DMG AUDIO

AUDIO TOOLS CRAFTED WITH LOVE

DMG AUDIO MULTIPLICITY

| PRESET | DIFF | ↺ | ↻ | A | COPY TO | SETUP | ⏻ |

0dB
-12dB
-24dB
-36dB
-48dB
-60dB
-72dB
-84dB

24dB
18dB
12dB
6dB
0dB
-6dB
-12dB
-18dB

-9.4   -9.4
12.0
6.0
0.0
-6.0
-12.0
1.1   1.4

S B X

| 3 : BPF | 2 : XOVER | 5 : XOVER | 6 : HPF | + |

24
16
8
0
-8
-16
-24

THRESHOLD	0.0dB	FREQUENCY	15.8kHz	ATTACK	3.15ms	DRY GAIN	OFF	IN TRIM	0.0dB
RATIO	1.00:1	GAIN	0.0dB	REL SLOW	200.00ms	RATIO BELOW	1.00:1	OUT TRIM	-1.0dB
CEILING	24.0dB			REL FAST	20.00ms	FLOOR	24.0dB	WET/DRY	100%
KNEE	0%			REL RMS	50.00ms	DEADBAND	0.0dB	AUTOGAIN	OFF

SC EQ – RESPONSE -5.0   0.0   M/S – L/R   BOTH   DYN/TRAN   DYN   CREST   6.0dB   SHAPE   LIN

SIDECHAIN   →

ADVANCED   X

GLOBAL

ⓘ **Input trim is gain applied before any other processing.**   X

MULTIPLICITY

Contents

1 Introduction

1.1 System Requirements

1.1.1 Windows

Multiplicity works with Windows Vista, 7, 8 and 10, 32bit and 64bit.
VST, VST3 and AAX are supported in both 32bit and 64bit hosts.
Your graphics card must support OpenGL2; this should include most cards, though performance with integrated Intel graphics may be poor.

1.1.2 Mac OS

Multiplicity requires OS X 10.7 or newer on Intel Mac.
VST, VST3, AU and AAX are supported in both 32bit and 64bit hosts.

1.2 Installation and Setup

1.2.1 How to Install on Windows

You need two files to install; the plugin installer and the licence file. Both are available from the Downloads page of the DMGAudio site whilst logged in. For a 30-day demo, download the installer and click 'Demo' on the Downloads page to request a demo licence file to be emailed to you.
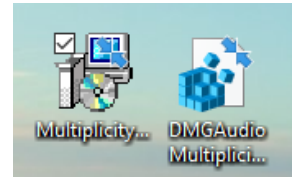
Double-click license.reg, and this box will open:
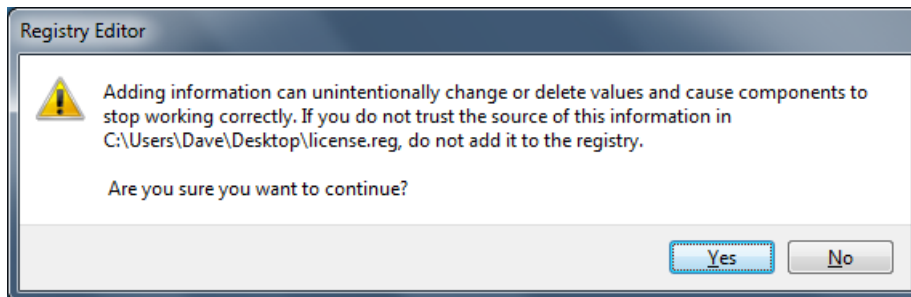
Click "Yes" and the license is installed. Now double-click the zip-file which contains the installer. Double-click the installer; it will look like this:
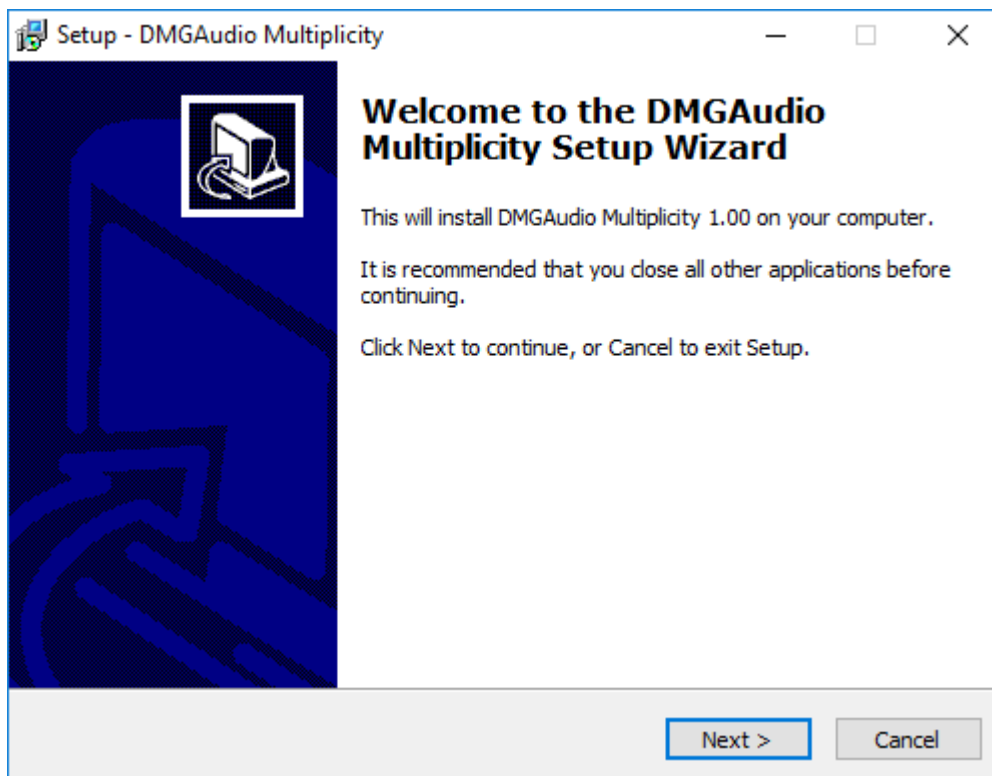
Click "Next" (changing any options if you need to), and Multiplicity is installed!
Reload your host, and enjoy!

1.2.2   How to Install on OS X

You need two files to install; the plugin
installer and the licence file. Both are available
from the Downloads page of the DMGAudio site
whilst logged in. For a 30-day demo, download the
installer and click 'Demo' on the Downloads page
to request a demo licence file to be emailed to you.

If you are using Safari, one or both of
these files may be automatically unzipped
for you. If not, double-click them to decompress
them, so you get this:

Double-click "license.command" to install
the license. The license will install, and
you'll get the following message to confirm:

Now double-click the installer, and it
will launch. It looks like this:
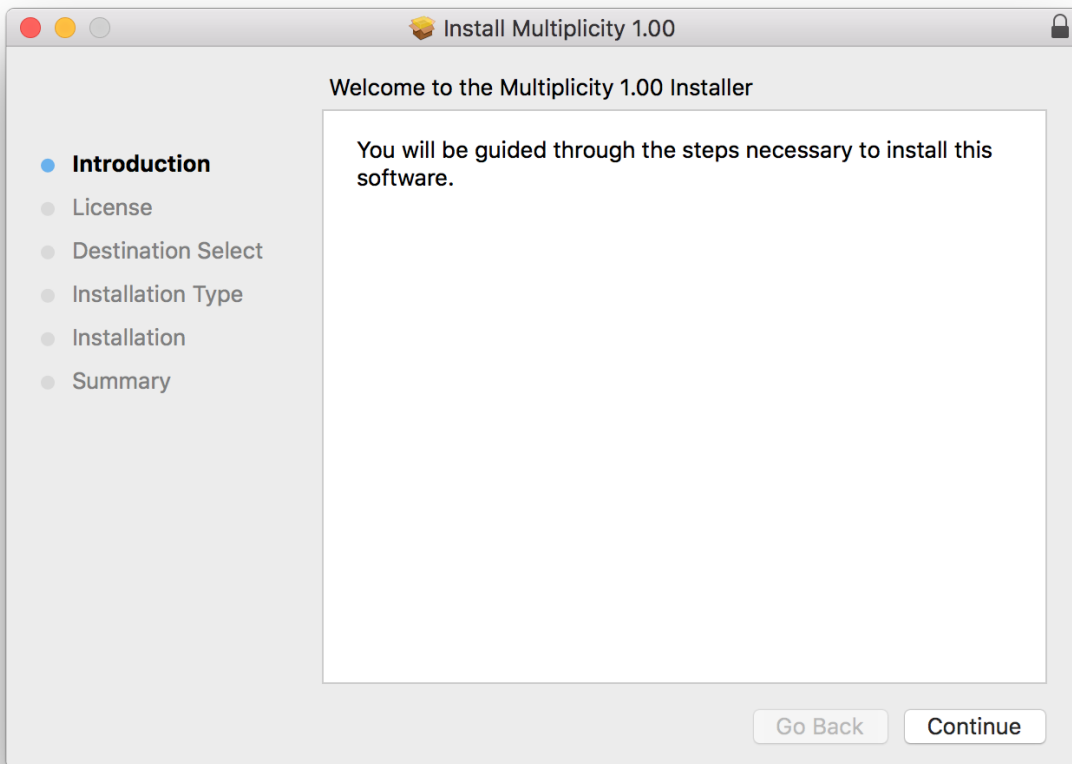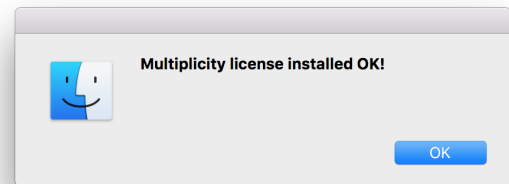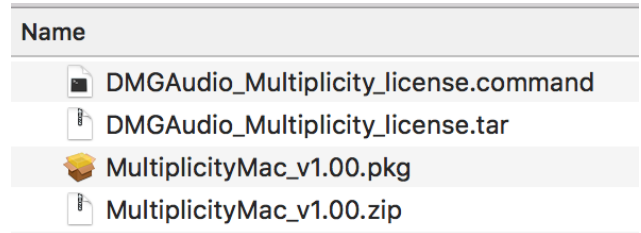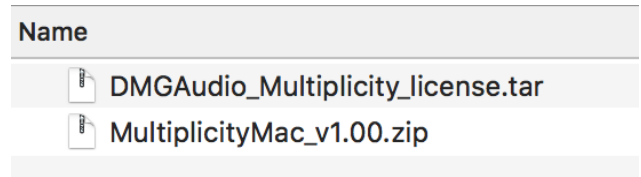
Click through until it installs, and everything is set! Now relaunch your host and enjoy!

2   The Multiplicity Story

I think it's fair to say that it's taken me a long time to find a design for a multiband processor I really believe worthwhile. Multiband designs are necessarily complicated and all too often the remedy is to reduce the degree of control on offer. I think our design manages to avoid this pitfall, so you can get great sounding results without having to compromise.

It's always been true that multiband and dynamic EQ are related in terms of how they're used and what they achieve, but it's taken a lot of consideration to achieve a synthesis of the two that works. Our strategy has been to observe and analyse the needs of mastering engineers and to design around that whilst offering further opportunities. Moreover, dynamics processing has been quietly evolving over the last few years and being able to address issues with transients has become especially important for achieving the necessary degree of control.

One of the major elements that made our limiter (Limitless) so successful was its ability to differentiate between transients and dynamics and apply different processing to each case. In Multiplicity we've taken things a step further. Without the requirement to limit peaks we are able to achieve a far greater depth of control over the results.

I have an ambition that it should be possible to master entirely in software and in doing so achieve better results, by obviating the need to transfer through converters. As such, our design needed to be able to outperform the regular analogue outboard units in both euphony and control. There are often scenarios where the material benefits from a particular character of processing, so we've designed Multiplicity to allow tuning the character to taste.

In the heyday of Apple the most exciting announcements were the "one more thing..." moments, where our expectations were suddenly exceeded with news of something new and unexpected. The hope with Multiplicity is to replicate that excitement with a series of "one more thing..." features. It's multiband... and also dynamic EQ. It's a dynamic processor... and also it allows detailed transient control. It's a compressor... and an expander... both above and below the threshold... independently. It has adjustable lookahead... per band! It has adjustable crossover slope... per band!

There's no getting around the fact that Multiplicity has a lot of controls, but we've worked hard to keep them manageable. Most of the complexity comes from the new possibilities of what you can achieve with it; things that were previously only ideas or hopes. I feel it's safe to say that there are no other processors that can do what Multiplicity can do for you. We hope you find new and exciting ways of using it to open doors to new and greater things. Our beta team has been very excited about this plugin. We hope it exceeds your expectations too!

Team DMG, Jan 2019

3 Overview of use

3.1 Theoretical Overview

Multiplicity is a highly versatile dynamics processor, allowing flexible routing of up to 8 bands. The routing for a band is determined by its type, which can be set to one of three options:

- XOVER (crossover) - If any band is set to XOVER, the signal will be split into separate frequency bands covering the entire spectrum. This allows individual dynamics processing for each band as with a traditional multiband compressor. The number of crossover bands determines the number of splits: 1 band requires no splits (wideband compressor), 2 bands requires 1 split, 3 bands requires 2 splits etc.. The band crossover frequencies can be set freely by the user. It is possible to use Multiplicity without any crossover bands, in which case the signal bypasses the crossover stage entirely.

- PRE - These are dynamic EQ bands that apply processing in series before the signal is split by the the crossover bands.

- POST - These are dynamic EQ bands that apply processing in series after the signal is recombined following the crossover stage.

You can combine some bands together to form a crossover, use some as PRE or POST dynamic EQ bands, and leave any you don't need off to save CPU.

On the UI you'll see a set of tabs, one per band, which can be clicked to access the parameters for each band. The crossover band tabs are always grouped together in order of ascending frequency from left to right. Any PRE band tabs will appear to the left of the crossover bands and any POST band tabs will appear to the right of the crossover bands. PRE and POST band tabs can be dragged around to change the processing order. This also means that you can drag a PRE band tab to the right of the crossover bands to make it a POST band, and vice versa. Roughly speaking, processing can be understood to take place left-to-right through the list of bands.

Crossover bands have **FREQUENCY** and **SLOPE** parameters, which set the frequency and slope of the crossover at their upper-frequency edge. The lowest crossover band is a low-pass filter, the highest is a high-pass filter, and any in-between are band-passed signals.

Dynamic EQ (PRE/POST) bands allow you to filter a part of the spectrum for processing and mix it back into the rest of the signal. Depending upon how you set the routing, this processing takes place before it gets passed to the next dynamic EQ band in the chain, gets split and fed to the crossover bands, or gets sent to the plugin output. These bands have selectable filtering properties, including high-pass, low-pass, band-pass and wideband, with differing designs that variously include **FREQUENCY**, **SLOPE** and **Q** controls.

Every band has a **GAIN** parameter, allowing for EQ-like control before introducing any dynamic processing, and also a **DRY GAIN** parameter for implementing parallel compression.

In addition to the signal it processes, each band receives a sidechain signal used to trigger the dynamic behaviour. The sidechain signal will, by default, be the same as the primary input to the band (BAND). It can also be set to the wideband input to the plugin (WIDE), an external sidechain signal (EXT) or for crossover bands, the input to any other crossover band. The sidechain signal is passed through a 3-band EQ allowing control over how the frequency content of the sidechain signal affects the dynamic behaviour.

Multiplicity is a stereo processor end-to-end. There are two **M/S - L/R** parameters, one for the processed signal and one for the sidechain signal. These allow you to select a blend of either Mid and Side channels, or Left and Right channels. For the processed signal this weights the processing towards one channel or another. For the sidechain signal this selects which channel is preferred for triggering dynamic behaviour. You can, for instance, allow the Mid to compress the Side. A **SC LINKAGE** parameter is also available. At the default setting of 100%, both processed channels receive the same gain change, determined by an equal mix of the sidechain channels. At 0% they are processed independently, so the Mid/Left sidechain channel affects only the Mid/Left processed channel, and the same for Right/Side.

To compute the gain change from a sidechain signal, a number of stages of analysis are performed. Around each band, a lookahead circuit with corresponding peak hold and smoothing are used to determine the overall time-base for processing. **LOOKAHEAD** time can be set per-band and used to tune the character of the processing. Short lookahead times allow for more aggressive handling of transient material whilst longer times provide an overall smoother gain reduction. With Transient material more aggressive processing may result in a less audible effect, whilst for Dynamic material the reverse is true. We'll come back to targeting Transient material after the next paragraph.

The mechanics of gain computation involve the **THRESHOLD**, **RATIO**, **CEILING**, **RATIO BELOW**, **FLOOR**, **DEADBAND** and **KNEE** parameters. Firstly **THRESHOLD** determines our point of interest, a fixed level which the signal is either exceeding or falling below at any point in time. The **RATIO** determines how much gain reduction (or increase for inverse ratios) is applied when the signal exceeds the **THRESHOLD** level. The maximum amount of gain reduction (or increase) is set by the **CEILING** control. **RATIO BELOW** determines how much gain reduction (or increase for inverse ratios) is applied when the signal is below the **THRESHOLD**. The maximum gain reduction (or increase) when the signal is below the **THRESHOLD** is set by the **FLOOR** control. The **DEADBAND** control creates a space with a 1:1 ratio below the threshold, so a signal will be left untreated when its level is within a certain range of the **THRESHOLD** level (as is typical for speech at dialnorm in a post-production context). The **KNEE** parameter applies an intelligent minimum-curvature smoothing to the transfer curve defined by the other parameters in this paragraph, which can result in a more transparent sound.

The amount of gain reduction or increase is computed instantaneously, but its application depends on further settings. The **ATTACK** control determines how quickly the newly computed gain change

is applied when the gain increase/reduction is moving away from zero. A slow attack can cause short peaks to be missed, as the processing is not responding quickly enough. We refer to these "missed" parts of the signal as Transients. The parts of the signal which the attack is fast enough to respond to are referred to as Dynamics.

The distinction is important, because each band can process just the Dynamics, just the Transients, or a blend of the two. Transients will obey the gain calculation transfer (set with **THRESHOLD**, **RATIO**, **CEILING** etc.) with an attack and release time determined by the **LOOKAHEAD** control. Dynamics will obey the gain calculation transfer with attack and release times configured with the **ATTACK**, **REL SLOW**, **REL FAST** and **CREST** controls. This independence allows for considerable versatility.

When processing Dynamics, the release time determines how quickly newly computed gain change is applied when the gain increase/reduction is moving toward zero. Multiplicity has a dual release system which can switch between FAST and SLOW release times, set by the user. The FAST release time is used when the instantaneous signal level exceeds the RMS level by an amount determined by the **CREST** control (so quick level increases get FAST release, while more gentle increases get SLOW release). To disable the dual release system and use just one of them, you can set **CREST** to either SLOW or FAST. The shape of the attack and release curves can be adjusted using the **SHAPE** control, which allows free adjustment of the timing character between linear (LIN) and logarithmic (LOG).

In summary, each band offers both compression and expansion above and below the threshold, and can have up to two attack times (one each for Transients and Dynamics) and three Release times (one for Transients and two for Dynamics), which are intelligently selected following your settings. All of this can be set in parallel with the unprocessed signal. All filtering is linear-phase and optional oversampling is offered in the Advanced DSP menu to avoid aliasing from intermodulation distortion.

Global **IN TRIM**, **OUT TRIM**, and **WET**/**DRY** level controls are provided. For monitoring purposes an AUTO**GAIN** option allows for a perceptual-level compensated workflow. DIFF signal monitoring allows you to audition what is being changed. For visual feedback there is a spectrum analyser and, for each band, metering and display of the gain calculation transfer curve.

3.2   Practical Overview

- A multiband compressor - create up to 8 crossover bands and set ratios and thresholds per band.

- A multiband upwards expander - create up to 8 crossover bands but use **RATIO BELOW** with an inverse ratio setting to boost the signal below the threshold.

- Introduce parallel processing with the **DRY GAIN** parameter.

- Expand transients by setting the target to Transients and adjusting the **ATTACK** time to target the appropriate parts of the signal of interest. Then set **RATIO** to an inverse ratio setting (expansion) and adjust **LOOKAHEAD** to taste.

- De-ess with a dynamic EQ band, using the Sidechain EQ to isolate the sibilance.

- Use a low-pass dynamic EQ band to compress sub-bass and even out low-frequency content.

- Make snares pop out with a dynamic EQ band configured for upwards expansion, and tune the target between Transients and Dynamics. Then carve out some space after the snare hits with the same sidechain settings, but targeting only the Dynamics with some compression and a tuned release timing. Use the **CREST** parameter to make this work invisibly in a full mix.

- Use a tight-Q BPF dynamic EQ band (such as the EE BPF filter type) to dynamically notch out problem notes or resonances.

- Do all these things at the same time within a single instance!

4 Main Controls

4.1 Global Controls

IN TRIM allows gain adjustment before any processing is applied. It affects the audio input but not any external sidechain input.

OUT TRIM allows gain adjustment after band processing is applied.

WET/**DRY** allows crossfading between the unprocessed and processed signals, usually for monitoring purposes. Clicking the **WET**/**DRY** label toggles between 0% and 100%.

AUTOGAIN uses an ITU-1770 perceptual loudness algorithm to compute the perceived gain change between input and output signal levels and adjusts the **OUT TRIM** to compensate. Adjusting the **OUT TRIM**, the **DIFF**, or engaging **SOLO**/**SIDECHAIN LISTEN** will temporarily disable **AUTOGAIN** functionality.
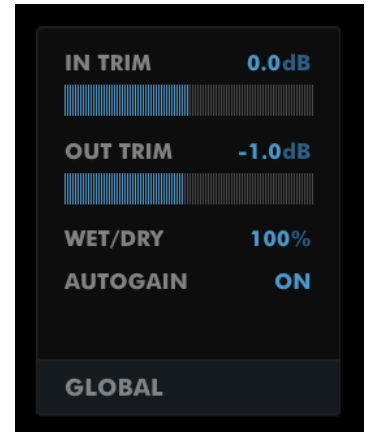
4.2 Band Controls
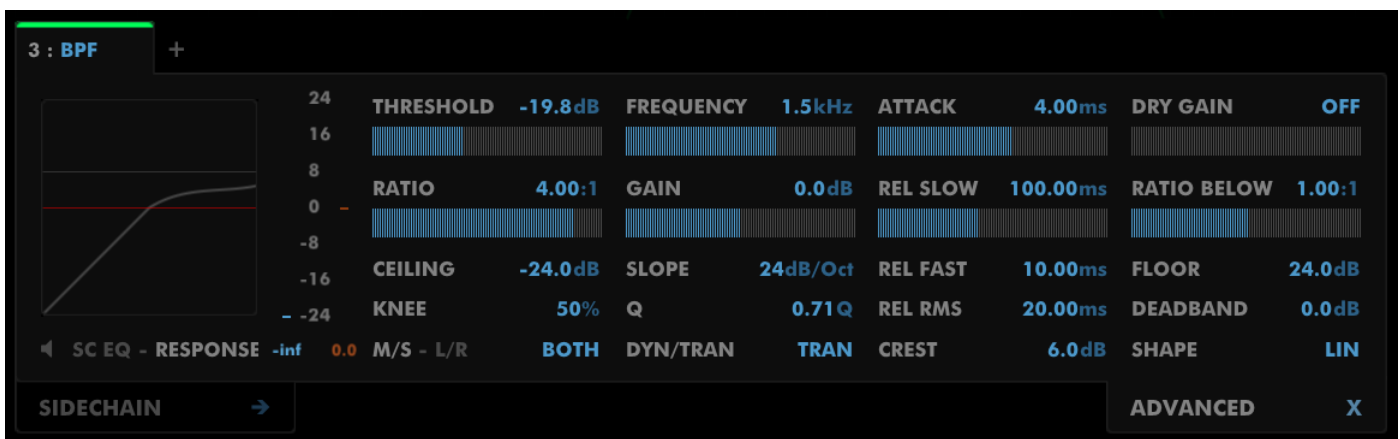
THRESHOLD sets the operating level for the band. Above **THRESHOLD**, **RATIO** and **CEILING** apply. Below **THRESHOLD**, **RATIO BELOW** and **FLOOR** apply. If multiple bands are selected (via the Main Graph) this control will simultaneously make a relative adjustment to the **THRESHOLD** of all other selected bands.

RATIO determines the compression or expansion ratio to be applied when a signal is detected which exceeds the **THRESHOLD** level. Alt-drag the **RATIO** control to snap to useful values.

CEILING configures the maximum amount of gain reduction/increase allowed for the band when signals exceed the **THRESHOLD**.

M/S - L/R is a dual-control used to determine how gain reduction/increase should be applied to the

band. When M/S is selected, the band is Mid-Side encoded for gain processing, and the value to the right is used to assign whether processing is directed towards affecting the MID channel, BOTH channels, the SIDE channel, or some combination of the two. Intermediate values between MID and BOTH (such as 25%) will fully compress the MID, and will apply reduced gain change to the SIDE. Values between BOTH and SIDE (such as 75%) will fully compress the SIDE, and will apply reduced gain change to the MID. When L/R is selected, the band is treated as a Left-Right pair, and the value to the right is used to assign whether processing is directed towards affecting the LEFT channel, BOTH channels, the RIGHT channel, or some combination of the two. Intermediate values between LEFT and BOTH (such as 25%) will fully compress the LEFT, and will apply reduced gain change to the RIGHT. Values between BOTH and RIGHT (such as 75%) will fully compress the RIGHT and will apply reduced gain change to the LEFT.

KNEE is used to smooth the curve used for the calculation of gain reduction/increase, as shown in the **RESPONSE** graph immediately to the left. With **KNEE** at 0%, the curve is precisely as described by the other settings. With **KNEE** at 100%, a very gentle curve blends through the key points of the graph.

FREQUENCY determines the key frequency around which processing will take place. For BPF bands, the **FREQUENCY** determines the center of the band. For LPF and HPF bands, the **FREQUENCY** determines the frequency at which 3dB of attenuation has been applied. For Crossover bands, the situation can be more complex depending on **SLOPE** settings, but generally represents the center frequency of the band. If multiple bands are selected (via the Main Graph) this control will simultaneously make a relative adjustment to the **FREQUENCY** of all other selected bands. Shift-Ctrl/Cmd click on the **FREQUENCY** value to display it as note value and cents.

GAIN sets the static gain increase or reduction applied to audio passed through the band. If multiple bands are selected (via the Main Graph) this control will adjust the **GAIN** of all other selected bands, scaled relative to 0dB.

SLOPE For Crossover bands this sets the slope of the band-edge above the **FREQUENCY** setting. For dynamic EQ bands this sets the slope for the selected filter type. Crossover bands have settings adjustable in 1dB/oct increments. Other bands (where **SLOPE** is available) have slope adjustable in 6dB/oct increments. The BPF Butterworth band type allows independent adjustment of both slopes above and below the **FREQUENCY** setting.

Q is shown for some dynamic EQ band types, and allows adjustment of the bandwidth of the processed audio independent from the **SLOPE** setting.

DYN/TRAN determines whether gain change is focussed on Dynamic material (after attack time), Transient material (before attack time), BOTH, or some combination of the two. Intermediate values between DYN and BOTH (such as 25%) will fully process the Dynamic material, and will apply reduced gain-change to Transient material. Values between TRAN and BOTH (such as 75%) will fully process the Transient material and will apply reduced gain-change to Dynamic material. Click on the parameter label to instantly switch between DYN (0%) and TRAN (100%).

ATTACK determines how quickly the band's gain can change in response to Dynamic material in the incoming signal. In doing so, it also allows you to configure the distinction between Transient and Dynamic content. A slower attack will miss short peaks which will mark more of the signal as Transients.

REL SLOW determines how long the band's gain change takes to return to zero. It applies to Dynamic material that does not meet the **CREST** requirement for a fast release.

REL FAST determines how long the band's gain change takes to return to zero. It applies to Dynamic material that meets the **CREST** requirement.

REL RMS is used to configure the time-base for RMS (Root Mean Square) calculations alongside the **CREST** value. Smaller values will ignore very low-frequency content and make usage of **REL SLOW** more common, whereas larger values make **REL FAST** more common.

CREST is the primary control for configuring usage of **REL FAST** and **REL SLOW**. The instantaneous signal level must meet or exceed the RMS level by **CREST** dB to select **REL FAST**. Hence, when **CREST** is set to 0dB, only the **REL FAST** timing is used. At the other extreme, only **REL SLOW** is used. In general usage, a value of 6dB provides for a reasonable balance. Using Setup->Instance Prefs->Release->Flash Labels can help with configuring the **CREST** and **REL RMS** values.

4.3   Advanced Controls

DRY GAIN is used for parallel compression effects and allows you to mix the unprocessed audio in with the processed audio within the band.

RATIO BELOW determines how audio below the **THRESHOLD** should be treated, acting as a gate/expander or upwards compressor. Alt-drag the **RATIO BELOW** control to snap to useful values.

FLOOR determines the maximum gain reduction or increase that can be applied while the signal is below the **THRESHOLD** level.

DEADBAND is used to specify a range below the **THRESHOLD** where the signal will be treated with a 1:1 ratio.

SHAPE allows you to adjust the shape of the attack/release curves for Dynamic material between LOG (0%) and LIN (100%). Set to LIN, the attack/release curves are calculated in terms of linear signal level, akin to some older hardware dynamics processors. Set to LOG, the attack/release curves are calculated in terms of dB signal level, which is more reminiscent of modern dynamics processors. You can blend freely between the two, and this can often be helpful in cases where the character of dynamic behaviour you require needs to be adjusted to match the audio being processed. Click on the parameter label to switch instantly between LOG (0%) and LIN (100%).
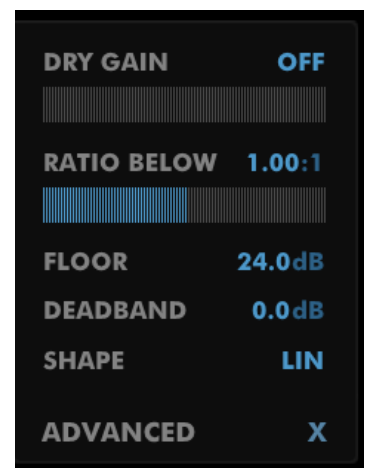
4.4 Sidechain Controls

SC TRIM applies a fixed gain to
the sidechain signal on the band.
It acts as an offset to the **THRESHOLD** control.

SOURCE allows you to select the
signal that will be used to trigger
processing for the band. You can select
between the wideband signal (WIDE), the
audio being processed by the band (BAND),
or the external sidechain signal (EXT). For
crossover bands, you can also select the input
to any other crossover band as the source.

SC M/S - L/R is a dual-function control which
allows you to select whether the **SOURCE** signal is to be Mid-Side encoded or treated as a stereo
Left-Right pair. The control further allows you to choose whether processing will be triggered by the
LEFT/RIGHT/MID/SIDE/BOTH channels, or some intermediate value between the two. This control
functions the same way as the band **M/S - L/R** control (see Band Controls **M/S - L/R**).

SC LINKAGE allows you to have both channels processed independently (DUAL), or as one
(LINKED), or some intermediate value.

LOOKAHEAD sets the lookahead time for processing the band, and correspondingly provides the
timings for the processing of Transient material (if this is selected). Short times will create more
distortion, but for a shorter duration, whilst longer values create less distortion, but the
corresponding gain change may become audible. As such, this control must be adjusted to suit the
material being processed.

SC LISTEN is a small speaker icon below the band's graph. Click this to audition the SOURCE
signal, processed by the sidechain EQ.

SC EQ is a 3-band multi-function EQ for tailoring the signal used to trigger processing. The lowest
band can be configured as a high-pass filter, with Frequency, Q and Slope controls, or a low-shelf
EQ band with Gain, Frequency and Q controls. The mid band can be configured as a peak or a
band-pass filter, both with Gain, Frequency and Q controls. The highest band can be configured as
a low-pass filter, with Frequency, Q and Slope controls, or a high-shelf EQ band with Gain,
Frequency and Q controls.

RESPONSE is a graph centered around the **THRESHOLD** level, showing the resulting transfer
curve for the **RATIO**, **RATIO BELOW**, **CEILING**, **FLOOR**, **DEADBAND** and **KNEE** parameters as
applied to the selected band. Instantaneous values are animated on the graph, so you can see
what the band is doing.
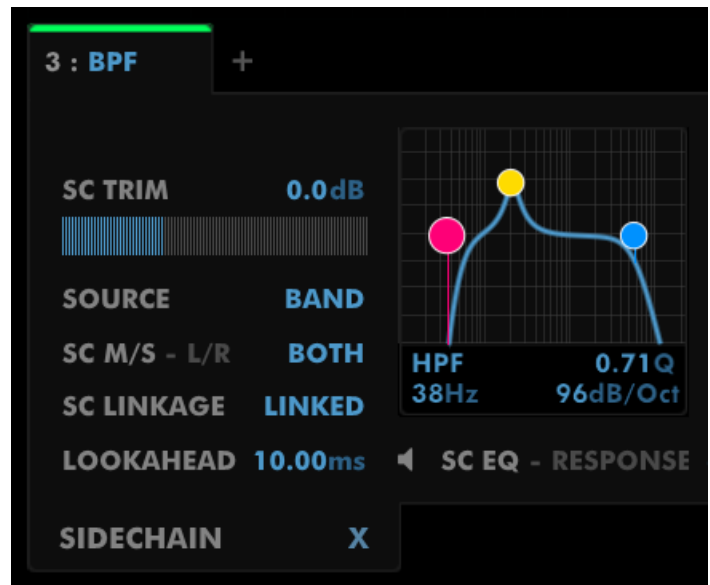
METERING is provided beside the graphs, showing the instantaneous level measured for triggering processing, and the corresponding gain increase/reduction. Dynamic response is drawn in red, and Transient response in white. Right-clicking in this area opens a menu allowing you to select whether the display shows Dynamics, Transients or Both and which channel (Mid, Side, Left, Right, or the maximum) is displayed. This menu also allows you to toggle Zoom mode for fine-resolution metering.

4.5   The Main Graph

The Graph provides a graphical representation of all the bands. Each band has a representative node, positioned at the **FREQUENCY** and **GAIN** that the band is set to. Dragging these around will update the bands, which allows the Graph to be used as an EQ. Hovering over a node will open a tooltip offering appropriate parameters for adjustment of the band. The following actions are also available on the Graph:

- Use the mousewheel on a node to adjust **SLOPE**. If the band type has a **Q** control the mousewheel will be assigned to that instead and you can use Alt+mousewheel for **SLOPE** adjustment.

- Use Ctrl/Cmd+mousewheel on a node for gain-locked **FREQUENCY** adjustment.

- Click on a node to select the corresponding tab for the band.

- Right click and drag a node to temporarily engage solo for the band.

- Double click or Ctrl/Cmd click on a node to change the bypass state for the band.

- Alt-double click or Alt-Ctrl/Cmd click on a node to delete the band.

- Double click or Ctrl/Cmd click in empty space to add a new band.

It is possible to select multiple bands on the graph. Do this by dragging a lasso around the desired nodes or by shift-clicking on nodes to add them to or remove them from the current selection. You can hold shift whilst dragging a lasso to add nodes to the current selection too. With multiple selection, **GAIN**, **FREQUENCY** and **THRESHOLD** can be relatively adjusted for all selected bands simultaneously. Note that **GAIN** adjustments are scaled relative to 0dB. You can also change the bypass state of all selected bands using double click or Ctrl/Cmd click on any selected node.

The graph draws the frequency response corresponding to each band's shape settings, plus a curve to indicate the instantaneous frequency response as a result of dynamic processing. Additional nodes are plotted on the graph to show the Crossover band frequencies. These can be dragged to adjust the **SLOPE** of the crossover. The Graph also includes a spectrum analyser, for detailed monitoring of spectral content. Ctrl/Cmd+Mousewheel can be used to zoom the dB range displayed, while the blue bar at the bottom (or regular Mousewheel away from a node) can be used to zoom the frequency range displayed. Alt-dragging on the graph allows you to select an area to zoom.

4.6   PPM/GR Meter

The main meters show the output signal levels, alongside
a dB sum total of the gain reduction (GR) activity. When
bands are configured such that some increase gain whilst
other bands reduce gain, cancellation may occur, so precise
metering values should be taken from the individual band GR meters.

Right-clicking the meters engages "zoom" mode, which
will display a linear range in dB zoomed in on the GR that's active.
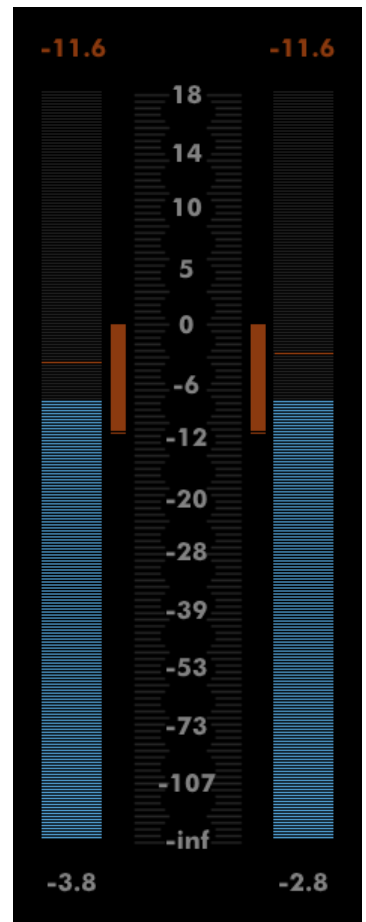
5 Organising Bands

5.1 Dragging

Dynamic EQ bands can be re-ordered by dragging their tabs into a new order. Audio is processed left-to-right through the bands, so all PRE bands are to the left of the crossover, and all POST bands are to the right.

5.2 Add Bands

Clicking the + icon allows you to choose a new band type to be created.

5.3 Band Menu

5.3.1 Presets

Since each band has many parameters, a separate mechanism exists for managing presets for individual bands. Under the Presets menu, you have the option to Save the current band's parameters as a Band Preset, to Load parameters from a Band Preset, to Save the current band as your new default (settings that will be used when creating new bands), or to reset the current band to default. Note that not all parameters (**SOLO**, **BYPASS**, **FREQUENCY**, **SLOPE**, **Q**) will be saved with a Band Preset. In addition, Multiplicity includes a set of factory band presets, which are displayed on this menu. Saving to the default folder (or a subfolder) will cause them to appear on this menu. Selecting any of these presets will load it to the current band.

5.3.2 Types

Next on the menu is a set of Types that can be selected for a band. You can move a band into the Crossover by selecting XOver, or select between BPF, LPF and HPF for a Dynamic EQ band. The More submenu offers Butterworth BPF, LPF and HPF, which have steeper slopes, an EE BPF, which allows for extremely narrow Q, and Flat, which allows you to process the wideband signal. The Butterworth BPF band type also allows for independent adjustment of high and low slopes.

5.3.3   Copy Band To

Copy Band To allows you to copy the settings from the current band to any other band.

5.3.4   Sort Bands Into Order

Sort allows you to sort bands into numerical order without affecting the processing order. This is a cosmetic result, but may have the consequence of causing any automation of the band parameters for that instance to replay incorrectly. As such, selecting this will open a confirmation dialog. This confirmation dialog can be disabled in Setup->Global Prefs->Misc.
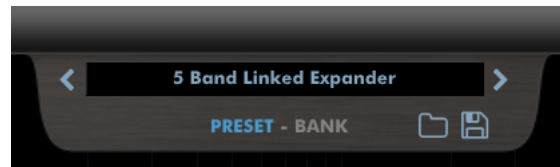
5.3.5   Lock/Link

Each individual parameter can be locked or linked to others. These menu options allow you to lock or link all parameters of this band. A submenu on each option allows you to select whether Locking/Linking is applied to just this band, or to others as well.

6 Other UI

6.1 The Menu Bar

6.1.1 Preset

Pressing this button will pop out the Preset tray. See Presets.

6.1.2 DIFF

Selecting **DIFF** will audition the difference between input and output signals, so you can hear what is being changed.

6.1.3 Undo / Redo

A full undo/redo for any parameter changes on the UI.

6.1.4 A/B and Copy To

Multiplicity maintains 8 banks of controls at all times, so you can easily A/B (or A/H) through different variants of your settings.

For example, you might create a curve, then use **Copy To** to copy it to B, then modify that a little and keep going to get as many different settings as you want to evaluate. Then you can use the A/B menu to audition each setting.

If you'd like the auditioning process to happen with one click, simply right-click on the A/B button. You can configure (in Global Prefs, A/B Toggle) whether this toggles between the last two banks you visited, or between all banks you've visited.

6.1.5   Setup Panel

This opens the Setup Panel, which allows further configuration of Multiplicity. See Preferences and Options.

6.1.6   Bypass

The Bypass button bypasses all processing within Multiplicity and routes the input directly to the output.

6.2 Presets

Multiplicity includes a set of presets, which you can add to, to build up your library of settings.

By default, on OS X they reside at /Library/Application Support/DMGAudio/Multiplicity/Presets/ and on Windows, at C:\Users\<you>\Documents and Settings\DMGAudio\Multiplicity\Presets\.

You can change the location of the presets on Windows by re-running the installer and changing the "DMGAudio Multiplicity resources folder" path during the install.

Saving presets into these folders will allow you to select them from the Preset menu.

Don't forget to include these files in your backups.

6.2.1 Previous / Next

These buttons allow you to quickly jump back and forward within the list of presets. They grey out to show you when you've reached the start or end of the list.

6.2.2 Preset Menu / Name

This shows the Preset name which can be modified with a right-click. Clicking here will open the Preset Menu, which is a multi-level menu of all of the presets you currently have saved.
You can arrange this folder to suit your needs, but be aware that installing updates will reinstall the factory set.

6.2.3 Preset / Bank

Banks contain your full set of A/B settings, whereas a Preset contains only the values displayed onscreen for the current A/B bank. Using this selector, you can choose whether to save Banks or Presets, and whether to load a Preset into the current A/B bank, or to load a Bank to replace all settings in all A/B banks.

6.2.4 Load / Save

Use these buttons to open a window to save or load presets/banks as selected.

6.3   Parameter Menu

Right clicking on a parameter will open a menu offering a variety of options, where applicable, for working with the parameter.

6.3.1   Lock/Unlock

This will lock the parameter, making further adjustments impossible (with the UI, automation or MIDI) until unlocked. Where appropriate, you have the option of locking/unlocking the corresponding parameters on other bands. You can also quickly lock a parameter by Alt-Shift clicking on it. Note that locking parameters holds when switching A/B banks, but does not hold when switching presets. When you load a preset, all parameters unlock, apart from the parameters that were locked when that preset was saved.

6.3.2   Propagate

This is used to copy the value of the selected parameter to the equivalent parameter for other bands. A submenu allows you to select which other bands will be copied to. You cannot copy a value to a locked parameter.

6.3.3   Link

This is used to link the selected parameter with the corresponding parameter for other bands. Linking is absolute i.e. the value will be the same across all linked bands. A submenu allows you to select which bands to link to, or just to link/unlink the current parameter from the group. Note that linking parameters holds when switching A/B banks, but does not hold when switching presets. When you load a preset, all parameters unlink, apart from the parameters that were linked when that preset was saved.

6.3.4   Learn

All parameters can be MIDI Learned. Selecting Learn will flash the control until a MIDI CC value adjustment is received, at which point the mapping is established. MIDI mapping is global for all instances. Once a parameter has been mapped to a CC, this menu provides information on which CC number was mapped and allows you to unlearn the parameter.

7 Advanced DSP

The Advanced DSP section offers additional controls for processing.

7.1 Oversampling

Realtime selects an oversampling mode to be used while processing in realtime. Options are: Off, On, On HQ (requires more CPU). All oversampling is 2x, which is sufficient for elimination of aliasing in a dynamic processor. The HQ mode uses higher specification antialiasing filters.

Offline selects the oversampling mode to be used when rendering offline (if this is supported by your DAW).

LOG AR provides compatibility for presets saved with version 1.00 of Multiplicity, owing to a past issue with attack/release curve shape. This will automatically be set correctly on loading a preset and should not need to be changed by the user.

Range sets the maximum values for the **CEILING** and **FLOOR** parameters.

Ratios allows extreme compression and expansion ratios when set to Extended.

8   Preferences and Options
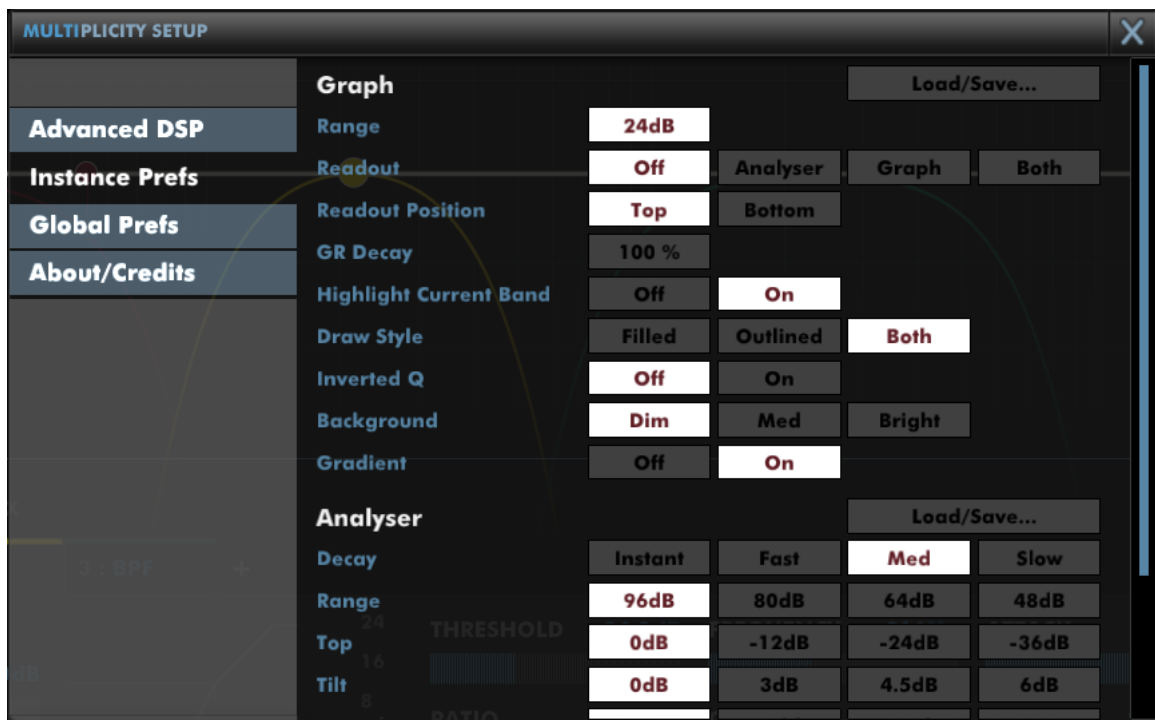
8.1   Instance Prefs

The settings in Instance Prefs are per-instance and can be saved with a preset.

8.1.1   Graph

Range determines the degree of vertical zoom for the main graph in dB.

The **Readout** values, if selected, are displayed at the top of the main graph.

GR Decay allows you to apply a smoothing to gain reduction (GR) values, to ensure you can read the maximal GR values applied to the signal on the main graph.

Highlight Current Band, when enabled, will highlight the band corresponding to the currently selected tab highlighted on the graph.

Draw Style allows you to set how the band attributions on the main graph are drawn.

Inverted Q will swap up/down movements when dragging **Q** parameters on the graph.

Background sets the brightness of the log bars.

Gradient will turn the graph background fade on or off.

8.1.2   Analyser

Decay sets the decay time for the smoothing of the response. The attack characteristic is always an instantaneous peak-type response.

Range sets the range of the graph in dB.

Top allows you to reduce the highest gain level shown on the graph.

Tilt tilts the spectrum readout. With no tilt, white noise is rendered flat, otherwise the spectrum is tilted to reduce low frequencies and boost high frequencies in the readout.

Smoothing allows you to have the response smoothed for a less detailed view.

Display allows you to configure the Analyser to be rendered as filled or outlined.

8.1.3   Release

Flash Labels will cause the **REL SLOW** and **REL FAST** parameter labels to flash to indicate whenever they are engaged. This can be used to tune the timing parameters.

8.2   Global Prefs

The settings in Global Prefs are shared between all instances of Multiplicity.

8.2.1   Mouse and Meter

Meter Ballistic allows you to pick the ballistics used by the meters.

Meter Peak/Hold sets the holding behaviour of peaks.

Meter Scale allows configuration of a K-Meter scale for the PPM meter, between regular Full Scale, and the K-12, K-14 and K-20 standards.

Meter Peak is used to select the colour of the peaks shown on the PPM meter.

Meter Zoom Range configures the range shown in PPM zoomed mode (when the meter is double-clicked or right-clicked).

Meter Auto Range allows the PPM meter to zoom out to ensure that GR values can be displayed when in PPM zoomed mode.

ProTools Opt/Shift determines whether you expect ProTools style keyboard modifiers (Opt/Alt for reset to default and Apple/Ctrl for fine-adjust).

MouseWheel Sensitivity configures mousewheel response for knobs and textboxes.

Hide Mouse will cause the mouse to disappear while you're adjusting a value to reduce distraction.

8.2.2   Graph

Tooltips Follow allows you to choose whether the Frequency graph tooltips respond to mouse movement, or adjustments made by a control surface.

MouseWheel Zoom can enable or disable zooming into/out of the Frequency graph.

Swap Alt/Right swaps Alt and Right, so that Alt-dragging engages autolisten.

8.2.3   Misc

Autolisten selects whether engaging **SOLO** for a band auditions the audio processed by the band (subband), or everything else (the passband).

A/B Toggle allows you to determine how right-clicking the A/B menu cycles through A/B banks.

Last 2 swaps between the last two A/B banks you have visited. Visited allows you to cycle through all A/B banks you've visited so far. If you want to assign the A/B bank selector to a MIDI CC parameter, select 'MIDI Learn' and then a right-click on the A/B menu will bring up MIDI learn options.

A/B Automation allows you to determine whether changing A/B bank writes full automation of all parameters to the session, or just records the change of A/B bank.

Mouseover Help allows you to hide the help display at the base of the plugin window (or reinstate it after it has been closed).

Sorting Warning allows you to choose whether a confirmation box is displayed when using Sort bands into order.

VST Gestures allows you to stop the plugin from sending begin and end edit calls to the host before and after a parameter change. This should not normally be necessary, but if preset changes are slow then try disabling this. Note it is possible this may have an impact on automation.

Save As Default is used to save the state of this instance as the state that new instances will have when created.

9 Troubleshooting

9.1 Get in touch

If you run into trouble, get in touch! We're here to help, after all!

For technical support, feature requests and general discussion, visit: https://dmgaudio.com/support

Or you can just email us directly at: contact@dmgaudio.com

For support with DMGAudio software, sending email is the way to go. It allows us to be much faster and more responsive, and we try to spend more time answering our emails than hanging out on social media!

For general discussion though, please feel free to drop by on Facebook/Twitter and tell us how you're getting on. We'll be posting news about updates there too - but also do join the DMGAudio mailing list to make sure you never miss out.

http://facebook.com/dmgaudio

http://twitter.com/dmgaudio

http://www.youtube.com/dmgaudioofficial

Questions about licensing, license transfers and discounts are covered in our FAQ.

Information about version numbers, updates, features and bug fixes is listed under the Specifications tab on the Multiplicity Product Page.

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