for purchase:

- **Simply Better Breeze Expansion**
- **Glacier Breeze Expansion**
- **Spatial Creatives Breeze Expansion**
- **Simplicity Breeze Expansion**

More presets may become available in future as well. As such, Breeze offers a huge number of presets to choose from, and management and organization of these presets becomes important to maintain maximum ease of use. In order to achieve that goal Breeze presets are organized into Packs and Folders.

Folder List

The Preset Browser Folder List is found in the left column of the Preset Browser. This area has two different levels of directory organization: one called Packages, and another called Sub-Folders. Packages are a collection of a single level of Sub-Folders, which comprise a particular collection of presets such as the Factory presets, the User presets, and Preset Expansions as they become available. Packages must have only one level of Sub-Folders. Sub-Folders contain preset files. All preset files must be found directly within these Sub-Folders.

Packages may be expanded or collapsed. When collapsed, they do not show their Sub-Folder contents, and are not selected. Clicking on a collapsed Package will expand it to show all sub-folders. All Sub-Folders within the Package will be automatically selected as well, and add all of the preset files contained within these Sub-Folders to the File Browser results. Clicking on an expanded Package will collapse it, deselect all of its Sub-Folders, and thus remove all of the preset files contained within these Sub-Folders from the File Browser results.

The following actions are possible in the Package & Sub-Folder List:

- **Select Individual Packages:** Clicking on a single collapsed Package will automatically expand the selected Package, select all of its Sub-Folders, and display the Sub-Folder contents in the File Browser. Additionally it will collapse and de-select all other Packages, and remove all of the preset files contained within these Sub-Folders from the File Browser results.
- **Select Multiple Packages:** Shift-Clicking on multiple Packages will allow multiple Packages to be expanded and selected.
- **Select Individual Sub-Folders:** Clicking on a single Sub-Folder will automatically de-select all other Sub-Folders, select the current Sub-Folder, and display its contents in the File Browser.
- **Select Multiple Sub-Folders:** Shift-Clicking on multiple Sub-Folders will allow multiple Sub-Folders to be selected and display their contents in the File Browser.

Select All & None

Two additional selection tools are offered for Packages:

- **Select All:** Clicking on this button expands all Packages, selects all Sub-Folders, and displays all of their contents in the File Browser.
- **Select None:** Clicking on this button collapses all Packages, de-selects all Sub-Folders, and removes all preset files from the File Browser results.

The general idea of the Package and Sub-Folder scheme is to make it easier to find what you are looking for as well as to have an easy way to browse the contents of a newly purchased Preset Expansions.

File Browser

The Preset Browser File list displays the contents of the currently selected Sub-Folders. Selected Sub-Folder names are also included in the display area as well, and are clearly delineated from Preset names to achieve maximum organizational clarity. This makes it clear at a glance which folder a given preset belongs to. The active preset selection is highlighted by a different background color. File Browser results are also subjected to the current Keyword Search keywords.

Scrollbars, Increment & Decrement

To the left of the Package and Sub-Folder List and at the bottom of the File Browser are found scrollbar interface elements on an as-needed basis. If the currently selected contents exceed the available size of these areas to display them, scrollbars become available to allow you to scroll as needed to see the full contents available. Increment and Decrement buttons are also offered to shift the viewable contents one row or column at a time.

Keyword Search

Above the File Browser Breeze offers three text-entry fields that can be used for keyword searches. Breeze will search the preset contents of the currently displayed presets found in the File Browser and adjust its contents to only those presets that match the keyword search. Keyword search is applied only to selected Sub-Folders. If you would like to search across any and all presets, found in any Sub-Folder, from any Package, use the Select All button to be sure all presets are available for searching.

Keyword Boolean Mode

Three Keywords are offered for searching. These three Keywords can use either Boolean AND or Boolean OR logic to determine if a given preset is a match or not. The Boolean Mode switch determines which logic rule is used.

- **OR:** the left state of the Boolean Mode switch, if **ANY** of the keywords match, the search is a match
- **AND:** the right state of the Boolean Mode switch, if **ALL** of the keywords match, the search is a match

OR will produce more matches than AND. The GUI iconography uses a Venn Diagram to denote these two states.

Advanced Keyword Search

In previous 2CAudio products, Keyword Search was limited to the Preset File Name. In Breeze search functionality has been extended to include Preset Author Name as well as to search for particular parameter values and ranges. Search functionality is quite sophisticated. Special syntax is used for these type of advanced searches

- **To search for Author Name use the “@” symbol before your text String.**
 - Partial matches will be found.
 - Many hosts do not like “space” characters, so it is best to avoid them and try partial matches.

- Example: to search for presets created by Andrew Souter search for “@Andrew” or “@Souter”
- **To search for Parameter Names and Parameter Values use the “\$” symbol before your text String**
 - Parameter Names and Values must be an exact match.
 - Parameter Names and Values are supplied in the appendix.
 - Depending on the parameter, some Parameter Values are text Strings, and others are numeric values
 - Numeric values are saved in floating point format. GUI values are displayed in percent. Therefore a value of 50% on the GUI is represented as 0.5 in a preset
 - The following operators are supported for numeric values: =, <, >, <=, >=
 - For String values use: =
 - If a parameter String value String has a space character in it, use “_” in place of the space.
 - Examples:
 - \$Time>0.6 : returns all presets with Feedback greater than 60%
 - \$AlgMode=ChamberA : returns all presets that use the “Chamber A” Algorithm mode.

All three search methods can be combined into a single query using the three keyword fields. For example:

- AND(Groove , @Andrew , \$Time>0.6) : returns all presets that contain the word Groove in the file name, were created by someone named Andrew, and have a Time value greater than 0.6 seconds.
- OR(@Simon , @Sascha) : returns all presets that were created by someone named Simon or Sascha

Random Preset Selection Tools

Two Random selection tools are offered to make random preset selections to encourage happy accidents and inspire creativity.

- **Random Folder (Solid Dice):** selects a random file from within the currently displayed File Browser results, which can come from and of the currently displayed Sub-Folders shown in the File Browser.
- **Random File (Outline Dice):** selects a random file from within the currently displayed File Browser results, which comes from the same Sub-Folder as the currently selected Preset File.

Note: Random selections are chosen only from within the current display results, which are a function of Sub-Folder selection in the Package and Sub-Folder List, as well as the action of any current Keyword Searches.

Author Name & Info Display

The Author Name and Info display shows the Author Name and Author Info for the currently selected preset. This is helpful to note for search functionality if you like the style of a particular preset designer and would like to find more of his or her work. It also encourages people to share presets and become involved in the community.

Info Page Details

Preferences

The Preferences tab of the Info Page contains options that control the general look and behavior of the GUI as well as other miscellaneous preferences. Preferences may be changed either by directly clicking on the text field button that displays the current preference setting, or by using the associated drop down menu to directly select the desired option.

All changes to preferences take place immediately and it unnecessary to reload the plugin if dealing with a single instance. When using multiple instances of Precedence in a host project, changes to Preferences are global for all instances of Precedence; however, the host project file must be closed and reopened before all instances of Precedence will use the new Preferences. In other words, changing Preferences in a single instance of Precedence will change the settings for all instances in the project, but the project file must be closed and reloaded to automatically switch the Preferences of all of the other instances used in the project.

Font Size Adjustment Slider

The font sizes used for most GUI elements can be scaled up or down to suite personal preference. Font size scales non-linearly with GUI size already, and the base font size should be reasonable for all GUI sizes. However in modern times with high DPI screens, and potentially huge display sizes, we find that using smaller font sizes can generally look a little more eloquent and allow the GUI design to breath a little more. Alternatively, users who need visual assistance can opt to use extra large fonts to improve readability if needed.

GUI Size

Precedence offers over 30 different GUI sizes all the way from “itsy-bitsy” to ultra huge full screen height 4K, 5K, and larger resolution. The menu options display the GUI size in X & Y pixel dimensions.

Note: *exact resulting pixel dimensions may also depend on OS settings if/when using on high DPI screens*

Tip: *Our GUIs look extremely sexy at huge sizes with font size adjustment set to small values such as the minimum of negative 100%. We are fully prepared for 4K, 5K, 6K, and even 8K or higher display resolutions and are big advocates of high-resolution displays. We advise users to use at least 4K displays whenever possible. The software experience as a whole, not just for 2CAudio products, is much better on high-resolution displays, in our opinion. As of 2019, 4K displays are also already very economical.*

Tip: *720*720 is the default GUI size for sake of compatibility with smaller legacy displays, but we strongly recommend to use a larger GUI size such as 1440*1440, particularly when working with Multi-Instance Edit Groups, where one GUI can be used to change parameter values for many instances, eliminating the need to open multiple GUI editors simultaneously.*

Show Values

The Show Values preference allows you to control how and when the numerical values of each knob are displayed. Changes to this preference take place immediately. This preference has three options:

- **Always:** Numerical values are displayed on all large knobs at all times—the default behavior
- **Never:** Numerical values are never displayed on any knob unless the knob is in Text Entry mode. This mode is designed to force users to use their ears when adjusting parameters instead of relying on using their eyes, mind, and numerical affinity.

- **While Tracking:** Numerical values are displayed only on the knob that is actively being changed by the user. This mode provides a minimalist GUI aesthetic while still communicating the relevant numerical feedback when it is needed.

Show Trackers

Trackers are pop-up displays that show numerical values and other parameter data for GUI elements that may not show numerical values themselves. Sliders are a good example. This preference has three options:

- **Never:** Tracker values are never displayed. Like above, this mode is designed to force users to use their ears when adjusting parameters instead of relying on using their eyes, mind, and numerical affinity.
- **When Changed:** Trackers are shown when the associated parameter is being changed.
- **On Mouseover:** Trackers are shown when the mouse cursor is held over the control for more than 1 second.
- **Both:** Both When Changed, and also On Mouseover – the default behavior

Show Labels

Labels are used for the circle node(s) in the Position Display to identify which instance a particular circle represents when using Precedence's Multi-Instance Edit Group functionality. Labels are automatically off if not using Multi-Instance Edit Groups. This preference has three options.

- **Never:** Labels are never displayed
- **On Mouseover:** Labels are shown when the mouse cursor moves over a circle node
- **Always:** Labels are always displayed -- default

Load Last

The Load Last Preference determines what preset settings are loaded each time a new instance of the plug-in is loaded.

- **Yes:** The last settings used by the plug-in are remembered and recalled when loading the new instance.
- **No:** The internal default values for all settings are loaded each time a new instance is loaded.

Load last can be especially useful when using audio editor applications such as Magix Sound Forge, or Steinberg Wavelab where the normal workflow is to load the plug-in and apply it to a single stereo audio file and then close the plug-in automatically.

Report Tails

The Report Tails preference determines whether or not Breeze attempts to communicate the actual realized reverb time length (i.e. The Tail) to the host application. Some hosts feature CPU saving-techniques where processing is suspended when there is no active audio region passing sound into the plug-in inserts in the mixer. This can potentially create issues for plug-ins such as reverbs and delays that continue to produce output long after the input audio region has stopped playing. Most hosts are able to correctly handle these situations without additional effort on our behalf, and it is not necessary to use the "Report Tail" setting. Some hosts are not quite as advanced however, and for these hosts we offer the "Report Tail" setting to keep the tails from being muted when no audio regions are active. Changes to this preference take place instantly. This preference has two options:

- **Do Not Report Tail:** This mode does not attempt to report the tail length to the host, and is the default.
- **Report Tail:** This mode attempts to report the tail length to the host, to accommodate rare situations where the host does not do this automatically.

Color Tab

The Color Tab holds controls that allow users to customize the color of the GUI and achieve fairly drastic modifications to the general look and feel of the GUI. Approximately 300 pre-made Color Preference Presets are already supplied with the shipping product that demonstrate the extreme variety of looks that are obtainable with 2CAudio's GUI Color system. Color Preference Presets are comprised of all of the settings found here on the Color Tab on the INFO page. The large collection of factory-supplied Color Preference Presets may be enough for most users, but the Info Page Color Tab exposes these parameters to users to allow you to adjust color settings as desired to create an infinite variety of personalized GUI themes, which can be saved as User Color Preference Presets.

Tip: Changes to any of the Color Preference parameters are reflected in the GUI instantaneously. The effect of each parameter will be visible and intuitive as it is changed. Users are encouraged to experiment as desired, and the descriptions below are likely redundant. Control/Apple Click on any parameter will reset it to its default value.

Object & Panel Colors

The GUI design makes use of multiple colors. Some GUI objects such as Knobs, Sliders, and Data Displays use intense colors to communicate parameter values and differentiate similar GUI objects. We call these Object Colors. Object Colors generally communicate parameter data in some way. It is also possible to colorize non-functional aspects of the GUI, such as the general backgrounds. We call these Panel Colors. The left column of sliders affect Object Colors, and the right column of sliders affect Panel Color. The double-wide Hue slider is global and effects all colors.

Hue

Hue is controlled in two ways:

- **Global Hue Slider:** controls the absolute hue of everything on the GUI, by applying an equal hue rotation to each and every Color Harmony Value. Musically you could think of this as like a reference tuning value such as A = 440hz. Hue is measured in degrees from 0 to 360 degrees and is cyclical like notes in a musical scale. 360 degrees gives the same value as 0 degrees.
- **Hue Color Harmony Values:** color targets can have relative offsets from the absolute Global Hue Slider value, achieving color harmonies. In the musical metaphor, you can think of these values as similar to notes in a chord. There are 12 evenly spaced values for each target just as there are 12 notes in a musical octave. They are spaced 30 degrees apart. This system makes it very easy to create various common color harmonies such as Complementary, Analogous, Triad, Square, Split-Complementary, etc. An Internet search for "Color Harmony" will provide more info if you are interested in this topic. There are multiple color targets:
 - **Primary Object**
 - **Secondary Object**
 - **Tertiary Object** (if available)
 - **Accent** (middle button in the Saturation row)
 - **Panel** (right button in the Saturation row))

Saturation

The Saturation controls affect color saturation, i.e. how distinct, far-from-gray-scale, colors are. The controls are:

- **Accent Saturation Switch:** determines if saturation tint is applied to GUI elements such as buttons and fonts
- **Object Saturation Slider:** controls the intensity of saturation for object colors
- **Panel Saturation Slider:** controls the intensity of saturation for Panel and Accent colors. This parameter is bipolar. Negative values give a different variation of the process.

Brightness

The Brightness controls affect color brightness, i.e. how far-from-black colors are. The controls are:

- **Brightness Mode:** switches the entire GUI between a Light theme, and a Dark theme
 - **Dark Theme:** a dark gray to black theme with light text to minimize eye strain (default)
 - **Light Theme:** a light gray to white theme with dark text to improve readability in high light environments (maybe you are checking your mix on a laptop at the beach, or just like to be generally cheerful?)
- **Accent Brightness Switch:** determines if the Panel Brightness slider effects accent colors such as buttons, fonts, etc. or just the background panels
- **Object Brightness:** controls the brightness of Object Colors
- **Panel Brightness:** controls the brightness of Panel and Accent colors

Contrast

The Contrast controls affect the general range or deviation of brightness values found in the GUI. The controls are:

- **Contrast Mode:** switches the entire GUI between a Standard and Duality theme variations
 - **Standard:** as described above in the Brightness Mode section (default)
 - **Duality:** a more adventurous design where dark objects are put on a light background or light objects are put on a dark background. This option is an exercise in pure aesthetics. It simply looks cool, fresh, and modern in some contexts with careful settings of the other parameter values.
- **Object Vibrance Mode Switch:** a subtle control that deals with the exact mapping of the human perception of color to computer display numeric RGB values. It is somewhat related to the concept of contrast, but at applied to a color space.
 - **Naive Mode:** a rigid mathematical mapping to RGB, that can provide very intense colors
 - **Vibrance Mode:** a more organic mapping that provides results that look closer to nature in most cases
- **Object Vibrance Slider:** controls the specific mapping used by Vibrance Mode (disabled if using Naive mode)
- **Panel Contrast Slider:** controls the range or deviation of brightness values used in background panels

Spectral

The Spectral controls are normally somewhat subtle and serve to create color variations within object and panel colors so that all pixels for a particular perceptual color actually have some variation as would happen in the real world with natural lighting and variable material properties. Extreme spectral values can create gradient effects. There are two controls:

- **Object Color Spectral Direction Switches:** changes the direction of the spectral effect for each object color
- **Object Spectral Slider:** controls the intensity of the spectral effect for object colors
- **Panel Spectral Slider:** controls the intensity of the spectral effect for panel colors

Color Preference Presets

The collection of all of the Color Preference controls can be saved and recalled as a Color Preference Preset. Precedence ships with many different factory Color Preference Presets which can be accessed from the Color Preference Preset

Menu ▼ as well as decremented ◀ and incremented ▶ from the supplied GUI buttons to allow fast Color Preference browsing. The Navigation Bar may also be switched to Color Preference Mode, to allow browsing Color Preference Presets from the Main page of the GUI so that users may see the result instantly as a matter of convenience while choosing one to use.

Note: the Color Preference Preset controls are disabled when using Multi-Instance Editing if the Selected Instance is not equal to the Host Instance.

User Name & User Info

User Name

The User Name field is used to tag user presets with the author name. Whenever a user preset is saved the User Name will be saved into the preset. When the preset is loaded, the name will be displayed in the Browser page to give credit to the author. This is useful when sharing presets with peers.

User Info

The User Info field is used to tag user presets with the author information. This information could be a web URL, a company name, a group name, a motto or slogan, or any other information you wish to include with your presets. It can be left blank as well. Whenever a user preset is saved the User Info will be saved into the preset. When the preset is loaded, the Info field will be displayed in the Browser page to give credit to the author. This is useful when sharing presets with peers.

Karma Boost

The Karma Boost area of the Info Page addresses product authorization. We call it Karma Boost because our motto here is “Do unto others as you would have done to yourself.” We do not employ authoritarian copy-protection schemes or hardware dongles. We prefer to treat our customers as our friends and make product authorization easy, non-invasive, and burden free. Our language choice in this area is designed to remind you that this sort of system is only possible with your support and reciprocation of our trust. We hope you will appreciate our decision and work with us to limit the distribution of pirated software. All we ask of you is this simple rule: “Do unto others as you would have done to yourself.”

Serial Number Field

The Serial Number Field is used to authorize the product as described in the “Installation & Authorization” section of the “Introduction” chapter of this document.

Version Number Display

The Version Number Display communicates the version of Breeze that is installed on your computer.

Authorization Status

The Authorization Status text field communicates exactly that. It can display several text strings:

- **Enter Serial:** This is displayed before the product has been authorized
- **Authorized:** This is displayed when the product has been properly authorized and the plug-in is functioning correctly.

Additional text stings are possible, but only occur when something is wrong. If encountered, please contact tech support.

Authorization Details

This area displays our friendly reminder regarding our philosophy on copy protection, and provides our blessing and appreciation for everyone who honors it.

Additional text stings are possible, but only occur when something is wrong. If encountered, please contact tech support.

Parameter Appendix

PARAMETER	UNITS	MIN VALUE	MAX VALUE	DEFAULT
Time	Seconds	0.125	32.0	2.0
Pre-Delay	Milliseconds	0.0	256.0	0.0
Contour	%	-100.0	100.0	0.0
Size	Meters	5.0	80.0	20.0
Shape	%	-100.0	100.0	0.0
Density	%	-100.0	100	0.0
Diffusion	%	0.0	100.0	50.0
Mod Depth	%	0.0	100.0	50.0
Mod Rate	Hertz	0.0625	16.0	1.0
Gain	dB	-inf	+12.0	0.0
Mix	%	0.0	100.0	50.0
Cross	%	0.0	100.0	50.0
Width	%	0.0	100.0	50.0
Damp P1	Hz	8.0	32768.0	4096.0
Damp P2	%	-100.0	100.0	0.0
Damp P3	%	-100.0	100.0	0.0
Damp P4	%	-100.0	100.0	0.0
EQ P1	Hz	8.0	32768.0	512.0
EQ P2	%	-100.0	100.0	0.0
EQ P3	%	-100.0	100.0	0.0
EQ P4	%	-100.0	100.0	0.0