Auro Technologies

Auro-3D Authoring Tools - User Guide

Plug-in Version:　　2.2.0

User Guide Version: 2.2.0

Auro-3D Authoring Tools - User Guide

Auro-3D Authoring Tools - Reference Manual

Chapter 1: Installing the Auro-3D Authoring Tools

1.1 System Requirements and Compatibility

The Auro-3D Authoring Tools exist in AAX format and run on the following:

- **Operating Systems**: Mac OS X 10.8.5, 10.9.5 and 10.10.5
- **DAW's**: Pro Tools 10, 11 and 12

ATTENTION: *Only the latest update of your DAW is supported*

- **Hardware**: Pro Tools|HDX and Pro Tools|HD Native

Please refer to complete system requirements and a list of qualified computers, operating systems, hard drives, and third-party devices for Avid's Pro Tools by visiting:

www.avid.com/compatibility

INFO: *The Auro-3D Authoring Tools support audio sample rates of 44.1 and 48 kHz. A future release will support higher sample rates.*

1.2 Installation

After purchasing the software, users must first download the latest software using the provided download link.

If the download link has expired, contact support for a new one:

support@auro-technologies.com

To install the Auro-3D Authoring Tools on a Mac running OS X:

1. Uninstall any previous installation of the Auro-3D Authoring Tools, by double-clicking **Auro-3D_Creative_Tools_Suite.Uninstall.command** from: /Library/Application Support/Auro Technologies/

2. Restart your computer

3. Double-click the ZIP file you downloaded from the Auro Technologies website, then double-click **Auro-3D Authoring Tools.pkg** to begin the standard installation.

4. Follow the installation instructions and select the type of installation wanted. For more information on the different installation types, please refer to the paragraph below.

Package Name	Action	Size
☑ Auro-3D Authoring Tools – Basic	Upgrade	Zero KB
☐ Auro-3D Authoring Tools – Advanced	Skip	Zero KB

Figure 1-1 Installation type

5. Finally, restart your computer.

ATTENTION: *Restarting your computer in step 2 and 5 is mandatory for a correct installation.*

Basic

The following software is installed:

- Auro-Panner, Auro-Bus, Auro-Mix Engine, Auro-Aux Engine, Auro-Return and Auro-DMix Control plug-ins
- A3DHost service
- Auro-Settings menu bar application

Advanced

The following additional software is installed:

- Auro-Decoder plug-in
- Auro-Encoder

1.2.1 Licensing

To use the Auro-3D Authoring Tools, it is required to install the correct license(s) on a 2nd generation iLok USB key. There are three license levels:

- **Auro-Panner** – Includes all DAW channel-based panning and mixing functionality.

- **Auro-Codec** – Includes the Auro-Panner license plus the following additional functionality: The channel-based output can be encoded with the Auro-Codec using Home Entertainment encoding profiles.

- **AuroMAX** – Includes the Auro-Codec license plus the following additional functionality: The channel-based output can be encoded with the Auro-Codec using Digital Cinema encoding profiles.

For more information about iLok, visit:

www.ilok.com

Chapter 2: Setting Up a Pro Tools Session

To set up a basic Auro-3D mixing session in Pro Tools, follow the steps outlined below.

ATTENTION: *Before launching your DAW, you need to configure Auro-Settings.*

2.1   Configuring Auro-Settings

1. Go to **Auro-Settings > DAW** and select the DAW you use.
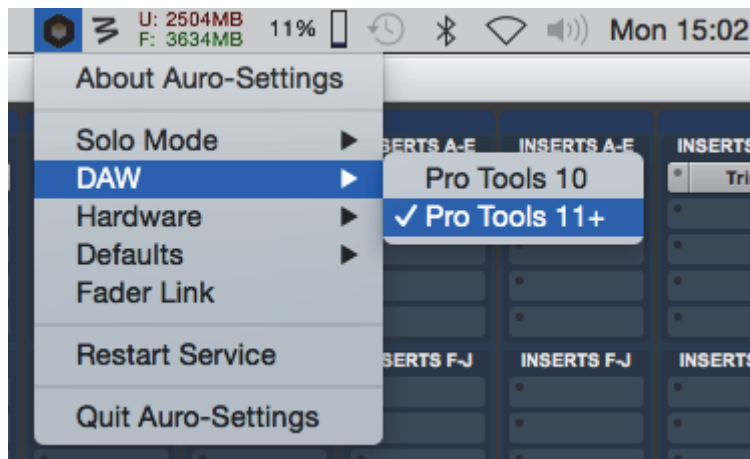
Figure 2-1 Selecting your DAW

2. Go to **Auro-Settings > Hardware** and select the type of hardware used with the DAW.

    •   **Native**: Select this option if you are using a Pro Tools Native or HD Native system.

    •   **HDX High Latency**: Select this setting if you are using an HDX System with a H/W buffer size of 1024 samples.

    •   **HDX Low Latency**: Select this setting if you are using an HDX System with a H/W buffer size lower than 1024 samples.

INFO: *Please note that only H/W buffer sizes of* **256***,* **512** *or* **1024**   *samples are supported when working with the Auro-3D Authoring Tools*.

⚠️ **ATTENTION:** *If you are using a H/W buffer size lower than 1024 samples, and therefore have selected the* **HDX Low Latency** *setting, a DSP plug-in must be inserted on the first Insert slot of every track that contains an Auro-3D plug-in.*

TIP: *Inserting a (multi)-mono DSP version of the Trim plug-in reduces the DSP-overhead to a minimum and leaves the audio unaffected if the initial settings remain unchanged.*

For more information about the **Hardware** setting, please refer to *"Pro Tools 11+: Choose this option to use the Auro-3D Authoring Tools in Pro Tools 11 or 12." on page 63.*

2.2 Configuring a DAW Session

For this example, Pro Tools HD 11 will be used as DAW.

2.2.1 Configuring Playback Engine... and I/O...

1. Go to **Pro Tools** > **Setup** > **Playback Engine...** and select a **H/W Buffer Size** corresponding to your **Hardware** setting in Auro-Settings.

2. Go to **Pro Tools** > **Setup** > **I/O…** > **Output** and create two 5.1 output paths.

3. Name the first 5.1 output path **Lower**, and the second one **Height**.

ℹ️ **INFO:** *The* **Lower** *and* **Height** *output paths make up the Auro 11.1 monitoring setup.*

4. Go to **Pro Tools** > **Setup** > **I/O…** > **Bus,** create a 7.1 bus, and name it **Mix Engine.**

TIP: *Make sure you enable the* **Auto-create sub paths** *option when creating the* **Mix Engine** *bus.*

Figure 2-2 Auto-create sub paths

5. Still in the **Bus** tab, create a mono bus, name it **Scrubbing,** and map it bus to the Center-channel output.

2.2.2   Setting up plug-in routing

6. Create a 7.1 aux input track and name it **Mix   Engine.**

7. Insert an Auro-Mix Engine plug-in on the second Insert slot of the **Mix   Engine** track.

INFO: *In this example, the default channel configuration in the Auro-Mix Engine will be used, i.e.* **Auro   11.1**.

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8. Select the **Mix   Engine** bus as the input bus of the **Mix   Engine** track.

9. Set the output of the aux input track to the **Lower** output path.

10. Create two 5.1 aux input tracks, and name them **Lower** and **Height** respectively.

11. Insert an Auro-Return plug-in on the **Lower** and **Height** track.

12. Configure the Auro-Return plug-ins.

13. Set the output of the **Lower** and **Height** track to the **Lower** and **Height** output path respectively.

INFO: *The Auro-Return plug-ins return the output channels of the Auro-Mix Engine to the DAW. Since the maximum channel-width of a bus in Pro Tools is 8 channels, two Auro-Return instances are needed to return all the channels of an Auro-3D format (e.g. Auro 11.1).*

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14. Create an audio track, and name it **Panner**.

15. Select the **Mix   Engine** bus as the output of the **Panner** track.

16. Insert an Auro-Panner plug-in on the last insert slot of the **Panner** track.

INFO: *Inserting the Auro-Panner on the last insert slot of an audio track allows for audio processing before the audio is panned by the Auro-Panner.*

ATTENTION: *Only tracks with an Auro-Panner or Auro-Matic Pro plug-in are allowed to be routed to the* **Mix   Engine** *bus.*

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17. Import an audio file to the **Panner** track.

18. Repeat steps 15 to 18 for additional source audio tracks.

19. Open up both the Auro-Panner and the Auro-Mix Engine plug-in.

20. Start playback and manipulate the controls in the Auro-Panner plug-in.

21. Panned audio can now be monitored through the Auro 11.1 setup.

Chapter 3: Using Fader Link

The Fader Link feature allows the Pro Tools fader, solo and mute buttons to control the Auro-Panner (or Auro-Matic Pro) fader, solo and mute buttons. Additionally, X/Y panning can also be linked to the Pro Tools X/Y panning controls.

3.1 Setup Procedure

Before activating the Fader Link feature, make sure the basic session setup corresponds to the steps outlined in *Chapter 2: Setting Up a Pro Tools Session on page 9*

To set up an Auro-Panner plug-in with the Fader Link feature:

1. Go to **Auro-Settings** and enable the global **Fader Link** option. This setting is reflected in the Auro-Panner status bar by the **Fader Link** LED.

Figure 3-1 Fader Link activated

2. Open the Auro-Mix Engine plug-in and start playback.

During playback, all Auro-Panner instances are linked to the Pro Tools track they are inserted on. The status of this linking phase is reflected in the Auro-Mix Engine.
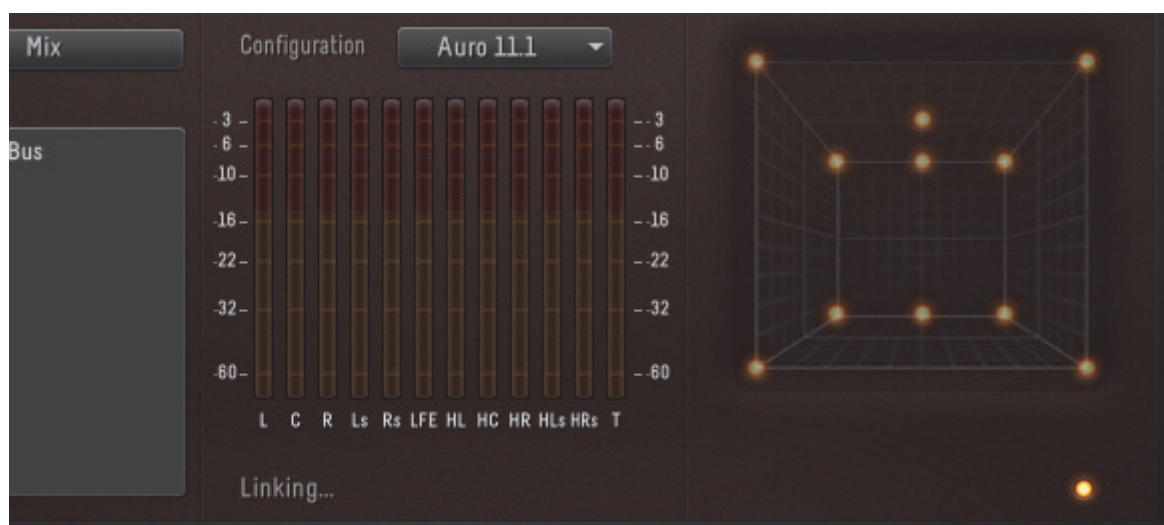
Figure 3-2 Linking state

The Fader Link status LED in the bottom right corner of the Auro-Mix Engine lights blue when the Auro-Panner instances have been successfully linked.
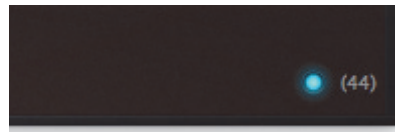
Figure 3-3 44 Auro-Panner instances are linked

The Fader Link status LED lights red if not all Auro-Panners are linked. Start playback to start the linking phase again.

Figure 3-4 Error during linking phase

⚠️ **ATTENTION:** *After changing the* **H/W   Buffer   Size** *or removing/adding an additional plug-in to your Pro Tools session, the Auro-Panners need to be relinked to the Pro Tools tracks they are inserted on.*

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3. In Fader Link, the volume and panning controls of the Auro-Panner follow the volume and panning controls of Pro Tools whenever you are in playback/record.

4. The Volume control of individual Auro-Panner instances can be (un)linked from Pro Tools' Volume by clicking the **Volume   Link** button.

ⓘ **INFO:** *Auro-Matic Pro can also be used in Fader Link mode. The setup procedure is the same as with the Auro-Panner, i.e. it has to be routed to the* **Mix   Engine** *bus.*

Figure 3-5 Volume Link button

5. Likewise, the XY panning of individual Auro-Panner instances can be (un)linked from the Pro Tools panner by clicking the **Pan Link** button.
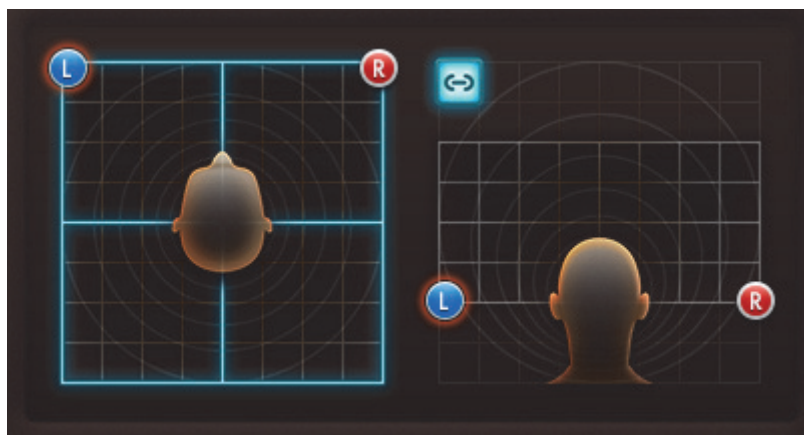
Figure 3-6 Activated **Pan Link** button

6. For Pro Tools metering, select **Sample Peak** type metering.
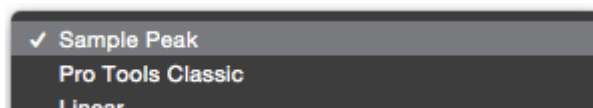
Figure 3-7 Sample Peak metering

INFO: *During silent passes, a low-level control signal can be seen on the Pro Tools meters. This signal is used to control the Auro-Panner Volume control and doesn't interfere with the Auro-Panner audio.*

To set up FX sends:

1. Go to **Pro Tools > Setup > I/O… > Bus** and create a mono bus, called **FX Send1**.

2. On the Panner track, create a Send to the **FX Send1** bus.

3. Create a mono aux input track, named **FX1**, and select the **FX Send1** bus as its input.

4. Insert an Auro-Aux Engine plug-in on the second Insert slot of the **FX1** track.

Figure 3-8 Auro-Aux Engine

5. Set the output of the **FX1** track to a dummy output (i.e. an output that doesn't go to the monitoring system).

TIP: *The Auro-Aux Engine outputs a downmix in the format of the aux input track it is inserted on. If desired, any FX plug-in can be inserted after the Auro-Aux Engine and sent to the output bus.*

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6. Create two 5.1 aux input tracks and name them **Lower Reverb** and **Height Reverb**

respectively.

7. Next, insert an Auro-Return plug-in on the second Insert slot of these tracks.

8. Set the Auro-Returns to receive the Lower and Height layer of the Auro-Aux Engine respectively.

Figure 3-9 Auro-Aux Engine output to the Lower Auro-Return

ATTENTION: *The Auro-Aux Engine plug-in uses the same 3D panning as the Auro-Mix Engine. In order to receive all channels, two Auro-Return plug-ins need to be connected to the Auro-Aux Engine. Alternatively, the Auro-Aux Engine is outputting a downmix in the format of the track it is inserted on, to feed any plug-in that follows.*

9. Insert a 5.1 reverb after the Auro-Return plug-ins and set the output of the **Lower** and **Height** tracks to your **Lower** and **Height** monitoring buses.

Figure 3-10 Inserts and I/O of the Auro-Aux Engine and Auro-Return tracks

Chapter 4: Creating an Auro-Encoded file

This section outlines the steps to follow to create an Auro-Encoded file, e.g. to encode an Auro 11.1 mix into a Auro-Encoded 5.1 carrier.

1. Go to the **Settings** tab of the Auro-Mix Engine.
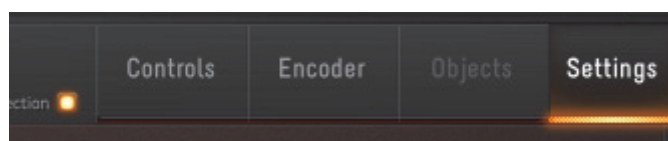
Figure 4-1 Settings tab

2. In the **Settings** tab choose an **Export   path** where the Auro-Encoded 5.1 file will be saved.

3. Choose a **Program   name**, which will be used for the exported and encoded files.

Figure 4-2 Export path and Program name

4. Make a timeline selection in your DAW.

ATTENTION: *It's strongly recommended to make timeline selections on video frame boundaries.*

5. Make sure Loop Playback is disabled in your DAW.

6. Go to the **Encoder** tab of the Auro-Mix Engine.

7. Select an encoding profile from the **Profile** menu, e.g. **Digital Cinema - Master Quality - 24 fps.**

8. Click the **Enable** button, to arm the Auro-Encoder.

Figure 4-3 Enable button

9. Start playback in your DAW.

During playback, the Auro-Mix Engine exports the discrete Auro 11.1 channels.

After playback has stopped, the Auro-Encoder encodes these discrete channels into an Auro-Encoded 5.1 carrier. The duration of the encoding process approximates the duration of the audio program.

TIP:	*To ensure optimal encoder speed, make sure OpenCL is supported by your graphics card and is properly configured on your machine.*

Chapter 5: Using the Auro-Decoder to Decode an Auro-Encoded File

This section covers the general workflow when using an Auro-Decoder plug-in. The DAW used here is Pro Tools, but the workflow is the same in any DAW.

5.1 Stand-alone Mode

When creating a new session to decode Auro-3D encoded content, follow the steps below:

1. Import an Auro-3D encoded file (e.g. Auro 11.1 encoded in a 5.1 carrier) to an audio track in your session.

2. Insert an Auro-Decoder instance on that track.

3. Create two 5.1 aux input tracks

4. Rename the tracks to **Lower   Decoded** and **Height   Decoded**, respectively.

5. On the aux input tracks, insert an Auro-Return plug-in on the second insert slot and rename these instances to **Lower   Decoded** and **Height   Decoded**.

6. Set the output of the **Lower   Decoded** track to the **Lower** output path.

7. Set the output of the **Height   Decoded** track to the **Height** output path.

8. In both Auro-Return instances, select **Decoder** from the **Bus** menu so that the Auro-Return plug-ins receive the output channels of the Auro-Decoder instance called **Decoder**.

9. In both Auro-Return instances, select the desired channel order from the **1   ...   N** dropdown menu's. Instead of selecting them one by one, you can choose a preset from the **Preset** dropdown menu as well.

10. Open the Auro-Decoder instance.

11. Start playback.

(i)   **INFO:**   *After starting playback, the Auro-Decoder plug-in takes a fraction of a second (2048 samples) to be synchronized.*

---

12. The levels of the encoded carrier signal and the decoded output signal are shown on the level meters in the plug-in.

5.2   In an Existing Auro-3D Mix Session

Apart from using the Auro-Decoder plug-in in stand-alone mode, it can also be integrated in the same session that the Auro-3D mix is made in. To do so, follow this procedure:

1. Import an Auro-Encoded file to an audio track in your session.

2. Insert an Auro-Decoder instance on that track.

3. Assign it to the Auro-Mix Engine instance in your session, by clicking the dropdown menu in the bottom right corner.
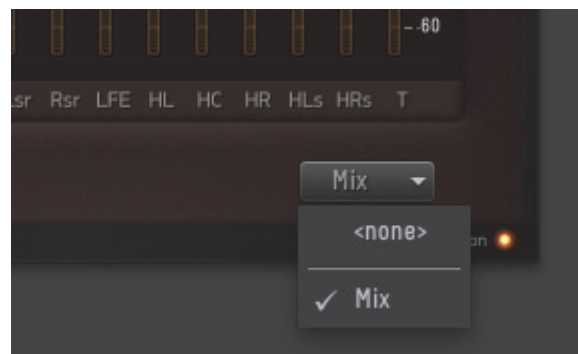

Figure 5-1

4. Enable the **S** switch to only listen to this Auro-Decoder instance.

5. Disable the **S** switch and enable the **M** switch to listen to the regular mix again.

Auro Technologies

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Plug-in Version: 2.2.0

User Guide Version: 2.2.0

Chapter 1: Introduction to Auro-3D

Welcome to Auro-3D®, the next step in sound evolution brought to you by Auro Technologies. Audio reproduction has evolved from a point source (mono), to a single dimension (stereo), to two-dimensional surround sound (5.1 or 7.1). To produce true three-dimensional sound, a reproduction system must include a vertical Z axis (top-to-bottom), in addition to the existing X (side-to-side) and Y (front-to-back) planar axes found in current systems. Auro-3D's three-layered approach (Lower, Height, and Top Layers) completes this evolution by creating a realistic three-dimensional soundscape.

Auro-3D content can be played back on systems without an Auro-3D decoding system (e.g. older cinema theatres) by storing the content in a surround sound (5.1 or 7.1) carrier and playing back the 5.1 or 7.1 surround sound standard without any loss of audio quality. Systems incorporating an Auro-3D decoder will play back the Auro-3D format while ignoring the 5.1- or 7.1-channel version.

Auro-3D Formats

The Auro 9.1–11.1 formats are based on and compatible with the 5.1 surround standard. They include the following additional channels:

- **Auro 9.1**: 5.1 surround + four Height Channels (one above each corner channel)
- **Auro 10.1**: Auro 9.1 + Top Channel (aka Voice of God)
- **Auro 11.1**: Auro 10.1 + Height Center Channel

The Auro 11.1b and 13.1 formats are based on and compatible with the 7.1 surround standard. They include the following additional channels:

- **Auro 11.1b**: 7.1 surround + four Height Channels (one above each corner channel)
- **Auro 13.1**: Auro 11.1b + Height Center Channel + Top Channel

Auro Technologies has developed the **Auro-3D Authoring Tools** to allow three-dimensional panning and **Auro-Matic Pro 2D** and **3D** to allow two- and three-dimensional upmixing in any DAW on Mac that supports AAX plug-ins.

> **INFO:** *Auro-Matic Pro is not included in the Auro-3D Authoring Tools.*

Auro-3D and Object-based Audio

The Auro-3D Authoring Tools will fully support the standard object-based audio workflow once the standardization of an object-based format has been finalized.

Auro-3D Authoring Tools

Auro-3D Authoring Tools consist of five plug-ins, the Auro-Encoder, the A3DHost service, and the Auro-Settings application. Each plug-in connects to the A3DHost service, which runs in the background to control all audio streams and processing.

The **Auro-Panner plug-in** enables 3D panning, replacing the DAW's panner when working in Auro-3D. The panned information is sent to the Auro-Bus plug-in.

The **Auro-Bus plug-in** collects panned information from a number of Auro-Panners to form a subgroup or stem. All connected Auro-Panners can be summed, leveled, and their downfold settings can be adjusted in case a planar mix is required.

The **Auro-Mix Engine plug-in** sets the Auro-3D configuration and controls how all connected Auro-Buses are mixed and encoded. It displays the level of all channels in the Auro-3D field and outputs a mix and downmix to the connected Auro-Return plug-ins. It also outputs a downmix to the DAW-track it is inserted on.

The **Auro-Aux Engine plug-in** creates an auxiliary mix to which sound effects (e.g. an Auro-3D reverb) can be applied.

The **Auro-DMix Control plug-in** lets the mixing engineer dynamically downmix all channels in an Auro-3D configuration to a different surround format.

The **Auro-Return plug-in** delivers the channels of an Auro-Mix Engine to the DAW. Because most DAW's have an eight-channel format limitation, the Height and Lower layers are typically delivered to two separate multichannel tracks, each with its own Auro-Return instance.

The **Auro-Decoder plug-in** is designed to decode Auro-3D encoded content. It's a real-time processing plug-in that connects to Auro-Return plug-ins, either directly or via an Auro-Mix Engine, to output the decoded Auro-3D mix.

The **Auro-Encoder** controls are embedded in the Encoder tab of the Auro-Mix Engine plug-in. It lets you encode up to three PCM channels into one channel while remaining in the PCM domain. There is no signal degradation or loss of audio quality, and the encoded format complies with DCI specifications.

A3DHost runs as a background service that ensures that all Auro-3D plug-ins are correctly connected to each other.

The **Auro-Settings application** (accessible through the Mac menu bar) enables you to select the Solo behavior for Auro-3D plug-ins, specify the hardware and software the Auro-3D Authoring Tools are used with, and activate the global Fader Link option.

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> **INFO:** *We currently support AAX plug-ins for Avid's Pro Tools 10 or higher. Please contact Auro Technologies for information on when VST and AU versions will be available.*

Auro-3D Authoring Tools Concept

Auro-3D introduces additional channels for the extra layers to enhance sound reproduction. As discussed above, even the smallest Auro-3D listening format (Auro 9.1) has 10 channels. To enable Auro-3D panning in DAW's limited to eight-channel pan/bus formats, the vector-based panning information is actually rendered in the A3DHost processor outside the DAW.

Each inserted Auro-Panner sends its individual audio stream, with its vector-based panning information, through the Auro-Bus plug-in to the Auro-Mix Engine.

> **INFO:** *All the Auro-3D plug-in interconnections are managed by A3DHost, which lies at the heart of the Auro-3D Authoring Tools.*

An Auro-3D configuration (e.g. Auro 11.1) uses two Auro-Return plug-ins inserted on separate DAW tracks to split the Auro-Mix Engine output into a Lower and a Height + Top channel-layer. The number of channels that are returned to the DAW depends on the configuration selected in the Auro-Mix Engine plug-in.
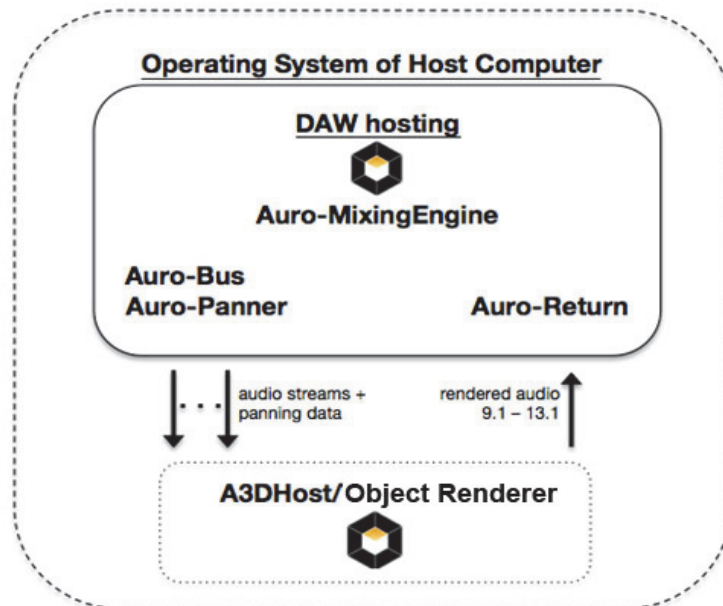

Figure 1-1 Auro-3D block diagram

This reference manual covers the following information:

- *Chapter 2: System Requirements and Installation* – Lists system and DAW requirements and discusses how to install Auro-3D software.

- *Chapter 3: Auro-3D Authoring Tools Plug-ins* – Elaborates on each plug-in's parameters in detail.

Chapter 2: System Requirements and Installation

2.1   System Requirements and Compatibility

The Auro-3D Authoring Tools exist in AAX format and run on the following:

- **Operating Systems:** Mac OS X 10.8.5, 10.9.5 and 10.10.5
- **DAW's:** Pro Tools 10, 11 and 12

TIP: *Only the latest update of your DAW is supported.*

- **Hardware:** Pro Tools|HDX and Pro Tools|HD Native

Please refer to complete system requirements and a list of qualified computers, operating systems, hard drives, and third-party devices for Avid's Pro Tools by visiting:

www.avid.com/compatibility

INFO: *The Auro-3D Authoring Tools support audio sample rates of 44.1 and 48 kHz. A future release will support higher sample rates.*

2.2   Installation

After purchasing the software, download the latest software using the provided download link.

If the download link has expired, contact support for a new one:

support@auro-technologies.com

To install the Auro-3D Authoring Tools on a Mac running OS X:

1. Uninstall any previous installation of the Auro-3D Authoring Tools, by double-clicking **Auro-3D_Creative_Tools_Suite.Uninstall.command** from: /Library/Application Support/Auro Technologies/

2. Restart your computer

3. Double-click the ZIP file you downloaded from the Auro Technologies website, then double-click **Auro-3D   Authoring   Tools.pkg** to begin the standard installation.

4. Follow the installation instructions and select the type of installation wanted. For more

information on the different installation types, please refer to the paragraph below.

Package Name	Action	Size
☑ Auro-3D Authoring Tools - Basic	Upgrade	Zero KB
☐ Auro-3D Authoring Tools - Advanced	Skip	Zero KB

Figure 2-1 Installation type

5. Finally, restart your computer.

⚠ **ATTENTION:** *Restarting your computer in step 2 and 5 is mandatory for a correct installation.*

Basic

The following software is installed:

- Auro-Panner, Auro-Bus, Auro-Mix Engine, Auro-Aux Engine, Auro-Return and Auro-DMix Control plug-ins
- A3DHost service
- Auro-Settings menu bar application

Advanced

The following additional software is installed:

- Auro-Decoder plug-in
- Auro-Encoder

2.2.1 Licensing

To use the Auro-3D Authoring Tools, it is required to install the correct license(s) on a 2nd generation iLok USB key. There are three license levels:

- **Auro-Panner** – Includes all DAW channel-based panning and mixing functionality.

- **Auro-Codec** – Includes the Auro-Panner license plus the following additional functionality: The channel-based output can be encoded with the Auro-Codec using Home Entertainment encoding profiles.

- **AuroMAX** – Includes the Auro-Codec license plus the following additional functionality: The channel-based output can be encoded with the Auro-Codec using Digital Cinema encoding profiles.

For more information about iLok, visit:

www.ilok.com

Chapter 3: Auro-3D Authoring Tools Plug-ins

A basic Auro-3D session consists of an Auro-Panner, Auro-Bus, Auro-Mix Engine, and an Auro-Return plug-in. Each plug-in is inserted on its own DAW audio track and connects to the A3DHost processor.

The Auro-Panner sends its track's audio to a selected Auro-Bus, which routes it (and other Auro-Panners) to the Auro-Mix Engine. The Auro-Mix Engine lets you set Auro-3D and downmix configuration settings, mixes the audio, and then sends it back to the DAW using the Auro-Return plug-in.

3.1   Auro-Panner

Figure 3-1 Auro-Panner plug-in

3.1.1 Connection LED

The **Connection** LED in the bottom right indicates the connection state of the Auro-Panner plug-in. If the LED blinks red, there is a connectivity problem (see "To force the Auro-3D Authoring Tools to work in the low-latency domain only, a DSP plug-in needs to be inserted on the first Insert slot of every track that contains an Auro-3D plug-in. Working with the low-latency buffer also keeps the latency to a minimum." on page 64 for help). If it lights yellow, the plug-in is ready to use.

3.1.2 Fader Link LED

The **Fader Link** LED indicates the current state of the **Fader Link** option in Auro-Settings (see *"Fader Link" on page 65* for help). If the LED lights blue, **Fader Link** is active. Otherwise it is inactive.

3.1.3 HDX Aux

On Pro Tools|HDX Systems, an Auro-Panner instance inserted on an Aux Input track requires enabling the **HDX Aux** switch. This ensures correct delay compensation between Auro-Panner and Auro-Matic Pro instances inserted on regular audio tracks and those inserted on aux input tracks, before being mixed together in the Auro-Mix Engine.

Figure 3-2 HDX Aux switch in the Auro-Panner

3.1.4 Name

The name field initially displays a unique, automatically generated name. We recommend assigning a more meaningful name to each Auro-Panner instance, such as the name of the track it is inserted on. To rename an Auro-Panner instance, click the **Name** field and type a new name.

> **INFO:** *Changing the name of the Auro-Panner instance does not change the name of the respective DAW-track.*

3.1.5   Volume

The **Volume** fader sets the signal level sent to the assigned Auro-Bus instance, but has no effect on the Auro-Panner's direct output to the DAW-track.

The **Volume** can be set three ways:

- Click and drag the fader.
- Click in the path of the fader.
- Double-click the numerical field below the fader and enter a value.

Level Meter

This meter displays the DAW-track's direct input level to the Auro-Panner.

Clip

The **Clip** LED lights red if more than five consecutive samples cross a threshold of -0.1 dBFS. Click the **Clip** LED to clear it.

Solo

The **S** switch lights yellow to indicate this instance is soloed, and all instances which aren't soloed nor designated *solo safe* are disconnected from their buses and become inaudible.

The **S** switch flashes yellow to indicate another Auro-Panner instance is soloed.

- Click the **S** switch to toggle the solo status of this Auro-Panner instance only.
- Alt + click the **S** switch to unsolo all soloed Auro-Panner instances.
- Command + click the **S** switch to designate this Auro-Panner instance *solo safe*: When other Auro-Panner instances are soloed, this instance will remain audible.

TIP:		*The Solo behavior can be set to X-OR or Latch in the Auro-Settings application (see "Auro-Settings options in the Finder menu bar" on page 63).*

Mute

The **M** switch lights red to indicate this instance is muted. Multiple instances can be muted at the same time.

- Click the **M** switch to toggle the mute status for this instance only.
- Alt + click the **M** switch to unmute all muted Auro-Panner instances.

Volume Link

The **Volume Link** button links the Volume fader of an Auro-Panner instance to the Volume fader of the Pro Tools track it's inserted on. The level of the Auro-Panner can then be controlled by adjusting the corresponding Pro Tools track's fader, either from the software or from a control surface.

Figure 3-3 Volume Link button

Deactivating the **Volume Link** button will unlink the Volume fader of this Auro-Panner instance from the Volume fader of the hosting Pro Tools track, in which case the level of the Auro-Panner is purely controlled in the plug-in.

3.1.6   Bus Assignment

The bus assignment menu, located below Solo and Mute, lets you send the audio and panning information to the Main Bus or an Auro-Bus plug-in. This bus can then be selected in an Auro-Mix Engine. The currently selected bus name is displayed in the menu.

INFO: *By default, all Auro-Panner instances connect to the Main Bus, which is available even when no Auro-Bus plug-ins are inserted.*

3.1.7   Send 1, Send 2

This feature is currently not implemented.

3.1.8   Object

The **Object** button has been deactivated until the standardization of an object-based format is finalized.

3.1.9   LFE

The **LFE** rotary encoder lets you control the amount of signal added to the LFE output routed to the Auro-Mix Engine. If an LFE channel is already present in the track (e.g. when the Auro-Panner is inserted on a 5.1-channel track), it is not affected by the **LFE** rotary encoder, and is added completely to the LFE output of the Auro-Panner to the Auro-Mix Engine.

Two switches affect the **LFE** encoder:

- The **M** switch lets you mute the LFE output of the Auro-Panner to the Auro-Mix Engine. It lights red when the LFE output is muted.

- The **P** switch lets you toggle the LFE send pre- or post-fader; the default setting is post-fader. It lights green when set to pre-fader and is unlit otherwise.

To send the signal from this Auro-Panner instance to the LFE channel only:

1. Mute the Volume fader.

2. Toggle the LFE send to pre-fader.

3. Use the LFE rotary encoder to set the signal amount.

3.1.10   Scene

The Scene parameters provide intuitive graphic control of the orientation of channels in the Auro-Panner. Each channel's icon can be dragged to a new location. The left graphical view shown in Figure 3-4 corresponds to the horizontal plane (X-Y coordinates) as viewed from the top; the right view corresponds to the vertical plane (X-Z coordinates) as viewed from behind. These two views clearly describe your 3D panning moves.

Figure 3-4 Scene parameters

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The Scene Parameters (**Link**, **Mirror** and **Rotate)** enhance the control of the different channels, so that complex panning moves are faster and easier to execute. **X Lock** prevents channel movement in the X-domain but allows changes to the Y-Z coordinates.

These parameters are explained below but the best way to learn how they work is to experiment by dragging channels around with various options enabled.

Link

When active, multichannel source channels move together when dragged. Their behavior depends on the **Mirror, Rotate** and **X Lock** controls described below, and on which channel is dragged.

Mirror

Mirror X, **Y**, and **Z** can be selected individually or in any combination. **Link** must be enabled for the **Mirror** controls to have an effect.

When one or more **Mirror** controls are active, the movement of the channel dragged around is mirrored by moving all other channels around the middle point between the channel dragged and any other channel on the same axis. Therefore, with **Mirror X** active, two channels with the same X-coordinate will not be mirrored along the X-axis because there is no distance between them on that axis.

Rotate

When **Rotate** is active, dragging a channel rotates all channels around the scene's origin in the X-Y plane. The relative distances of all channels to the origin remain intact. **Link** must be enabled for **Rotate** to have an effect.

> **INFO:** *When **Rotate** is enabled, the X- and Y-coordinates are linked, regardless of the state of the **Link X** and **Y** options.*

X Lock

When **X Lock** is active, all channels retain their current X-coordinate position, but can move in the Y-Z plane.

> **INFO:** *When both **Rotate** and **Lock** are enabled, the channels cannot move in the X-Y plane.*

3.1.11 Channel

The Channel parameters determine the position of a source by specifying its X, Y, and Z coordinates, divergence (width and height), and phantom or discrete routing for each channel.

Figure 3-5 Channel parameters

X, Y, Z

Each channel has X-, Y-, and Z- panning coordinates. If you dragged the channels around the Scene, these numbers reflect the channel's current location.

X- and Y-coordinates vary from -100 to 100. LEDs around the rotary encoders light to indicate the current value, with 0 at the top-center. Z-coordinates vary from 0 to 100. LEDs around the rotary encoder light to indicate the current value, with 0 being fully counterclockwise.

To assign coordinates to a channel:

- Click and drag the channel icon in the Scene (see "Scene" on page 36).
- Adjust a rotary encoder by clicking it and dragging up and down.
- Double-click a rotary encoder's numeric field and enter a coordinate value.

Width and Height

The **Width** and **Height** rotary encoders allow you to set the horizontal and vertical divergence, respectively, which controls how much signal is spread to adjacent channels. For example, in a 5.1-channel format, the **Width** parameter for the C channel causes the signal to first spread into L and R channels and then Ls and Rs. The **Height** setting affects spread into the Z dimension.

C%, HC%, T%

These settings determine whether a centered source (C, HC, T) will be reproduced by its own center channel or adjacent L and R channels to create a phantom image. The values range from 0–100%.

100% – Entire signal is sent to the center channel, none to L and R channels.

0% – Entire signal is sent to applicable L and R channels, none to C channel. The centered localization is reproduced entirely by a phantom image.

---

i **INFO:**   *How these settings affect adjacent channels also depends on the multichannel format.*

Pan Link

The **Pan Link** button links the XY panning of an Auro-Panner instance to the XY panner of the Pro Tools track it's inserted on. Additionally, the C% and LFE controls of the Auro-Panner instance are linked to the corresponding controls in the Pro Tools panner.
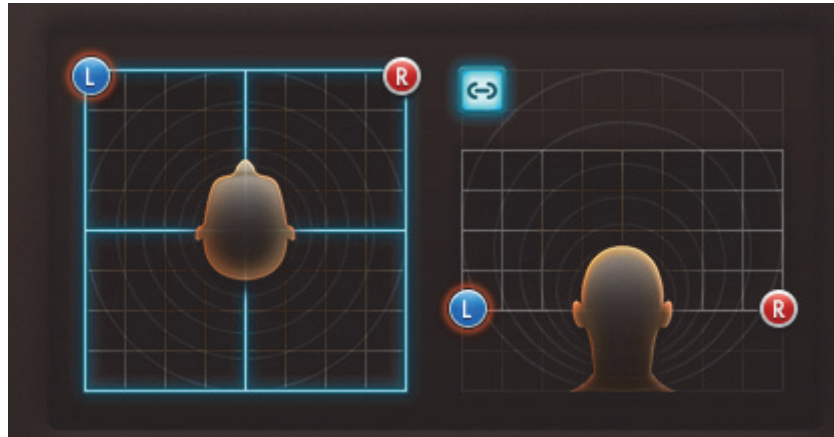
Figure 3-6 An activated Pan Link button

The linked panning state is represented by a blue outline around the XY panning pane.

INFO: *Only the XY panning pane can be linked to Pro Tools' panner. Vertical panning is controlled exclusively in the Auro-Panner.*

3.1.12   Controls and Settings Tabs

Click the **Controls** tab to access the Auro-Panner's main controls.

Click the **Settings** tab to adjust the **Downfold** settings for this Auro-Panner and view information about the Auro-Panner plug-in.

Figure 3-7 Auro-Panner Settings tab

Downfold Settings

These settings control the level of the Height and Top layers reproduced by the Lower layer if a planar mix is selected in the Auro-Mix Engine.

Enable

When the **Enable** button is lit, the **Height** and **Top gains** are active. When unlit, the entire Height and Top layer signals are folded down to their respective Lower layer channels.

Height and Top Gain

Both of these controls attenuate only and are at 0 when fully clockwise.

- Adjust **Height gain** to send the desired signal amount to the planar mix.
- Adjust **Top gain** to send the desired signal amount to the planar mix.

About

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3.2 Auro-Bus

The Auro-Bus collects panned information from a number of Auro-Panners to form a subgroup or stem before delivering them to the Auro-Mix Engine.

Figure 3-8 Auro-Bus plug-in

3.2.1 Connection LED

The **Connection** LED indicates the connection state of the Auro-Bus plug-in. If the LED blinks red, there is a connectivity problem (see "Restart Service" on page 65 for help). If it lights yellow, the plug-in is ready to use.

3.2.2 Name

The **Name** field initially displays a unique, automatically generated name. We recommend assigning a more meaningful name to each Auro-Bus instance, such as the name of the track it is inserted on.

To rename an Auro-Bus instance, click the **Name** field and type a new name.

INFO: *Changing the name of the Auro-Bus instance does not change the name of the respective DAW-track.*

3.2.3   Volume

The **Volume** fader sets the signal level sent to the assigned Auro-Mix Engine.

The **Volume** can be set three ways:

- Click and drag the fader.
- Click in the path of the fader.
- Double-click the numerical field below the fader and enter a value.

Level Meter

This meter displays the direct input level of the connected Auro-Panner instance with the highest level. It acts as an indication that audio is passing through the Auro-Bus instance. Precise metering should be done in the Auro-Mix Engine, where the audio is mixed to the corresponding channels.

Solo

The **S** switch lights yellow to indicate this instance is soloed, and all other instances not soloed or designated *solo safe* are disconnected from their buses and not audible.

The **S** switch flashes yellow to indicate another Auro-Bus instance is soloed.

- Click the **S** switch to toggle the solo status of this Auro-Bus instance only.
- Alt + click the **S** switch to unsolo all soloed Auro-Bus instances.
- Command + click the **S** switch to designate this Auro-Bus instance *solo safe*: When other Auro-Bus instances are soloed, this instance will remain audible.

TIP: *The Solo behavior can be changed between X-OR and Latch in the Auro-Settings application (see "Restart Service" on page 65).*

Mute

The **M** switch lights red to indicate this instance is muted. Multiple instances can be muted at the same time.

- Click the **M** switch to toggle the mute status for this instance only.
- Alt + click the **M** switch to unmute all muted Auro-Bus instances.

3.2.4   Tracks

The **Tracks** field lists all Auro-Panner instances that are assigned to this Auro-Bus instance.

3.2.5   Downfold Settings

- Like the Auro-Panner plug-in, the Auro-Bus contains two Downfold Settings to control how the Top and Height levels are delivered to a planar mix. The **Height gain** and **Top gain**

rotary encoders attenuate only, are always enabled, and default to 0 dB.

INFO: *When the* **Downfold Enable** *switch of a connected Auro-Panner is active, the Auro-Bus* **Downfold Settings** *will not have any additional effect on that Auro-Panner's audio.*

Height and Top Gain

Both of these controls attenuate only, and are at 0 when fully clockwise.

- Adjust **Height gain** to send the desired height layer signal amount from this Auro-Bus to the planar mix.

- Adjust **Top gain** to send the desired top layer signal amount from this Auro-Bus to the planar mix.

3.3 Auro-Mix Engine

The Auro-Mix Engine plug-in lies at the heart of the Auro-3D workflow and performs the following functions:

- Receives audio from connected Auro-Bus plug-ins.

- Sets the Auro-3D configuration format.

- Outputs a mix and a downmix to the Auro-Return plug-ins.

- Contains the Auro-3D Encoder.

The Auro-Mix Engine output can be monitored by routing it to one or more Auro-Return plug-ins.

Figure 3-9 Controls tab of Auro-Mix Engine

The Auro-Mix Engine has four tabs: **Controls, Encoder, Objects,** and **Settings**.

The **Objects** tab has been deactivated until the standardization of an object-based format is finalized.

3.3.1 Controls Tab

Click the **Controls** tab to access the Auro-Mix Engine's main controls.

Connection LED

The **Connection** LED indicates the connection state of the Auro-Mix Engine. If the LED blinks red, there is a connectivity problem (see "Restart Service" on page 65 for help). If it lights yellow, the plug-in is ready to use.

Name

The **Name** field initially displays a unique, automatically generated name. We recommend assigning a more meaningful name to each Auro-Mix Engine instance, such as the name of the DAW-track it is inserted on.

To rename an Auro-Mix Engine instance, click the **Name** field and type a new name.

INFO: *Changing the name of the Auro-Mix Engine instance does not change the name of the respective DAW-track.*

Volume

The **Volume** fader sets the signal level sent to the connected Auro-Return instances and also affects the downmix sent to the DAW-track.

The **Volume** can be set three ways:

- Click and drag the fader.
- Click in the path of the fader.
- Double-click the numerical field below the fader and enter a value.

Solo

The **S** switch lights yellow to indicate this Auro-Mix Engine instance is soloed, and all other instances not soloed or designated *solo safe* are disconnected from their buses and not audible.

The **S** switch flashes yellow to indicate another Auro-Mix Engine instance is soloed.

- Click the **S** switch to toggle the solo status of this Auro-Mix Engine instance only.
- Alt + click the **S** switch to unsolo all soloed Auro-Mix Engine instances.
- Command + click the **S** switch to designate this Auro-Mix Engine instance *solo safe*: When other Auro-Mix Engine instances are soloed, this instance will remain audible.

TIP: *The default Solo behavior can be set to X-OR and Latch in the Auro-Settings application (see "Auro-Settings options in the Finder menu bar" on page 63).*

Mute

The **M** switch lights red to indicate this Auro-Mix Engine instance is muted. Multiple instances can be muted at the same time.

- Click the **M** switch to toggle the mute status for this Auro-Mix Engine instance only.
- Alt + click the **M** switch to unmute all muted Auro-Mix Engine instances.

Configuration

The Auro-Mix Engine can create many formats that can be selected from the **Configuration** menu. The meter labels automatically change to reflect the channels present in each configuration.
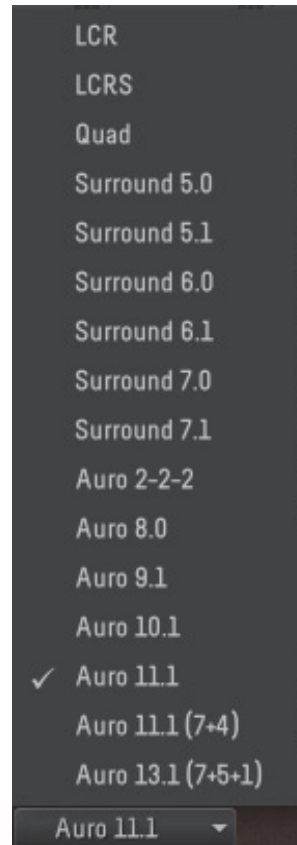
Select a format from the **Configuration** menu:

Figure 3-10 Configuration menu

Buses

The Buses area lists the Main Bus and the names of all active Auro-Bus instances present in your session. By default, the Main Bus is selected. To select additional Auro-Bus instances, click the toggle button to the left of the respective Auro-Bus name.

Metering

The channel meters and the pan graph both offer real-time visual representations of the signal level sent to each channel of the current configuration. While the meters give an accurate measurement of the signal level in decibels, the pan graph offers a three-dimensional localization of the energy. Each dot in the pan graph represents a channel's location; its brightness indicates the signal level.
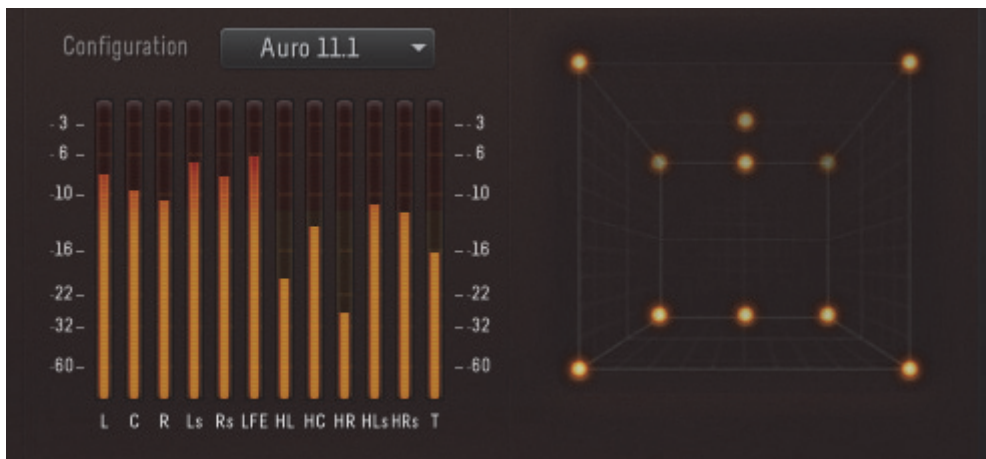
Figure 3-11 Meters and Pan Graph in Auro-Mix Engine

3.3.2 Encoder Tab

Click the **Encoder** tab to adjust parameters related to the encoding process.

Figure 3-12 Encoder tab with Stereo Downmix control

Encoding

To encode your session:

1. Select your start and stop locater positions in the DAW.

2. Activate the **Enable** switch.

3. Select an encoding profile from the **Profile** menu.

4. Launch playback in your DAW from the start of the audio you wish to encode, and stop playback at the end.
   When playback stops, the encoder will begin processing the audio

---

TIP: *To ensure optimal encoder speed, make sure OpenCL is supported by your graphics card and is properly configured on your machine.*

Enable

Click the **Enable** switch to toggle the encoder's status. The **Enable** LED lights yellow when activated for encoding.

Profile

Depending on the license level and the selected configuration, the **Profile** menu contains a collection of Encoder Profiles for different target applications.
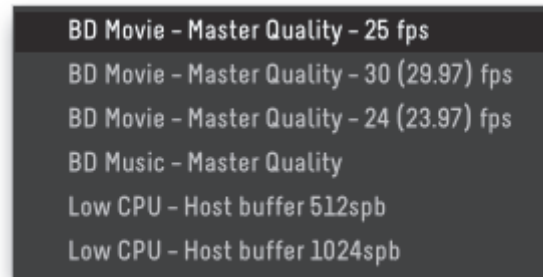
Figure 3-13 Encoding profiles for the Auro 8.0 configuration
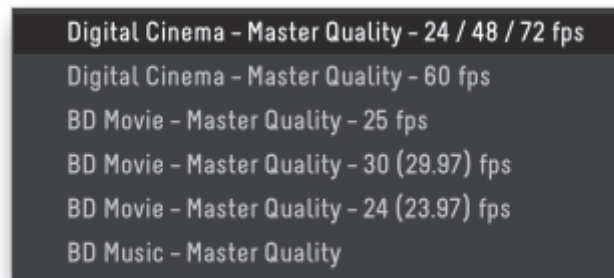

Figure 3-14 Encoding profiles for the Auro 11.1 configuration

Meters

The Auro-Codec Encoder always encodes higher-format content into a lower-format carrier. The meters show the signal level in each carrier channel. Each channel is a static, or dynamically controlled downmix of a combination of upper-format channels. To control this downmix, see "Stereo Downmix" on page 50.

Clip

On top of each meter, a **Clip** LED lights when the Encoder Limiter activates for that channel. The limiter prevents clipping during encoding, but we recommend using it as a preventive measure only, because of the inevitable distortion. Click a red **Clip** LED to clear it.

Program Settings

Program settings contain **Dither** and **Room type** parameters and a **Native Content** switch.
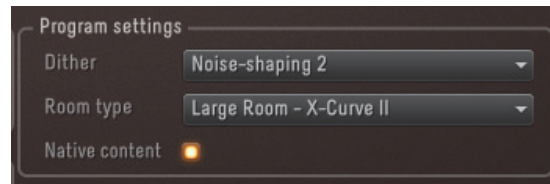
Figure 3-15 Program settings in Auro-Mix Engine Encoder tab

Dither

This menu lets you select a dithering algorithm for encoding.

> **INFO:** *Dithering is disabled for the Digital Cinema* **Profile** *menu options.*

There are four **Dithering** menu options:

- **None**: No dithering is applied during encoding.
- **Standard**: A TPDF dithering algorithm is used during encoding.
- **Noise-shaping 1**: The noise-shaping type 1 algorithm is used during encoding.
- **Noise-shaping 2**: The noise-shaping type 2 algorithm is used during encoding.

Room Type

This menu lets you specify which kind of environment the content was mixed in.

There are four **Room Type** options:

- **No room type defined**
- **Large Room – X-Curve**
- **Large Room – X-Curve II**
- **Small Room – Flat monitoring**

Native Content

Content that originates from an original Auro-3D recording or mix is considered *Native*. The **Native Content** checkbox is enabled by default.

Do not select the **Native   Content** checkbox for content that originates from upmixed mono, stereo, or surround material.

Stereo Downmix and Auro-Matic

The controls displayed in this area depend on the **Configuration** selected from the **Controls** tab. A **Configuration** with 5.1 (six) or less channels displays **Auro-Matic** controls, while those with more channels display **Stereo   Downmix** faders. The active category title is highlighted.

Stereo Downmix

The **Stereo   Downmix** faders let you replace the standard downmix coefficients for Surround carriers that require stereo playback with your own. Adjust each channel fader to specify the amount you wish to downmix to stereo. Figure 3-12 shows these controls.

Auro-Matic

These settings control how 2D content (e.g. surround 5.1), encoded in a 1D carrier (e.g. stereo), plays back in a 3D configuration (e.g. Auro 11.1) using the Auro-Matic upmixing algorithm. For example, when encoding an Auro 2-2-2 configuration into a stereo carrier, the Auro-Matic **Preset** and **3D   Strength** parameters supply precise instructions for the Auro-Matic upmixing algorithm to use when playing this content back through an Auro-3D configuration.

Figure 3-16 Encoder tab with Auro-Matic controls

Preset

Select an option from the **Preset** menu for the Auro-Matic algorithm to use when upmixing 2D content to a 3D configuration.

3D Strength

The **3D Strength** parameter is used when a planar (2D) configuration has been encoded into a stereo carrier but will be decoded and played back in a 3D configuration. Normal decoding renders the planar mix, but this must be upmixed through the Auro-Matic algorithm to play on a 3D system. The **3D Strength** parameter helps determine the default level for the height layer.

The **3D Strength** options are: **Low**, **Medium** (default), **High**, and **Extreme**.

3.3.3   Settings Tab

Click the **Settings** tab to adjust **Downmix settings, Panning settings, Export path**, set **Program name**, and view info about Auro-3D Authoring Tools.

Figure 3-17 Settings Tab

Downmix Settings

In the absence of an Auro decoding system, downmix settings enable 2D playback on a normal 5.1 surround system.

In addition to the encoded downmix, the Auro-Mix Engine always outputs a downmix in the same format as the track on which the plug-in is inserted. The Top channel is downmixed to the corner channels.

Source

The **Source** menu has a **Static** option that lets you specify fixed attenuations for **Lower gain, Height gain**, and **Top gain**.

The **Source** menu also contains the names of all the Auro-DMix Control instances in your session. You can choose one of these and use its settings for a dynamic downmix (see *"Auro-DMix Control" on page 56*).

Lower gain, Height gain, and **Top gain** each offer five attenuation options: **0, -3dB, -4.5dB, -6dB**, and **-9dB.**

Figure 3-18 Downmix Settings

LFE lowpass

A lowpass filter can be applied to the LFE channel of the encoded content with a cut-off frequency of 100 Hz and slope of 6 dB/octave.

Export Path

In the **Export path** field, specify a directory to save Auro-encoded files to.

Program Name

In the **Program name** field, specify a name for the Auro-encoded files.

Figure 3-19 Export Settings
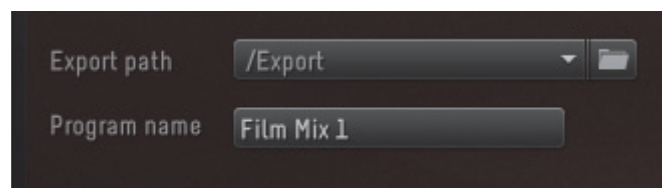
Panning Settings

Click the **Pan Law** menu to choose a **-3dB** or **-6dB pan law**.

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3.4   Auro-Aux Engine

The Auro-Aux Engine plug-in creates an auxiliary Auro-3D mix to which sound effects can be applied.

Figure 3-20 Auro-Aux Engine

3.5   Auro-Return

The Auro-Return plug-in routes channels from a specific Auro-Mix Engine to the DAW-track it is inserted on.

Figure 3-21 Auro-Return plug-in

3.5.1   Connection LED

The **Connection** LED indicates the connection state of the Auro-Return plug-in. If the LED blinks red, there is a connectivity problem (see "Restart Service" on page 65 for help). If it lights yellow, the plug-in is ready to use.

3.5.2   Name

The **Name** field initially displays a unique, automatically generated name. We recommend assigning a more meaningful name to each Auro-Return instance, such as the channel layer it routes back to the DAW.

To rename an Auro-Return instance, click the **Name** field and type a new name.

> **INFO:**   *Changing the name of the Auro-Return instance does not change the name of the respective DAW-track.*

3.5.3   Bus

This menu lets you select the Auro-Mix Engine plug-in from which to receive the audio channels.

3.5.4   Stem

This menu lets you select all stems or a single stem (i.e. an Auro-Bus).

3.5.5   Output

This menu lets you choose between a regular mix or downmix.

3.5.6   Preset

This menu lets you select a channel configuration that best suits your application. Film and ITU conventions are both available for Lower and Height channels.

The options in this menu depend on the following:

- The **Configuration** selected in the Auro-Mix Engine connected to this Auro-Return plug-in (see "Configuration" on page 46).

  - and -

- Whether **Mix** or **Downmix** is selected in the **Output** menu.

3.5.7   1...N

The **1...N** channel menu's are initially populated by the selected preset, but can be individually set to create a custom format. The **Preset** menu displays **Custom** to indicate a modified preset.

Select from these menus to reassign the Auro-Mix Engine channels routed to this Auro-Return plug-in's output channels.

TIP:	*To assign an incremental range of channels, hold down Alt and select an output.*

3.6 Auro-DMix Control

The Auro-DMix Control plug-in lets you:

- Creatively and dynamically control the downmix that encodes Auro-3D content into a 5.1 Surround or four-channel carrier.
- Control the non-encoded downmix.

Unlike the Downmix Settings in the Auro-Mix Engine, the Auro-DMix Control lets you automate the channel gain attenuations so you have complete dynamic control. When the encoded carrier plays through a 5.1 surround system, these gains determine how the source channels are mixed together.

The Auro-DMix Control plug-in can be inserted on an audio track or aux input track of any format.

Figure 3-22 Auro-DMix Control plug-in

3.6.1 Connection LED

The **Connection** LED indicates the connection state of the Auro-DMix Control plug-in. If the LED blinks red, there is a connectivity problem (see "Restart Service" on page 65 for help). If it lights yellow, the plug-in is ready to use.

3.6.2   Name

The name field initially displays a unique, automatically generated name. To rename an Auro-DMix Control instance, click the **Name** field and type a new name.

> **INFO:**   *Changing the name of the Auro-DMix Control instance does not change the name of the respective DAW-track.*

3.6.3   Mix Engines

The **Mix   Engines** field lists all the Auro-Mix Engines whose downmix is controlled by this instance of the Auro-DMix Control.

3.6.4   Channel Gain

Each source channel's level can be attenuated for the downmix. Only negative gain values are allowed because downmixing already creates a rise in level.

The channel gain can be set three ways:

- Click and drag the fader.
- Click in the path of the fader.
- Double-click the numerical field below the fader and enter a value.

3.6.5   Group Layer

The channel gain faders for the Lower and Height layers can be linked together:

- Click the **Group   layer** toggle button to link the channel gain faders.

When active, dragging one channel gain fader up or down also moves the others.

3.7 Auro-Decoder

The Auro-Decoder plug-in is designed to decode Auro-3D encoded content. It's a real-time processing plug-in that connects to Auro-Return plug-ins, either directly or via an Auro-Mix Engine, to output the decoded Auro-3D mix.

Figure 3-23 Auro-Decoder plug-in

3.7.1 Connection LED

The **Connection** LED indicates the connection state of the Auro-Decoder plug-in. If the LED blinks red, there is a connectivity problem (see "Restart Service" on page 65 for help). If it lights yellow, the plug-in is ready to use.

3.7.2 Name

The name field initially displays a unique, automatically generated name. To rename an Auro-Decoder instance, click the **Name** field and type a new name.

INFO: *Changing the name of the Auro-Decoder instance does not change the name of the respective DAW-track.*

3.7.3 Format Detection

In the top right corner, the Format Detection display indicates the type of content that is present:

- • Auro-3D Home Entertainment
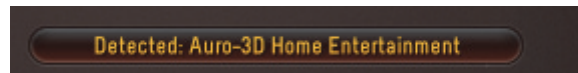- • Auro-3D Digital Cinema
- • No Auro-3D Encoded Content

Figure 3-24 Format Detection display

3.7.4 Encoded Input Channels

The upper metering section of the Auro-Decoder plug-in displays the signal level of the encoded input channels in either a 5.1 (Auro 9.1 - 11.1) or 7.1 (Auro 11.1b - 13.1) format.

Channel Labels

The Channel Labels indicate which encoded channel the meter and controls belong to. For a list of channel abbreviations, please refer to the table below.

Label	Channel
L	Left channel
C	Center channel
R	Right channel
Ls(s)	Left surround (side) channel
Rs(s)	Right surround (side) channel
Lsr	Left surround rear channel
Rsr	Right surround rear channel
LFE	Low Frequency Effect channel

Table 3-1 Encoded channel labels

Channel Mute

The **M** switch lights red to indicate this encoded channel is muted. Multiple encoded channels can be muted at the same time.

- Click the **M** switch to toggle the mute status for this channel only.

INFO: *When an encoded channel is muted, all of the channels that are encoded in it are also muted. For example, when muting the encoded Center channel, both the decoded Center and Height Center channels are muted.*

Channel Meters

These meters indicate the signal level of the corresponding encoded input channels.

Sync LED

The Sync LEDs indicate whether the Auro-Decoder plug-in finds the correct synchronization data in the encoded files.

ATTENTION: *Applying any kind of post-processing to an Auro-3D encoded audio stream will damage the metadata after which the stream can no longer be decoded.*

3.7.5   Decoded Output Channels

The bottom pane of the Auro-Decoder plug-in displays information about the decoded channels.

Channel Meters

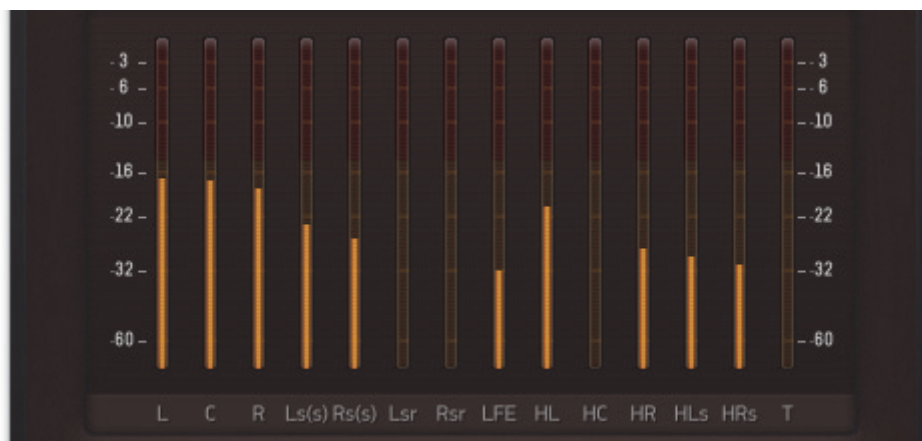These meters indicate the signal level of the corresponding decoded output signal.

Figure 3-25 Decoded channel meters

Channel Labels

The Channel Labels indicate which decoded channel the meter belongs to. For a list of channel abbreviations, please refer to the table below.

Label	Channel
L	Left channel
C	Center channel
R	Right channel
Ls(s)	Left surround (side) channel
Rs(s)	Right surround (side) channel
Lsr	Left surround rear channel
Rsr	Right surround rear channel
LFE	Low Frequency Effect channel
HL	Height Left channel
HC	Height Center channel
HR	Height Right channel
HLs	Height Left surround channel
HRs	Height Right surround channel
T	Top channel

Table 3-2 Decoded channel labels

3.7.6 Solo

The **S** switch lights yellow to indicate this Auro-Decoder instance is soloed, and all other instances not soloed or designated *solo safe* are disconnected from the Auro-Mix Engine and are muted.

The **S** switch flashes yellow to indicate another Auro-Decoder instance is soloed.

- Click the **S** switch to toggle the solo status of this Auro-Decoder instance only.
- Alt + click the **S** switch to unsolo all soloed Auro-Decoder instances.
- Command + click the **S** switch to designate this Auro-Decoder instance *solo safe*: When other Auro-Decoder instances are soloed, this instance will remain audible.

TIP: *The Solo behavior can be changed between X-OR and Latch in the Auro-Settings application (see "Auro-Settings options in the Finder menu bar" on page 63).*

3.7.7   Mute

The **M** switch lights red to indicate this Auro-Decoder instance is muted. Multiple instances can be muted at the same time.

- Click the **M** switch to toggle the mute status for this instance only.

- Alt + click the **M**   switch to unmute all muted Auro-Decoder instances.

3.7.8   Auro-Mix Engine Assignment

The Auro-Mix Engine assignment menu, located in the bottom right corner of the Auro-Decoder lets you connect the output of the Auro-Decoder to an Auro-Mix Engine. This enables monitoring of the decoded channels and the original mix through the Auro-Return plug-ins already connected to the Auro-Mix Engine.

INFO: *When using the Auro-Decoder plug-in in the Auro-3D mix session, all Auro-Panner, Auro-Matic Pro, and Auro-Decoder instances belong to the same Solo and Mute group. Enabling Solo in an Auro-Decoder instance will therefore mute all Auro-Panner and Auro-Matic Pro instances, so that only the decoded channels can be heard.*
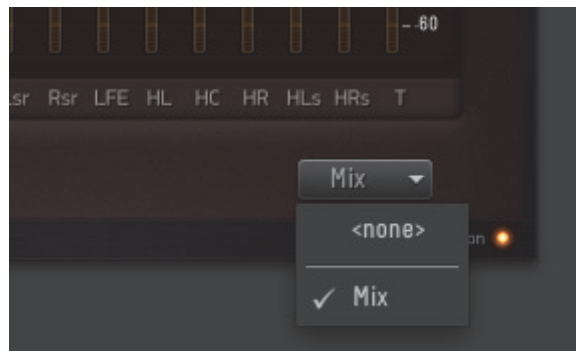

Figure 3-26 Auro-Mix Engine assignment

3.8   Auro-Settings Application

Auro-Settings runs as a menu bar application. It provides easy access to **Solo   Mode, DAW** and **Hardware** settings, and can restart the A3DHost (**Restart   Service**) if necessary.
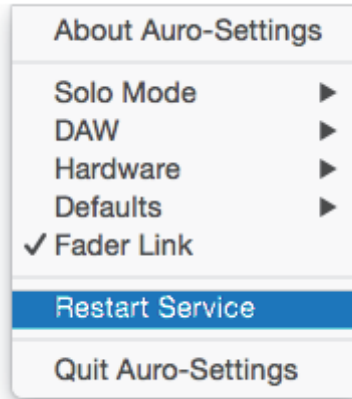

Figure 3-27 Auro-Settings options in the Finder menu bar

3.8.1   Solo Mode

There are two **Solo   Mode** options:

- **X-OR**: Each solo selection replaces the previous selection(s).

- **Latch**: Each solo selection adds to the previous selection(s).

ATTENTION: *When using the Auro-Matic Pro plug-in in combination with the Auro-3D Authoring Tools, all Auro-Panner and Auro-Matic Pro instances belong to the same Solo and Mute group. Enabling Solo in an Auro-Matic Pro instance will therefore disable Solo in an Auro-Panner instance if the X-OR Solo Mode is enabled.*

3.8.2   DAW

Before launching your DAW, select which DAW you are using. There are two options:

- **Pro   Tools   10**: Choose this option to use the Auro-3D Authoring Tools in Pro Tools 10.

- **Pro   Tools   11+**: Choose this option to use the Auro-3D Authoring Tools in Pro Tools 11 or 12.

ATTENTION: *If an incorrect **DAW** is selected, the **Connection** LED blinks red, indicating that the plug-in will not function correctly.*

3.8.3 Hardware

To apply correct delay compensation, you need to select the hardware you are using:

- **Native**: Select this option if you are using a Native or HD Native system.

- **HDX High Latency**: Select this setting if you are using an HDX System with a H/W buffer size of 1024 samples.

- **HDX Low Latency**: Select this setting if you are using an HDX System with a H/W buffer size lower than 1024 samples.

Pro Tools 11 (or higher) and its Low- and High-Latency Hardware Buffer

Pro Tools 11 HD introduced different hardware buffers, namely a low-latency buffer and a high-latency buffer. The high-latency buffer has a fixed value depending on the session sample rate (1024 samples for 48 kHz, 2048 samples for 96 kHz) and is used to play back tracks without sacrificing plug-in performance. The low-latency buffer is set to a user-defined value of **64**, **128**, **256**, **512**, or **1024** samples (in **Setup > Playback Engine > H/W Buffer Size**). This low-latency buffer is automatically enabled by Pro Tools under specific conditions where low-latency monitoring is required, like:

- on an input monitor-enabled track

- on a record-enabled track

- on a track which has a DSP plug-in inserted on it

- on an Aux Input Track with both an active input and output

.

INFO: *Please note that only the following hardware buffer sizes are supported:* **256***,* **512** *or* **1024** *when Fader Link is enabled*.

ATTENTION: *The Auro-3D Authoring Tools currently don't support the use of multiple buffer sizes simultaneously, and are therefore restricted to work in either the low-latency domain or the high-latency domain.*

To force the Auro-3D Authoring Tools to work in the low-latency domain only, a DSP plug-in needs to be inserted on the first Insert slot of every track that contains an Auro-3D plug-in. Working with the low-latency buffer also keeps the latency to a minimum.

TIP: *Inserting a (multi-)mono DSP version of the Trim plug-in reduces the DSP-overhead to a minimum and leaves the audio unaffected if the initial settings remain unchanged.*

3.8.4   Fader Link

The Fader Link feature allows the Pro Tools fader, solo and mute buttons to control the Auro-Panner (or Auro-Matic Pro) fader, solo and mute buttons. Additionally, X/Y panning can also be linked to the Pro Tools X/Y panning controls.

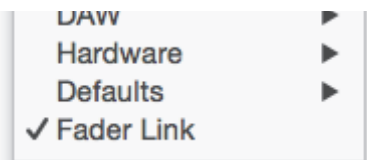Click **Fader   Link** to activate the Fader LInk mode.

Figure 3-28 Active Fader Link mode

3.8.5   Restart Service

If the **Connection** LED in an Auro-Matic Pro or Auro-3D Authoring Tools plug-in blinks red, there is a connectivity problem with that plug-in instance. This can occur for the following reasons:

- The A3DHost service, which is responsible for establishing plug-in connections, was not installed properly, or the workstation was not restarted after installation.

- An incorrect **DAW** setting has been selected from the Auro-Settings application.

- The A3DHost service stopped for some reason and did not restart automatically.To restore your system, quit your DAW, select Restart Service from the Auro Settings application and restart your DAW. If the **Connection** LED still blinks red, restart your computer.

TIP: *The* **Restart   Service** *command can also be found in /Library/Application Support/Auro Technologies/A3DHost (A3DHost.RestartService.command).*

3.9 Keyboard Shortcut List

Table 3-3 General

Function	Mac Shortcut
Reset fader/rotary encoder	Opt + click fader/rotary encoder
Adjust with precision	Cmd + adjust rotary encoder

Table 3-4 Auro-Panner

Function	Mac Shortcut
Reset X-, Y- and Z-coordinates	Opt + Cmd + click X-, Y- or Z-encoder
	Shift + Opt + click X-, Y- or Z-encoder
Reset X-, Y- and Z-coordinates	Opt + click Channel Icon
Unmute all Auro-Panners	Opt + click any Auro-Panner Mute switch
Solo Safe Auro-Panner	Cmd + click Auro-Panner Solo switch
Unsolo all Auro-Panners	Opt + click any Auro-Panner Solo switch

Table 3-5 Auro-Mix Engine

Function	Mac Shortcut
Unmute all Auro-Mix Engines	Opt + click Auro-Mix Engine Mute switch
Solo Safe Auro-Mix Engine	Cmd + click Auro-Mix Engine Solo switch
Unsolo all soloed Auro-Mix Engines	Opt + click Auro-Mix Engine solo switch

Table 3-6 Auro-Return

Function	Mac Shortcut
Select incremental range of outputs	Opt + click fader/rotary encoder