

Mixing for Dolby Atmos[®]



Cristina Bachmann, Heiko Bischoff, Christina Kaboth, Insa Mingers, Matthias Obrecht, Sabine Pfeifer, Benjamin Schütte, Marita Sladek

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Dolby Atmos[®] Mixing in Nuendo

You can use the VST MultiPanner plug-in to create 3D mixes for Dolby Atmos.

VST MultiPanner allows the following:

- Creating a channel-based bed mix in 9.1 Dolby Atmos format. This speaker configuration is also known as Dolby Atmos 7.1.2 speaker setup.
- Creating an object-based Dolby Atmos mix with up to 118 audio objects when using a Dolby Rendering and Mastering Unit (RMU).

NOTE

If you want to use a Dolby RMU, you must install the “Nuendo RMU Connector for Dolby Atmos[®]”. For more information, visit www.steinberg.net/dolbyatmos.

NOTE

All other surround mixing and panning functions are described in the Nuendo **Operation Manual**.

RELATED LINKS

[Setting Up Busses for 9.1 Dolby Atmos Bed Mixing](#) on page 5

[Creating 9.1 Dolby Atmos Bed Mixes with VST MultiPanner](#) on page 7

[Mixing for Dolby Atmos with a Dolby Rendering and Mastering Unit \(RMU\)](#) on page 13

Setting Up Busses for 9.1 Dolby Atmos[®] Bed Mixing

Mixing for a 9.1 Dolby Atmos audio bed requires a signal routing to a 9.1 Dolby Atmos output bus.

The processing format of the VST MultiPanner plug-in depends on the channel routing. For example, if a mono source channel is routed to a 5.1 bus, the panner works in 5.1 mode. For 9.1 Dolby Atmos mixing, the source channel must be routed to an output bus that provides top channel speakers.

For the mixing of a 9.1 Dolby Atmos audio bed, the following applies:

- You must route the source channel to a 9.1 Dolby Atmos output bus or a 9.1 Dolby Atmos group channel.

To ensure the correct routing for the Dolby Atmos mix, we recommend you to route the first 10 device ports of your audio interface to the 9.1 Dolby Atmos bus. You can select the device ports in the **VST Connections** window.

IMPORTANT

In Nuendo, the order of surround busses and side busses differs from the Dolby specification for side surround busses (Lss, Rss) and surround rear busses (Lsr, Rsr). To meet the specification for the Dolby RMU, you must swap the device ports of surround busses and side busses.

Bus Name	Speakers	Audio Device	Device Port
9.1 Bed	9.1 Dolby Atmos	ASIO Hammerfall DSP	
Left			HDSP MADI 1 (1)
Right			HDSP MADI 2 (1)
Center			HDSP MADI 3 (1)
Lfe			HDSP MADI 4 (1)
Left Surround			HDSP MADI 7 (1)
Right Surround			HDSP MADI 8 (1)
Side Left			HDSP MADI 5 (1)
Side Right			HDSP MADI 6 (1)
Top Side Left			HDSP MADI 9 (1)
Top Side Right			HDSP MADI 10 (1)
DIA OBJ 1	Mono	ASIO Hammerfall DSP	
Mono			HDSP MADI 11 (1)
DIA OBJ 2	Mono	ASIO Hammerfall DSP	
Mono			HDSP MADI 12 (1)
DIA OBJ 3	Mono	ASIO Hammerfall DSP	
Mono			HDSP MADI 13 (1)
DIA OBJ 4	Mono	ASIO Hammerfall DSP	
Mono			HDSP MADI 14 (1)

- You can route mono, stereo, or surround channels to a 9.1 Dolby Atmos bus. If you route a 9.1 Dolby Atmos channel to a 9.1 Dolby Atmos bus, the MixConvert plug-in is used for panning.
- Plug-ins that are used in a 3D bus or group channel must support a corresponding number of channels.

RELATED LINKS

[MixConvert for Dolby Atmos](#) on page 6

[Creating 9.1 Dolby Atmos Bed Mixes with VST MultiPanner](#) on page 7

MixConvert for Dolby Atmos®

The downmix function in Nuendo supports 9.1 Dolby Atmos mixing. If the Control Room mix is different from the main mix output bus, or if the signal is routed to an output bus with a lower number of channels, the signal is converted automatically using the MixConvert plug-in.

MixConvert allows you to solo or mute the top and side channels, and to adjust the top and side channel level.

For Dolby Atmos 3D mixing, the following downmix rule applies:

- If a 9.1 mix is converted to a 7.1 mix, the top channel signals are attenuated by 1.5 dB and added to the side channel signals.

NOTE

For further details about the MixConvert functions, see the documentation of the MixConvert V6 plug-in in the **Operation Manual** and in the separate document **Plug-in Reference**.

Creating 9.1 Dolby Atmos[®] Bed Mixes with VST MultiPanner

The VST MultiPanner plug-in allows you to create channel-based Dolby Atmos bed mixes.

NOTE

The processing mode of the panner is determined by the routing of the audio channels. If an audio channel is routed to a 9.1 Dolby Atmos output bus or group channel, the panner operates in 9.1 Dolby Atmos bed mode. Otherwise, the 3D panning functions are disabled.

NOTE

For details about the mixing functions of VST MultiPanner, see the documentation of VST MultiPanner in the Nuendo **Operation Manual**.

VST MultiPanner Plug-in Panel

For 3D mixing, VST MultiPanner offers additional parameters and a **Rear View** that allow you to create channel-based Dolby Atmos bed mixes.

For 3D bed mixing, VST MultiPanner provides a 2D (**Top View**) and a 3D (**Rear View**) pan area.

- If the **Rear View** is hidden, click **Show/Hide Extended Display**  to show both views.



Movement restriction buttons

Allow you to restrict the movement to one direction when moving the sound source with the mouse.

NOTE

- The movement restrictions only affect the graphic presentation in the two pan areas. This means, activating **Vertical Movements Only** allows movements only on the y-axis in the **Top View** area, and movements only on the z-axis in the **Rear View** area.
- The controls in the positioning section below the pan area are not affected by the movement restriction buttons.

Reset Parameters

Alt-click this button to reset all panner parameters to their default values.

Position left/right channels independently

Activate this option to adjust the front left and right input channels independently by dragging.

Elevation Pattern buttons

Allow you to activate/deactivate predefined elevation patterns for the height parameter.

If no elevation pattern is active, you can adjust **Bottom-Top Pan** manually.

Top View

Shows the room from the top. You can move the audio source on the x-axis and y-axis by dragging the panning balls. The position on the z-axis is represented by the size of the panning balls: the bigger the panning ball, the higher the audio is positioned in the room. To adjust the position on the z-axis, middle-click and drag.

To zoom out of the **Top View** pan area, activate **Overview Mode**.

Rear View

Shows the room from the rear. You can move the audio source on the x-axis and z-axis by dragging the panning balls. The position on the y-axis is represented by the size of the panning balls: the bigger the panning ball, the nearer the audio is positioned to the rear of the room. To adjust the position on the y-axis, middle-click and drag.

If you use a stereo or multi-channel configuration, the axes of the audio object are indicated by colored lines: the x-axis is red, the y-axis is green, and the z-axis is blue.

Show/Hide Extended Display

Shows/Hides the **Rear View** pan area. If a 2D audio format is used, the **Rear View** pan area is not available.

Speaker channel buttons

The speaker buttons around the pan area represent the output configuration. The buttons allow you to solo, mute, and disable the corresponding channels.

NOTE

You cannot automate the soloing of output channels.

Left-Right Pan

Sets the position of the signal on the x-axis.

Rear-Front Pan

Sets the position of the signal on the y-axis.

Bottom-Top Pan

Sets the position of the signal on the z-axis. If you move this control all the way to the right, the sound comes from the top speakers only.

Elevation On/Off

Activates/Deactivates the height parameter.

NOTE

If elevation is deactivated, **Bottom-Top Pan** is set to bottom, even if automation for bottom-top panning is present. **Elevation On/Off** can also be automated.

Rotate Signal around Z-Axis

Rotates the sound source around its positioning handle. This option is only available for stereo and multi-channel signals.

Tilt Signal around Y-Axis

Tilts the sound source around its own y-axis. This option is only available for stereo and multi-channel signals.

Tilt Signal around X-Axis

Tilts the sound source around its own x-axis. This option is only available for stereo and multi-channel signals.

Orbit Center

Rotates the sound source including all input channels and the positioning handle signal around the center of the room.

Click **Counter Shot** to rotate the sound source by exactly 180 degrees.

Radius

Sets the distance of the sound source from the center of the room when using **Orbit Center**.

Center Distribution

Distributes part or all of the center signal to the left and right front speakers.

NOTE

If **Front Divergence** is set to 100 %, **Center Distribution** has no effect.

Front Divergence

Determines the attenuation curve that is used when positioning the sound source on the front x-axis.

Front/Rear Divergence

Determines the attenuation curve that is used when positioning the sound source on the y-axis.

Rear Divergence

Determines the attenuation curve that is used when positioning the sound source on the rear x-axis.

Height Divergence

Determines the attenuation curve that is used when positioning sound sources on the z-axis.

Signal Width

Sets the expansion of the sound source on the x-axis. This parameter is only available for channels with stereo or multi-channel output configurations.

Signal Depth

Sets the expansion of the sound source on the y-axis. This parameter is only available for channels with multi-channel output configurations.

LFE Level

Sets the signal amount that is sent to the LFE (Low Frequency Effects) channel.

- If the selected input already contains an LFE channel (x.1 configuration), it is routed through VST MultiPanner and the LFE encoder is used to control the volume of this channel.
- If the selected input does not contain an LFE channel (x.0 configuration), all input channels are distributed evenly to the output LFE channel. In this case, it might be useful to raise the volume of this downmix using the LFE encoder.

NOTE

The LFE channel is used as a full range channel, no low-pass filtering is applied.

RELATED LINKS

[Elevation Patterns](#) on page 11

Elevation Patterns

You can use elevation patterns to let the height parameter automatically follow a predefined curve while positioning a sound in the 2D pan area. The active pattern is shown in the **Rear View** pan area.

- To activate/deactivate an elevation pattern, click one of the **Elevation Pattern** buttons.

NOTE

If an elevation pattern is active, **Bottom-Top Pan** cannot be adjusted manually.

The following elevation patterns are available:

Wedge, Ceiling, Sphere

These patterns correspond to the elevation modes that are defined by Dolby for Dolby Atmos authoring.

Cup, Tunnel, Half-Pipe

These patterns make use of the bottom of the 3D room which might not have the expected effect in a small room speaker setup with close distance between side and top speakers.

Ridge

This pattern is similar to **Wedge** but more suitable for 9.1 bed-only mixes without an additional object mix.

Automation Rules for Elevation Patterns

- An active elevation pattern overrides any automation for **Bottom-Top Pan**, however, the automation remains intact.

- If elevation is deactivated, **Bottom-Top Pan** is set to bottom, even if automation for bottom-top panning is present. **Elevation On/Off** can also be automated.

Panning and Routing Rules

When an audio signal is moving through the room at a changing height, Nuendo makes use of a complex set of pan laws that ensures smooth and gapless transitions.

The following applies:

- The pan laws can cause a difference between the graphical position of a panning ball and the audible position of the sound source. If the graphical position of the sound source differs from the audible position, in the **Top View** pan area, the audible position is shown as a gray circle and the distance between both positions as gray line.



- If you move the **Bottom-Top Pan** control all the way to the right, the sound comes from the top speakers only.

RELATED LINKS

[MixConvert for Dolby Atmos](#) on page 6

Remote Controlling VST MultiPanner

You can control the VST MultiPanner plug-in remotely with several control devices. To control all panner functions, you may need updated software for your device.

Yamaha Nuage

To control 3D sound mixing functions of VST MultiPanner remotely on a Nuage system, you must install “Tools for Nuage V1.8” or later.

Avid

The parameters of VST MultiPanner are mapped on the following devices:

- System 5-MC
- S6
- Artist Series

Mixing for Dolby Atmos[®] with a Dolby Rendering and Mastering Unit (RMU)

Object-based mixing for Dolby Atmos requires a connection to a Dolby RMU and the installation of the “Nuendo RMU Connector for Dolby Atmos[®]”.

If the “Nuendo RMU Connector for Dolby Atmos[®]” is installed, the following functions are available:

- The **Object Mapping** dialog that allows you to establish a connection to a Dolby RMU and to define your audio objects by mapping audio outputs to object IDs. Mapped audio outputs that are connected to output busses in the **VST Connections** window serve as your object busses.
- An additional **Object Mode** in the VST MultiPanner plug-in that allows you to pan audio objects and to route the signal through object busses to the Dolby RMU.

NOTE

For details about object-based mixing for Dolby Atmos refer to the documentation provided with your Dolby RMU.

Object Routing

To be able to create an object-based Dolby Atmos mix with VST MultiPanner, you must first connect your system to the Dolby RMU, define objects, and create object busses.

Connecting Your System to the Dolby RMU

Your system must be connected to the Dolby RMU. The last used connection to an RMU persists and is restored when you start the application.

Set up the connection between your system and the Dolby RMU as follows:

- In the **Object Mapping** dialog, enter the IP address of the Dolby RMU into the RMU field.

Defining Objects

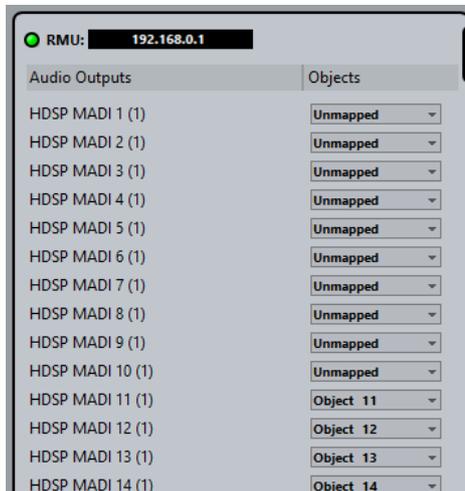
If you want to use an audio stream as a Dolby Atmos object, you must map an object ID to this audio stream first.

A Dolby Atmos object consists of an audio stream that is sent to the Dolby RMU plus a meta data stream transporting the panning information. Objects are always sent in real time, and they are monitored and recorded in the RMU. For this to work, you must define which audio streams that are sent to the RMU are objects. This is done in the **Object Mapping** dialog.

NOTE

You can use up to 118 objects. However, the first 10 objects are reserved for the 9.1 Dolby Atmos bed and are excluded from mapping. Therefore, it is recommended that the 9.1 Dolby Atmos bus uses the first 10 device ports of your audio interface.

- To open the **Object Mapping** dialog, select **Devices > Object Mapping**.



You can map objects to audio outputs either manually or automatically:

- To map an object to an audio output manually, click the corresponding **Objects** pop-up menu and select an object ID.

NOTE

- Manual mapping of objects is necessary if the 9.1 Dolby Atmos bus does not use the first 10 device ports of your audio interface.
- Objects that are already mapped to an audio output are shown as in use in the pop-up menu. If you select an object that is already in use, the previous mapping is lost.

- To map objects to all available audio outputs automatically, click **Map All**.

NOTE

- The first 10 audio outputs are reserved for the 9.1 bed and therefore excluded from automatic mapping.
- Objects that are already mapped remain unchanged.

- To discard the mappings between all device ports and objects, click **Unmap All**.

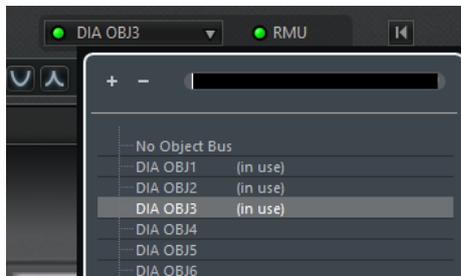
RELATED LINKS

[Setting Up Busses for 9.1 Dolby Atmos Bed Mixing on page 5](#)

Using Output Busses with Objects

If you want to use a channel in object mode, you must connect it to an object bus in the VST MultiPanner plug-in. An object bus is defined as an output bus that is connected to a device port that is mapped to an object ID.

- To connect a channel to an object bus, open VST MultiPanner in **Object Mode**, click on **Select Object Bus**, and select a bus from the pop-up menu.



If the LED to the left of the name field lights up in green, this indicates that a valid object bus is selected. If the LED lights up in red, at least one output bus of a selected multi-object bus is unmapped.

The following applies:

- Only object busses with a matching channel configuration can be selected. For example, if you want to pan a stereo-channel as object, you can only connect the channel to a stereo object bus.
- Each object bus can only be used by the panner of one channel in object mode at the same time. The connection between panner and object bus is broken if the object bus is selected in the panner of another channel.

IMPORTANT

To avoid unwanted results when working with object audio, observe the following:

- Do not use object busses as routing destinations for normal audio channels.
- The object audio stream is automatically routed through send 8 to the object bus. For channels that are in object mode, do not use send slot 8 for other purposes.

EXAMPLE

1. In the **Object Mapping** dialog, map 16 of 64 available output streams to object IDs.
2. In the **VST Connections** window, create 16 mono output busses and connect these busses one by one to the 16 mapped output streams. The 16 mono output busses are now defined as your object busses.
3. In the VST MultiPanner plug-in, you can now select these 16 object busses in the **Select Object Bus** pop-up menu for mono channels.

RELATED LINKS

[Defining Objects](#) on page 13

[Multi-Object Busses](#) on page 16

Multi-Object Busses

You can make stereo and multi-channel busses available as multi-object busses.

Normally, objects are meant to be mono, but you can also create stereo or multi-channel busses and make them available as multi-object busses. This allows you to tilt and rotate pre-panned multi-channel signals in the Dolby Atmos surround field, for example, a 5.0 channel background mix.

NOTE

- Due to the close distance between side and top speakers in a Dolby Atmos system, tilting of multi-channel signals allows for a signal panning that may not always be perfectly reproduced.
- In **Object Mode**, there is no LFE channel. If you want to use a surround bus with an LFE channel, for example 5.1, as multi-object bus, it is recommended to downmix the LFE channel first.

EXAMPLE

1. In the **VST Connections** window, create a 5.0 output bus and connect it to audio streams that are defined as objects in the **Object Mapping** dialog.
2. In the VST MultiPanner plug-in, click **Select Object Bus** and select the 5.0 output bus. The panner now sends 5 objects to the Dolby RMU.

RELATED LINKS

[Object Routing](#) on page 13

[Object Mixing with VST MultiPanner](#) on page 16

Object Mixing with VST MultiPanner

If you use a Dolby RMU, VST MultiPanner offers two modes for creating both a channel-based bed mix and an object-based mix for Dolby Atmos.

In **Bed Mode**, the panner offers the same functions as if it is used without RMU and allows you to create the audio bed of your Dolby Atmos mix. In **Object Mode**, the panner allows panning for audio objects in your Dolby Atmos mix. The **Bed Mode** and **Object Mode** buttons allow you to switch between both modes. The following applies:

- In **Object Mode**, 3D panning functions are always provided, regardless of the audio routing.
- If VST MultiPanner is used as an insert plug-in, **Object Mode** is not available.
- If the switch between **Bed Mode** and **Object Mode** is automated, the bypass of send 8 is automated accordingly, using its own automation track.
- If the switch between **Bed Mode** and **Object Mode** is automated and the parameter settings differ between both modes, existing automation of a parameter that is not available due to the mode change remains.



The following additional settings and parameters are available if you use a Dolby RMU:

Bed Mode

Sets the panner to bed mode. This mode allows you to create the channel-based bed mix.

Object Mode

Sets the panner to object mode. This mode allows you to create mixes for audio objects.

Select Object Bus

Allows you to assign an output bus as object bus. If the LED lights up in green, a valid object bus is selected. If the LED lights up in red, at least one output bus of a selected multi-object bus is unmapped. To display a tooltip that shows which output busses are unmapped, move the mouse pointer over the LED.

RMU LED

If the LED lights up in green, a Dolby RMU is connected to the system. If the LED lights up in red, no RMU is connected.

Select Object Zone

Determines which speaker zones are active for the object. Active speaker zones are shown as small blue squares around the **Top View** pan field.

Active speaker zones are also shown in the miniature view in the Inspector.

Speaker Snap

Moves the object audio to the active speaker that is nearest to its established location during playback.

Object Size

Spreads the audio for an object in the room, based on the object position and the active speakers. This parameter is deactivated if **Speaker Snap** is activated.

NOTE

Objects cannot be monitored within the Control Room of Nuendo. However, if you want to monitor the result of your object mix, you can route a 7.1 downmix from the Dolby RMU to an external input of the Control Room.
