BLACKHOLE®
Immersive

User Guide

Eventide®

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Eventide Inc.
One Alsan Way
Little Ferry, NJ 07643
201-641-1200
www.eventide.com

Contents

1 Welcome **1**
1.1 About This Product . . . 1

2 Blackhole Immersive **2**
2.1 Navigating the Plug-In . . . 2
2.2 Supported Channel Formats . . . 3
Upmixing . . . 3
LFE . . . 4
2.3 Levels and Monitoring . . . 5
Master Controls . . . 5
Input Gain . . . 5
Output Gain . . . 5
Channel Levels . . . 5
In/Out/Levels . . . 5
Channel Faders . . . 5
Meters . . . 5
LFE Mute . . . 5
2.4 Controls . . . 6
Mix . . . 6
Mix Lock . . . 6
Gravity . . . 6
Gravity Tilt . . . 6
Size . . . 6
Size Tilt . . . 6
Feedback . . . 7
Feedback Tilt . . . 7
Crossfeed . . . 7
Kill Dry . . . 7
Kill Wet . . . 7
Freeze . . . 7
Morph . . . 8
Modulation Depth . . . 8
Modulation Rate . . . 8
Tempo Sync . . . 8
Predelay . . . 8
Loop delay . . . 8
Delay Link . . . 8
EQ . . . 9
2.5 Preset Bar . . . 11
Controls . . . 11

3 Notes on the Algorithm **13**
3.1 Decay . . . 13
3.2 Tilt Controls . . . 14
3.3 Delay Section . . . 15
3.4 Modulation Section . . . 15

4 Conclusion **16**

Welcome

PART 1



1.1 About This Product

Thank you for your purchase of the Eventide Blackhole® Immersive plug-in. Eventide Blackhole Immersive is a classic Eventide reverb effect capable of producing huge spaces and out-of-this-world soundscapes. For over 50 years, innovative effects like these have made Eventide an industry leader, and we are proud that they continue to be in demand today.

Before you forget, please take a few minutes to register online. This helps us keep you informed of any important software updates and provide you with special offers that may only be available to registered users.

Blackhole Immersive PART 2

Blackhole Immersive is a reverb algorithm on a truly galactic scale. Beginning life as a preset in the DSP4000, its lush sound and popularity encouraged us to feature it as one of the premier algorithms in our hardware line. Its soft attack and lingering, harmonic tail cause it to really shine on guitar, strings, and pads—but those same qualities can also transform a drum track into something other-worldly.

In redesigning Blackhole Immersive for Dolby Atmos® and surround formats, we have added functions and features that extend the capabilities of the original algorithm significantly. This is not just adding more channels to the classic algorithm; it is now possible to control the dynamics of the spatial image. Additionally, it is also now possible to adjust the reverb to have different qualities in each region of the surround speaker array.

2.1 Navigating the Plug-In

The Blackhole Immersive user interface is designed with an emphasis on user control and playability. Specifically, the knobs are easily adjusted with an up-and-down motion of the mouse/finger. Fine-tune drag is available via the ⌘ (Mac) or Ctrl (Windows) modifiers. The Morph control allows you to program ranges of settings and change dynamically between sounds. All controls produce smooth, glitch-free changes in audio.

2.2 Supported Channel Formats

Eventide designed Blackhole Immersive in accordance with the Dolby Atmos® speaker setup guides.

To ensure the highest quality results, we recommend reviewing the speaker placement specifications for your configuration on the Dolby website.

At present, Blackhole Immersive supports the following formats:

- Mono
- Stereo
- LCR
- Quadraphonic
- 5.0, 5.0.2, 5.0.4
- 5.1, 5.1.2, 5.1.4
- 7.0, 7.0.2, 7.0.4, 7.0.6
- 7.1, 7.1.2, 7.1.4, 7.1.6
- 9.0.4, 9.0.6
- 9.1.4, 9.1.6



When running as a VST3, the 9.0.4 ITU, 9.0.6 ITU, 9.1.4 ITU, and 9.1.6 ITU formats are also supported. This is done to provide compatibility with DAWs which only support the ITU formats.

For the 9.x.x ITU formats, Blackhole Immersive will remap the Left Centre and Right Centre channels to the Wide Left and Wide Right channels. This effectively creates a 9.x.x Atmos format, where it is expected that the Wide Left and Wide Right speakers are placed outside the Front Left and Front Right speakers.

While non-standard, this behavior mirrors that of several major DAWs which still support the ITU format, but also route Left and Right Centre in this manner.

Upmixing

In addition to symmetrical formats (where input format = output format), Blackhole Immersive will automatically upmix the input source to match the output configuration if necessary. Mono-in, stereo-in, and additional input combinations are provided for each output format (DAW-dependent).

When using Blackhole Immersive with only a mono input channel, the dry signal will only appear on the center channel. The input to the reverb, however, will appear on all channels except for the LFE channel, creating a reverb that comes from all directions. If this behavior is not desired, place Blackhole Immersive on a surround bus and use the DAW's panner to route the input sound where desired.

LFE

The LFE channel is excluded from the reverb's signal path. Accordingly, the Mix knob has no effect on its level. The LFE channel's level may be adjusted using its channel fader, and a mute button is provided for removing LFE content entirely from the mix.

When upmixing (e.g., from mono or stereo to 5.1), if the input format does not contain an LFE channel, the LFE channel's output will be silent.

2.3 Levels and Monitoring

Master Controls

Input Gain Controls the input gain to the plug-in, between -60 and +12 dB. This parameter sets the input gain for both wet and dry signals. Please note that if input levels are too hot, it is possible to clip the signal internally.

Output Gain Controls the output gain of all channels of the plug-in, between -60 and +12 dB. This gain is applied post-mix, and affects both wet and dry signals.

Channel Levels

In/Out/Levels Three-way switch to choose what information to display for the individual channels.

In and Out views show dot meters indicating the presence of signal (nominal level of -60 dBfs) for individual input or output channels respectively. These meters make it easy to quickly diagnose routing issues. The dot meters also include clipping indicators. These indicators may be reset by clicking on any dot meter.

The Level view shows individual channel faders with level meters.

Channel Faders Controls the output gain for individual speakers. The link buttons link the gain for the sliders within the group in order to preserve the stereo image within the group when changing gain.

When the Link button for a group is engaged, only the left channel of the group will be read from automation or control surfaces. The other channel faders in the group will be ignored.

Meters Individual channel meters appear next to the channel faders. These meters display the channel's peak level, RMS level, and held peak level. Additionally, a clipping indicator appears at the top of the channel meter. Clipping indicators can be cleared via mouse click.

LFE Mute Mutes the LFE channel when active. The mute and gain controls for the LFE channel only affect the level of the dry signal since the reverb does not use the LFE channel.

2.4 Controls

Many of Blackhole Immersive's controls will be familiar to users of Eventide's stereo Blackhole® plug-in. For those users, please note that the following parameters are new in Blackhole Immersive:

- Gravity Tilt
- Size Tilt
- Feedback Tilt
- Crossfeed
- Kill Wet
- Loop Delay
- Delay Link
- EQ section
- Individual speaker levels

Mix

Determines the relative level of the wet and dry signals.

Mix Lock

The Mix Lock control is located to the right of the Mix dial's value. When locked, it prevents the Mix value from changing as you load presets. This is especially useful on an effect return track where the mix should always be set to 100%.

Gravity
affects decay time

Alters the shape of the reverb's decay. In its center position (0), the decay is very dense and clustered. As you move the knob towards 100, the decay transitions to a more direct sound with a long and smooth decay. For negative values of Gravity, as the knob sweeps towards -100 ("Inverse Gravity"), the reverb takes on the character of a reverse reverb.

For a detailed description of how Gravity affects the reverb's decay time, please read the note on Decay Time (p. 13).

Gravity Tilt

Weights the Gravity towards the front or rear by scaling down the opposite side's value. Set Gravity to the value you want for the maximum allowable Gravity in the array, then move Gravity Tilt positive to make the rear Gravity values smaller, or negative to make the front Gravity values smaller. Gravity Tilt always pulls the array towards 0 Gravity.

Note: Gravity Tilt is disabled in Mono, Stereo, and LCR formats.

Size
affects decay time

Scales the size of the reverb. This can range from slapback delays, to cartoonishly small spaces, to cosmically epic washes.

For a detailed description of how Size affects the reverb's decay time, please read the note on Decay Time (p. 13).

Size Tilt

Weights the Size towards the front or rear by scaling down the opposite side's value. Set Size Tilt to the value you want for the maximum allowable Size in the array, then move Size Tilt positive to make the rear Size values smaller, or negative to make the front Size values smaller.

Note: Size Tilt is disabled in Mono, Stereo, and LCR formats.

Feedback
AFFECTS DECAY TIME

Controls the feedback around the entire reverb structure to make the reverb tail even larger.

Similar to the Freeze button, you can create infinite reverb tails by setting Feedback to 100% and Modulation Depth to 0%. Note that if new audio continues to play into the reverb, audio will continue to build up in the buffer, potentially producing clipping on the output if levels build sufficiently. The Freeze button avoids this issue by internally muting dry input to the reverb.

For a detailed description of how Feedback affects the reverb's decay time, please read the note on Decay Time (p. 13).

Feedback Tilt

Weights the Feedback towards the front or rear by scaling down the opposite side's value. Set Feedback to the value you want for the maximum allowable Feedback in the array, then move Feedback Tilt positive to make the rear Feedback values smaller, or negative to make the front Feedback values smaller.

Note: Feedback Tilt is disabled in Mono, Stereo, and LCR formats.

Crossfeed
AFFECTS DECAY TIME

Controls the distribution of reverb energy around the surround array. At 0, the spatial image stays locked in place; higher values produce a more dynamic spatial image. Unlike the Feedback control, Crossfeed remains active when Freeze is engaged, and can be used to alter the spatial image of the frozen audio.

This control will also increase decay, so users are encouraged to compensate by tuning the Gravity, Crossfeed, and Feedback knobs to get the desired reverb decay tail.

For a detailed description of how Crossfeed affects the reverb's decay time, please read the note on Decay Time (p. 13)

Kill Dry

Mutes the input signal, allowing you to hear the reverb tail fade out. This can be useful to help dial in the sound, or it can be automated for a more tremolo-like effect.

Kill Wet

Kill Wet is a momentary button that damps the entire reverb tail and clears all delay lines, giving an immediate fade of all volume. This can be automated for tremolo like effects with the build-up of reverb after each time Kill Wet is pressed.

Freeze

When active, the decay of the reverb is infinite, and input to the reverb is muted, effectively freezing the audio in the reverb buffer. When Freeze is active, the Feedback, Modulation Depth and Modulation Rate controls are disabled.

Making changes to some controls when Freeze is active can allow for interesting sound design. For example, the Crossfeed control can be used to make the spatial image of the reverb tail dynamic or static. Altering the loop delay while Freeze is active can also produce interesting results.

MORPH

The MORPH slider is a macro control which morphs between two sets of values: I and II. To use the MORPH slider, you must first assign some values to I and II. To do this, click the I button, then change the values of the main controls or the EQ section that you want to morph. Next, click the II button and then assign values in a similar fashion. Click the II button to exit assignment, or simply move the MORPH slider. Now the MORPH slider will interpolate between the values set for I and II. The mapped controls have highlighted values to indicate that they have been mapped. To remove a control from the morph, click the × on the highlight.

The MORPH slider can be used to perform subtle or drastic transformations of the reverb's settings. You could, for example, map the MIX and SIZE knobs so that as the MORPH slider moves from I to II the reverb gets larger, but also decreases in the mix. Alternatively, you could use it to shift the emphasis of the EQ from the front to the back of the room.

MODULATION DEPTH

Sets the modulation depth in the reverb tail. This can be a subtle control, which nevertheless can reduce ringing in the reverb tail and add some motion to the sound.

MODULATION RATE

Sets the relative speed of the random modulation in the reverb tail, from glacial to seasick.

TEMPO SYNC

Controls the tempo mode of the plug-in for PREDELAY and LOOP DELAY.

- SYNC Delay amounts sync to the tempo of the DAW session.
- MANUAL Delay amounts sync to manually set TEMPO value.
- OFF Delay amounts set in milliseconds.

PREDELAY

Sets the amount of delay before the reverb section, ranging from 0 to 2000 ms. When TEMPO SYNC is off, the value is specified in milliseconds. When TEMPO SYNC is set to either Sync or Manual, the value is specified in beat subdivisions and is calculated using the specified tempo.

LOOP DELAY

Sets the amount of delay after the reverb section, which feeds back into the reverb array. LOOP DELAY range is 0 to 2000 ms. When TEMPO SYNC is off, the value is specified in milliseconds. When TEMPO SYNC is set to either Sync or Manual, the value is specified in beat subdivisions and is calculated using the specified tempo.

In order to hear LOOP DELAY's effects, either FEEDBACK or CROSSFEED must be larger than 0%.

DELAY LINK

The DELAY LINK button is located between the PREDELAY and LOOP DELAY dials. When active, the PREDELAY and LOOP DELAY values will be linked based on the value of the PREDELAY control.

When the DELAY LINK button is active, only the PREDELAY value will be read from automation or control surfaces.

EQ

Blackhole Immersive features a three-band equalizer (EQ) section consisting of Low, Mid, and High bands. The EQ section can be adjusted directly on the plot or using the draggable text controls beneath the plot.

The Mid band is a traditional peaking filter; it produces a broader peak when boosting than it does for cuts at the same Q value. The Low and High bands offer a choice between shelving and cut filters. Like other iterations of the Blackhole algorithm, Blackhole Immersive uses a non-traditional shelf filter that has been chosen for musicality reasons. With this filter, Q values do more than change the slope of the shelf: they also have the effect of adding a mild resonant bump to the midrange while having a smoother and less resonant transition into the stopband.



While the plot is useful for quickly changing the EQ's parameter values, we recommend careful listening in tuning the parameters given the unique nature of the filters.

Speaker Groups

The EQ section allows independent settings for up to three spatial groups of speakers: Front, Top, and Rear. In the top-right of the EQ section, you can select the currently viewed group by clicking on the All, Front, Top, or Rear buttons. To reset the EQ curve for a particular group or all groups, simply alt-click the relevant group button.

Front	Front (L/C/R) and Wide
Top	Top Front, Top Side, and Top Rear
Rear	Surround Side and Surround Rear

Editing the EQ for a single group

When viewing Front, Top, or Rear, only the handles for the selected group are shown and any edits to the plot only affect the current group.

Editing the EQ for multiple groups

When viewing All curves, the white handles and curves indicate shared settings. If you click and drag on a white handle, it will affect multiple groups at once. Similarly, dragging on a band rather than a handle within the plot will affect all of the groups while preserving their relative offsets from each other. To set the other handles in a band to match a particular handle, double-click the desired handle and the other handles will jump to its position.

Plot Mouse Controls

Action	Mac	Windows
Adjust Q	⇧ drag	⇧ drag
Precision Drag	⌘ drag	Ctrl drag
Reset handle	⌥-click	Alt-click
Join handles (All view)	double-click	double-click

EQ Controls

The FREQUENCY, GAIN, and Q controls displayed below the plot correspond to the selected group of speakers: All, Front, Top, or Rear. When the All group is selected, if a parameter has different values for the Front, Top or Rear groups, the control beneath the plot will read "--" to indicate that there are multiple values associated with that parameter. To set the value for all groups to a single value, simply click on the text and then enter the desired value.

LOW FILTER TYPE Selects the filter type for the Low band for all groups: low shelf (default) or low cut.

LOW FREQUENCY Adjusts the frequency of the Low band in the current group.

LOW GAIN Adjusts the gain of the Low band in the current group.
This control is disabled when using a low cut filter.

LOW Q Adjusts the Q of the Low band in the current group.

MID FREQUENCY Adjusts the frequency of the Mid band in the current group.

MID GAIN Adjusts the gain of the Mid band in the current group.

MID Q Adjusts the Q of the Mid band in the current group.

HIGH FILTER TYPE Selects the filter type for the High band for all groups: high shelf (default) or high cut.

HIGH FREQUENCY Adjusts the frequency of the High band in the current group.

HIGH GAIN Adjusts the gain of the High band in the current group.
This control is disabled when using a high cut filter.

HIGH Q Adjusts the Q of the High band in the current group.

2.5 Preset Bar



Located at the top of the Blackhole Immersive Plug-In, the Preset Bar lets you load and save presets, along with several other features.

When Blackhole Immersive is installed, the factory preset library is placed in the following platform-specific location:

Mac	`<user>/Music/Eventide/Blackhole Immersive/Presets`
Windows	`<user>/Documents/Eventide/Blackhole Immersive/Presets`

Within the `Presets` folder are two sub-folders: `Factory Presets` and `User Presets`. The first contains the presets that come with the plug-in. The second is for storing any presets that you create. You can create sub-folders within the `User Presets` folder for organizing your presets if you wish. Presets for Blackhole Immersive have a **.tidex** extension and can be saved or loaded from the Blackhole Immersive preset bar in any supported DAW.

> ⚠ *Many DAWs offer an additional generic preset bar that saves DAW-specific presets to a separate location. We strongly recommend only saving your presets using the Blackhole Immersive preset bar to ensure that your presets will be accessible from any DAW and fully compatible with the plug-in.*

Controls

UNDO The Undo button undoes the last change, and restores the plug-in to the previous state. Pressing this button multiple times will move you backwards in the plug-in's state history.

REDO The Redo button reverses the last undo command, if any. Pressing this button multiple times will move you forwards in the plug-in's state history.

PREVIOUS PRESET Loads the preset before the current preset in the preset menu.

NEXT PRESET Loads the preset after the current preset in the preset menu.

PRESET CHOOSER Choose a preset from the Factory or User preset collections.

- **Save as...** Save the preset with a new name or location.
- **Load...** Open a preset from a location on disk.
- **Import...** Copy a preset from a location on disk into the User preset collection.

SAVE Saves the preset to disk.

A ► B Switches between two temporary plug-in states, A and B. This is useful for making A/B comparisons.

- Click A or B to switch states.
- Click ► to copy state A into B.
- Click ◄ to copy state B into A.

The A and B states are not saved in your DAW session. When you load a session, the current settings for the plug-in will be loaded into A and B.

INFO (I) Opens a drop-down menu with various help topics and settings.

- **User Guide** – Open this document.
- **Webpage** – Launches the Blackhole Immersive webpage.

Notes on the Algorithm PART 3

These notes are provided to give insight into how the underlying Blackhole algorithm works. They are not intended to be the definitive path on ways to use the plug-in, and exploration for new sounds is encouraged above all.

3.1 Decay

Blackhole Immersive's decay time is dependent on the values of Gravity, Size, Feedback, and Crossfeed controls.

Size is the most straightforward of these controls; changing this knob will alter the virtual spatial dimensions of the Blackhole algorithm. Turning Size to the right will take longer for echoes to build up, but will produce a smooth decay tail; turning Size to the left will make the echoes build up more rapidly but add more combs, often perceived as tinny and resonant peaks in the reverb tail. The settings of 0-100 on the Size knob represent the values developed for the algorithm on the Space pedal; turning Size down to -10 will set the reverberant size to true zero, and this can be used for delay-like settings. Size settings between 101-120 are truly galactic in scale, and can be used to create large washes of reverb.

Gravity is broken up into two regions: positive and negative. On the positive side of the knob, Gravity controls how long the reverb decays as well as the balance of direct-to-reverberant energy. Turning the knob higher extends decay time as well as makes the direct sound more prominent and defined; turning this knob lower offers a slightly shorter (although still very long) reverb tail with the direct sound setting back into the wash. If using Gravity on the positive side of the knob, increase Gravity for more direct sound, and compensate for the extended decay by reducing Feedback, and vice versa. On the negative side, Gravity ranges from extended and very smeared puffs of reverb close to 0, all the way towards a more lopsided and inverse reverb sound as the knob approaches -100. Values close to -100 have lots of use, from the aforementioned inverse reverbs to more chorused delay sounds with modulation turned up and the Size set fairly small.

Feedback and Crossfeed both control feedback within the algorithm. Feedback controls how much the Blackhole sound feeds back into itself at a given speaker, while Crossfeed controls how much the Blackhole sound feeds back into all other speakers in the Immersive speaker array. Both controls can be used to extend or reduce decay time, depending on the desired reverb tail. Crossfeed has a significant effect on the degree to which the spatial image of the reverb is static or dynamic, with the image becoming more dynamic as Crossfeed increases.

The tilt knobs can be further used to tweak the sound between the front and rear of the array. With these controls, extensive shaping of the reverb tail is possible.

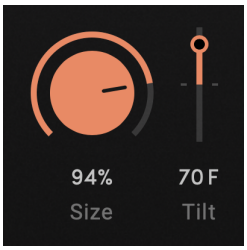
3.2 Tilt Controls

Blackhole Immersive has three parameters with associated Tilt controls: Gravity, Size, and Feedback. These associated Tilt controls allow you to quickly produce different weightings of the control between the front and rear of the room.

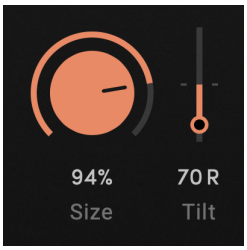
For example, to create a space that is large in the front and small in the rear, set the Size control to a large positive value, then gradually move the Size Tilt control from center (C) towards the front (F). To create a space that is small in the front and large in the rear, simply move the Size Tilt control towards the rear (R). Finally, for a space that is uniform in size in the front and rear, simply set Size Tilt to C, its default neutral position.



No Size Tilt



Tilt towards the front



Tilt towards the rear

A brief word on what is *actually* happening here: as you move the Size Tilt control towards the front, the values for the Size in the front of the room remain at the value set by the control. The Size values for the rest of the speakers are proportionally scaled towards their minimum value (-10), with the rearmost speakers being scaled down the most. Similarly, when the Size Tilt control is moved towards the rear, the values for the Size in the rear of the array use the Size control value while the values for the non-rear speakers are proportionally scaled down, with the frontmost speakers being most affected.

The Feedback control extends the tail of the reverb by feeding the output back into the input; by using the Feedback Tilt control, you can fine-tune the amount of feedback that the front and back of the room receive. For example, moving Feedback Tilt towards the rear will produce a shorter tail towards the front of the room.

The Gravity Tilt control allows for fine-grained control of the reverb's spatial image in terms of front and rear. For example, if you set Gravity to a large positive value and then move Gravity Tilt forwards, this will produce a clearly defined image in the front with a more diffuse wash towards the rear. Setting Gravity Tilt towards the back will have the opposite effect, producing a less direct and shorter reverb tail in the front with a clearer and longer tail in the back. Unlike Size Tilt and Feedback Tilt, Gravity Tilt always scales down towards 0, rather than its minimum value.

> *Because the tilt controls work by scaling down from the associated control value, they will have the most impact when the associated value is a larger value. For example, the Size Tilt control will have a much greater effect when Size is 80 rather than when Size is 5.*



The Tilt controls are disabled for the Mono, Stereo, and LCR formats since there are no rear speakers in those formats.

3.3 Delay Section

Predelay is a traditional reverb control used to increase the perceived size of a reverberant algorithm. We offer an extended range compared to traditional predelay settings so that Blackhole Immersive can be used for delay-like sounds.

The Loop Delay control sits after the Feedback and Crossfeed knobs; when both of those controls are set to 0, Loop Delay will have no impact on Blackhole Immersive's reverb. While it can be used to tweak Blackhole Immersive's settings to act delay-like, this control is also useful for controlling the reverb tail's echo density. Loop delay values of less than 300 ms assist in creating a "bloom" of sound that builds up smoothly in the reverb tail.

3.4 Modulation Section

The modulation section of Blackhole Immersive is not a traditional LFO as is often used in musical modulation products. It is better to think of these controls as a timbre shaper. Increasing Depth helps to make the reverb tail darker, while Rate changes from subtle darkening at lower values to seasick pitch shifting at higher values.

Conclusion

PART 4

We hope you enjoy the Blackhole Immersive plug-in and put it to good use in all of your mixes. Please be sure to check out Eventide's other native plug-in offerings for more unique and interesting effects.

For further questions or support, head over to the user forums.