Quartet DynPEQ™
and
Trio DynPEQ™

Version 1.4
for
Pro Tools
and
Audio Unit workstations

User Manual

by
Wholegrain Digital Systems LLC

Table of Contents

Preamble

Welcome to DynPEQ plugins version 1.4. There are two configurations of the plugin: Trio DynPEQ, with three bands, and Quartet DynPEQ, with four. There are four host configurations that version 1.4 supports.

• Pro Tools AAX (Native and HDX), Pro Tools versions 10 to current, Mac OS X only

• Audio Unit v2 Intel (32-bit and 64-bit), Mac OS X 10.6 to current

Each host configuration has its own plugin installer, which is covered on the next page.

The Two Flavors

Trio DynPEQ is designed to function as a single-channel insert, while Quartet DynPEQ can operate on groups of channels as well as mono. The Quartet channel capacity as an Audio Unit is arbitrary, provided that the processor you are using is sufficiently fast for the sample rate. The Quartet channel capacity as an AAX plugin is 10, but Pro Tools DynPEQ running on HDX hardware has channel capacity restrictions based on sample rate and plugin employed, detailed as follows.

• For the HDX DSP, Quartet can support tracks up to 10 channels at 44.1 and 48 kHz sample rates, and up to 4 channels at 88.2 and 96 kHz sample rates. Trio, as a single-channel insert, supports samples rates up to 192 kHz, and leaves its processor resource availability to Pro Tools arbitration.

The main difference between Trio and Quartet, besides the number of bands, is that the Quartet output stage includes a peak limiter. So Quartet is geared to be placed at the end of the processing chain, if not at the master fader, while Trio is more appropriately placed near the beginning of a mono track processing chain.

A Bird's Eye View of the Processing

The processing of one DynPEQ band combines the features of a parametric equalizer and a dynamics compressor or expander. You should have some knowledge of how the traditional effects work. If you need an external reference, may we suggest an excellent treatise by Geoff Martin entitled *Introduction to Sound Recording*. Its online home is located at *http://www.tonmeister.ca/main/textbook/*.

As is explained in detail further on in this manual, a DynPEQ band can function as a stand-alone parametric equalizer or dynamics processor. But the dynamics component of the band is inherently connected to the parametric band so that the dynamics can operate on the specified band.

About This Manual

We made this manual to be read on computer-based PDF readers. The text density is not very high for most of its contents. We kindly ask that you limit printing pages of this manual. We hope that the spacious formatting will help you follow the many and various procedures described within.

Your Feedback and Our Support

We freely admit that Quartet and Trio are not easy to understand. As such, the input from users can make a big difference in its performance and efficiency. In order to make this release and future versions of DynPEQ the best tools possible, we at Wholegrain encourage reports of your problems and suggestions with the plugins.

Please send your DynPEQ performance reports via email to *support@wholegrain-ds.com*. It is best to include with your report as much supporting documentation as possible. If DynPEQ crashes in a particular instance, include a crash log and a description of events leading up to the crash. If the issue is with the processed sound from DynPEQ, capture the parameter settings that produce your anomaly. You can make a snapshot of the parameter window with the Mac OS utility at */Applications/Utilities/Grab.app*. Alternatively, you can save the band or bands in question into the band toolchest, as described in the Band Toolchest section, close the workstation setting, and include the file *$(HOME)/Library/Preferences/com.wholegrain.ds.dpeqbands.plist* in your email with a pointer to which entry in your toolchest is the subject of the email. You may send a soundfile as well, but please keep sound examples short, no more than 15 seconds in duration.

We at Wholegrain hope that you will find DynPEQ plugins powerful yet transparent in its processing. This is our intention in making them. If you think of a feature that will improve your work flow or the plugin performance, please send it in. In the meantime, here's to our common pursuit of the golden tone.

Installation

If you have purchased your DynPEQ plugin via a vendor that does not provide a DMG distribution file, that service may have an automated installer integrated into its purchase process. The installation process described below will not apply.

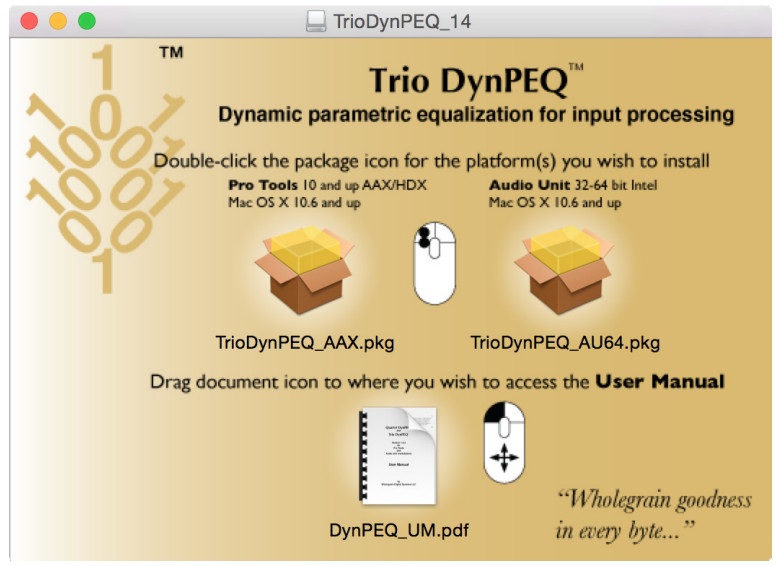
If you have received a DMG file for your purchase, please follow along below as we cover plugin installation from the Wholegrain distribution.

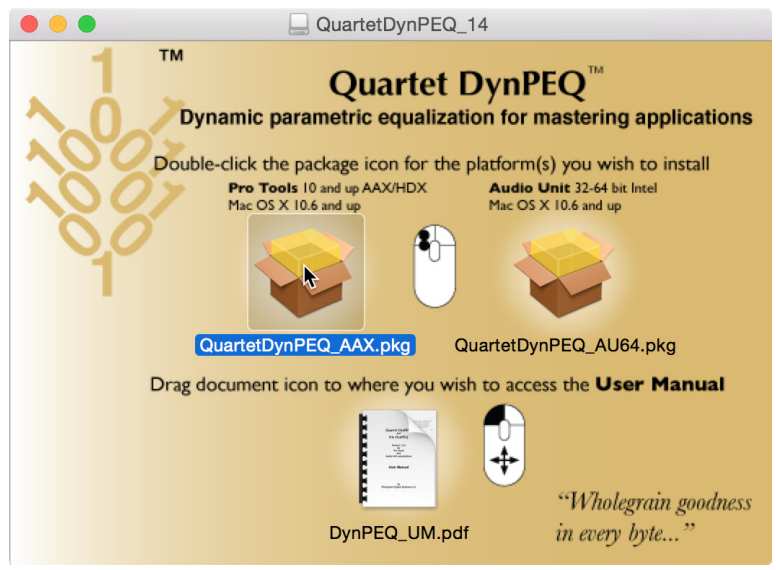
Disk Image and Package (.pkg) Contents

The Wholegrain-issued distribution for a DynPEQ plugin is a Mac OS X disk image file, with the suffix '.dmg'. The application from which you receive the distribution file may open the file automatically. If this is not the case, locate the downloaded file and open it by double-clicking its icon in the Finder or another OS X method for opening files, such as right-clicking the disk icon and selecting Open from the pop-up menu.

If the .dmg file has been transferred to you without errors, opening the disk image will display a Finder window containing installation packages for supported workstation hosts and the user manual you are now reading.

There should be two .pkg files in the Finder window. Each .pkg file contains the installation module for a particular audio workstation type. The .pkg file to the left contains the Pro Tools AAX distribution, and the one to the right contains the Audio Unit distribution. Double-click on the .pkg file or files for the workstation variants you plan to use DynPEQ.





Opening the .pkg file launches the OS X Installer application, which takes you through a few steps to install the plugin on your system. The steps are listed on the left side of the Installer window, and the Continue and Go Back buttons will advance and reverse steps in the process.

The next to last step reveals an Install button. Clicking this button will prompt you for an administrator user name and password. Once they are entered, the DynPEQ plugin will be installed on your system.

To cancel the installation prior to clicking the Install button, either click the red circle on the upper left of the Installer window or Quit the Installer application either via its menu or by command-Q.

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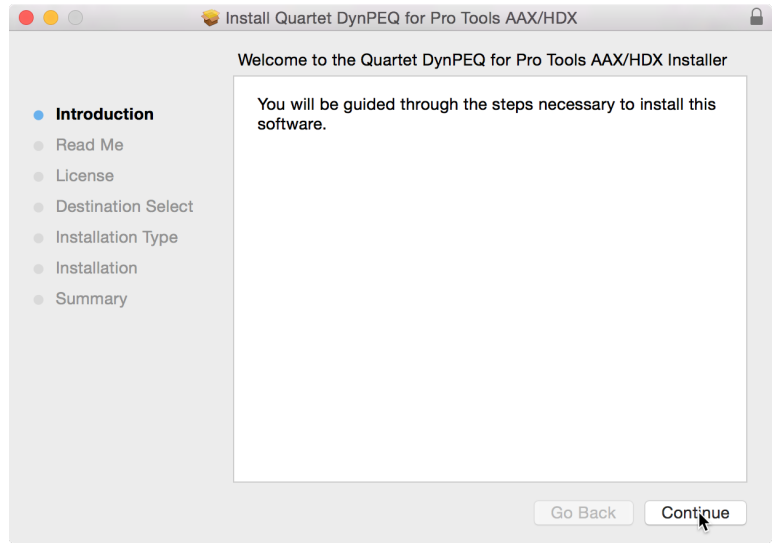
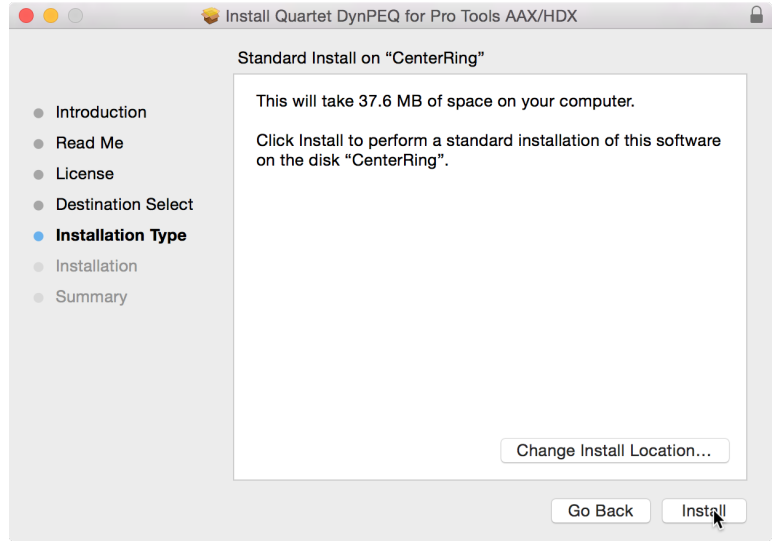




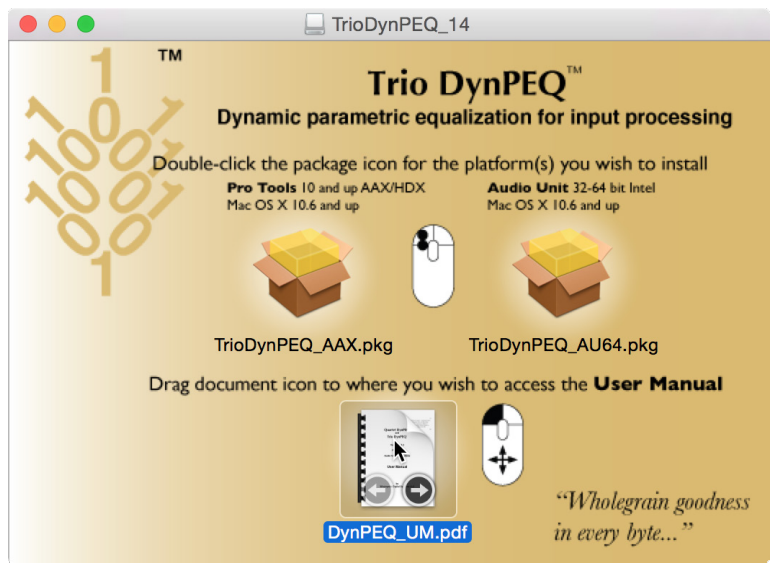
Installation

Disk Image and Package (.pkg) Contents, continued

The installation process will place the DynPEQ plugins into the following workstation-dependent directories.

- Pro Tools: /Library/Application Support/Avid/Audio/Plug-Ins
- Audio Unit: /Library/Audio/Plug-Ins/Components

The installer package does not have the capability to uninstall your DynPEQ plugins. If you need to uninstall your DynPEQ plugins, open the above workstation-dependent directories in a Finder window and implement Move To Trash on the QuartetDynPEQ and/or TrioDynPEQ files in that directory.



User Manual

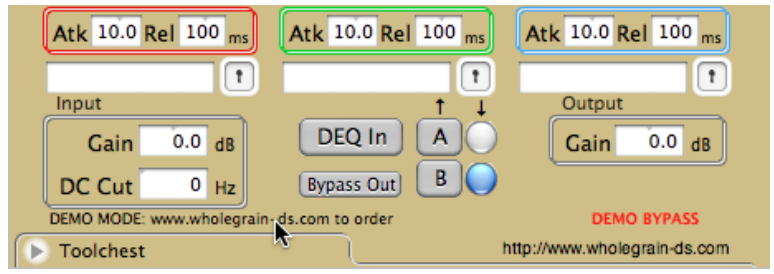
The item beneath the two .pkg files in the Finder window is another copy of this user manual. You may double-click the manual icon to read it immediately, but note that the Finder window will eventually close and not be accessible. You may drag-and-drop the manual icon onto your desktop or another Finder window to copy it to a location where you know you will have ready access to it.

Copy Protection

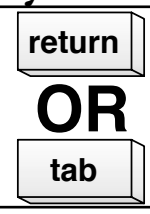
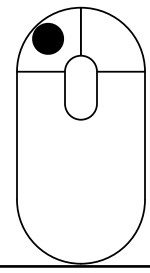
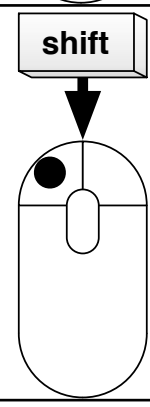
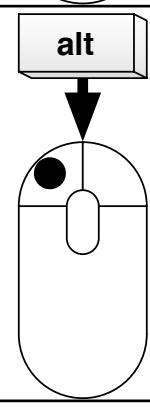
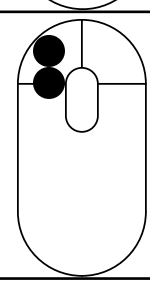
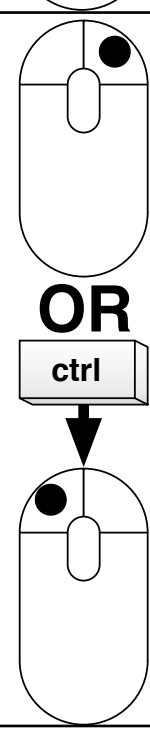
The DynPEQ plugins employ copy protection software. The copy protection software requires the presence of a license resident on an iLok USB dongle in order to complete its initial launch.

If the DynPEQ license has an expiry date, you will occasionally get a reminder of the date of expiration on plugin launch.

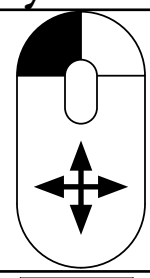
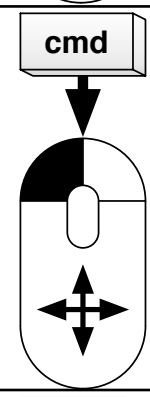
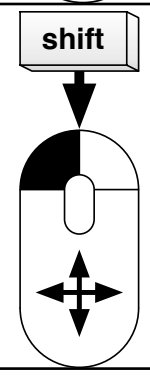
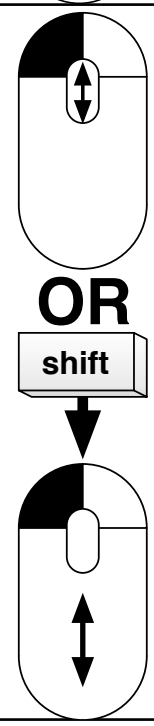
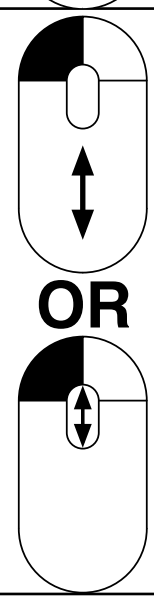
A running DynPEQ plugin that cannot locate its license will execute in a Demo audition mode, where the audio processing will be periodically bypassed. If this happens and you have forgotten to plug in your iLok dongle, do so and click the DEMO MODE text on the plugin window. On finding the license, the DynPEQ plugin will exit Demo audition mode. During Demo mode, the instances of processing bypass will be indicated by a red DEMO BYPASS message on the plugin window.



Legend of Input Operations

Gesture	Symbol	Action
Press Return key or Tab key on the keyboard		• Conclude text editing--if the element is a slider-text, notify the workstation that the parameter has changed
Click the left mouse button or the single mouse button		• Change state of a push button, display a selection menu
Click the left mouse button while pressing the Shift key		• Change auxiliary state of a push button, such as solo mode; or activate a special mode, such as plugin bypass
Click the left mouse button while pressing the Alt or Option key		• Change the value of a slider-text parameter to its default
Double-click the left mouse button or the single mouse button		• Enter text editing mode of a slider-text parameter
Click the right mouse button, or click the left mouse button while pressing the Control key		• Display a type selection menu on a coarse display bead

Legend of Input Operations

Gesture	Symbol	Action
Drag mouse--implies left mouse button down		• Move coarse bead clicked on • Drag-and-drop band toolbox item
Drag mouse with Command key down		• Move coarse bead at a slower speed than that of the mouse pointer • Adjust slider-text value at a slower speed than normal
Drag mouse with Shift key down		• Drag-and-drop multiband toolbox item from a band well
Roll scroll wheel with left mouse button down, or drag mouse up or down with Shift key down		• Adjust auxiliary parameter of the coarse bead clicked on: Q/slope for parametric beads, ratio for dynamics beads (in threshold mode)
Drag mouse up or down, or roll scroll wheel with left mouse button down		• Adjust parameter value of the slider-text clicked on

Parameter Controls

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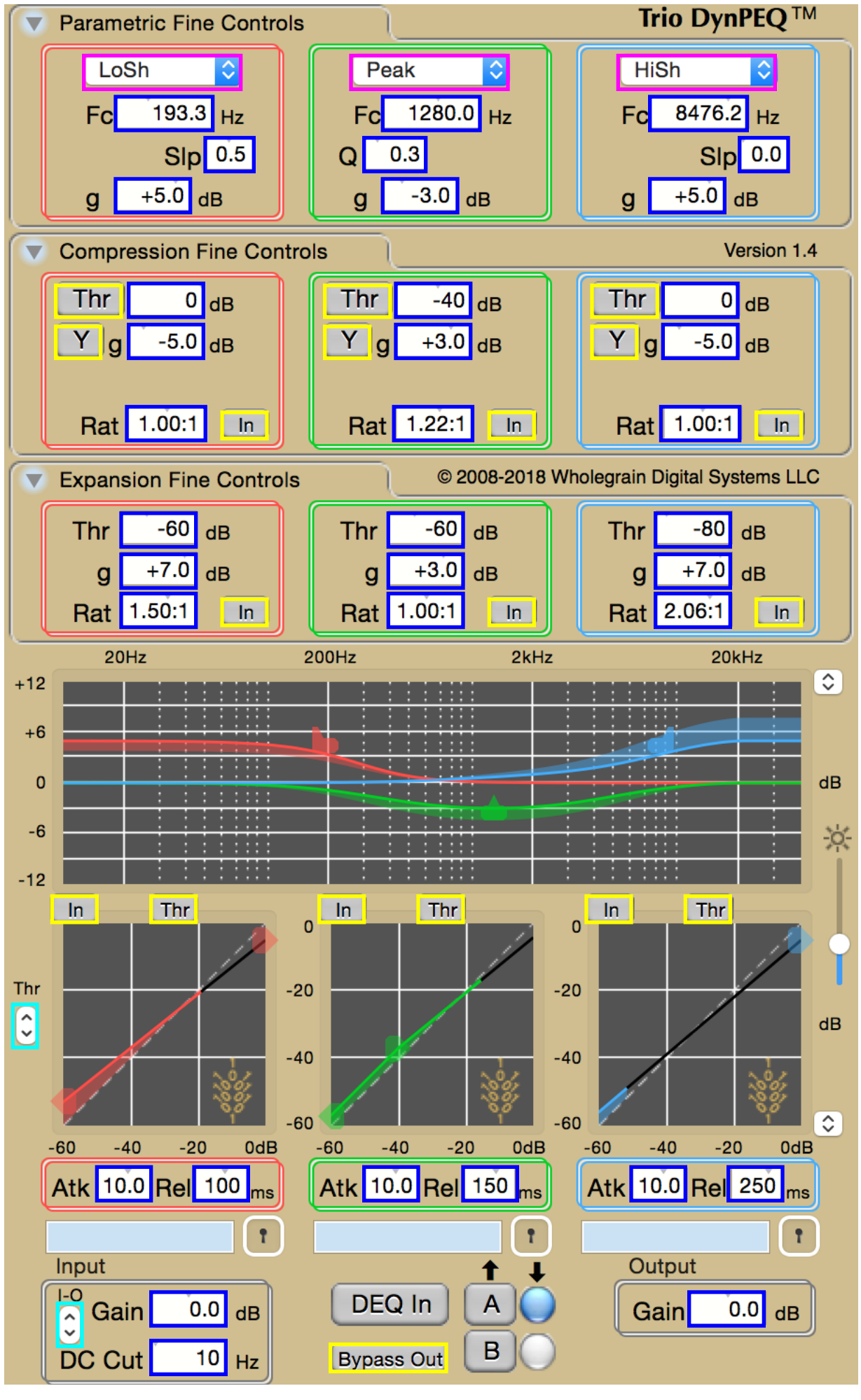
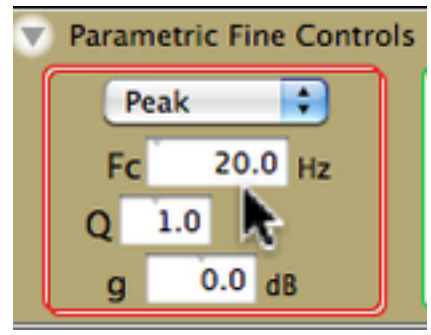
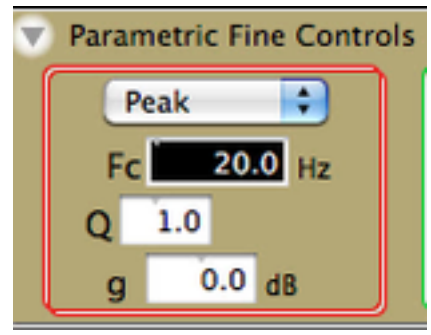
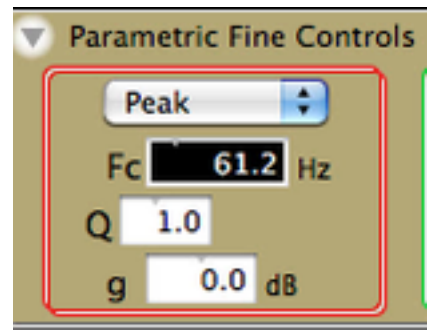
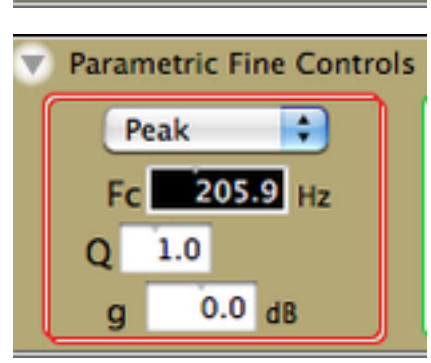


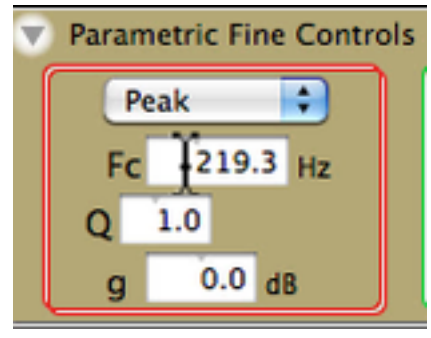
Parameter Controls











Slider-Text

Most of the individual parameters can be changed by what we call a slider-text, in that it acts as both a slider and a text field.

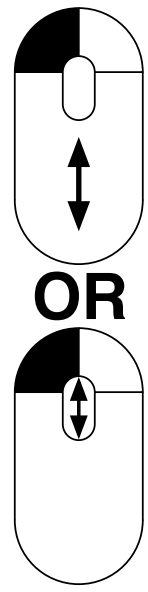
The primary way to manipulate a slider-text is by clicking and holding the left mouse button on its face. Doing this will put it in slider mode, indicated by inverting the foreground and background colors and hiding the mouse pointer.

To increase the value of the parameter, drag the mouse upwards. Alternatively, move the scroll wheel upwards. To decrease the value, either drag the mouse downwards or move the scroll wheel downwards.

To slow down the speed of updating, hold down the command key while manipulating up or down.

Because the slider-text hides the mouse cursor when updating, the update mode will time out after five seconds if no mouse or scroll wheel movements are made in the term.

There is a small gray triangle along the upper edge of the slider-text. The position of the triangle represents the location of the current setting relative to the valid range of the parameter.



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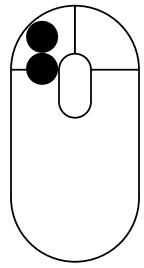
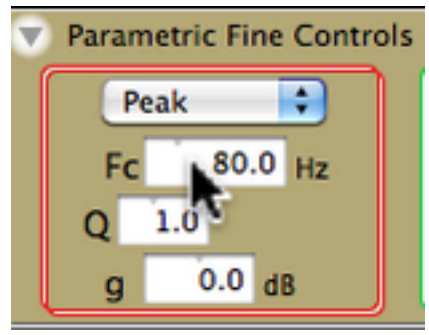
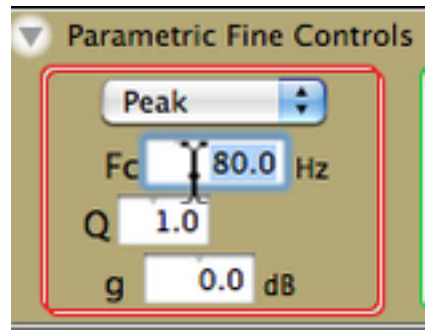
Parameter Controls



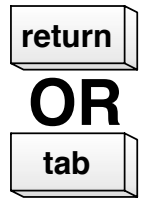


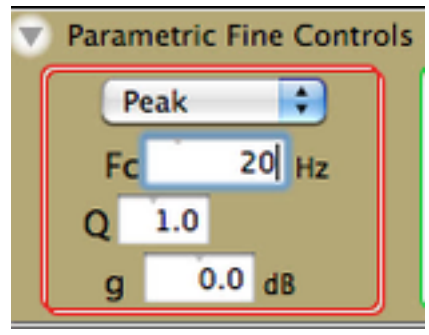
Slider-Text, continued

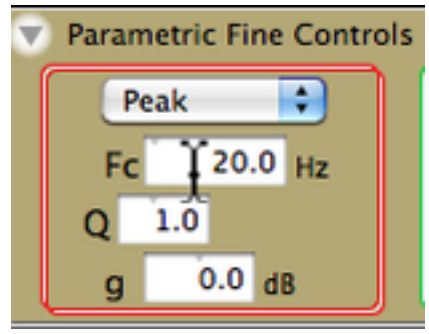
The other way to manipulate a slider-text is by double-clicking on its face. When a slider-text is ready for editing, the perimeter of the field turns blue--this is called a keyboard focus ring in computer parlance. The parameter's value can then be changed by typing in the new number. When the tab or return key is pressed, the focus ring disappears, signaling that the editing has ended, and the new parameter value will be registered with the host workstation.

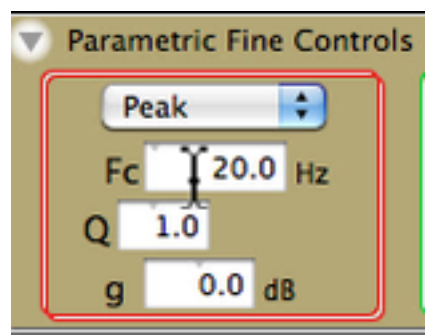


If the slider-text represents a ratio, for compression or expansion, the control will recognize a regular number or a ratio with a colon separating the parts.

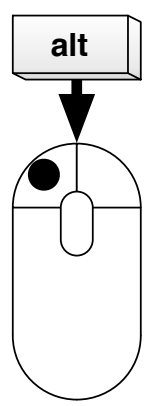


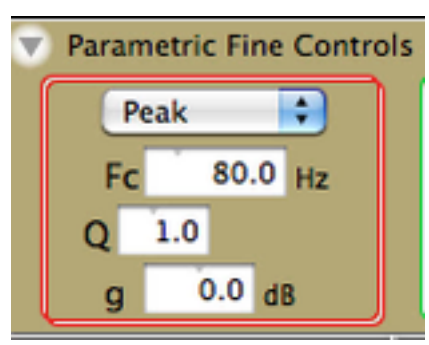




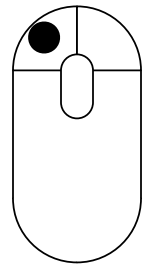


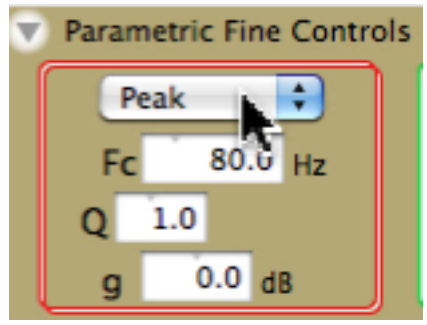
To reset the slider-text value to its default, click on the face with the alt key pressed.

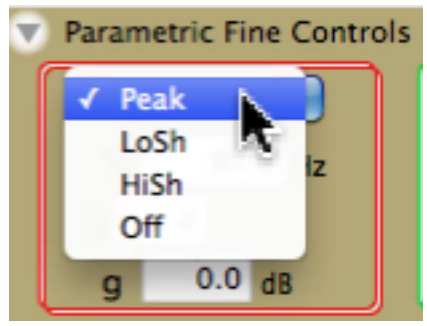




Parameter Controls

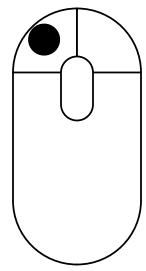


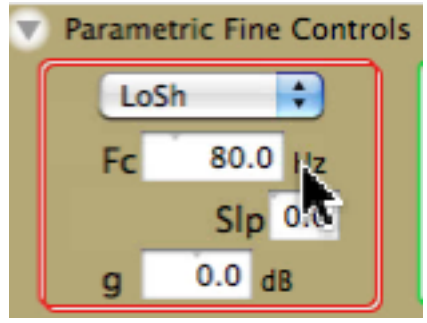


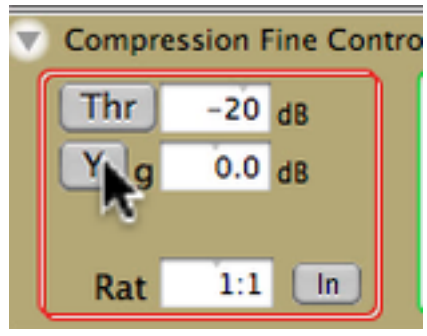


Menu Selector

The menu selector allows for choosing among a small number of options that do not have to be numeric. To display the menu of choices, click on the selector with the left mouse button. Click on the desired item in the menu to register the change. Clicking outside the menu will cancel the selection process.



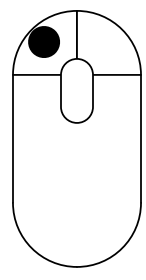


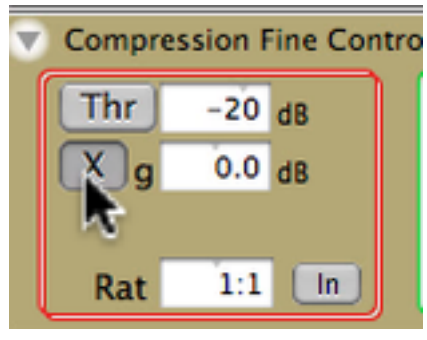


On-Off Button

The on-off button switches between two, and in special cases three, discrete states.

To change the value, click on the button.





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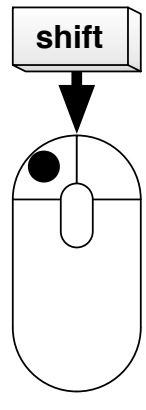
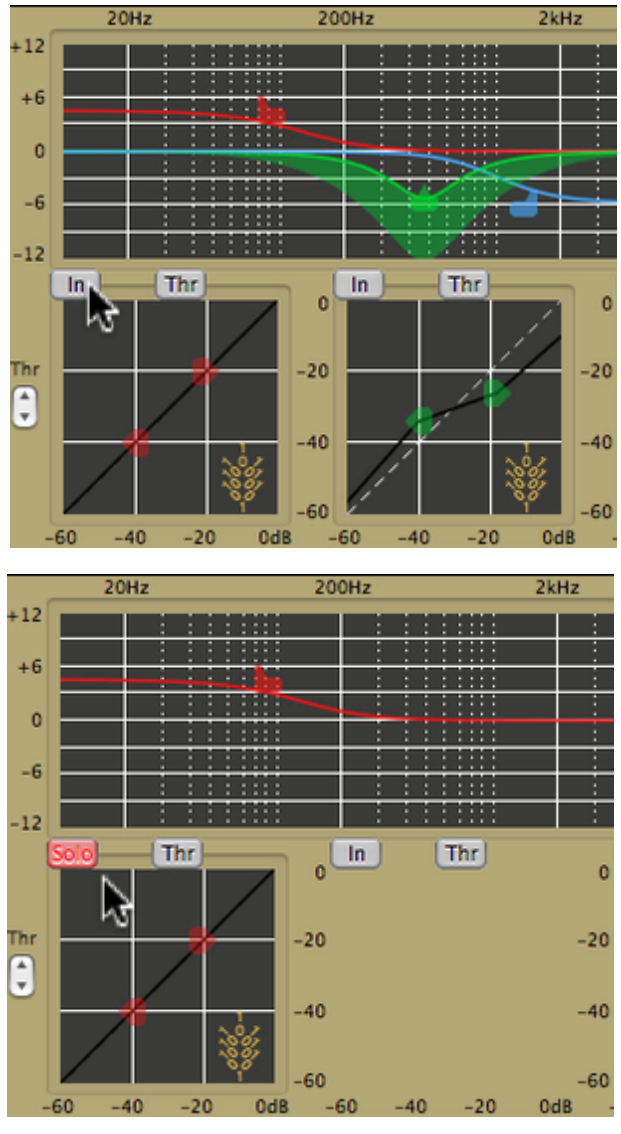
Parameter Controls

On-Off Button, continued

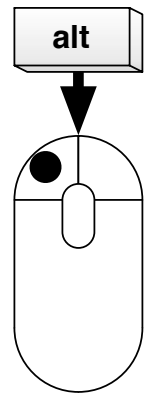
For the band on-off buttons, clicking on them with the shift key down will toggle band solo on that band. More information on band solo mode is *through this link*.

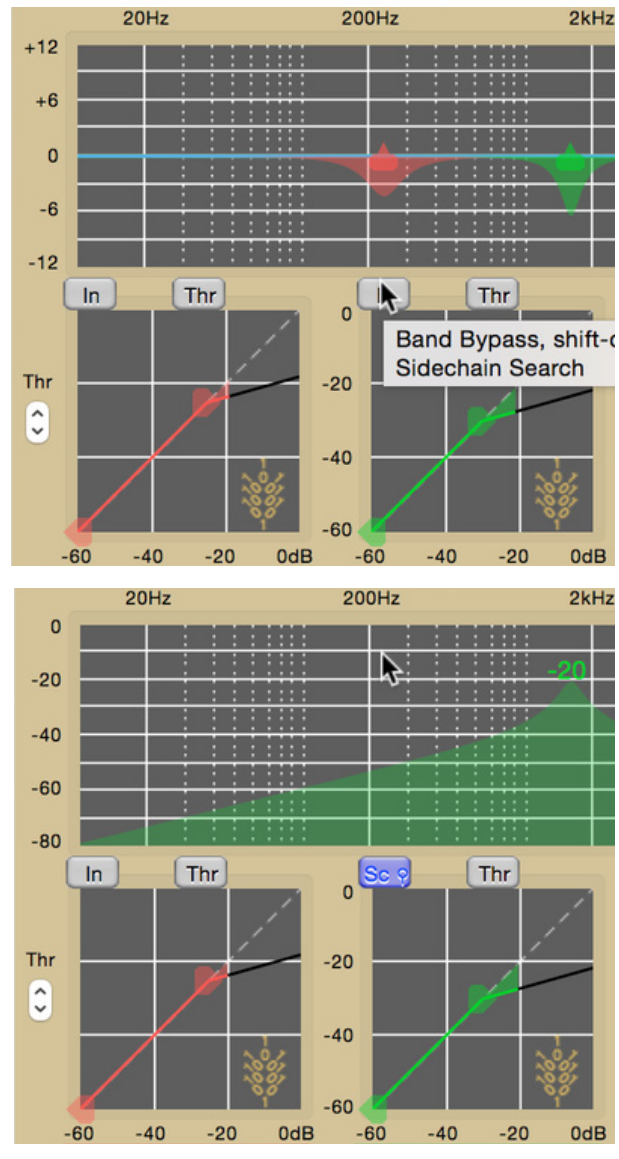




In addition, clicking on the band on-off buttons with the alt key down will toggle sidechain search on that band. More information on sidechain search mode is *through this link*.

continued next page

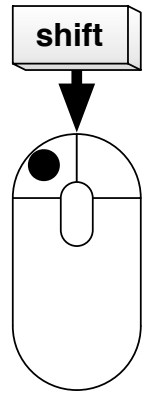


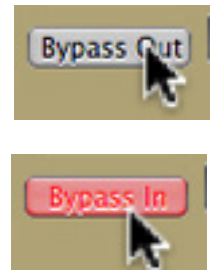


Parameter Controls

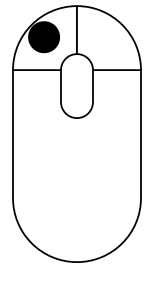
On-Off Button, continued

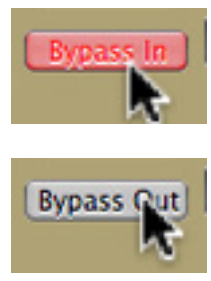
For the global bypass button, clicking on it with the shift key down will bypass all the effect processing.





On-off buttons in their special modes will be red or blue. To revoke the special condition, click on the red button.



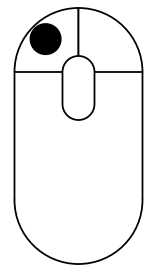


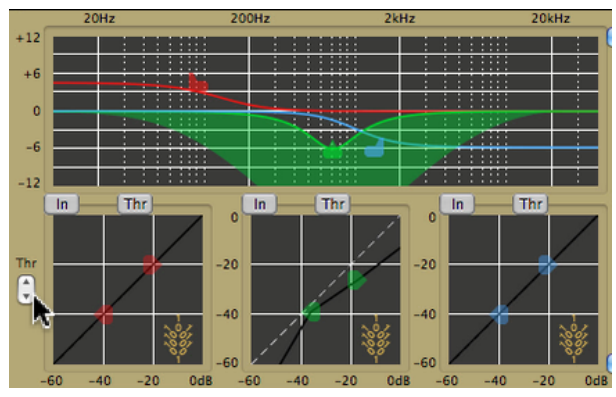
Level Stepper

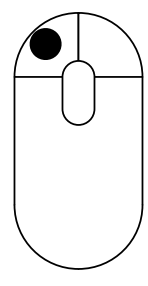
The threshold level stepper, located to the left of the dynamics coarse display, moves all compression and expansion thresholds simultaneously. Click on the lower half of the stepper, with the downwards arrow, to reduce all thresholds by 1 dB.

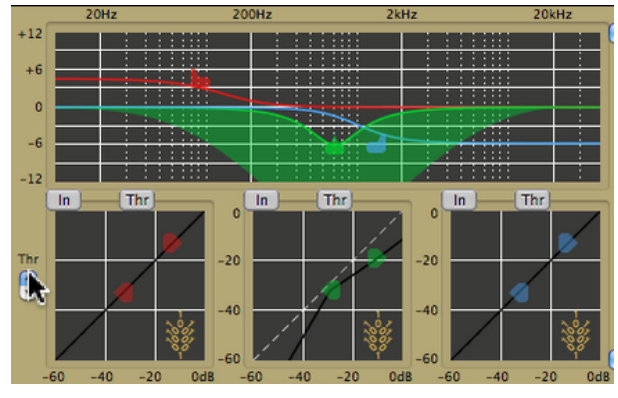
Click on the upper half of the stepper, with the upwards arrow, to increase all thresholds by 1 dB.

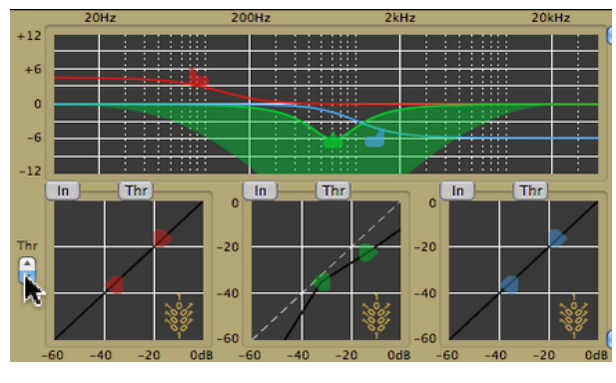
continued next page







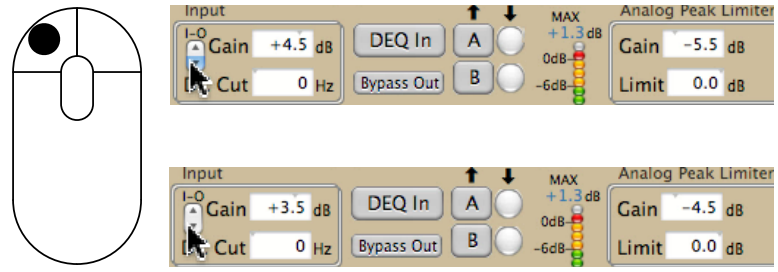




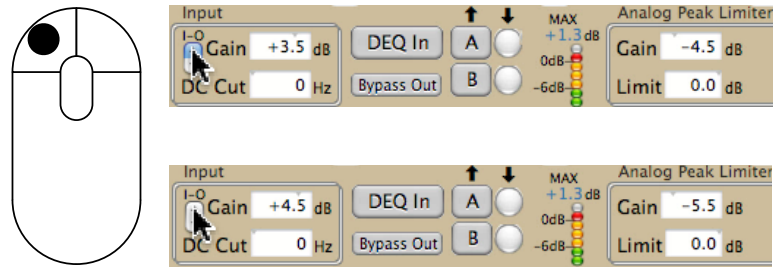
Parameter Controls

Level Stepper, continued

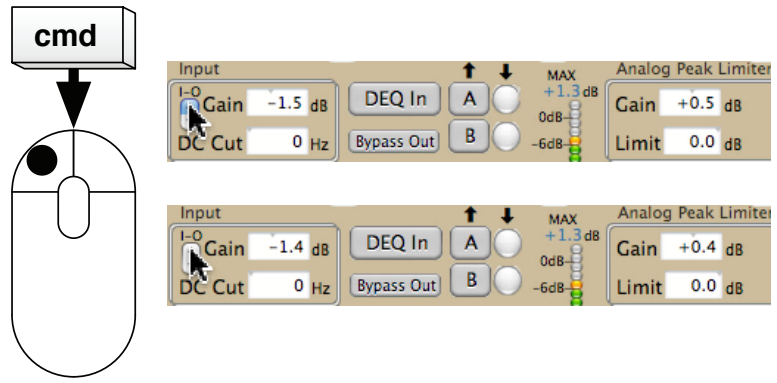
The I-O level stepper, located on the upper-left corner of the input controls, adjusts the plugin input and output gains symmetrically. Click on the lower half of the stepper, with the downwards arrow, to decrease the input gain and increase the output gain by 1 dB simultaneously.



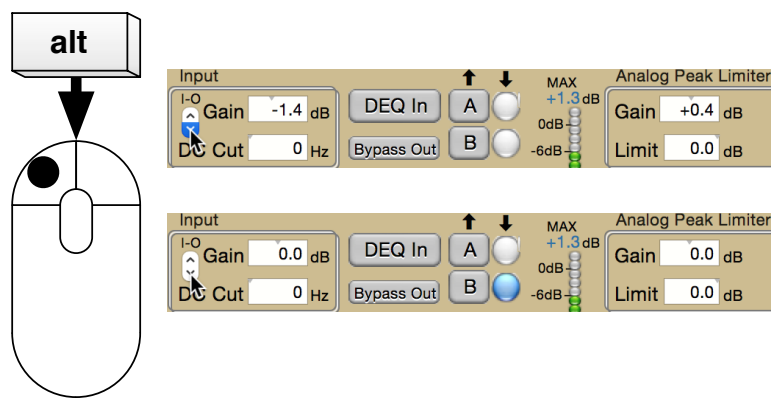
Click on the upper half of the stepper, with the upwards arrow, to increase the input and decrease the output gain by 1 dB.



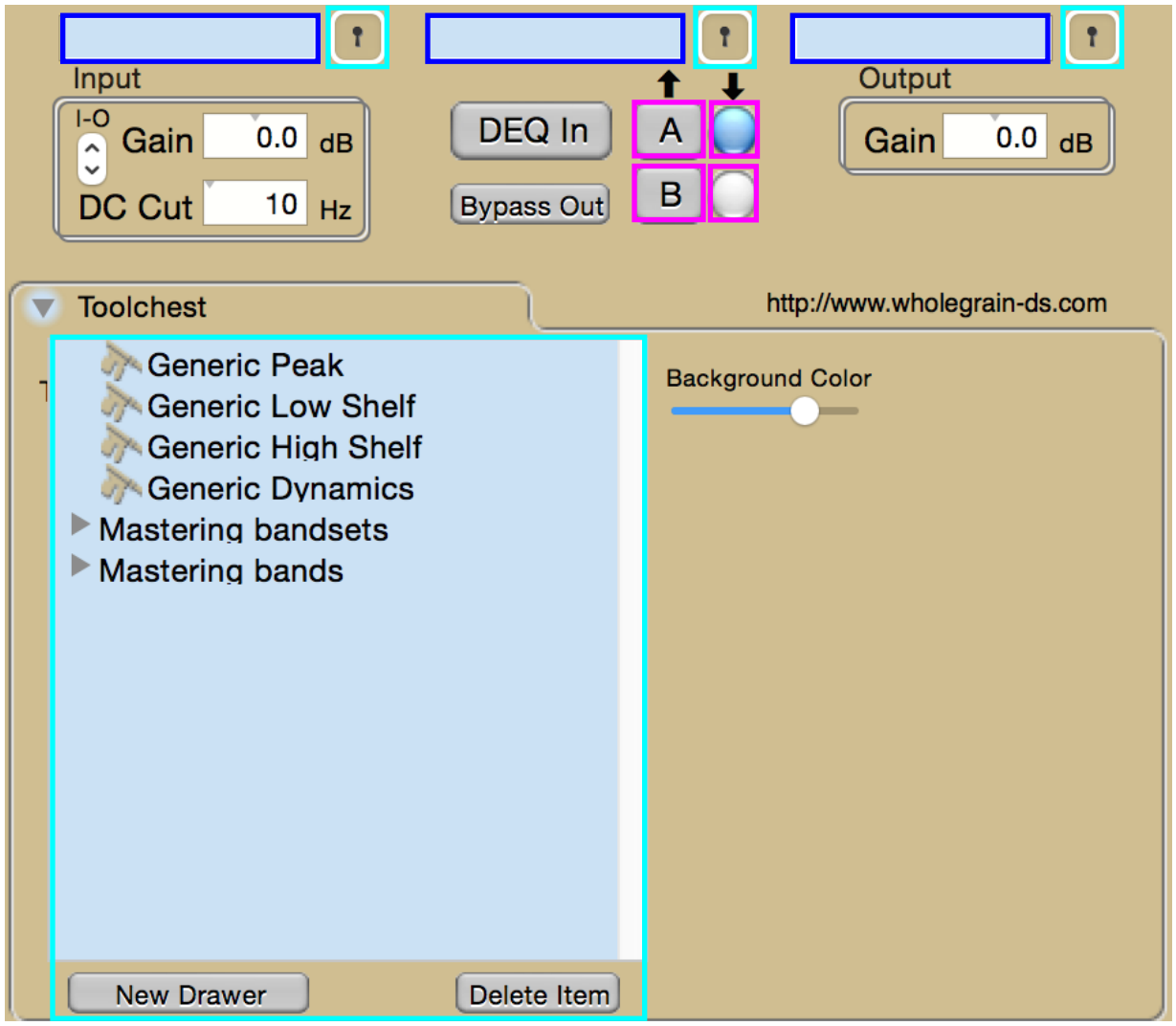
Holding down the command key while clicking the I-O level stepper changes the step size to 0.1 dB.



Holding down the alt key while clicking the I-O level stepper resets both input gain and output gain to their default values of 0 dB.



Administrative Controls



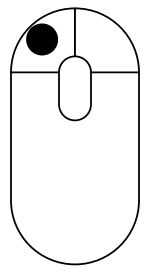
Administrative Controls

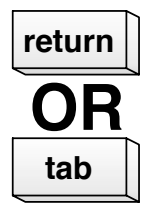
Band Title and (*Quartet only*) Patch Title

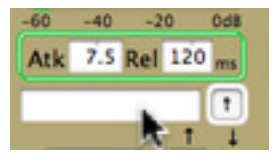
There are two generic text field categories for entering and displaying tags or mnemonic text. They look much like the slider-text controls but are much wider.

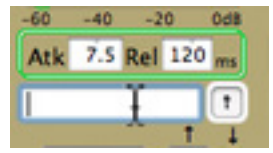
A band title control lies at the bottom of a band column. Clicking in a band title control allows editing of its contents. As with the slider-text, the blue focus ring signifies the field will respond to keyboard input.

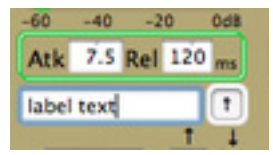
A patch title control in the Quartet patch store works on the same principle. However, the field can be edited only when there is a patch stored in that numbered register.

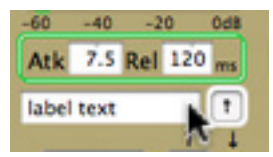










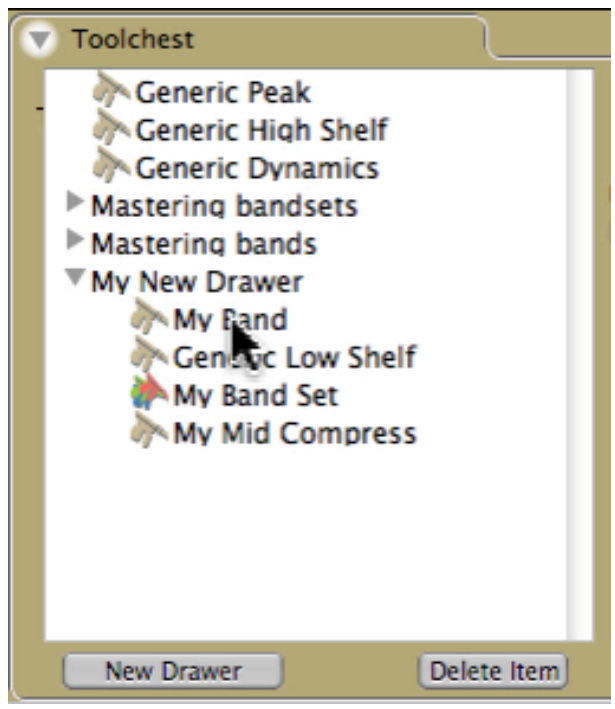


Band Well and Band Toolchest

To the immediate right of the band title controls are square elements with the image of a keyhole. These controls are band wells, and they serve as drag-and-drop ports for all band tuning parameters. For a drag-and-drop transaction using a band well as its source, the special mode prompted by holding down the shift key allows for the tunings of all bands to be packaged instead of one.

The band toolchest is located in the bottom segment of the parameter window. It is the other drag-and-drop port for band tuning parameters. The toolchest represents and organizes a permanent store of band and multiband tunings.

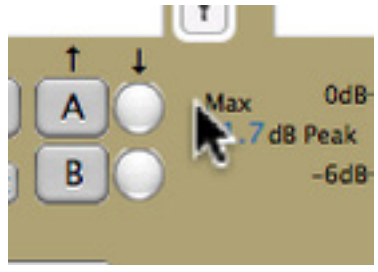
More information on using the band well and toolchest is *through this link*.

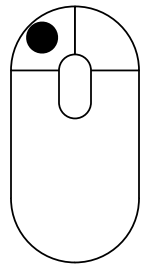


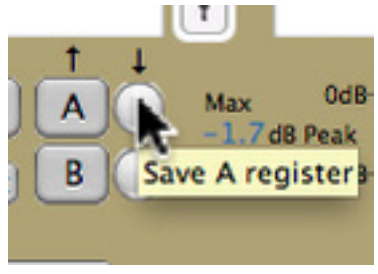
Administrative Controls

Register Save and Load

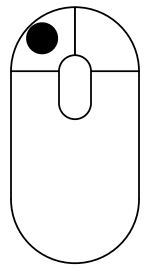
A patch represents all DynPEQ processing parameters which are maintained by the host workstation. There are pairs of buttons that represent patch registers that are maintained within the plugin. All DynPEQ plugins have two registers, A and B, which are best used for tuning comparisons. Quartet offers an auxiliary bank of registers that are saved and restored with the workstation project file, which are given numbers instead of letters.

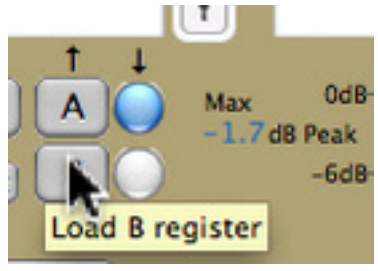


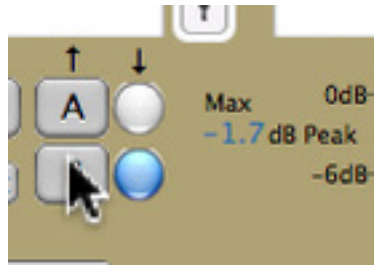




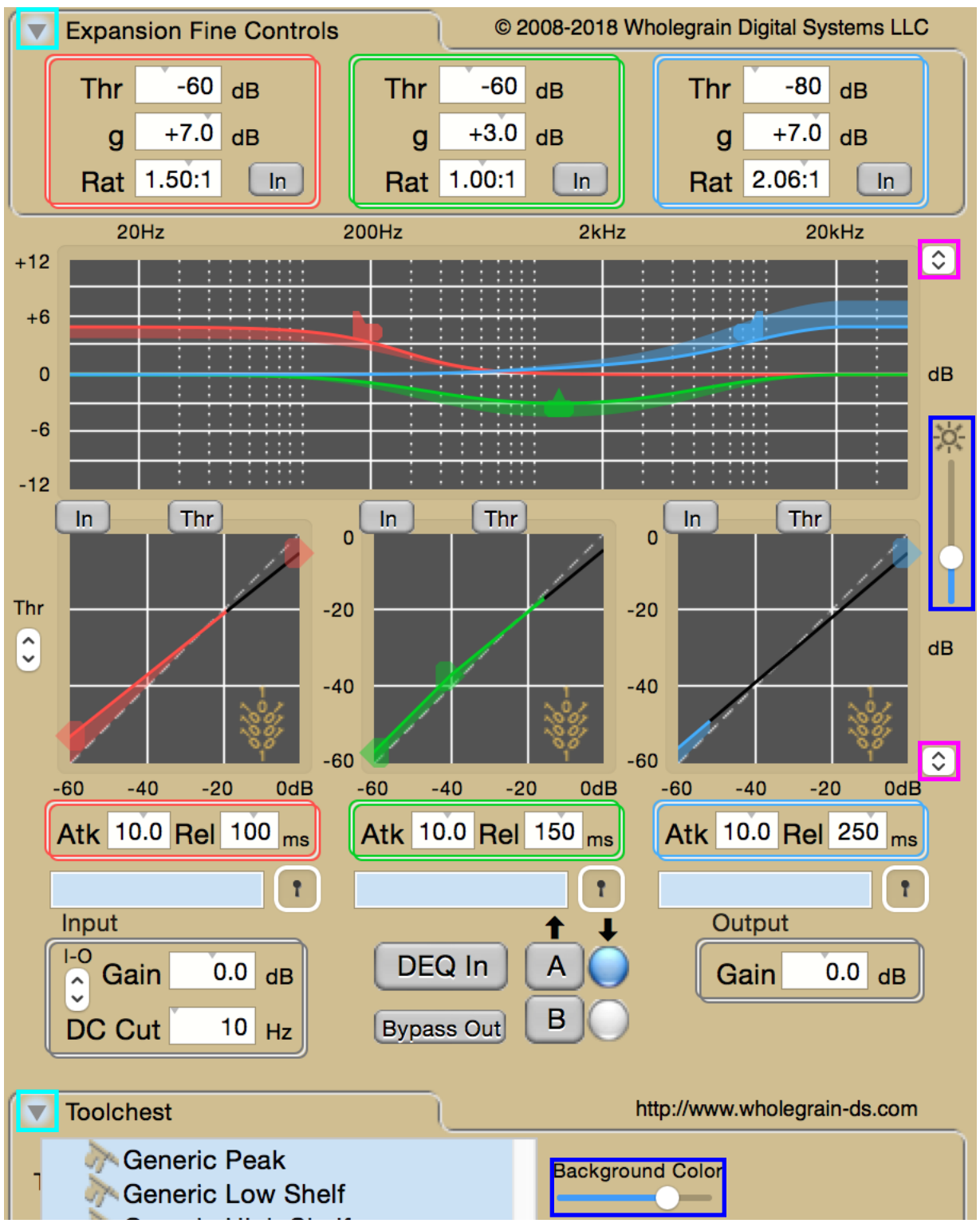
Clicking on the round buttons saves the current parameter set into the corresponding register. The round button will turn blue when the current parameter set matches the register contents. Clicking on the labeled square button to the left of the save button restores the register contents to the current working parameters.



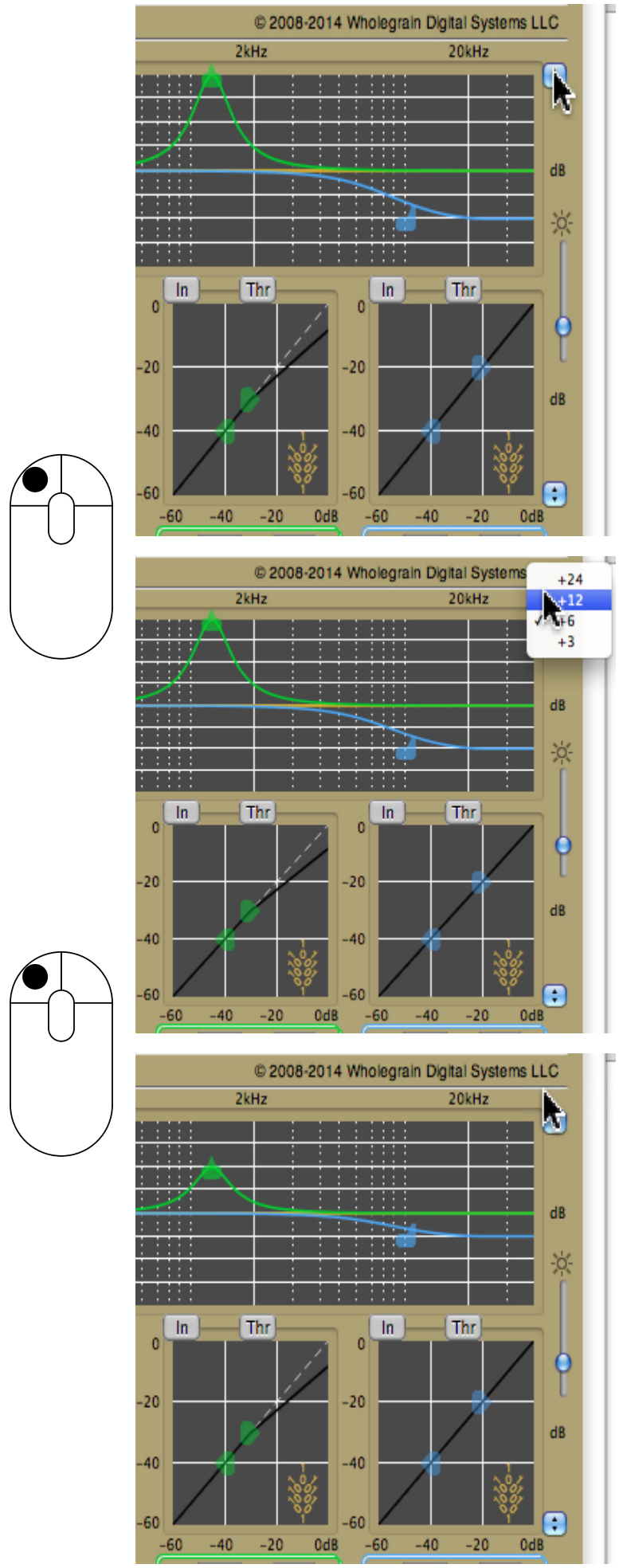




Window Controls



Window Controls



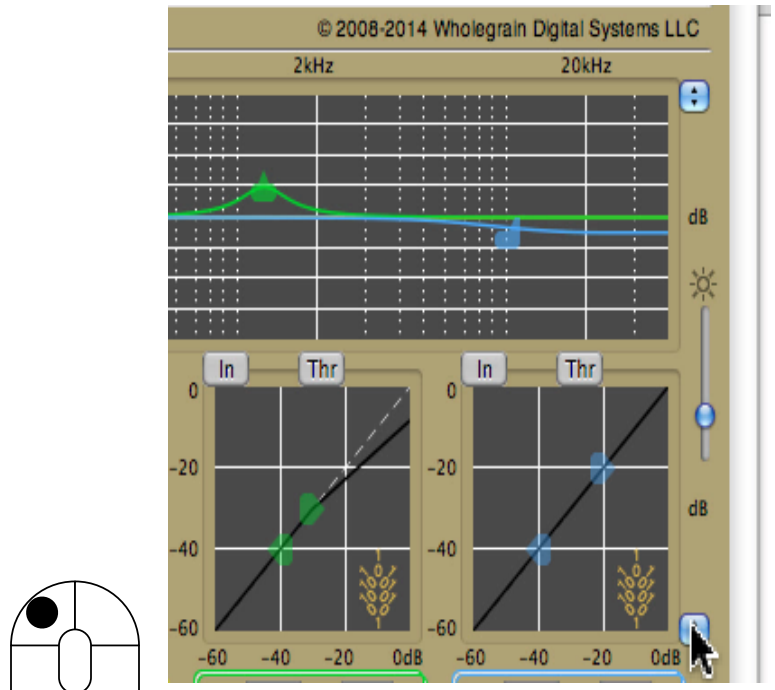
Menu Selector

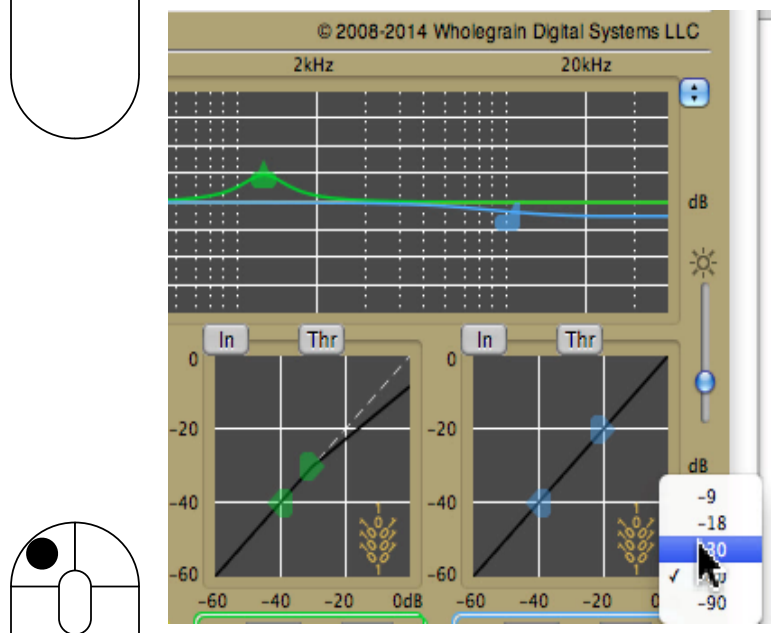
There are two small menu selectors on the right side of the coarse displays. They are specifically located at the extreme y-axis of the coarse displays, and they allow selection of the y-axis range to apply.

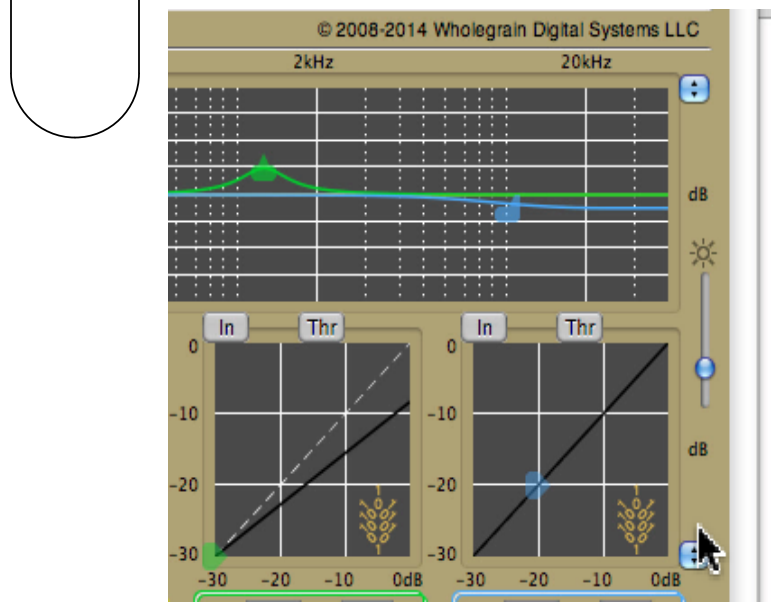
Clicking on the upper selector shows a menu of scale values to apply to the band tuning display. Select a new value via left click to change.

continued next page

Window Controls



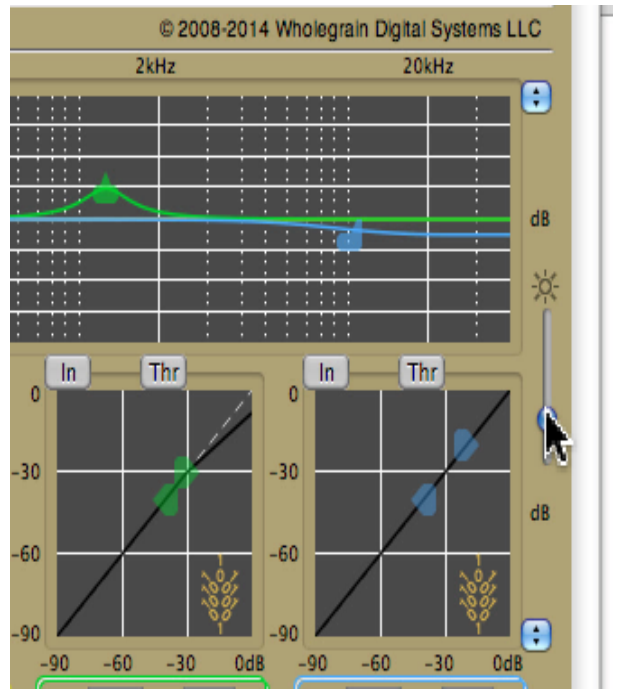




Menu Selector, continued

Clicking on the lower selector presents a menu of scale values to apply to all coarse dynamics displays. Select a new value via left click to change.

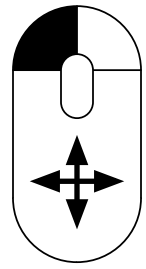
Window Controls



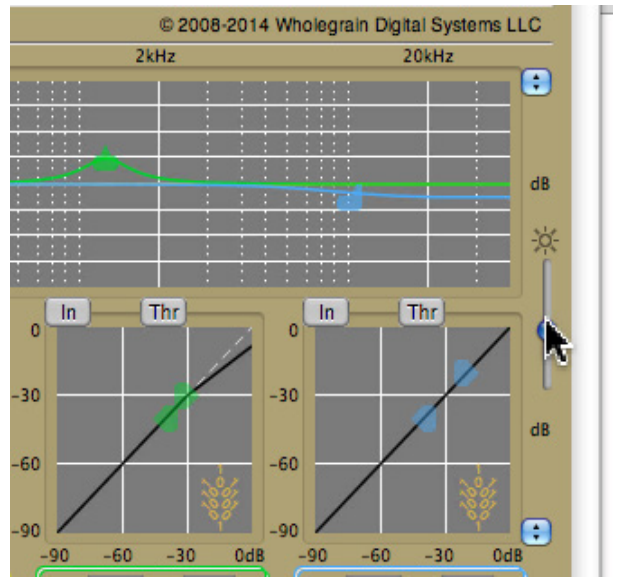
Brightness Sliders

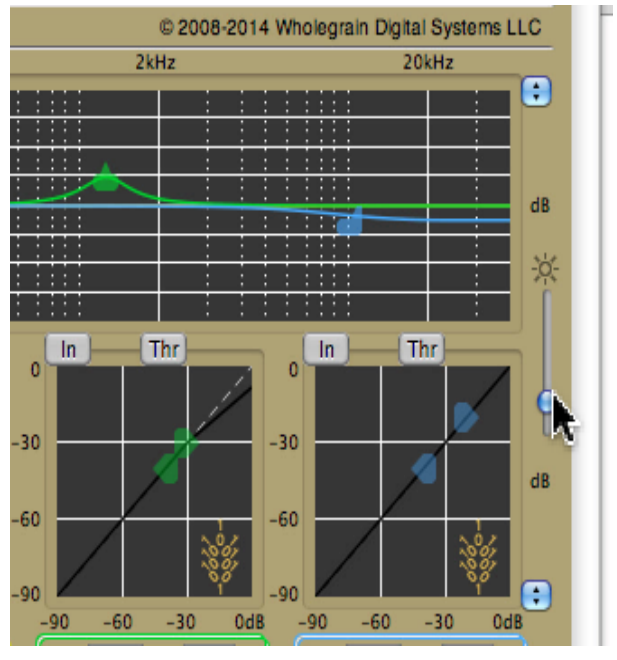
There are two sliders that control background brightness to help with overall visibility in ambient light. Click on the slider knob and drag it to adjust.

The first slider is to the right of the coarse displays and adjusts the brightness of the background of all coarse displays.

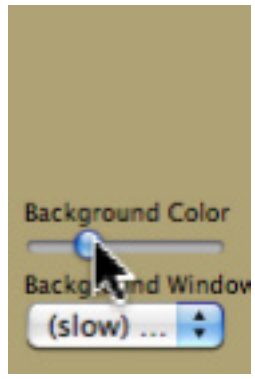


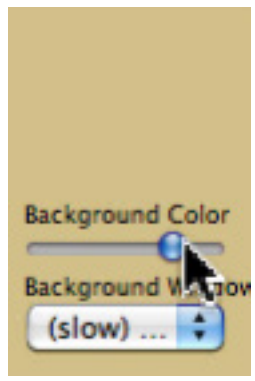
continued next page

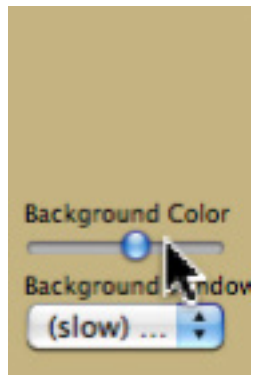




Window Controls

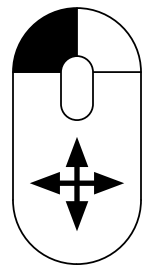




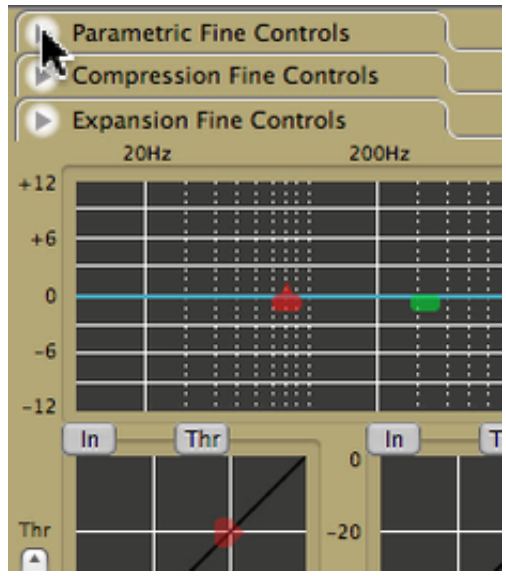


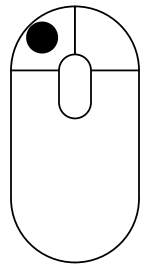
Brightness Sliders, continued

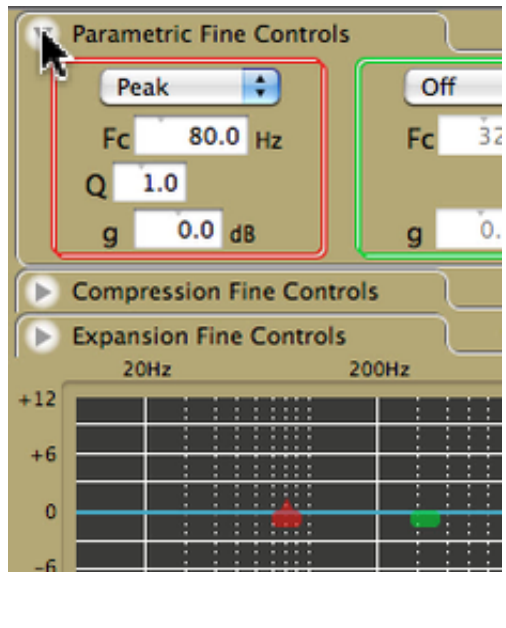
The other slider is in the toolchest window segment and adjusts the hue of the background color of the plugin window.



Window Controls



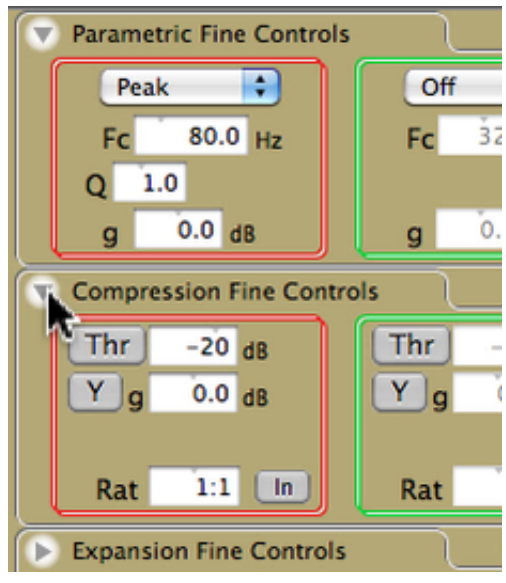


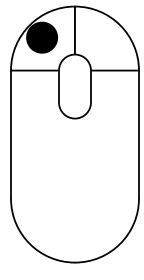


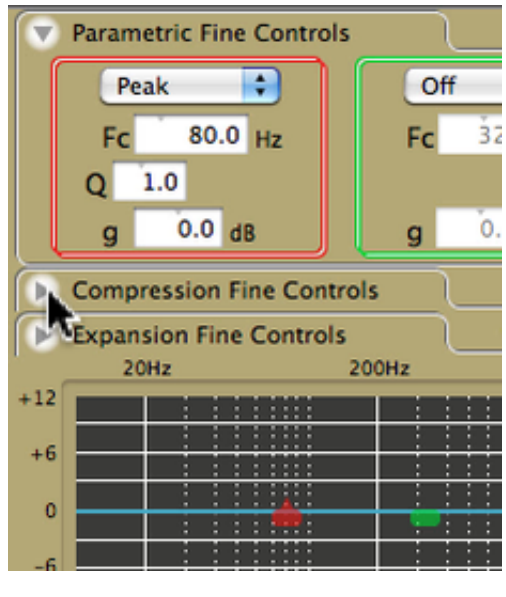
Window Segment

The fine parameter controls and the toolchest are located in window segments that can be visible or hidden. The control for this segment state is located in the upper left corner of the segment. Click on the arrow icon to change the state.

There are four controllable window segments: parametric band tuning, compression, expansion, and toolchest.

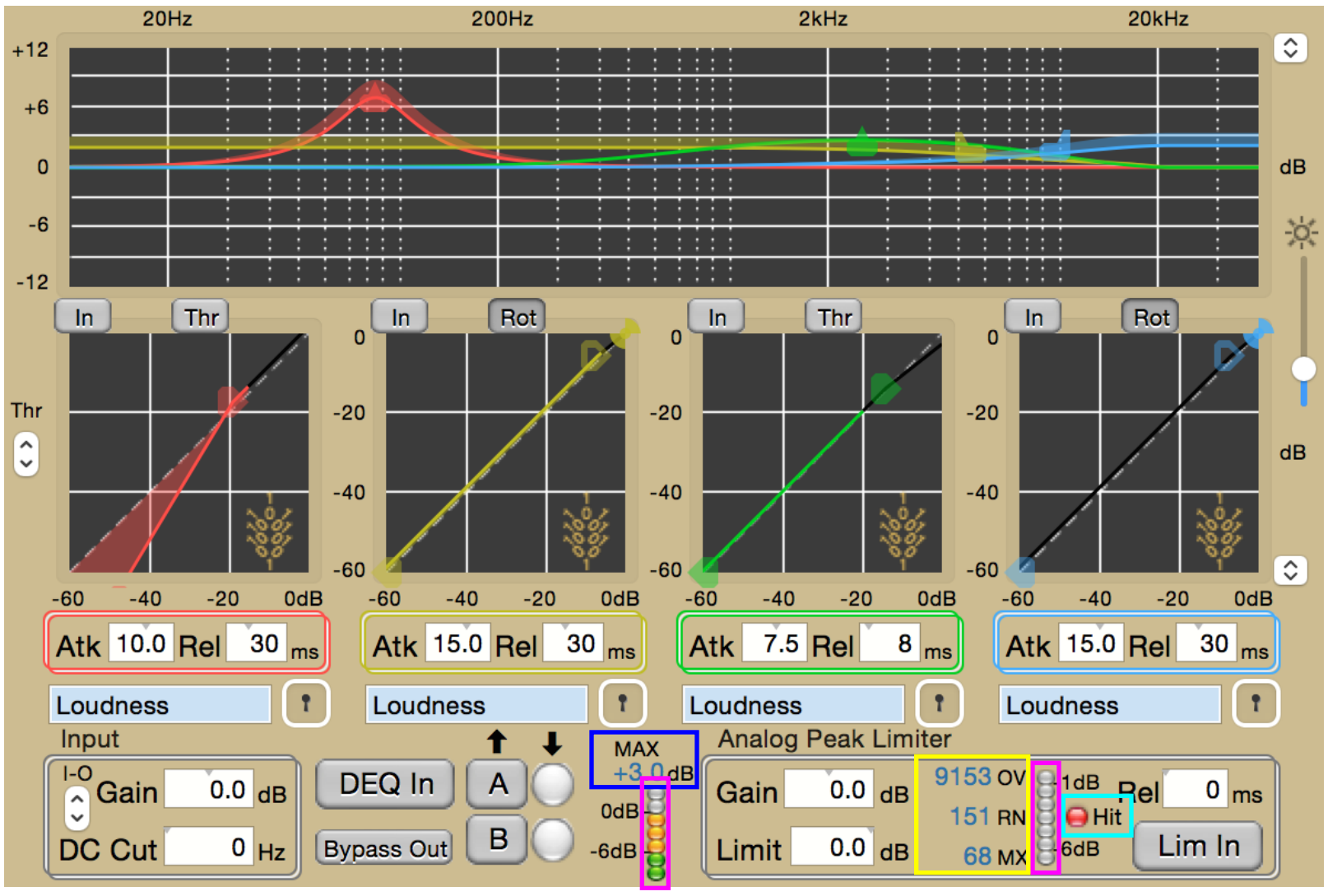






Processing Feedback (*Quartet only*)

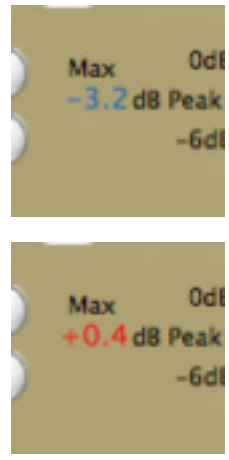
Maximum Peak Level Compiler	25
Limiter Hit Indicator	25
Over Statistics	26
Peak Level and Limiter Gain Meters	27



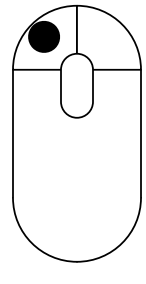
Processing Feedback (*Quartet only*)

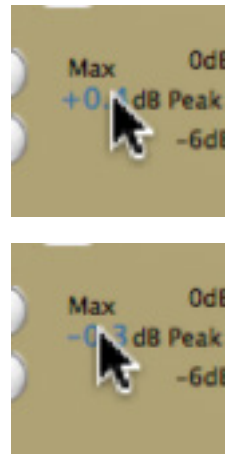
Maximum Peak Level Compiler

The maximum peak level, in decibels, encountered for all channels mapped to this plugin window is displayed next to the A/B register controls. The lowest level this indicator can register is -120 dB. The increment of the displayed value is 0.1 dB. The value indicates that the maximum compiled peak level is closest to yet does not exceed the given number. For example, an indication of 0.0 dB means that the maximum peak encountered is greater than -0.1 dB but not above 0.0 dB. If the current peak level exceeds the limit level parameter, the indicator is colored red, otherwise it is blue.



To reset the peak level and start compiling anew, click on the value.

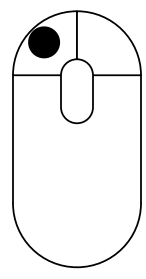




Limiter Hit Indicator

If a peak level exceeds the limit level parameter, a limiter hit indicator will turn red. This indicator is sticky, meaning that once it has been tripped it will remain in its red state regardless of the current peak level.

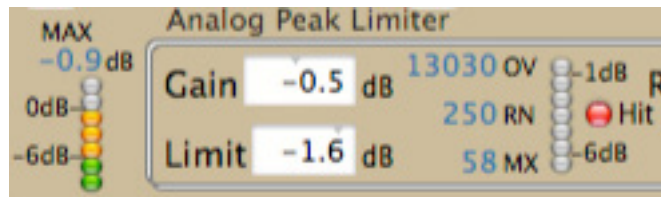
To reset the hit indicator, click on it.



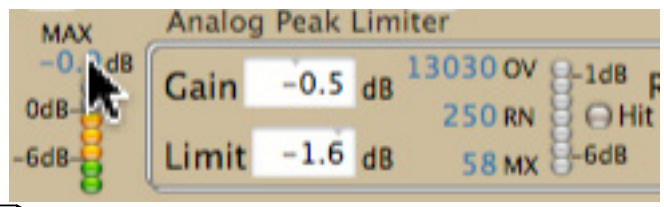
Processing Feedback (*Quartet only*)

Over Statistics

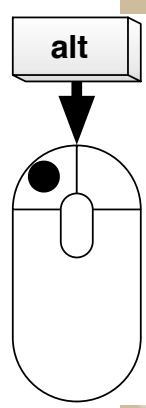
To the left of the limiter hit indicator are three counters compiling statistics of over samples. An over sample is a digital sample whose level from zero exceeds the limiter level. As with the maximum peak level compiler, the numbers will flash red when an over is encountered.



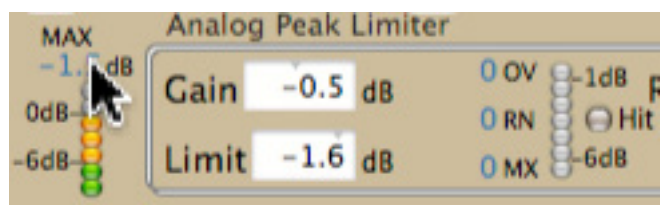
OV indicates the total number of over samples. RN indictes the total number of over-runs. MX indicates the length of the longest over-run. The maximum that each field can represent is 99,999. To reset the counters, click on any one of the three.



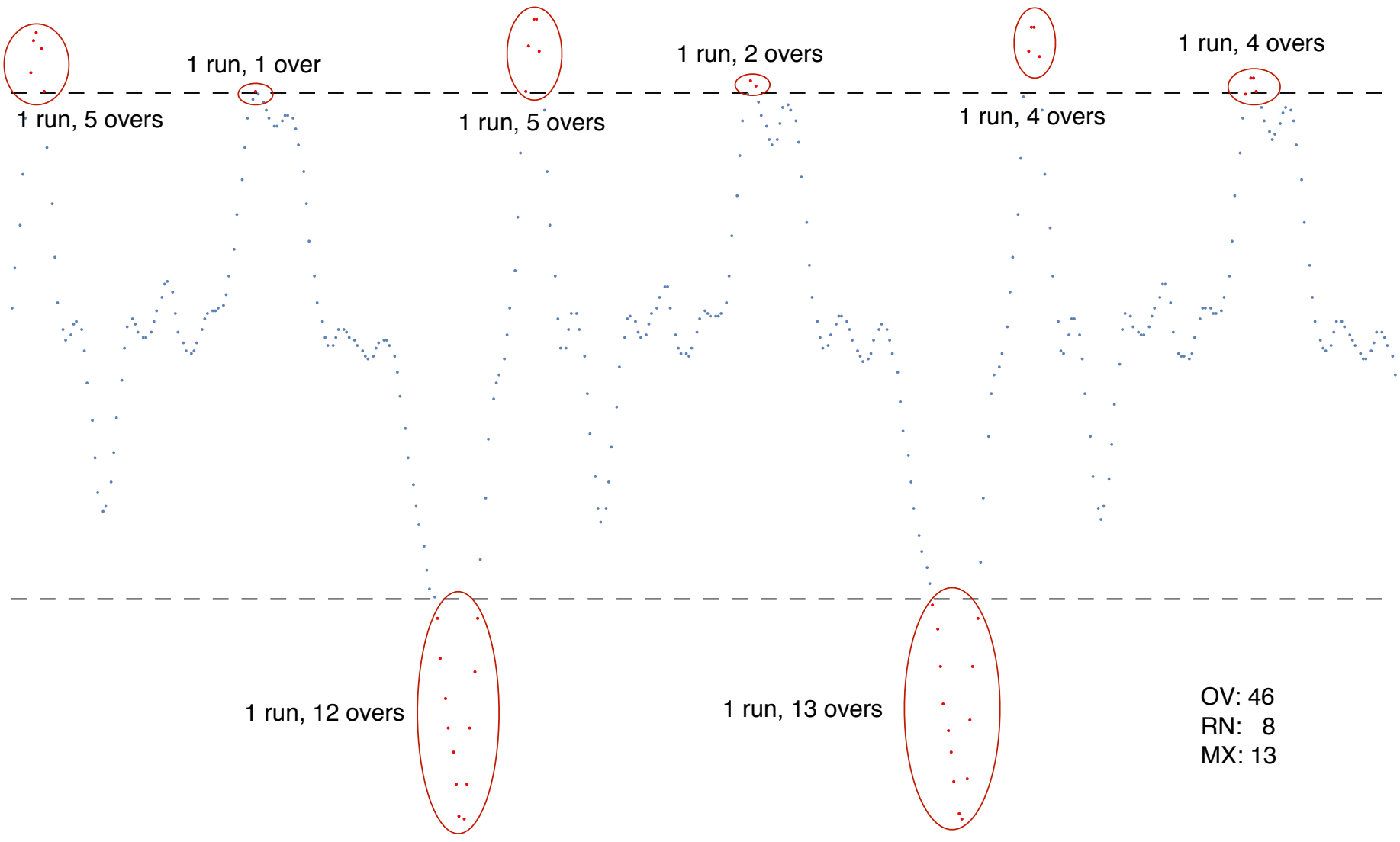
For all compiled indicators, maximum peak level, limiter hit, and over statistics, clicking on them while pressing the alt key will clear all of them simultaneously.



To illustrate how the over statistics are compiled, please refer to the figure below showing a brief excerpt of audio samples. The dashed lines represent the limiter level, positive and negative. Non-over samples are plotted as blue points, and over samples are red. An over-run starts with the first over after a non-over sample and continues through all consecutive samples over the limiter level. This constitutes one over-run.

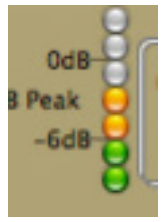


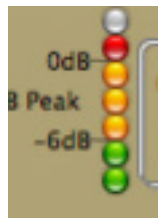
To get a rough breakdown from a large over total, assess the number of over-runs and the maximum over-run. If the number of over-runs is large, on the order of the over total, then the limiter level is being lightly touched often--keeping in mind this implies the maximum over-run should be a low number. If the maximum over-run is large, then the limiter level has been deeply breached but just a few times--in this case the over-run count should be a low number.



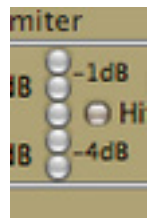
Processing Feedback (*Quartet only*)

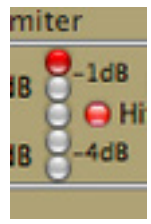
Peak Level and Limiter Gain Meters

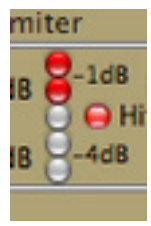




To the right of the maximum peak level compiler is a vertical line of peak level indicators. The bottom indicator turns green when the current peak level exceeds -10 dB. The next highest indicator activates 2 dB higher than its lower neighbor. The middle three turn yellow for peak levels greater than -6 dB up to but not exceeding 0 dB. The two indicators turn red for peak levels exceeding 0 dB and +2 dB respectively.

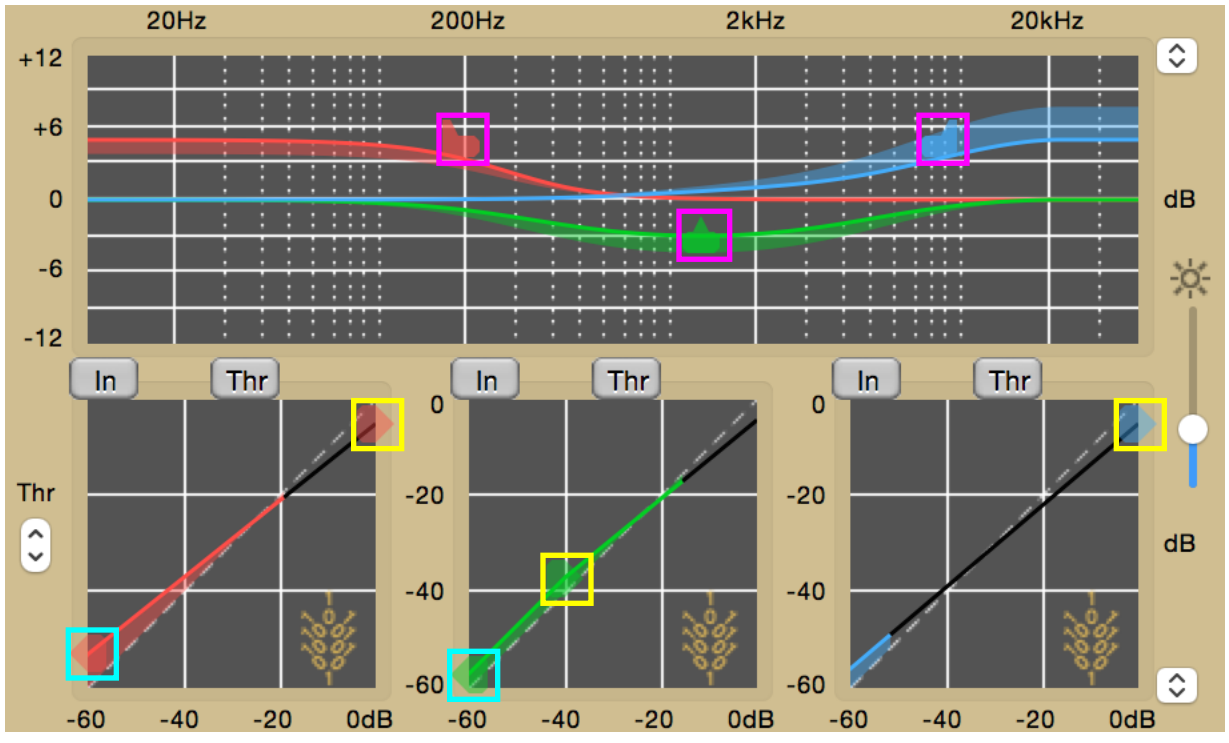






To the left of the limiter hit indicator is a vertical line of limiter gain indicators. The top indicator turns red when the limiter gain applied is less than 0 dB. Each indicator down the line turns red for a limiter level 1 dB lower than its higher companion.

Coarse Controls and Operation



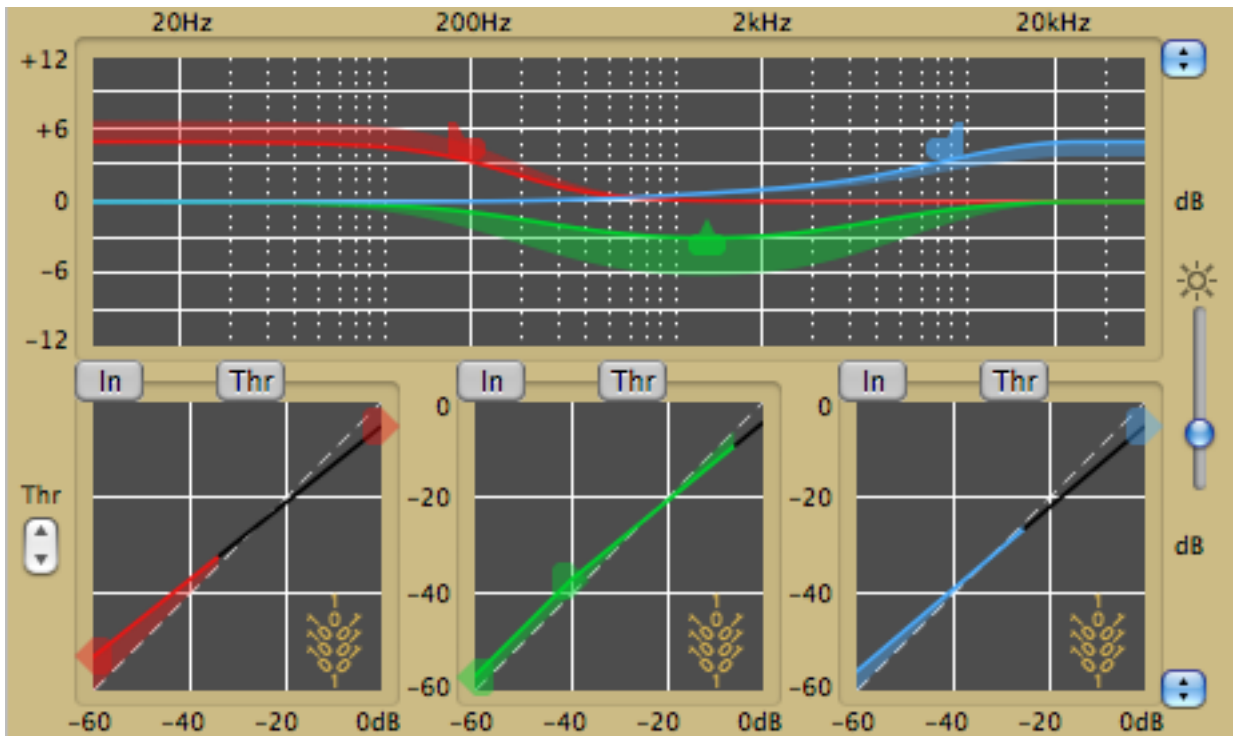
Coarse Controls and Operation

Operational Feedback and Coarse Controls

The section of the parameter window that cannot be hidden hosts an overview of the operational parameters and how they are performing with the current audio input. Each band's tuning parameters are represented within the displays by icons referred to as beads. There is one gain-to-frequency plot that is shared among all DynPEQ bands. Below that, each band has its own input-level-to-output-level dynamic curve plot.

We refer to the beads as coarse controls because it is difficult to manipulate the beads with fine detail. However, the coarse controls allow for manipulation of multiple parameters simultaneously. The coarse controls can be used to cover all the fine tuning parameters, so it is possible to operate DynPEQ to its fullest without accessing the fine control window segments.

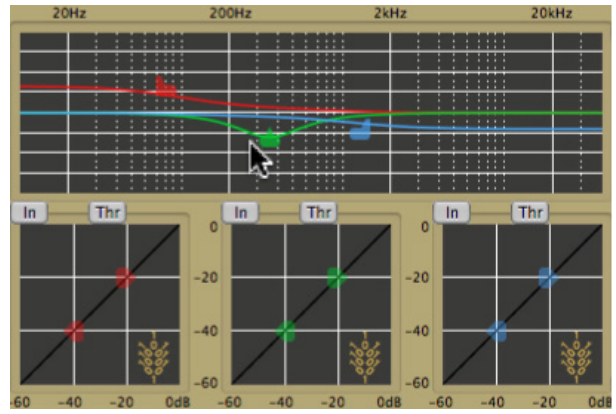
The details of coarse control operation help introduce the operational behavior of DynPEQ, so this section will serve both purposes.

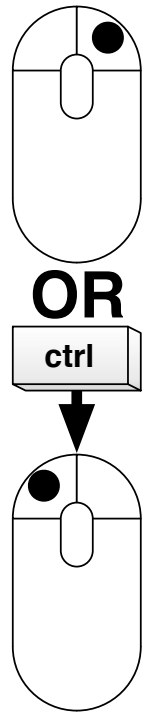


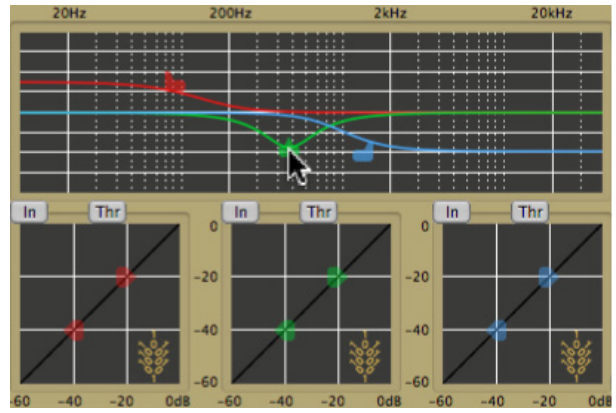
Coarse Controls and Operation

Parametric Band

The base filters of DynPEQ are parametric band filters: presence (or peak/dip), low shelf, and high shelf. The graphic display for band controls show the frequency response of each individual band filter.. Associated with the frequency responses are beads whose locations correlate with their parameter values.



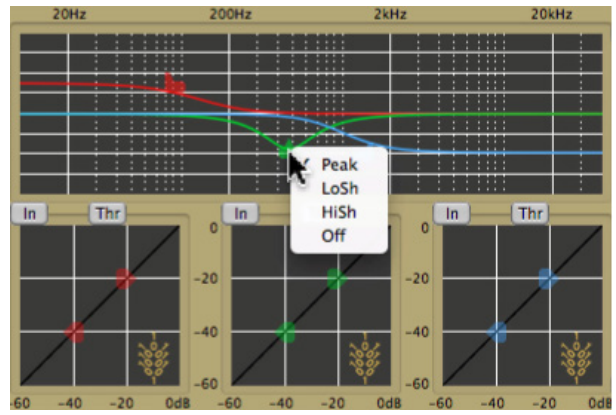


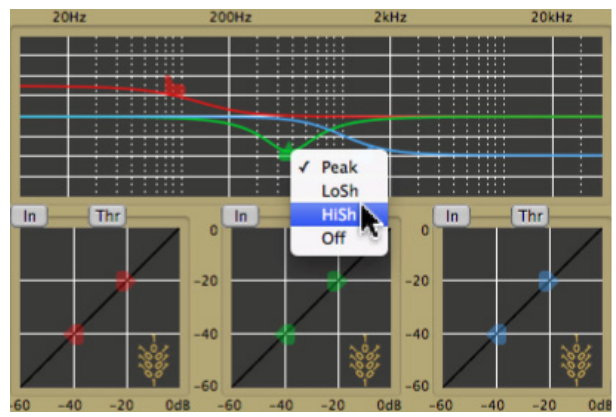


To change the filter type, either control-click or right-click the band bead to expose the type menu, then select the type on the menu with another click. Note that there is a fourth option, 'Off'. This will make the band filter a pass-through operation, but note that this setting will not deactivate any dynamic settings for that band. More details are available *through this link*.

The shape of the band bead reflects the corresponding filter type.

continued next page

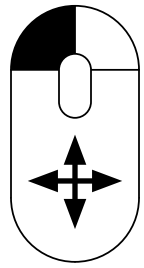


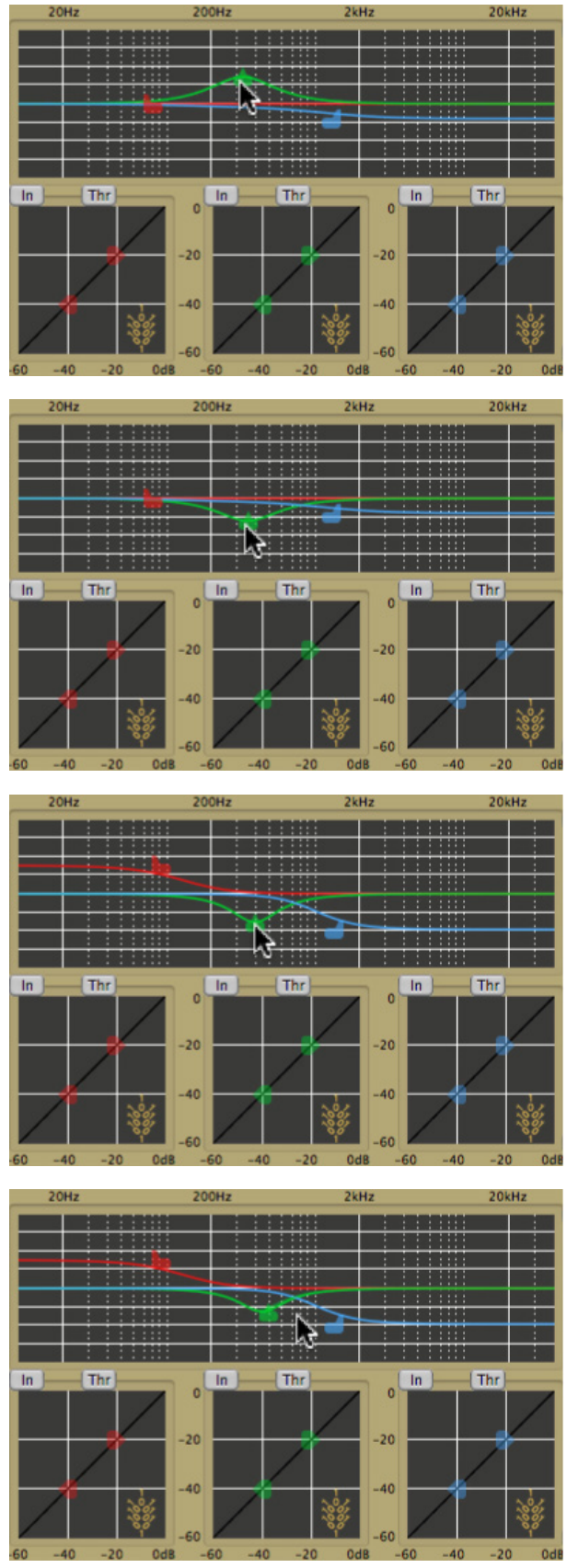


Coarse Controls and Operation

Parametric Band, continued

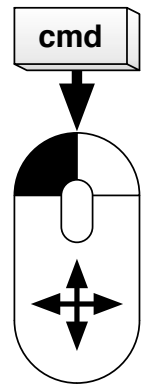
The two primary parameters for a band filter are center frequency or cutoff frequency (for presence or shelves respectively) and boost/cut gain. The position of the band bead reflects the frequency and boost/cut parameters. Left-clicking on the band bead allows it to be dragged about the frequency response field. The limit to which the bead can be dragged along the gain axis is the current setting of the plot limit, and the limit to which the bead can be dragged along the frequency axis is dependent on the sample rate.



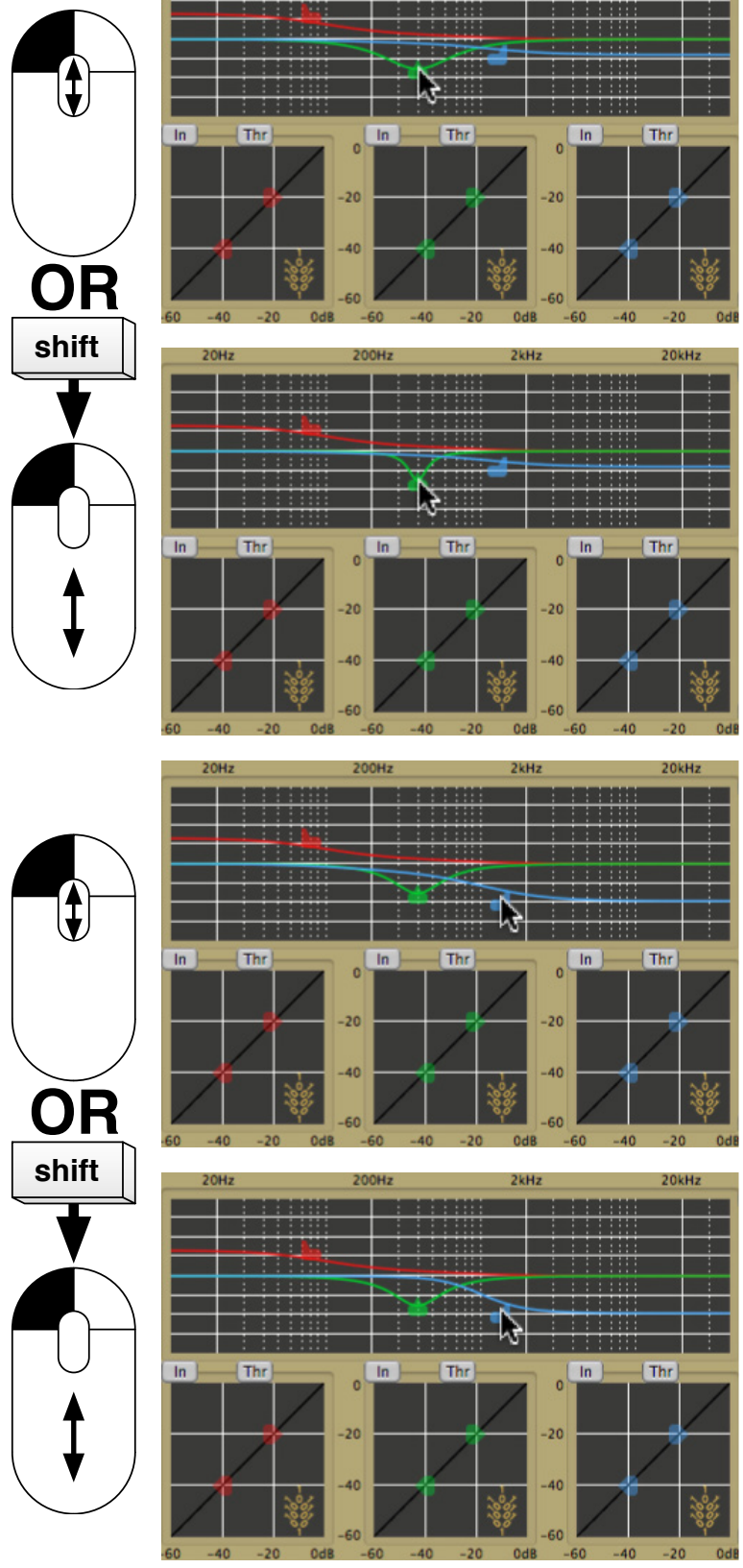


By default, the bead will follow the mouse pointer during dragging. By holding down the command key, the dragging speed of any bead will slow to where it will lag behind the mouse pointer. This allows for finer dragging control.

continued next page



Coarse Controls and Operation



Parametric Band, continued

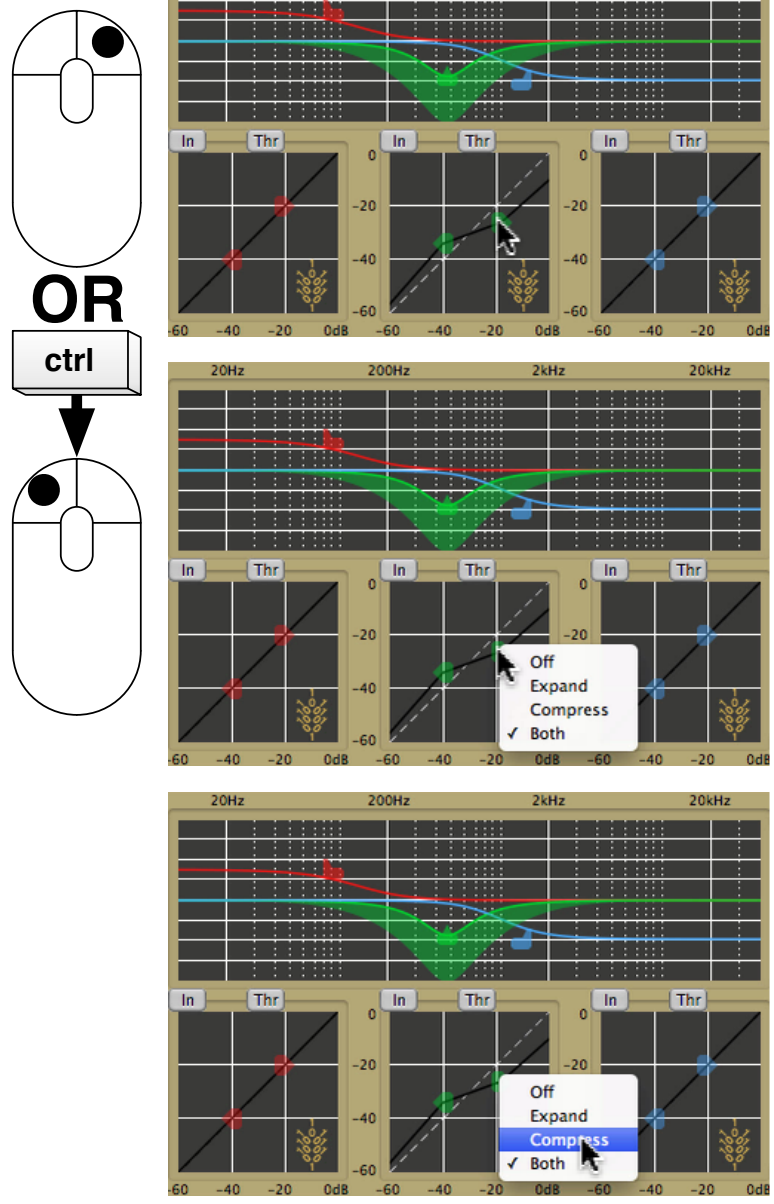
The auxiliary parameter of a band filter controls the rate at which the gain retreats from the frequency parameter to the neutral baseline. For the presence filter type, the parameter is Q, which is inversely related to bandwidth. For low and high shelves, the parameter is slope, which varies between 0 (most gradual) to 1 (most steep). While holding down the left mouse button, the scroll wheel controls the auxiliary parameter. In addition to the scroll wheel, the auxiliary parameter can be controlled by pressing and holding the shift key while dragging the mouse upwards or downwards.

Coarse Controls and Operation

Compression and Expansion

The dynamics curve for a DynPEQ band can have two segments: compression for high input levels and expansion for low input levels. On the coarse dynamics display for the band, the compression and expansion points are indicated by their own beads. The compression bead points to the right (towards higher input level), and the expansion bead points to the left. A special mode of compression introduces an additional element to the display, more information is *through this link*.

Control-clicking or right-clicking on either dynamics bead displays a menu of curve choices. The compression or expansion specifiers can be activated by themselves. The option 'Off' disables dynamics for the band. The option 'Both' enables both compression and expansion. In this mode, the points of the compression and expansion thresholds are joined by a straight line.

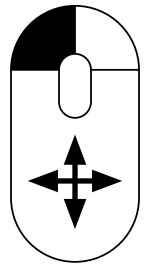


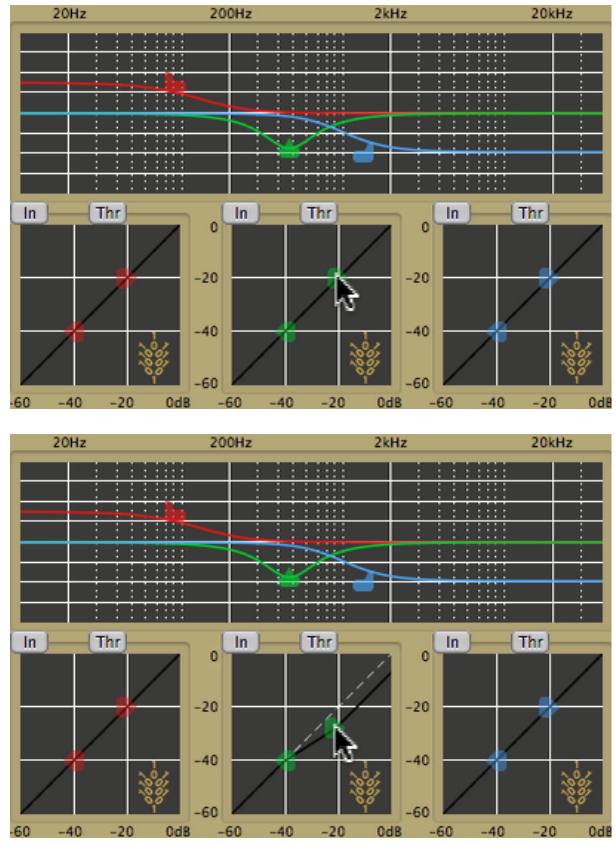
Coarse Controls and Operation

Compression Curve

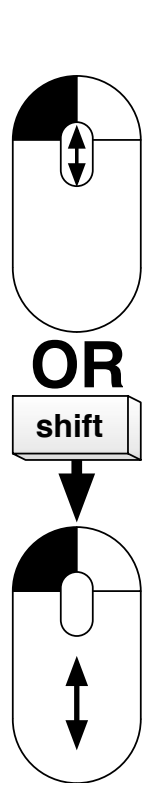
The compression portion of a dynamics curve establishes a threshold past which an increase in input level proportionally adjusts the output level. For example, a compression ratio of 2:1 (two-to-one) implies that, above the threshold, a 2 dB increase in input level yields a 1 dB increase in output level.

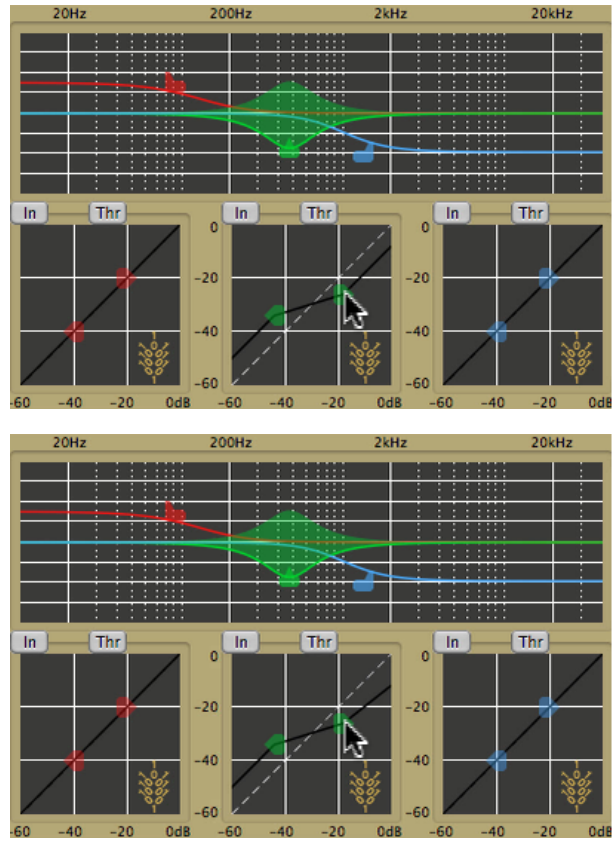
The traditional method of setting a compression curve has the button atop the band's coarse dynamics display set to 'Thr'. In this mode, click and drag the compression bead to set the location of the threshold.





While holding down the left mouse button, move the scroll wheel up or down to adjust the compression ratio.



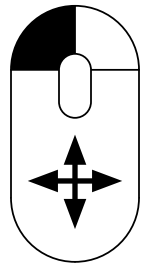


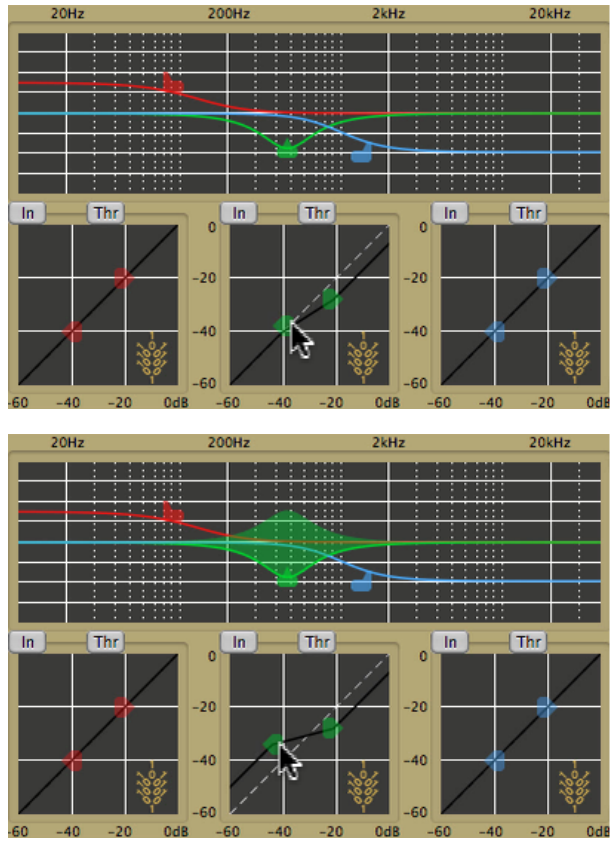
Coarse Controls and Operation

Expansion Curve

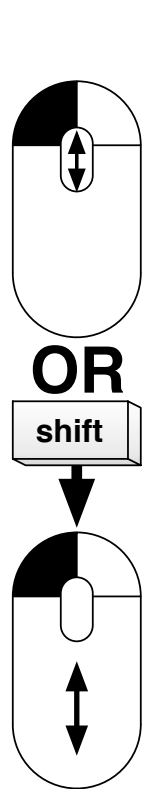
The expansion portion of the dynamics curve establishes a threshold below which a decrease in input level proportionally adjusts the output level. It is adjusted in the same manner as the compression curve in its normal mode, that being gain before threshold.

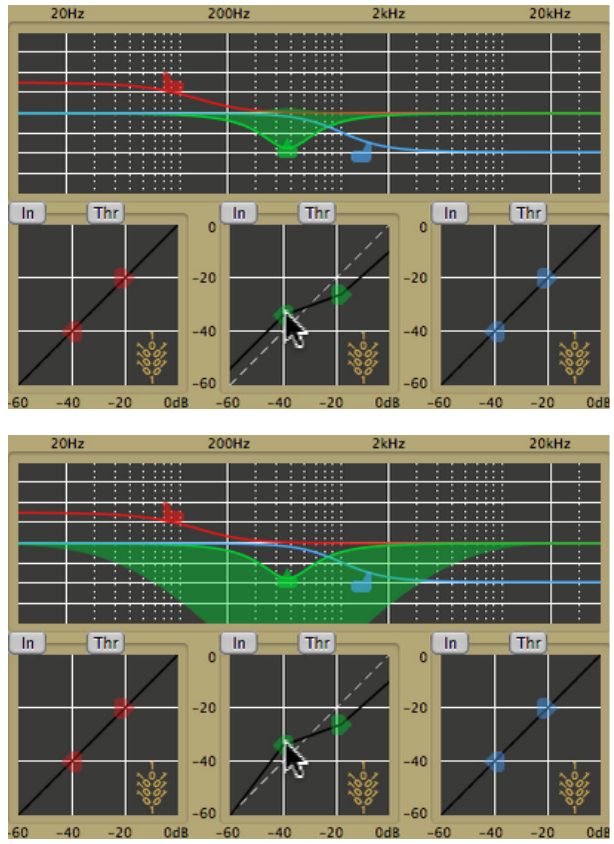
Click and drag the expansion bead to move the threshold point. This will change both the threshold and gain offset parameters. The gain offset is always applied along the y axis.



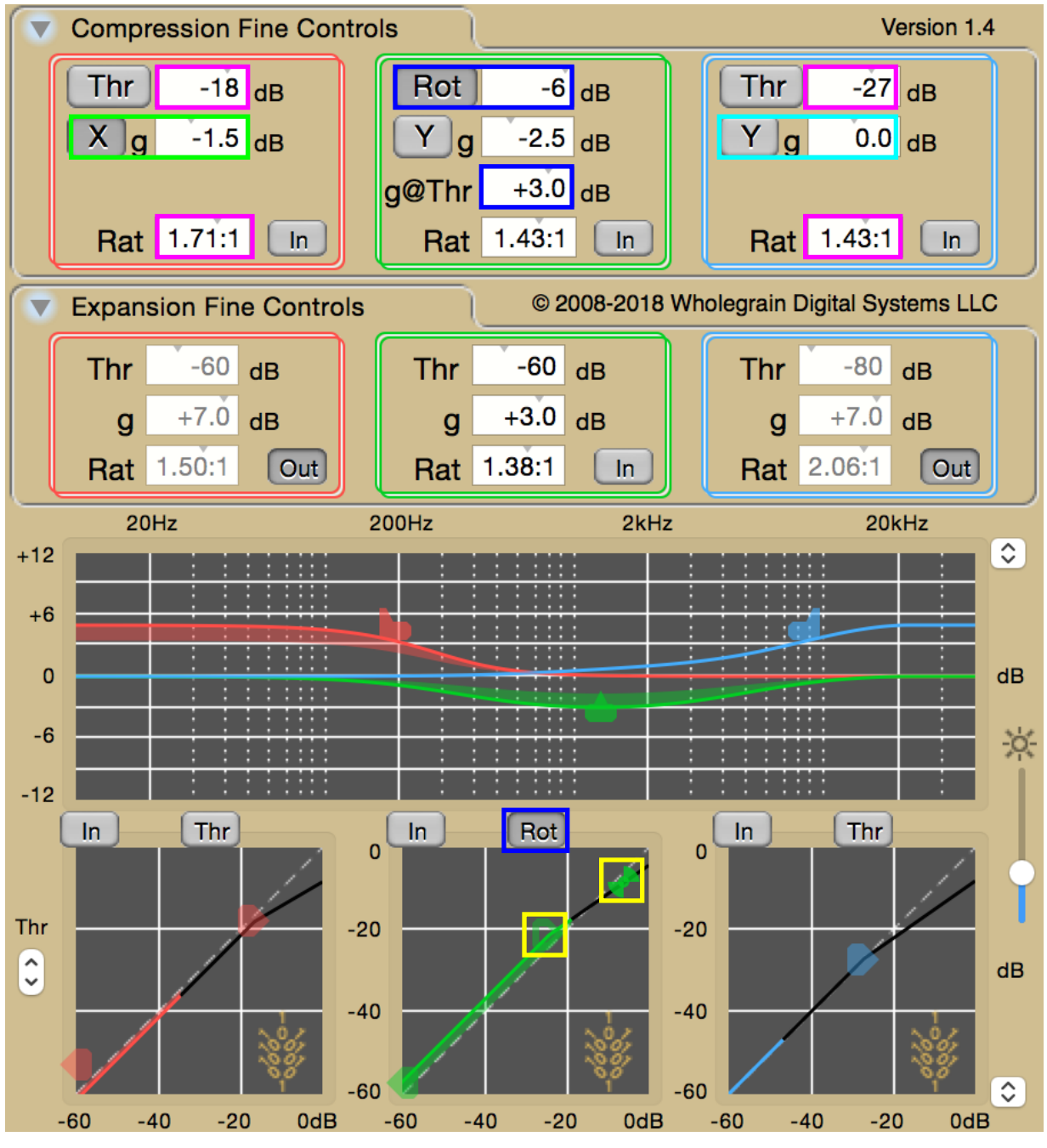


While holding the left mouse button over the expansion bead, move the scroll wheel to adjust the expansion ratio.





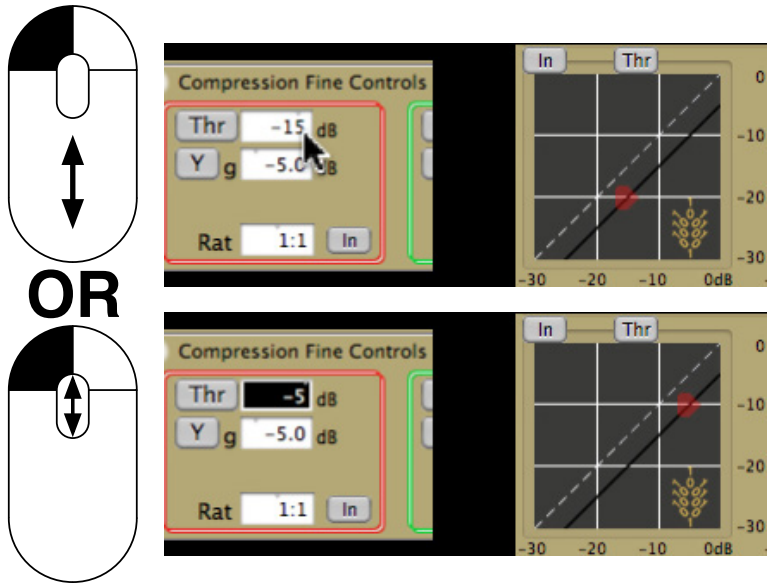
Compression Curve Methods



Compression Curve Methods

Coarse Dynamics Plot Layout

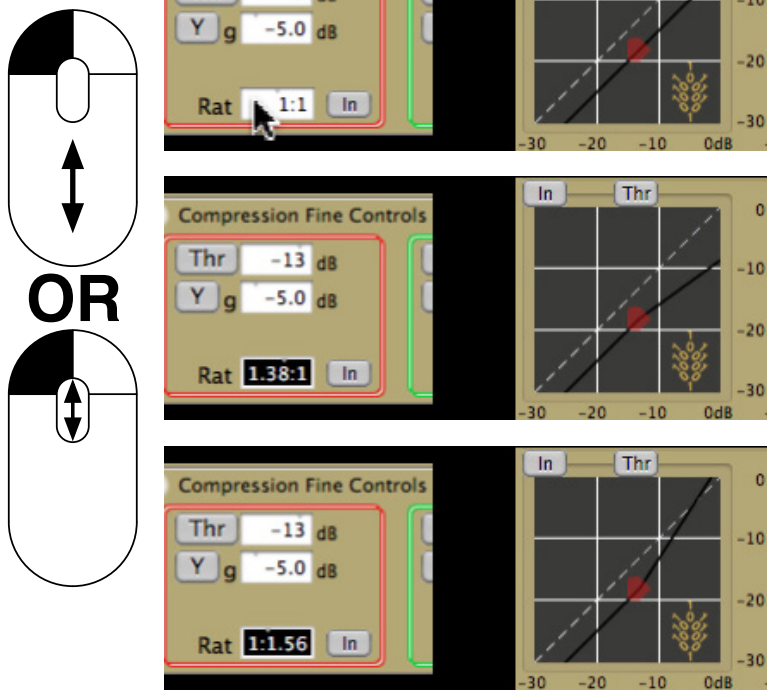
The x axis of the band dynamics display represents input level, and the y axis represents output level. The dashed diagonal line represents the path of neutral gain. Points above the dashed line represent positive gain applied, and points below represent negative gain or attenuation.



Compression Threshold and Ratio

The top fine parameter in the compression column represents the input level at which the threshold resides. Adjusting the parameter moves the threshold in the direction of the neutral gain path.

The bottom fine parameter in the compression column is the ratio the input level increases relative to the output level beyond the compression threshold.. Similar to the expansion ratio, note that the compression ratio value can be inverted so that the relative output level increases beyond the threshold.

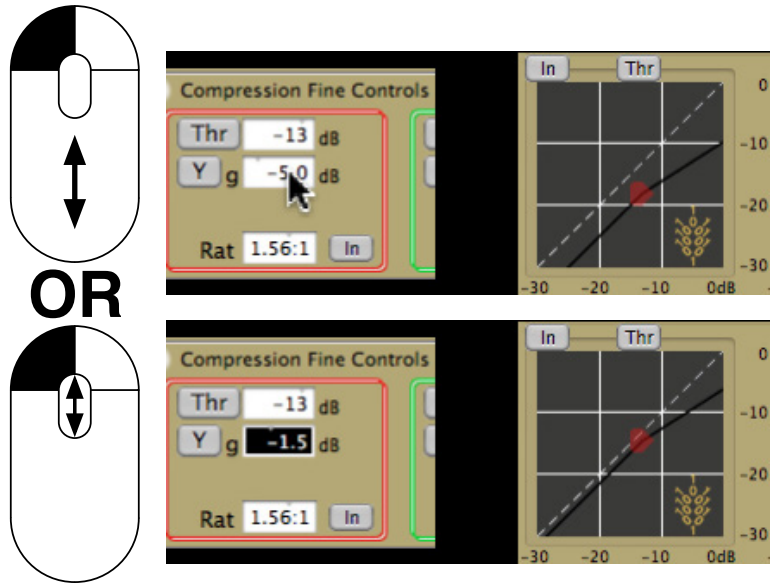


Compression Curve Methods

Gain Before Threshold

A button in the fine controls for band compression becomes relevant for special modes of specifying the curve. The axis button is located to the left of the g label and indicates on which axis the gain is applied via the slider-text value.

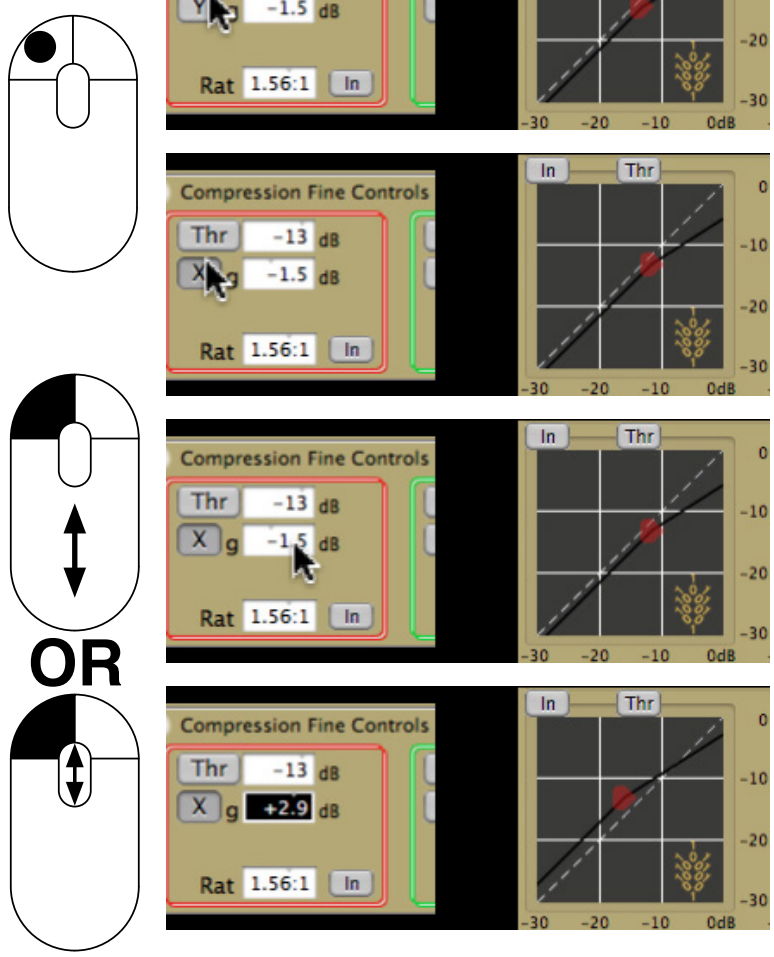
The normal mode is with the button set to 'Y', which is a specification mode known as gain before threshold. The compression threshold in this mode is set as an absolute input level, and the gain is applied along the output level axis at the threshold.



Gain Before Compression

Clicking the 'Y' button changes the mode to 'X', which is a specification mode known as gain before compression. The compression threshold in this mode is set as an absolute output level, and the threshold gain is applied along the input level axis.

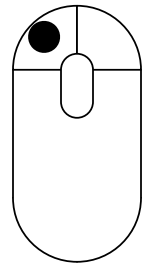
Note that the coarse compression bead is not restricted in its movements due to the setting of the axis button.

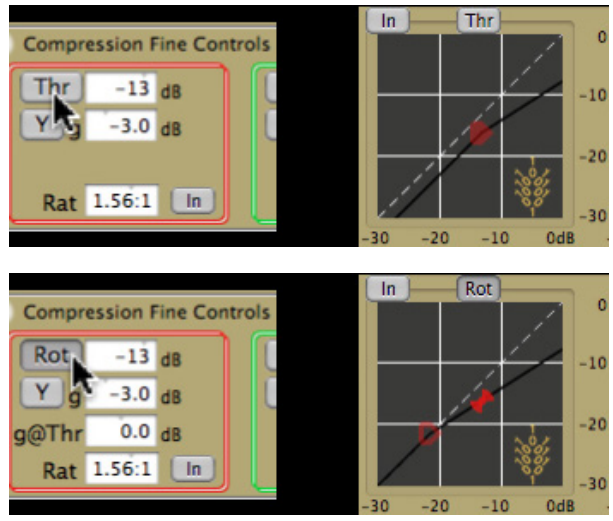


Compression Curve Methods

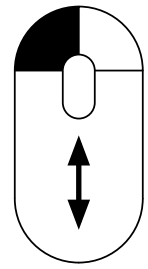
Rotation Point, Fine Controls

Clicking the 'Thr' button, either on the top of the coarse display or in the compression fine controls, switches the button label to 'Rot' and activates a special mode for specifying the compression curve. The compression bead is replaced by a pivot icon. This is the location through which the compression slope intersects, which is known as the rotation point.

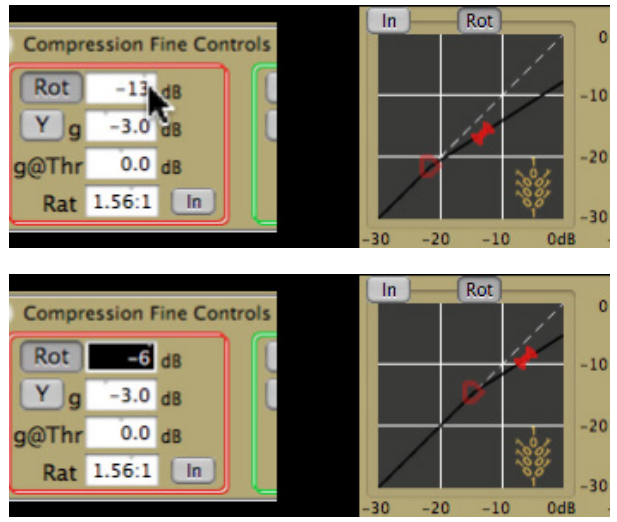




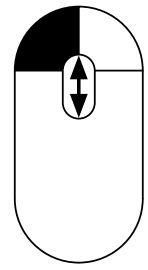
The compression threshold bead takes on a hollow center, indicating it is no longer the primary control for the compression curve. The top fine parameter along with the gain offset and offset axis now control the location of the rotation point.

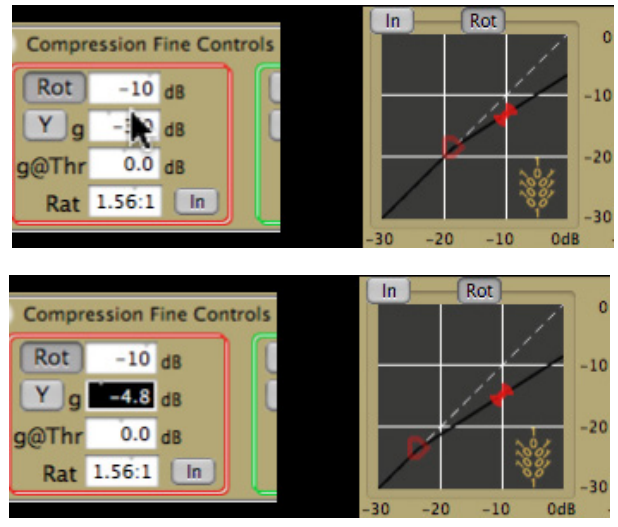


OR



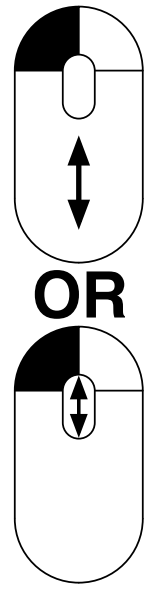
The fine parameters can be adjusted as before, and the location of the rotation point will respond accordingly. Note that the now virtual threshold can also move, but it will move relative only to the diagonal.





Entering the rotation point mode exposes another parameter in the fine controls. The new parameter is called gain at threshold. The principle is this: the compression line moves through the rotation point at a slope determined by the compression ratio until the gain (relative to the dashed line of neutral gain) reaches the gain at threshold.

Note that the gain at threshold can be adjusted to the point where the threshold occurs prior to the intersection through the rotation point.



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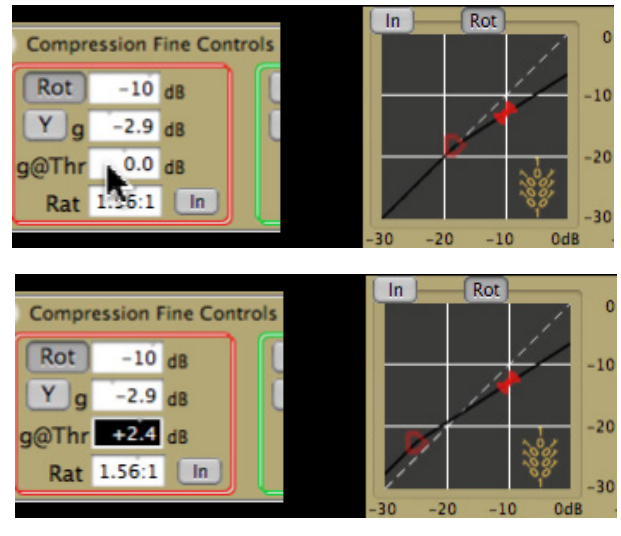
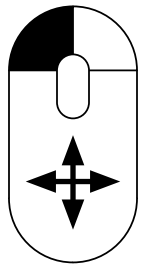
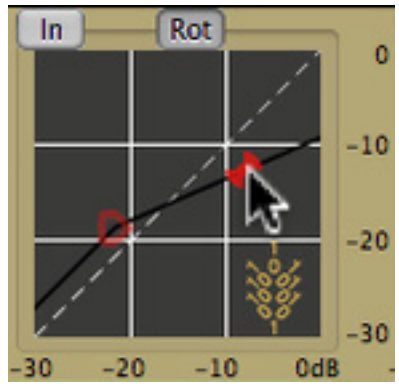


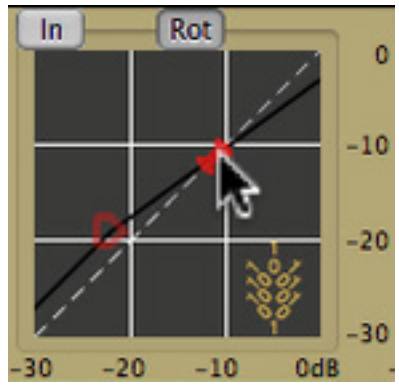
Compression Curve Methods

Rotation Point, Coarse Controls

Both the rotation point and the virtual threshold can be moved in the coarse display by clicking and dragging. Dragging the rotation point changes the point's location and also the compression ratio, as the gain at threshold is held constant. As the effective compression ratio gets smaller, the virtual threshold can progressively move along the diagonal line of neutral gain while adjusting the rotation point. The UI calculates the closest location to the one established at the beginning of dragging according to the current point and compression ratio combination.







While holding the left mouse button over the rotation point, move the scroll wheel to adjust the gain at threshold.

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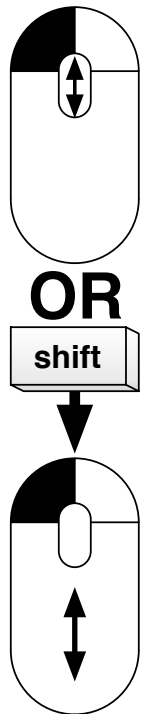
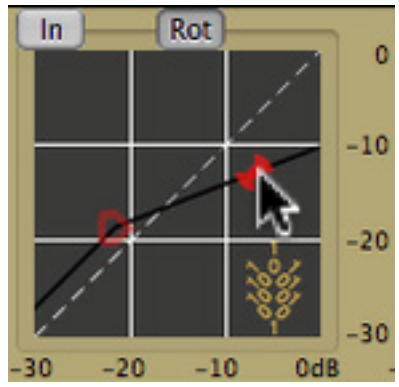
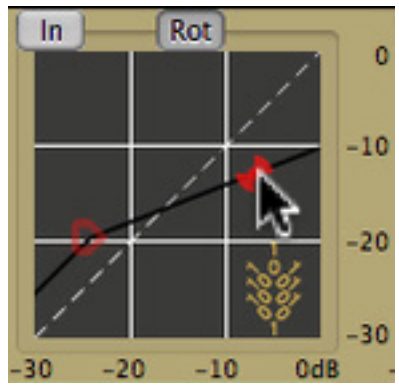


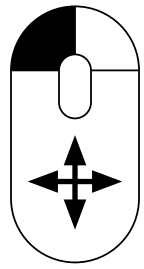


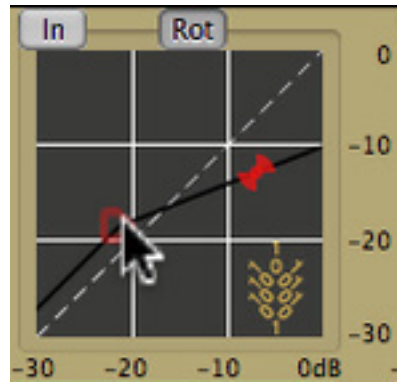


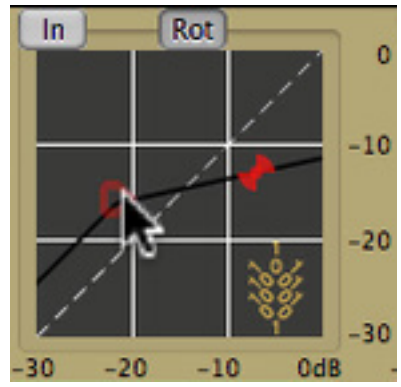
Compression Curve Methods

Rotation Point, Coarse Controls, continued

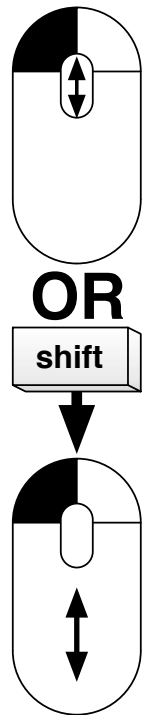
Dragging the virtual threshold changes the gain at threshold and compression ratio while holding the location of the rotation point.

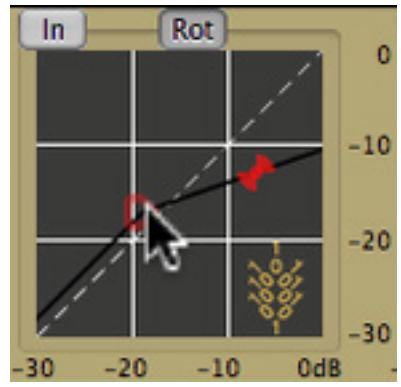


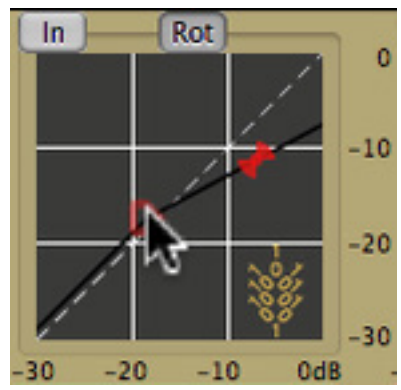




While holding the left mouse button over the virtual threshold, move the scroll wheel to adjust the gain offset of the rotation point. Note that the offset follows the setting of the axis button.







DynPEQ Audio Processing

DynPEQ Audio Processing

Processing Overview

There are three processing stages in a DynPEQ effect. The first is input processing, where the audio input is subject to DC filtering and gain. The second is multi-band dynamic parametric equalization, which will receive the bulk of the coverage here. The third and last stage is output processing, where the output is subject to gain. In Quartet, an interpolated peak limiter operates on the post-gain output.

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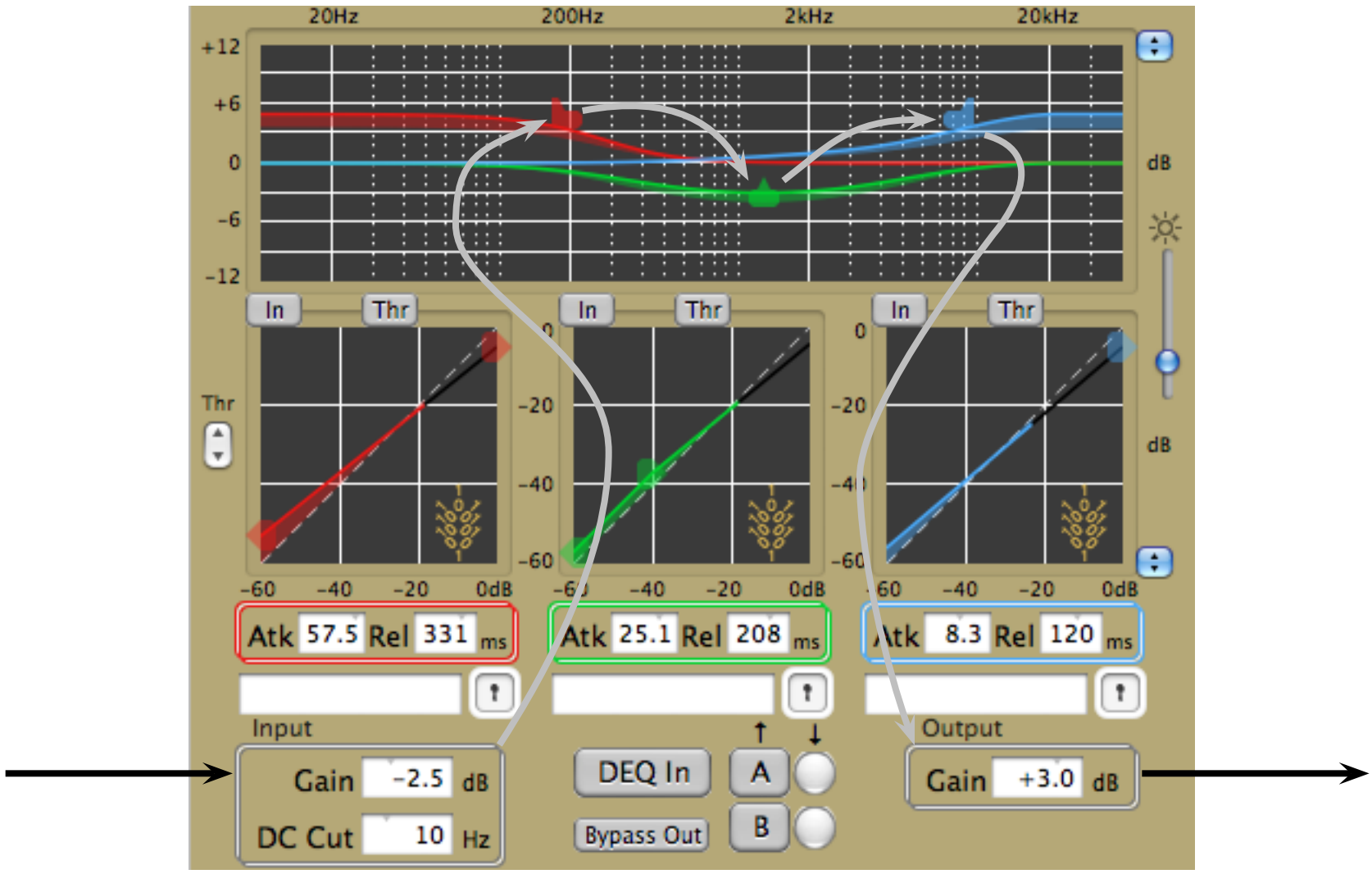


DynPEQ Audio Processing

Processing Overview, continued

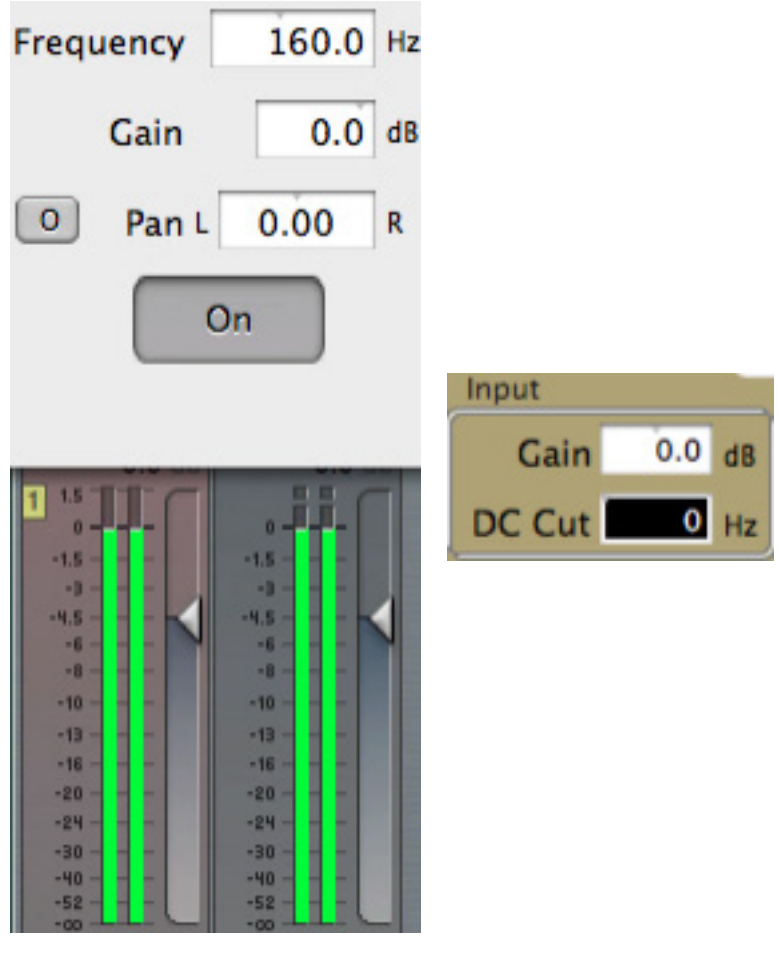
To illustrate the plugin processing in action, we introduce the interface to a sinewave generator and plugin input and output metering. While this is a print-based facsimile of DynPEQ working on audio, the reader is encouraged to follow along with one's working environment, which will likely have its own oscillator plugin.

Input Processing

The audio input to a DynPEQ plugin is first processed by a 6-dB-per-octave IIR highpass filter to null out DC offset. The DC cut parameter specifies the -3dB cutoff frequency of the filter.

To bypass any filtering at DC, set the DC cut frequency to 0 Hz.

In conjunction with DC block filtering, the input for all channels is subject to gain, applied through the gain parameter.



To demonstrate, first set the input oscillator to a low 20 Hz.

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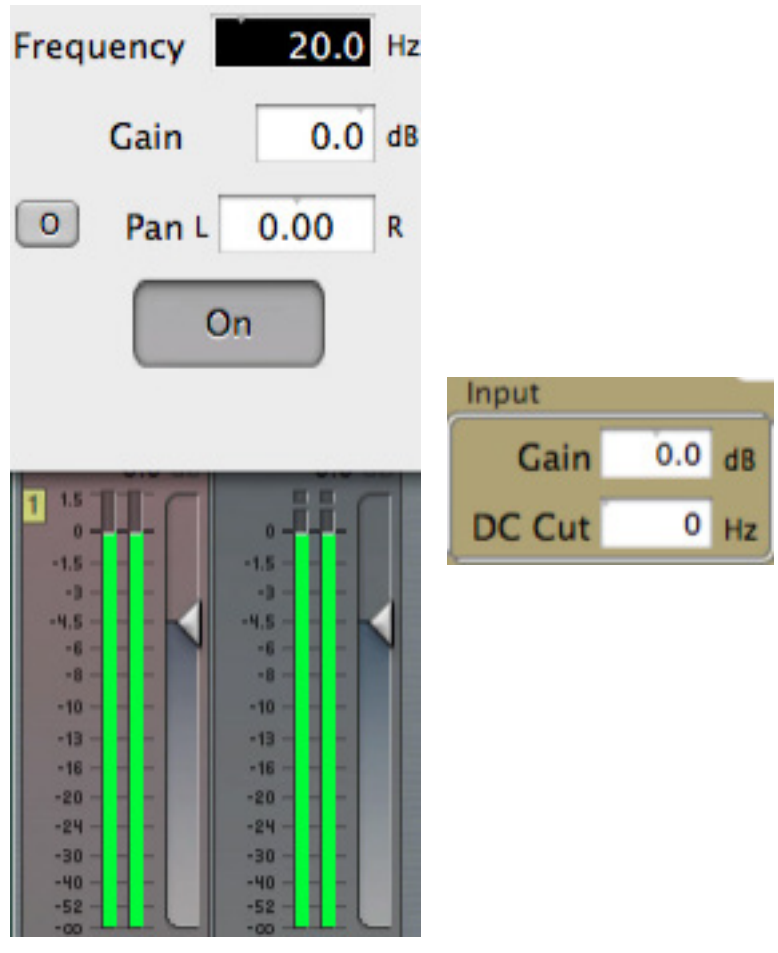
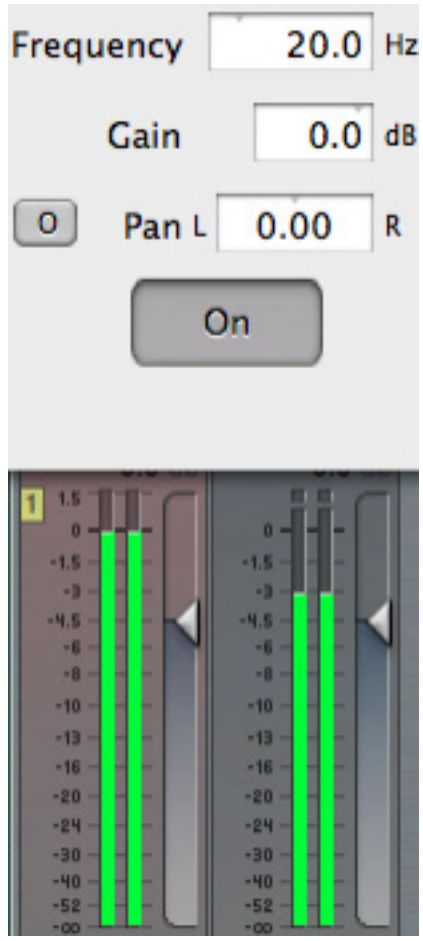
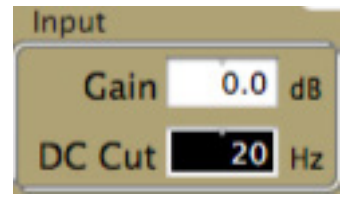
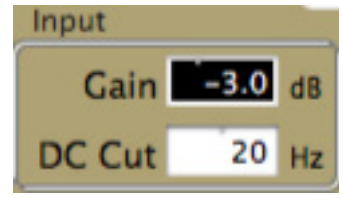


DynPEQ Audio Processing





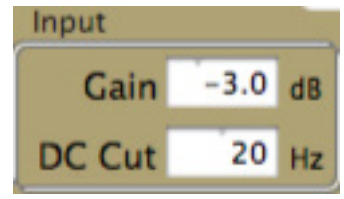


Input Processing, continued

Now set the DynPEQ DC cut parameter to 20 Hz as well, and set the input gain to -3 dB. The output level in this case should be - 6 dB less than the input, accounted as -3dB due to gain and -3dB for the cutoff frequency of the highpass filter.

continued next page

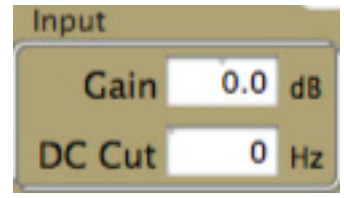
DynPEQ Audio Processing



Input Processing, continued

Changing the oscillator frequency to 10 Hz should adjust the output level to about -9 dB, which is the composition of -6 dB for filter slope over one octave and -3 dB for input gain.

Setting the DC cut and gain parameters to zero, which is their default values accessible by alt-clicking, will match output level to input level.

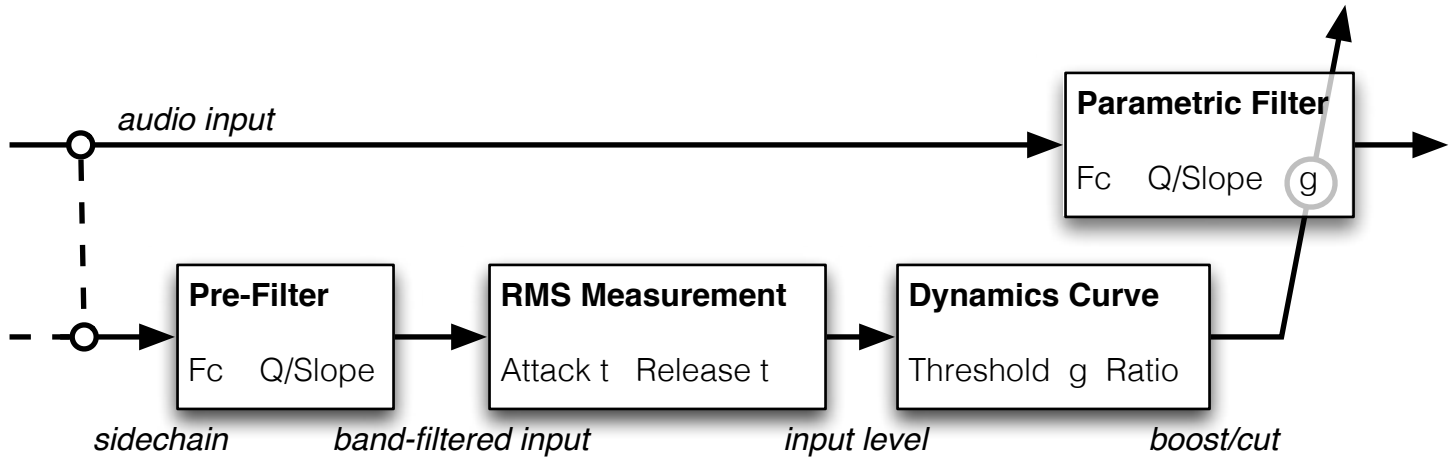


DynPEQ Audio Processing

Dynamic Parametric Equalization

After input processing, stages of dynamic parametric equalization filter the stream of audio channels. Trio has three stages of DynPEQ, and Quartet has four.

Here is a diagram of an individual stage of a dynamic parametric equalizer. The following sections investigate the components within and how they relate to band parameters.



Detailed coverage of the individual components follows this section. The summary of the DynPEQ stage behavior is: a parametric filter processes the audio input, while the level of the sidechain signal is measured. The level is mapped through a dynamics curve to modulate the boost/cut of the parametric filter.

Parametric Filter

A single parametric filter adjusts audio level in selected bands. A DynPEQ stage can become a traditional parametric filter by bypassing the dynamics portion of the band.

In this case, the center frequency of the presence filter is set to 80 Hz, the Q is set to 2, and the boost/cut is set to -3 dB. Note that the current oscillator setting of 160 Hz is an octave away from the center frequency, so the presence filter has only a slight cut on the audio input.

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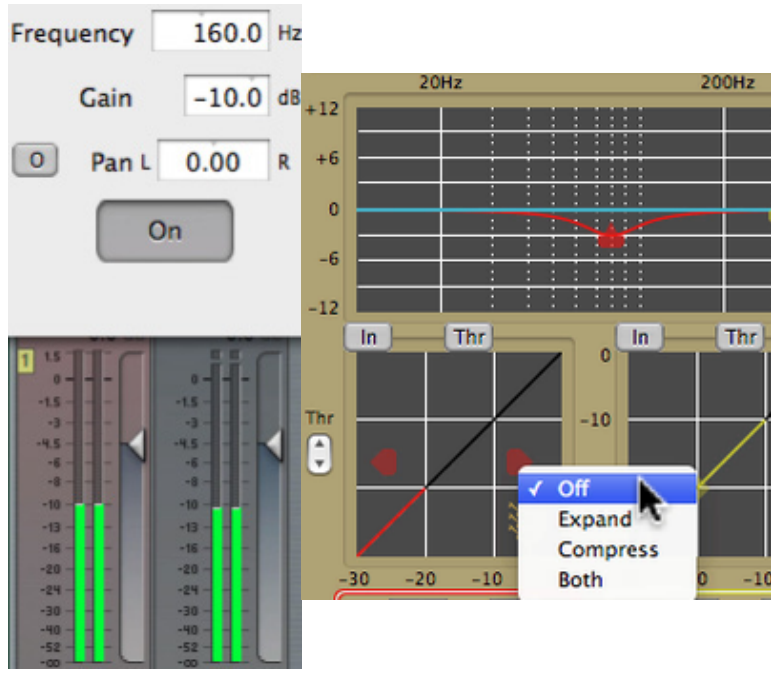
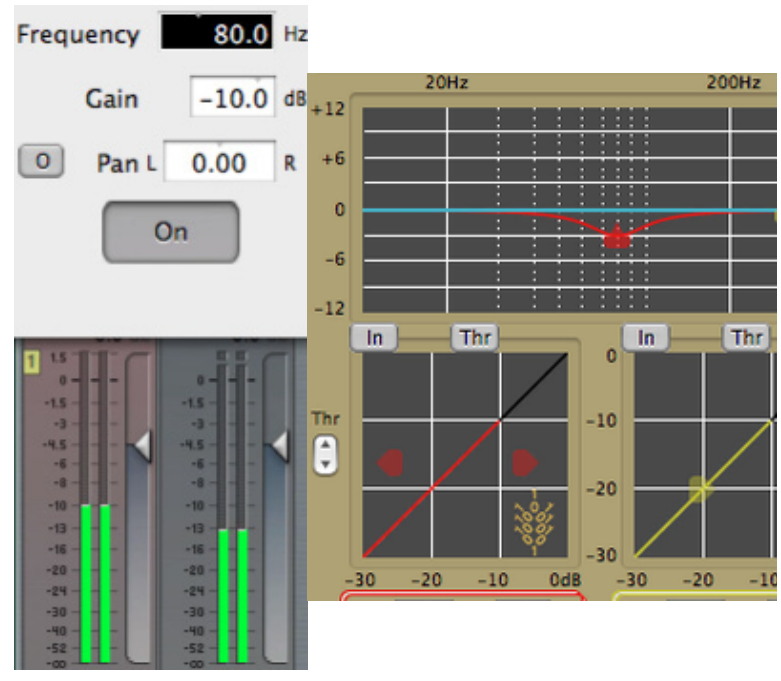
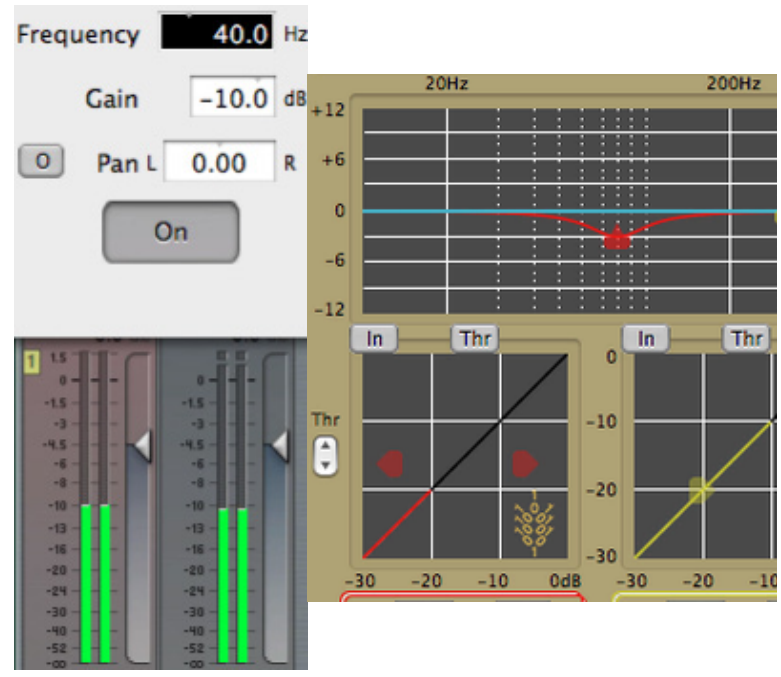


DynPEQ Audio Processing



Parametric Filter, continued

Tuning the oscillator to the presence center frequency exhibits the 3 dB cut. Moving the oscillator frequency further down reduces the cut back towards neutral gain.



To further illustrate band operation as a simple parametric filter, adjust the boost/cut further downwards. Note that the coarse parametric display reflects the boost/cut adjustment, and that the filter curve for the band also adjusts.

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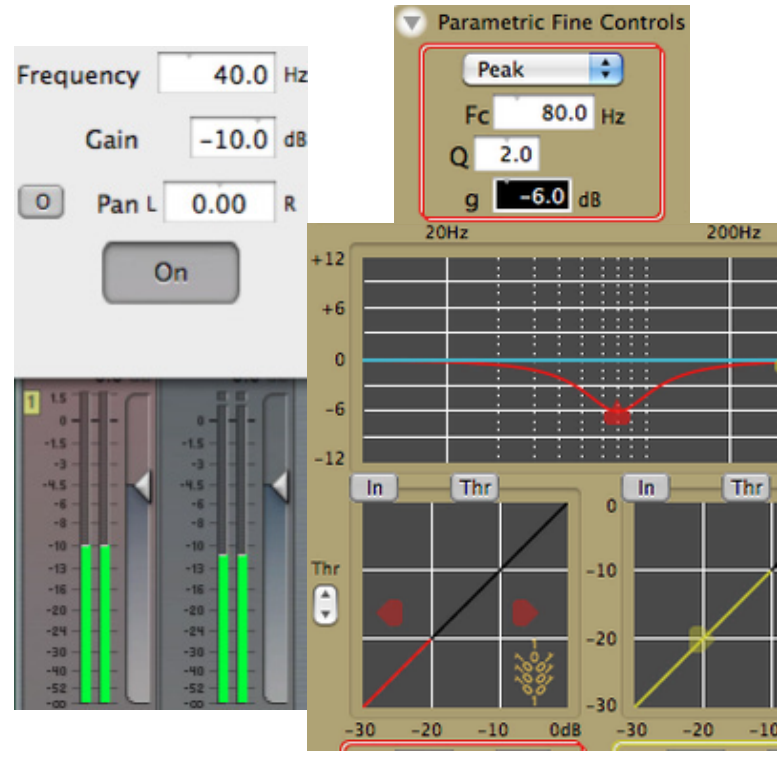
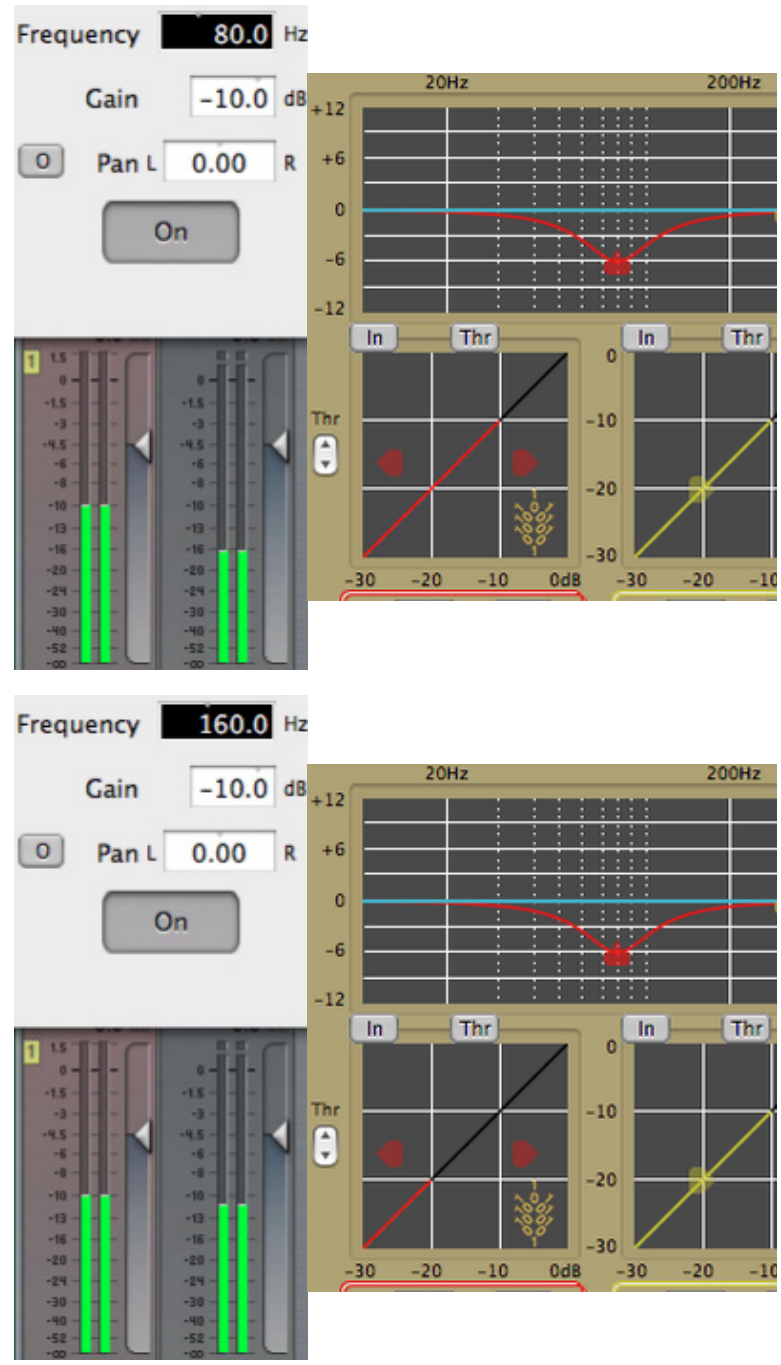
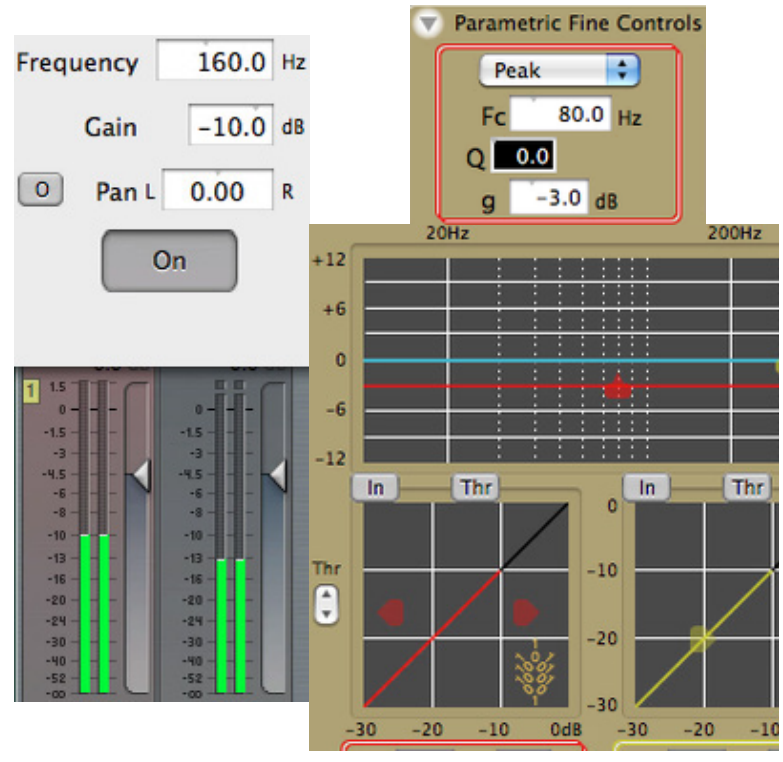


DynPEQ Audio Processing



Parametric Filter, continued

Tuning the oscillator frequency reflects the new boost/cut setting of -6 dB.



Dynamics Processor

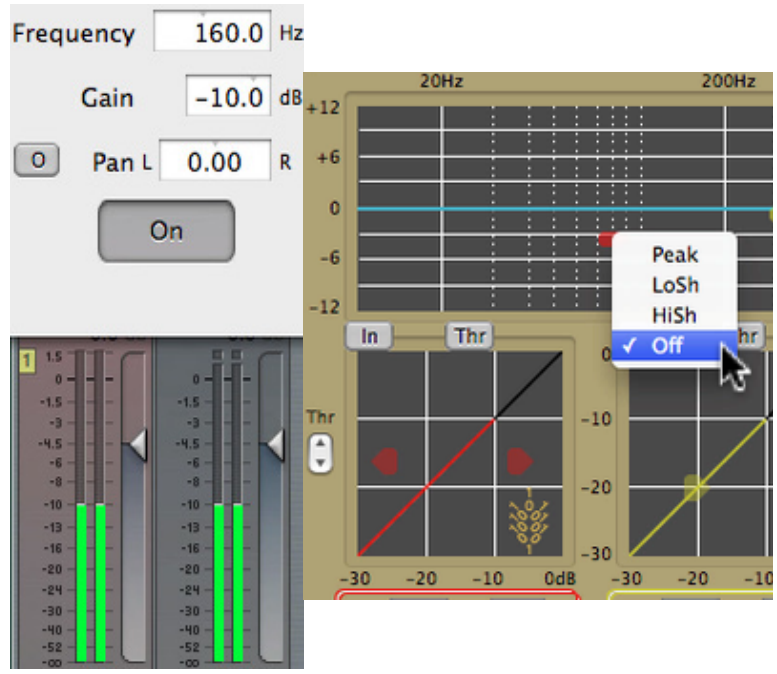
The Q parameter for a DynPEQ parametric filter can be set to zero. A zero-Q bandpass filter has infinite bandwidth, which will pass-through all input frequencies, making this filter an identity operation. A presence filter based on this zero-Q bandpass offsets the root filter with a fixed unity gain, and in this special case they are the same function. So a zero-Q presence filter is broadband gain for which the boost/cut is the gain control.

continued next page

DynPEQ Audio Processing

Dynamics Processor, continued

A traditional dynamics processor is made of three elements: a level measurement taken from the sidechain, a dynamics curve to map the measured level to output level, and a gain stage to adjust input level to output level. A DynPEQ stage can become a traditional dynamics processor by bypassing the parametric filter of the band by setting the band type to off. When the band type is set to 'Off', the parametric filter employed is a zero-Q presence filter with boost/cut fixed to zero dB. Note that the frequency response line for an off band is fixed at zero and does not necessarily thread through its band bead on the coarse display.



To convert this band to a traditional dynamics processor, leave the band type off and activate the dynamics for the band. The dynamics have been set up as follows: both compression and expansion are active with both ratios set to their neutral defaults of one. Enabling both compression and expansion connects their thresholds with a straight line on the dynamics curve. The compression threshold is -6 dB and the expansion threshold is -26 dB. The compression and expansion offsets are set so that the output level between the input levels from -26 to -6 dB is a constant -16 dB.

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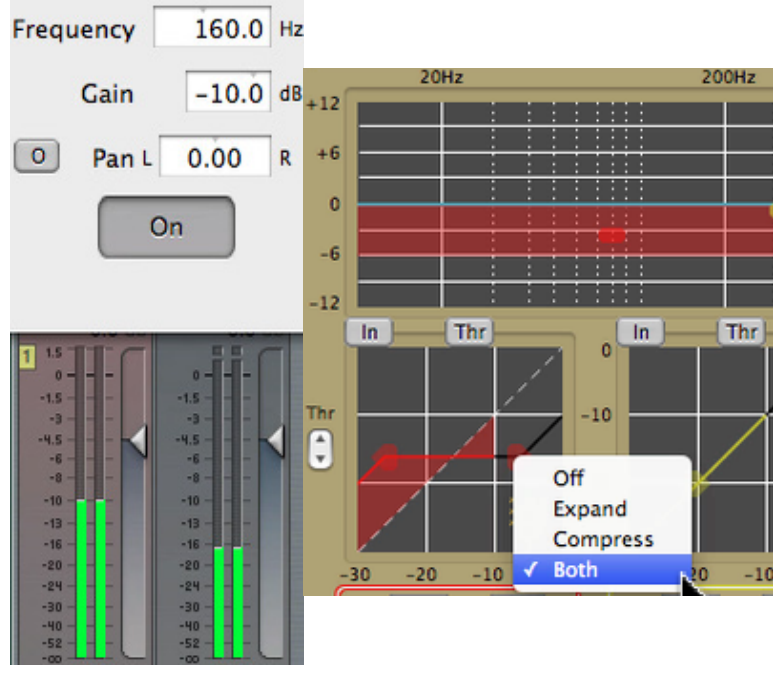
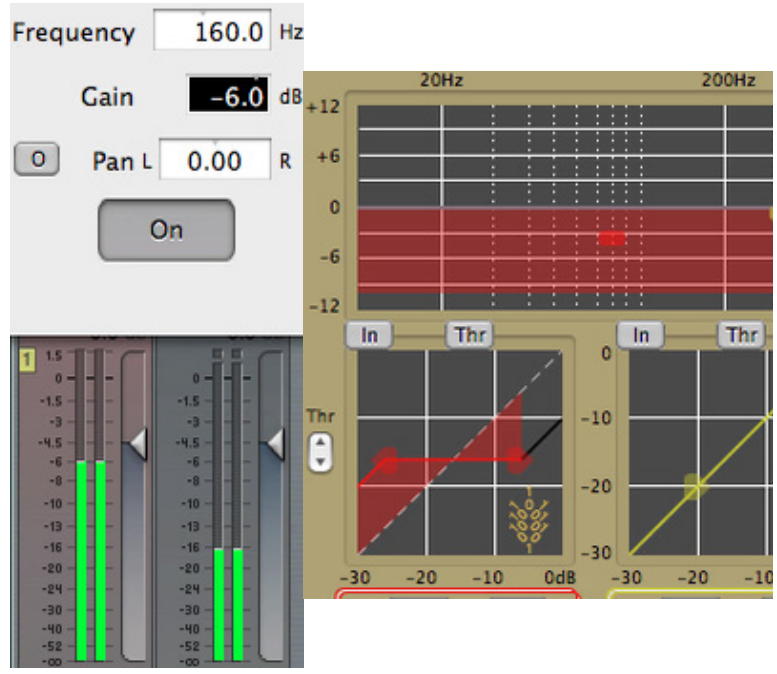


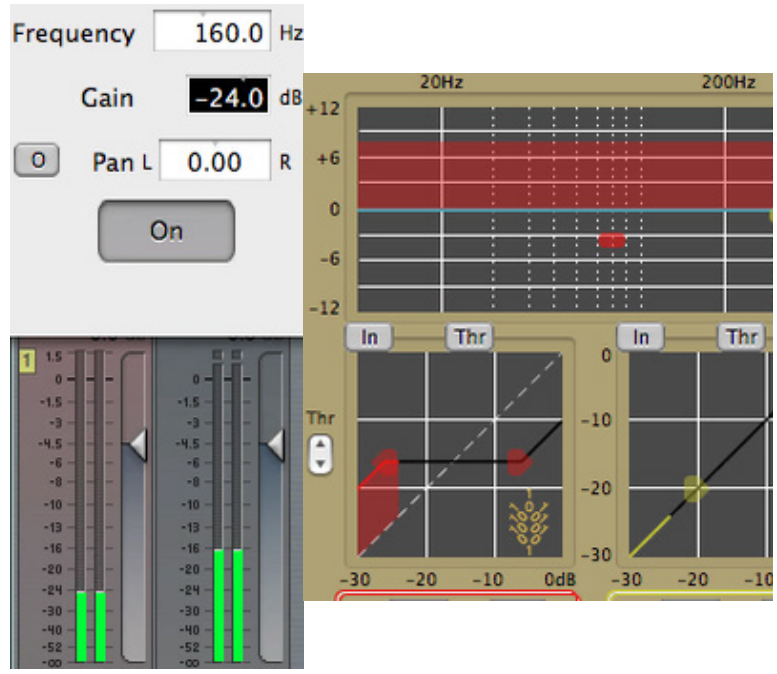
DynPEQ Audio Processing

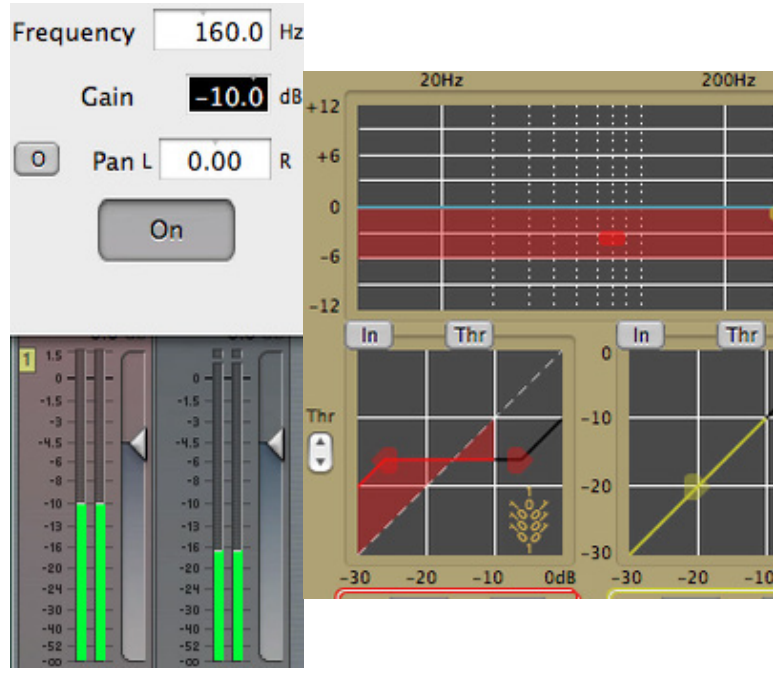


Dynamics Processor, continued

Adjusting the gain of the input oscillator shows the simple dynamics processor in action. The output level indeed remains at -16 dB for a wide range of input levels. On the coarse dynamics view, the input level is noted on the x axis of the display, and a solid color line overwrites the dynamics curve to the input level. The region from the dynamics curve to the diagonal line of neutral gain is shaded in up to the input level. The distance from neutral gain to the dynamics curve becomes the distance to offset the boost/cut of the parametric filter, which in this case is broadband gain. This is the manner in which a DynPEQ band with the filter type off behaves as a traditional dynamics processor.

Note that since the band is off and the filtering is broadband, this would be the result regardless of the oscillator frequency.



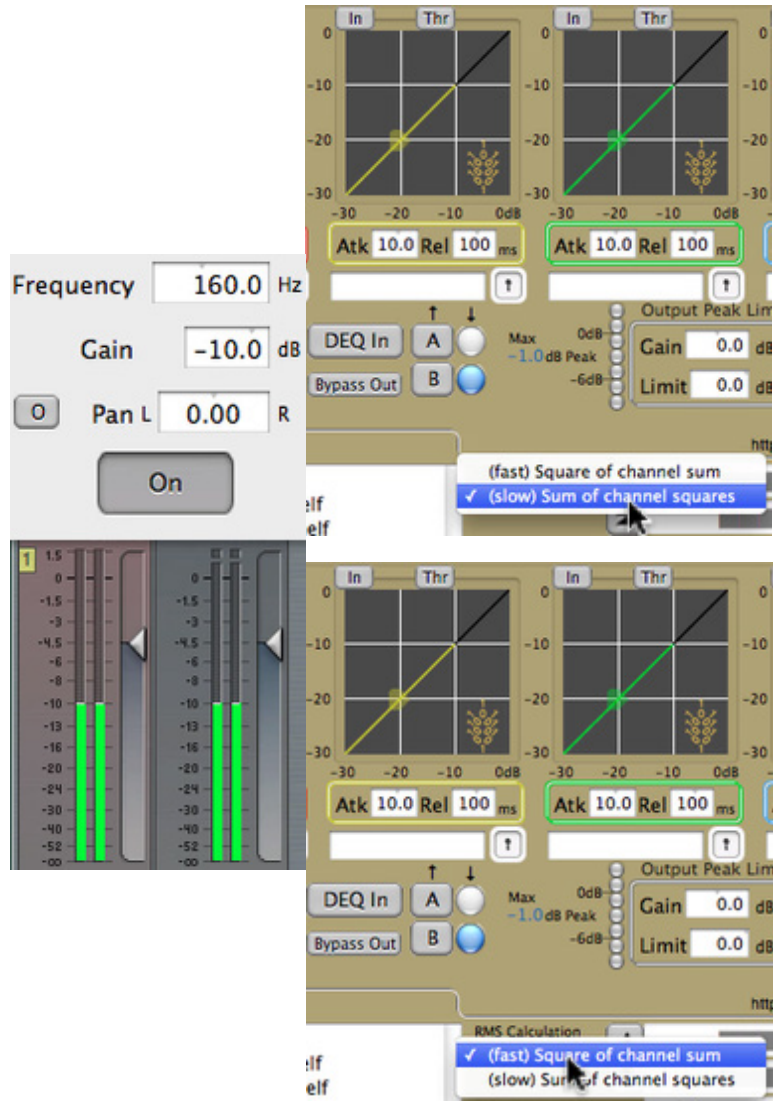


DynPEQ Audio Processing

Multichannel RMS Level Measurement (*Quartet only*)

The RMS method--square samples, keep a running sum, and square-root the sum--is used to calculate the input level for each band. The act of squaring samples before the running sum raises an issue in the case of multi-channel audio input. For Quartet DynPEQ, keeping running sums of multiple channels burdens the CPU load.

There is a menu selector in Quartet's toolchest section, labeled RMS Calculation, to address this. There are two options categorized as fast and slow. The slow option is the traditional RMS calculation, but the fast option sums the samples from all input channels prior to the squaring operation.



The two options will yield similar results in most cases. If the fast option is applied, phase offsets between channels may reduce the overall input level measured.

If Quartet DynPEQ is run in Pro Tools on an HD-board-based DSP, the multichannel RMS technique will be determined by the capacity of the DSP. The technique will be displayed on the menu selector, but the selector is grayed out and cannot be changed.

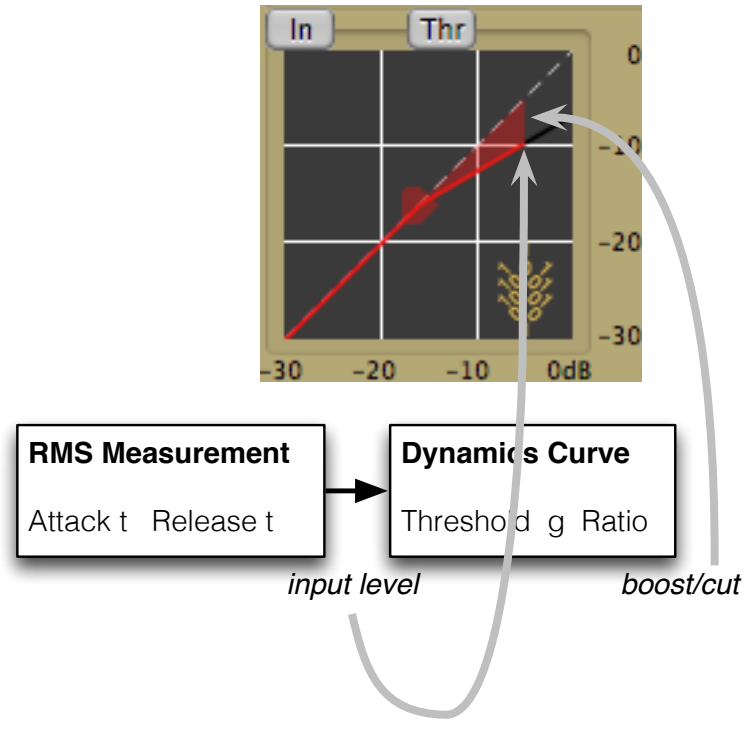
RMS Measurement Speed

The running sum of sample squares is processed by a first-order attack/release filter. The attack and release times are controlled by the attack and release parameters located just below the coarse dynamics display. The release parameter represents the interval over which the output would reduce by 60 dB if the input suddenly became all zeros.

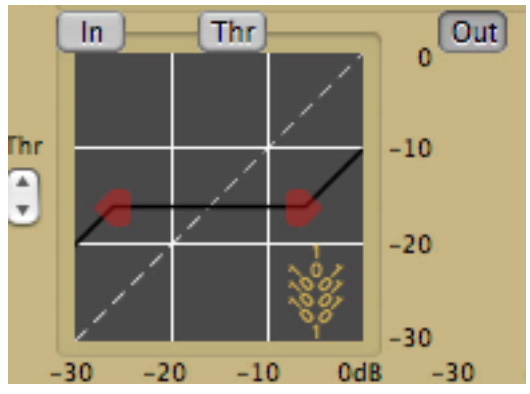
DynPEQ Audio Processing

Dynamics Curve and Gain Application

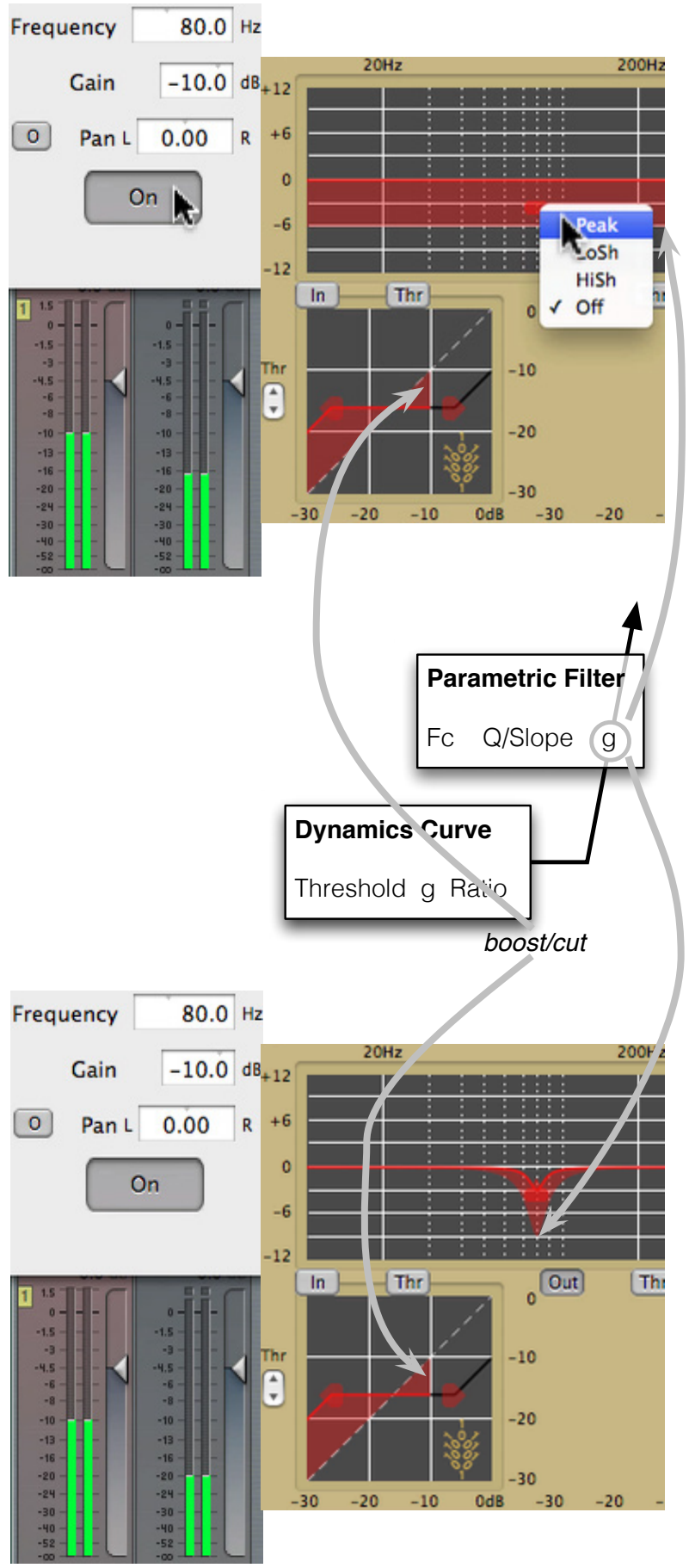
The input level measured via RMS is applied to the dynamics curve. The x axis of the coarse dynamics display represents input level. The portion of the dynamics curve up to the input level illuminates with the band's color. The illuminated path is also filled to the line of neutral gain, which represents the gain applied for that input level.



For example, set the dynamics curve so that the output level remains constant regardless of input level.



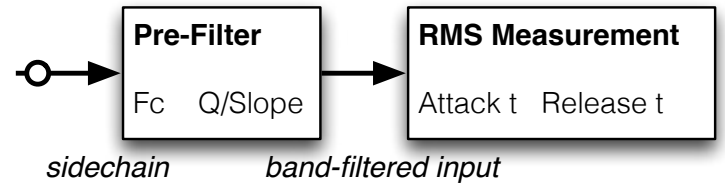
DynPEQ Audio Processing

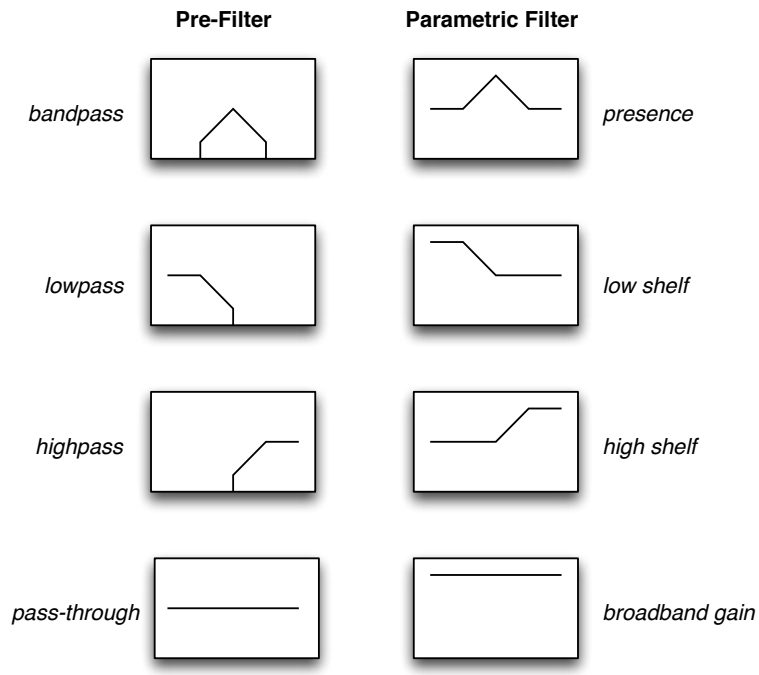


DynPEQ: Modulated Parametric Filter

Starting with a traditional dynamics processor, the first step to make it a DynPEQ stage is by replacing the broadband gain stage with a parametric filter. The dynamic gain signal is repurposed to control the boost/cut of the parametric filter.

DynPEQ Audio Processing



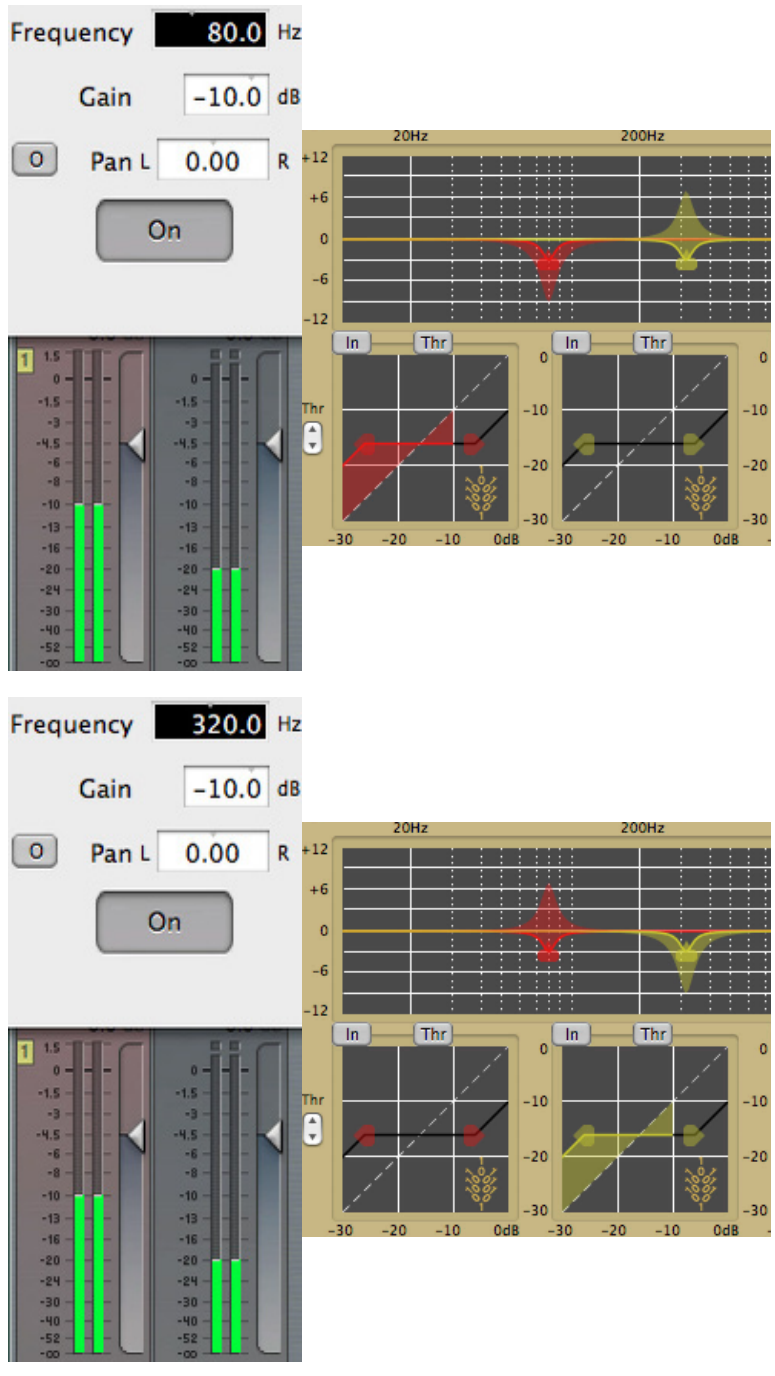


DynPEQ: Pre-Filtered RMS Measurement

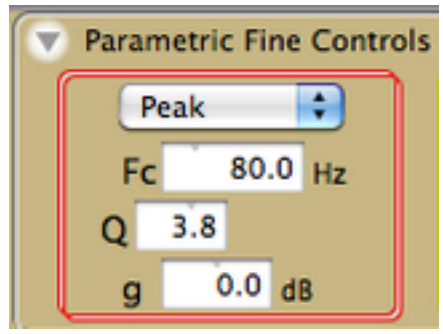
The other change in making a DynPEQ stage is by inserting a filter prior to the RMS level measurement. The pre-filter is a complement to the parametric filter, so it is a lowpass for the low shelf stage, highpass for the high shelf stage, and bandpass for the presence stage.

Note that each band has its own input level feedback. If each band did not have its own pre-filter, this would not be necessary. In normal operation, the input band levels will often differ.

This can be illustrated by making two high-Q peak/dip bands that differ only in center frequency. When the oscillator frequency matches the band center frequency, the input level reported in the coarse dynamics display should be near the oscillator level, while the level of the other band should be significantly less.

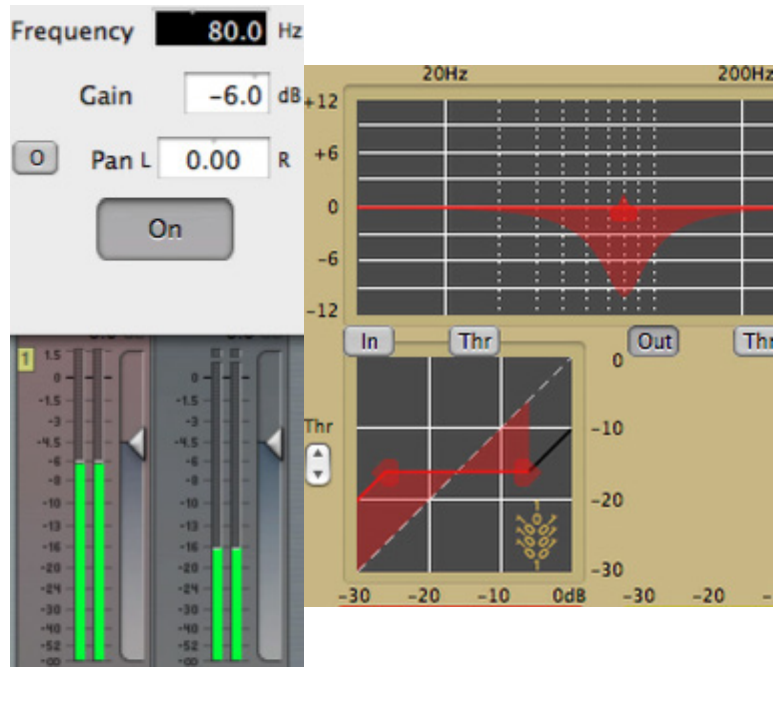


DynPEQ Audio Processing



Complete DynPEQ Stage

Returning to the dynamics example, change the band type to a narrow-band presence filter. If the sine wave input matches the center frequency of the presence filter, the DynPEQ stage will behave as it will for a broadband dynamics processor.



While changing the oscillator level over the flat range of the dynamics curve, note that the output level remains constant. The shaded area of the coarse tuning display is the effective frequency response of the peak/dip.

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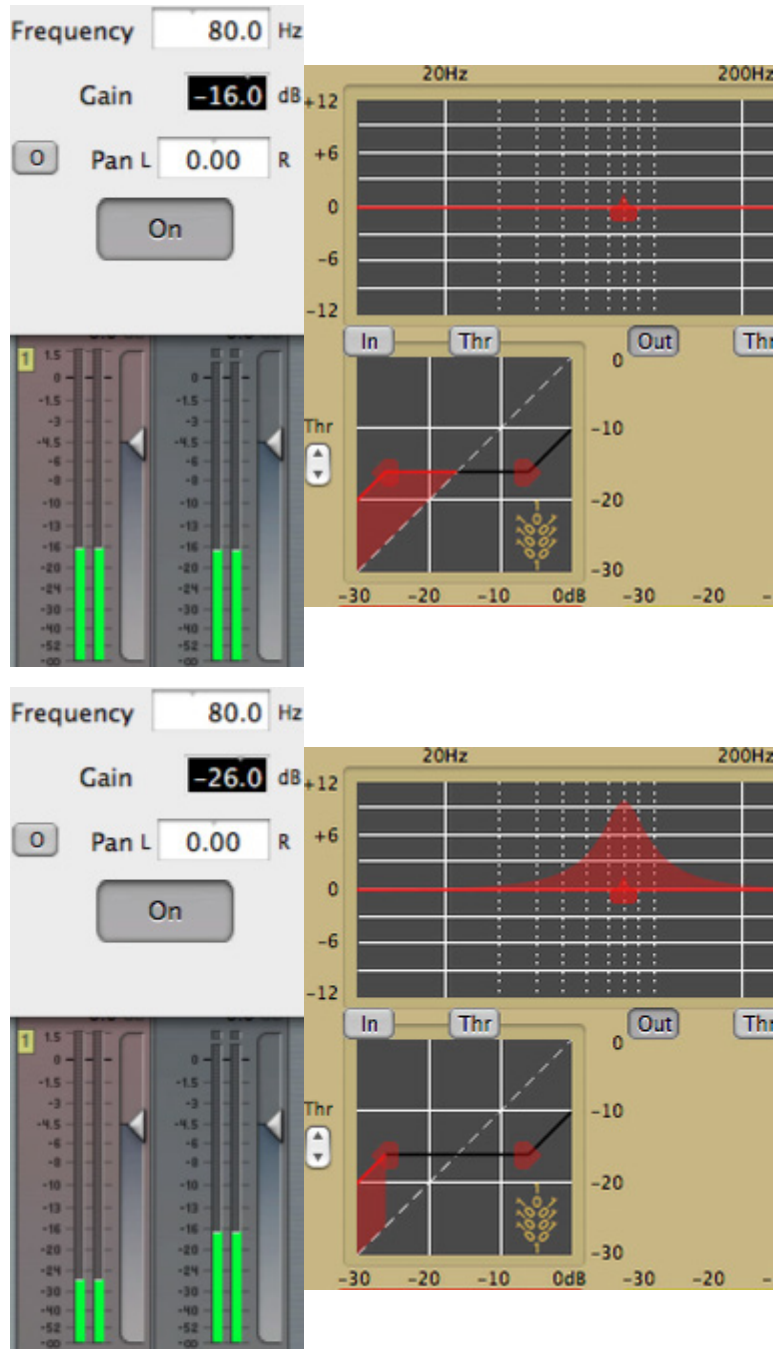
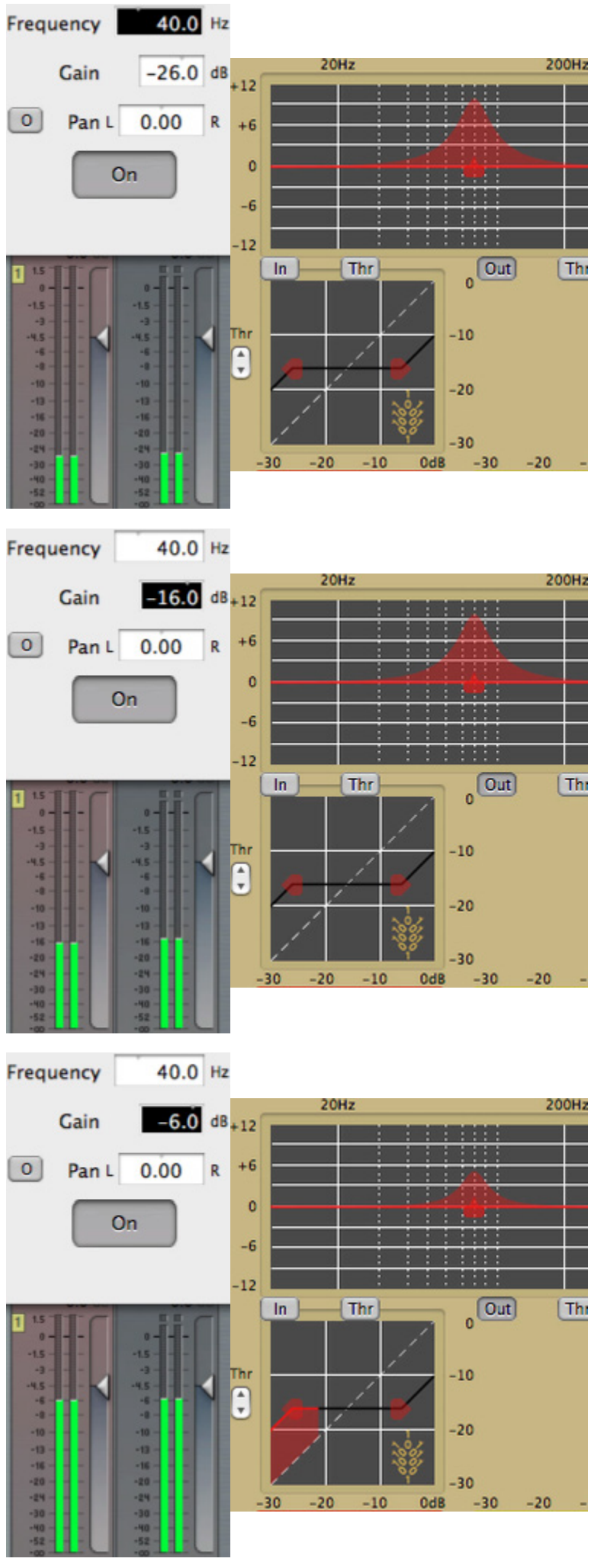


DynPEQ Audio Processing



Complete DynPEQ Stage, continued

If the input frequency is moved outside of the nominal bandwidth of the presence filter, two things of note happen. First, the pre-filter to the RMS measurement attenuates the input, so the measurement of the in-band input level decreases. Second, the input frequency moves outside of the band where the presence filter operates, so the effective gain applied to the input signal is close to neutral.

Note that when the oscillator level is low, the frequency response of the band at 80 Hz is 10 dB. However, the oscillator frequency is 40 Hz, and the frequency response there is significantly less, on the order of 1 dB. When the oscillator level increases, the input level of the band lags behind the oscillator level due to the stage's pre-filter. Eventually the input band level reaches the point where the effective boost/cut of the presence filter reduces. At the oscillator level of -6 dB, the boost at 40 Hz has shrunk to a small fraction of a dB.

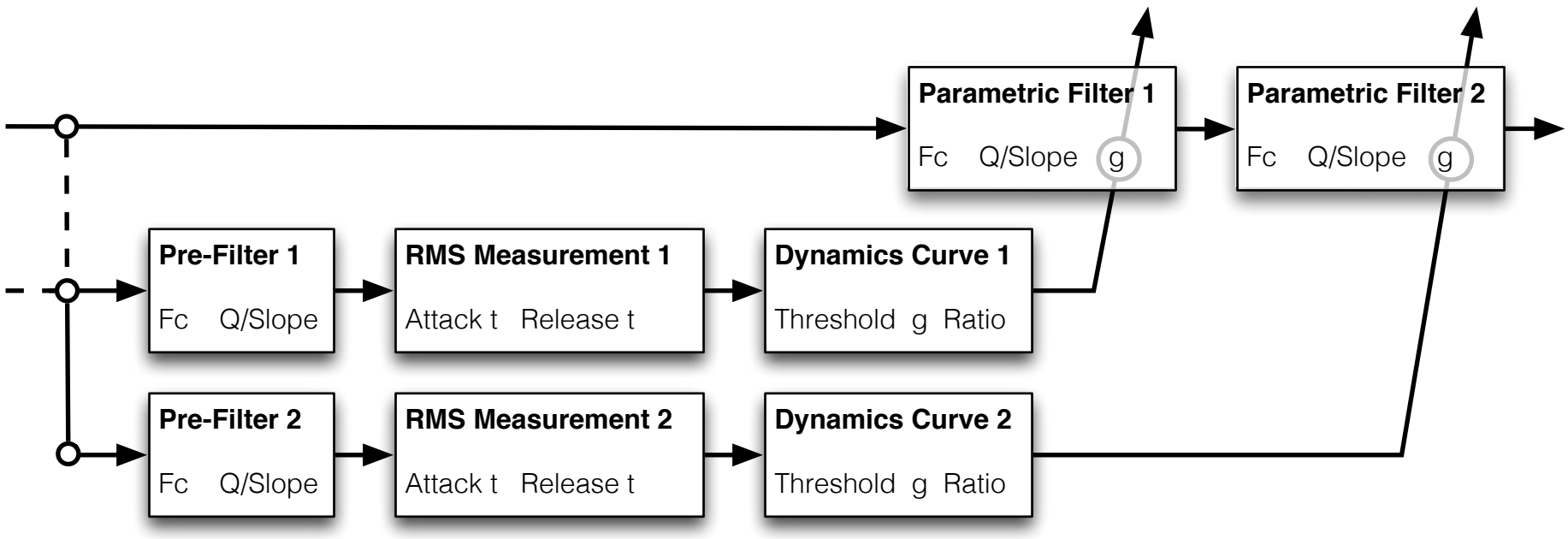
In this manner, a DynPEQ stage concentrates its dynamic operation within the parametric band.

DynPEQ Audio Processing

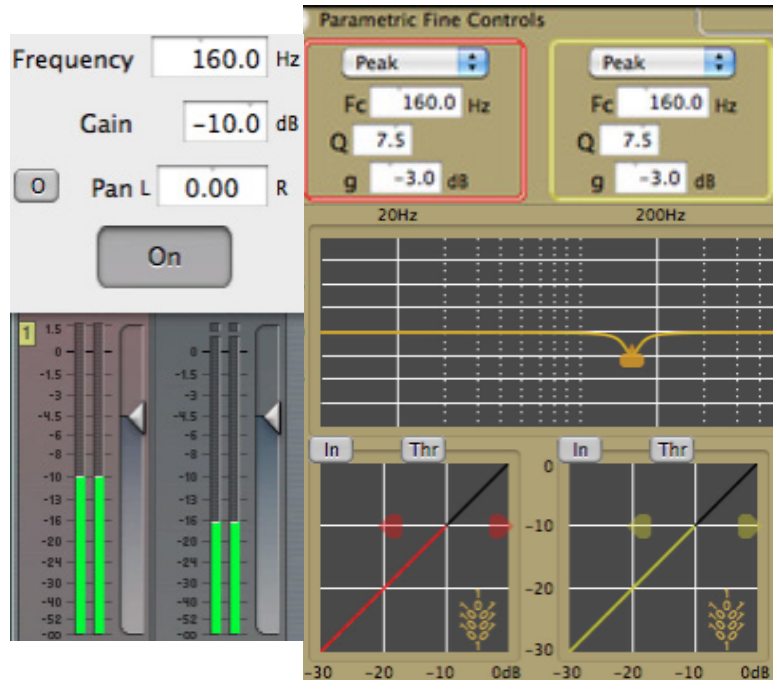
Multi-Stage Dynamic Parametric Equalization

A typical multi-stage parametric equalizer feeds the output of one stage to the input of the next, which is known as a serial connection. The audio processing chain of DynPEQ stages are also connected in serial, but there is a subtle difference. The output of one DynPEQ stage can change the level for the next stage. Performing a band-filtered level measurement on the output of the previous stage implies that the order which the bands process is significant. This is not true in DynPEQ.

To avoid this level measurement dependence, the pre-filtered input level of all DynPEQ bands is measured from the sidechain signal. This is called a parallel connection. Since the sidechain levels are calculated in parallel, the plugin output will not change regardless of band order.



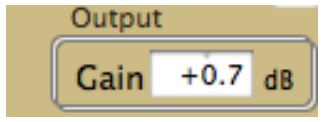
This can be illustrated by configuring two bands as equivalent narrow-band cuts. Tuning the oscillator to the common center frequency will cut the output by twice the cut of one band. Note that the level indicated for both bands is the same and is equivalent to the input level. Neither band reports a level that is 3 dB different than the other.



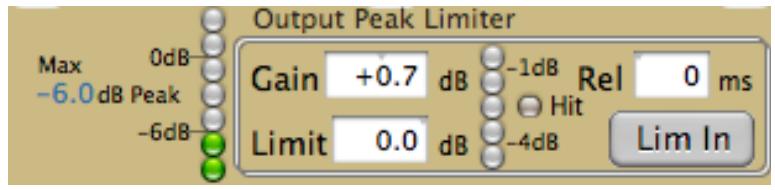
DynPEQ Audio Processing

Output Processing

After the DynPEQ stages have completed their processing, the signal undergoes output gain, controlled in the same manner as the input gain. The Trio plugin completes its processing at this point.



The Quartet plugin performs two more processing steps. Before output gain, it calculates an interpolated analog peak from the DynPEQ output. After output gain, Quartet acts upon the peak information to limit the plugin output to a specified level. The lim in/out button enables or bypasses the Quartet peak limiter.

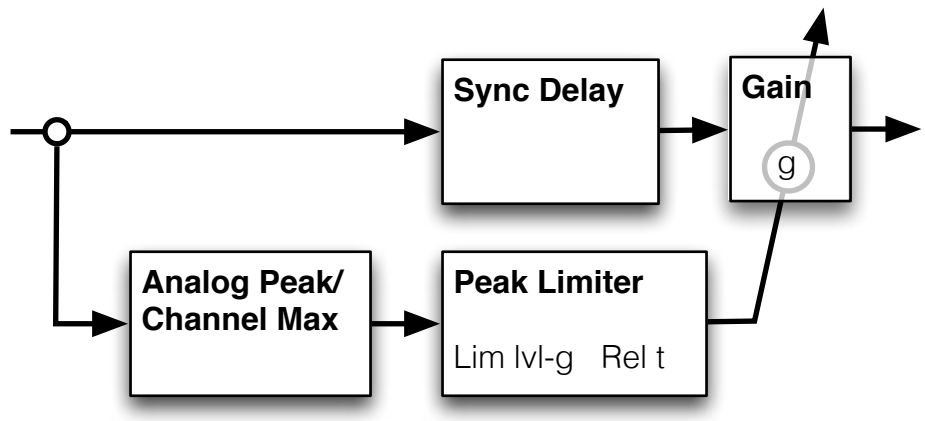


Peak Calculation and Peak Limiting (*Quartet only*)

Prior to the application of output gain, the digital signals from each output channel are interpolated into quasi-analog form so that the peak levels can be located and estimated. The level information of all output channels are collected and the maximum level is compiled and reported.

If the peak limiter is enabled, the maximum value is multiplied by the output gain and compared to the limiter ceiling level parameter. If the current maximum value exceeds the ceiling level, the limiter calculates the attenuation necessary to pass the signal under the ceiling level. The limiter will gradually transition into this new gain level, so the output signal must be delayed prior to the final gain stage to synchronize the limiter processing.

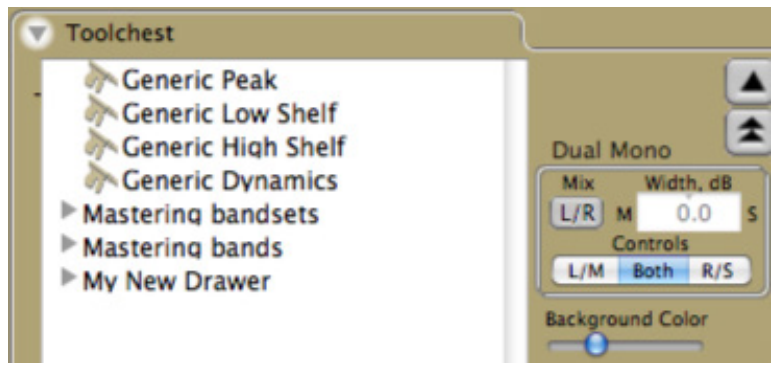
The gradual adjustment of the effective gain may not be sufficient to make the transition back to the original output gain as graceful as the attack. To address this, the limiter release time parameter defines a rate for which the effective gain returns to the output gain.



DynPEQ Audio Processing

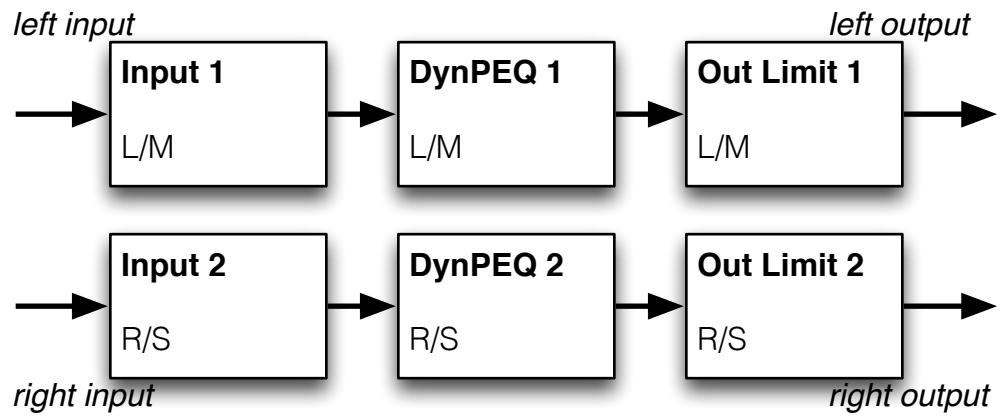
Dual Mono Processing (*Quartet AU only*)

The Audio Unit version of Quartet DynPEQ consists of two plugins instead of one. The extra component is a stereo-only plugin that operates on the two audio channels independently, which we call dual mono processing. Dual mono Audio Unit serves to operate in the same manner as Pro Tools Quartet in multi-mono mode.

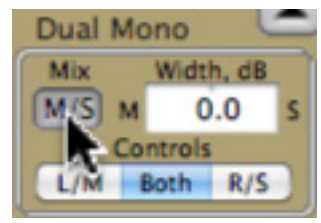


Dual mono Quartet works much like the regular Quartet with a few changes. First, a new set of controls appears in the toolchest section of the parameters window. Next, the processing parameters in the window are doubled in number, one set for each channel, though the settings for only one channel are displayed at one time.

The dual mono control set is two new parameters and a channel display. The first new parameter is the left/right or mono/stereo mix button. Click on the button to switch between channel mix modes. When the button is set to L/R, The left and right stereo channels are each processed unmixed.



When the button is set to M/S, the channel inputs are mixed into mono (sum) and stereo (difference) signals. After the channels are independently processed through the DynPEQ bands, the mono and stereo signals are reassembled into left and right channels for independent output/limiter processing.



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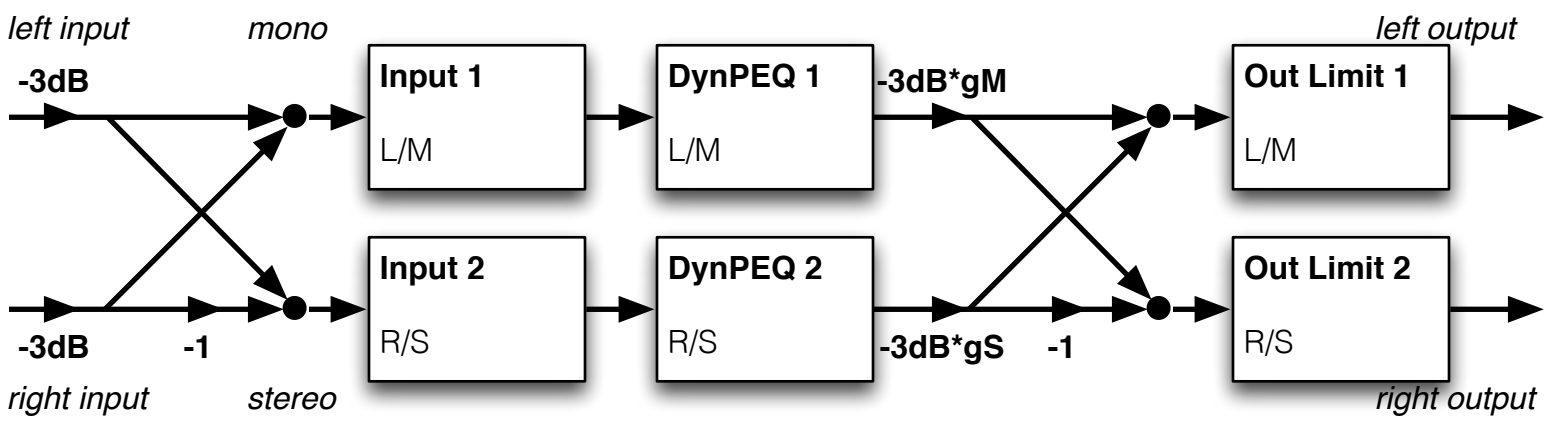

DynPEQ Audio Processing

Dual Mono Processing (*Quartet AU only*), continued

When in M/S mix mode, the mono/stereo width mix parameter becomes active. This slider-text controls the relative mix of the mono and stereo signals when they are reassembled to left and right. The number in the slider-text is the difference between the mono and stereo levels in dB. The arrow in the field indicates which level, M or S, is dominant. This slider-text cannot be edited via double-click. The special infinity character ∞ indicates that the left/right output consists of all mono if the arrow is pointed at M or all stereo if the arrow is pointed at S. This control is a special shortcut to bypass adjusting the output gain for the individual channels.

If the input oscillator is in phase, the mono/stereo breakdown puts all the input energy in the mono channel and none in the stereo. In this case, any M/S width in favor of the stereo channel will attenuate the output by the indicated gain.

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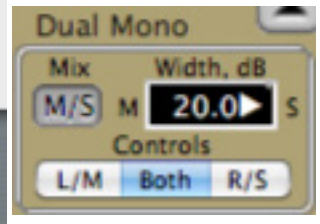
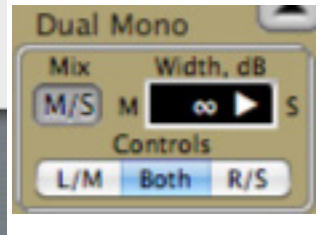
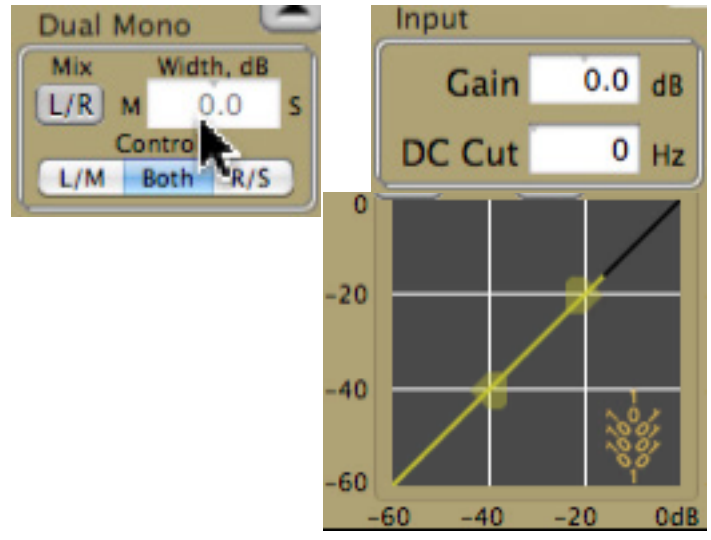




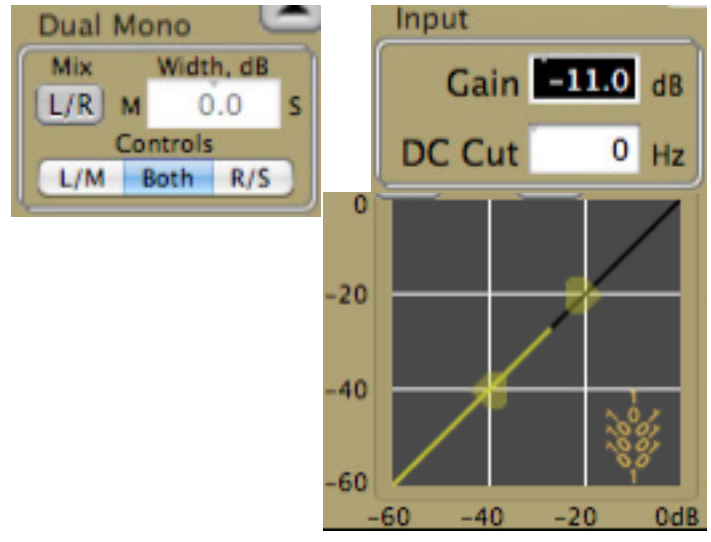
DynPEQ Audio Processing



Dual Mono Processing (*Quartet AU only*), continued

The last new control determines which channel the parameter view reflects and influences. Click on any of the three segments to activate that mode, which will turn blue.

The initial mode is called 'Both'. In this mode, all processing parameter changes made will apply to both left/right or mono/stereo channels. To show its operation, make a change to the input gain parameter. The new gain now applies to both left and right channels.



Click on the 'L/M' segment to transform the mode. Note that the gain value previously entered does not change, as that change applied to both channels. When in L/M mode, the parameter controls and level indicators are mapped to the left or mono channel (depending on L/R or M/S mode) only.

Changing the input gain parameter in L/M mode changes the gain for the left channel while leaving the right channel gain alone.

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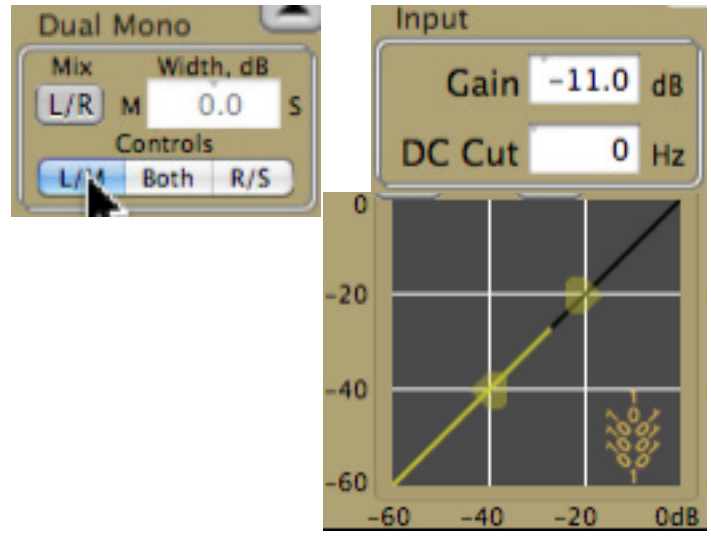
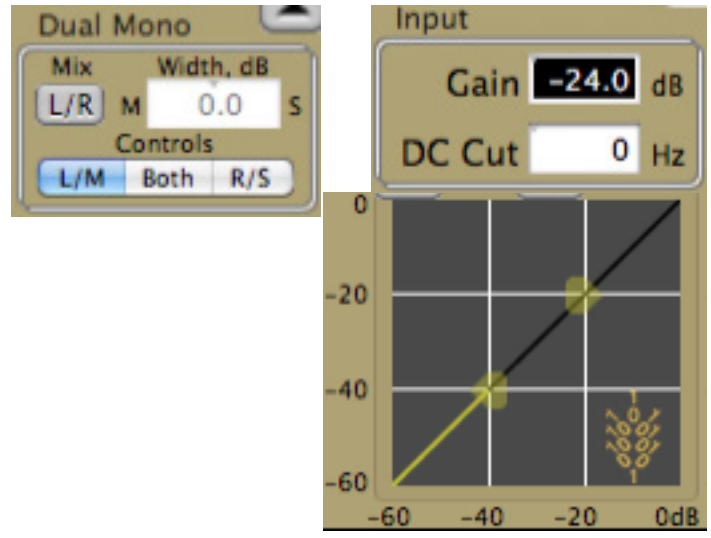
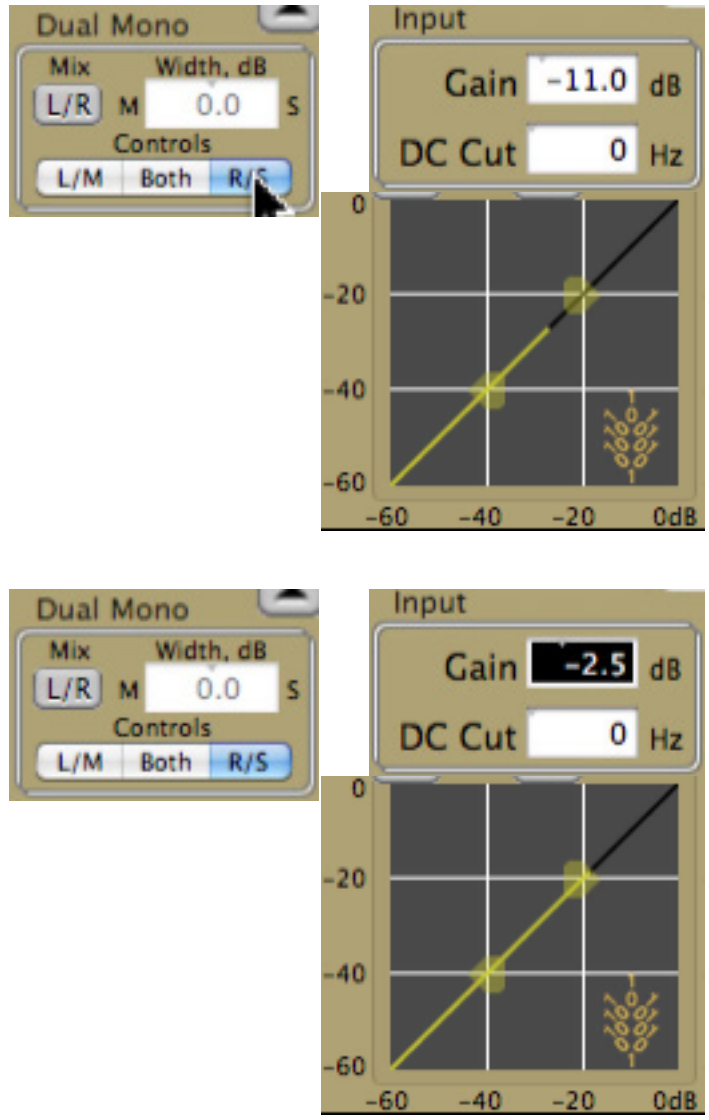




DynPEQ Audio Processing



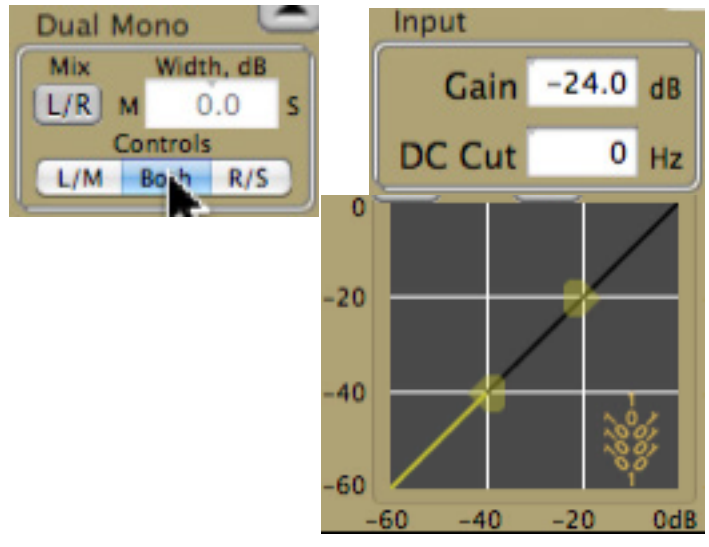
Dual Mono Processing (*Quartet AU only*), continued

Now click on the 'R/S' segment and note that the input gain parameter display now reflects the adjusted value when in both mode. When in R/S mode, the parameters and indicators are mapped to the right or stereo channel only.

Changing the input gain parameter in R/S mode applies the change only to the right channel.

The both mode is special in its display. The dual mono plugin has double the operational parameters of the regular plugin, but the control values and the processing state for only one channel can occupy the UI. In both mode, the values in the parameter controls and indicators are those of the left or mono channel, but manipulating any parameter control in the view affects that parameter for both channels simultaneously.

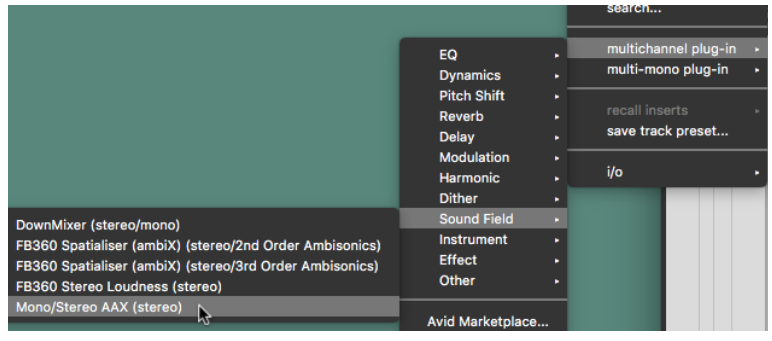
Clicking the 'Both' segment will show the left channel input gain, and the input level reported in the coarse dynamics display will be that of the left channel.



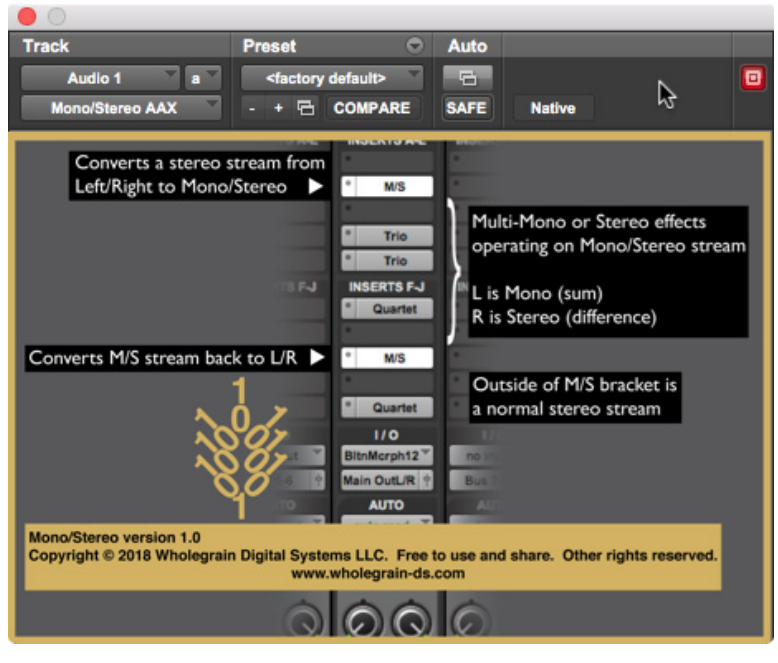
DynPEQ Audio Processing

Mono/Stereo Processing (*Pro Tools only*)

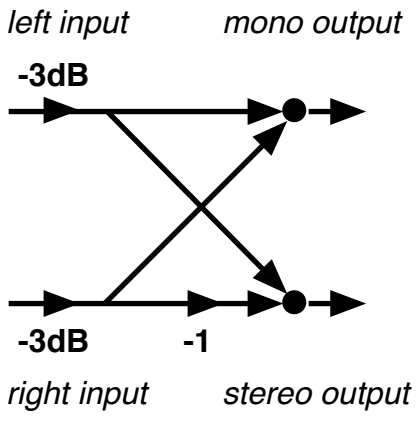
A stereo track in Pro Tools can take the advantage of running DynPEQ and other non-linear signal processors in multi-mono. This lessens the need for a dual-mono version of Quartet, as Pro Tools can easily be configured for independent left/right processing, but it leaves mono/stereo processing without a solution. The DynPEQ distribution package for Pro Tools includes a stereo plugin that performs the mono/stereo conversion, both forward and inverse. The AAX/HDX plugin is called Mono/Stereo, and it can be found in the Sound Field category.

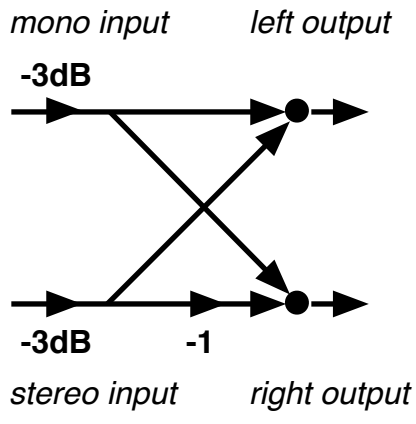


The Mono/Stereo plugin does not have any parameters, nor will it work with track formats other than stereo. Instead of a parameter display, the plugin's user interface shows how it is used in the Pro Tools insert chain. The Mono/Stereo plugin should be used twice in the chain. The initial instance of Mono/Stereo converts the left/right format of the stereo track to mono/stereo, or sum/difference. Down the plugin chain, the second instance of Mono/Stereo converts the track from sum/difference back to left/right. Between the two instances, any plugins instantiated will operate on mono/stereo signals. A multi-mono Quartet between the Mono/Stereo bracket will work in much the same manner as the dual-mono Audio Unit Quartet in M/S mode.

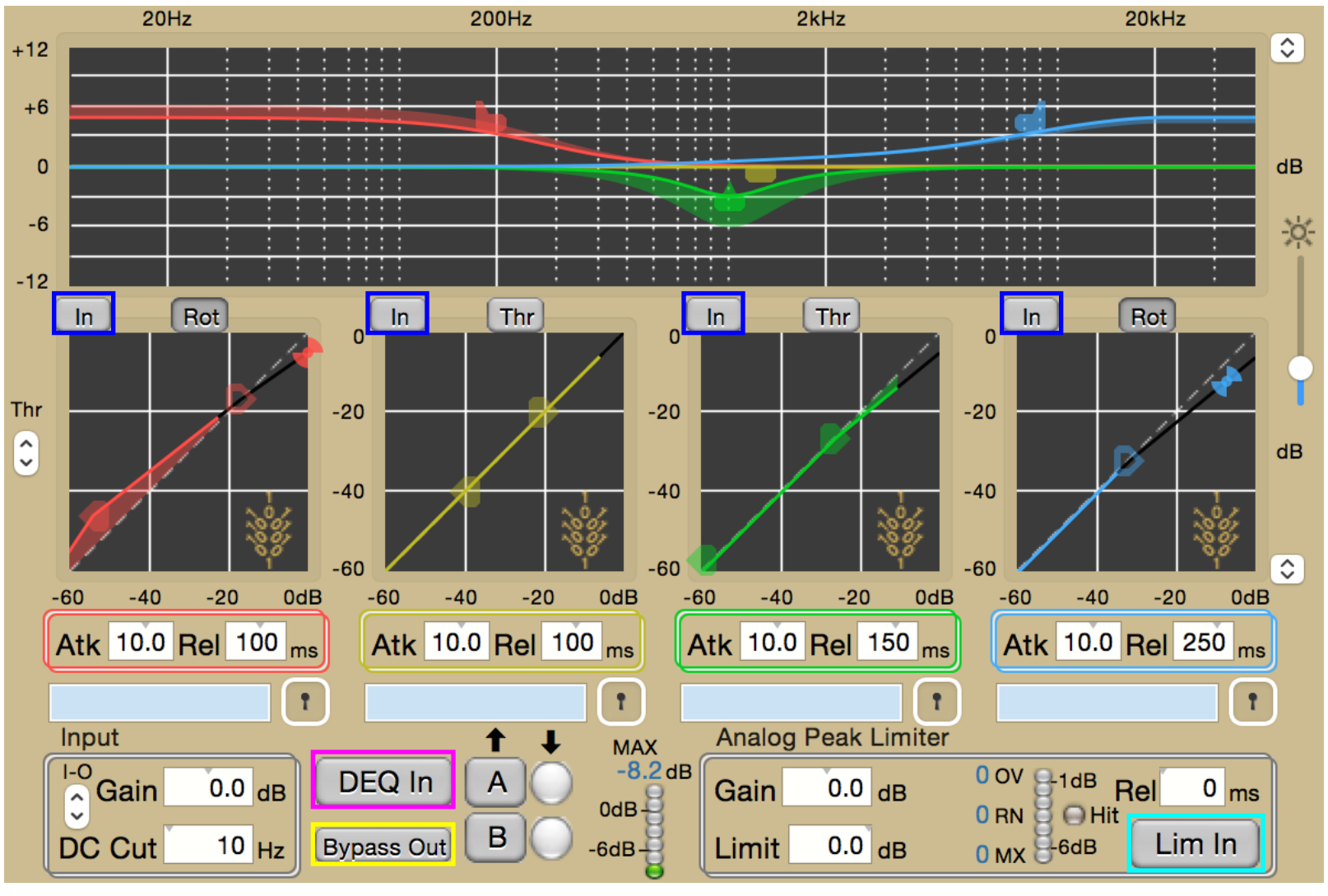


The audio processing within the Mono/Stereo plugin is straightforward. The two input channels are subject to -3 dB of gain and then summed into the first ordered channel and subtracted into the second channel. The reasons for the gain are two-fold. First, it preserves the energy levels of the two channels. Second, it allows for the single plugin operation to do both conversions and have the result have no overall gain relative to the initial input.





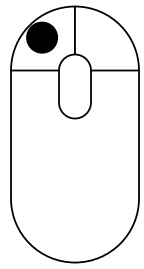
Audition Controls

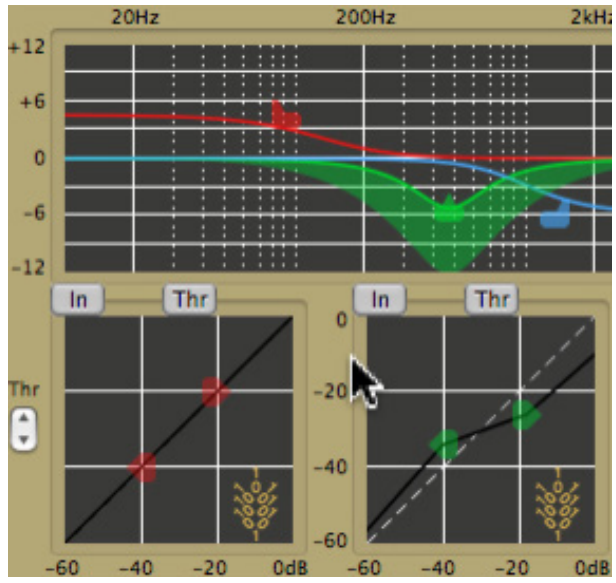


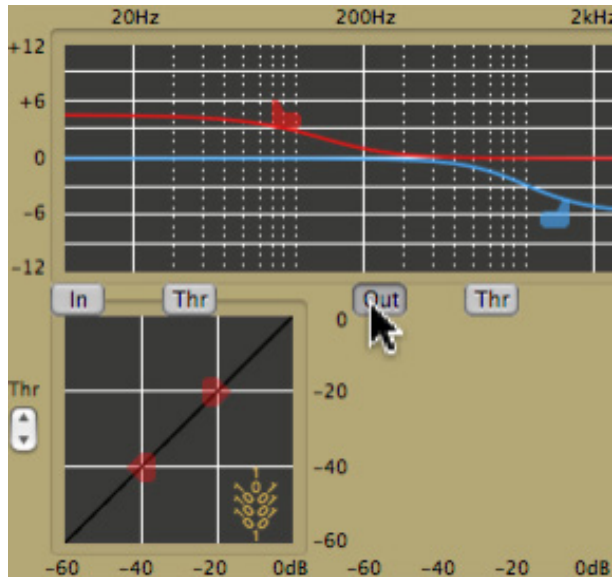
Audition Controls

Band In/Out

The bands of a DynPEQ plugin can be individually included or excluded in the processing chain. The band in/out buttons on top of the coarse dynamics display are tied to tuning parameters for band activation. Click on the button to change the active state of a band.







Band Solo

Holding down the shift key while clicking a band in/out button enables a special state called band solo. The button turning red indicates band solo mode is active. In band solo mode, only the bands with red solo buttons are active.

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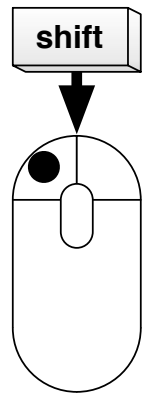
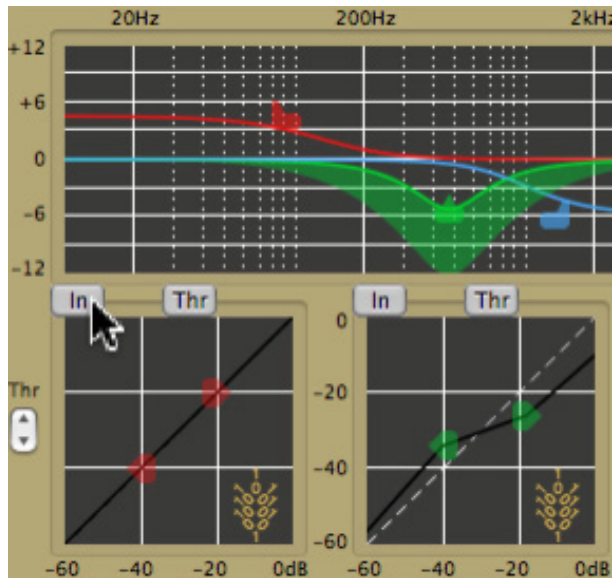
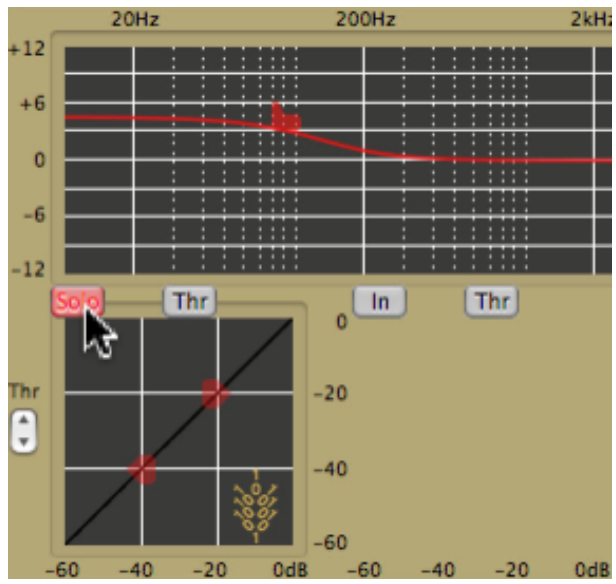
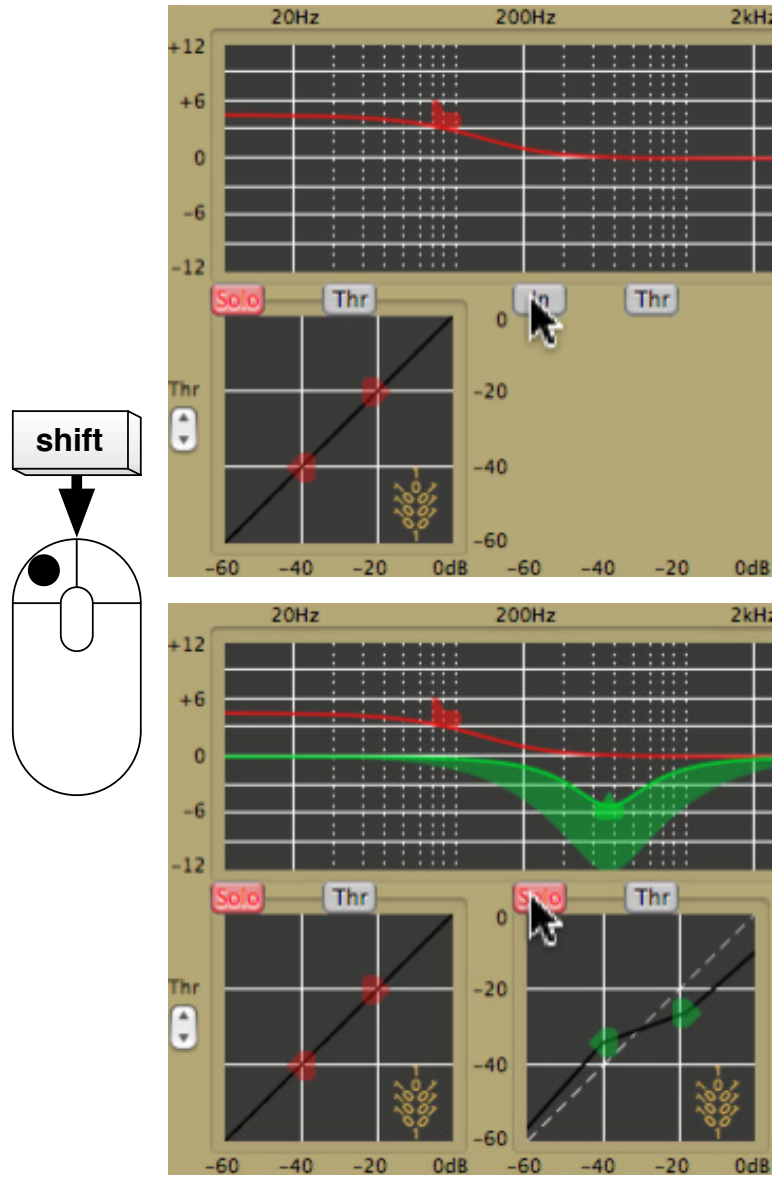






Audition Controls



Band Solo, continued

Further shift-clicks of band in/out buttons will switch bands in and out of the solo set.

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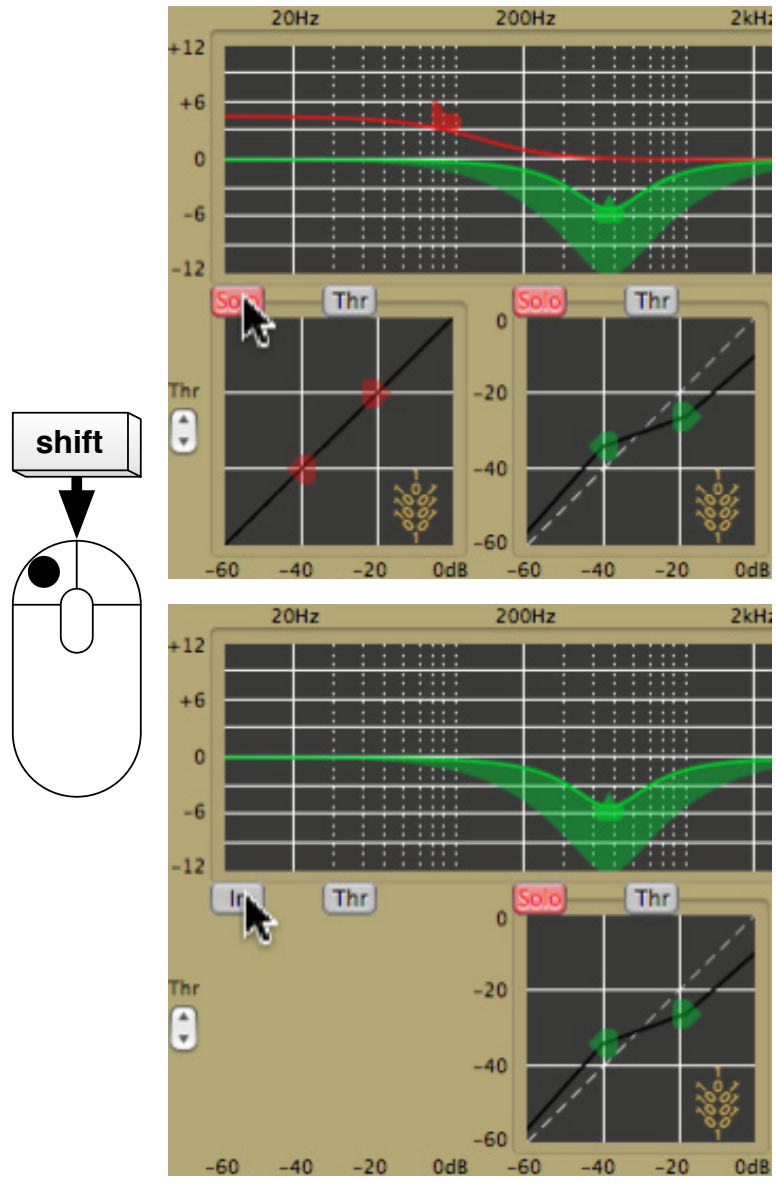
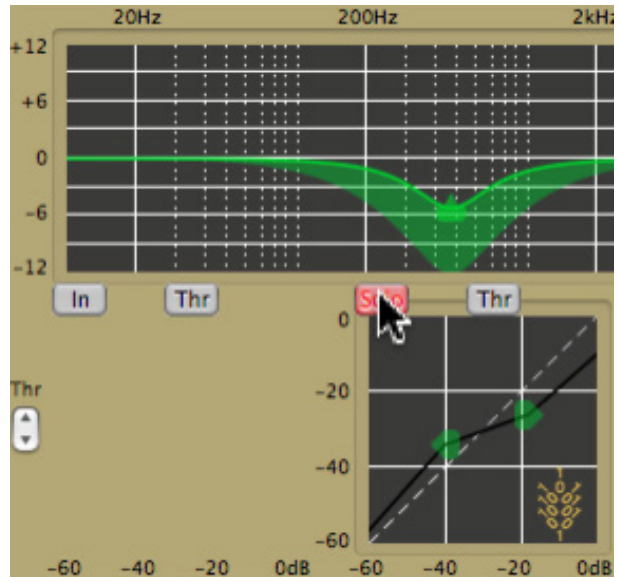
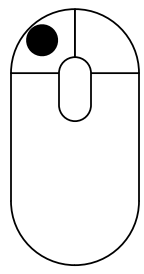
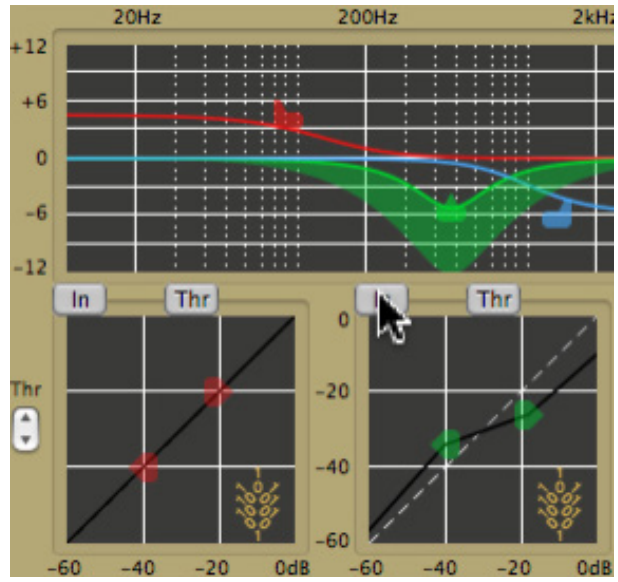


Audition Controls







Band Solo, continued

To end band solo mode, perform a regular click on any red solo button. The band solo mode is not a recognized plugin parameter per se. It is for administrative and not operational purposes.

Audition Controls

Sidechain Search

Holding down the alt key while clicking a band in/out button enables a special state called sidechain search. The button turning blue indicates sidechain search is active. The coarse tuning beads withdraw from their display, and the display's scaling changes. Since the coarse tuning disappears, the fine tuning control segment will open automatically if it is closed on entering sidechain search.

Sidechain search discards DynPEQ audio processing and replaces it with the pre-filtered sidechain signal for all active search bands. This allows for monitoring the focus of the band filtering, leading to more accurate band tuning.

The coarse tuning display shows the frequency response of the pre-filter modulated by the current band level measurement. Note that the Y-axis location of the peak in the sidechain search display matches the X-axis location of the corresponding coarse dynamics level feedback. Above the band peak is a number representing the running maximum level encountered in the band.

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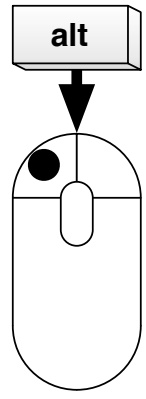
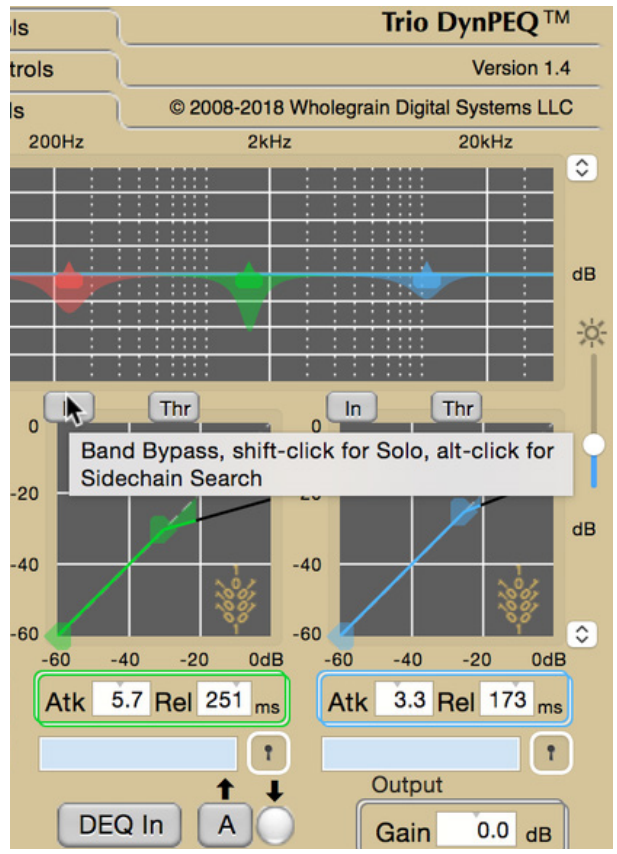
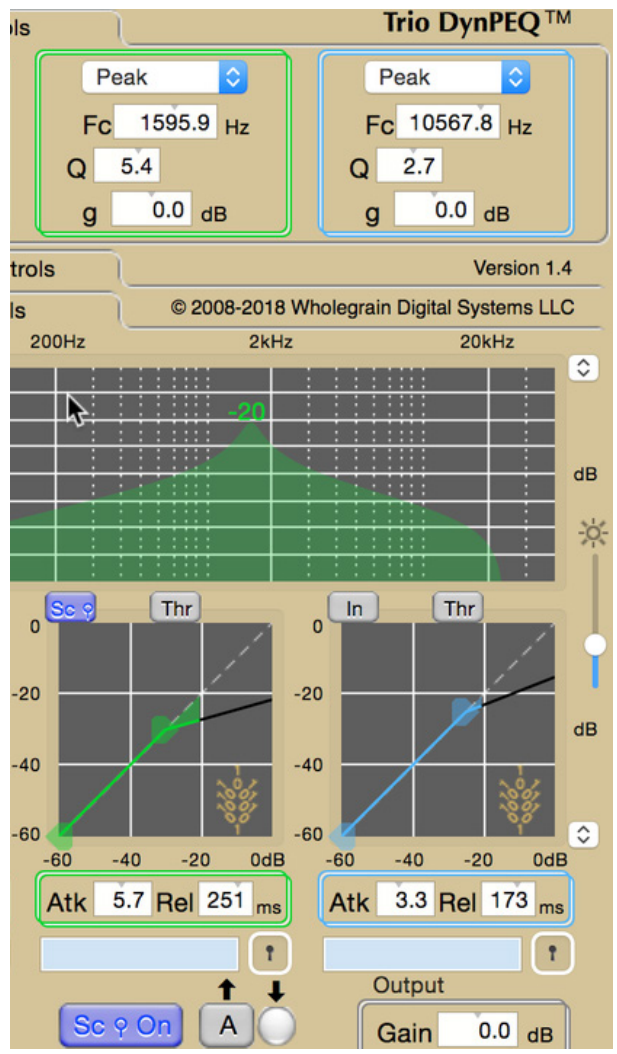




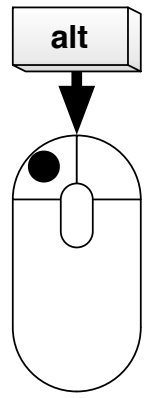


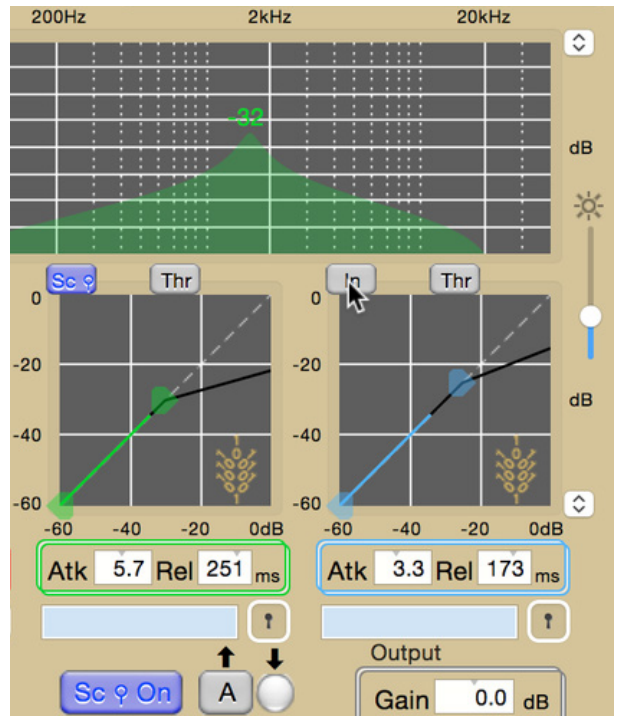
Audition Controls

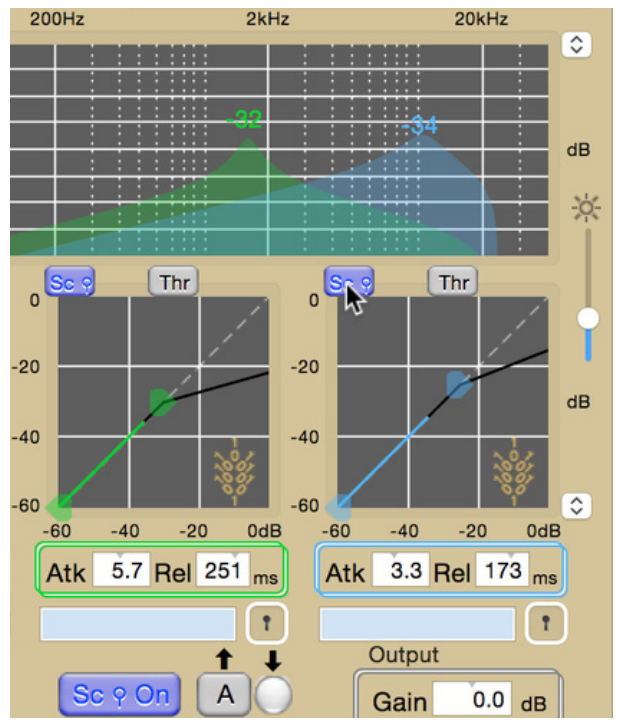
Sidechain Search, continued

As with band solo mode, bands can be toggled in to and out of the sidechain mix by alt-clicking on the band's in/out button. Note that the pre-filtered sidechain from each band is added in to the search output, so it is possible to have phase interactions between the pre-filters. It is reccommended to evaluate in sidechain search one band at a time.

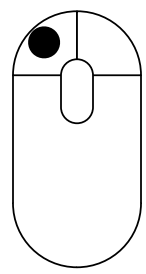
Note that it is possible to be in sidechain search with all bands toggled out of the mix. The DEQ in/out button will still be blue, indicating that sidechain search is still active. Sidechain search with no bands active will yield silence regardless of audio input.

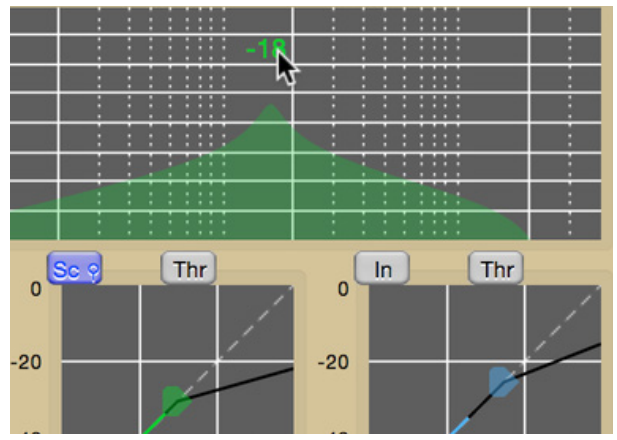


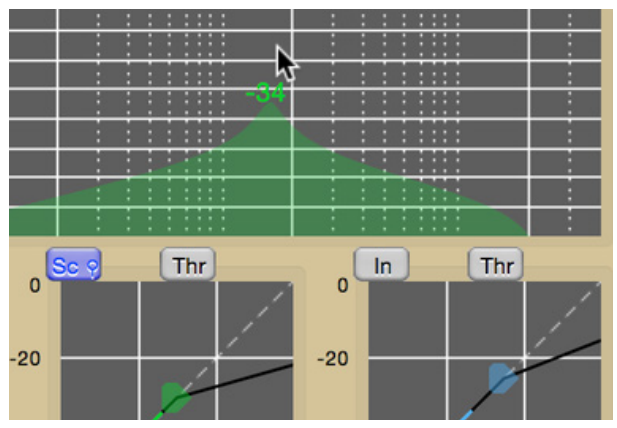




The running maximum level number for a band can be reset by clicking on the number. If the band is not currently in the sidechain search mix, the number will disappear after clicking on it.







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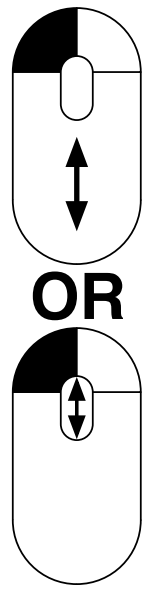
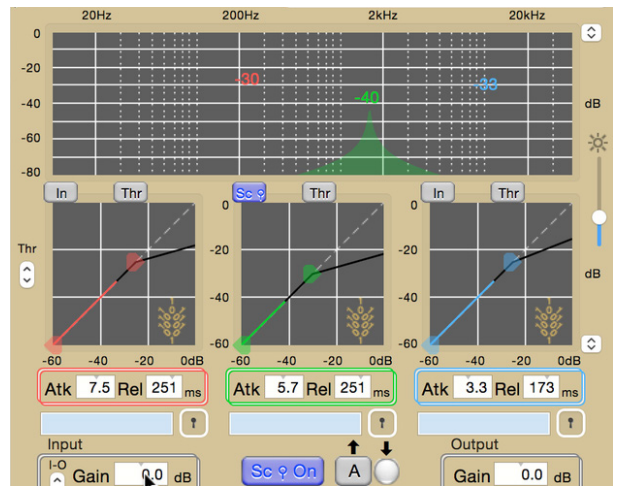
Audition Controls

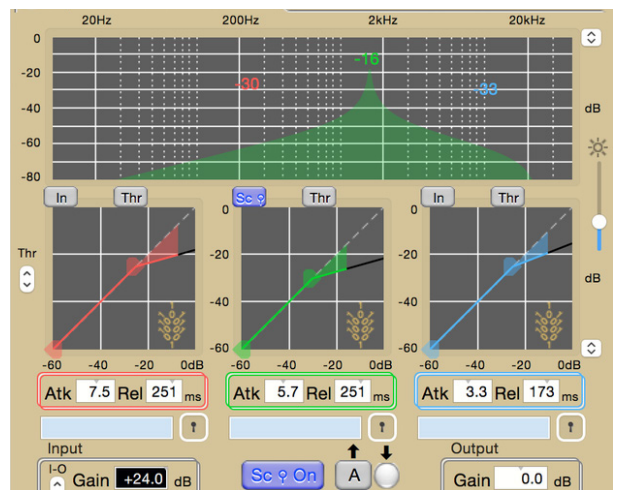
Sidechain Search, continued

Since sidechain search replaces normal output, it may become difficult to hear the pre-filtered sidechain. If this happens, increase the input gain to the plugin. Note that output processing is bypassed in sidechain search, so adjusting the output gain will have no effect. On adjusting the input gain, keep in mind the corresponding band levels on the display will adjust accordingly.

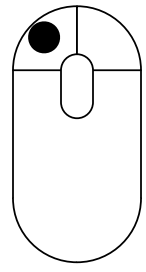


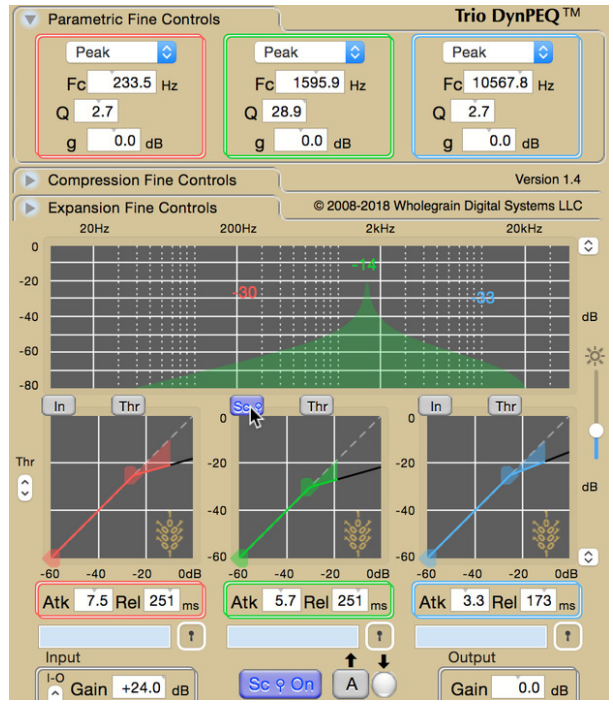
OR

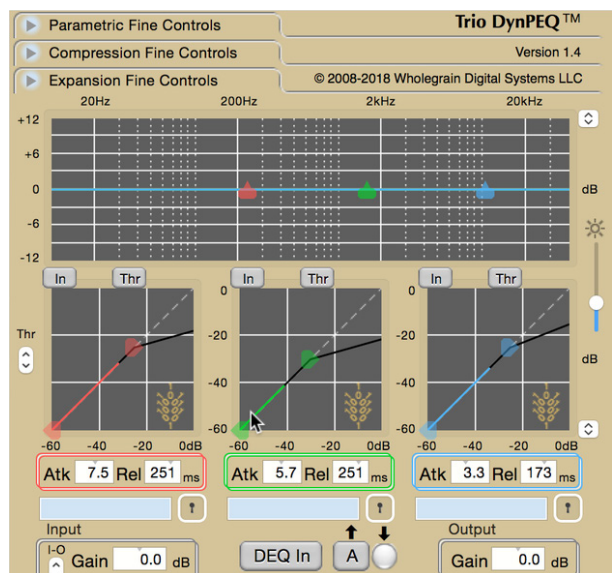




To exit sidechain search and return to regular DynPEQ processing, perform a regular click on any blue button. On leaving sidechain search, the fine tuning segment will close if that segment was closed on entry. Also, the input gain will reset to its value on entry. If a large input gain transition is made, there may be a moderate pop sound. This cannot be avoided.



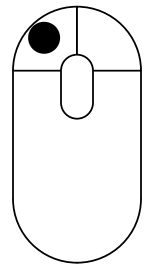


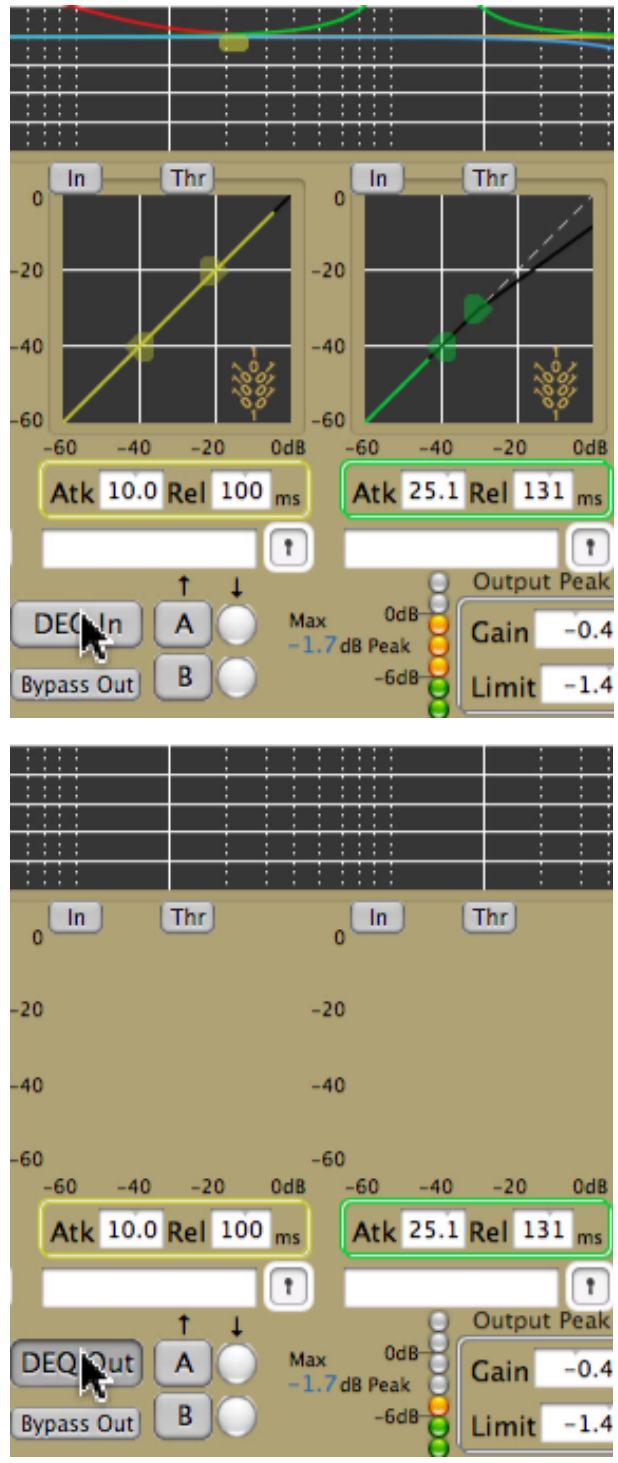


Audition Controls

DEQ In/Out

The DEQ in/out button bypasses the processing of all bands in the plugin. Click on the button to change the state. Note that 'DEQ In' will not override the in/out states of individual bands. Also note that this button is for administrative use and is not a plugin parameter.





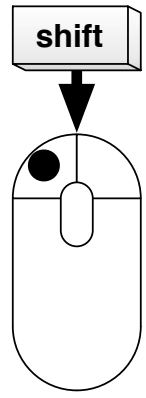
Audition Controls

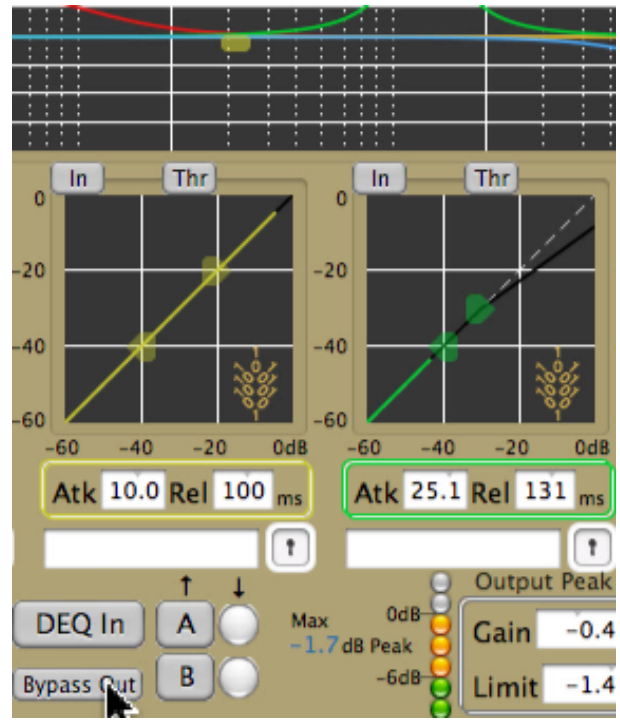
Global Bypass

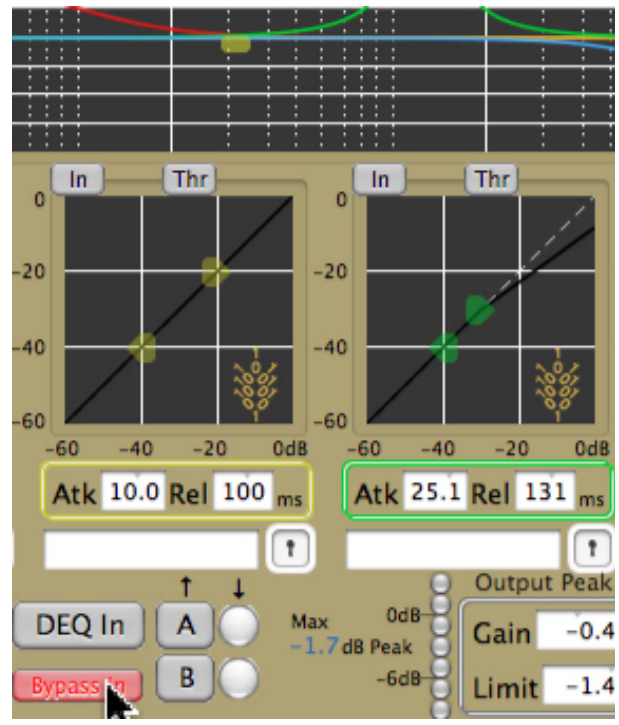
The bypass in/out button, or global bypass, operates in conjunction with the workstation's plugin bypass controls. While DynPEQ conforms to plugin interface specifications, the completeness of workstation synchronization depends on the workstation software.

Global bypass controls the active state of all signal processing in the plugin: input, output, and all DynPEQ bands. To activate global bypass from the parameter view, shift-click the 'Bypass Out' button. While global bypass is active, the button will read 'Bypass In' and will turn red. To exit bypass, perform a regular click on the global bypass button.

While in bypass mode, there are a few workstation hosts that will functionally bypass the signal processing of plugins. While this will not make an audible difference, the runtime measurements that DynPEQ records will not be made. If the workstation stops plugin processing in bypass mode, the levels in the coarse dynamics displays, and the peak and limiter levels in the case of Quartet, will stop, as is depicted here.

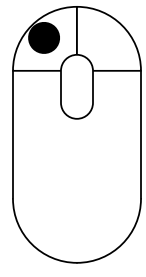


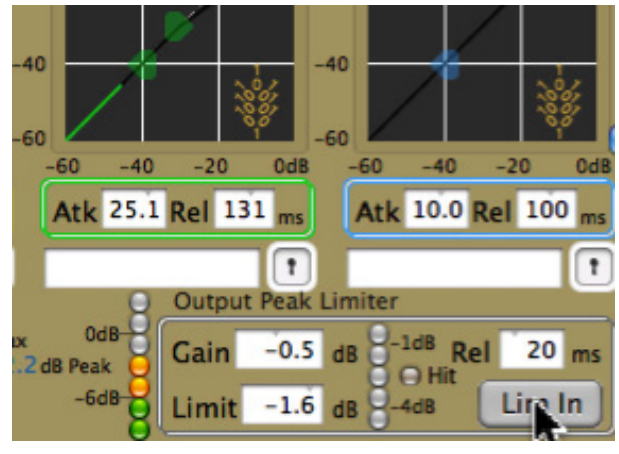


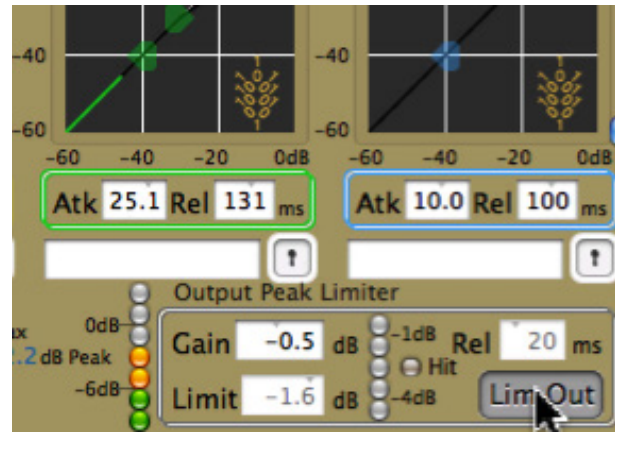


Lim In/Out (*Quartet only*)

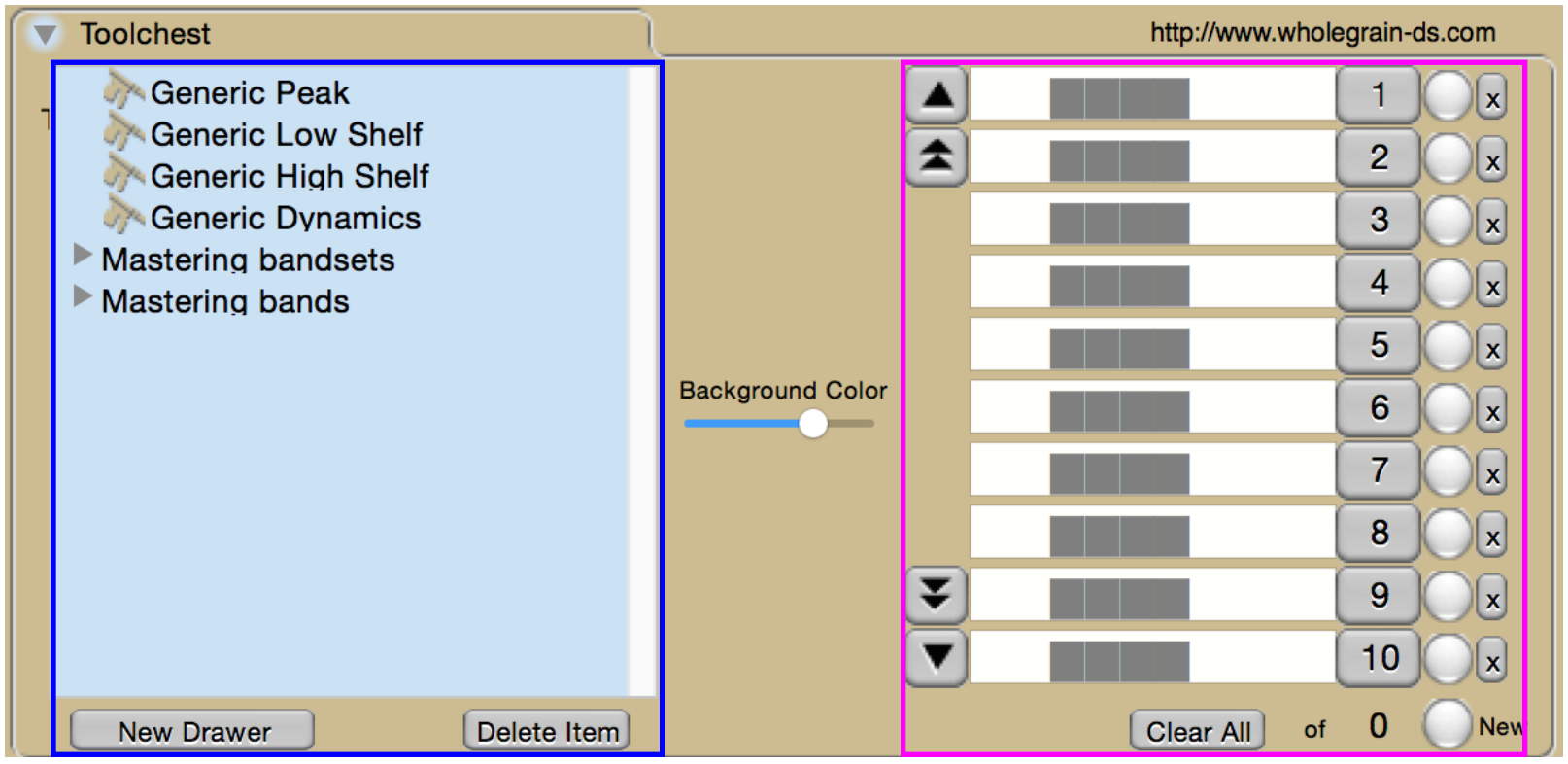
The lim in/out button activates and bypasses the Quartet peak limiter while retaining output gain. Click the button to change the limiter active state. When the limiter is bypassed, the limit level and limit release controls will be inactive. The lim in/out button is another administrative parameter, in that it is not registered as a plugin parameter with the workstation.







Library Controls

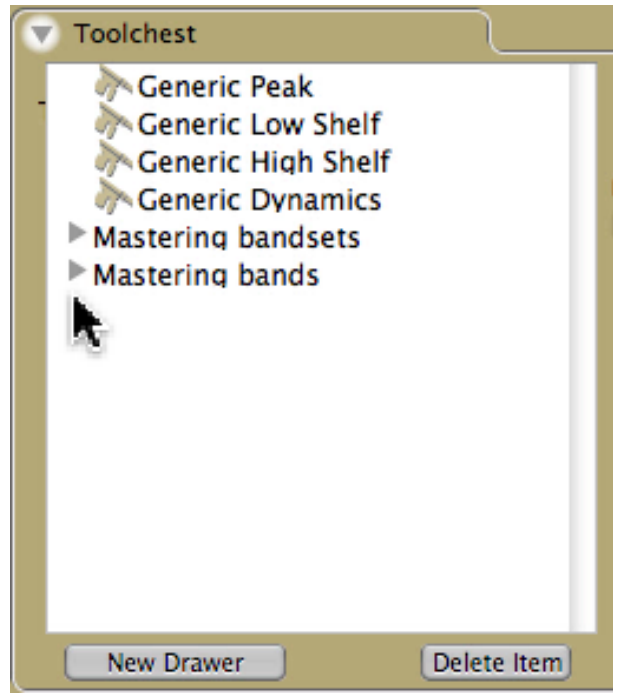


Library Controls

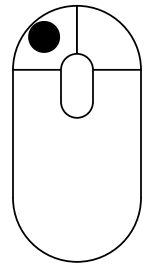
Band Toolchest

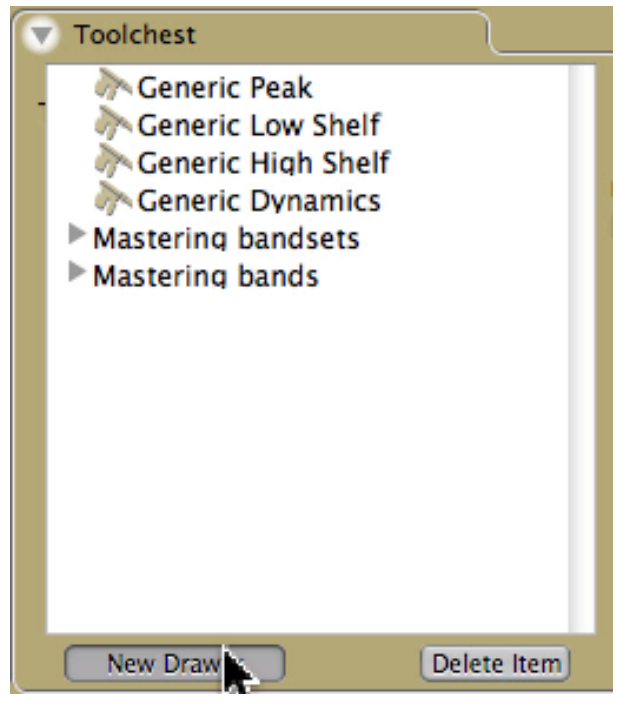
The band toolchest is the leftmost section of the toolchest window segment. It represents a storage location for preset parameters of DynPEQ bands or bandsets. Within the toolchest, a line headed by a key icon indicates a band setting. These items can be dragged to and from the band wells in the parameter window.

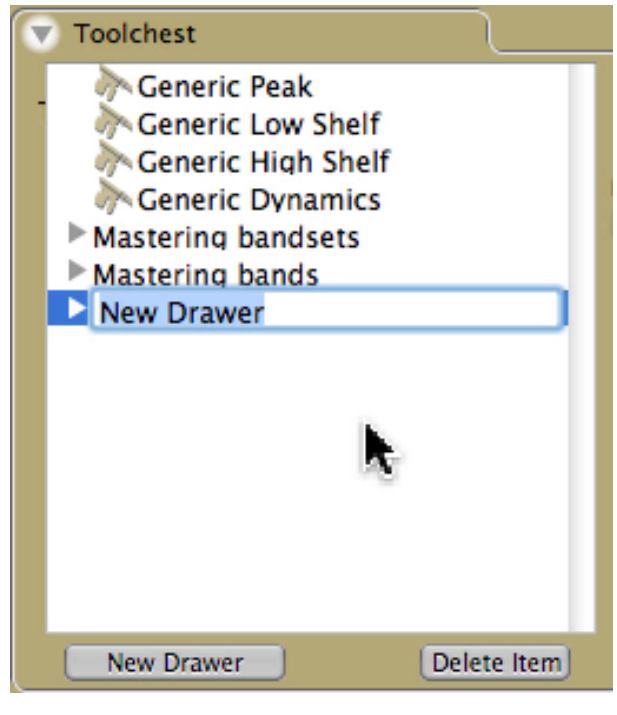
Items of band settings can be grouped into a drawer, which is headed by a triangle icon for opening and closing. A drawer is similar to a folder in the computer operating system, for it is a container for band items and other drawers.



To create a new drawer, click the 'New Drawer' button located below the toolchest display. The new drawer will appear on the display and blue-outlined for entering its title via the keyboard.



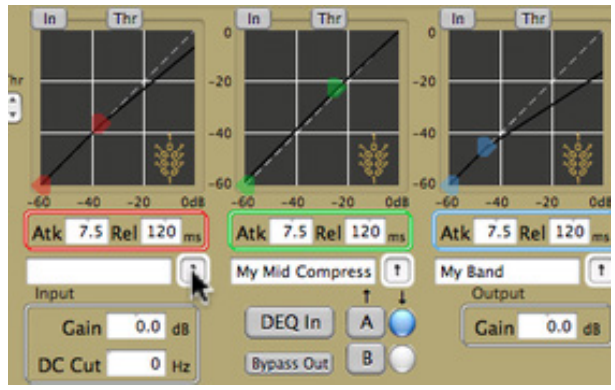


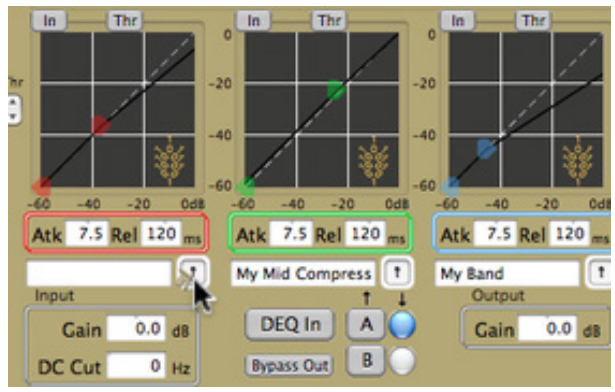


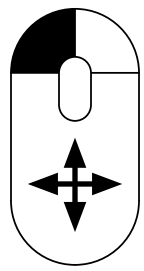
Library Controls

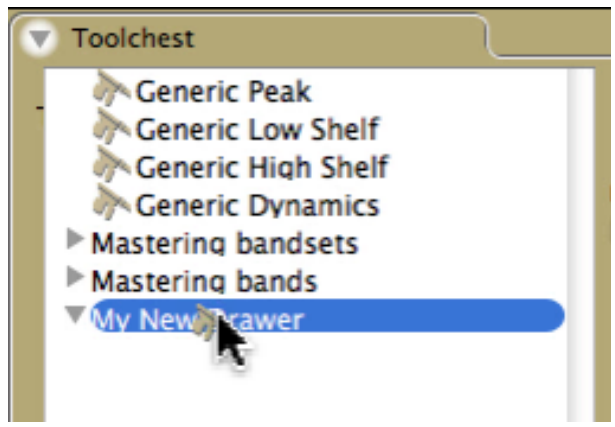
Transactions with the Band Toolchest

To save the settings of one band into the band toolchest, start by clicking on the band well of the band of interest and holding down the left mouse button. The single copper key icon should appear next to the mouse cursor.

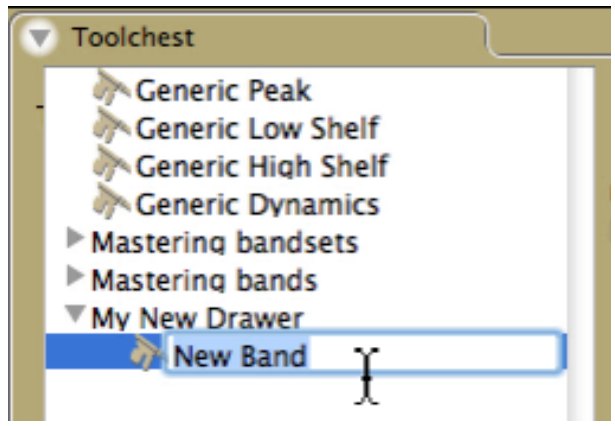








Drag the key icon to the spot in the toolchest hierarchy where the band should be inserted. Release the left mouse button upon reaching the desired destination.



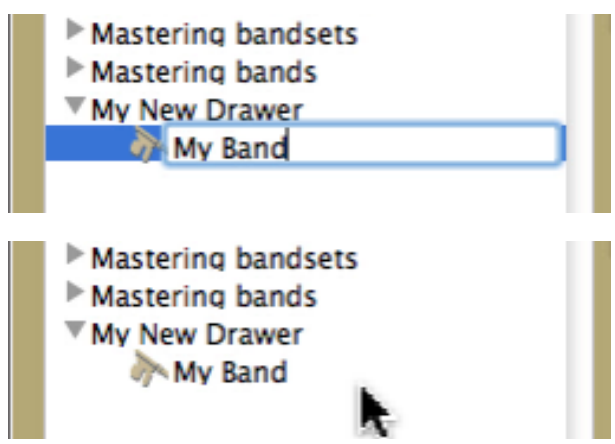
Once the new band is inserted into the band toolchest, it will be given the generic title 'New Band', and the title will be shaded blue, which is the prompt for text editing. Type in the desired label for the new band, pressing the tab key or return key when finished.

continued next page

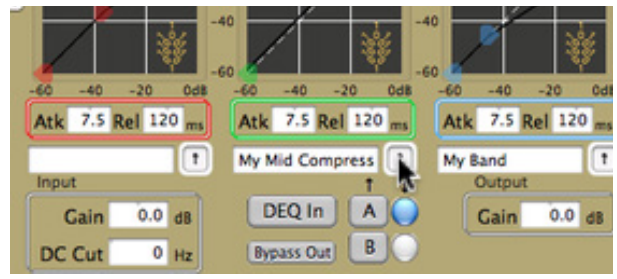
return

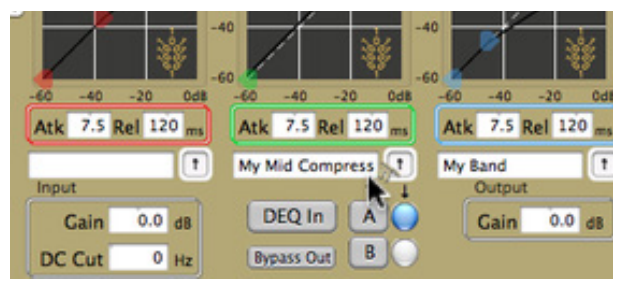
OR

tab



Library Controls

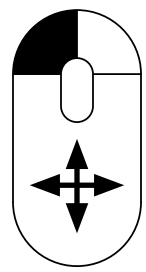


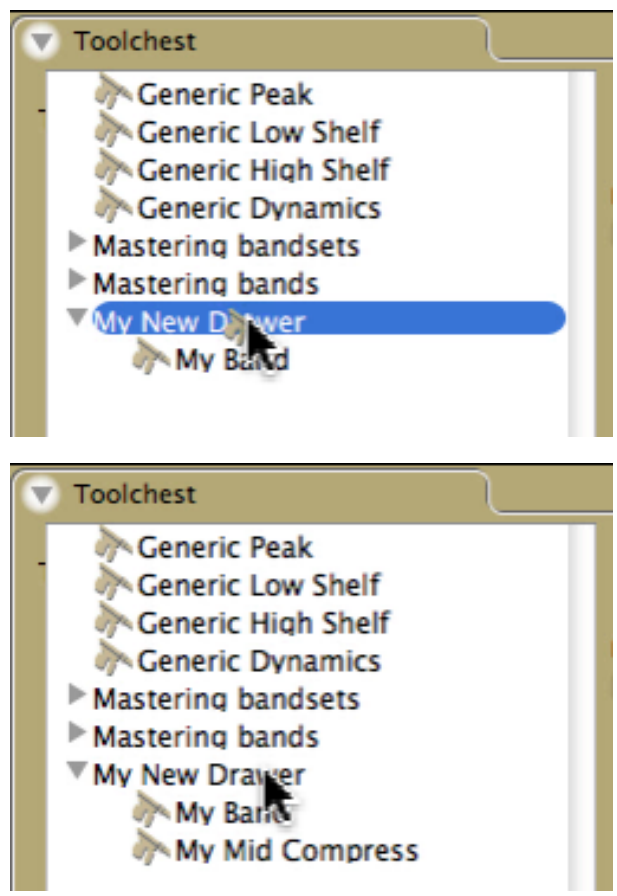


Transactions with the Band Toolchest, continued

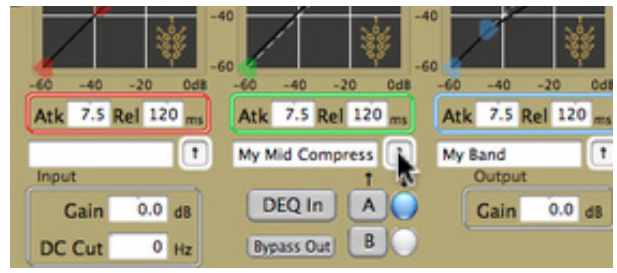
Alternatively, the band title can be defined prior to the drag-and-drop by clicking on the band title field to the left of the band well. Type in the desired title and end with pressing tab or return. The drag-and-drop to the band toolchest will retain the contents of the title field and will not be in an editable state when the band is dropped.

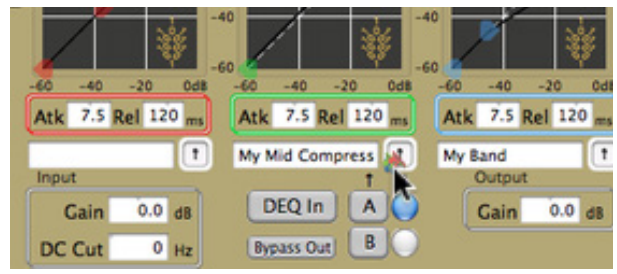
continued next page

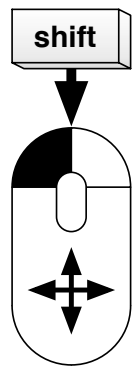


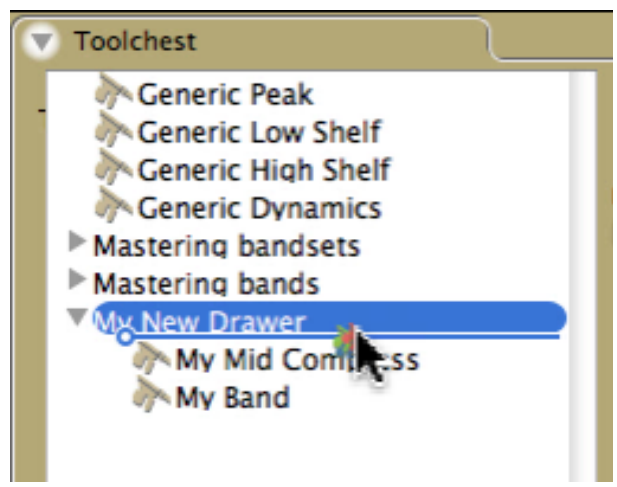


Library Controls



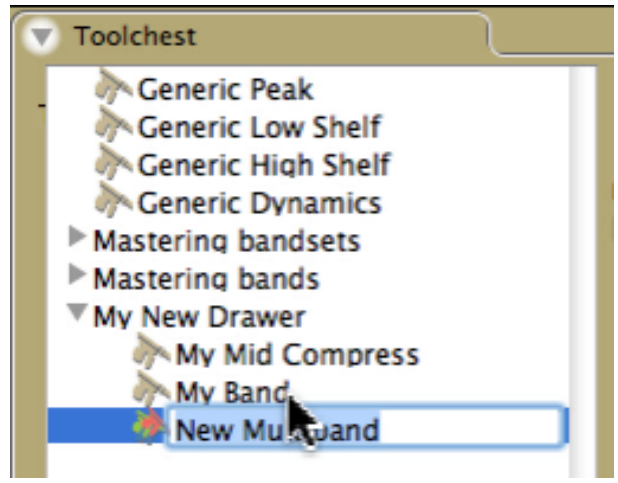






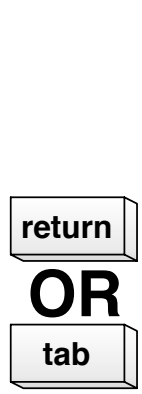
Transactions with the Band Toolchest, continued

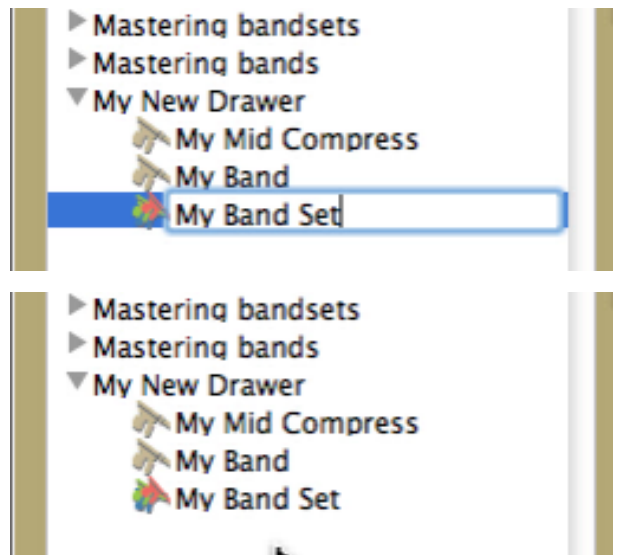
The settings of all bands can be saved into the band toolchest, which yields an icon of multi-colored keys. While holding down the shift key, implement the drag-and-drop from the band well to the toolchest as outlined above.



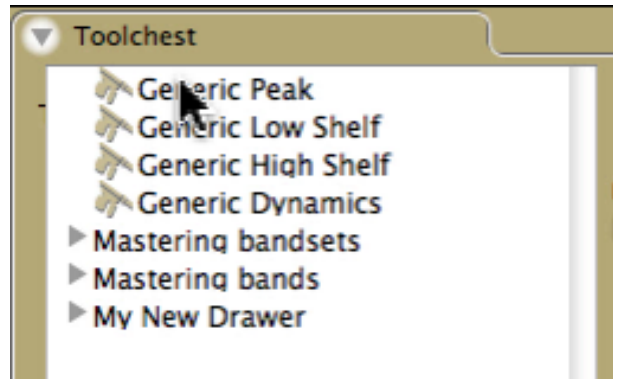
Regardless of the contents of the source band title field, the multi-band item in the toolchest will be given the title 'New Multiband' and set for immediate editing via the keyboard.

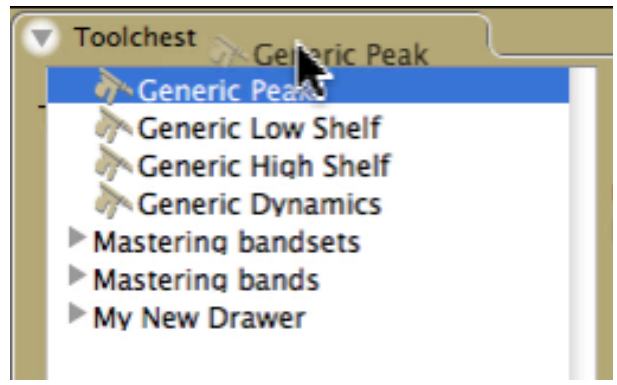
continued next page

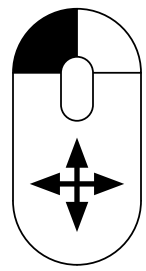


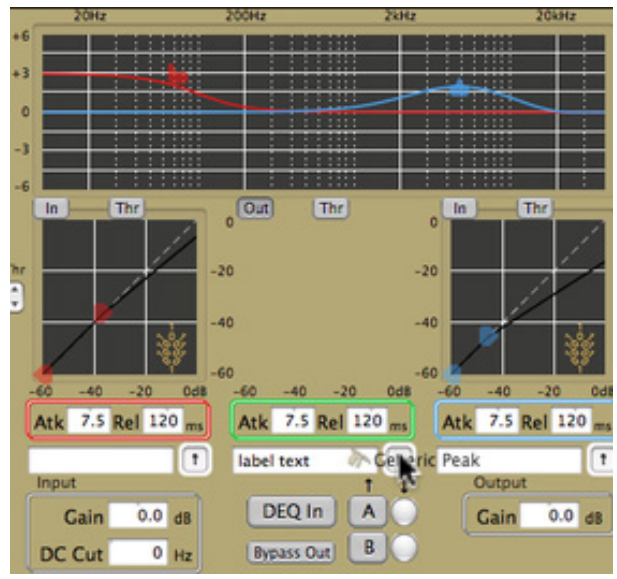


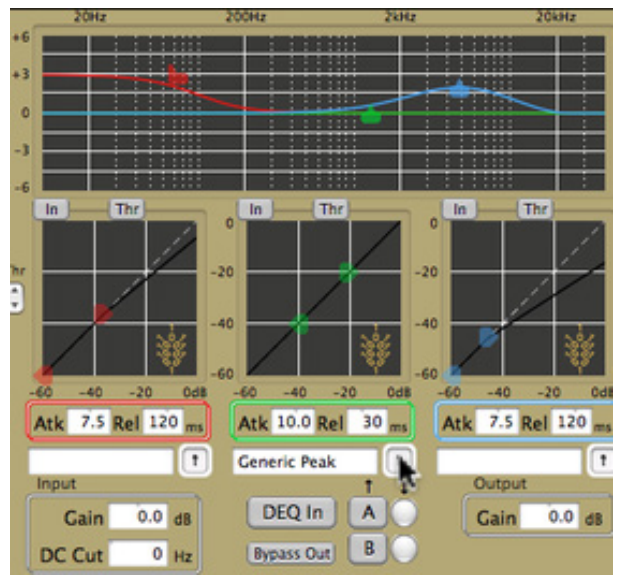
Library Controls









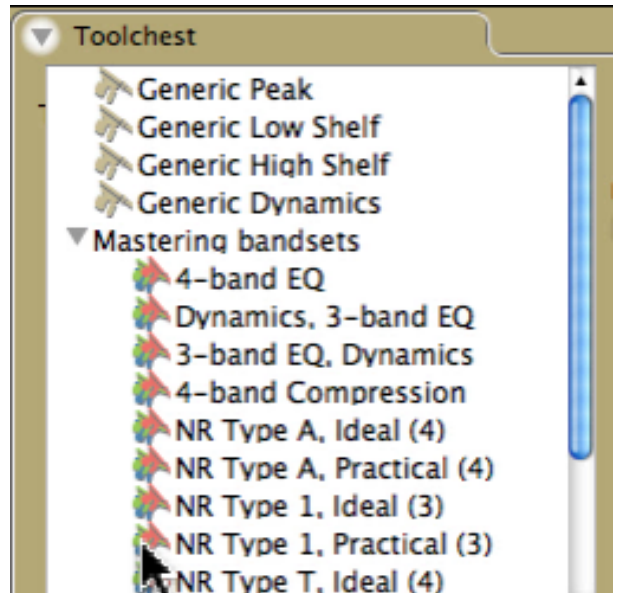


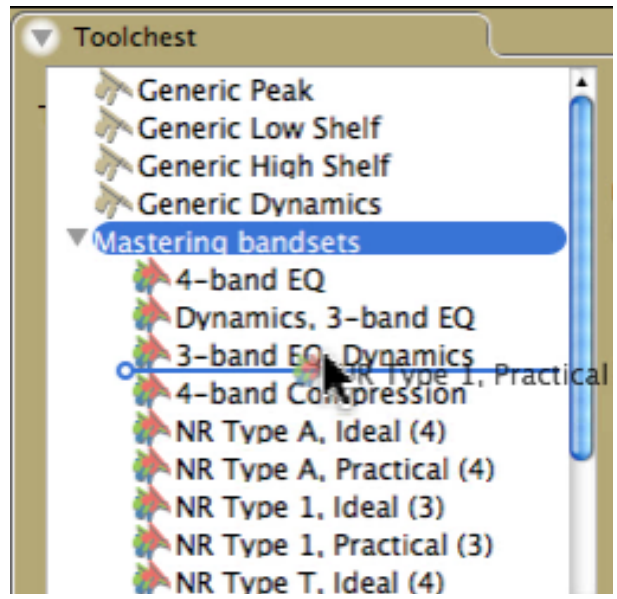
Transactions with the Band Toolchest, continued

Single-band and multi-band items in the band toolchest can easily be transferred to the operational parameters. Click on the desired item and drag it to the target band well. Note that the destination band will become active regardless of its in/out status.

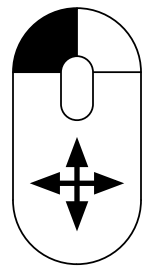
continued next page

Library Controls

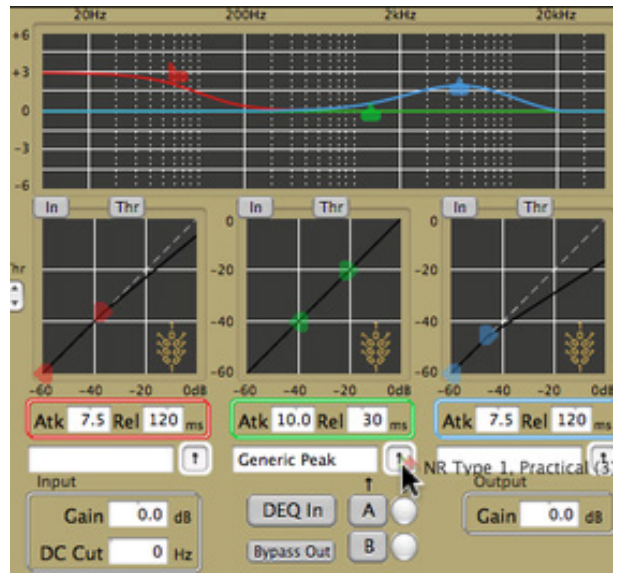


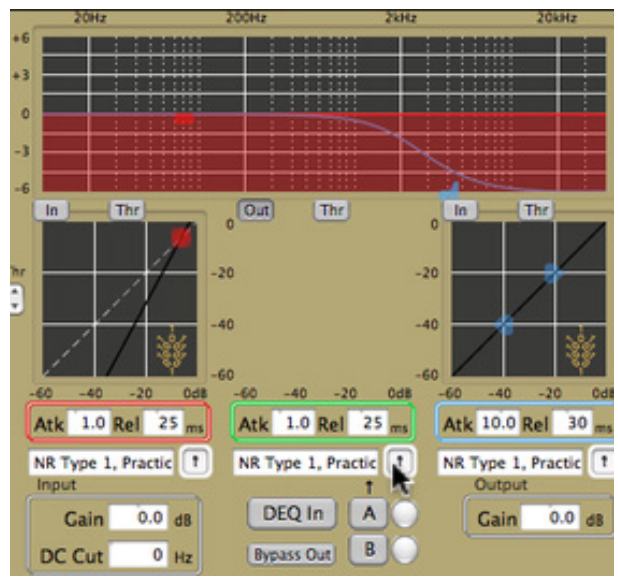


Transactions with the Band Toolchest, continued

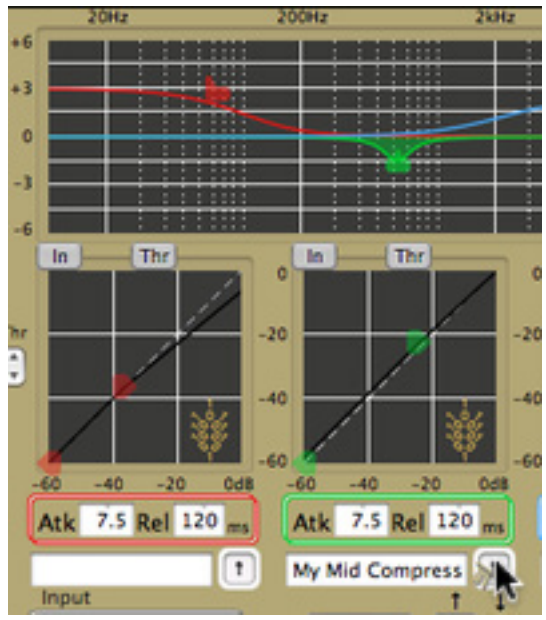


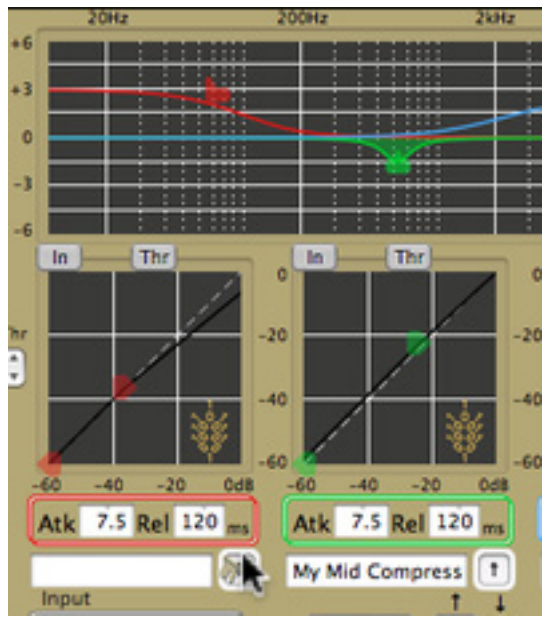
If the item to drag to the operational parameters is multi-band, the specific target band well does not matter. All of the band settings will be replaced by those of the multi-band item. Note that a multi-band item can contain inactive bands.



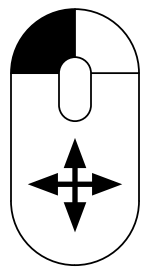


Library Controls

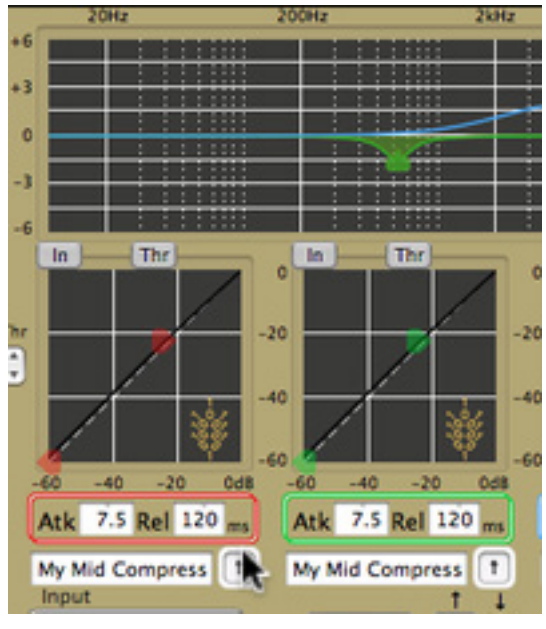




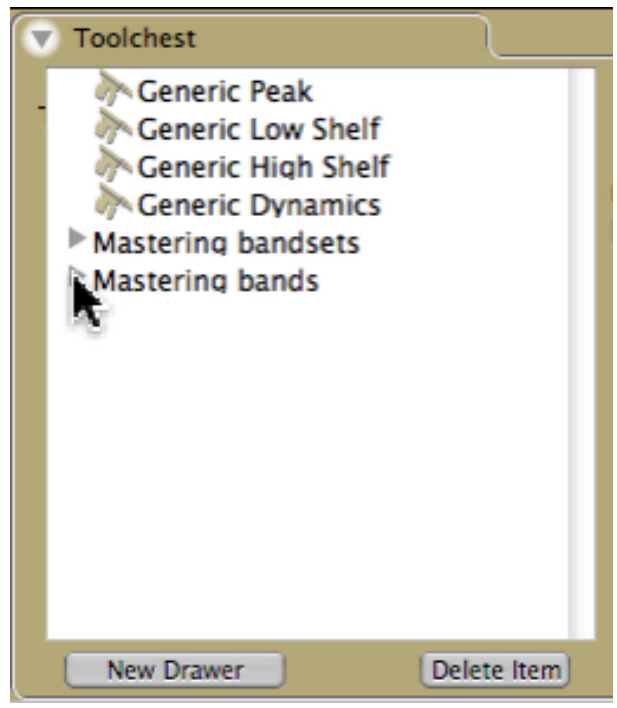
Transactions between Band Wells

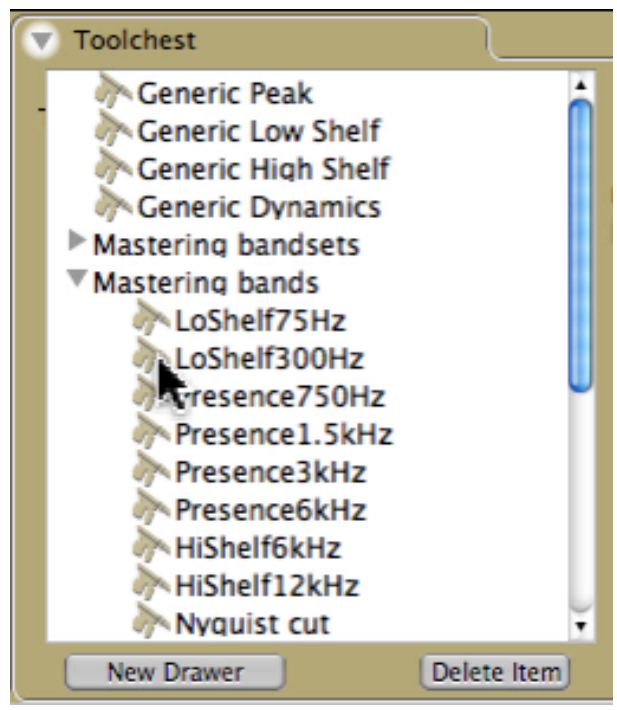


Note that since the band well can be both a source and destination of a transfer, it is also possible to copy the contents of one band to another by drag-and-drop between band wells.

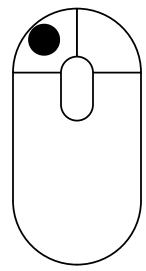


Library Controls





Maintenance of Band Toolchest

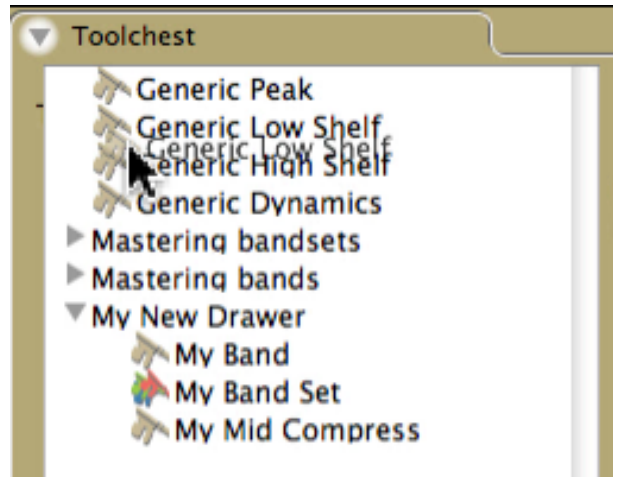


Since the band toolchest occupies a limited space, there are tools to help organize custom band items. As mentioned above, the new drawer button creates a new drawer to hold band items and other drawers.

The drawer has a triangle icon. Click on the triangle to reveal or hide the contents of the drawer. When dragging an item over a drawer, the drawer may open to allow placing the item at a specific location within.

continued next page

Library Controls



Maintenance of Band Toolchest, continued

Band items and drawers can be dragged and dropped elsewhere within the band toolchest to move their location.

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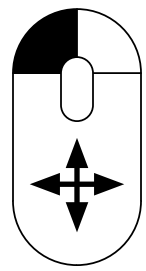
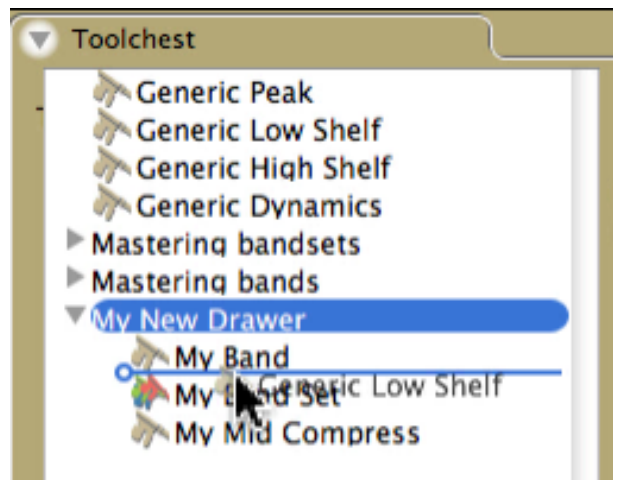
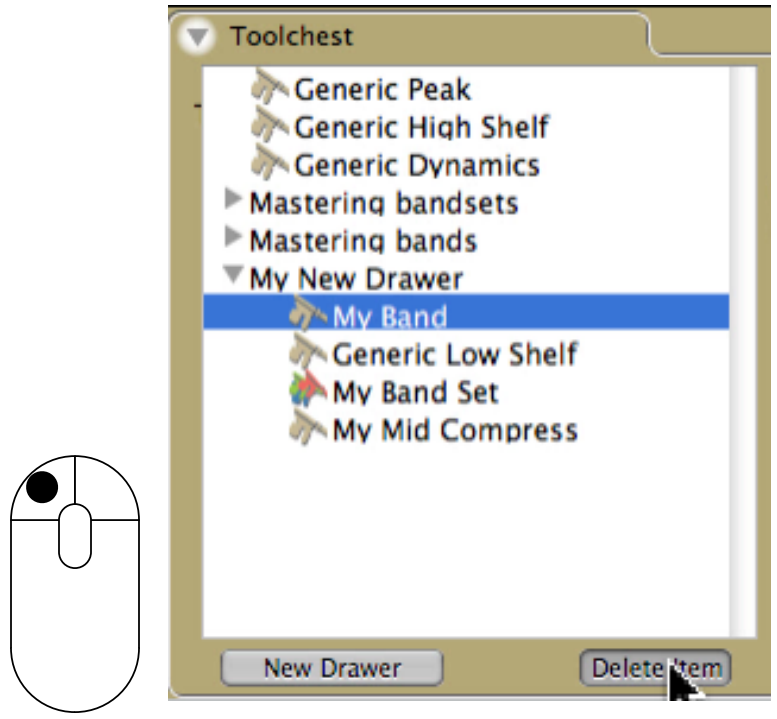


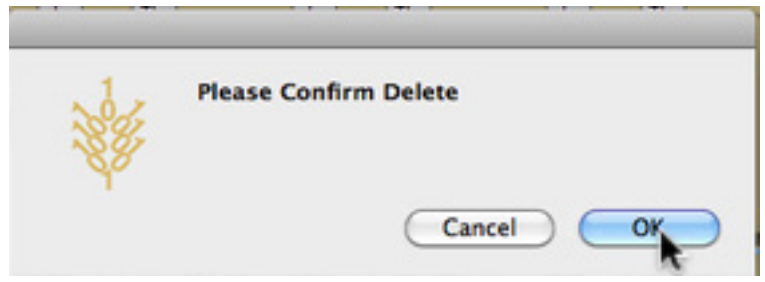


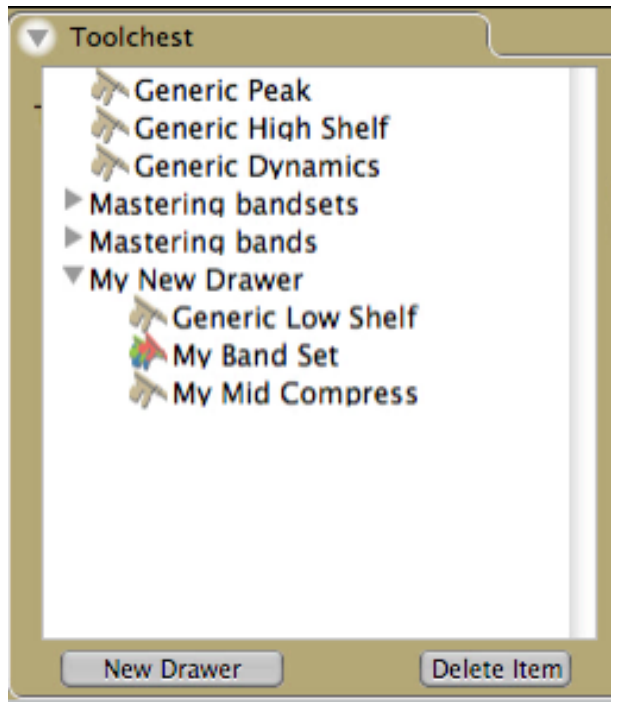
Library Controls



Maintenance of Band Toolchest, continued

If a band item or drawer is no longer needed, click on the item to select it and then click on the 'Delete Item' button. Since the delete is irreversible, a confirmation panel will appear with option buttons to complete the delete or to cancel. Click on the desired button.



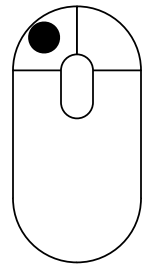


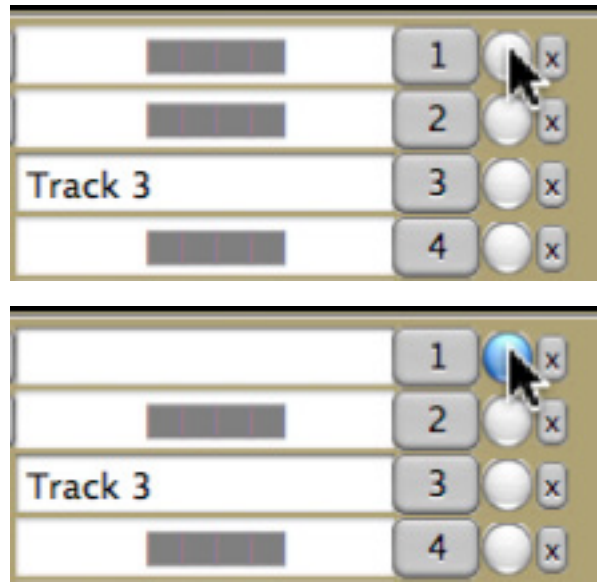
Library Controls

Patch Store (*Quartet only*)

The set of A/B registers is extended in Quartet to what is called the patch store, located at the right side of the toolchest segment. The patch store offers register space that is associated with the workstation project that is limited only by system capacity. Upon initializing Quartet, the patch store contains 127 registers filled with a neutral patch.

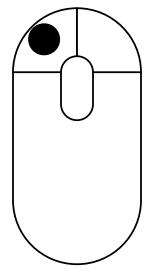
The registers in the patch store have load and save buttons that work like their A/B counterparts. The patch store save button, the round button, has slight changes in behavior. Click on a save button corresponding to a blank load button to save the current Quartet operational parameters to that register.

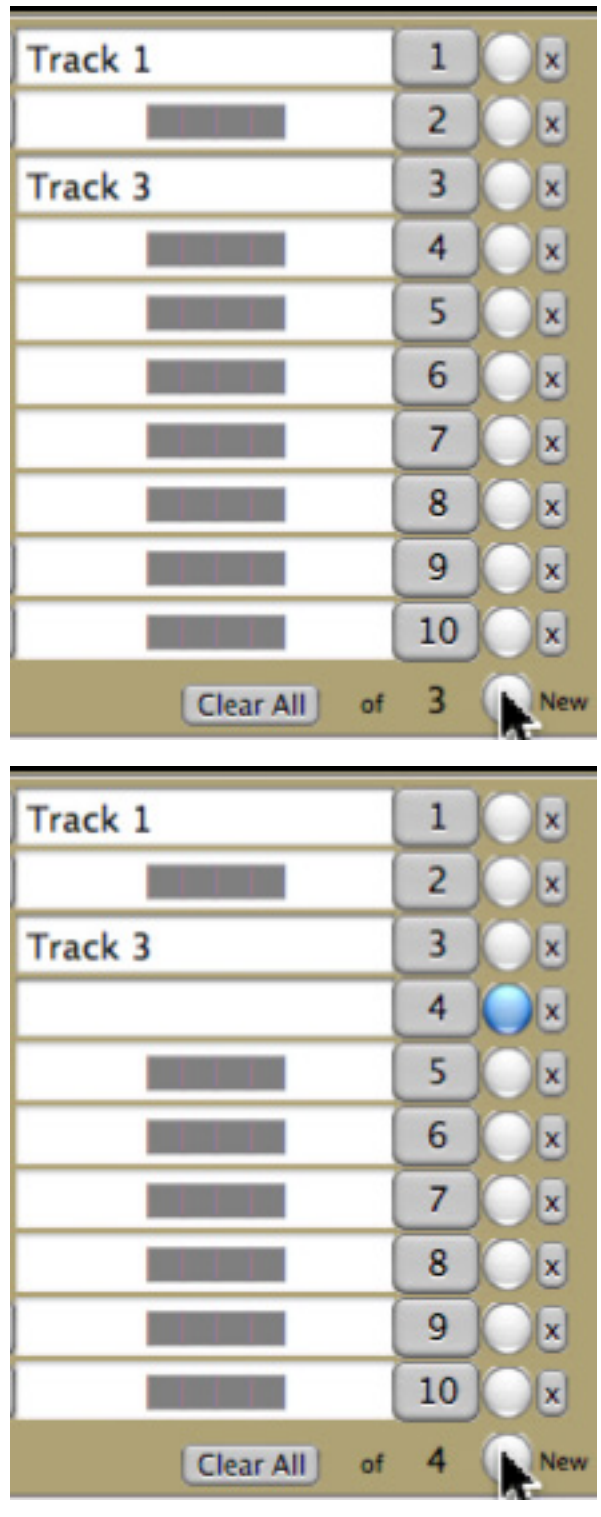




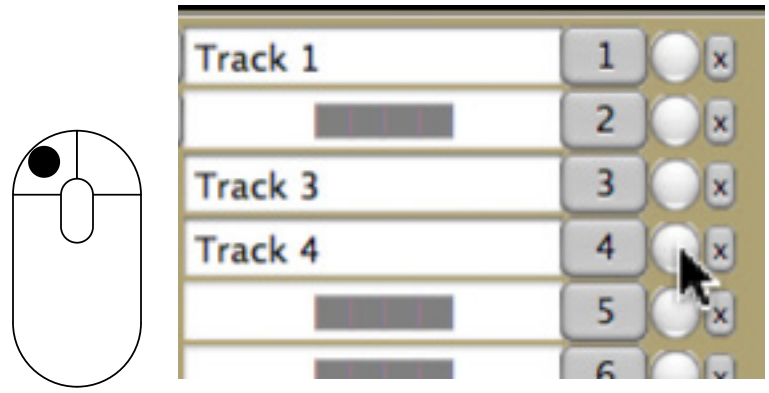
Click on the save button at the very bottom to save the current input, output peak limiter, and band parameters to the register after the last non-empty entry in the list.

continued next page



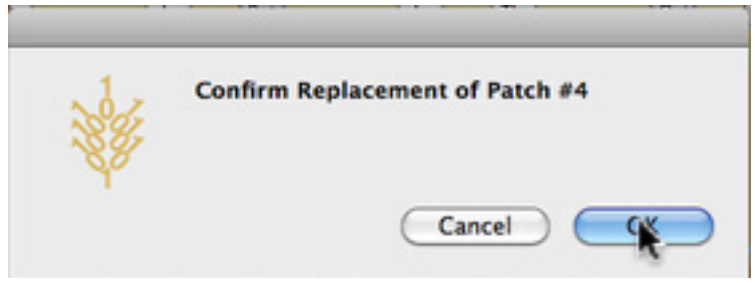


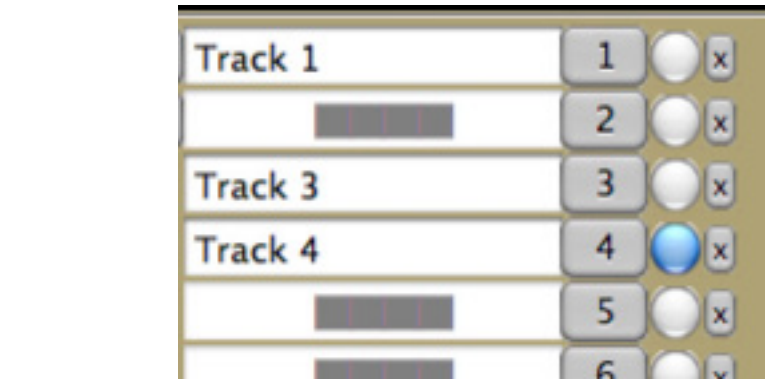
Library Controls



Patch Store (*Quartet only*), continued

If the save button clicked corresponds to an occupied register, a prompt appears to confirm that the current operational parameters should replace those in the register.





A newly saved register does not have a label attached to it. Click on the label field at the left of the register row to type in a mnemonic title for the patch. The patch titles will be saved with their respective patches in the workstation project file. The label field of the register does not change when overwriting its contents via the save button.

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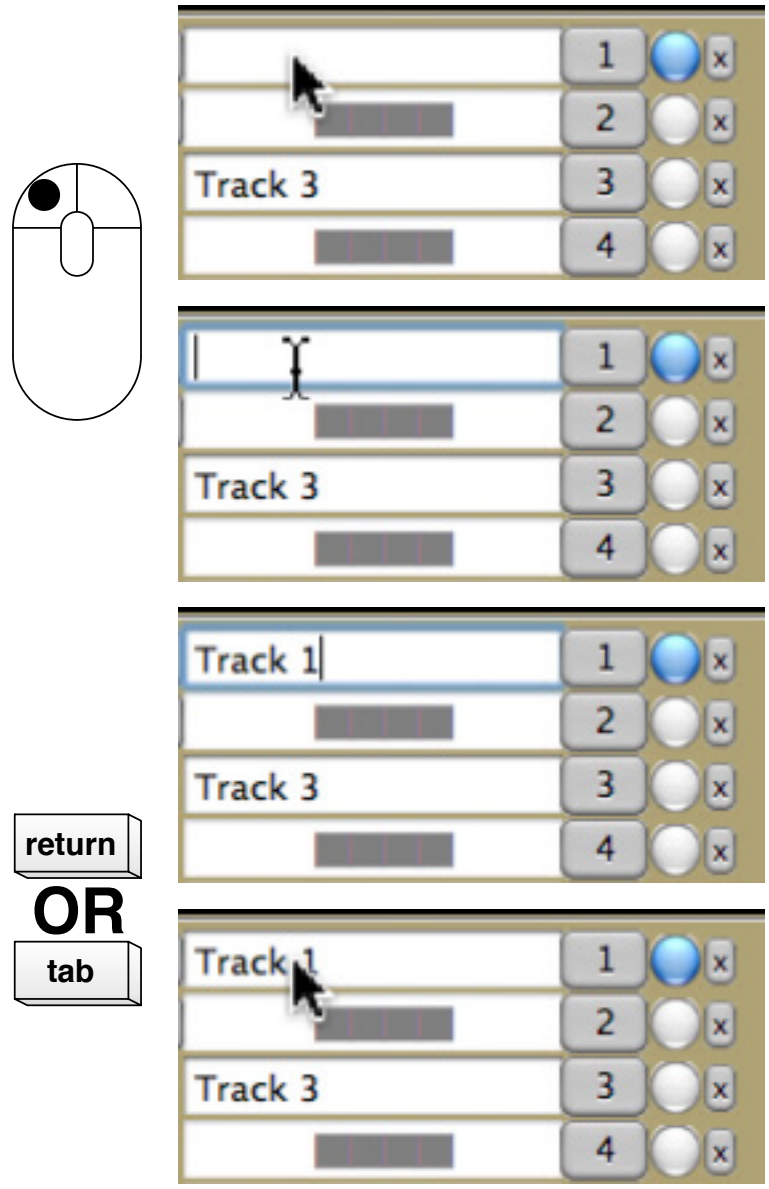
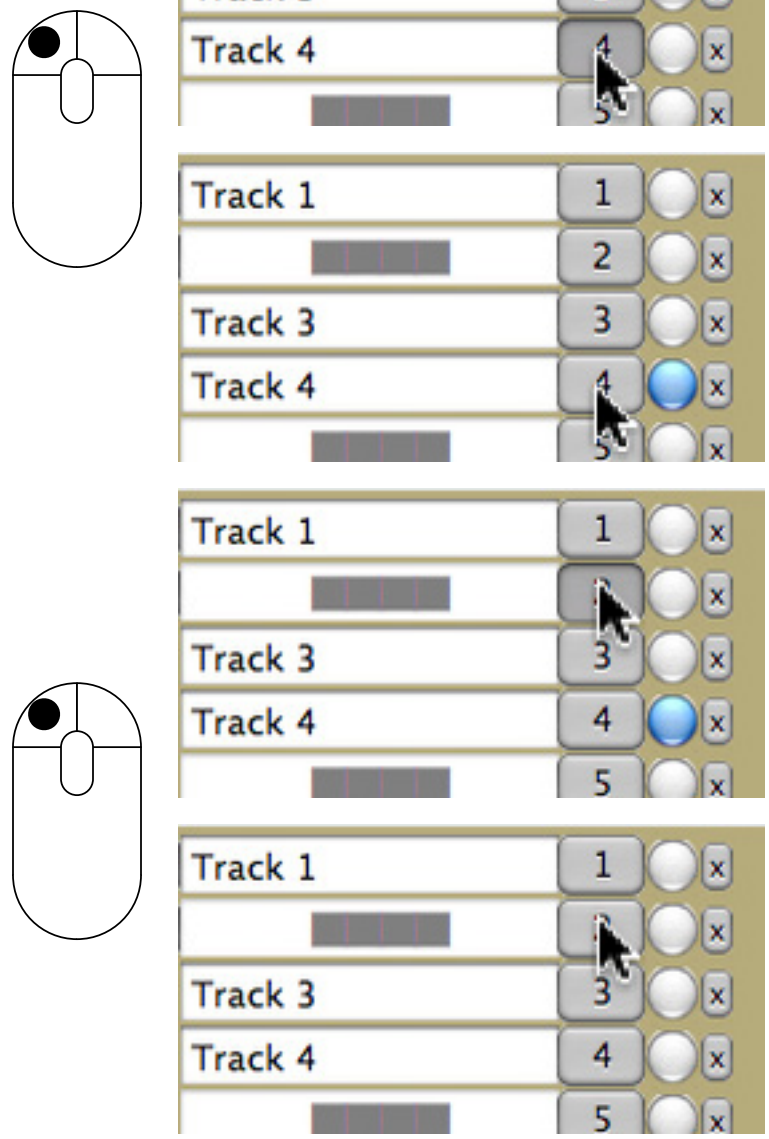
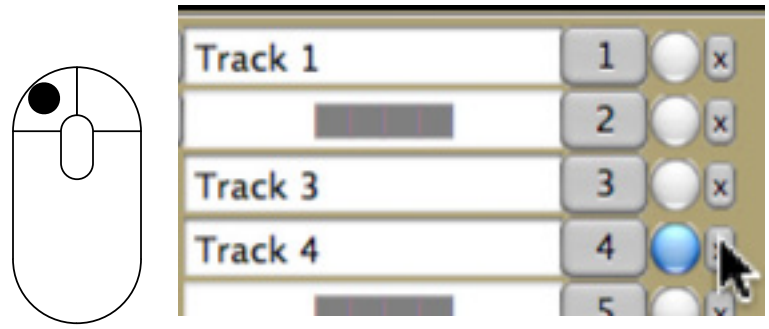


Library Controls

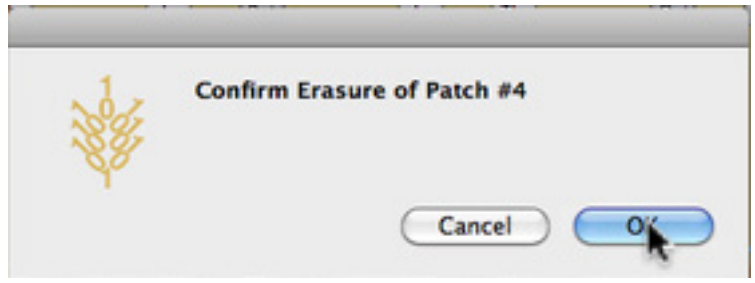


Patch Store (*Quartet only*), continued

Click a square button with a numbered label to load that register into the operational parameters. As with the A/B registers, the round save button will turn blue when the operational parameters match those in the register, except in the case when the register is empty. Note that clicking a square button on an empty register, denoted by the gray bar in its label field, will load the neutral patch into Quartet.



To the right of the load and save buttons are small buttons with the label 'X'. Click on one of these buttons to erase the saved parameters from the respective register and replace its contents with the neutral default. A modal panel will prompt for confirmation that the register should be irrevocably erased.



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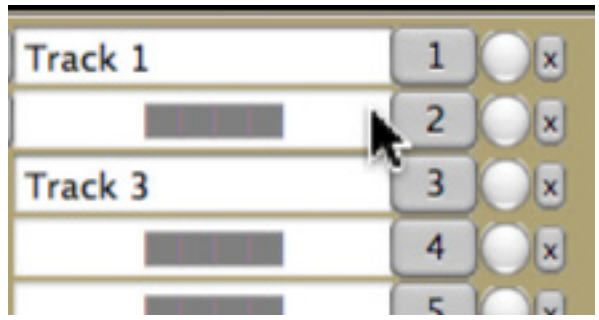
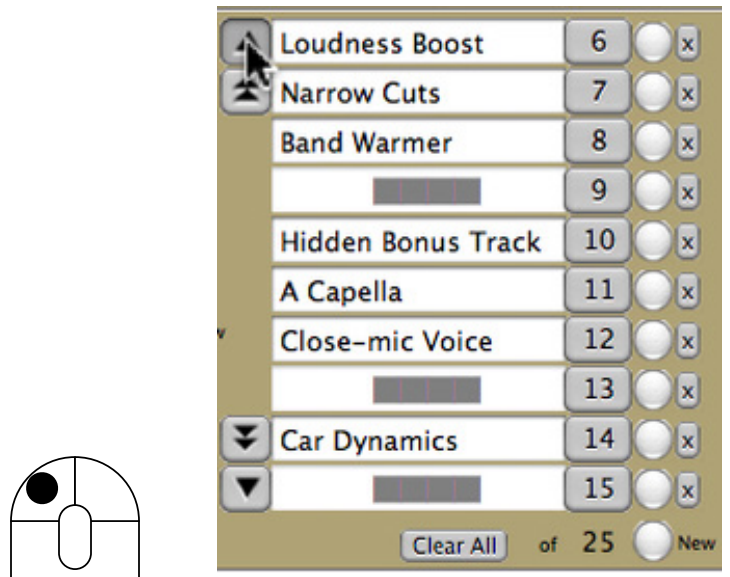
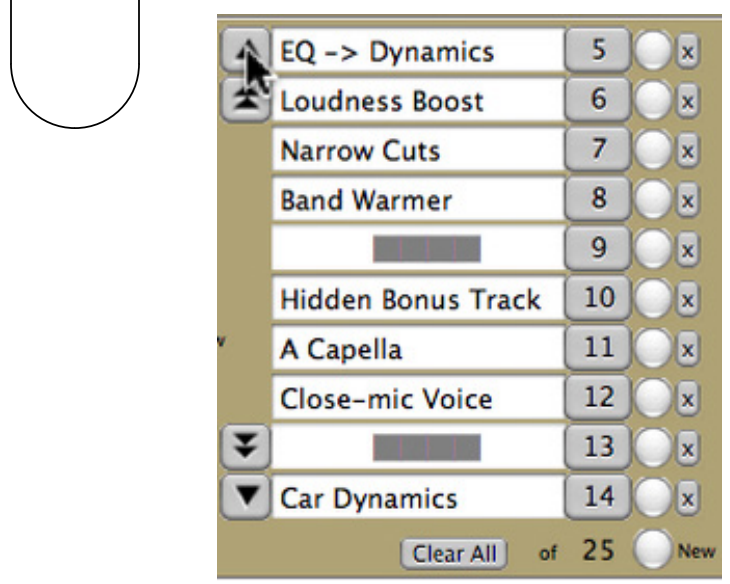
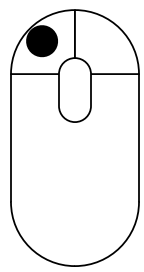


Library Controls



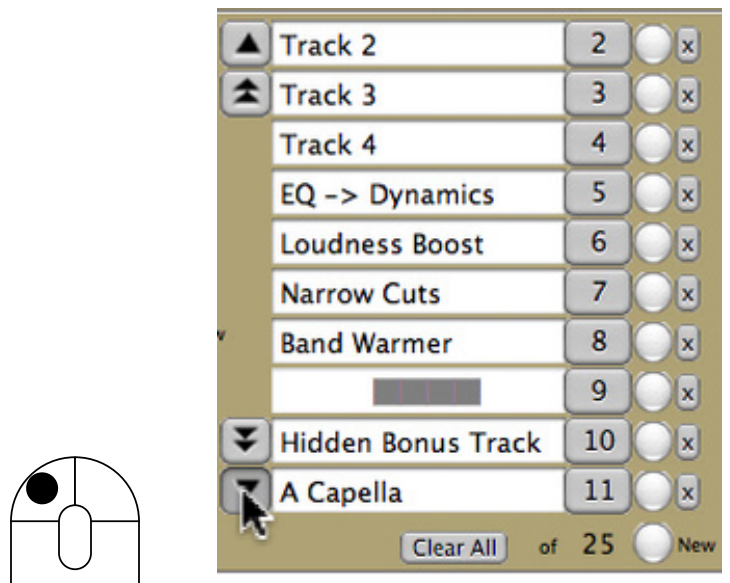


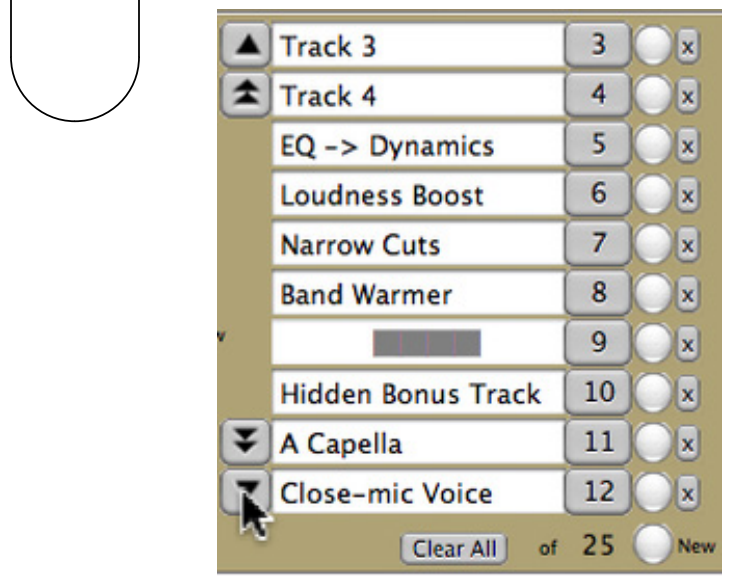


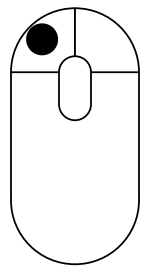
Patch Store (*Quartet only*), continued

The patch store display has room for 10 patches, yet the actual store has a much higher capacity. The arrow buttons to the left of the patch store view navigate the group of patches visible when the store contains more than 10 patches. The single arrow buttons move the register view up or down by one item.

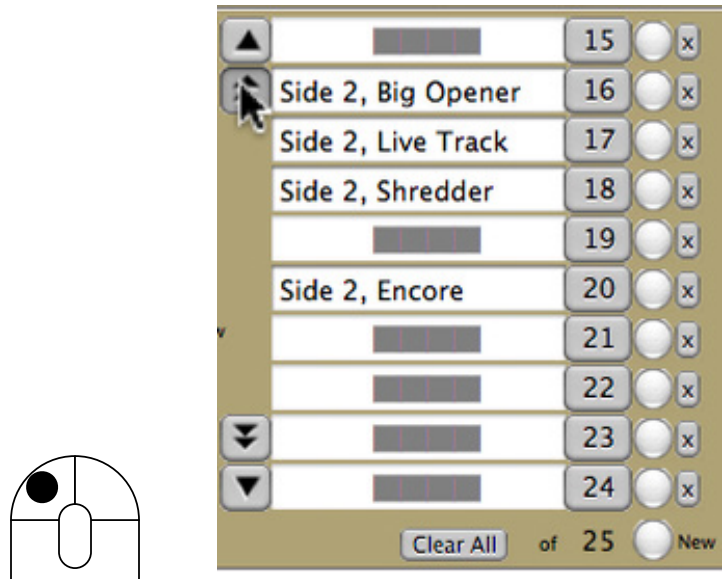
continued next page

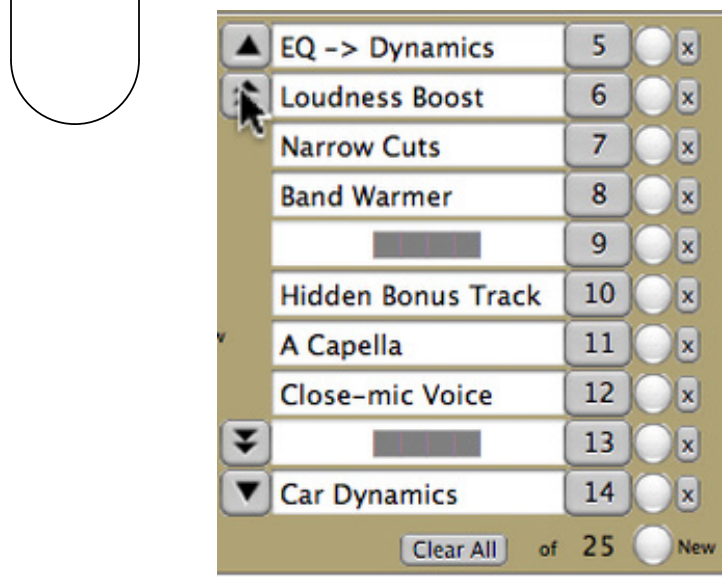


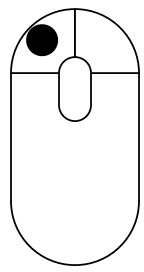




Library Controls

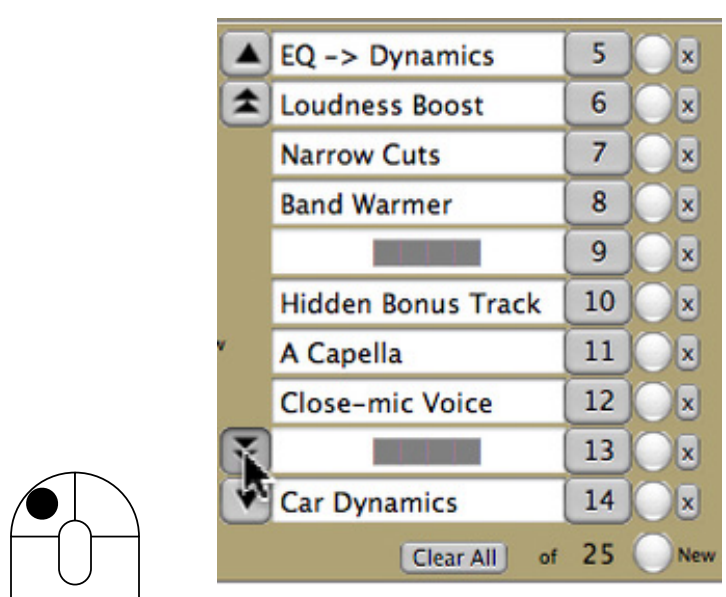


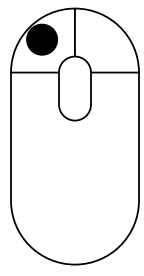


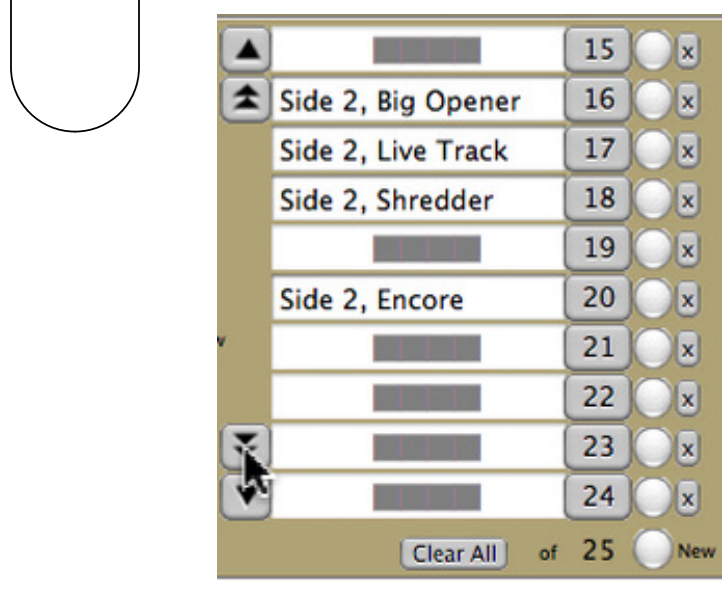


Patch Store (*Quartet only*), continued

The double arrow buttons move the register view up or down by 10 items, or a page. If a page move takes the visible set beyond the beginning or end of the overall patch set, the page move will stop so that the initial or final 10 patches are visible.

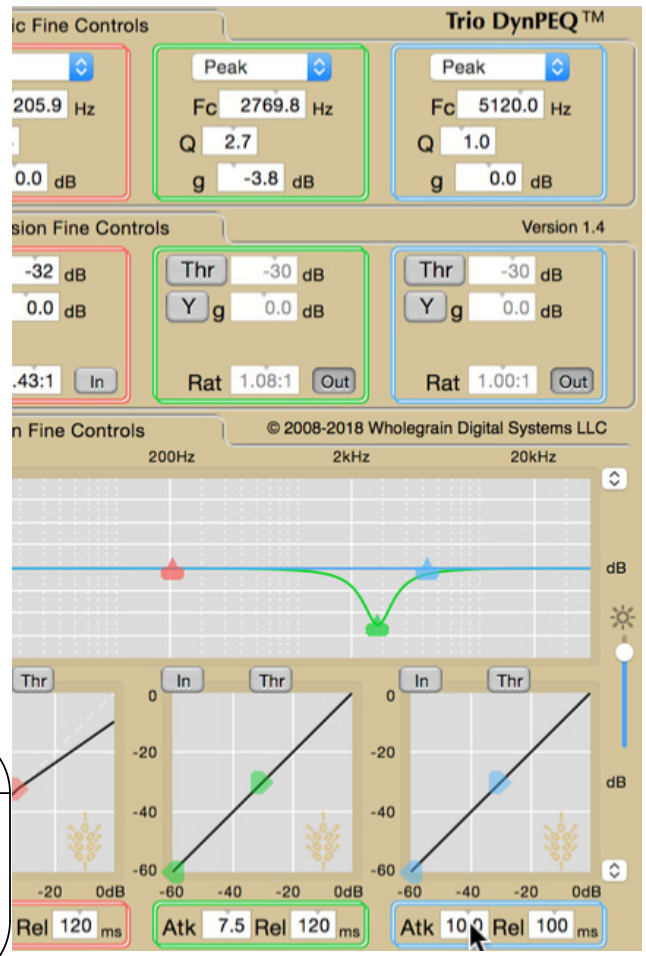






Application: Resonance Compression

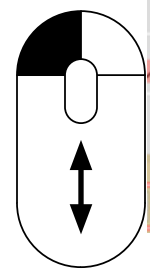
Application: Resonance Compression



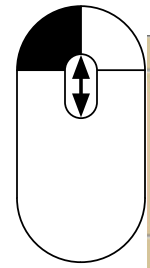
How DynPEQ Can Help

A principal application of DynPEQ is reducing the level of specific resonances or spectral components within an audio signal. Using a compression curve, a DynPEQ band can be configured to reduce a band level when it exceeds a threshold. If you are working on a recorded signal, the first step is to find the band to target. The second step is to find the band compression parameters. This section covers a method that uses two unique features of DynPEQ, sidechain search and rotation point compression. With a little practice, we hope you will find this method efficient and effective.

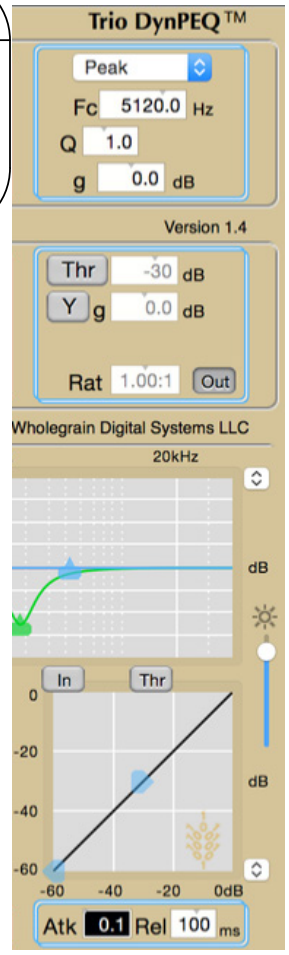
The scenario for this application is taken from the video *Application of Sidechain Search and Rotation Point: Find, Measure, Control, Balance*, which can be found on the Wholegrain website.

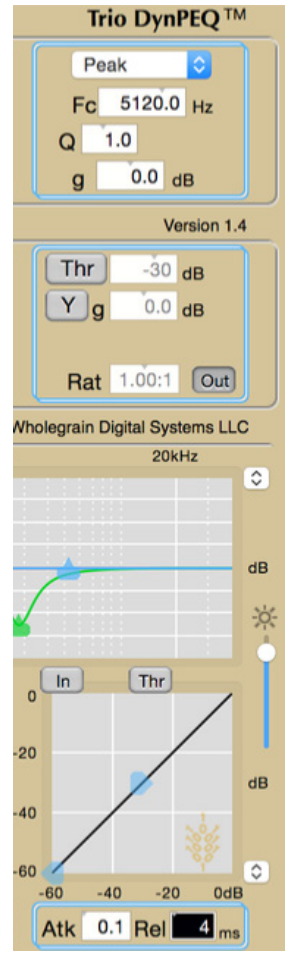


OR

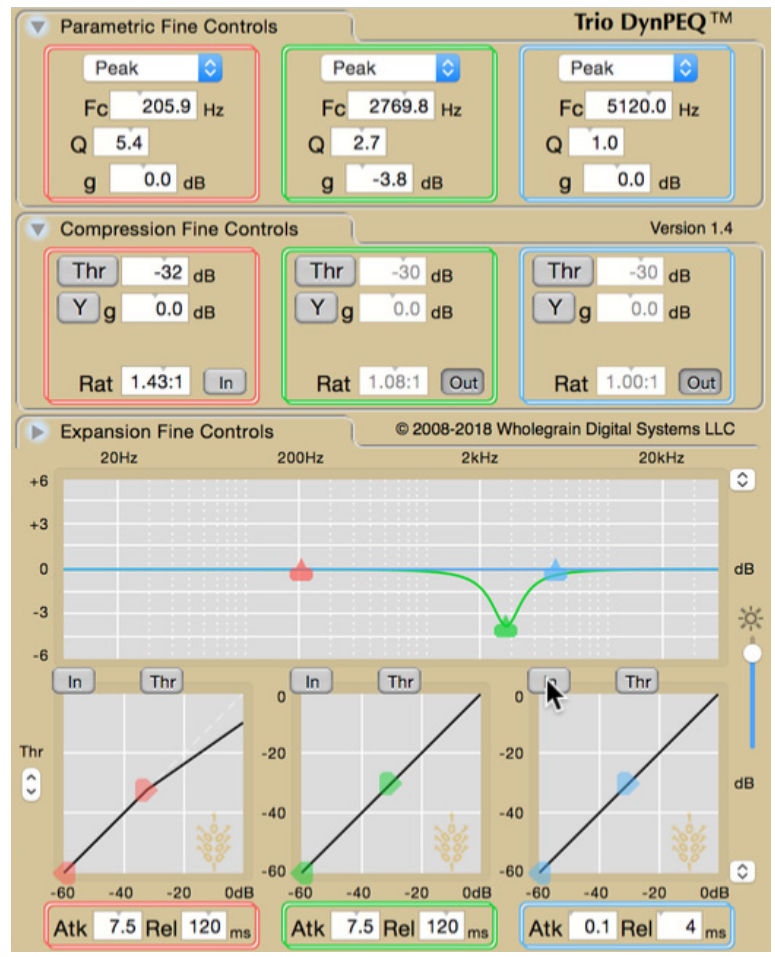


Use the blue band to address this application. The specific application in the video (and herein) is to control the guitar pick sound, which is very short in duration. So that the band level can be accurately measured to properly control dynamics, the first thing to do is reduce the band attack and release time so that they are at or near their minimum values.



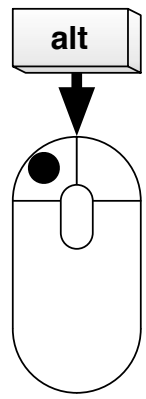


Application: Resonance Compression



Find: Band Isolation with Sidechain Search

Turn on sidechain search for the target band by alt-clicking the band's In/Out button. Once that band's mode has changed, the button will turn blue and its label will change to indicate sidechain search is active for this band. The tuning beads and feedback will vanish from the coarse tuning display, and the scaling on the display's left side will change. While in sidechain search, the coarse tuning display is re-purposed to show pre-filter responses and levels for active bands.



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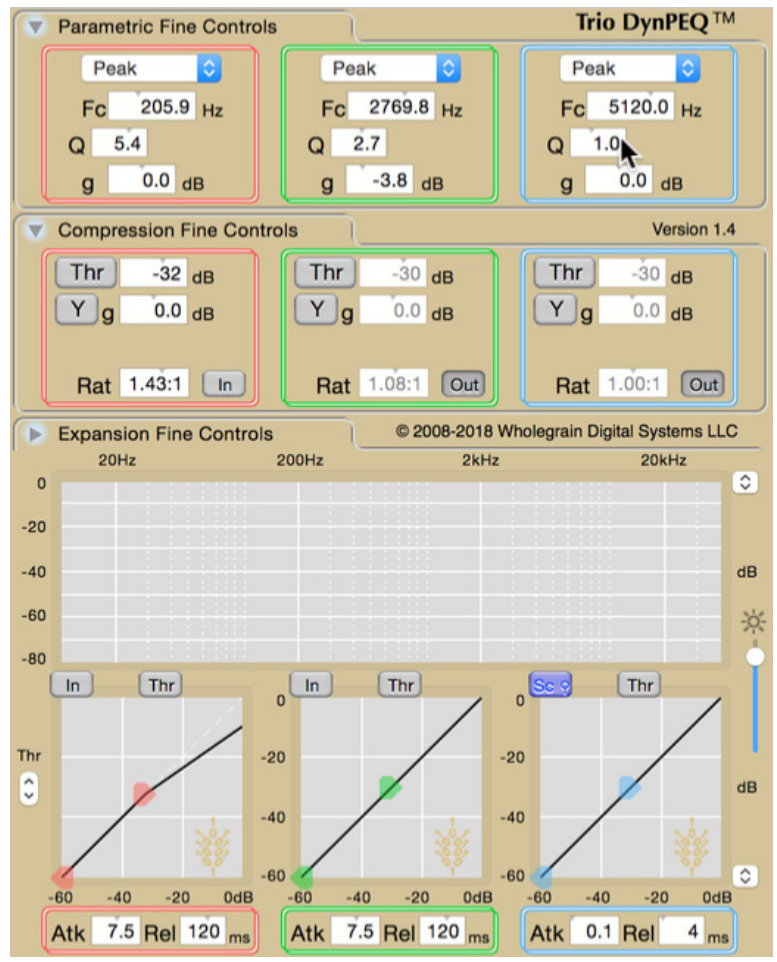
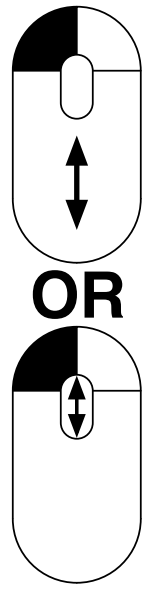
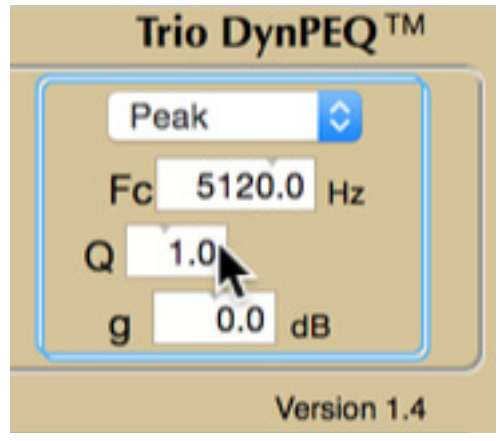


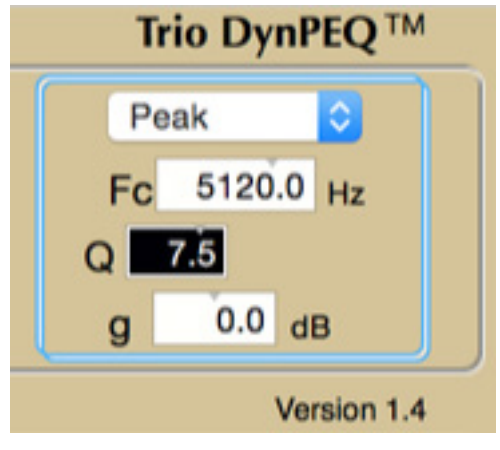
Application: Resonance Compression

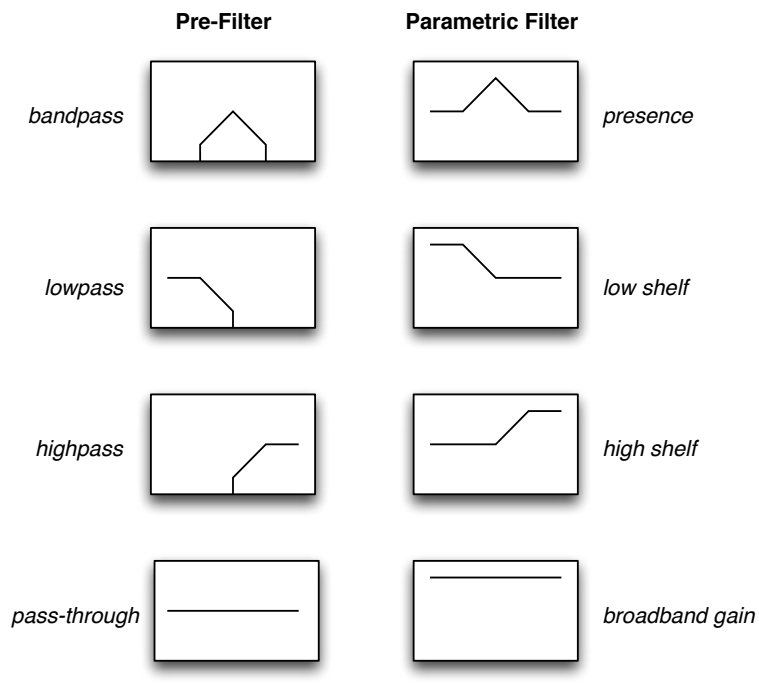
Find: Band Isolation with Sidechain Search, continued

Searching with too broad a band can make it difficult to establish a center frequency for a peak-dip band Before auditioning the pre-filter, it is best to adjust the Q between the range of 5 to 15. With experimentation, you should find the specific starting Q that fits your purposes.





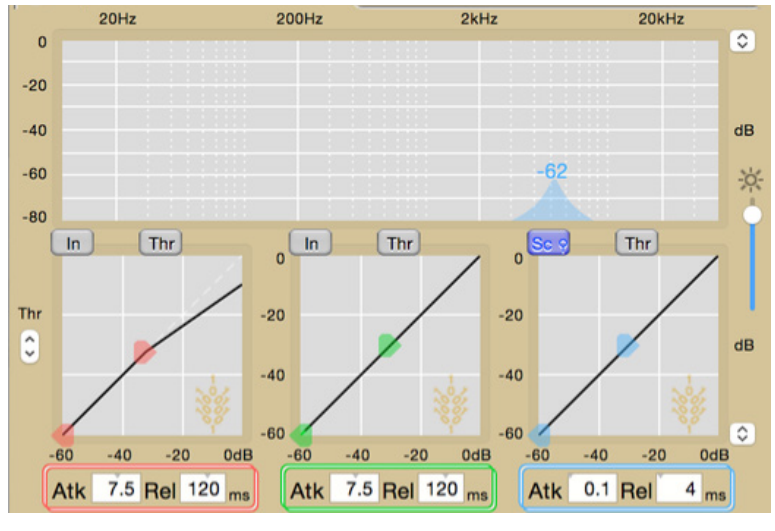




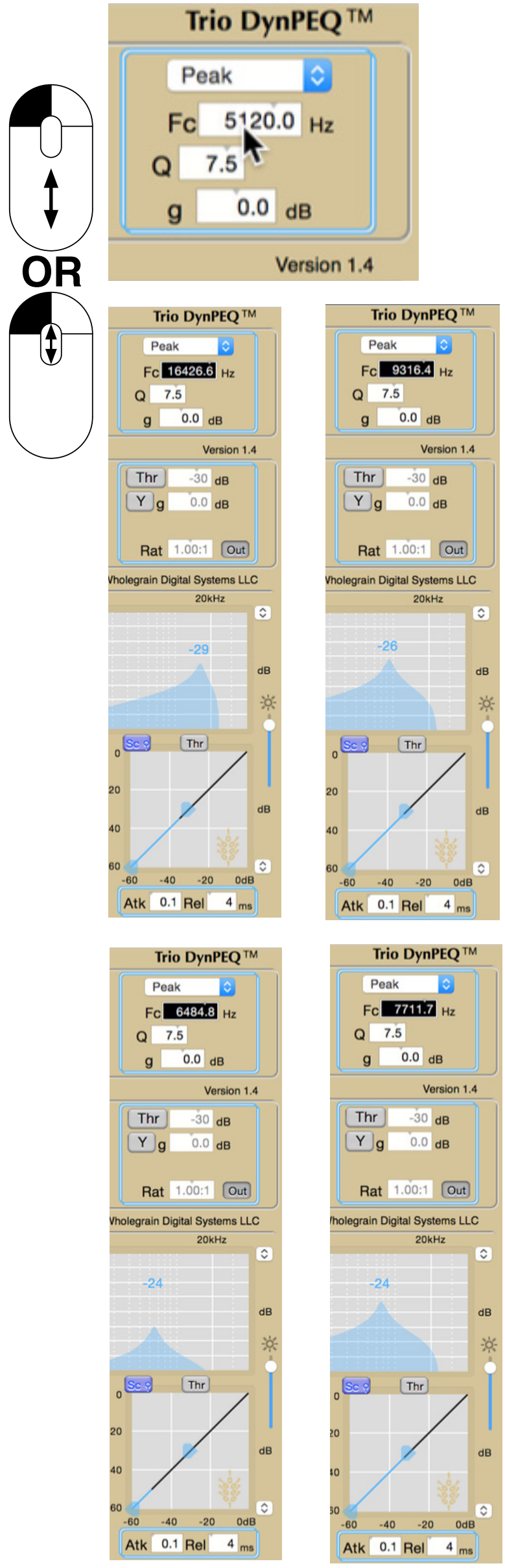
If you haven't done so, it is a good time to start the target signal for search audition. Remember that regular DynPEQ processing is interrupted during sidechain search. The plugin audio output is the sidechain signal through the target band's pre-filter, as shown in the left column opposite.

The coarse tuning display will show, for all active sidechain search bands, the frequency response of the band's pre-filter modulated so that the band's center or cutoff freqeuncy corresponds to that band's measured level. The number above the band's frequency response represents the running maximum level encountered for the band.

continued next page



Application: Resonance Compression

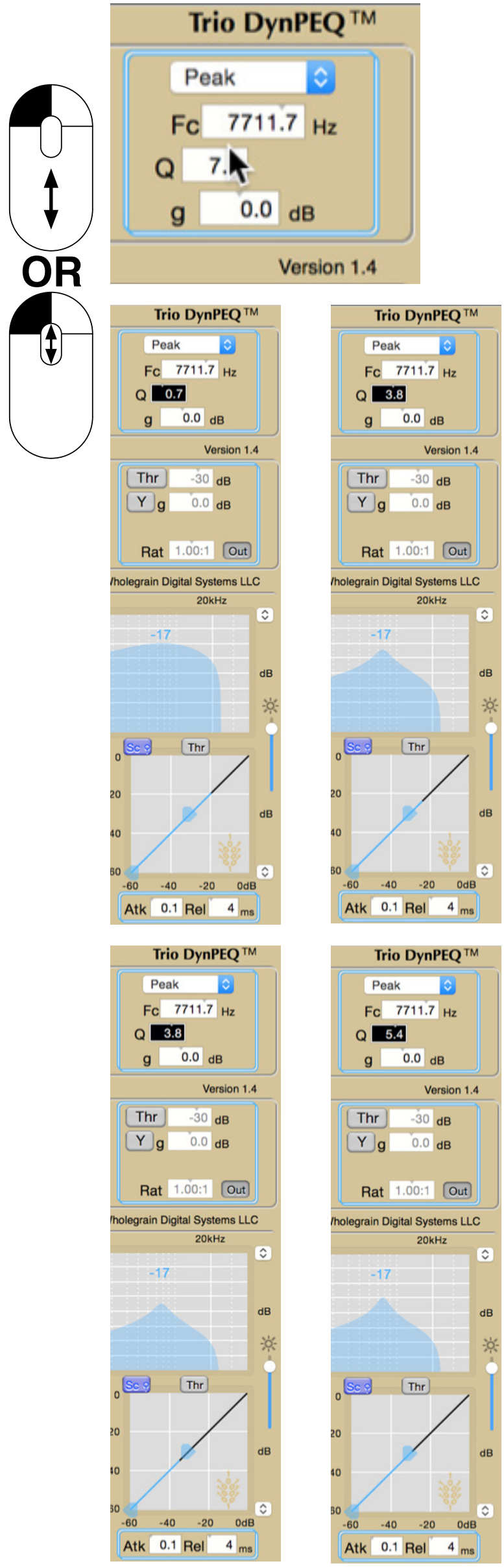


Find: Band Isolation with Sidechain Search, continued

Adjust the center frequency of the target peak/dip band and listen for your target sound in the sidechain search output. The adjustment ends when the target sound seems the most prominent through the narrow bandpass.

continued next page

Application: Resonance Compression



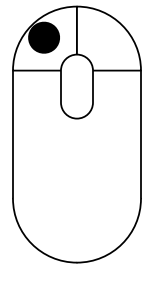
Find: Band Isolation with Sidechain Search, continued

Adjust the Q of the target peak/dip band and listen for the value that captures the most of the target signal while letting through as little outside of the target as possible. It is a balancing act somewhat, but you should be able to decide on the optimum.

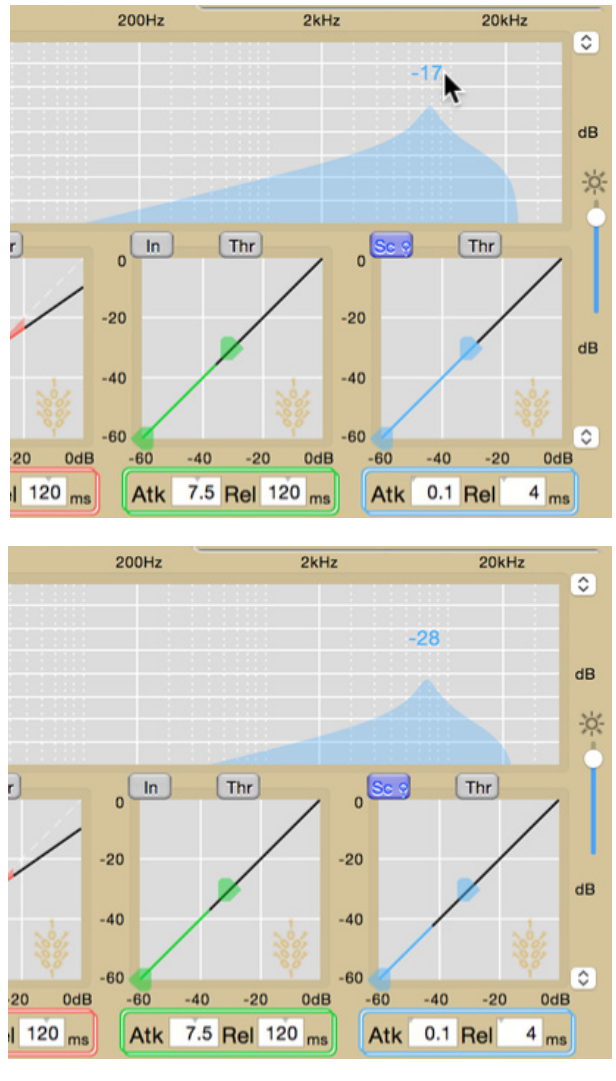
Application: Resonance Compression

Measure: Band Reference Level with Sidechain Search

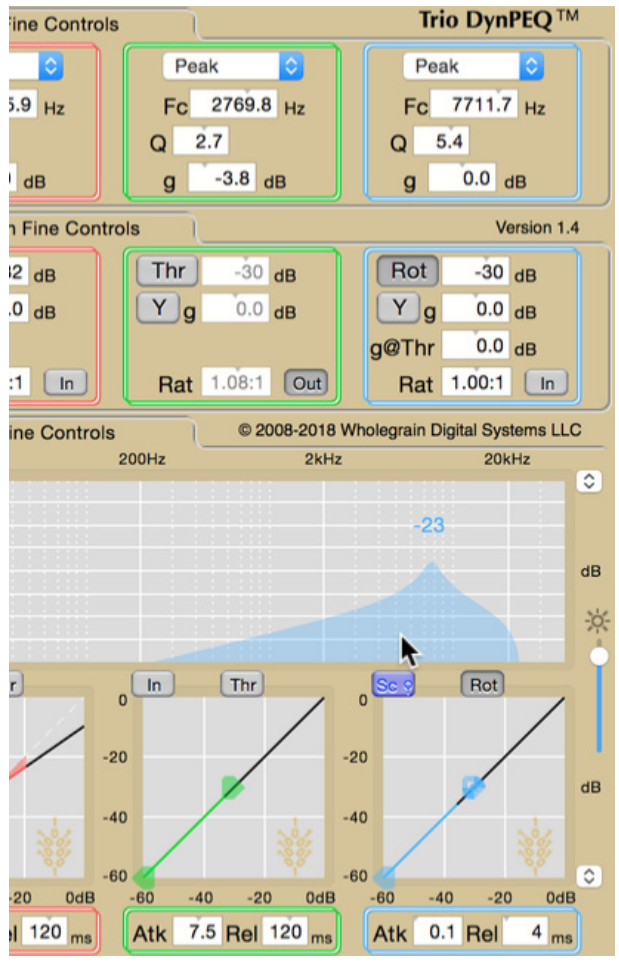
While finding a good fit for the target band while in sidechain search mode, the center frequency and Q of the band have both been adjusted over a range. The maximum level indicator for this band does not reflect the maximum level using the final parameters. The maximum level measurement should be reset and done again.



Click on the maximum level indicator to reset it. Let the level indicator compile until it appears to settle and not likely to increase more.



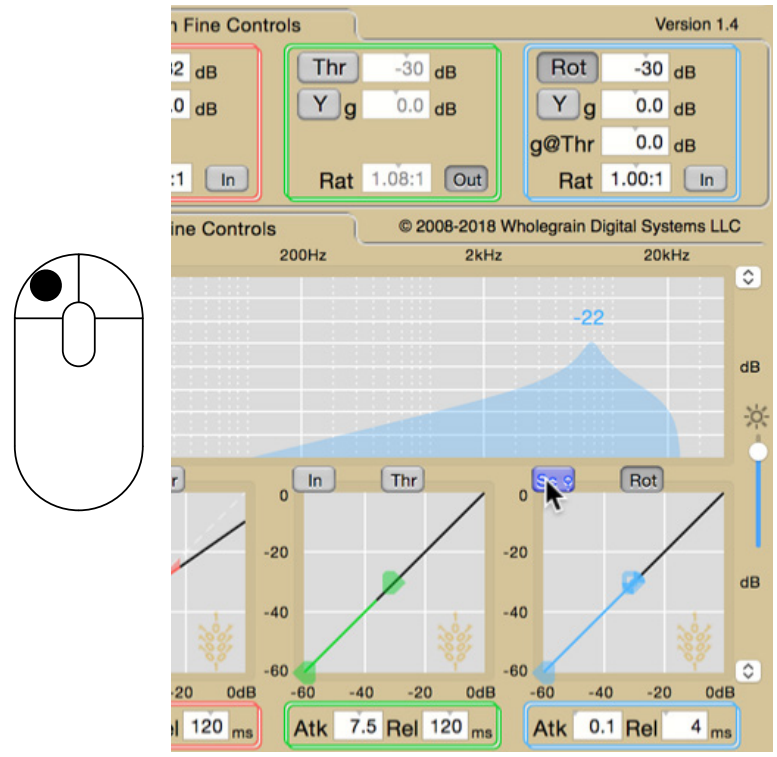
While the maximum level indicator is settling, it is a good idea to activate the compressor for this band and, furthermore, to set the compression mode to rotation point. While it is possible to observe the moving band level in sidechain search and estimate where a threshold could go, the maximum level indicator is a more precise measurement. However, we do not want to put the threshold where the maximum level resides. We do know that the maximum level should be above the desired threshold, and therefore reside on the compression slope. When the reference point for a compression curve does not define the threshold, rotation point can help to quickly fit a compression curve, for the threshold is derived from the reference level, boost/cut offset, and compression slope.

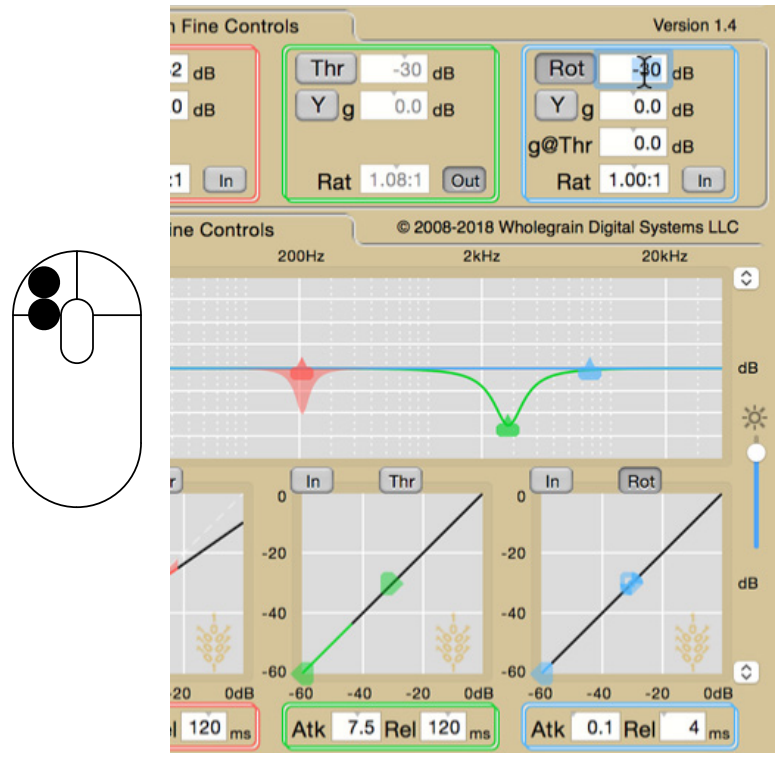


Application: Resonance Compression

Control: Set the Rotation Point Location

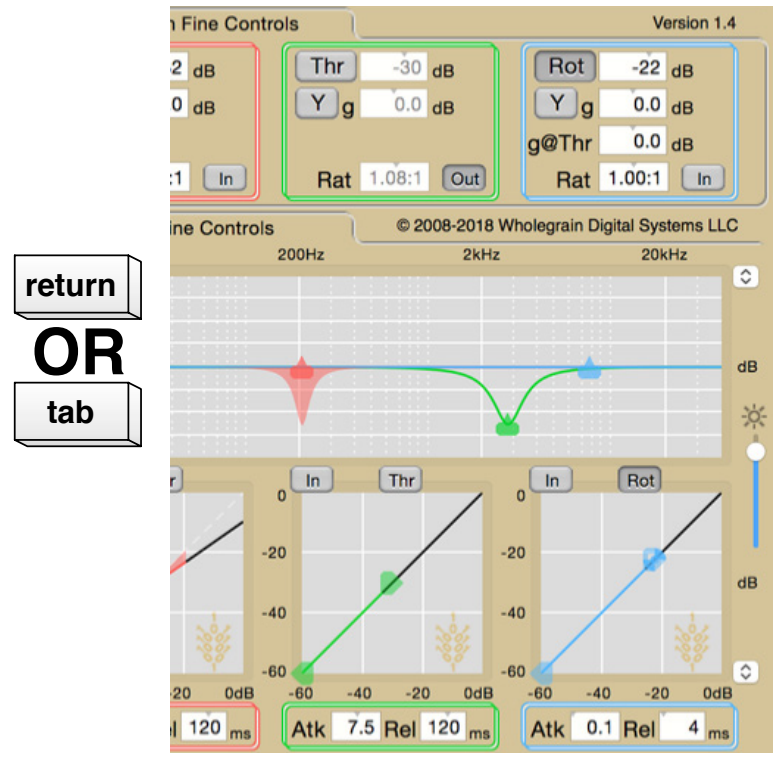
When you are ready to leave the Measure phase, make a note of the maximum band level. Click a blue 'Sc' button to leave sidechain search and return to regular DynPEQ processing.



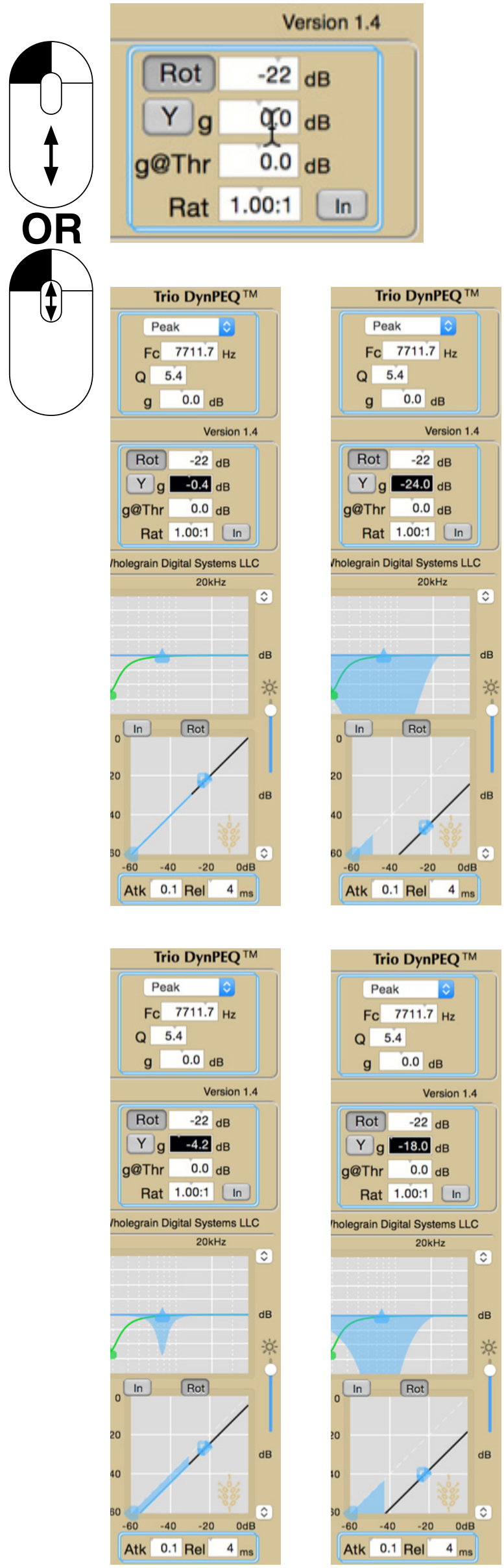


Double-click the rotation point location parameter for the target band and type in the maximum band level into the field. Register the new parameter by pressing the return or tab key.

continued next page



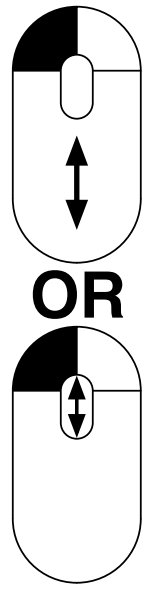
Application: Resonance Compression

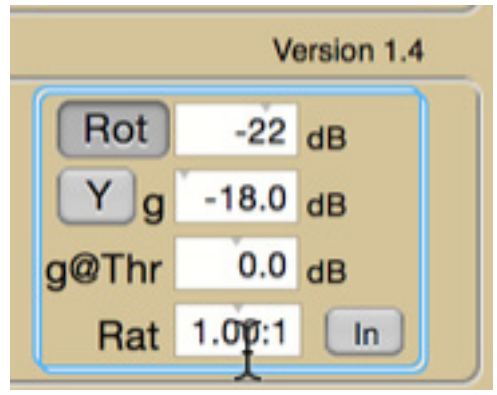


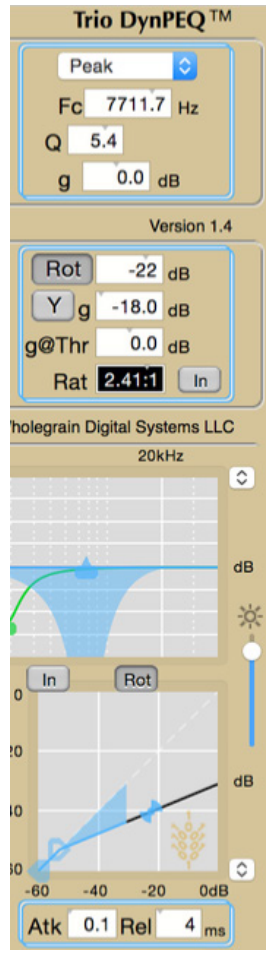
Control: Set the Rotation Point Location, continued

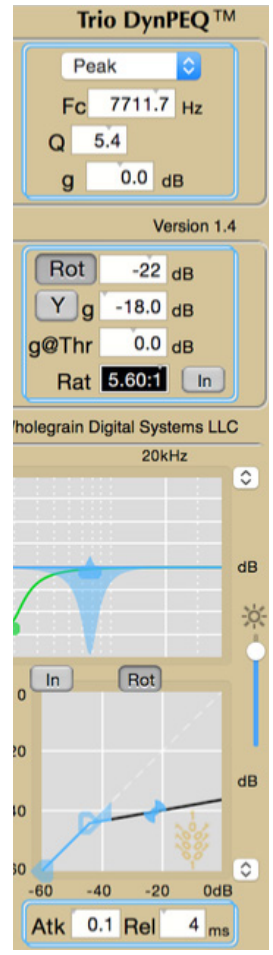
Now that the audio effect has been restored, we adjust the boost/cut offset of the rotation point. Note that the compression ratio has been left at its default of one, so no dynamics processing is taking place during this step. We are looking for a constant boost/cut offset that adequately covers the worst case of the target sound. The lack of dynamics likely means the target sound is overly covered or that the overall sound is affected. The next step should remedy this.

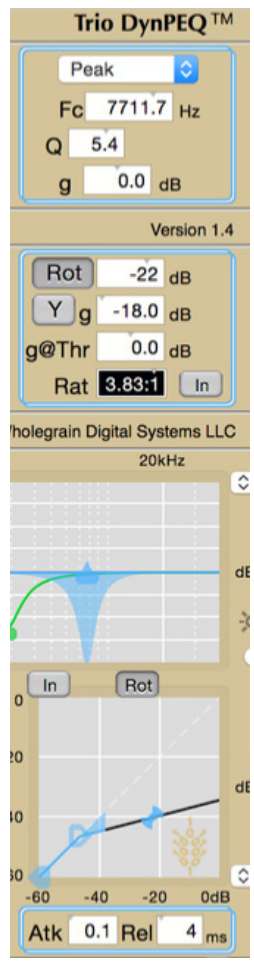
Application: Resonance Compression











Balance: Set the Compression Ratio

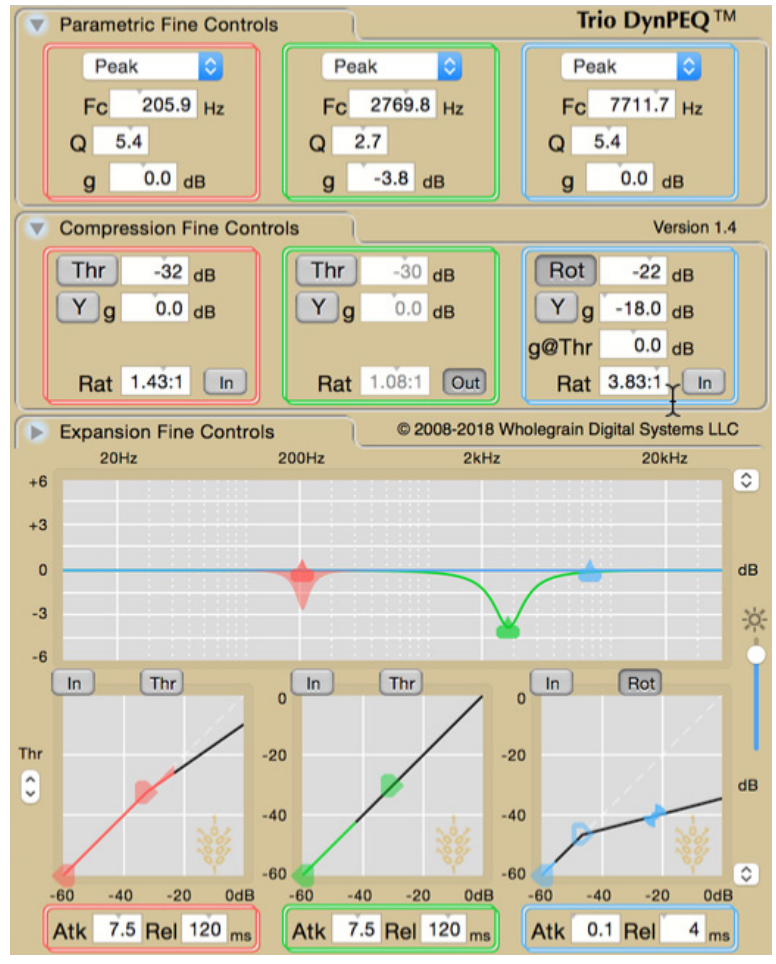
Adjust the compression ratio for the target band upwards. Note that the rotation point offset, g, is lower than the gain at threshold, g@Thr, so an inverse compression ratio will not place the virtual threshold underneath the pivot. As the compression ratio moves further upward, the compression slope becomes more flat on the display, meaning that the control cut applies to less of a range below our measured maximum. The context around the target sound should return without the band cutting into it. The goal is to retain the desired cut of the target sound while disturbing as little as possible from everything else.

Application: Resonance Compression

Refining the Rotation Point Compression

If the result at this point is not quite to your liking, only the last two steps of the process, Control/g and Balance/Rat, should need repeating.

If you are more comfortable working with traditional compression parameters, the translation of rotation point back to threshold is straight-forward. Before clicking the Rot button to return to Thr, note the location of the virtual threshold along the X axis. This will become the threshold level. Copy the value of gain at threshold, g@Thr, to the threshold offset, g. Change the threshold level to the virtual location and you will be ready to switch back to Thr mode.

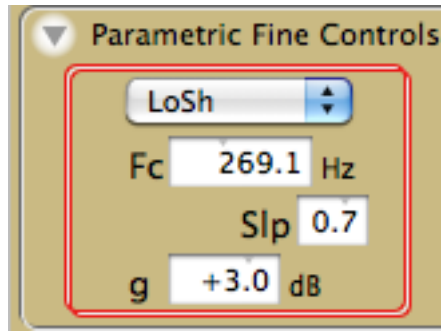


General Reference

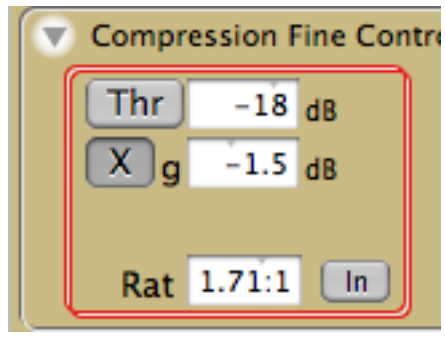
General Reference

DynPEQ Processing Controls by Category

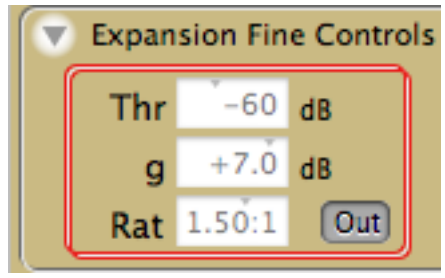
Band parametric controls
Filter type (peak/dip, low shelf, high shelf, off)
Center (peak)/cutoff (shelf) frequency
Q (peak)
Slope (shelf)
Boost/cut



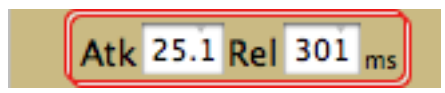
Band compression controls
Definition type (threshold, rotation point)
Boost/cut offset axis (x/input level, y/output level)
Definition level
Definition boost/cut offset
Gain at threshold (rotation point)
Compression ratio
In/out



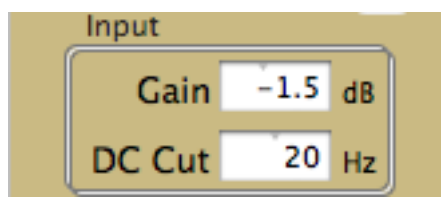
Band expansion controls
Threshold level
Threshold boost/cut offset
Expansion ratio
In/out



Band RMS controls
Attack time
Release time



Input processor controls
Gain
DC block cutoff



Output processor controls
Gain
Limiter level *(Quartet only)*
Limiter release time *(Quartet only)*

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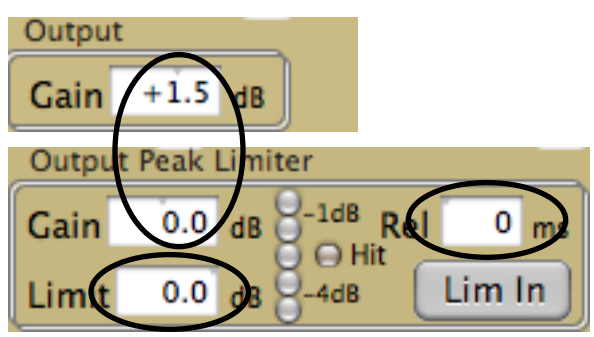
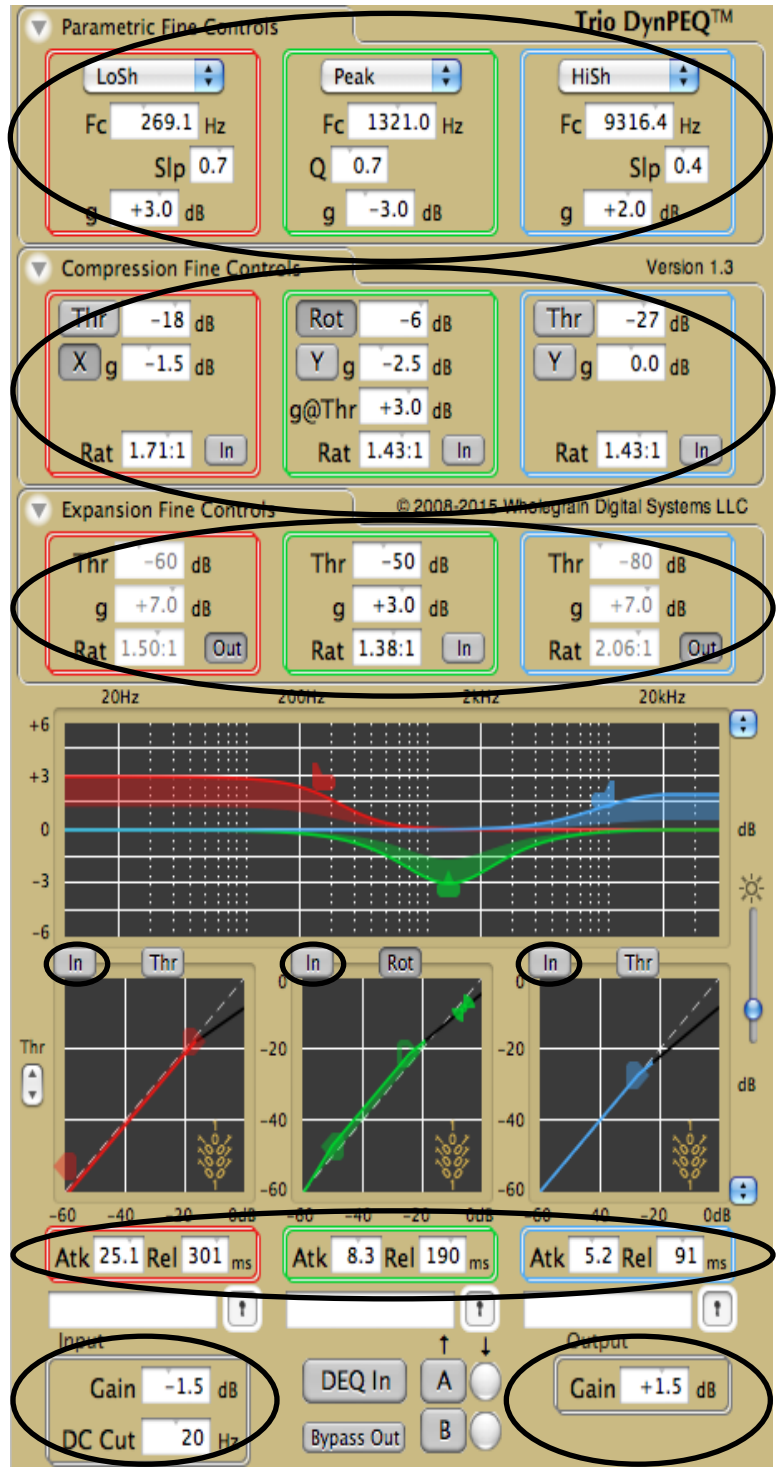


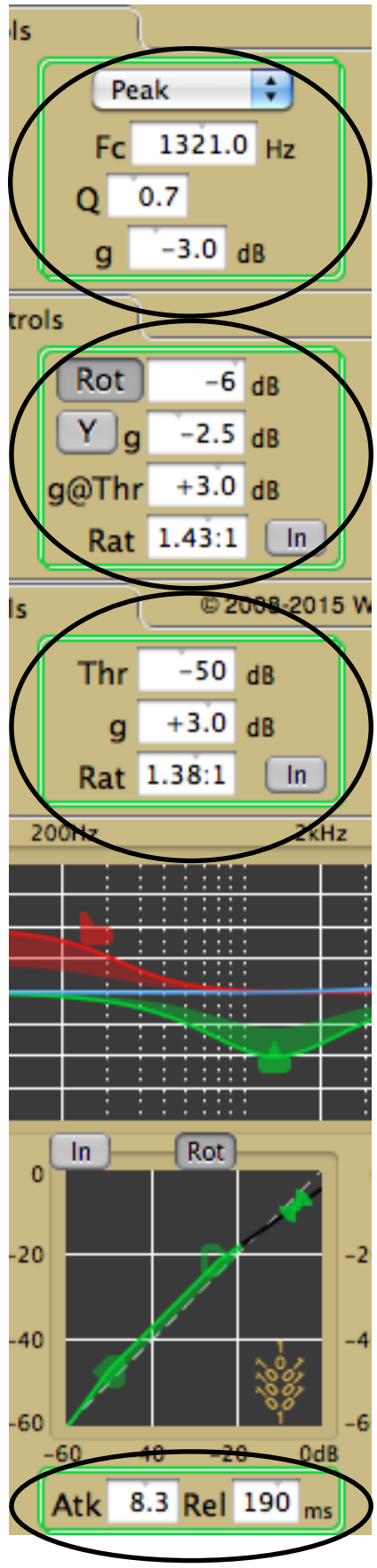
General Reference



DynPEQ Processing Controls by Category, continued

A/B or patch register
Band parametric controls for all bands
Band compression controls for all bands
Band expansion controls for all bands
Band RMS controls for all bands
Band in/out for all bands
Input processor controls
Output processor controls

General Reference



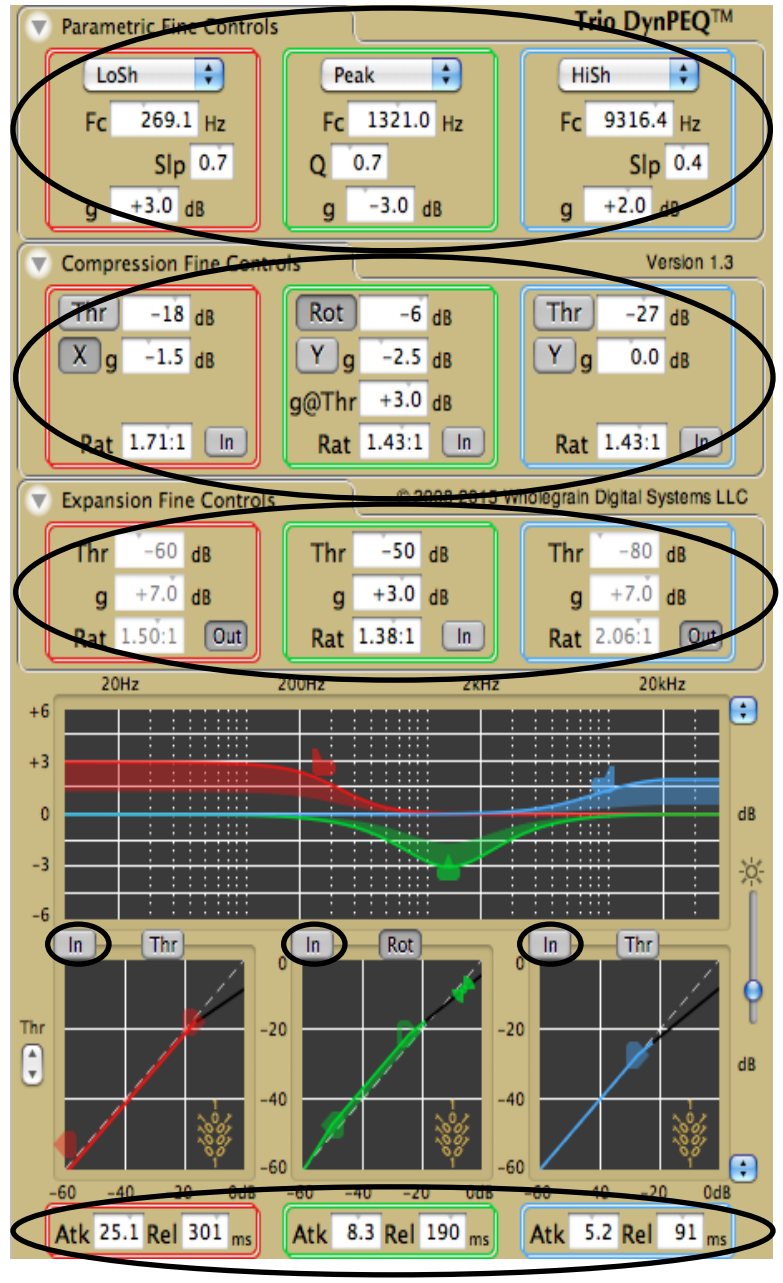
Information Saved in Preferences Folder

The band toolchest is kept in a file located at (\$HOME)*/Library/Preferences/com.wholegrain.ds.dpeqbands.plist* . The toolchest contains two types of tuning entries, single band and multiband.

Single band toolchest entry
Band parametric controls
Band compression controls
Band expansion controls
Band RMS controls

continued next page

General Reference



Information Saved in Preferences Folder, continued

Multiband toolchest entry
Single band entry for all plugin bands (3 for Trio, 4 for Quartet)
Band in/out for all plugin bands

When saving a multiband entry to the band toolchest, the individual bands will be stored from left to right as they appear on the parameter window. Bands in a multiband entry will be loaded in the same left-to-right order. If the multiband entry contains fewer bands than are supported in the plugin instance, the excess bands will be loaded with neutral values and switched out of operation--that is, the band in/out will be set to out. If the multiband entry contains more bands than are supported in the plugin instance, the excess bands at the end of the ordered list are discarded.

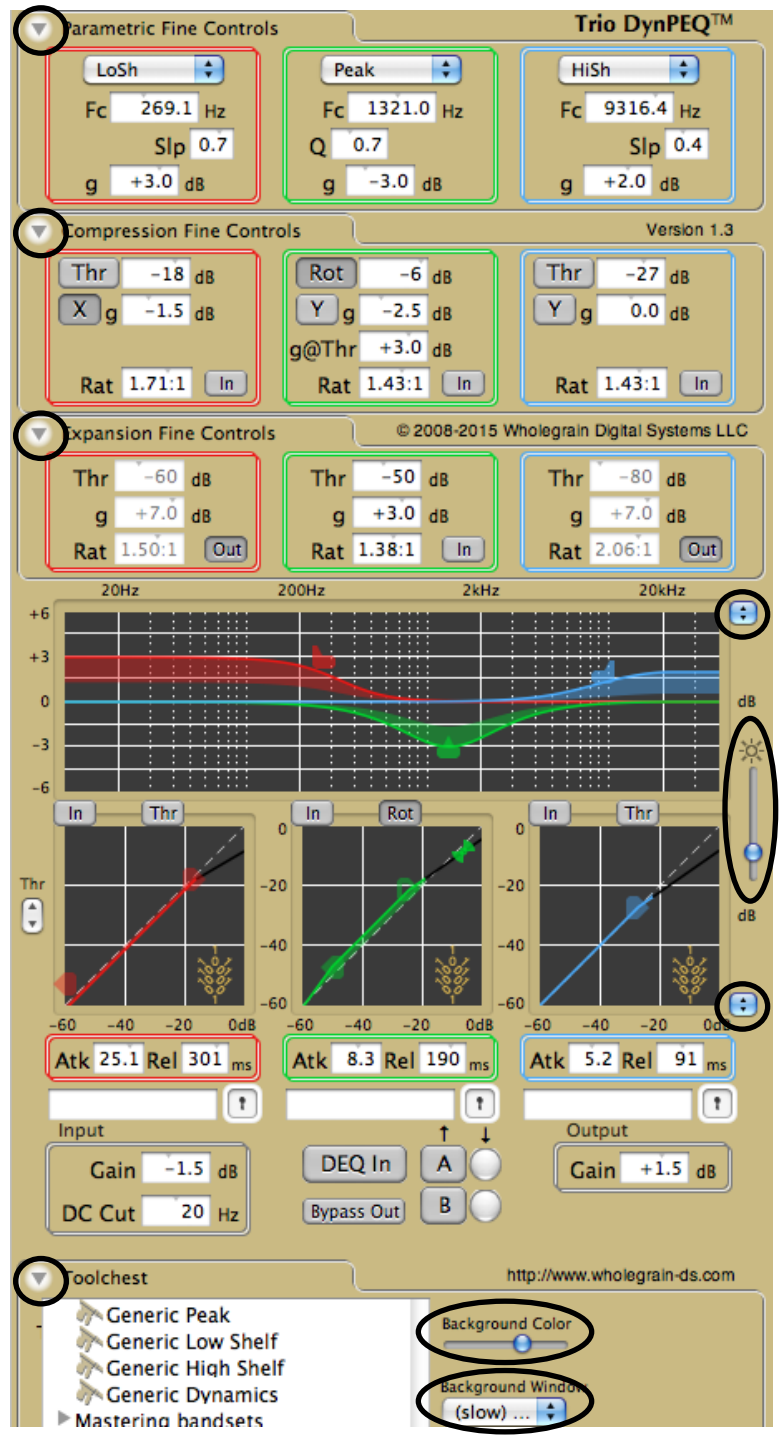
continued next page

General Reference

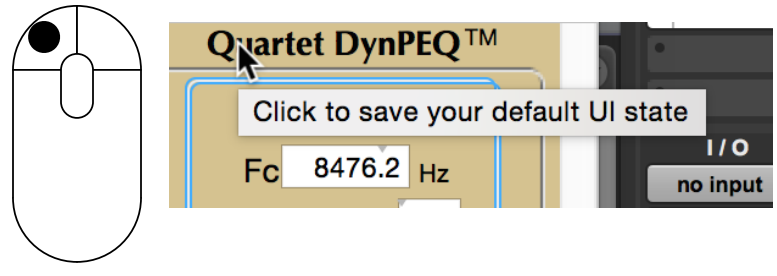
Information Saved in Preferences Folder, continued

On plugin launch, UI configuration information is loaded from a file in the preferences folder if the file is there. The path to this default plugin UI file is (\$HOME)*/Library/Preferences/com.wholegrain.ds.quartetui.plist* for Quartet and (\$HOME)*/Library/Preferences/com.wholegrain.ds.trioui.plist* for Trio. The information stored in these files follows.

UI controls
Coarse display background brightness (circled)
Parameter window background color (circled)
Coarse parametric scaling (circled)
Coarse dynamics scaling (circled)
Parametric fine segment visible/collapsed (circled)
Compression fine segment visible/collapsed (circled)
Expansion fine segment visible/collapsed (circled)
Toolchest segment visible/collapsed (circled)
Background window state (circled)
Parameter window size, scroll state, level, and position (if supported)
RMS calculation method *(Quartet only)*

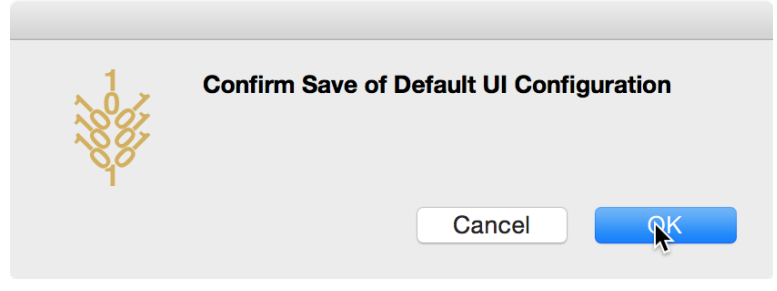


To save the current UI controls as the default into the corresponding preferences file, click on the DynPEQ logo in the upper right hand corner of the plugin display.

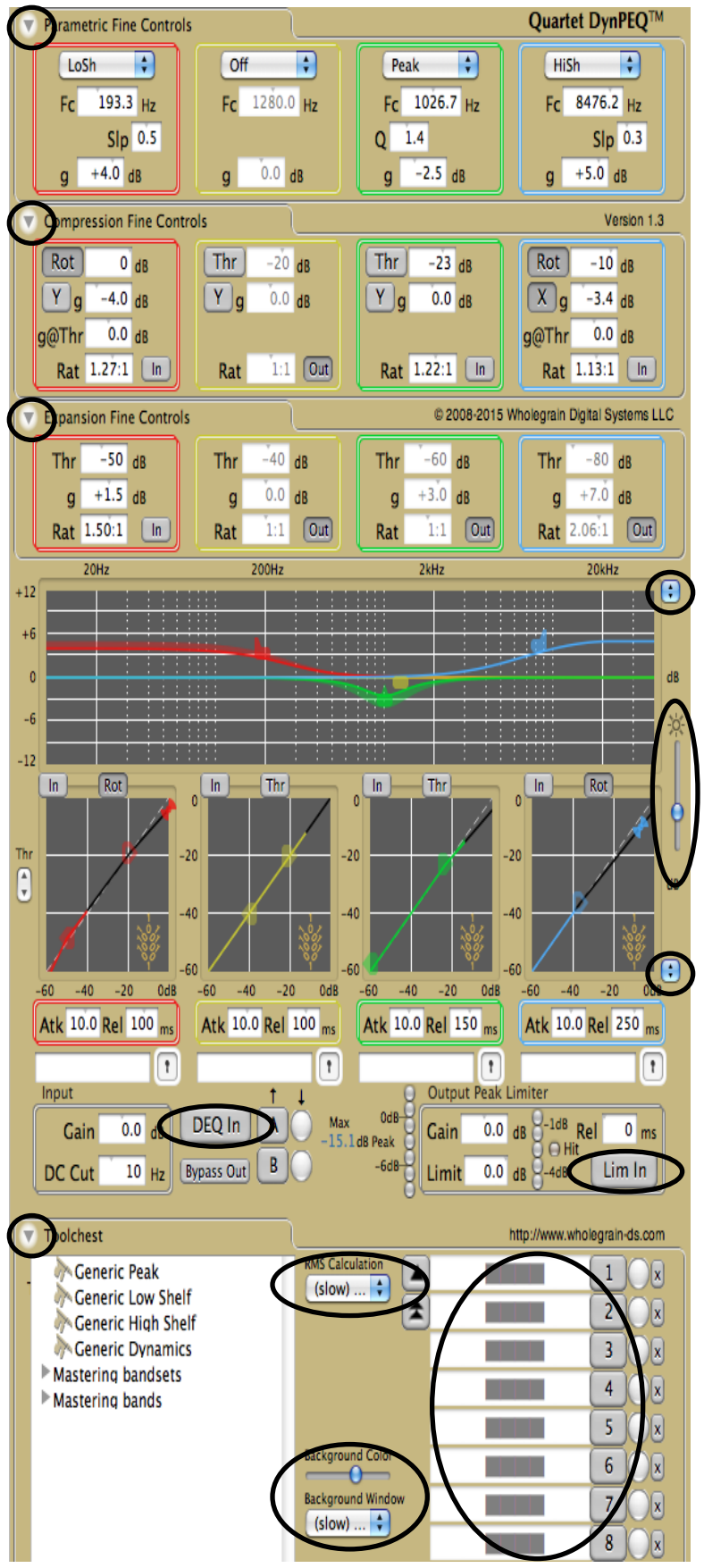


Clicking the logo will display a modal alert to confirm saving the UI configuration information into the default file.

Pro Tools note: an AAX host stores its own default settings, so the results of this default save will vary on Pro Tools. You may have to quit and restart Pro Tools--at the very least--to get the new default to take effect.



General Reference



Information Saved with Workstation Project

In the workstation project which a DynPEQ plugin resides, information is stored in and retrieved from the project file. The plugin information saved in the workstation project file is as follows.

Project configuration
Patch for operational parameters at project save
A/B *(Trio)* or all patch store *(Quartet)* registers (circled)
UI controls (all visible controls circled)
DEQ (all bands) in/out (circled)
Limiter in/out (circled) *(Quartet only)*

The UI controls saved in the workstation project override the continuity settings in the Preferences folder.

General Reference

Operational Caveats

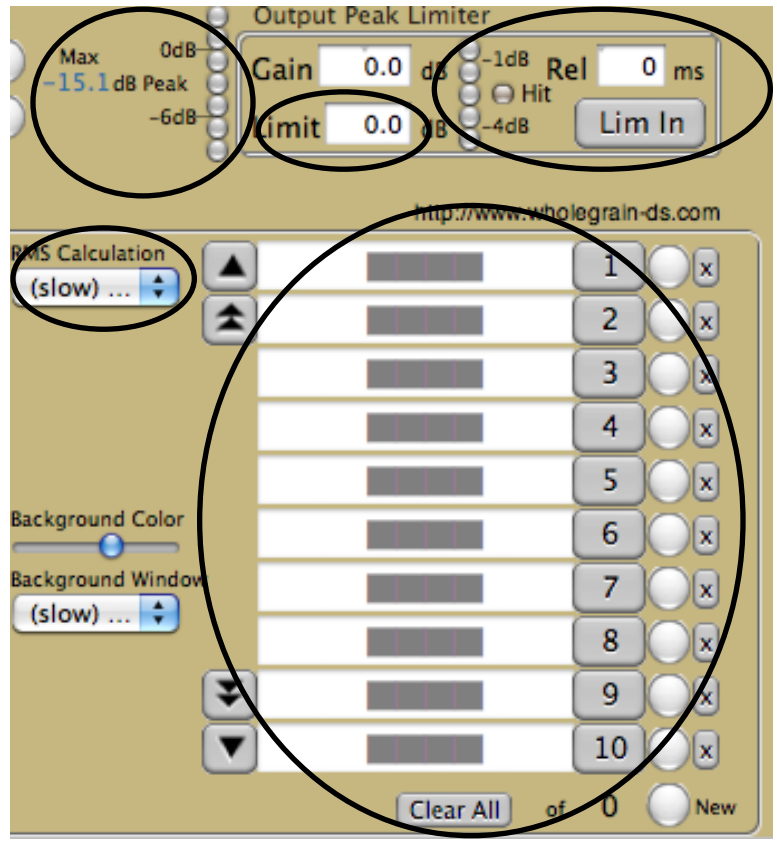
Workstation software interacts with DynPEQ by transacting individual parameters and not parameter groups. The processing of dynamics curve information prevents the creation of a curve where a segment has negative slope--this is why the compression bead should always be to the right and above the expansion bead. Since the plugin has no guarantee of receiving parameters in a specific order, it is possible, though rare, that a compression or expansion point may be moved away from the location specified in the patch or toolchest band. When this happens, the course of action to take is simply to reload the band or patch.

DynPEQ plugins are designed so that multiple instances should be able to safely share the band toolchest file. However, if there are multiple instances of workstation software running simultaneously on the same computer home, there is the possibility that band toolchest updates made on one workstation can be overwritten with updates from another workstation instance. Please keep this in mind if your workstation host is a server to multiple users. In this case, each user should have a unique home directory in order to avoid this conflict. Also, the quit operation on some workstations may quickly exit by dismissing plugins without notification. If this happens, a DynPEQ plugin will save neither the band toolchest nor the project information.

Summary of Differences between Trio and Quartet

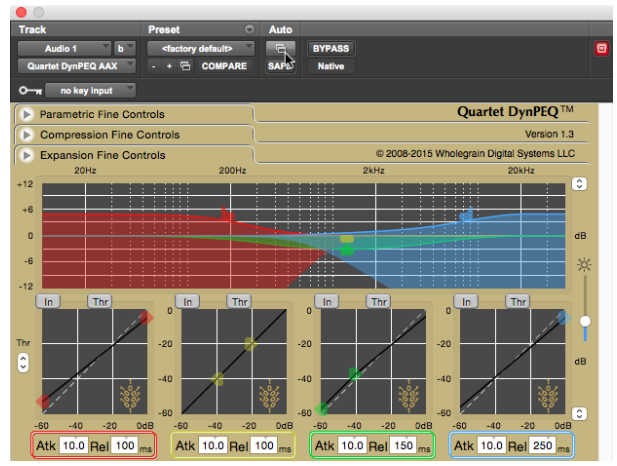
The principal difference between Trio DynPEQ and Quartet DynPEQ plugins, as their titles suggest, is that Trio employs three bands of DynPEQ and Quartet employs four. However, the peripherals around the DynPEQ bands are different as well. Trio DynPEQ is designed to function near the beginning of the processing chain, in that it assumes that any number of arbitrary plugins follow it. Quartet DynPEQ is designed to reside at or near the end of the processing chain, in that it inherently supports multichannel I/O and measures peak levels for monitoring and limiting.

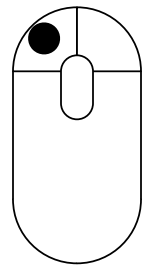
The summary of features in Quartet and not in Trio are as follows. Quartet measures maximum peak levels and displays the results in the peak level meter and the maximum peak compiler. Quartet employs the peak data in a limiter with level and release parameters in addition to a limiter gain meter and limiter hit indicator. Quartet extends the A/B registers to an unlimited patch store that is tied to the workstation project file. While Trio is designed to be a single-channel insert, Quartet is inherently multi-channel, which offers an option to process multichannel RMS so that native CPU is conserved, as is described *through this link*. Lastly, the Audio Unit version of Quartet has an extra plugin that accepts stereo I/O only and processes the channels independently, similar to the Pro Tools multi-mono mode.



Pro Tools Reference

Pro Tools Reference





Patch Index Automation (*Quartet only*)

DynPEQ supports automation on all slider-text parameters in Pro Tools. In the case of Quartet DynPEQ, there is an additional parameter under automation, called 'Patch Index'. This virtual parameter can load numbered patches in the patch store. A patch index value of 1 through 127 will load its corresponding numbered patch store register into the operational parameters. A patch index value of zero has no effect.

After saving patches into the patch store, enable the patch index parameter in the Quartet automation list.

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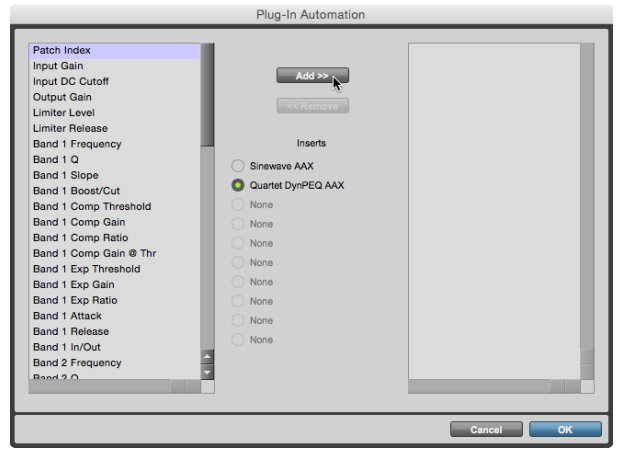
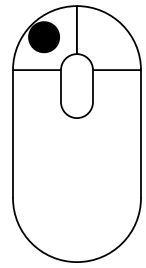
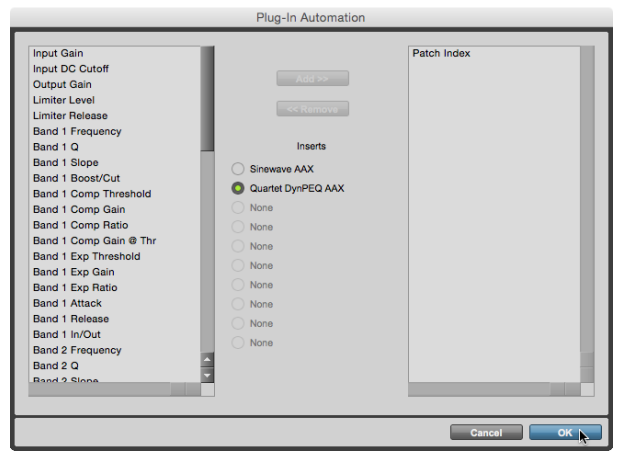


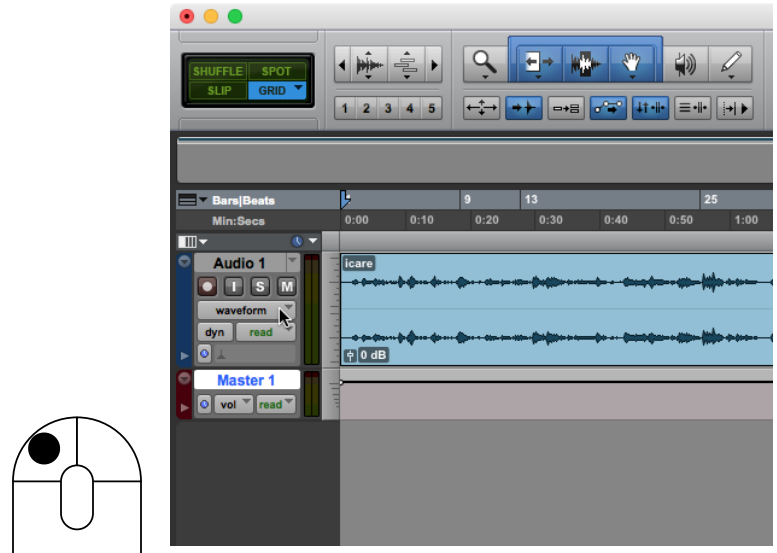


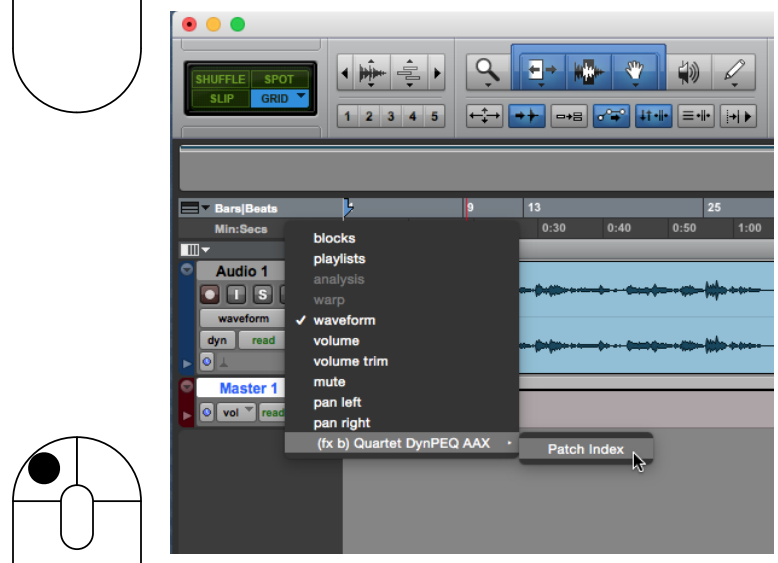


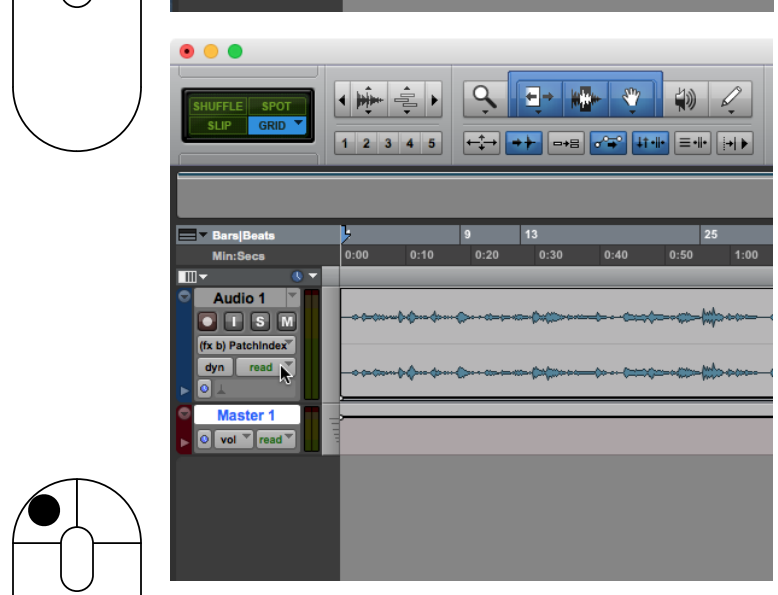
Pro Tools Reference

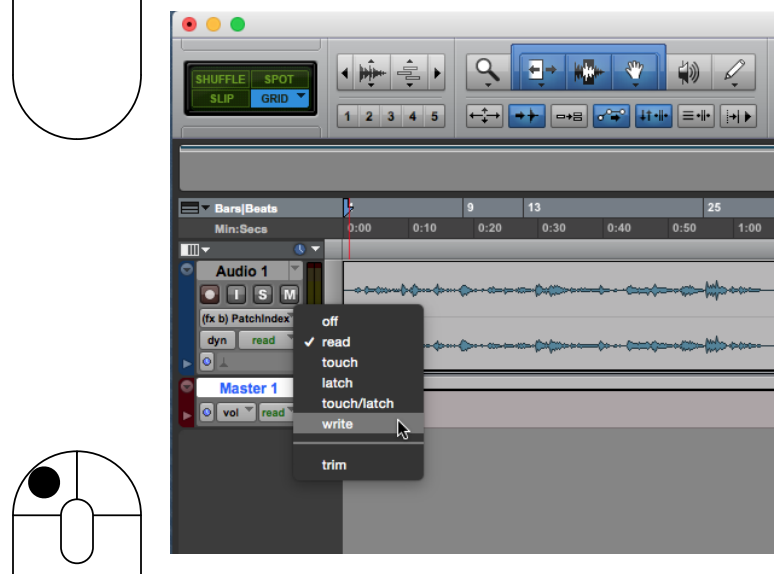
Patch Index Automation (*Quartet only*), continued

On the track that Quartet is processing, select that the track automate the patch index parameter.









Select write for automation mode and play the track.

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Pro Tools Reference

Patch Index Automation (*Quartet only*), continued

While the track plays, select the desired numbered patch for Quartet to render. When playing stops, the patch cues should be recorded in the track's automation.

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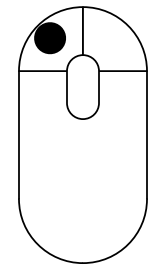
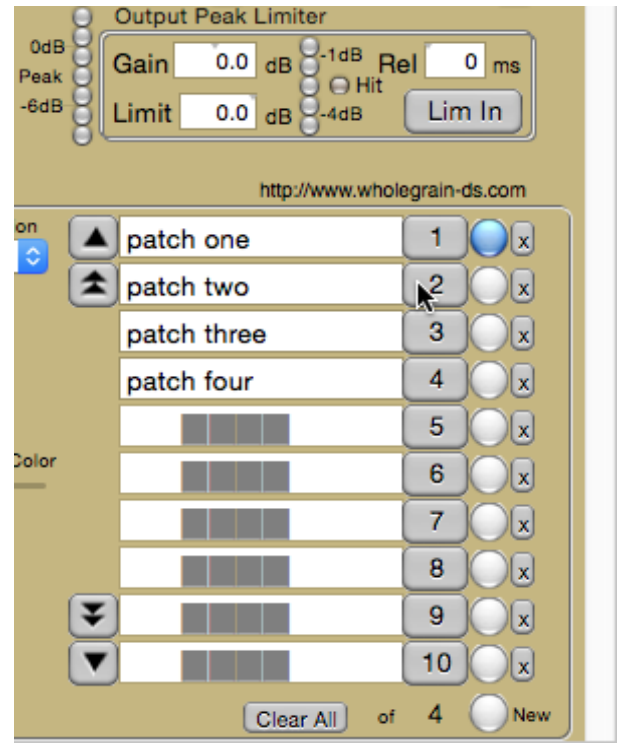
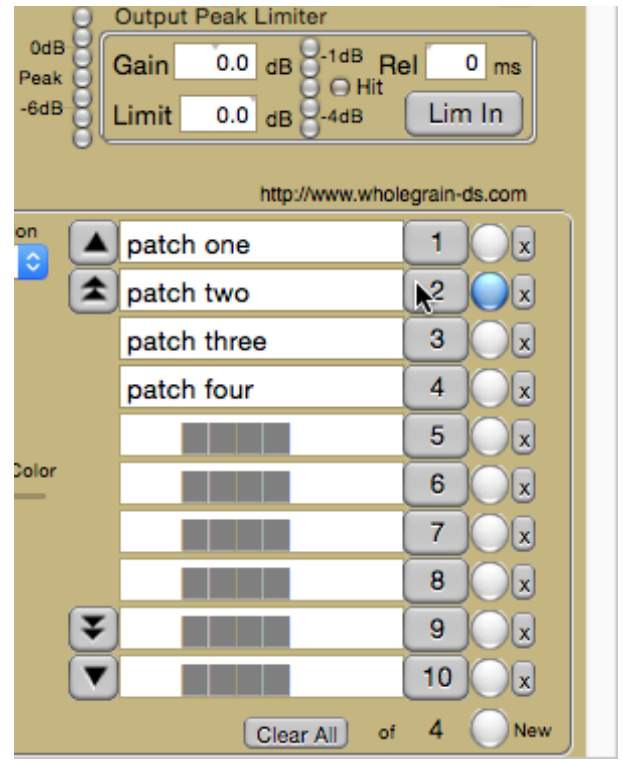
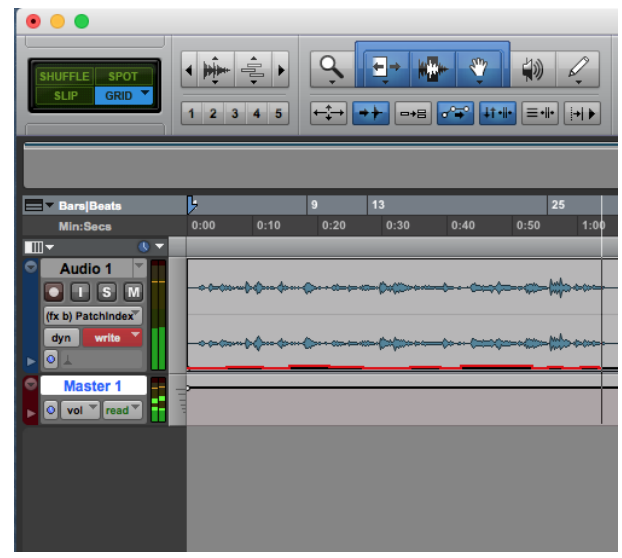
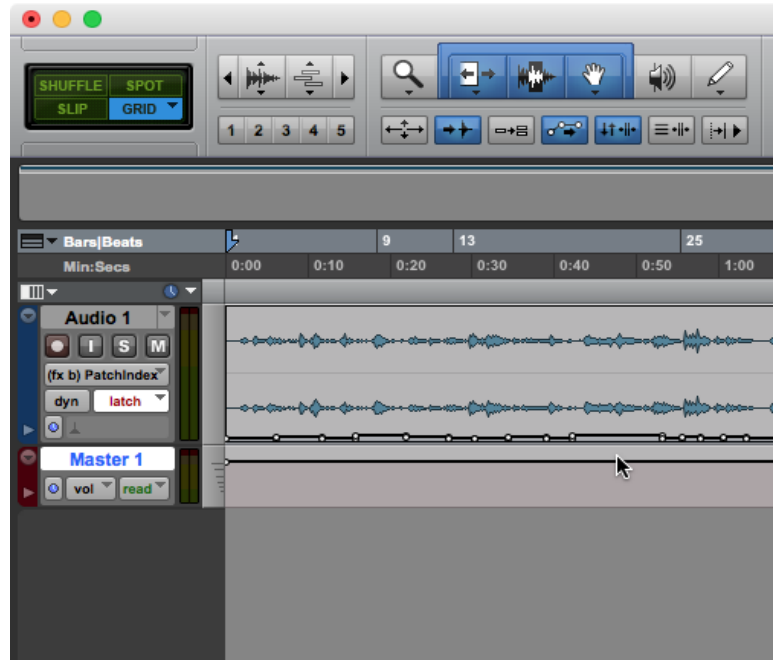








Pro Tools Reference



Patch Index Automation (*Quartet only*), continued

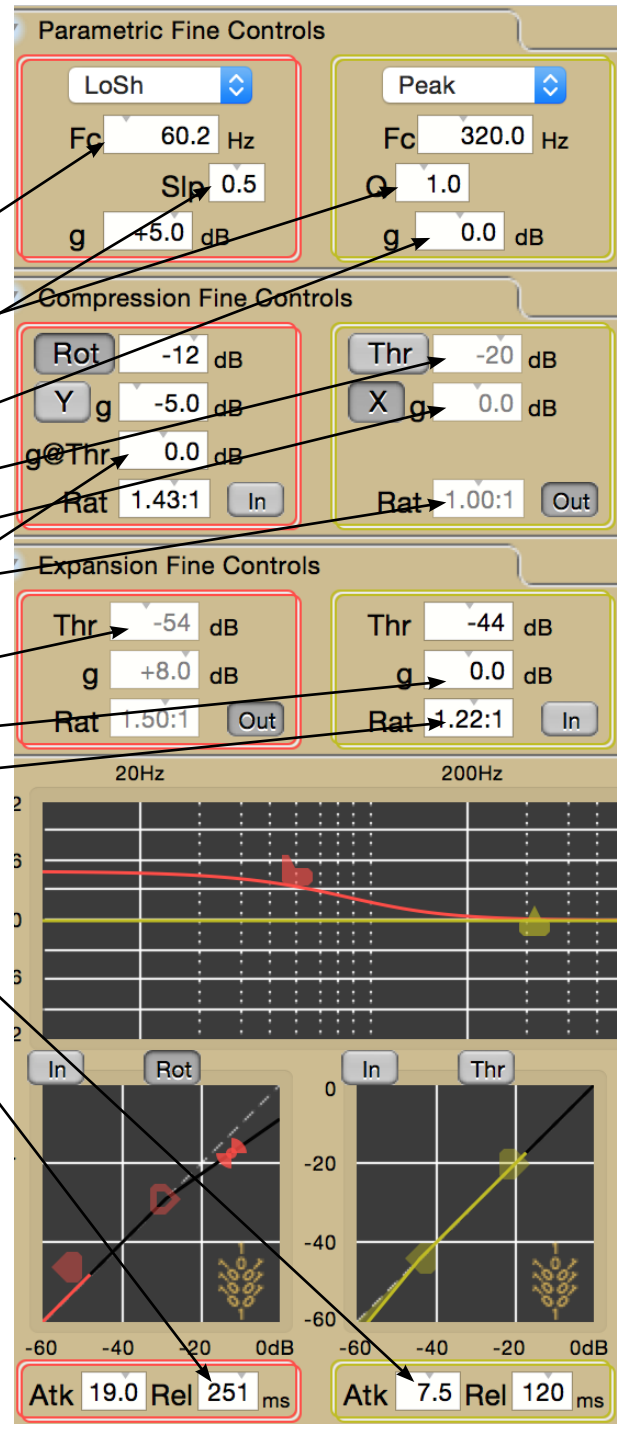
Switch the automation mode back to read. Now on playing the track, the patch number in Quartet will switch according to what was just recorded.

Automation and Control Surface Parameters

All slider-texts on the DynPEQ parameter window are supported in Pro Tools automation. They are also supported on the larger control surfaces, though the layout for smaller surfaces requires the parameter set be abbreviated.

Band Parameter	Slider-Text Label
Frequency	Fc
Q	Q
Slope	Slp
Boost/Cut	g
Comp Threshold	Thr (alt. Rot)
Comp Gain	g
Comp Ratio	Rat
Comp Gain @ Thr	g@Thr
Exp Threshold	Thr
Exp Gain	g
Exp Ratio	Rat
Attack	Atk
Release	Rel

I/O Parameter	Slider-Text Label
Input Gain	Gain
Input DC Cutoff	DC Cut
Output Gain	Gain
Limiter Level	Limit
Limiter Release	Rel



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Pro Tools Reference

Automation and Control Surface Parameters, continued

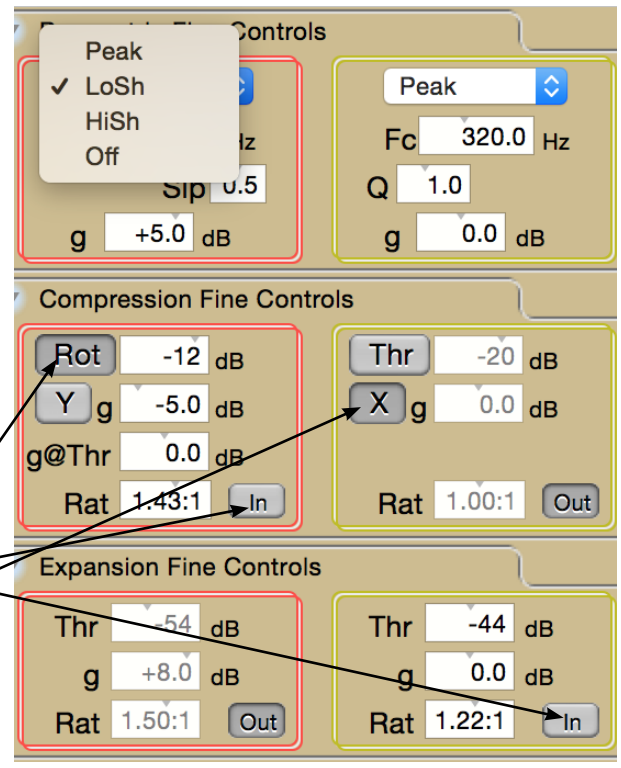
There are three indexed automation parameters that are not mapped to slider-texts. The first is the patch index, described in the previous section. The other two are the band type and dynamics type for each DynPEQ band.

The band type, or just type, parameter is straight-forward. The integer values the parameter can take on are in the range 0 to 3, and each one represents a particular band type. Enter the index value for the band type desired into either the automation control or surface.

Band Type	Type Index
Peak/Dip (Peak)	0
Low Shelf (LoSh)	1
High Shelf (HiSh)	2
Off	3

The band's dynamics type parameter is more tricky in that it represents four toggled settings in one indexed value. The settings are: expansion in/out, compression in/out, compression offset axis (x/y), and compression threshold/rotation point. Each setting adds one value into the overall index if it is in the active state.

Setting	Off State, +0	On State
Expansion	Out	In, +1
Compression	Out	In, +2
Compression Offset	Y	X, +4
Compression Type	Threshold	Rotation Point, +8



These settings lead to the following dynamics type indices for entry into automation or surfaces.

Dynamics Type	Type Index
No dynamics	0
Expansion and Compression, Threshold	1+2 = 3
Compression only, Threshold	2
Compression only, Rotation Point	2+8 = 10
Expansion and Compression, Rotation Point	1+2+8 = 11

Note on Previous DynPEQ Versions and Patch Index Automation

Due to our oversight, the patch index parameter in versions of DynPEQ before 1.4 is scaled incorrectly. On opening a session made with DynPEQ 1.3 and patch index automation, if the current DynPEQ on the system is 1.4 or later the patch indices will be wrong. There are two remedies for this.

- Re-cast the patch index automation in the current DynPEQ session.
- Retain the installer for DynPEQ 1.3, in additon to the installer for your current version, and temporarily revert back to the 1.3 plugins when working with the session. Alternatively, contact Wholegrain support to receive an installer for a previous version of DynPEQ.

We apologize for our error and the troubles it may cause you.

Pro Tools Reference

Limitations on Feedback Support on Large Surfaces

The EQ display on a large control surface should reflect the static EQ settings for each band, i.e. the solid line on the parametric coarse display, added together. The surface display will not reflect changes to the EQ response due to dynamics.

As a large control surface can display a single dynamics curve, this is not compatible with DynPEQ, as there is one independent curve for each band. For Trio, there is no support for the dynamics display of a control surface. For Quartet, the dynamics display is used to show the curve generated by the peak limiter only.

An Appeal for Your Surface Interface Feedback

Our support for control surfaces is in its early stages. At this point, we have very limited access to control surfaces. We ask you to please help us refine the layout and behavior of both Trio and Quartet controls on surfaces. We are also interested in your views on how to support the dynamics display on large control surfaces. Please email your suggestions and observations to *support@wholegrain-ds.com*.

Known Issues with DynPEQ on Pro Tools

The following anomalies are known to Wholegrain, and we are working with Avid on solutions to the following.

In Quartet, the mono version of the plugin supports the sidechain channel. However, since the number of channels do not match, Quartet does not support the sidechain for all multi-channel formats. The sidechain key button will appear on the window of multi-channel Quartet instances. Assigning a sidechain to multi-channel Quartet will not behave as intended.

The HDX DSP version of Quartet will mis-report the percentage of DSP chip occupied in the System Usage window.

In versions of Pro Tools prior to 12.8, executing Save Settings to store the tuning parameters will also store that plugin's project configuration. This means that the Load Settings operation may adversely affect the UI configuration, such as window segment open/closed status, the A/B registers in the case of Trio, or the patch store in the case of Quartet. This issue no longer applies for current versions of Pro Tools. If you are using Pro Tools prior to 12.8, we suggest using the multiband toolchest to save and restore the band settings in case the Load Settings behavior gets annoying.

Other AAX Workstation Compatibility

The DynPEQ plugins also work with other AAX workstations, which of this writing is Media Composer version 2018.7 and up. The performance for other AAX workstations may differ from Pro Tools. For example, changing parameters via dragging the mouse over an extended period will degrade the performance in Media Composer. We recommend using DynPEQ in Media Composer with band toolchest entries refined via Pro Tools and light parameter editing.

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