

Master Perfection Suite™

Version 1.2

Software User's Guide



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<http://www.bias-inc.com/support.html>

Or, email: support@bias-inc.com

For customers preferring telephone assistance, (connect and toll charges apply), please have your computer running and close by the phone and call us at: +1-707-782-1865

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USA

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Credits:

Master Perfection Suite Software: Steve Berkley, Eric Eizenman, Guillermo Garcia, Wayne Jackson, Andrew Kimpton, David Ralley, Rick Sustek, Eric Johnson, Dan Spirlock, Ben Ventura

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Zac Wheatcroft

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Chapter 1: Introducing the Master Perfection Suite



Chapter 1: Introducing the Master Perfection Suite

Welcome!

Thank you for purchasing the BIAS Master Perfection Suite! This collection of powerful audio tools was designed in conjunction with professional audio engineers, based on their feedback and production needs. The Master Perfection Suite provides the ultimate tools for mixing, mastering, sound design, and analysis.

The Master Perfection Suite includes six professional audio plug-ins:

- GateEx – Gate/Downward Expander
- PitchCraft – Pitch Correction/Transposition/Modification
- Repli-Q – EQ Matching/Linear Phase EQ
- Reveal – 7 Advanced Analysis Tools in One Intuitive Interface (Peak/RMS Level Meters, Lissajous Phase Scope, Oscilloscope, Pan Power Meter, Peak/RMS Power History, Spectral Analyzer, Spectrogram)
- Sqweez-3 & -5 – Linear Phase Multiband Compressors/Expanders/Limiters
- SuperFreq-4, -6, -8 & -10 – Parametric Equalizers

Master Perfection Suite Features (All Plug-Ins)

- Powerful, professional audio processing
- Convenience – works with practically any Audio Units, RTAS/AudioSuite, or VST host on Mac OS X, Windows XP, and Windows Vista

- Easy-to-use and intuitive user interfaces with tools for practically any element of the mixing, mastering, or sound design process

GateEx Features

- User-Selectable Gate or Expander Functionality
- High-Precision Input/Output Level Meters
- Threshold Control
- Attack Control
- Release Control
- Depth Control
- Hold Control
- Hysteresis Control
- Lookahead Control
- Ratio Control
- Gain Control
- Waveform Display with Integrated Gate Threshold
- High-Precision Graph Display
- A/B/C/D Compare Snapshots
- Numerical Value Entry Fields

- Keyboard Parameter Nudging
- Parameter Automation (in Compatible Hosts)

PitchCraft Features

- User-selectable Reference Source
- User-selectable Pitch Range
- Pitch Transposition
- Formant Modification
- Automatic Formant Preservation
- User-selectable Pitch Correction Tuning
- User-selectable Pitch Correction Scale
- User-selectable Pitch Correction Key
- User-selectable Pitch Correction Time
- User-selectable Detuning
- Keyboard display with Current Scale Display
- User-Defined Custom Tuning Scale
- High-Precision Graph with Tuning History Display
- Tuning Meter
- A/B/C/D Compare Snapshots
- Numerical Value Entry Fields
- Keyboard Parameter Nudging
- Parameter Automation (in Compatible Hosts)

Repli-Q Features

- “Learn” Frequency Spectrum Function
- Save & Load Learned Frequency Spectrums
- User-selectable Reference Frequency Spectrum
- Save & Load EQ Function
- Spectrum Frequency Matching

- Spectrum Frequency Smoothing
- Gain Control
- Automatic Gain Compensation
- Soft Clip
- High-Precision Graph with Profile & EQ Spectrum Display
- A/B/C/D Compare Snapshots
- Numerical Value Entry Fields
- Keyboard Parameter Nudging
- Parameter Automation (in Compatible Hosts)

Reveal Features

- Peak/RMS Level Meters
- Lissajous Phase Scope
- Oscilloscope
- Pan Power Meter
- Phase Correlation Meter
- Peak/RMS Power History
- Spectral Analyzer
- Spectrogram
- User-Selectable Input Source
- Global Display Mode
- Individual Tool Display Mode
- User-Selectable Level Meter Range
- Global Freeze for all Displays
- A/B/C/D Compare Snapshots
- Numerical Value Entry Fields
- Keyboard Parameter Nudging
- Parameter Automation (in Compatible Hosts)

Sqweez-3 & -5 Features

- Includes two separate plug-ins (3 & 5-band editions)
- Automatic Gain Compensation
- Soft Clip
- User-Selectable Digital Ceiling
- Integrated Spectrograph Display
- High-Precision Input/Output Level Meters
- Gain Control – Global & Per Band
- Threshold Control
- Ratio Control
- Maximum Reduction Control
- Attack Control
- Release Control
- User-Adjustable Knee
- Individual Band Bypass
- Individual Band Solo
- Ratio/Max Reduction/Attack/Release/
Knee Parameter Grouping
- High-Precision Graphic Display with EQ/
Threshold/Both View
- A/B/C/D Compare Snapshots
- Numerical Value Entry Fields
- Keyboard Parameter Nudging
- Parameter Automation (in Compatible Hosts)

SuperFreq Features

- Includes 4-, 6-, 8-, and 10-Band Editions
- Peak, High Shelf, Low Shelf, High Cut, and Low Cut
Filters
- -18dB to + 18dB Gain Values

- .1 to 30 Q Values
- 20Hz-20kHz Frequency Values
- Individual Band Bypass
- -24 to +24 dB Logarithmic Output Level Control
- -24 dB Logarithmic Meters
- A/B/C/D Compare Snapshots
- Numerical Value Entry Fields
- Keyboard Parameter Nudging
- Parameter Automation (in Compatible Hosts)

Minimum System Requirements

Systems must meet the minimum requirements of the host application or platform when that is higher than the Master Perfection Suite minimum system requirements stated here.

To use the Master Perfection Suite on a Macintosh – you will need:

- G4, G5, or Intel-based Mac
- Mac OS X v.10.3.9, 10.4 (≥500 MHz processor), or
10.5 (≥867 MHz processor)
- ≥1 GHz processor recommended

To use Master Perfection Suite on a Windows PC – you will need:

- Intel P3/P4, Athlon w/SSE Instructions (≥800 MHz
processor)
- ≥2 GHz processor recommended
- Windows XP Home/Professional with Service Pack
2 or Windows Vista

Both:

- Compatible Audio Units (Mac only),
RTAS/AudioSuite, or VST host

- 256 MB RAM (512 MB RAM or higher recommended)
- 300 MB available hard disk space
- Color monitor, minimum 1024 x 768 resolution

For the most up-to-date info, please visit:

<http://www.bias-inc.com/products/masterperfectionsuite/>

About Your User's Guide

The Master Perfection Suite is designed to be powerful, yet intuitive. Your User's Guide is designed to help you set up and use the Suite for processing as quickly and easily as possible.

This User's Guide assumes that you are familiar with standard computer operating techniques, including:

- Setting up, starting, and using your computer
- Choosing commands from menus
- Clicking, double-clicking, selecting, shift-selecting, dragging with the mouse, and other common operations
- Opening, copying, saving and deleting files
- Opening, closing, scrolling, moving, re-sizing, and selecting windows

If you don't know how to perform these tasks, please refer to your computer's documentation and spend a little time learning about your computer before going any further. This will make working with the Master Perfection Suite much easier and more enjoyable.

The chapters in your Master Perfection Suite User's Guide are arranged in the order listed below, and will familiarize you with each plug-in's interface, controls, and parameters – and will give basic getting started tips for using them:

- Chapter 1 introduces you to the Master Perfection Suite and explains some of the requirements for using it

- Chapter 2 explains how to install, register, and activate the Master Perfection Suite
- Chapter 3 introduces you to GateEx
- Chapter 4 introduces you to PitchCraft
- Chapter 5 introduces you to Repli-Q
- Chapter 6 introduces you to Reveal
- Chapter 7 introduces you to SuperFreq
- Chapter 8 introduces you to Sqweez-3 & -5



Look for important tips and notes whenever you see this exclamation mark.

Getting Help with the Master Perfection Suite

This User's Guide will answer many common questions about each plug-in's controls. For additional help on usage and techniques, you may wish to access tutorials, technical support, and FAQs, all available via the BIAS website:

<http://www.bias-inc.com>

BIAS recommends using these resources before contacting Technical Support. The answers to most common technical questions can be found online. Best of all, using online help resources is free, easy, and available 24 hours a day, 7 days a week, 365 days a year. If you do need to contact Technical Support, please see the BIAS Technical Support Policy on page 5 of this user's guide.

Conclusion

Now that you know a little about the Master Perfection Suite, proceed to the next chapter to learn how to install your software and get started using it.

Chapter 2: Installation, Registration, and Authorization



Chapter 2: Installation, Registration, and Authorization

Installing the Master Perfection Suite

The Master Perfection Suite's auto-installer software makes installation very easy. The steps below will guide you through the process.

Your complete Master Perfection Suite system consists of:

- CD-ROM installer
- Serial number
- Authorization File



Before you install the Master Perfection Suite, please check the Minimum System Requirements on Page 13.



If you purchased any of the Master Perfection Suite plug-ins separately, you may choose to install only for which you have a serial number. If you choose to install the entire suite, please be aware that plug-ins you do not have a serial number for will operate only in trial mode for a limited time.

To install the Master Perfection Suite on a Macintosh:

1. If you are using any virus protection software, turn it off or temporarily remove it, and restart your Macintosh.
2. Insert the Master Perfection Suite installer CD-ROM into your CD-ROM drive – when it appears on your computer's desktop, double-click the BIAS Master Perfection Suite.mpkg icon.
3. The Installer will prompt you about running a program to determine if the Master Perfection Suite

can be installed – click Continue when this appears.

4. When the Installer dialog appears, click the Continue button.
5. Read the Software License Agreement – then click the Continue button to proceed.
6. Click the Agree button if you agree to the terms of the Software License Agreement.
7. Select the hard drive/volume on which you wish to install the Master Perfection Suite, and click the Continue button.
8. Click the Install/Upgrade button (depending on the configuration of your user account, you may need to enter your account password. If prompted for your password, enter it and click the OK button. If you do not know your account password, please contact your system administrator for assistance).
9. When the installation is complete, a message will appear indicating that the installation was successful. Click the Close button to quit the Installer. (Don't forget to turn back on any virus-protection software that you may be using the next time you restart the computer).

To install the Master Perfection Suite on a Windows PC:

1. If you are using any virus-protection software, turn it off or temporarily remove it, and restart your computer.
2. Insert the Master Perfection Suite Installer CD-ROM in your CD-ROM drive. If the Master Perfection Suite Setup program does not automatically launch, double-click the Install Master Perfection Suite icon.

3. When the InstallShield Wizard for BIAS Master Perfection Suite appears, click the Next button.
4. Read the Software License Agreement, and then click the “I accept the terms in the license agreement” radio button to continue with installation.
5. To install the Master Perfection Suite into the default directory (recommended), click the Next button (Vista users – skip this step).
6. In the Setup Type dialog, choose the Typical option (Vista users choose the Complete option), and click the Next button.
7. In the Select Program Folder dialog, click the Next button to continue with installation.
8. In the Ready to Install dialog, click the Next button to continue with installation.
9. When you are finished installing, click Finish to exit the installer.



At the end of installation, the Installer program will instruct you to authorize the plug-in – this is described later in this chapter.

What the Master Perfection Suite installs

The Master Perfection Suite installer automatically places various formats of the selected plug-ins, and documentation on your computer.

Mac OS X-based Systems:

The files and install locations for Mac OS X-based computers are described below:

Audio Units Hosts: (Peak, Digital Performer, GarageBand, Logic, etc.)

The installer automatically places the Audio Units format plug-ins into the following directory:

/Macintosh HD/Library/Audio/Plug-Ins/Components/

RTAS/AudioSuite Hosts (Pro Tools):

The installer automatically places the RTAS/AudioSuite format plug-ins into the following directory:

/Macintosh HD/Library/Application Support/
Digidesign/Plug-Ins/

VST Hosts: (Peak, Cubase, Live, Nuendo, etc.)

The installer automatically places the VST format plug-ins into the following directory:

/Macintosh HD/Library/Audio/Plug-Ins/VST/

Documentation

An electronic (PDF format) version of the Master Perfection Suite User’s Guide, and a Read Me file with late-breaking information are both installed into:

/Macintosh HD/Library/Documentation/BIAS/Master Perfection Suite /



Check the documentation included with your host application for more information on where it expects plug-ins to reside in order to function properly.

Windows XP & Vista-based Systems:

The files and install locations for Windows-based computers are described below:

RTAS/AudioSuite Hosts (Pro Tools):

The installer automatically places the RTAS/AudioSuite format plug-ins into:

/Program Files/Common/Digidesign/DAE/Plug-Ins/

VST Hosts: (Cubase SL/SX, Nuendo, etc.)

The installer automatically places the VST format plug-ins into the VstPlugIns folder of your VST host program.

Documentation

An electronic (PDF format) version of the Master Perfection Suite User’s Guide, and a Read Me file with late-breaking information are both installed into:

/Program Files/BIAS/BIAS Master Perfection Suite/

If you would like to register and authorize the Master Perfection Suite at this point, simply attempt to use one of the component plug-ins – when an unauthorized copy is first launched, the Welcome to Master Perfection Suite dialog appears – click the Authorize button to proceed to the BIAS Authorization Manager. Have your Owner’s Certificate handy, and follow the directions in the next section.

Registration & Authorization

The Master Perfection Suite must be authorized to work on your computer. You must register the Master Perfection Suite with BIAS in order to authorize it.

To register and authorize your software, you will need Internet access – either on the computer where the software will be used, or on another computer.

Serial Number-Based Authorization System

The Master Perfection Suite’s authorization system consists of the following components:

- **BIAS Authorization Manager** – A simple application for managing BIAS software licenses.
- **Serial Number** – Located on Owner’s Certificate, or on

the electronic receipt from a downloadable purchase.

- **Registration Account** – Your registration and authorization information on the BIAS Server.
- **Authorization Request File** – A file transferred from your computer to the BIAS server, which adds the computer you are authorizing to your BIAS Registration Account.
- **Authorization File** – A file transferred from the BIAS server to your computer, which authorizes it to run the Master Perfection Suite.



You must register with BIAS in order to authorize your computer – the Master Perfection Suite will not launch unless you authorize it.

The registration/authorization process provides the following services:

- Registers your software with BIAS – making you eligible for technical support and product updates.
- Authorizes your computer so it can run the Master Perfection Suite. You may authorize up to two computers for use with the Master Perfection Suite – for example, a studio or office computer, and a laptop for home or mobile use.



Keep in mind that for each license of the Master Perfection Suite – the software may only be used by one user, on one computer system at a time. If you have used both of your authorizations, and need to authorize a new computer, you will need to first deauthorize one of the authorized computers before you are issued a new authorization for the new computer.

To Register & Authorize a Computer to Run the Master Perfection Suite:

1. Attempt to run one of the Master Perfection Suite plug-ins in your host program – the first time it is opened on an unauthorized computer, you will be

prompted to use it in trial mode, or to authorize it – click the Authorize button.

2. When the BIAS Authorization Manager appears, select BIAS Master Perfection Suite 1.x in the “Please Choose a Product” section – then enter your Master Perfection Suite serial number (your serial number is printed on the Owner’s Certificate included in the Master Perfection Suite package, or on the electronic receipt from a downloadable purchase) and email address in the appropriate fields, and click the Authorize button.



Your serial number appears on the Owner’s Certificate, included in the Master Perfection Suite package, or on the electronic receipt from a downloadable purchase (not shown here).



If you use more than one email address, be sure to make a note of which one you registered with – this will make managing your BIAS Registration Account faster and simpler in the future.

- 3a. If you have previously registered another BIAS product, using the same email address, the Master Perfection Suite (or individual plug-in) will be authorized automatically – please continue to step 4.
- 3b. If the BIAS Registration system does not recognize your email address (i.e., if this is the first BIAS product you are registering, or if you enter a different email address than with previously registered BIAS products) – a dialog will appear, prompting you to enter your registration information. Enter your registration information, and click the Submit button – a dialog will appear indicating that you have been successfully registered – please continue to step 4.
4. A dialog will appear indicating successful authorization – click the OK button, and then click the Done button to exit the Authorization Manager, and begin using the Master Perfection Suite.



If you have purchased individual Master Perfection Suite plug-ins, be sure to select a specific plug-in in the step above, instead of the entire Master Perfection Suite. If you have purchased more than one, you will need to repeat the authorization process for each plug-in (plug-ins purchased separately will each have a unique serial number). Depending on how you access the BIAS Authorization Manager (i.e., launching the stand-alone version, or by instantiating an unauthorized Master Perfection Suite plug-in), you may need to click the “Show All BIAS Products” button, to have specific plug-ins appear in the Authorization Manager’s product list.

Alternate Methods of Registration/Authorization

If the computer on which you plan to use the Master Perfection Suite cannot be temporarily connected to the internet, even for this one-time authorization process, there are a number of other ways to register and authorize the Master Perfection Suite.

Registering & authorizing the Master Perfection Suite using another computer with internet access

To use this method of registration/authorization, you will need to run the BIAS Authorization Manager program

from your installer CD-ROM – or copy the BIAS Authorization Manager from your installer CD-ROM to the internet-equipped computer’s hard drive and run it from there.

To Register & authorize using another computer with internet access:

1. Attempt to open the Master Perfection Suite on the computer where it will be used (i.e., the computer without internet access) – the first time one of the Master Perfection Suite plug-ins is used on an unauthorized computer, the Welcome to Master Perfection Suite dialog appears – click the Authorize button to proceed to the BIAS Authorization Manager.
2. In the BIAS Authorization Manager dialog, select BIAS Master Perfection Suite 1.x in the “Please Choose a Product” section – then enter your Master Perfection Suite serial number and email address (your serial number is printed on the Owner’s Certificate included in the Master Perfection Suite package, or on the electronic receipt from a downloadable purchase).

 *If you have purchased individual Master Perfection Suite plug-ins, be sure to select a specific plug-in in the step above, instead of the entire Master Perfection Suite. If you have purchased more than one, you will need to repeat the authorization process for each plug-in (plug-ins purchased separately will each have a unique serial number). Depending on how you access the BIAS Authorization Manager (i.e., launching the stand-alone version, or by instantiating an unauthorized Master Perfection Suite plug-in), you may need to click the “Show All BIAS Products” button, to have specific plug-ins appear in the Authorization Manager’s product list.*

3. Click the Alternate Authorization button – the Alternate Authorization dialog appears.
4. In the Alternate Authorization dialog, click the Generate Authorization Request button – the

Serial Number/Email Address dialog appears.

5. Confirm that the email address and serial number are correct, and click the OK button to save an Authorization Request File to your hard drive.
6. Transfer the Authorization Request File to another computer that has internet access (via a LAN, by burning it to CD, copying to a floppy diskette, flash drive, external hard drive, iPod, digital camera, etc.)
7. Launch the BIAS Authorization Manager program on your internet-equipped computer.
8. In the “Please Choose a Product” section, choose BIAS Master Perfection Suite 1.x (or individual plug-in if purchased separately).
9. Click the Alternate Authorization button in the BIAS Authorization Manager program.
10. Go directly to step 3 in the Alternate Authorization dialog – click the Open Authorization Request button.
11. In the Open dialog that appears, locate and select the Authorization Request File, then click the Open button – this will transmit the Authorization Request File to the BIAS Server.
- 12a. If you have previously registered another BIAS product, using the same email address, the BIAS server will transmit an Authorization File back to your internet-equipped computer – click the Save button to save this to the internet-equipped computer’s hard drive. Please proceed to step 13.
- 12b. If the BIAS Registration system does not recognize your email address (i.e., if this is the first BIAS product you are registering, or if you enter a different email address than with previously registered BIAS products) – a dialog will appear, prompting you to enter your registration information.
- 12c. Enter your registration information, and click the Submit button, then click the OK button when the successful registration dialog appears.

- 12d. You will be prompted to open the Authorization Request File a second time – locate it, and then click the Open button – The BIAS server will transmit an Authorization File back to your internet-equipped computer – click the Save button to save this to the internet-equipped computer’s hard drive.
13. Click OK to exit the Authorization Successful dialog, then click the Done button in the Alternate Authorization dialog, and again in the BIAS Authorization Manager.
14. Transfer the Authorization File (the file is called “BIAS Master Perfection Suite 1.x” for the whole suite, or “BIAS <Plug-in Name> 1.x” for individual plug-ins) from the internet-equipped computer back to the host computer where the plug-in(s) will be used (via a LAN, by burning it to CD, etc.).
15. Go directly to step 4 in the Alternate Authorization dialog – click the Open Authorization File button.
16. In the Open dialog that appears, locate and select the Authorization File, then click the Open button.
17. Click OK in the Authorization Complete dialog, and Done in the Authorization Manager.

To register & authorize the Master Perfection Suite with no internet access

If you do not have temporary internet access on any computer, or need help with any part of the registration/authorization process, please contact BIAS at:

US Toll-Free: 1-800-775-2427
International: +1-707-782-1866

Deauthorizing a Computer

If you need to de-authorize a particular computer that will no longer be used to run the Master Perfection Suite, you can do so by following the steps below.



The computer running the Master Perfection Suite must be connected to the internet in order to be deauthorized.

To De-Authorize a Computer:

1. Launch the BIAS Authorization Manager from your hard drive (or launch the BIAS Authorization Manager program from your installer CD-ROM).
2. In the BIAS Authorization Manager, select the product you wish to de-authorize – the serial number and email address used to authorize that product will be automatically recalled and will appear in the Serial Number and Email Address fields.
3. Click the Deauthorize button.
4. Click the Deauthorize button to confirm the deauthorization process – the Deauthorization Successful dialog appears.
5. Click the OK button – then click the Done button in the BIAS Authorization Manager.

Conclusion

Now that you have installed, registered, and authorized the Master Perfection Suite, please proceed to the next chapter to learn about using it.

Chapter 3: GateEx



Chapter 3:

GateEx

Introduction

GateEx is a full-featured noise gate and downward expander plug-in. When used as a noise gate, GateEx allows an audio signal to be reduced in amplitude when it falls below a user-defined threshold level. When used as a downward expander, GateEx allows the apparent dynamic range of an audio signal to be increased.

Some common examples of how a gate would typically be used are:

- In dialogue recordings, a gate might be used to remove (or minimize) the presence of background noise or room tone that is audible in the amplitude dips between the speaker's words or phrases. When the subject speaks, the rising amplitude of the voice triggers the gate to open, allowing the voice to pass through, and as words trail off and the amplitude drops, the gate closes and prevents any low level background noise from being audible.
- In music recordings (we'll use a drum kit as an example), a gate might be used to remove or isolate one type of drum from another. When used properly on a drum recording, a gate can accomplish such tasks as isolating the snare drum, and removing any bleed picked up through the snare mic from other nearby drums, such as the kick or hi-hat.

A common example of how a downward expander would typically be used:

- A downward expander can be applied to increase the apparent dynamic range. This increase in

dynamic range is accomplished by decreasing the gain amount in the relatively quiet portions of the recording, so that the apparent noise floor is lowered.

GateEx User Interface & Controls

The GateEx plug-in is designed to be intuitive and easy to use. This section discusses the graphical user interface, and will familiarize you with each of the various controls.

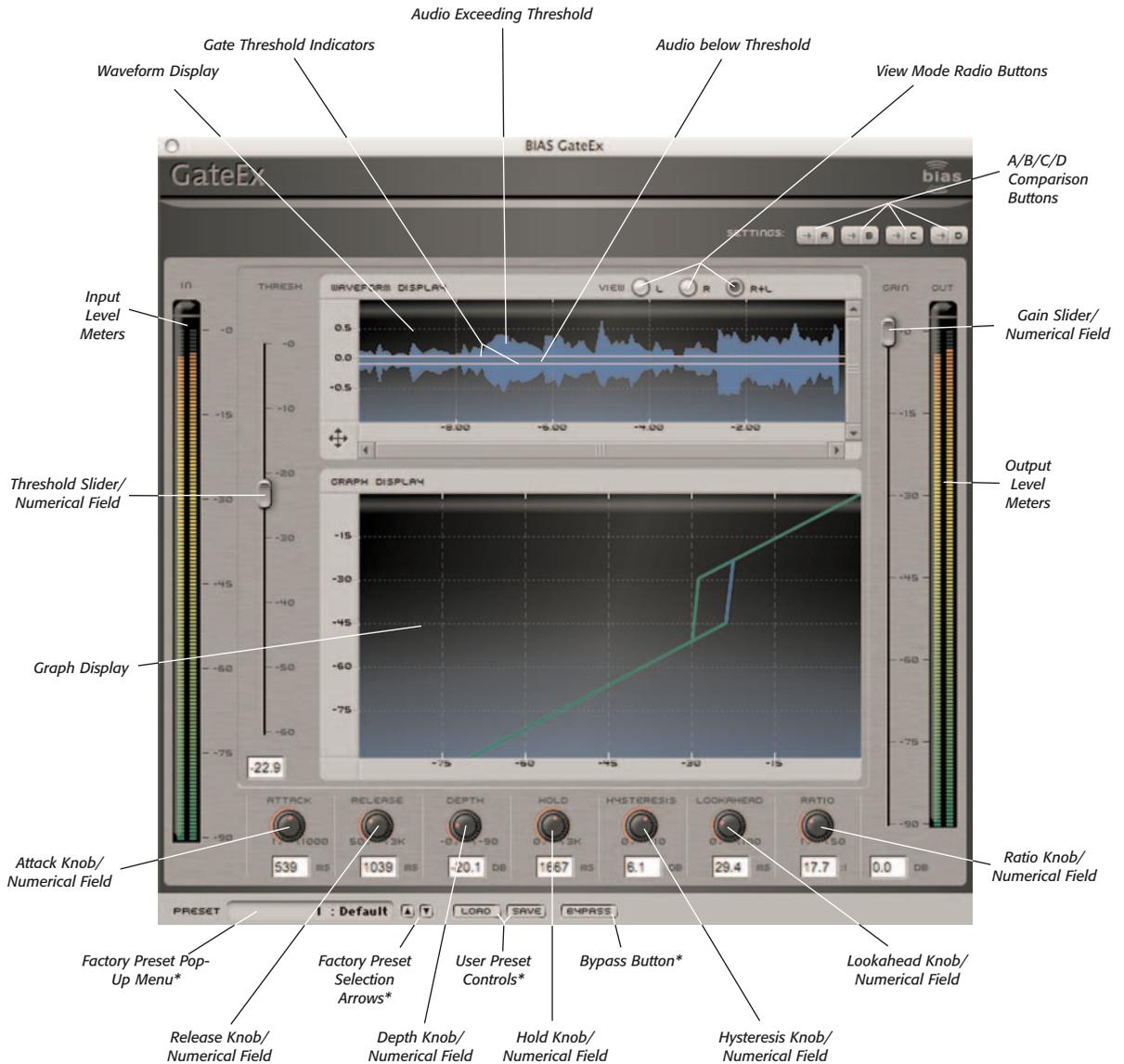
Global Controls

GateEx features a variety of parameters designed for specific tasks, and also features some "global" controls, that affect the state of the entire plug-in. Below is a brief description of these "global" tools, and how they operate.

A/B/C/D Compare Buttons

The A/B comparison feature is common in audio programs, and gives the ability to preview different settings before committing to them. Essentially, various tool settings are made and stored as snapshot "A" –

GateEx Graphical User Interface



*Appearance of preset/bypass controls will vary depending on the platform, host, and plug-in format used

another group of settings can then be assigned as snapshot “B” – and then clicking the A or B buttons in the interface instantly toggles between the two. As GateEx offers many fine-tuning options, it features not just two comparison modes – but instead includes A/B/C/D comparisons, for four unique snapshots to compare between, before committing to any file processing. These snapshots are similar to saving and loading presets, but are instantaneous, and do not require selecting presets from a menu to load them. To permanently save one of these snapshots, simply select the desired snapshot, and save it as a custom User Preset.

Factory Preset Pop-Up Menu

This menu displays the current factory preset, if one has been selected. Clicking this menu shows a list of all available factory presets. A factory preset may be selected by choosing it from this pop-up menu.

Factory Preset Selection Arrows

These arrows are used to navigate through factory presets. Clicking the down arrow moves to the next available factory preset, and clicking the up arrow moves to the previous factory preset.

User Preset Save Button

Saves a user preset, which includes the state of all GateEx parameters.

User Preset Load Button

Recalls a user preset, includes the state of all GateEx parameters.



User presets do not appear in the Factory Preset pop-up menu, so be sure you are aware of the directory where you are saving them into, so they may be recalled easily later.

Bypass Button

The Bypass button is used to temporarily disable the plug-in. When the plug-in is bypassed, audio playback is not affected by the plug-in.

Gate/Expander Controls

The Gate/Expander controls each affect a unique characteristic of the overall gate/expander behavior. These are described briefly below.

Input Level Meters

The Input Level Meters show the level of the original audio signal being fed into the plug-in, before it is affected by any of the various controls.

Output Level Meters

The Output Level Meters show the level of the processed audio signal, after being affected by the active parameter settings.

Threshold Slider

The Threshold slider determines the amplitude level at which the gate opens or closes. If the signal level exceeds the Threshold setting, the gate opens, and remains open for as long as the signal remains above the Threshold. If the signal falls below the Threshold setting, the gate closes, and remains closed until the signal exceeds the Threshold setting.

By default, the Threshold slider is set to a value of -60dB, and has a range of 0 to -60dB.

Attack Knob

The Attack Knob determines how quickly the gate opens when the audio signal being fed into it exceeds the threshold level.

By default, the Attack Knob is set to a value of 30ms, and has a range of 1-1000ms.

Release Knob

The Release Knob determines how quickly the gate closes when the audio signal being fed into it falls below the threshold level.

By default, the Release Knob is set to a value of 100ms, and has a range of 50-3000ms.

Depth Knob

The Depth Knob determines how far the gate closes (i.e., how deeply the signal is attenuated) when triggered by a signal that exceeds the threshold level. By default, the Depth control is set to its maximum level, -90dB, which causes audio signals to be completely silenced when the gate is in the closed position. The Depth control is useful as it allows a variable level of signal reduction when the gate is closed, and can help produce a more subtle gating effect. Another useful effect of having a Depth setting lower than the maximum amount is that it allows the gate to open faster than if it were in the fully closed position, and can be useful if a faster attack time is needed, and the Attack knob is already set to operate at its lowest value (1ms).

By default, the Attack Knob is set to a value of -90dB, and has a range of 0 to -90dB.

Hold Knob

The Hold Knob allows the gate to remain in the open position for a user-specified amount of time, even after the signal level has fallen below the threshold level. This control is especially useful when the audio signal is very close to the threshold level, and might cause the gate to

open and close repeatedly, very quickly, as the signal exceeds and then falls below the threshold over a very short period of time. This rapid opening and closing of the gate can create an unwanted artifact called “chatter” or “jitter”, and the Hold control helps to avoid it.

By default, the Hold Knob is set to 0ms, and has a range of 0 – 3000ms.

Hysteresis Knob

The Hysteresis control is similar to the Hold control in its practical application of helping to avoid/eliminate “chatter”, but achieves this in a different way. Rather than simply maintaining the gate’s open position for a user-specified duration, the Hysteresis control allows setting independent threshold levels for opening or closing the gate, by specifying the difference between them in decibels. With this approach, the gate opens when a primary threshold level is exceeded by a suitable signal level, and closes again only when the signal level drops below a secondary threshold level.

By default, the Hysteresis Knob is set to 0dB, and has a range of 0 – 10dB.

Lookahead Knob

As its name implies, the Lookahead Knob reads data from a file a bit earlier than it is actually played back. This allows the gate to react earlier than it would, based on its threshold setting alone. This feature is useful as it helps to preserve transients and attacks that might be eliminated (or minimized) due to the gate opening after they had already occurred.

By default, the Lookahead Knob is set to 0ms, and has a range of 0 – 100ms.

Ratio Knob

The Ratio Knob is used to set the rate at which audio signal reduction is applied, when the signal exceeds the threshold level.

By default, the Ratio Knob is set at 1:1, and has a range of 1:1 – 50:1.

Gain Slider

The Gain slider is used to set the output level. By default, it is set to 0dB, and has a range of 0 to -90dB.



Sliders & knobs can be reset to their default values by Alt/Option-clicking on them.



When numerical fields are in an editable state (i.e., after clicking in them with the mouse), their values may be changed by typing in new values, by using the Up/Down Arrow keys on your keyboard, or by using the scroll wheel on a compatible mouse.

Graphic Displays

GateEx features two graphic display areas that are helpful in making the appropriate settings quickly. These are described below.

Waveform Display

The Waveform Display shows a graphical representation of the audio signal being fed into GateEx in real-time. This display is particularly helpful in quickly setting the threshold level, as it creates a graphical relationship between the signal level and the threshold level.

Gate Threshold Indicators

These indicators appear as horizontal white lines superimposed over the Waveform Display, and give a graphical representation of the current threshold value, in relation to the input signal level.

Freeze Waveform Button

The Freeze Waveform Button allows you to stop and start the waveform from scrolling. This is useful for examining particular areas of the waveform display as you scroll through its timeline.

Waveform View Radio Buttons

This group of radio buttons allows choosing between having the Waveform Display calculated by the content of a stereo signal's left channel (L), right channel (R), or both channels (L+R).



When using L+R mode, a single waveform displays the sum of both channels.

Zoom Button

This control is located where the X & Y-axes meet. It can be used to zoom in/out on either axis independently, or both at the same time. This allows for higher precision viewing of the graph display.

Horizontal Scrollbars/Arrows

When zoomed in on the horizontal axis, the scrollbars and/or scroll arrows may be used to move the Waveform Display earlier or later in time, allowing examination of waveform events anywhere along the timeline.

By default, the zoom level is set to “zoomed out all the way”, and the horizontal scrollbars/arrows have no effect.

Vertical Scrollbars/Arrows

When zoomed in on the vertical axis, the scrollbars and/or scroll arrows may be used to move the Waveform Display up or down, allowing examination of events that occur in the waveform's positive or negative phase.

By default, the zoom level is set to “zoomed out all the way”, and the vertical scrollbars/arrows have no effect.

Graph Display

The Graph Display shows a number of key parameter settings in an easy-to-read graph format, with each axis labeled in decibels. The X-axis represents audio input level, while the Y-axis represents output level. The graph makes it fast and easy to make settings, and allows easy plotting of input and output level values.



When Hysteresis is used, the Attack threshold setting in the graph display is represented in blue, and the Release threshold setting appears in green.

Parameter Automation

GateEx’s various controls may be automated (i.e. applied dynamically) within hosts that support parameter automation. For more information, please consult your host’s documentation on how to automate parameters.

Using GateEx

This section contains some basic “hands-on” getting started tips.

1. Use the Ratio Knob to set the rate at which reduction increases when the audio signal exceeds the current threshold level. A good starting point is to set it to the highest setting (i.e., 50:1).



2. Adjust the Threshold slider until the gate opens to allow the desired audio content to pass through it, and closes to prevent lower level, unwanted audio from being passed.



3. Fine-tune your settings by making adjustments to the following controls, and try these tips:

- **Attack and Release** – Use faster times for percussive material (such as drums), or slower times for less-percussive material (such as voice).
- **Depth** – Set the depth so the proper amount of reduction is happening when the gate is closed. This allows for subtle gating where not all the signal is removed when the gate is closed, or more drastic gating where all the signal is removed when the gate is closed.
- **Hold** – Use the hold control to ensure the gate stays open for the desired length of time (i.e., so that it does not begin to close prematurely and reduce part of the desired audio signal).
- **Hysteresis** – Use the hysteresis control to set independent threshold levels for opening/closing the gate if the audio signal hovers near the threshold setting.
- **Lookahead** – Use the Lookahead control if you need the gate to open a little before the audio signal goes above the threshold level in order to preserve any transients or attacks.

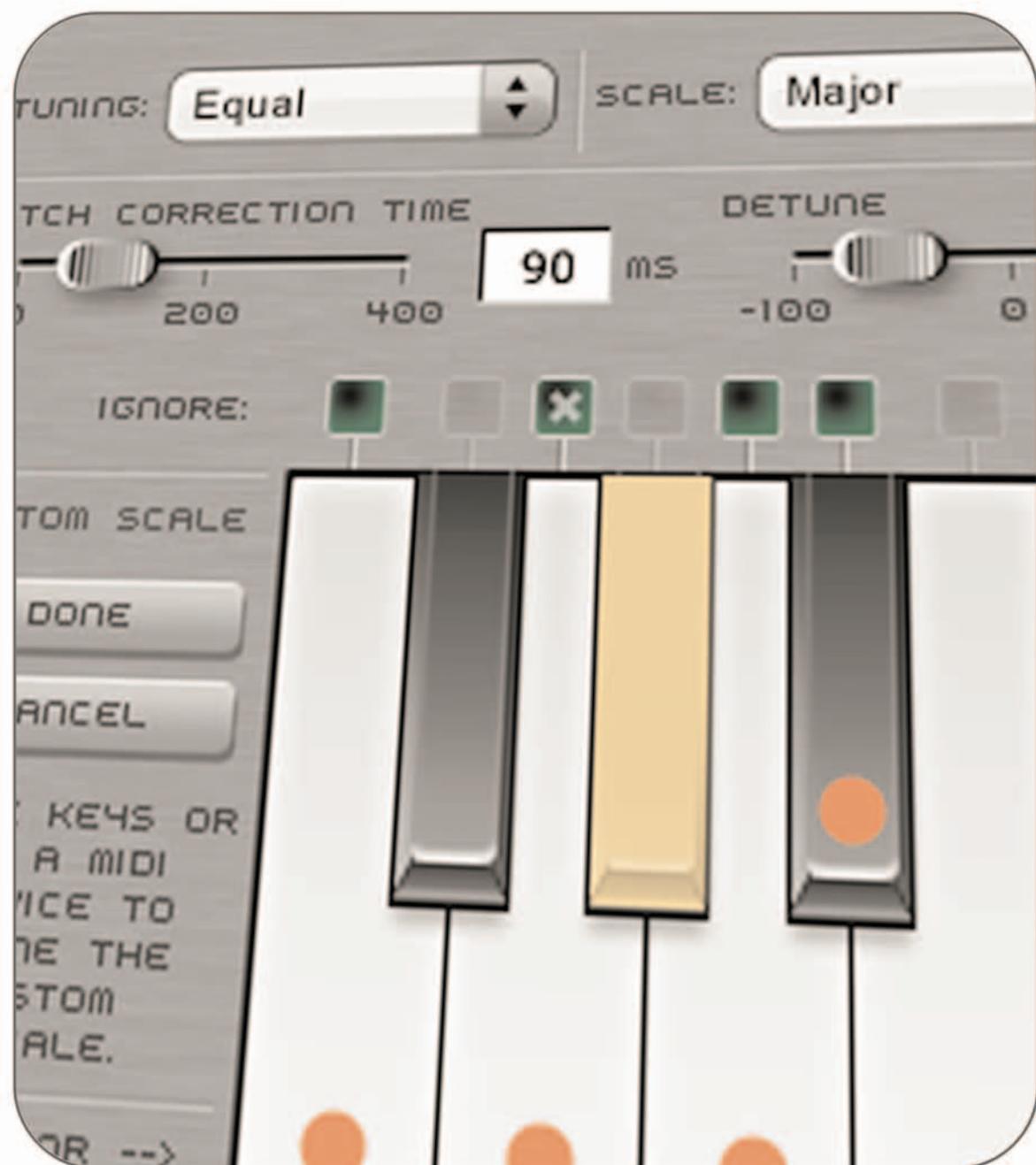
If you are unfamiliar with using gates, try using some of the included factory presets, which are representative of common gate settings. These should provide a good starting point, from which you can fine-tune the controls to best suit the audio material you are working with.

- ✓ 1: Default
 - 2: Hard Gate
 - 3: Soft Knee Downward Expan
 - 4: Standard Gate
 - 5: Voice
-

Conclusion

Now that you are familiar with the various GateEx controls, and its basic workflow, please continue along to the next chapter, where you will learn about the PitchCraft plug-in.

Chapter 4: PitchCraft



Chapter 4: PitchCraft

Introduction

PitchCraft is a pitch correction and transposition plug-in that can be used to correct and/or change pitch from a variety of sources. The high quality algorithm includes formant correction to retain the natural sound of a voice – and may also be used to intentionally modify the characteristics of a voice.

This plug-in provides high-quality professional pitch correction/transposition, with an easy to use, intuitive interface.

Some common examples of how PitchCraft might be used include:

- To correct pitch problems in vocal or instrumental recordings
- Change pitch of a performance to match a different key than was used in the original performance
- Pitch and formant modification, as a sound design tool
- Virtually altering the size of the vocal cavity and vocal cords, for effects such as “gender transformation”, voice disguising, changing an adult’s voice into a child’s voice and vice-versa

PitchCraft User Interface & Controls

The PitchCraft plug-in is designed to be intuitive and easy to use. This section discusses the graphical user interface, and will familiarize you with each of the various

controls. The user interface is divided into a number of sections, each with dedicated controls or displays used for pitch transposition and correction.

Global Controls

PitchCraft features a variety of parameters designed for specific tasks, and also features some “global” controls, that affect the state of the entire plug-in. Below is a brief description of these “global” tools, and how they operate.

Reference Source Pop-Up Menu

This menu allows you to choose whether the reference source (i.e., the signal being fed into PitchCraft) is a single (left or right) channel of a stereo file, or both channels simultaneously.

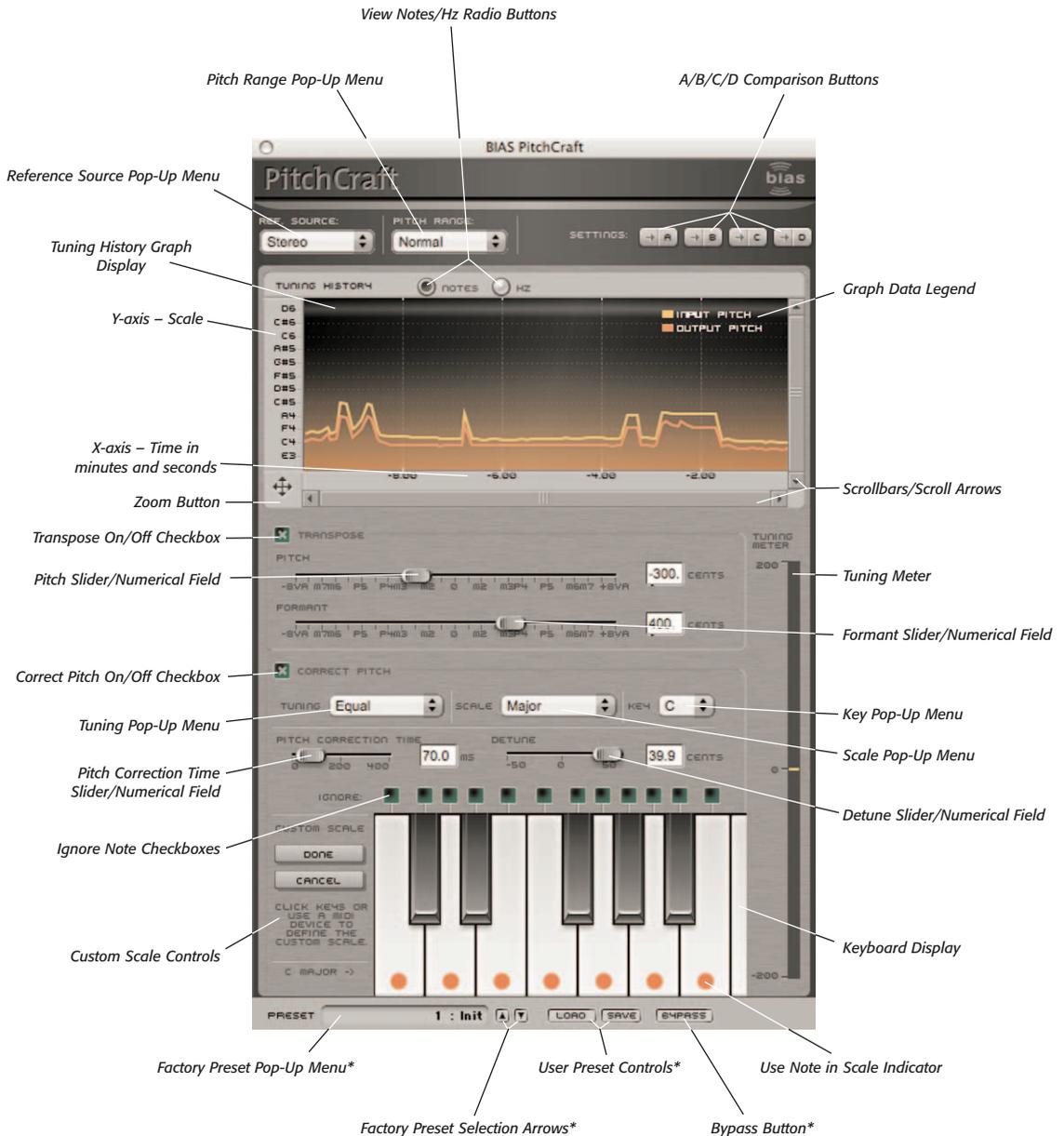


If you are working with a mono file, be sure to set the Reference Source Pop-Up menu to “Left”.

Pitch Range Pop-Up Menu

This menu allows you to choose the desired pitch range to use. Using the appropriate pitch range optimizes PitchCraft for certain source types. The plug-in will not detect pitch values outside the bounds specified for a given source. If you hear artifacts in the audio output,

PitchCraft Graphical User Interface



**Appearance of preset/bypass controls will vary depending on the platform, host, and plug-in format used*

you might want to try a different setting, as artifacts are generally produced when the source pitch falls outside the bounds specified by the value selected in the Pitch Range pop-up menu.

Making a pitch range selection in the Pitch Range pop-up menu assigns a corresponding pitch range scale along the Y-axis of the Tuning History Graph. Pitch range options include:

- Normal – D2 (73 Hz) to E6 (1318 Hz)
- Female – E3 (165 Hz) to E6 (1318 Hz)
- Male – D2 (73 Hz) to B4 (494 Hz)
- Lower Register – E0 (20 Hz) to E4 (330 Hz)
- Higher Register – E4 (330 Hz) to D#7 (2500 Hz)

A/B/C/D Compare Buttons

The A/B comparison feature is common in audio programs, and gives the ability to preview different settings before committing to them. Essentially, various tool settings are made and stored as snapshot “A” – another group of settings can then be assigned as snapshot “B” – and then clicking the A or B buttons in the interface instantly toggles between the two. As PitchCraft offers many fine-tuning options, it features not just two comparison modes – but instead includes A/B/C/D comparisons, for four unique snapshots to compare between, before committing to any file processing. These snapshots are similar to saving and loading presets, but are instantaneous, and do not require selecting presets from a menu to load them. To permanently save one of these snapshots, simply select the desired snapshot, and save it as a custom User Preset.

Factory Preset Pop-Up Menu

This menu displays the current factory preset, if one has been selected. Clicking this menu shows a list of all available factory presets. A factory preset may be selected by choosing it from this pop-up menu.

Factory Preset Selection Arrows

These arrows are used to navigate through factory presets. Clicking the down arrow moves to the next available factory preset, and clicking the up arrow moves to the previous factory preset.

User Preset Save Button

Saves a user preset, which includes the state of all PitchCraft parameters.

User Preset Load Button

Recalls a user preset, includes the state of all PitchCraft parameters.



User presets do not appear in the Factory Preset pop-up menu, so be sure you are aware of the directory where you are saving them into, so they may be recalled easily later.

Bypass Button

The Bypass button is used to temporarily disable the plug-in. When the plug-in is bypassed, audio playback is not affected by the plug-in.

Tuning History Graph Display and Tuning Meter

These controls are used to view an audio signal’s tuning history over time, and also to customize and navigate the Graph display.

View Notes/Hz Radio Buttons

These controls allow you to choose whether the Graph display's Y-axis is represented as Notes or Hz (frequencies).

Graph Display

This display plots the pitch of both the input (raw) and output (processed) signals, and is useful for comparing the difference between the two. The yellow line represents the input pitch, and the orange line represents the output, or corrected pitch. The X-axis represents time, and the Y-axis represents the currently selected scale, and may be viewed as notes or Hz (frequencies).

Zoom Button

Zooming in or out is accomplished using the Zoom Button, located at the point where the X and Y-axes meet. This control allows a very detailed zoomed-in view, or can be zoomed-out for a “big picture” view. Option-clicking on the Zoom Button resets the zoom level.

- Zoom In Horizontally – Click and drag to the right
- Zoom Out Horizontally – Click and drag to the left
- Zoom In Vertically – Click and drag up
- Zoom Out Vertically – Click and drag down

Tuning Meter

The Tuning meter appears vertically along the right side of the interface, and displays the current amount of tuning. The divisions along the Tuning meter's scale is marked at 200-cent intervals, with the maximum tuning amount of 200 cents at the top of the scale, zero cents in the middle, and -200 cents at the bottom.

Transposition Controls

This group of controls is used for altering the pitch and formant of the reference source being fed into PitchCraft.

Transpose On/Off Checkbox

This control allows enabling/disabling all Transposition controls.

Pitch Slider/Numerical Field

This control allows raising or lowering the pitch value (in cents), while maintaining the original formant structure (i.e., the “timbre” or “tonal color” of the voice).



When working with vocal sources this control is the equivalent to modifying the length of the vocal cords.

Each division along the Pitch Slider's scale represents the associated musical interval (major second, major third, etc).



Sliders can be reset to their default values by Alt/Option-clicking on them.



When numerical fields are in an editable state (i.e., after clicking in them with the mouse), their values may be changed by typing in new values, by using the Up/Down Arrow keys on your keyboard, or by using the scroll wheel on a compatible mouse.

Formant Slider/Numerical Field

This control allows raising or lowering the formant value

(in cents) through a tilt of the spectral envelope, stretching the spectrum at the high end, and compressing it at the low end. The formant slider acts as a particular type of filter, while the pitch control performs the usual pitch transposition on the instrument.



When working with vocal sources this control is the equivalent to modifying the volume of the vocal cavity.

Each division along the Formant Slider's scale represents the associated musical interval (major second, major third, etc). When the Formant slider is set to zero, formants are preserved independently of pitch transposition (known as "formant-corrected pitch transposition").

Pitch Correction Controls

This group of controls is used for correcting problems with the pitch of the reference source being fed into PitchCraft.

Correct Pitch On/Off checkbox

This control allows enabling/disabling all Pitch Correction controls.

Tuning Pop-Up Menu

This menu allows you to choose the desired type of tuning to be used in the pitch correction process. Tuning is expressed in number of cents with respect to the equal-tempered note, for each of the twelve notes, and includes the following options:

- Equal – 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0

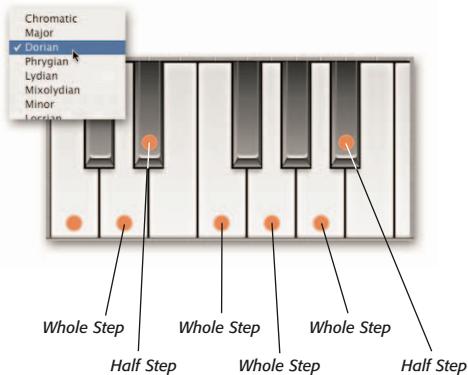
- Classic Just – 0, -29, 4, 16, -14, -2, -10, 2, 14, -16, 18, -12
- Harmonic – 0, 5, 4, -2, -14, -29, -49, 2, 41, 6, -31, -12
- Indian Raga – 0, -10, 4, -6, -16, -2, -12, 2, -8, -18, -4, -14
- Arabic – 0, 30, -20, -50, -45, 2, 23, 6, -14, -43, -70, 10
- Bali/Java – 0, 27, -58, -42, -123, -130, -126, -211, 24, -61, -57, -142
- Tibetan – 0, -42, 32, 10, -22, 22, 18, 25, -27, -4, 19, -14
- Carlos Alpha – 0, -12, 44, 66, 88, -110, -132, -164, -176, -198, -220, -242
- Pythagorean – 0, -10, 4, -6, 8, -2, 12, 2, -8, 6, -4, 10
- Mean – 0, -24, -7, 10, -14, 3, -21, -3, -27, -10, 7, -17

Scale Pop-Up Menu

This menu allows you to choose the desired scale to be used in the pitch correction process. When a scale is chosen in the pop-up menu, PitchCraft's keyboard will highlight the notes used in that scale. The following scales are available:

- Chromatic
- Major
- Dorian
- Phrygian
- Lydian
- Mixolydian
- Minor
- Locrian
- Whole Tone
- Blues
- Harmonic Minor
- Melodic Minor
- Major Pentatonic
- Minor Pentatonic

- Major Bebop
- Dominant Bebop
- Super Locrian
- Diminished
- Hungarian Minor
- Arabian



PitchCraft's keyboard showing a "C" Dorian scale's notes.

Key Pop-Up Menu

This menu allows you to choose the root note of the scale selected in the Scale pop-up menu. Options include:

- A
- A#
- B
- C
- C#
- D
- D#
- E

- F
- F#
- G
- G#

Pitch Correction Time Slider

This control allows you to adjust the speed at which pitch correction is applied.

Detune Slider

This control allows you to adjust the reference frequency used for tuning (i.e., from 440Hz to 445Hz). This control should be adjusted only if attempting to match the pitch with another source that is not in "concert pitch" (i.e., not tuned to A 440).

Keyboard Controls

The Keyboard controls are used for defining custom notes and scales to be used in the pitch correction process. These controls are described below.

Ignore Note Checkboxes

These checkboxes allow certain notes to be ignored in the pitch correction process, even when they are present in the scale being used. The presence of a check in an Ignore checkbox means that the note represented by the key that appears directly below it in the interface will be ignored. The absence of a check means the note will be used in the pitch correction process.

Keyboard Display

The virtual keyboard is used to display the active notes

being used in the pitch correction process, and can also be used to define a custom scale for pitch correction.

Use Note in Scale Indicators

The Use Note in Scale indicators appear as orange dots superimposed over keys in the Keyboard display. Scales can be created or modified using any MIDI device, such as Peak's MIDI keyboard window, or a MIDI controller/keyboard. Any MIDI "Note On" message from a controller or sequence is added to the current scale, if the note is already part of the current scale, the "Note On" message will remove it from the current scale. When a Use Note in Scale indicator appears over a key, that key's note is detected and its pitch is corrected. When an indicator does not appear over a key, that note is not part of the current scale.

Custom Scale Controls

These controls allow the creation of a custom scale to be used for pitch correction. Custom scales are automatically saved into the Scale pop-up menu, and may be recalled for use later.

Done Button

Clicking the Done button activates a custom scale, and loads this scale's name into the Scale pop-up menu.

Reset Button

Clicking the Reset button clears current custom scale information, and resets the scale to that selected in the Key pop-up menu.

Current Scale Display

Displays the name of the current scale, as well as appropriately placed Use Note in Scale indicators over the keys/notes in the active scale.

Parameter Automation

PitchCraft's various controls may be automated (i.e. applied dynamically) within hosts that support parameter automation. For more information, please consult your host's documentation on how to automate parameters.

Using PitchCraft

This section includes hands-on directions for accomplishing common pitch modification tasks.

To Define a Scale:

- Choose the desired Scale Preset from the Scale pop-up menu.

To Define a Custom Scale:

- 1a. Click the desired keys in PitchCraft's virtual keyboard – clicking a key toggles the Use Note in Scale indicators into the On or Off position.

Or:

- 1b. Click the keys of a MIDI input device (such as Peak's virtual MIDI keyboard) – the MIDI Note On messages toggle the Use Note in Scale indicators into the On or Off position.
2. When you have finished defining your custom scale, click the Done button, and enter a preset name – the custom scale is added to the Scale menu as a preset, and becomes active.



PitchCraft's A/B/C/D snapshot controls will not store custom scales until they have first been saved into the Scale pop-up menu, as described in Step 2 in the previous section.

To Correct Pitch:

1. Select the appropriate type of reference source from the Reference Source pop-up menu.
2. Select the appropriate pitch range for the reference source, using the Pitch Range pop-up menu.
3. Enable the Correct Pitch section, by checking the Correct Pitch checkbox.
4. Define a scale or set of notes using the Scale, Key, and Keyboard controls.
5. Play the audio source. As audio enters the plug-in and is analyzed, the current pitch is displayed in the Tuning History Graph. The plug-in determines which note in the current scale is “correct” and applies the appropriate amount of pitch correction to the input source, to match the note in the scale.



The Pitch Correction Time control can be used to smooth out the correction effect if the pitch becomes “warbly”. It can also be used to create interesting “robotic” voice effects by setting the pitch correction time to zero.

The Transpose and Correct Pitch sections may be enabled simultaneously, with transposition and formant modification being performed in parallel with pitch correction. Advanced features include the ability to detune the reference frequency (for example from A = 440Hz to 443Hz), the ability to define the scale via a MIDI controller, and the ability to save up to 4 temporary presets.



PitchCraft is designed for monophonic, harmonic sources and it will not work on polyphonic material – such as drums, cymbals, or mixes consisting of several instruments/voices. Please keep in mind that material with excessive reverb or background noise is not considered monophonic. It is advised that you clean up the audio signal as much as possible before processing it with this algorithm. PitchCraft may produce interesting creative effects when used with polyphonic audio material, but keep in mind this



is an algorithm carefully designed for transparent processing of monophonic sounds. For best results, the narrowest pitch range should be selected to match the input source's pitch range.

To Transpose Pitch and/or Formant:

1. Select the appropriate type of reference source from the Reference Source pop-up menu.
2. Select the appropriate pitch range for the reference source, using the Pitch Range pop-up menu.
3. Enable the Transpose section of the interface, by checking the Transpose checkbox.
4. Adjust the Pitch and/or Formant sliders until the desired effect is achieved.

Voice Modification Using the Pitch & Formant Controls

The Pitch and Formant controls can produce very interesting special effects, especially when the source is a recording of a human voice. When using these controls for modifying a human voice, the following guidelines may be useful:

- Transposing pitch upward is the equivalent of shortening vocal cords
- Transposing pitch downward is the equivalent of lengthening vocal cords
- Shifting formants upward is the equivalent of reducing the size of the vocal cavity
- Shifting formants downward is the equivalent of enlarging the size of the vocal cavity

Some examples of voice modification possibilities are listed below:

To Transform a Female Voice into a Male Voice:

1. Using the Pitch slider, transpose pitch downward substantially.

2. Move Formant slider down until a natural sound is achieved, (which usually occurs when the Formant slider's value is slightly smaller than the Pitch slider's value).

To Transform a Male Voice into a Female Voice:

1. Using the Pitch slider, transpose pitch upward.
2. Move the Formant slider up until a natural sound is achieved.

To Transform an Adult's Voice into a Child's Voice:

- Raise the Formant slider's value – notice how “age” decreases as the formant value increases.

To Transform a Child's Voice into an Adult's Voice:

- Lower the Formant slider's value – notice how “age” increases as the formant value decreases.

To Transform a Human Voice into an “Alien” Voice:

1. Raise the Pitch value all the way (i.e., slider all the way to the right).
2. Lower the Formant value all the way (i.e., slider all the way to the left).

To Disguise a Human Voice:

1. Lower the Formant value slightly.
2. Adjust Pitch value to suit level of voice disguise.

Conclusion

Now that you are familiar with the various PitchCraft controls, and its basic workflow, please continue along to the next chapter, where you will learn about the Repli-Q plug-in.

Chapter 5: Repli-Q



Chapter 5:

Repli-Q

Introduction

Repli-Q is a powerful spectral matching/balancing plug-in, which is designed to analyze, edit, and compare the spectral content of audio recordings. Once analysis has taken place, spectral characteristics of one recording may be applied to another. By viewing the frequency spectrum plotted as graphical data (and by listening of course), a user can discern where there are peaks, “holes”, or other characteristics in the spectral content of the recording. Various steps in the recording and mastering process can result in problems such as studio resonance caused by the natural comb filtering effect of a poorly shaped recording/listening environment – or equalization used to compensate for a studio’s equipment and environmental deficiencies. Repli-Q allows these sorts of spectral problems to be located and repaired using its high quality linear-phase filters.

Some common examples of how Repli-Q might be used are:

- Mimicking and applying a favorite artist’s spectral “style” to your own recordings.
- In the mastering process, it can give a cohesive sound to a collection of songs that may have been recorded and mixed in different locations/environments.
- It can be used to create a collection of profiles – microphones, for example. These profiles may later be applied to audio recordings to give them the characteristic sound of a particular type of microphone.

Repli-Q matching profiles may be created for other types of equipment, such as consoles, compressors, recording environments, etc.

Repli-Q User Interface & Controls

Repli-Q is designed to be intuitive and easy to use. This section discusses the graphical user interface, and will familiarize you with each of the various controls.

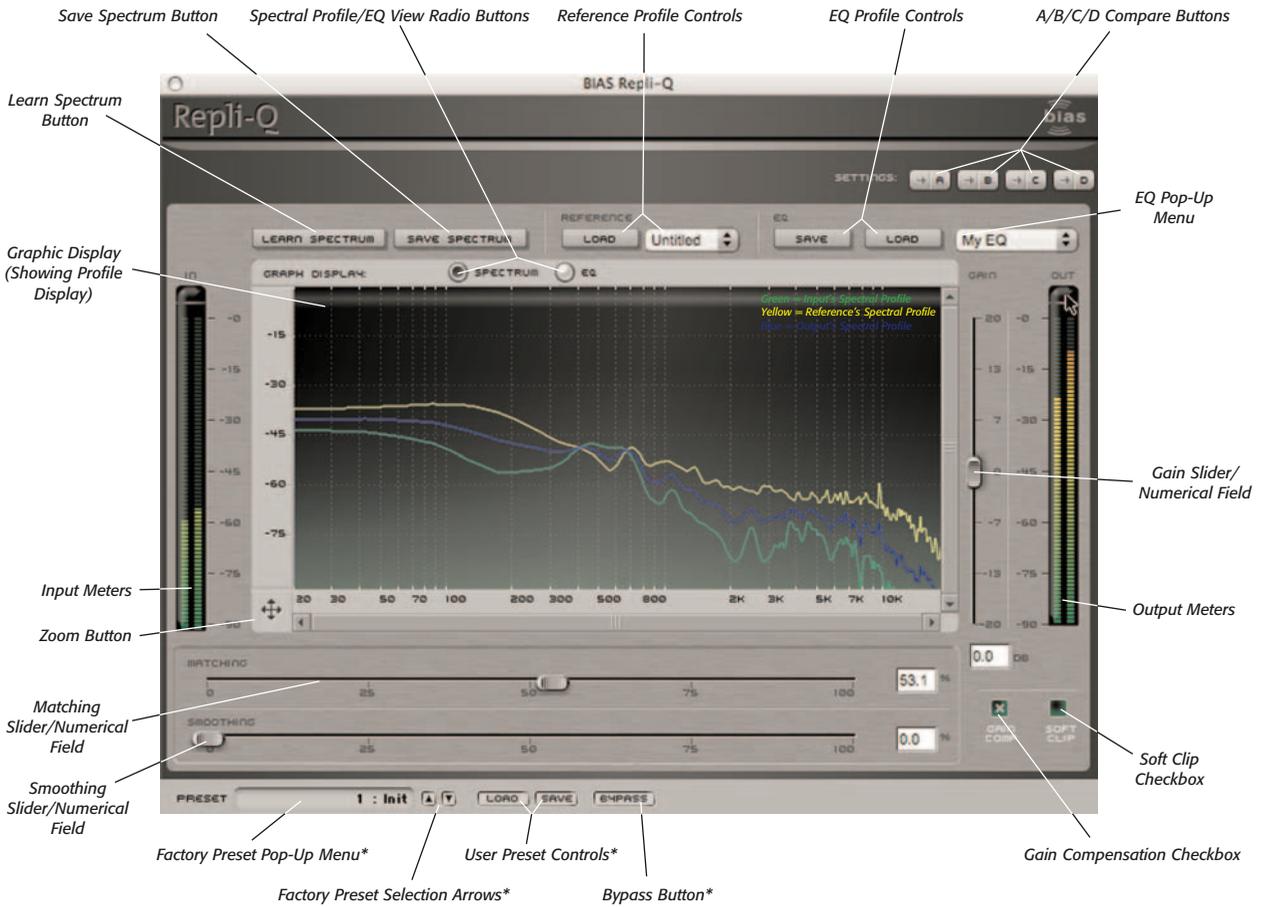
Global Controls

Repli-Q features a variety of controls designed for specific tasks, and also features a number of “global” controls, that affect the state of the entire plug-in. Below is a brief description of these “global” tools, and how they operate.

A/B/C/D Compare Buttons

The A/B comparison feature is common in audio programs, and gives the ability to preview different settings before committing to them. Essentially, various tool settings are made and stored as snapshot “A” –

Repli-Q Graphical User Interface



*Appearance of preset/bypass controls will vary depending on the platform, host, and plug-in format used

another group of settings can then be assigned as snapshot “B” – and then clicking the A or B buttons in the interface instantly toggles between the two. As Repli-Q offers many fine-tuning options, it features not just two comparison modes – but instead includes A/B/C/D comparisons, for four unique snapshots to compare between, before committing to any file processing. These snapshots are similar to saving and loading presets, but are instantaneous, and do not require selecting presets from a menu to load them. To permanently save one of these snapshots, simply select the desired snapshot, and save it as a custom User Preset.

Factory Preset Pop-Up Menu

This menu displays the current factory preset, if one has been selected. Clicking this menu shows a list of all available factory presets. A factory preset may be selected by choosing it from this pop-up menu.

Factory Preset Selection Arrows

These arrows are used to navigate through factory presets. Clicking the down arrow moves to the next available factory preset, and clicking the up arrow moves to the previous factory preset.

User Preset Save Button

Saves a user preset, which includes the state of all Repli-Q parameters.

User Preset Load Button

Recalls a user preset, which includes the state of all Repli-Q parameters.



User presets do not appear in the Factory Preset pop-up menu, so be sure you are aware of the directory where you are saving them into, so they may be recalled easily later.

Bypass Button

The Bypass button is used to temporarily disable the plug-in. When the plug-in is bypassed, audio is not affected.

Profile Controls

The Profile controls are used for learning, saving, and loading spectral profiles and EQ curves, as well as for matching and smoothing between different profiles. This section discusses each control’s function.

Learn Spectrum Button

This control analyzes the spectral content of the audio source being fed into Repli-Q. When the Learn Spectrum button is clicked, Repli-Q immediately begins analyzing, or “learning” the input signal.

When audio playback is stopped, the host program may still be sending digital silence (a zero amplitude signal for all samples) to the plug-in. If the Learn Spectrum button has been clicked, Repli-Q is learning the spectrum of digital silence – which is a flat spectrum of very low amplitude (-96 dB). If playback starts, Repli-Q continues averaging the actual signal spectrum with the already averaged flat -96 dB spectrum. The resulting final spectral average will be false.



The recommended ways to operate Repli-Q are:

- *Start playback first, and then click the Learn Spectrum button, in that order. Then, click the Learn Spectrum button again to stop learning.*
- *Alternatively, once the Learn Spectrum button is clicked, start playback immediately, and when*



playback is stopped (or ends on its own), click the Learn Spectrum button again immediately to stop the learning process – or digital silence may be averaged into the learned profile.

The second method is best for learning the spectrum of a very short sample – looping short samples while learning is also a useful technique.

When using BIAS Peak as a host application, a quick and easy way to capture an accurate spectral profile is:

1. Select the portion of the audio file you wish to learn.
2. Click "Learn Spectrum" button in Repli-Q.
3. Choose "Bounce..." from Peak's Plug-Ins menu, (and then click "No" in the bypass/disable dialog).
4. The spectrum has been learned.
5. Turn off Learn mode and undo the bounce – you may now continue working, with the learned spectrum.

Save Spectrum Button

This control saves the current spectrum as a Repli-Q Spectral Profile, and automatically places it in the Reference pop-up menu as the current/active profile.

Reference Pop-Up Menu

This pop-up menu contains all Repli-Q Spectral Profiles created during the current session (i.e., since the plug-in was instantiated) – and also allows loading Spectral Profiles saved in earlier sessions.

Save EQ Button

This button saves the current EQ curve as a Repli-Q EQ Profile, and automatically loads it in the EQ pop-up menu as the current/active profile.

EQ Pop-Up Menu

This pop-up menu contains all Repli-Q EQ Profiles created during the current session (i.e., since the plug-in was instantiated) – and also allows loading EQ Profiles saved in earlier sessions.

Matching Slider/Numerical Field

This control allows variable spectral matching between an input source's profile and a reference file's profile.

By default, the Matching slider is set to 50%.



Sliders can be reset to their default values by Alt/Option-clicking on them.



When numerical fields are in an editable state (i.e., after clicking in them with the mouse), their values may be changed by typing in new values, by using the Up/Down Arrow keys on your keyboard, or by using the scroll wheel on a compatible mouse.

Smoothing Slider/Numerical Field

This control allows variable EQ smoothing, and helps to prevent resonance artifacts.

By default, the Smoothing slider is set to 0%.

Gain Slider/Numerical Field

This control increases or decreases the output level.

By default, the Gain slider is set to 0dB, and has a range of -20 to 20 dB.

Gain Compensation Checkbox

When active, this control compensates for gain differences introduced by an EQ setting, and makes the output level identical to the input level. The presence of a check in this box means that Gain Compensation is active.

Soft Clip Checkbox

When active, this control acts as a soft limiter to ensure that the output level does not clip due to gain differences introduced by an EQ setting. The presence of a check in this box means that Soft Clip is active.

Spectral Profile/EQ View Radio Buttons

These radio buttons allow choosing between viewing of spectral profiles and EQ curves.

Graph Display

The Graph Display operates in two modes, Spectral Profile Mode and EQ Profile Mode. The mode depends on which of the Spectrum/EQ View radio buttons is selected. Various elements of the Graph Display Area change depending on the mode being used.

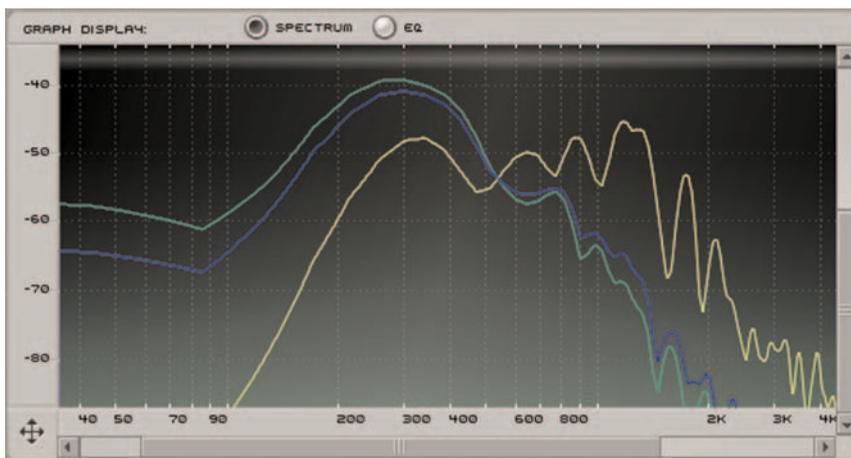
Spectrum Profile View Mode Display

In Spectrum View Mode, spectral data is shown in the graph. The X-axis is labeled in Hz (Frequencies), and the Y-axis is labeled in dB (decibels). Three different colored lines are plotted in the Spectrum graph, each represents a unique spectral profile.

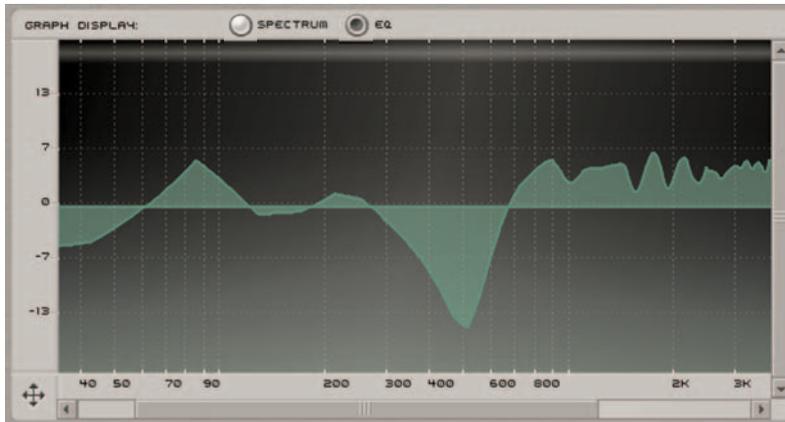
Yellow – Represents the spectral profile of the Reference file, which has the desirable characteristics you are attempting to match, and eventually apply to another file (i.e., which is referred to here as the “Input” file).

Green – Represents the spectral profile of the Input file, which is the file onto which you are attempting to apply the Reference’s desirable spectral characteristics.

Blue – Represents the average spectrum of the Output profile (i.e., the actual degree of matching between the Input and the Reference). The



The Graph Display can be toggled between Spectrum and EQ views using the radio buttons just above the display – Spectrum View is shown here



Repli-Q's EQ View is shown here

position of the Blue line within the graph is linked to the position of the Matching slider, and indicates the current output spectrum. When the Matching slider is set to 0%, it matches the Input's (Green line) spectral characteristics perfectly. When set to 100%, it matches the Reference source's (Yellow line) spectral characteristics perfectly. When the Matching slider is set somewhere between 0 – 100%, it represents a blend of both the Reference and Input's spectral characteristics.

EQ View Mode Display

In EQ View Mode, the EQ curve is shown in the graph. The X-axis is labeled in Hz (Frequencies), and the Y-axis is labeled in dB (decibels). The frequency data shown in the graph depends on the position of the Matching slider. When the matching slider is set to 0%, the EQ curve is flat at 0 dB and the Output spectrum is identical to the Input spectrum. When it is set to 100%, the EQ provides full matching and the Output spectrum is identical to the Reference spectrum. Note that the Output and Reference spectrums will not be identical when smoothing and edits have been performed on the EQ. When the matching slider is set to a value between 0 - 100%, the EQ is scaled by the same value and the Output spectrum is a blend of the frequency content of both the Input and Reference spectrums.

Editing EQ Filtering Properties

In EQ View Mode, clicking on the graph display allows editing of the EQ curve. Each single edit adds a "peak" or a "hole" in the EQ curve. The user can control the frequency, gain and bandwidth of the edit.

- Click in EQ Graph – Displays the current edit parameters: frequency, gain and Q factor (bandwidth).
- Click & Drag in EQ Graph – Dragging vertically controls the gain of the edited peak (dragging down produces a negative gain and therefore a hole rather than a peak). Dragging horizontally controls the frequency position of the edited peak. The Q factor (bandwidth of the edited peak) remains fixed.
- Shift-Click & Drag in EQ Graph – Dragging horizontally now controls the Q factor (bandwidth) of the edited peak, while dragging vertically modifies the gain. The frequency remains fixed.

Zoom Button

Zooming in or out is accomplished using the Zoom Button, located at the point where the X and Y-axes meet. This control allows a very detailed zoomed-in view, or can be zoomed-out for a "big picture" view. Option-clicking on the Zoom Button resets the zoom level.

- Zoom In Horizontally – Click and drag to the right
- Zoom Out Horizontally – Click and drag to the left
- Zoom In Vertically – Click and drag up
- Zoom Out Vertically – Click and drag down

Parameter Automation

Repli-Q's various controls may be automated (i.e. applied dynamically) within hosts that support parameter automation. For more information, please consult your host's documentation on how to automate parameters.

Using Repli-Q

This section contains some basic “hands-on” getting started tips, and introduces some typical Repli-Q workflows.

To Match the Spectrum of an Audio File:

1. Open a Reference file and select the portion to be used as a Reference – the “Reference” file being the one with the desirable spectral characteristics that you wish to apply to another file.



Note that different sections of a Reference file may have different spectral characteristics. If your host program features markers, you may wish to use these to denote specific portions of the Reference file.

2. Instantiate Repli-Q, and start playback of the reference file.
3. Click the Learn Spectrum button – the spectral profile is plotted as Repli-Q learns it.

4. Click the Learn Spectrum button again to end the spectral “learning” process.
5. Click the Save Spectrum button to save the learned spectral profile – it will automatically be loaded into the Reference pop-up menu as the current/active spectral reference profile. This profile is plotted as a yellow line in the Graph display.
6. Open another audio file – this will be the material onto which we apply the Reference audio file's desirable spectral characteristics.
7. Click the Learn Spectrum button and start playback, the Input file's spectral profile is plotted as a green line in the Graph display.
8. Click the Learn Spectrum button again to end the learning process. As soon as the second learning process is stopped, the Output spectrum's profile is immediately calculated (appears as a blue line in the graph display). At this point, the Graph display will show three differently colored plotted lines – yellow is the Reference profile whose spectral characteristics will be applied to the Input file when the plugin is active, green is the Input profile, and blue is the output profile. The EQ curve corresponding to the current Input and Reference profiles may be viewed by switching to the EQ Graph Display (by using the EQ View radio button above the Graph Display).
9. Use the Matching slider to adjust the degree of matching between the Reference and Input profiles – when the Matching slider is at 0%, the Output profile (blue line) coincides with the Input profile (green line), which means that the Input will not be modified. When the slider is at 100%, the Output profile is identical to the Reference profile (yellow line), applying maximum equalization matching to the Input.
10. Use the Smoothing slider to smooth the Output profile (blue line) if it presents too many sharp peaks and dips, which can cause undesirable resonance, or inconsistent performance over different sets of reference monitors.

For additional control, the EQ curve's properties may be manually edited – described in additional steps below.

11. In the EQ Graph Display, click and drag to modify EQ gain properties (and/or shift-click and drag to modify the EQ's bandwidth filtering properties).
12. Repli-Q is now ready for processing – play back the input and the new EQ settings will be applied.



At any point after learning the Input and matching/smoothing/editing the EQ, that EQ may be saved with the Save EQ button. This is useful when the same EQ is needed in the future. Saving the EQ is not required for processing the current Input, however, if not saved, the current EQ will be lost when learning a different spectral profile, or de-instantiating the plug-in.

To Process Using a Saved EQ Profile:

1. Instantiate Repli-Q and load a saved EQ profile using the EQ pop-up menu.
2. Match, smooth and edit the EQ as desired – matching will simply scale the EQ between a flat 0dB curve and the loaded EQ profile.
3. Open an input file and play it back – the loaded EQ profile is applied.

To Use Repli-Q as an Editable Linear Phase EQ:

1. Instantiate Repli-Q and select the EQ Graph Display – a flat 0dB curve is displayed.
2. Play back audio material that needs EQ changes, and perform as many manual edits to the EQ curve as desired until the desired effect is achieved.
3. Bounce/apply the plug-in – the custom EQ settings are applied.

To Automatically Compensate for Gain Changes:

- Check the Gain Comp checkbox – gain changes

introduced by EQ settings are compensated for automatically, keeping the output level approximately equal to the input level. This is useful in evaluating actual differences in EQ characteristics independently of differences in loudness – as increases in loudness sometimes translate to “better sounding”.

To Prevent Clipping the Output Signal:

- Check the Soft Clip checkbox – potential clipping caused by EQ settings that boost output amplitude is now avoided.

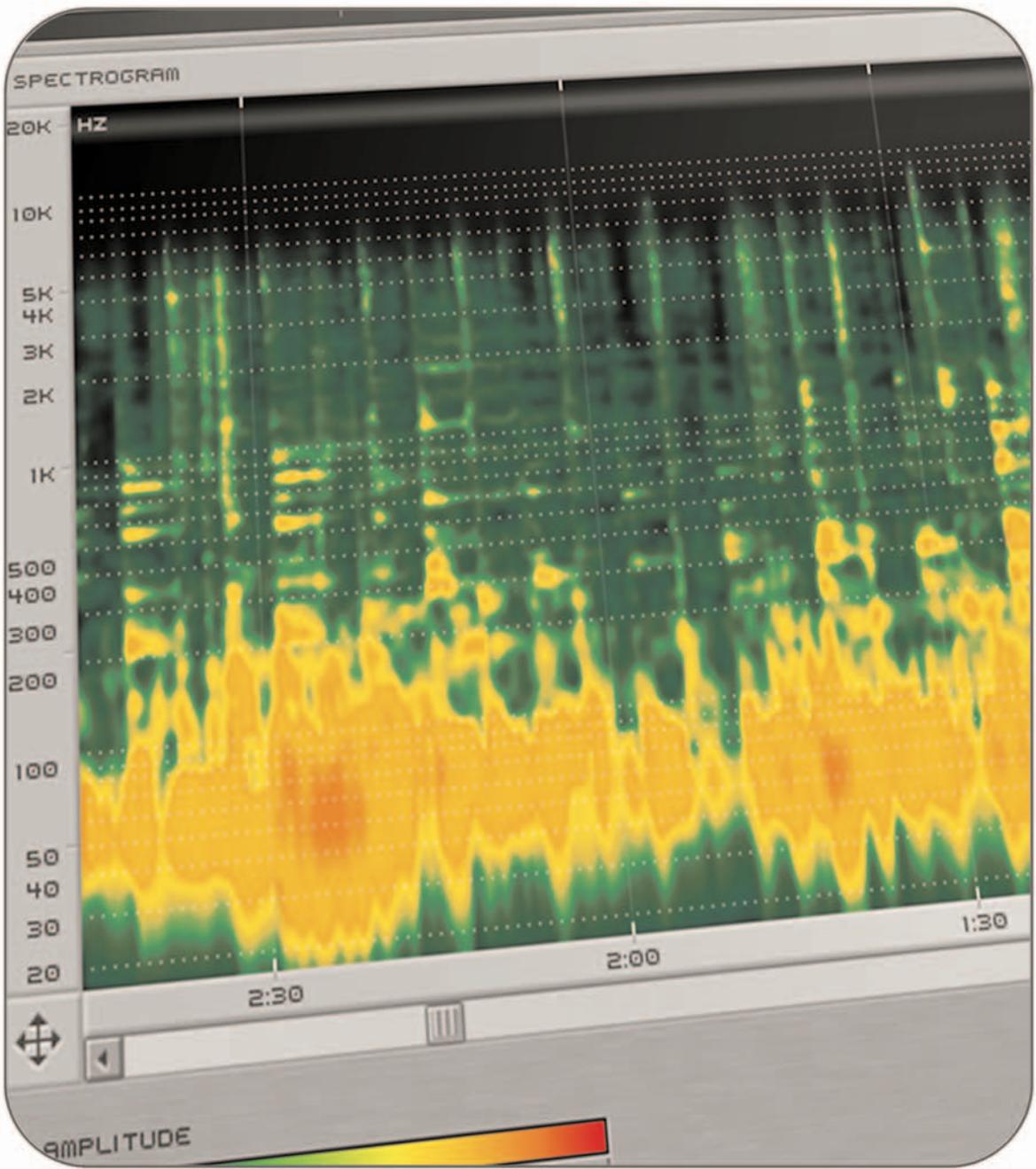
To Manually Control Output Level:

1. Uncheck the Gain Comp checkbox.
2. Use the Gain slider to adjust the output to the desired level.

Conclusion

Now that you are familiar with the various Repli-Q controls, and its basic workflow, please continue along to the next chapter, where you will learn about the Reveal plug-in.

Chapter 6: Reveal



Chapter 6:

Reveal

Introduction

Reveal offers an integrated solution to spectral, power, and phase analysis. Its components can be broken down into three categories:

Frequency Analysis Tools

- Oscilloscope
- Spectral Analyzer (Graph & Meter Displays)
- Spectrogram

Level Analysis Tools

- Peak and RMS Level History Display
- Peak and RMS Level Meters

Phase & Pan Analysis Tools

- Lissajous Phase Scope
- Pan Power History Display
- Phase Correlation Display

This combination of tools provides audio engineers with all the elements needed to analyze recordings (or live input), and is indispensable during the audio production process. Audio engineers typically use these types of analysis tools in the following scenarios:

- In the studio, they are used to determine problem

areas in a mix, or to observe how processing or mixing is affecting the audio content.

- The tools may also be used for analyzing real-time live input, in order to analyze room acoustics, and potential phase issues due to speaker placement and speaker tuning.

It takes a combination of audio analysis tools to get a comprehensive understanding of audio content, and Reveal provides them all, in a single easy-to-use plug-in.

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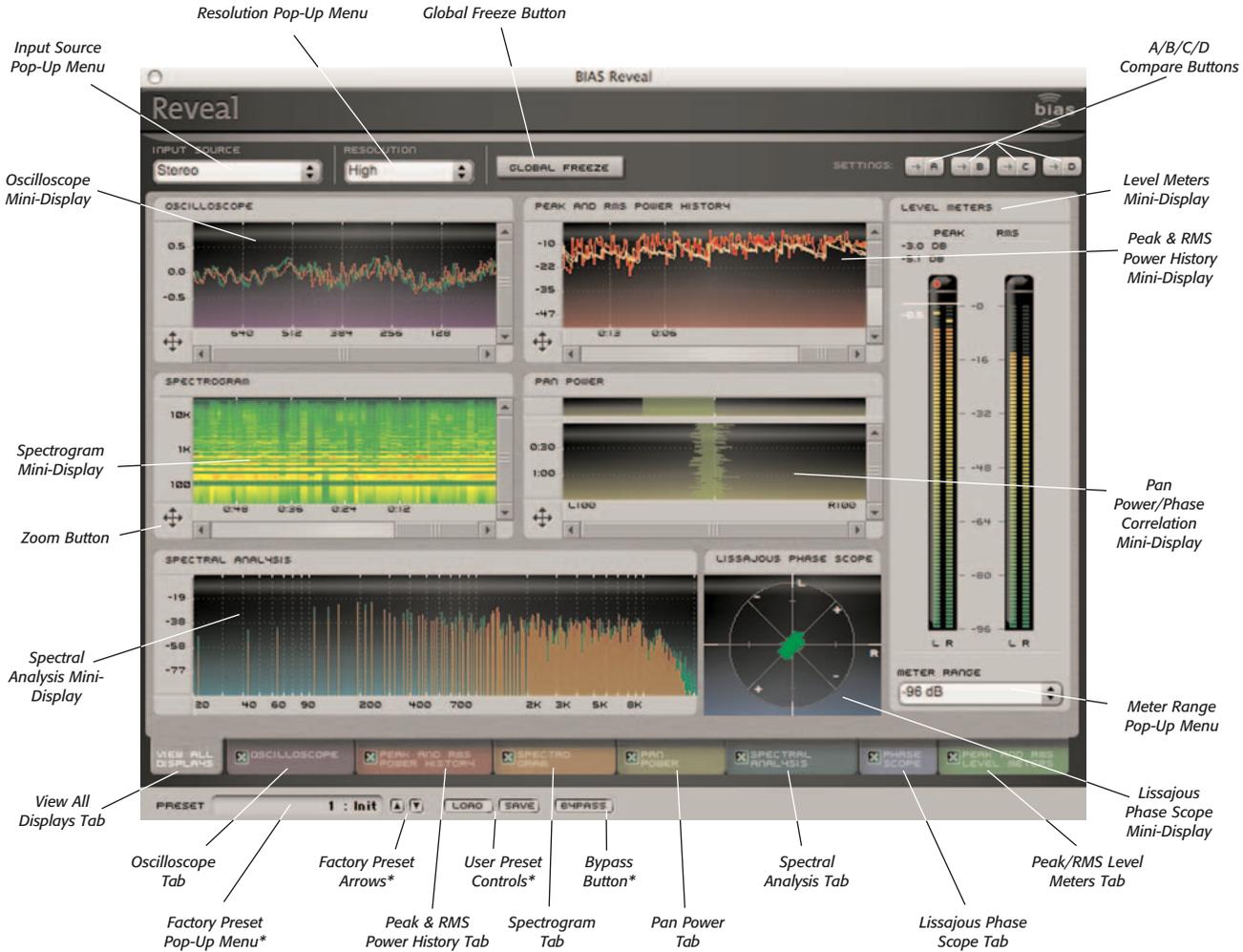
Reveal User Interface & Controls

Reveal is designed to be intuitive and easy-to-use. This section discusses the graphical user interface, and will familiarize you with each of the various controls.

Global Controls

Reveal includes many controls designed for specific tasks, and also features several “global” controls, that affect the state of the entire plug-in. Below is a brief description of these “global” tools, and how they operate.

Reveal Graphical User Interface



*Appearance of preset/bypass controls will vary depending on the platform, host, and plug-in format used

Resolution Pop-Up Menu

This control sets the screen update rate used in Reveal's various displays. The resolution may be adjusted to suit the CPU of the computer on which Reveal is being used. Higher resolution settings are intended for faster CPUs, and lower settings are intended for slower CPUs – you may want to experiment with this setting to get the best results for your particular computer system.

Global Freeze Button

Clicking the Global Freeze button temporarily stops movement in all displays, allowing for closer examination of their data. Clicking this button again resumes activity in all displays.

Input Source Pop-Up Menu

This menu allows you to choose whether the input source (i.e., the signal being fed into Reveal for analysis) is a single (left or right) channel of a stereo file, or both channels simultaneously.



If you are working with a mono file, be sure to set the Input Source pop-up menu to “Left”.

Zoom Buttons

Technically, these are not “global” controls, but they appear in several of Reveal's tools, so they will be covered here.



The Zoom Button appears in several of Reveal's tools, and allows zooming along the X & Y-axes.

Zooming and scrolling is possible within tools that feature this control, which allows a very detailed zoomed-in view, or can be zoomed-out for a “big picture” view. Zooming is accomplished using the Zoom Button, located at the point where the X and Y-axes meet.

Option-clicking on the Zoom Button resets the zoom level.

- Zoom In Horizontally – Click and drag to the right
- Zoom Out Horizontally – Click and drag to the left
- Zoom In Vertically – Click and drag up
- Zoom Out Vertically – Click and drag down

A/B/C/D Compare Buttons

The A/B comparison feature is common in audio programs, and gives the ability to preview different settings before committing to them. Essentially, various tool settings are made and stored as snapshot “A” – another group of settings can then be assigned as snapshot “B” – and then clicking the A or B buttons in the interface instantly toggles between the two. As Reveal offers many fine-tuning options, it features not just two comparison modes – but instead includes A/B/C/D comparisons, for four unique snapshots to compare between, before committing to any file processing. These snapshots are similar to saving and loading presets, but are instantaneous, and do not require selecting presets from a menu to load them. To permanently save one of these snapshots, simply select the desired snapshot, and save it as a custom User Preset.

Factory Preset Pop-Up Menu

This menu displays the current factory preset, if one has been selected. Clicking this menu shows a list of all available factory presets. A factory preset may be selected by choosing it from this pop-up menu.

Factory Preset Selection Arrows

These arrows are used to navigate through factory presets. Clicking the down arrow moves to the next available factory preset, and clicking the up arrow moves to the previous factory preset.

User Preset Save Button

Saves a user preset, which includes the state of all Reveal parameters.

User Preset Load Button

Recalls a user preset, which includes the state of all Reveal parameters.



User presets do not appear in the Factory Preset pop-up menu, be aware of the directory where you are saving them into, so they may be recalled easily later.

Bypass Button

The Bypass button is used to temporarily disable the plug-in. When the plug-in is bypassed, audio playback is not analyzed by the plug-in.

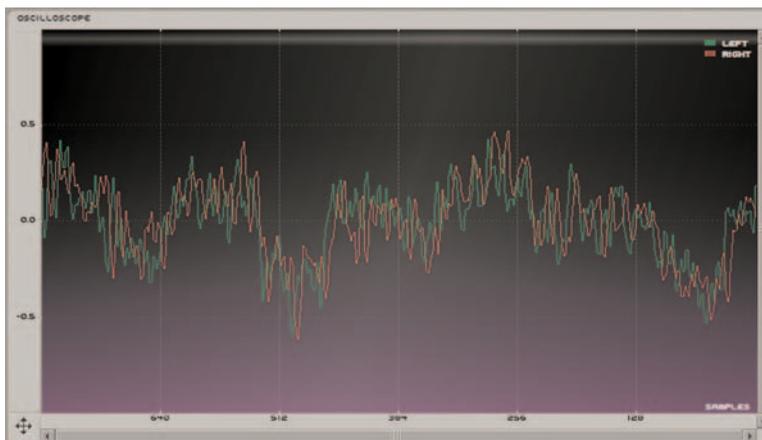
Tool-Specific Controls & Displays

While all of Reveal's analysis tools may be viewed simultaneously in the View All Displays Tab, you may also view each tool independently. Viewing a single tool offers a much larger display area, which can translate into more accurate data interpretation. Having this option allows you to view many types of data simultaneously, or a single type of data in great detail.

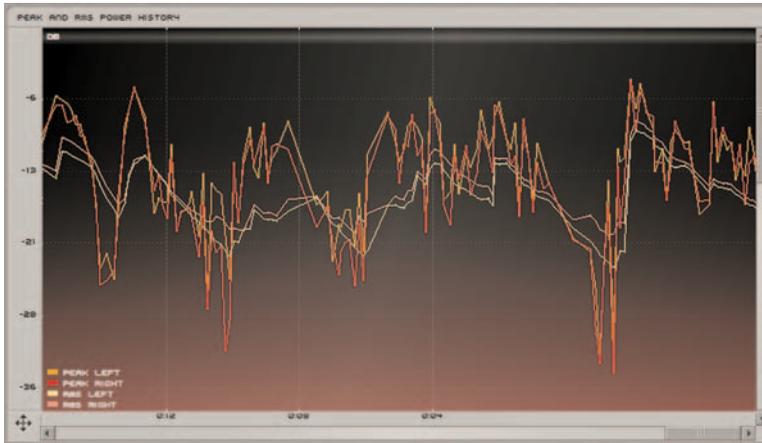
Navigating between the various tools is possible by clicking the desired tool's tab in the lower part of the Reveal interface will do the same. In this section, we'll take a look at each of Reveal's tools.

Oscilloscope

The Oscilloscope displays a trace-style scope waveform. Left channel data is displayed in green, and right channel data is displayed in red. The graph display's X-axis measures amplitude, and is labeled in dB (decibels), while the Y-axis measures time, and is labeled in samples.



Reveal's Oscilloscope Display



Reveal's Peak and RMS Power History Tool Display

Peak and RMS Power History Tool

This tool analyzes an audio file's Peak and RMS ("Root Mean Square" or average) level history. By plotting the Peak and RMS levels in a graph it's possible to monitor the volume of an audio signal over a period of time. The data plotted in the graph display area includes:

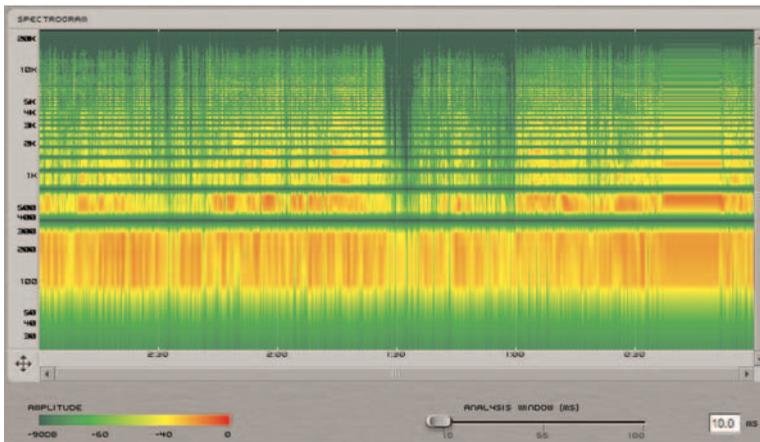
- Left Channel Peak Level – Orange
- Right Channel Peak Level – Red
- Left Channel RMS Level – Yellow
- Right Channel RMS Level – Pink

The graph display's Y-axis measures amplitude, and is labeled in dB (decibels), while the X-axis measures time, and is labeled in minutes and seconds. The precision of the intervals along each axis varies, and depends on the zoom level being used.

6

Spectrogram Tool

The Spectrogram analyzes an audio file's spectral content, and displays it in a time-frequency graph (in which the X-axis represents time and the Y-axis represents frequency). A color gradient is used to represent the varying amount of power present in



Reveal's Spectrogram Display

different parts of the frequency spectrum. Red represents the highest amplitude for a given frequency, while green represents the lowest amplitude.

Analysis Window Slider/Numerical Field

The Analysis Window control allows varying frequency resolution versus time (attack/decay) resolution. The higher the Analysis Window setting, the more frequency resolution and the less time resolution is displayed, and vice-versa.

A higher Analysis Window setting means that partials/harmonics (i.e., sine waves) with very close frequencies will be seen as separate peaks in the spectrum (each peak is a lobe about 7 spectral points wide). If the Analysis Window setting is steadily decreased, at some point the peaks will merge into one large lobe, and it will be impossible to distinguish whether separate partials exist.

A lower Analysis Window setting means that two attacks which occur very close to each other in time will be seen as two separate events (i.e., the spectrum will jump up, decay, and jump up again). If the Analysis Window setting is steadily increased, at some point the two attacks will be within one Analysis Window, and the spectrum will only go up once.

Therefore, if partials/harmonics are important for the analysis you are performing, the Analysis Window setting should be increased until separate spectral peaks are visible. Too big of an Analysis Window averages too much of the signal, so fast changes (attacks or fast pitch variations) merge into one blurry spectrum.

For monophonic signals, the Analysis Window setting should be around 4 periods of signal (on average, since the pitch is changing) for adequate frequency resolution (i.e. so that the partials are seen as separate peaks in the spectrum).

By default, the Analysis Window slider is set to 50ms, and has a range of 10 – 100ms.

The graph display's Y-axis measures frequency, and is labeled in Hz (Hertz), while the X-axis measures time, and is labeled in minutes and seconds. The precision of

the intervals along each axis varies, and depends on the zoom level being used.



Sliders can be reset to their default values by Alt/Option-clicking on them.



When numerical fields are in an editable state (i.e., after clicking in them with the mouse), their values may be changed by typing in new values, by using the Up/Down Arrow keys on your keyboard, or by using the scroll wheel on a compatible mouse.

Pan Power/Phase Correlation Tool

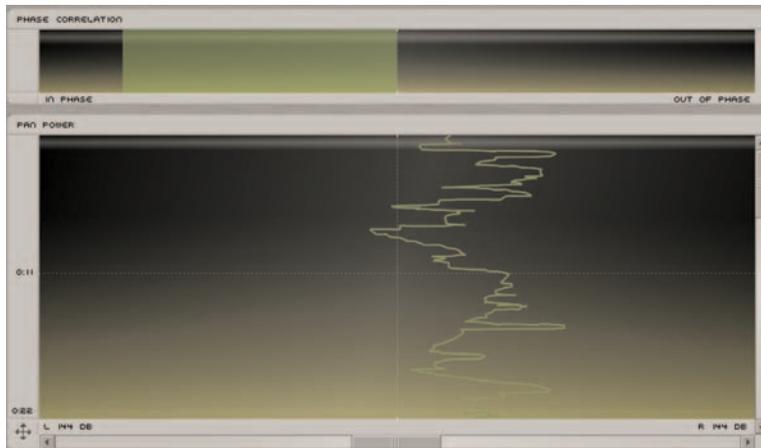
This tool analyzes phase correlation and power balance between a stereo signal's left and right channels. Phase correlation data is shown in the Phase Correlation Meter. Maximum correlation (i.e., a strong "In Phase" reading) means the left and right signals are identical. Zero correlation (i.e. meter reading is centered) means the signals are completely unrelated (i.e., panned hard left or right). Pan power data is shown in the Pan Power Graph. If both channels contain equal power, the meter reading is centered. If one channel contains more power than the other, the meter reading appears stronger for that channel.

The Phase Correlation meter displays correlation as a percentage, either in phase or out of phase.

The Pan Power graph display's X-axis measures pan power in decibels (left/right), while the Y-axis measures time, and is labeled in minutes and seconds. The precision of the intervals along the Y-axis varies, and depends on the zoom level being used.

Spectral Analysis Tool

The Spectral Analysis tool analyzes frequency content contained in an audio file, and displays it in the form of a



Reveal's Pan Power and Phase Correlation Display

Spectral Meter or Spectral Graph, with amplitude on the Y-axis, and frequency on the X-axis. Left channel data is displayed in green, and right channel data is displayed in red.

Display Pop-Up Menu

This control allows configuring the Spectral Meter or Graph to display Instantaneous, Peak, or Average levels.

Response Time Slider/Numerical Field

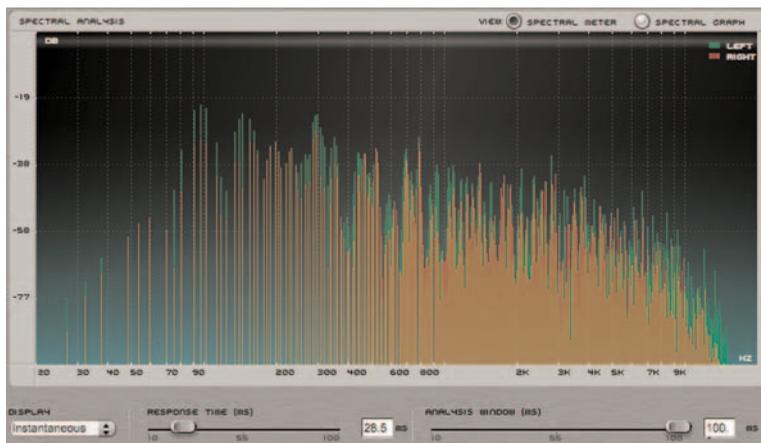
The Response Time control is used to set the duration over which the Average Spectrum is calculated. A low

setting causes it to react relatively quickly, and a high setting causes a slower reaction.

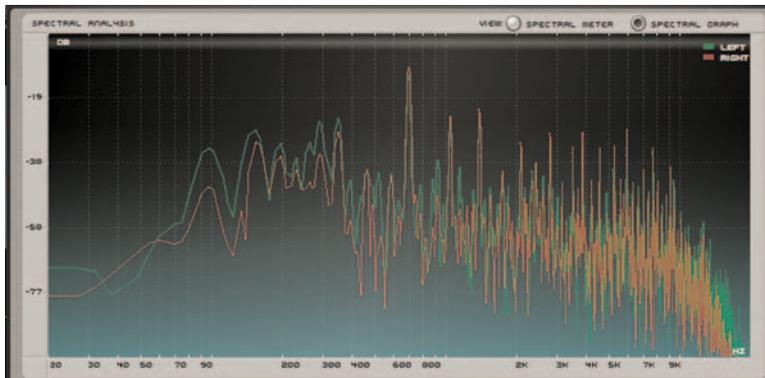
By default, this slider is set to 50ms, and has a range of 10 - 100ms.

Analysis Window Slider/Numerical Field

The Analysis Window control sets the amount of data being analyzed, and allows varying frequency resolution versus time (attack/decay) resolution. The higher the Analysis Window setting, the more frequency resolution and the less time resolution is displayed, and vice-versa.



Reveal's Spectral Analysis Tool – showing the Spectral Meter Display



Reveal's Spectral Analysis Tool – showing the Spectral Graph Display

A larger Analysis Window will better separate partials/harmonics, but will also average spectral variations within the duration of the window.

A shorter Analysis Window will better separate spectral variations over time (i.e., will more clearly show an attack of the piano as a sudden rise of the middle portion of the spectrum), but will not separate partials as well, and eventually, with a short enough setting, discrete spectral peaks for each partial will not be visible.

A good rule of thumb is to make this window three to four times the average pitch period in the signal. Some common examples include:

- Female vocals – (around 300 Hz pitch), the window should be around $4/300$, or 0.01333 seconds, or 13.33 milliseconds long.
- Bass – (around 50 Hz), the window should be around $4/50$ or 0.08, or 80 milliseconds long.
- Complete Mix – Use the lowest-pitch instrument (usually the bass) as the guideline for setting the Analysis Window size.

The graph display's X-axis measures frequency, and is labeled in Hz (Hertz), while the Y-axis measures amplitude, and is labeled in dB (decibels).

Lissajous Phase Scope Tool

The Phase Scope tool displays the amplitude and phase of two signals (i.e., the left and right channels of a stereo signal) as a Lissajous pattern, in which the left channel's frequency data is plotted along the graph's Y-axis, and the right channel's is plotted along the X-axis. Lissajous patterns are useful for determining phase and amplitude relationships between the left and right signals of a stereo pair.

Peak/RMS Level Meters Tool

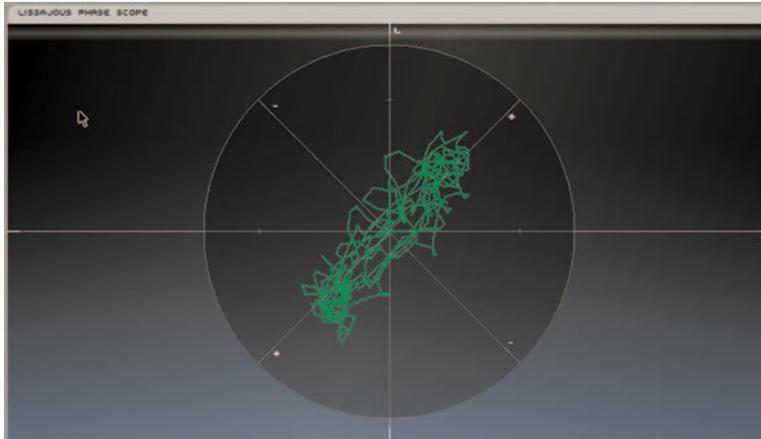
This tool contains both Peak and RMS ("Root Mean Square" or average) Level metering. Other features include Clip Indicators, Clip Statistics, and variable Peak Hold, RMS Smoothing, and Meter Range. Each of these features is described below.

Clip Indicators

These indicators are located just above the Peak Level Meters. They light up in red when the signal exceeds 0dBFS. The Clip Indicators can be reset by clicking on them.

Peak Level Indicators

These indicators appear as horizontal yellow lines, at the top of the Peak Level Meter display. Various options for these indicators may be set using the Peak Hold pop-up menu.



Reveal's Lissajous Phase Scope Display

Overall Peak Level Indicator

This indicator displays the overall Peak Level, with an infinite hold time (similar to setting the Peak Hold time for the Peak Level indicators to Infinity). This indicator can be reset by clicking the Reset All button.

Total Samples Clipped Display/Button

This control is both a numeric display, and a button – it shows the total number of samples in all clipping incidents. Clicking this button resets the clipped sample count to zero.

6

Sample Count in Last Clip Display/Button

This control is both a numeric display, and a button – it shows how many samples were clipped in the last clipping incident. Clicking this button resets the clipped sample count to zero.

Total Clips Display/Button

This control is both a numeric display, and a button – it shows the total number of clips. Clicking this button resets the clip count to zero.



Reveal's Peak/RMS Level Meters Display

Peak Hold Pop-Up Menu

This control sets the duration that the Peak Level indicators stay at the Peak Level.

By default, this control is set to 3 Seconds, and options include:

- Off
- 1 Second
- 3 Seconds
- 5 Seconds
- Infinity

RMS Smoothing Pop-Up Menu

This control sets the duration over which RMS level values are calculated. By default, this control is set to 3 Seconds, and options include settings between 1 – 10 Seconds.

Meter Range Pop-Up Menu

This control sets the range of both the Peak and RMS meters. By default, this control is set to -96dB, and options include:

- -48dB
- -96dB
- -144dB

Conclusion

Now that you are familiar with the various analysis tools in Reveal, continue along to the next chapter, which covers SuperFreq.

Parameter Automation

Reveal's various controls may be automated (i.e. applied dynamically) within hosts that support parameter automation. For more information, please consult your host's documentation on how to automate parameters.

Chapter 7: SuperFreq



Chapter 7: SuperFreq

Introduction

SuperFreq is a high-end suite of parametric equalizer plug-ins, which includes 4-, 6-, 8-, and 10-band editions, so the right amount of EQ control is always available.

SuperFreq includes everything for professional-caliber equalization, including -24dB to $+24\text{dB}$ Gain Values; 0.1 to 30 “Q” (bandwidth) values; sweepable frequencies from 20 Hz to 20 kHz, individual band bypass buttons; 24 dB stereo input/output meters; and filters including Peak, Notch, High Shelf, Low Shelf, High Cut, and Low Cut.

SuperFreq is now at version 2.0, and includes the following new features:

- Updated User Interface
- Numerical fields allow parameter values to be typed in, nudged up or down with arrow keys, or modified using a compatible scroll wheel mouse
- A/B/C/D Compare buttons
- Wider Gain value range ($\pm 24\text{dB}$)
- High precision, high contrast meters
- RIAA Compensation preset

SuperFreq User Interface & Controls

The SuperFreq interface is similar for the four SuperFreq plug-ins (SuperFreq-4, SuperFreq-6, SuperFreq-8, and SuperFreq-10). The number of vertical sets of knobs in

the middle of the interface corresponds to the number of bands of EQ — for example, SuperFreq-10 has 10 bands of EQ, so its interface has 10 vertical sets of knobs in the middle of the interface.

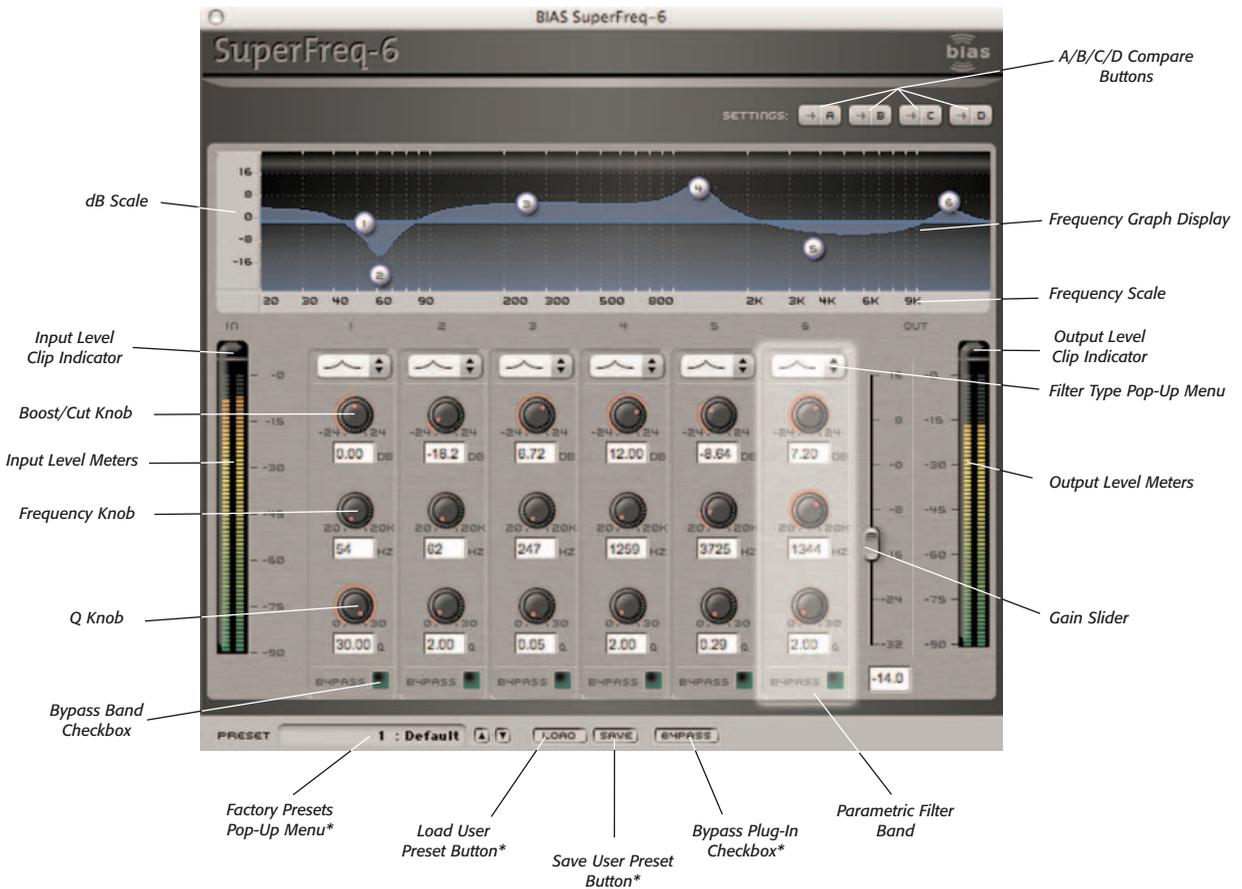
Global Controls

SuperFreq features a variety of controls designed for specific tasks, and also features a number of “global” controls, that affect the state of the entire plug-in. Below is a brief description of these “global” tools, and how they operate.

A/B/C/D Compare Buttons

The A/B comparison feature is common in audio programs, and gives the ability to preview different settings before committing to them. Essentially, various tool settings are made and stored as snapshot “A” — another group of settings can then be assigned as snapshot “B” — and then clicking the A or B buttons in the interface instantly toggles between the two. As SuperFreq offers many fine-tuning options, it features not just two comparison modes — but instead includes A/B/C/D comparisons, for four unique snapshots to compare between, before committing to any file processing. These snapshots are similar to saving and loading presets, but are instantaneous, and do not require selecting presets from a menu to load them. To permanently save one of these snapshots, simply select the desired snapshot, and save it as a custom User Preset.

SuperFreq 2.0 Graphical User Interface



**Appearance of preset/bypass controls will vary depending on the platform, host, and plug-in format used*

Factory Preset Pop-Up Menu

This menu displays the current factory preset, if one has been selected. Clicking this menu shows a list of all available factory presets. A factory preset may be selected by choosing it from this pop-up menu.

Factory Preset Selection Arrows

These arrows are used to navigate through factory presets. Clicking the down arrow moves to the next available factory preset, and clicking the up arrow moves to the previous factory preset.

User Preset Save Button

Saves a user preset, which includes the state of all parameters.

User Preset Load Button

Recalls a user preset, includes the state of all parameters.



User presets do not appear in the Factory Preset pop-up menu, so be sure you are aware of the directory where you are saving them into, so they may be recalled easily later.

Bypass Button

The Bypass button is used to temporarily disable the plug-in. When the plug-in is bypassed, audio playback is not affected.



The Factory, User Preset, and Bypass controls are found in a host-provided section of the interface. This will vary depending on the host and plug-in format being used.

SuperFreq Factory Presets

SuperFreq provides several factory loaded presets to help get you started: Default, Bass Boost, Loud, SuperLoud, Double Low Cut, DeNoiser, Comb Filter, Phony, and RIAA Phono Compensation.

Default

Sets all parametric frequency bands to 0 dB.

Bass Boost

Provides a Low-Shelf boost of 6 dB starting at 130 Hz.

Loud

Provides a moderate boost (4 dB) to the high-end (High-Shelf at 7 kHz) and low-end (Low-Shelf at 200 Hz), while slightly attenuating (−2 dB) the mid-range (Peaking at 2 kHz).

SuperLoud

Provide a prominent boost (7 dB) to the high-end (High-Shelf at 7 kHz) and low-end (Low-Shelf at 200 Hz), while slightly attenuating (−2 dB) the mid-range (Peaking at 2 kHz).

Double Low Cut

Rolls off the low-end using two Low-Cut filters at 60 Hz and 40 Hz respectively.

DeNoiser

Rolls off the high-end using a High-Cut filter at 10 kHz and a few notch filters (Peaking) to eliminate frequencies at 60 Hz, 120 Hz, and 180 Hz. This is a useful setting to help reduce room noise.

Comb Filter

Provides as many notch filters (Peaking) as there are

Parametric Filter Bands available in the specific version of SuperFreq (i.e., 4 in SuperFreq-4 and 10 in SuperFreq-10). A comb filter can produce some very interesting special effects.

Phony

Eliminates the high-end and low-end by using a gentle Low-Cut filter at 500 Hz and a gentle High-Cut filter at 3 kHz. The result is that only the mid-range frequencies pass through, not unlike the bandwidth of a telephone signal.

RIAA Phono Compensation

This preset compensates for RIAA equalization that is inherent in the record manufacturing process (in which low frequencies are cut and high frequencies boosted). This preset boosts the low frequencies, and cuts the high frequencies. When vinyl records are digitally recorded without a suitable phono preamplifier, their RIAA EQ curve must be compensated for, in order for the material to sound “normal”.

Output Level Controls

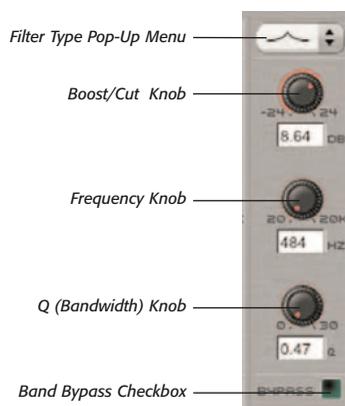
The Output Gain control and Output meters are located on the far right of the plug-in window. This gain control allows you to attenuate or boost the gain of the signal coming out of the plug-in. However, if you are significantly altering the frequency content of a signal, there can be a significant difference in the output gain from the input gain. Use the output gain slider to reduce the gain to prevent clipping. If the output is clipping, the meters will light the top light of the meter, known as the clip light. This light lets you know that something has clipped even after it has happened. To turn off the clip lights, click on one of them.

Equalization Controls

A set of master compression controls appears just above the Frequency Graph Display area. These controls affect individual equalization bands. Each control is described in further detail below.

Parametric Filter Bands

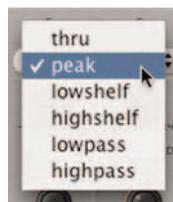
The vertical sections that consist of a pop-up menu and three vertically aligned knobs are the individual filter bands. Each one of these bands is independent and can alter arbitrary parts of the frequency spectrum.



Parametric Filter band with controls for gain, frequency, and Q

Filter Type Pop-Up Menu

SuperFreq features five types of parametric filters: Peak, Low Shelf, High Shelf, High Pass, and Low Pass. Also listed in the Filter Type pop-up menu is an item called Thru. Choosing Thru has the same effect as clicking the filter band’s Bypass checkbox. This is helpful when evaluating the sound difference of a specific band.



Multiple filter types are available for each band

A Peak filter is the classic parametric filter. It allows you to boost or cut a specific area of frequencies with an arbitrary bandwidth.

The Low Shelf and High Shelf filters boost or cut all the frequencies below or above the selected frequency. These are useful for boosting the bass or bringing up the detail in the treble regions.

The High Pass and Low Pass filters cut out frequencies above or below the specified frequency. These are mostly used to eliminate high-frequency noise or low-frequency rumble.

Boost/Cut Knob

The knob right below the Filter Type pop-up menu is the Boost/Cut knob. This knob attenuates or boosts the signal gain in dB for the specified frequency band. This knob has no effect for the Low Cut and High Cut filters.

Frequency Knob

The knob below the Boost/Cut knob controls the frequency at which the filter is applied. For a Peaking filter, it determines the frequency of the center of the peak or notch. For a Low Shelf or High shelf filter it determines the frequency of the transition. For High Pass and Low Pass filters it determines the frequency at which the filters start to cut out the signal.

Q Knob

The bottom knob controls the Q, or bandwidth, of the filter. For a Peak or Pass filter this knob controls the width of the peak or notch. For the Shelf and Pass filters it controls the transition region of the filter — a standard value for high cut and low cut filters is 0.7. Higher Q values create a steeper transition between the boosted or cut frequencies and the unaffected frequencies.

Bypass Checkbox

The checkbox labeled Bypass at the bottom of each filter

band toggles the band on or off. This is helpful when evaluating the sound difference of a specific band.



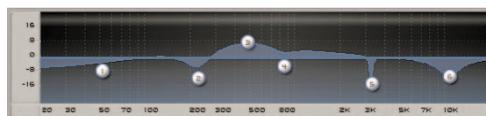
Knobs & sliders can be reset to their default values by Alt/Option-clicking on them.



When numerical fields are in an editable state (i.e., after clicking in them with the mouse), their values may be changed by typing in new values, by using the Up/Down Arrow keys on your keyboard, or by using the scroll wheel on a compatible mouse.

Frequency Graph Display

The Frequency Graph display provides information about all frequency bands and allows you to change each band's gain and frequency values. The graph represents the entire range of human hearing, from 20Hz on the left, to 20kHz on the right.



SuperFreq's Graph Display

The horizontal line through the middle of the display represents the dry signal passing straight through the plug-in (without altering any frequencies in the signal).

The light blue region on the graph represents changes to the signal's frequency content. If the blue region is above the horizontal line you are boosting those frequencies, if it is below you are cutting them.

The vertical divisions on the graph are 8 dB, so the graph can display up to +24 dB and down to -24 dB. You can also control some of the band parameters from here. All of the active bands display a little white ball with their corresponding band number on them. Click the

ball for the desired band and drag it left or right to change the band's frequency parameter and drag it up or down to change its boost/cut parameter.

Parameter Automation

SuperFreq's various controls may be automated (i.e. applied dynamically) within hosts that support parameter automation. For more information, please consult your host's documentation on how to automate parameters.

Using SuperFreq

This section covers the basics of using SuperFreq. It will teach you how to open, make parameter adjustments to, apply, and close SuperFreq.

To Boost a Frequency Band:

1. Open SuperFreq.
2. Select a frequency band to boost.
3. Click the band's ball in the frequency graph, and move it upwards (or turn the band's gain knob to the right/clockwise).

To Cut a Frequency Band:

1. Open SuperFreq.
2. Select a frequency band to cut.
3. Click the band's ball in the frequency graph, and move it downwards (or turn the band's gain knob to the left/counter-clockwise).

To Adjust the Center Frequency of a Filter Band:

1. Open SuperFreq.
2. Select a band in which to adjust the center frequency.
3. Click the band's ball in the frequency graph, and move it to the left or right – or use the frequency knob (Hz) to make this adjustment. Moving the filter band's ball in the graph to the left (or turning the Hz knob to the left) moves the center frequency lower in the frequency spectrum. Moving the filter band's ball to the right (or turning the Hz knob to the right) moves the center frequency higher in the spectrum.

To Adjust Bandwidth:

1. Open SuperFreq.
2. Select a band to adjust its bandwidth (how wide a range of frequencies it affects).
3. Turn the Q knob for that filter band to the left/counter-clockwise, to create a wide bandwidth – or turn it to the right/clockwise to create a narrow bandwidth. Smaller values represent wide bandwidth, and larger values represent narrow bandwidth.

To Change a Band's Filter Type:

1. Open SuperFreq.
2. Select a band to change its filter type.
3. Click on the Filter Type pop-up menu, and choose the desired filter type. Descriptions of filter types appear in the section "SuperFreq User Interface & Controls".

To Boost/Cut Output Gain:

1. Open SuperFreq.
2. Make adjustments to desired filter bands.
3. If you lose overall gain with the adjustments made to individual frequency bands, raise the output gain slider to make up for lost gain – and if you raised the overall gain with the individual band

adjustments, lower the output gain slider to reduce overall gain.

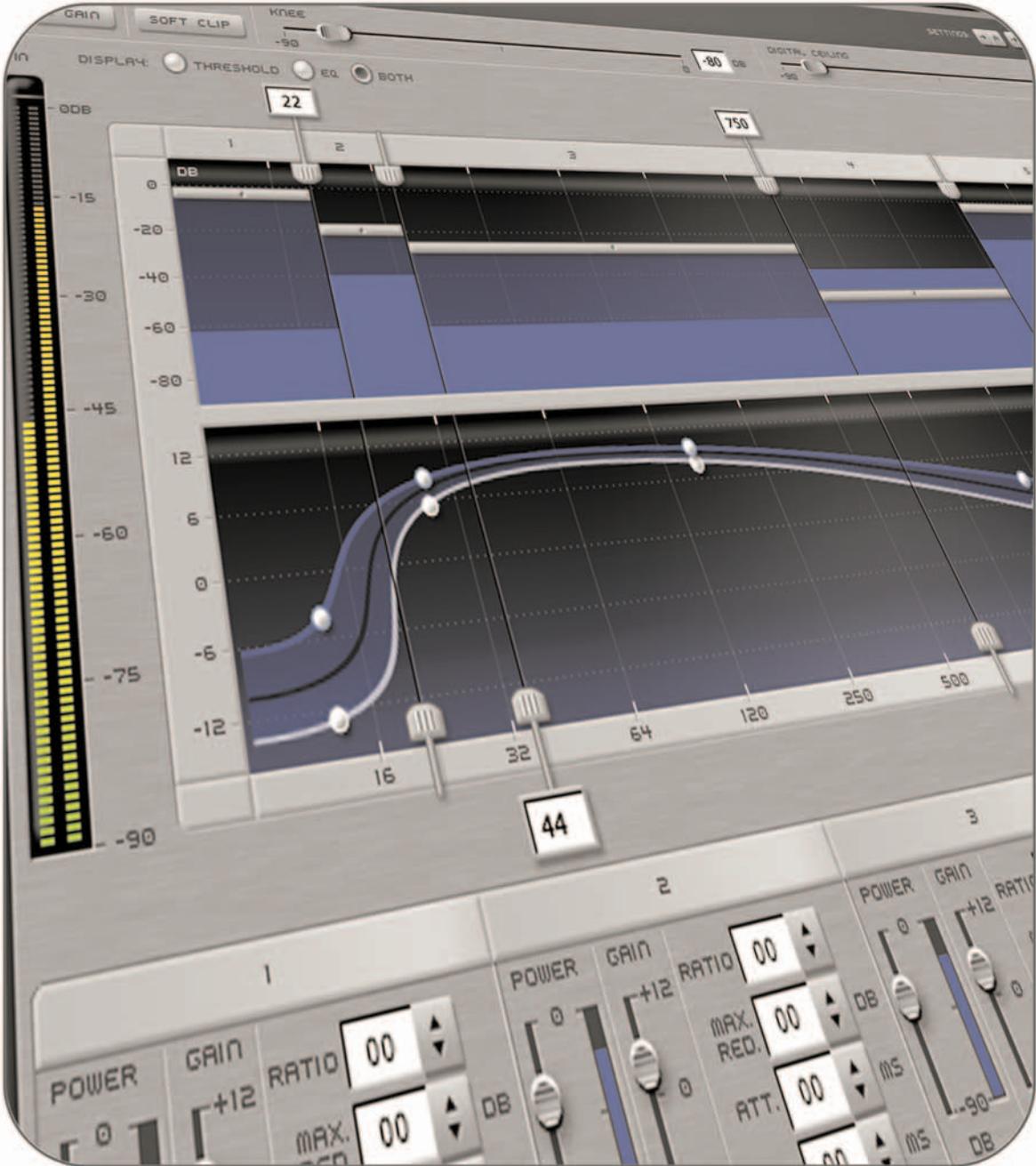
To Bypass a Filter Band:

1. Open SuperFreq.
 2. Make desired settings.
 3. Click the Bypass checkbox for the band you wish to temporarily bypass – while the Bypass checkbox is checked, that filter does not affect audio passing through SuperFreq.
-

Conclusion

Now that you have learned a bit about SuperFreq, please continue along to the next chapter, where you will learn about the Sqweez-3 & -5 multiband compressor plug-ins.

Chapter 8: Squizez-3 & -5



Chapter 8:

Sqweez-3 & -5

Introduction

Sqweez-3 & -5 represent the very latest in professional multi-band compression, limiting, and upward expansion technology. Its linear phase filters give precise control over compression settings for three frequency bands in the case of Sqweez-3, and five bands with Sqweez-5. The advanced visual display provides crucial analysis feedback, and allows parameter adjustment with the highest degree of control.

Sqweez-3 & -5 allow independent compression settings to be applied for low, mid, and high frequencies, and each band can be configured to affect the exact frequency range desired.

This chapter will introduce the graphical user interfaces, how the controls work, and gives some basic hands-on getting started tips for working with Sqweez-3 & -5.

Sqweez-3 & -5 User Interface & Controls

Sqweez-3 & -5 are designed to be intuitive and easy to use. This section discusses the graphical user interface, and will familiarize you with each of the various controls.

Global Controls

Sqweez-3 & -5 feature a variety of controls designed for specific tasks, and also features a number of “global”

controls, that affect the state of the entire plug-in. Below is a brief description of these “global” tools, and how they operate.

A/B/C/D Compare Buttons

The A/B comparison feature is common in audio programs, and gives the ability to preview different settings before committing to them. Essentially, various tool settings are made and stored as snapshot “A” – another group of settings can then be assigned as snapshot “B” – and then clicking the A or B buttons in the interface instantly toggles between the two. As Sqweez-3 & -5 offer many fine-tuning options, it features not just two comparison modes – but instead includes A/B/C/D comparisons, for four unique snapshots to compare between, before committing to any file processing. These snapshots are similar to saving and loading presets, but are instantaneous, and do not require selecting presets from a menu to load them. To permanently save one of these snapshots, simply select the desired snapshot, and save it as a custom User Preset.

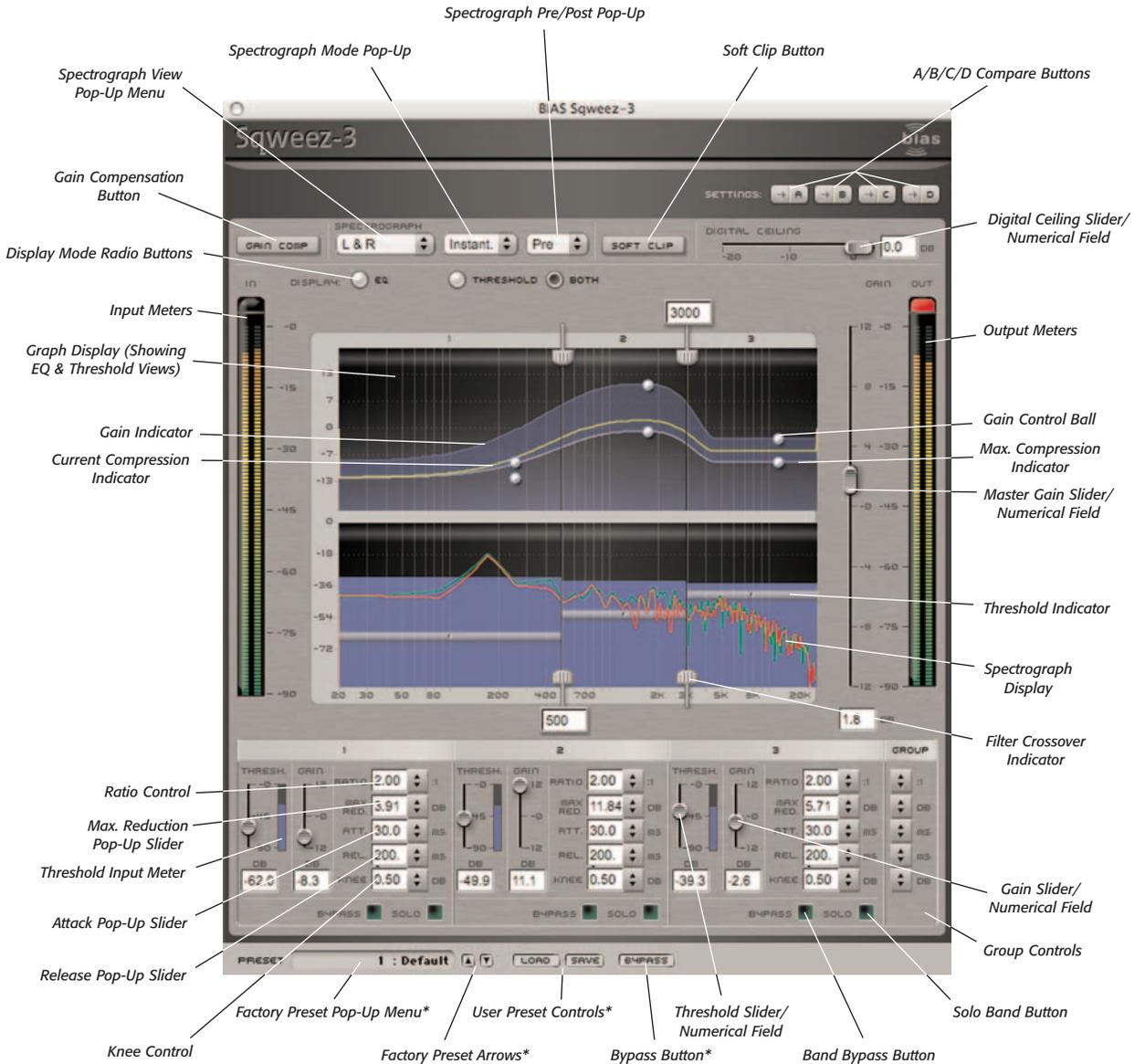
Factory Preset Pop-Up Menu

This menu displays the current factory preset, if one has been selected. Clicking this menu shows a list of all available factory presets. A factory preset may be selected by choosing it from this pop-up menu.

Factory Preset Selection Arrows

These arrows are used to navigate through factory

Sqweez-3 Graphical User Interface



*Appearance of preset/bypass controls will vary depending on the platform, host, and plug-in format used

presets. Clicking the down arrow moves to the next available factory preset, and clicking the up arrow moves to the previous factory preset.

User Preset Save Button

Saves a user preset, which includes the state of all parameters.

User Preset Load Button

Recalls a user preset, includes the state of all parameters.



User presets do not appear in the Factory Preset pop-up menu, so be sure you are aware of the directory where you are saving them into, so they may be recalled easily later.

Bypass Button

The Bypass button is used to temporarily disable the plug-in. When the plug-in is bypassed, audio playback is not affected.

Master Compression Controls

A set of master compression controls appears just above the EQ/Threshold Graph Display area. The controls affect all compression bands. Each control is described in further detail below.

Gain Compensation Button

When clicked, this control toggles automatic gain compensation on or off. When Gain Compensation is active, the output signal level is approximately equal to the level of the original input signal.

Spectrograph View Pop-Up Menu

This control allows choosing whether left channel, right channel, or stereo channel information is shown when the Spectrograph is active. The spectrograph display appears only in the Threshold View (or in the Threshold portion of the “Both” View).

Spectrograph Mode Pop-Up Menu

This control allows the Spectrograph display to be turned on or off. Two display options are available when the Spectrograph is active – Instantaneous and History. Instantaneous mode displays the current spectral qualities of the audio signal. History mode displays an RMS Average of the file’s spectrum over the past few seconds.

Spectrograph Pre/Post Pop-Up Menu

This control allows the display of spectral data in a pre-processing or post-processing state. It is useful for visually comparing the “before” and “after” states of compression settings before the plug-in is applied.

Soft Clip Button

When active, this control acts as a soft limiter to ensure that the output level does not clip due to gain differences introduced by a compression setting. The presence of a check in this box means that Soft Clip is active.

Digital Ceiling Slider/Numerical Field

This control sets the maximum allowable level in decibels (used by the Soft Clip control’s algorithm).

By default the Digital Ceiling slider is set to 0dB, and has a range of -20 to 0dB.



Sliders/pop-up sliders can be reset to their default values by Alt/Option-clicking on them.



When numerical fields are in an editable state (i.e., after clicking in them with the mouse), their values may be changed by typing in new values, by using the Up/Down Arrow keys on your keyboard, or by using the scroll wheel on a compatible mouse.

Input/Output Meters

These meters show levels for both the original signal being input, and the output level, after being affected by the current compression parameters.

Master Gain Slider

This control affects output level globally.

By default, the Gain Slider is set to a value of 0dB, and has a range of -12 to 12 dB.

Graph Display

This display shows a variety of compression data for each band in graphical format. The Graph display may be viewed in three modes – EQ, Threshold, or Both (which displays EQ & Threshold data simultaneously). The graph's X-axis represents frequencies and the Y-axis represents amplitude. In Threshold or Both mode, a spectrograph may be optionally displayed. The Spectrograph can be especially useful for visualizing the frequency range of independent sources in the mix, and setting crossover frequencies accordingly (see description of Spectrograph, earlier in this chapter).

The Graph display presents many useful pieces of

information in a way that is easy to interpret with just a quick glance. The display's elements are described below.

Display Mode Radio Buttons

This set of radio buttons allows choosing between the three available display modes – EQ, Threshold, or Both.

Filter Crossover Indicator/Numerical Entry Field

The Filter crossovers appear in the display as vertical lines, and are used to adjust the width of each compression band (and edit the crossover frequency between it and its neighboring bands). Each crossover indicator features a control tab at its top and bottom, and a numerical entry field so that specific custom values may be quickly entered. Numerical entry fields are staggered so as to fit the interface smoothly – the field for the crossover between bands 1 and 2 appears at the bottom of the indicator, the field for the crossover between bands 2 and 3 appears at the top of the indicator, and so on.

Threshold Indicator

The Threshold indicators appear only in Threshold or Both view modes, and are used to adjust the compression threshold for each band. Each band's Threshold indicator corresponds (and is linked) to the Threshold slider in the band-specific control area below the graph display area – moving the indicator in the graph also moves the slider, and vice-versa.

Gain Indicator

The Gain level for each band is indicated by a thin, light blue line (see Graphical User Interface overview earlier in chapter) in the EQ graph display area. This indicator appears in a horizontal position by default (with all bands set to 0dB, but its shape and orientation change with adjustments made to the Gain slider and Maximum Compression Indicator). The Gain Indicator appears in the EQ and Both view modes.

Maximum Compression Indicator

This indicator displays the maximum amount of compression currently being applied. It appears as a thin white line (see Graphical User Interface earlier in chapter) in the EQ graph display area. The Maximum Compression Indicator appears in the EQ and Both view modes.

Current Compression Indicator

This indicator displays the compressor's current frequency response at any given instant. It appears as a thin yellow line (see Graphical User Interface overview earlier in chapter) whose position will vary depending on the current compression settings – but will never exceed the amount of compression set with the Maximum Reduction pop-up slider. The Current Compression Indicator appears in the EQ and Both view modes.

Gain Edit Control

The Gain Edit controls appear as small white three-dimensional balls within each compression band in the graph display. These controls are used to adjust a compression band's Gain level, and they correspond with (and are linked to) the Gain slider in the band-specific control area below the graph display area – moving the Gain Edit control in the graph display also moves that band's Gain slider, and vice-versa. The Gain Edit controls appear in EQ or Both View mode.



Each band contains an upper and lower control ball. The upper one controls Gain, and the lower one controls the Maximum Reduction setting (see next control description).

Maximum Reduction Edit Control Balls

The Maximum Reduction Edit Controls appear as small white three-dimensional balls within each compression band in the graph display. These controls are used to adjust a compression band's Maximum Reduction, and

they correspond with (and are linked to) the Maximum Reduction pop-up slider in the band-specific control area. Moving the Maximum Reduction Edit control in the graph display also moves that band's Maximum Reduction pop-up slider, and vice-versa. The Maximum Reduction Edit controls appear in EQ or Both View mode.

Band-Specific Controls

In addition to the global control discussed in the previous section, band-specific controls are also included. These allow fine-tuning of particular compression characteristics that need to be made only within a certain frequency range.

Threshold Slider

This control allows setting a threshold level – audio signals that exceed this threshold are processed with the current compression settings. Signals that fall below the threshold are not affected by the band's compression settings.

By default, Threshold Sliders are set to 0dB, and have a range of 0 to -90dB.

Threshold Input Meter

Each band features an input level meter, which is specific to the frequencies that fall within the range of that band. These meters are useful for setting the Threshold Sliders within each band.

Gain Slider

This control can be used to manually make up gain that may be lost as a result of compression settings within a given band.

By default, the Gain Sliders are set to 0dB, and have a range of -12 to 12dB.

Ratio Pop-Up Slider

This control determines how much a signal is reduced when it exceeds the threshold level for that band. For example, using a 3:1 ratio means that every 3dB over the threshold level results in a signal that is 1dB over the threshold, which is a reduction of 2dB.

By default, the Ratio Pop-Up Sliders are set to a value of 2:1, and have a range of 2:1 to 50:1.

Maximum Reduction Pop-Up Slider

This control allows setting a maximum reduction value for a given band. Some ratio and threshold settings may result in unrealistic reduction values. This slider allows setting a user-defined maximum amount of reduction.

By default, the Maximum Reduction sliders are set to 0dB, and have a range of 0 to 60dB.

Attack Pop-Up Slider

This control determines how quickly compression is applied, when a signal exceeds the threshold for that band.

By default, the Attack Pop-Up Sliders are set to 30ms, and have a range of 0 to 200ms.

Release Pop-Up Slider

This control determines how quickly compression effect is released, once a signal falls below the threshold level for that band.

By default, the Release Pop-Up Sliders are set to 200ms, and have a range of 0 to 200ms.

Knee Pop-Up Slider

This control determines how hard (dramatic) or soft (transparent) the knee of the compression curve is at the threshold point.

By default, the Knee Pop-Up Sliders are set to .50dB, and have a range of .50 to 3.00dB. (This value corresponds to the interval on which the compression curve is smoothed around the threshold.)

Bypass Checkbox

The Bypass checkbox is used to temporarily disable a specific compression band. When a band is bypassed, audio within its frequency range is not affected by compression settings. The presence of a check means that band is bypassed.

Solo Checkbox

The Solo checkbox is used to temporarily disable all other compression bands. When a band is soloed, only audio within its frequency range is affected by compression settings. The presence of a check means that band is soloed.

Group Controls

This set of controls is used to apply common Ratio, Maximum Reduction, Attack, Release, and Knee settings to all bands simultaneously.

Parameter Automation

Sqweez-3 & -5's various controls may be automated (i.e. applied dynamically) within hosts that support parameter automation. For more information, please consult your host's documentation on how to automate parameters.

Using Sqweez-3 & -5

This section contains some basic “hands-on” getting started tips for using Sqweez-3 & -5.

To Apply Compression (Basic Steps):

1. Instantiate Sqweez-3 or -5, open an audio file, and start playback.
2. In each compression band, use the input meter to help gauge the appropriate Threshold level – and set this using the Threshold slider. The amount of compression applied depends on how far the Threshold slider is set below the meter’s highest reading.
3. Click the Gain Compensation button (or use the Master Gain Slider) to make up for overall output level reduction introduced by the compression settings.
4. In each band:
 - Adjust the Ratio, Attack and Release to suit your audio material.
 - Adjust the Gain slider to a level that suits the content in that band.

To Fine-Tune Compression Settings:

1. Click and drag the Filter Crossover Indicators to create compression bands that span frequency ranges best suited for the audio material you are working with.



The Spectrograph Display can help to visualize the audio material’s frequency spectrum, and is useful in determining the ideal position for each filter crossover.

2. Check the Soft Clip Checkbox to prevent unwanted clipping.
3. Use each band’s Bypass and Solo controls to audition changes to each band’s settings.

4. For a more dramatic compression effect, try the following:

- Decrease the Attack or Release values.
- Set the Knee to a higher value.
- Set the Ratio to a higher value.
- Increase the Maximum Reduction level.

Conclusion

You should now be familiar with the various plug-ins in the Master Perfection Suite, and their basic operation. For more information, or for additional help, please visit the BIAS website, where you can find tutorials, access technical support, and search through a database of frequently asked technical questions.

We hope you enjoy the Master Perfection Suite!
