Auro Technologies

Auro-3D Authoring Tools Guide

Plug-in Version: 2.0

User Guide Version: 1.0.1

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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 films can still be shown in theatres without an Auro-3D decoding system by storing the Auro-3D 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. Theatres with an Auro-3D system decode and 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

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 + 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 (Mac and PC) that supports AAX plug-ins.

NOTE: 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.

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

Auro-Bus plug-in: The Auro-Bus 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.

Auro-Mixing Engine plug-in: The Auro-Mixing Engine 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 downmix to the DAW-track on which it is inserted, and a mix and downmix to the connected Auro-Return plug-ins.

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

Auro-Return plug-in: The Auro-Return delivers the channels from the Auro-Mixing Engine to the DAW. Because most DAWs 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.

Auro-Encoder: The Auro-Encoder controls are embedded in the Encoder tab of the Auro-Mixing 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: A3DHost runs as a background service that ensures that all Auro-3D plug-ins are correctly connected to each other.

Auro-Settings: The Auro-Settings application (accessible through the Mac menu bar and the Windows system tray) enables you to specify the Solo behavior for Auro plug-ins and the software architecture of the DAW used for the Auro-3D Authoring Tools.

NOTE: *We currently support AAX plug-ins for Avid's Pro Tools 10 and 11. 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 DAWs 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 A3DHost process and Auro-Mixing Engine. An Auro-3D configuration (e.g., Auro 11.1) uses two Auro-Return plug-ins inserted on separate DAW tracks, both set to a 5.1-channel format, to split the Auro-3D output into Lower and Height + Top channel layers. The channels returned depend on the configuration selected in the Auro-Mixing Engine plug-in.

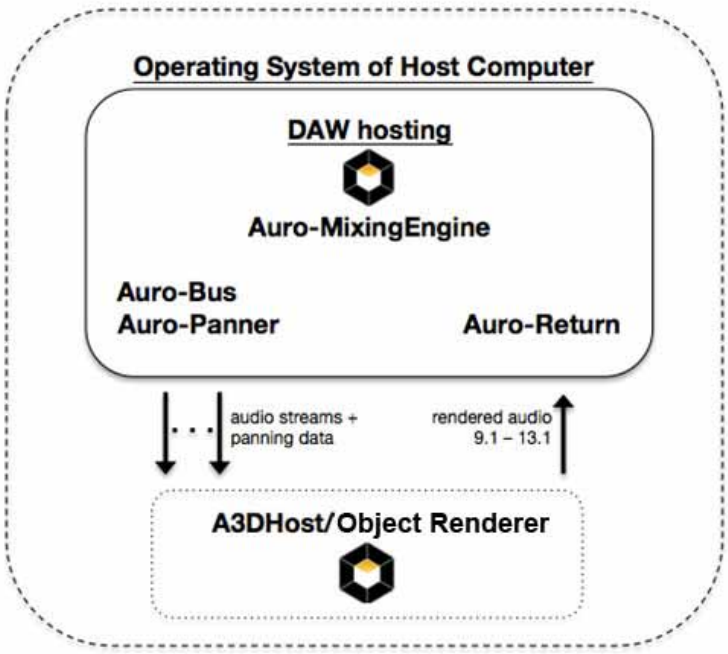

Figure 1-1 Auro-3D block diagram

This user guide 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* – Discusses 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 (or later) and Windows 7 (or later)
- **DAWs**: Pro Tools 10.3.9 (or later) and Pro Tools 11.2.1 (or later)

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

NOTE: *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, both Mac and Windows 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

2.2.1 Mac

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 AuroPlugins.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 installation instructions.
5. Finally, restart your computer.

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

The following software is installed:

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

2.2.2 Windows

To install the Auro-3D Authoring Tools on a PC running Windows:

1. Uninstall any previous installation of the Auro-3D Authoring Tools, by locating Start > Control Panel > Programs > Programs and Features, selecting the Auro-3D software in the Program column, and clicking Uninstall.
2. Restart your computer
3. Double-click the ZIP file you downloaded from the Auro Technologies website. Both 32-bit (x86) and 64-bit (x64) installer versions of the software are provided. Then, double-click the Auro-3D Authoring Tools installer to begin the standard installation.

NOTE: To use the Auro-3D Authoring Tools in a 32-bit DAW (e.g. Pro Tools 10), install the 32-bit version. Likewise, to use the Auro-3D Authoring Tools in a 64-bit DAW (e.g. Pro Tools 11), install the 64-bit version.

4. Follow installation instructions.
5. Finally, restart your computer.

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

The following software is installed:

- Auro-Panner, Auro-Bus, Auro-Mixing Engine, Auro-Return and Auro-DMix Control plug-ins
- A3DHost service
- Auro-Settings system tray application

2.2.3 Licensing

To use the Auro-3D Authoring Tools, it is required to install the correct licenses 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-Mixing 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-Mixing Engine. The Auro-Mixing 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

The Connection LED indicates the connection state of the Auro-Panner plug-in. If the LED lights red or blinks red, there is a connectivity problem (see "Restart Service" on page 36 for help). If it lights yellow, the plug-in is ready to use.

3.1.2 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 Aux Input Tracks, before being mixed together in the Auro-Mixing Engine. Please refer to "HDX Aux Delay" on page 36 for further information.

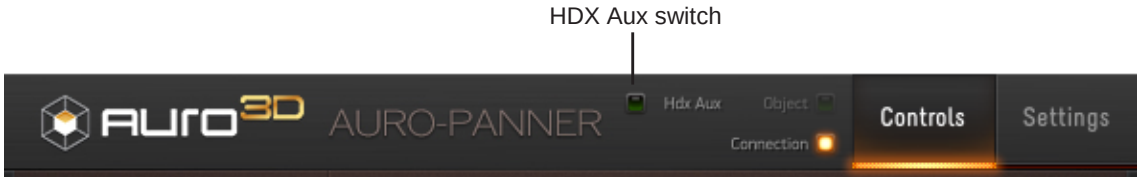

Figure 3-2 HDX Aux switch in the Auro-Panner

3.1.3 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.

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

3.1.4 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 audio 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 that 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 (Mac) or Ctrl (Windows) + click the S switch to designate this Auro-Panner instance *solo safe*: When other Auro-Panner instances are soloed, this instance will remain audible.

NOTE: *The Solo behavior can be set to X-OR or Latch in the Auro-Settings application (see "Solo Mode" on page 35).*

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.

3.1.5 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 in your session. The currently selected bus name is displayed in the menu.

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

3.1.6 Send 1, Send 2

This feature is currently not implemented.

3.1.7 Object

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

3.1.8 LFE

The LFE rotary encoder lets you control the amount of signal added to the LFE output routed to the Auro-Mixing Engine. If an LFE channel is already present in the track (e.g., 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 to the Auro-Mixing Engine.

Two switches affect the LFE encoder:

- The M switch lets you mute the LFE output to the Auro-Mixing 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.

3.1.9 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 3-3 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 3-3 Scene parameters

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.

NOTE: *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.

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

3.1.10 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 3-4 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 14).
- 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.

NOTE: How these settings affect adjacent channels also depends on the multichannel format.

3.1.11 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 3-5 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-Mixing 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 from this Auro-Panner to the planar mix.

Adjust Top gain to send the desired signal amount from this Auro-Panner to the planar mix.

About

Click the user manual link to view this guide as a PDF.

Click the www.auro-technologies.com weblink to visit our website.

The plug-in's software version is displayed in the top right.

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-Mixing Engine.

Figure 3-6 Auro-Bus plug-in

3.2.1 Connection

The Connection LED indicates the connection state of the Auro-Bus plug-in. If the LED lights red or blinks red, there is a connectivity problem (see "Restart Service" on page 36 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.

NOTE: 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-Mixing 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 with the highest level. It acts as an indication that audio is passing through the bus. Precise metering should be done in the Auro-Mixing Engine, where the audio is mixed to the correct 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 (Mac) or Ctrl (Windows) + click the S switch to designate this Auro-Bus instance *solo safe*: When other Auro-Bus instances are soloed, this instance will remain audible.

NOTE: The Solo behavior can be changed between X-OR and Latch in the Auro-Settings application (see "Restart Service" on page 36).

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 tracks routed to this Auro-Bus by its Auro-Panner instances.

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.

NOTE: *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 signal amount from this Auro-Bus to the planar mix.

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

3.3 Auro-Mixing Engine

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

Figure 3-7 Controls tab of Auro-Mixing Engine

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

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

3.3.1 Controls Tab

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

Connection

The Connection LED indicates the connection state of the Auro-Mixing Engine plug-in. If the LED lights red or blinks red, there is a connectivity problem (see "Restart Service" on page 36 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-Mixing Engine instance, such as the name of the track it is inserted on.

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

NOTE: Changing the name of the Auro-Mixing 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 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-Mixing Engine instance is soloed.

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

NOTE: *The Solo behavior can be changed between X-OR and Latch in the Auro-Settings application (see "Restart Service" on page 36).*

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-Mixing Engine instances.

Configuration

The Auro-Mixing 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.

Figure 3-8 Configuration options

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 3-9 Meters and Pan Graph in Auro-Mixing Engine

3.3.2 Encoder Tab

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

Figure 3-10 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.

NOTE: *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 , the Profile menu contains a collection of Encoder Profiles for different target applications.

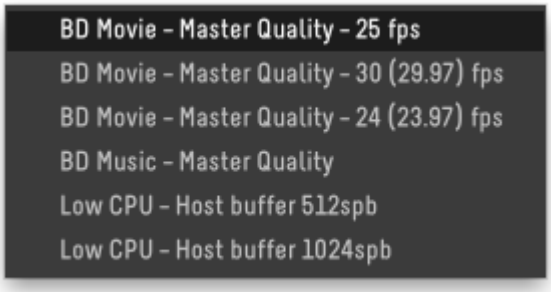

Figure 3-11 Encoding profiles for the Auro 8.0 configuration

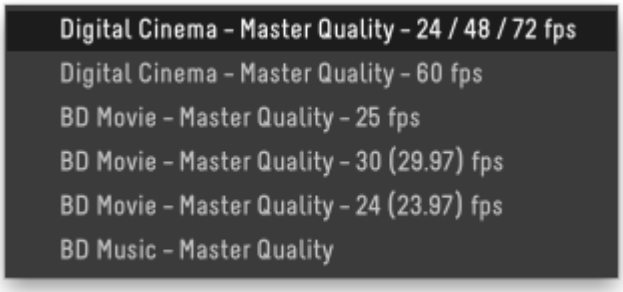

Figure 3-12 Encoding profiles for the Auro 11.1 configuration

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 27.

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 3-13 Program settings in Auro-Mixing Engine Encoder tab

Dither

This menu lets you select a dithering algorithm for encoding.

NOTE: 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 to 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 3-10 shows these controls.

Auro-Matic

These settings control how content encoded in a 2D carrier will play in a 3D configuration 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 3-14 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 3-15 Auro-Mixing Engine 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-Mixing Engine always outputs a downmix in the same format as the track on which the plug-in is inserted (Stereo – 5.1). 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 33.

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

LFE lowpass

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

Export Path

You can specify a folder location to save Auro-encoded files.

Program Name

You can assign a name to the Auro-encoded file.

Panning Settings

Click the Pan Law menu to choose -3dB or -6dB.

About

Click the user manual link to view this guide as a PDF.

Click the www.auro-technologies.com weblink to visit our website.

The plug-in's software version is displayed in the top right.

3.4 Auro-Return

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

Figure 3-16 Auro-Return plug-in

3.4.1 Connection

The Connection LED indicates the connection state of the Auro-Return plug-in. If the LED lights red or blinks red, there is a connectivity problem (see "Restart Service" on page 36 for help). If it lights yellow, the plug-in is ready to use.

3.4.2 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 name of the track it is inserted on.

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

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

3.4.3 Bus

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

3.4.4 Stem

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

3.4.5 Output

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

3.4.6 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-Mixing Engine connected to this Auro-Return plug-in (see "Configuration" on page 22).
  - and -
- Whether Mix or Downmix is selected in the Output menu.

3.4.7 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-Mixing Engine channels routed to this Auro-Return plug-in's output channels.

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

3.5 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-Mixing 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 3-17 Auro-DMix Control plug-in

3.5.1 Connection

The Connection LED indicates the connection state of the Auro-DMix Control plug-in. If the LED lights red or blinks red, there is a connectivity problem (see "Restart Service" on page 36 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-DMix Control instance, such as the name of the track it is inserted on.

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

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

3.5.3 Mixing Engines

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

3.5.4 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.

3.5.5 Group Layer

The channel gain faders for the Lower and Height layers can each operate as their own group. Click the Group layer LED so it lights. When active, dragging one channel gain fader up or down also drags the others.

3.6 Auro-Settings Application

Auro-Settings runs as a menu bar (Mac) or system tray (Windows) application. It provides easy access to Solo Mode, Architecture and HDX Aux Delay settings, and can restart the A3DHost if necessary.

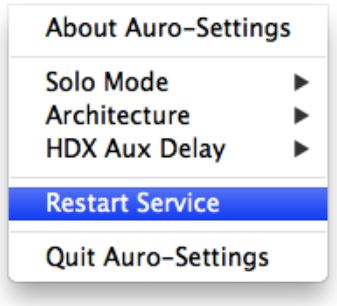

Figure 3-18 Auro-Settings options in the Finder menu bar

Figure 3-19 Auro-Settings options in the System Tray

3.6.1 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).

NOTE: *When using the Auro-Matic Pro plug-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.*

3.6.2 Architecture

Before launching your DAW, set the plug-in Architecture corresponding to the software architecture of your DAW. There are two options:

- 32-bit: Choose this option to use Auro-Matic Pro in a 32-bit DAW, e.g. Pro Tools 10.
- 64-bit: Choose this option to use Auro-Matic Pro in a 64-bit DAW, e.g. Pro Tools 11.

NOTE: *If an incorrect* Architecture *is selected, the* Connection *LED blinks red, indicating that the plug-in will not function correctly (see "Architecture" on page 36 for help).*

3.6.3 HDX Aux Delay

On Pro Tools|HDX Systems, Auro-Matic Pro an Auro-Panner instances on Audio Tracks and Aux Input Tracks require correct synchronization. Select a setting appropriate for your system:

- Off: No Pro Tools|HDX System is used.
- Auto (PT10 only): Select this setting if you are using an HDX System with Pro Tools 10. Synchronization will be applied correctly, independent of the H/W Buffer Size in Setup > Playback Engine.
- 64 ... 1024: Select one of the H/W Buffer Sizes if you are using an HDX System with Pro Tools 11. Make sure you mirror this setting for the H/W Buffer Size in Setup > Playback Engine in your Pro Tools software.

See “HDX Aux” on page 12.

3.6.4 Restart Service

If the Connection LED in an Auro-Matic Pro or Auro-3D Authoring Tools plug-in lights red or 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 Architecture 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 lights red or blinks red, restart your computer.

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

3.7 Keyboard Shortcut List

Table 3-1 General

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

Table 3-2 Auro-Panner

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

Table 3-3 Auro-Mixing Engine

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

Table 3-4 Auro-Return

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