



# **Auro Technologies**

## **Auro-Matic Pro Plug-in Guide**

**Plug-in Version:** 2.0

**User Guide Version:** 2.0

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# Chapter 1: Introduction to Auro-3D

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Welcome to Auro-3D<sup>®</sup>, 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-3D 9.1–11.1 formats are based on, and compatible with the 5.1 Standard. They include the following additional channels:

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

The Auro-3D 11.1b and 13.1 formats are based on, and compatible with the 7.1 Standard. They include the following additional channels:

- **11.1b:** 7.1 + four Height Channels
- **13.1:** 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 up-mixing in any DAW (Mac and PC) that supports AAX plug-ins.

## Auro-Matic Pro

Auro-Matic Pro is an *up-mixing* plug-in based on an intelligent and highly efficient algorithm that uses a variety of early reflection patterns to create a two-dimensional sound field from a one-dimensional source, or a three-dimensional sound field from a one- or two-dimensional source, all without affecting the intentional aesthetics of the original mix. There are two available versions of the plug-in:

- Auro-Matic Pro 2D can create a surround 5.1 sound field from mono and stereo sources. It acts as a stand-alone plug-in that outputs directly to a DAW-track but can also be used in combination with the Auro-3D Authoring Tools.
- Auro-Matic Pro 3D can create an Auro-3D sound field from mono, stereo and surround 5.1 and 7.1 sources. This version needs to be connected to other plug-ins in the Auro-3D ecosystem to surmount the eight-channel format limitation of most DAWs.

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

**Auro-Bus:** The Auro-Bus collects multiple Auro-Matic Pro outputs to form a subgroup or a stem.

**Auro-Mixing Engine:** 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 mix and downmix to the connected Auro-Return plug-ins. It also outputs a downmix to the DAW-track it is inserted on.

**Auro-Return:** The Auro-Return plug-in returns the output channels of an Auro-Mixing Engine or an Auro-Matic Pro 3D 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-Settings:** The Auro-Settings application (accessible through the Mac menu bar and the Windows system tray) enables the user to change system-specific settings, e.g. the Solo behavior of the Auro-3D plug-ins and the software architecture of the DAW.

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**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.*

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This user guide covers the following information:

Chapter 2: *System Requirements and Installation* – Discusses how to install Auro-3D software.

Chapter 3: *Auro-Matic Pro Plug-ins* – Discusses the Auro-Matic Pro and the other Auro-3D plug-in parameters.

Chapter 4: *Using Auro-Matic Pro* – Shows how to set up two Pro Tools sessions for Auro-Matic Pro.



# Chapter 2: System Requirements and Installation

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## 2.1 System Requirements and Compatibility

Auro-Matic Pro exists in AAX format and runs on the following:

- **Operating Systems:** Mac OS X 10.7.5 (or later) and Windows 7 (or later)
- **DAWs:** Pro Tools 10.3.8 (or later) and Pro Tools 11.1.2 (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](http://www.avid.com/compatibility)

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*NOTE: Auro-Matic Pro supports sample rates of 44.1 and 48 kHz. A future release will support higher sample rates.*

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## 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](mailto:support@auro-technologies.com)

### 2.2.1 Mac

To install Auro-Matic Pro on a Mac running OS X:

1. Any previous installation of Auro-Matic Pro needs to be uninstalled, by double-clicking `AuroMaticPro.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-Matic Pro 2D.pkg` or `Auro-Matic Pro 3D.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.*

---

Auro-Matic Pro 2D.pkg only installs the Auro-Matic Pro 2D plug-in.

Auro-Matic Pro 3D.pkg installs the following software:

- Auro-Matic Pro 2D and Auro-Matic Pro 3D plug-ins
- Auro-Return plug-in
- A3DHost service
- Auro-Settings menu bar application

## **2.2.2 Windows**

To install Auro-Matic Pro on a Mac running Windows:

1. Any previous installation of Auro-Matic Pro, 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, then double-click Auro-Matic Pro 2D.exe or Auro-Matic Pro 3D.exe 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.*

---

Auro-Matic Pro 2D.pkg only installs the Auro-Matic Pro 2D plug-in.

Auro-Matic Pro 3D.pkg installs the following software:

- Auro-Matic Pro 2D and Auro-Matic Pro 3D plug-ins
- Auro-Return plug-in
- A3DHost service
- Auro-Settings system tray application

### **2.2.3 Licensing**

Auro-Matic Pro requires installing a license on an iLok USB key. There are two license levels:

- Auro-Matic Pro 2D – Includes 2D up-mixing functionality.
- Auro-Matic Pro 3D – Extends the Auro-Matic Pro 2D license with 3D up-mixing functionality.

## Chapter 3: Auro-Matic Pro Plug-ins

Auro-Matic Pro is used as an insert plug-in on an audio track.

- Auro-Matic Pro 2D can be inserted on a mono or stereo track and outputs a 5.1 sound field to the DAW-track it is inserted on.
- Auro-Matic Pro 3D can be inserted on a mono, stereo, 5.1 or 7.1 audio track. It can connect to an Auro-Mixing Engine via an Auro-Bus or be routed directly to Auro-Return plug-ins.

### 3.1 Auro-Matic Pro



Figure 3-1 Auro-Matic Pro 3D

#### 3.1.1 Connection

The Connection LED indicates the connection state of the Auro-Matic Pro plug-in. If the LED lights red or blinks red, there is a connectivity problem (see page 29 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-Matic Pro instance inserted on an Aux Input track requires enabling the HDX Aux switch. This ensures correct delay compensation between Auro-Matic Pro and Auro-Panner instances inserted on regular Audio Tracks and Aux Input Tracks, before being mixed together in the Auro-Mixing Engine. Please refer to page 28 for further information.

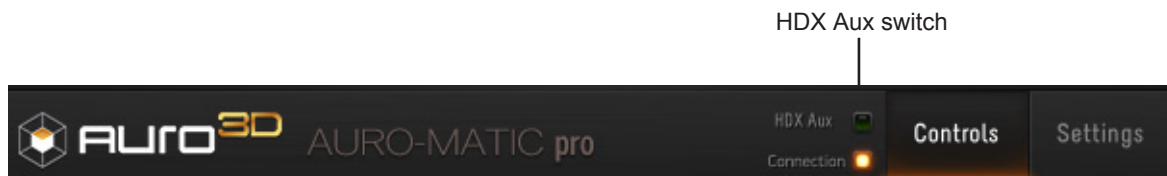


Figure 3-2 HDX Aux switch in Auro-Matic Pro

### 3.1.3 Name

This field initially displays a unique, automatically generated name. To rename an Auro-Matic Pro instance, click the name field and type a new name.

---

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

---

### 3.1.4 Volume

The Volume fader sets the signal level sent to a connected Auro-Bus or Auro-Return instance, and affects Auro-Matic Pro's direct output to the DAW track.

The Volume can be set three ways:

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

#### Level Meter

This meter displays the DAW track's direct input level to the Auro-Matic Pro plug-in.

#### Clip

The Clip LED lights red if one sample exceeds a threshold of -0.1 dBFS on any of the input channels. Click the Clip LED to clear it.

## Solo

The S LED 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 LED flashes yellow to indicate another Auro-Matic Pro or Auro-Panner instance is soloed.

- Click the S to toggle the solo status of this Auro-Matic Pro instance only.
- Alt + click a lit or flashing S to unsolo all Auro-Matic Pro and Auro-Panner plug-ins.
- Command (Mac) or Ctrl (Windows) + click the S to designate this Auro-Matic Pro instance *solo safe*: When other Auro-Matic Pro or Auro-Panner instances are soloed, this Auro-Matic Pro instance will remain audible.

---

*NOTE: The Solo behavior can be changed between X-OR and Latch in the Auro-Settings application (see page 28).*

---

## Mute

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

- Click the M to toggle the mute status for this instance only.
- Alt + click an M LED to unmute all Auro-Matic Pro and Auro-Panner plug-ins.

### 3.1.5 Bus Assignment

The bus assignment menu, located below Solo and Mute, lets you send the processed output of this Auro-Matic Pro plug-in to the Main Bus or an Auro-Bus plug-in. This bus can then be selected in an Auro-Mixing Engine. The currently selected bus name displays on the menu.

---

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

---

### 3.1.6 Input Source

The Input Source field displays the input source format to this Auro-Matic Pro plug-in. If the instance has been inserted on a mono, stereo or 5.1 track, this field will display mono, stereo or 5.1 respectively.

### 3.1.7 Configuration

The Configuration field displays the output configuration of this instance of Auro-Matic Pro:

- In Auro-Matic Pro 2D, the output configuration is 5.1 Surround.
- In Auro-Matic Pro 3D, the output configuration options are: Auro 9.1, Auro 10.1, Auro 11.1 and Auro 13.1.

---

*NOTE: For mono and stereo inputs, all x.1 output configurations leave the LFE channel empty. The introduction of an LFE-generator is expected in an upcoming release.*

---

### **3.1.8 Ambience**

The Ambience parameter sets the overall size and sonic characteristics of the virtual space. Two versions of each size are available: Small, Medium, Large, and Open.

### **3.1.9 Strength**

The Strength fader sets the amount of generated signal in the up-mix.

A low Strength value produces less signal in the up-mixed channels, while a high Strength value produces more signal in the up-mixed channels. In the latter case, the original signals are attenuated to maintain equal loudness.

### **3.1.10 Space**

This parameter changes the strength of the added ambience.

### **3.1.11 Depth**

These parameters affect how spatial information is sent to the additional Auro 3D channels.

### **3.1.12 Weight**

Both F/R and Height determine where the weight of the up-mixing effect lies. They influence directly how much of the generated spatial information is sent to Front/Rear and Height channels, respectively.

#### **F/R**

The F/R control adjusts the general balance between front and rear. Increasing the F/R control towards the rear gives the impression of sound emanating from behind the listening position and is useful for increasing the effect of surround channels in ambience processing.

#### **Height**

The Height control adjusts the general balance between lower layer (regular 5.1 layer) and height layer (height and top channels).

### 3.1.13 Center

The Center parameters determine how to generate the Center channel if the input source is a stereo format. The Center menu has the following options: Bypass, Classic, Standard, Advanced Music, Advanced Medium, Advanced Dialog.

---

**NOTE:** *In Bypass, Classic, and Standard modes, the Center generating algorithm doesn't induce added latency. When using Advanced Music, Medium, and Dialog modes, the algorithm adds a latency of 4095 samples.*

---

#### Level

The Level knob sets the output level of the of the Center channel, whether it is a generated or native center channel.

#### Divergence

The Divergence knob sets how much Center signal is diverted to the Left and Right channels (only available in Advanced Mode).

### 3.1.14 Equalizer

The Equalizer section can be used to fine-tune the spectral quality of the up-mixed channels. It can be toggled on and off by clicking the toggle button.

#### Bass

The Bass control sets the low-frequency gain that is applied to the up-mixed channels, ranging from -6 dB to +6 dB.

#### Treble

The Treble control sets the high-frequency gain that is applied to the up-mixed channels, ranging from -6 dB to +6 dB.

---

**NOTE:** *Strength, Space, Depth, Weight, and EQ affect only the generated output channels.*

---

### 3.1.15 Controls and Settings Tabs

Click the Controls tab to access the plug-in's normal controls.

Click the Settings tab to access Routing and Knob Mode settings.





**Figure 3-3** Auro-Matic Pro Settings

## Routing

The routing panel can be used to change the routing of:

- input channels to Auro-Matic Pro
- output channels from Auro-Matic Pro

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**NOTE:** *This feature is inactive for the AAX version of Auro-Matic Pro, which uses Pro Tools' default channel ordering.*

---

## General

The Knob Mode menu determines how the knobs are adjusted:

- Rotary: Drag the knob as if you are turning it physically.
- Horizontal Drag: Click the knob and drag left to decrease and right to increase the value.
- Vertical Drag: Click the knob and drag down to decrease and up to increase the value.

## About

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

Click the [www.auro-technologies.com](http://www.auro-technologies.com) web link to visit our website.

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

## 3.2 Auro-Bus

The Auro-Bus collects the output of all assigned Auro-Matic Pro and/or Auro-Panner plug-ins to form a subgroup or stem before delivering them to the Auro-Mixing Engine.

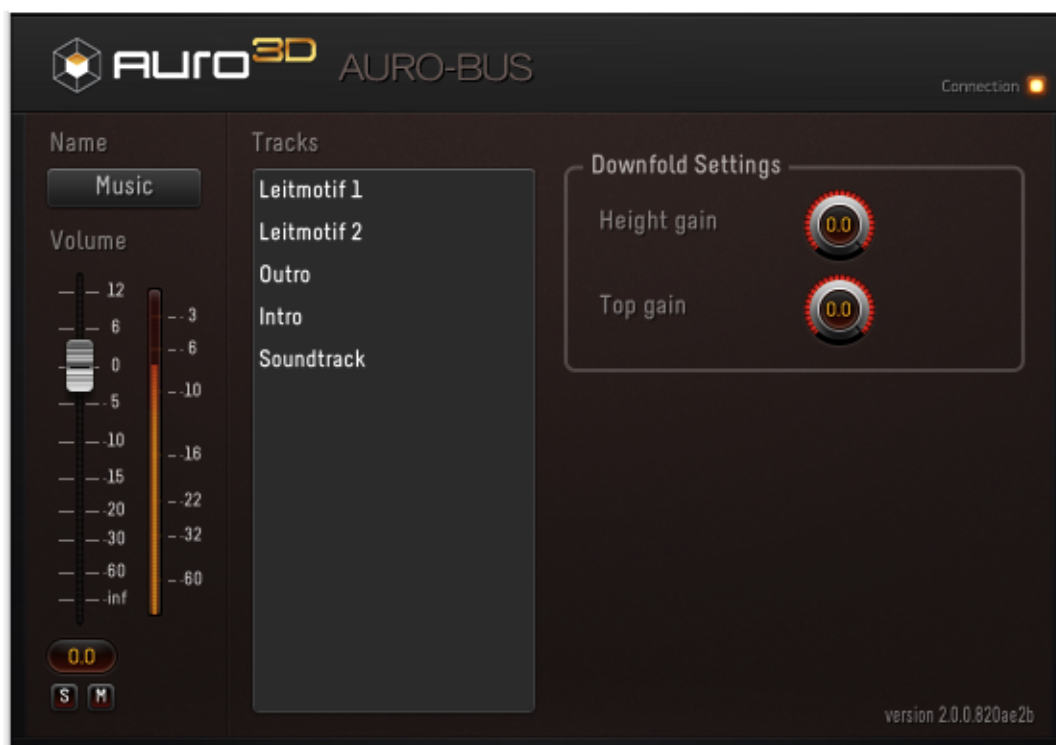


Figure 3-4 Auro-Bus plug-in

---

**NOTE:** When Auro-Matic Pro is used together with the Auro-3D Authoring Tools, Auro-Matic Pro and Auro-Panner plug-ins can be assigned to the same Auro-Bus.

---

### 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 page 29 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 at the bottom of the fader and enter a value.

#### Level Meter

This meter displays the direct input level of the connected Auro-Matic Pro or 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-Mixing Engine, where the audio is mixed to the correct corresponding channels.

#### Solo

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

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

---

**NOTE:**     *The default Solo behavior can be changed between X-OR and Latch in the Auro-Settings application (see page 28).*

---

#### Mute

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

- Click the M to toggle the mute status for this instance only.
- Alt + click an M LED to unmute all Auro-Bus plug-ins.

### 3.2.4 Tracks

The Tracks field lists all Auro-Matic Pro and Auro-Panner instances that are assigned to the Auro-Bus.

### 3.2.5 Downfold Settings

These settings control the level of the Height and Top layers that will be reproduced by the Lower layer if a planar mix (e.g. Surround 5.1) is selected in the Auro-Mixing Engine. Both of these controls attenuate only, and are at 0 when fully turned 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-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 downmix from its own DAW-track, depending on that track's format.
- 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 3-5 Auro-Mixing Engine plug-in

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

The Objects tab has been deactivated awaiting standardization of the object-based format.

### 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. If the LED lights red or blinks red, there is a connectivity problem (see page 29 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 that this does not change the name of the respective DAW track.

## Volume

The Volume fader sets the signal level sent to the connected Auro-Return plug-ins 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 at the bottom of the fader and enter a value.

## Clip

The Clip LED lights red if more than five consecutive samples exceed a threshold of -0.1 dBFS on any of the input channels. Click the Clip LED to clear it.

## Solo

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

The S LED flashes yellow to indicate another Auro-Mixing Engine instance is soloed.

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

---

**NOTE:**     *The default Solo behavior can be changed between X-OR and Latch in the Auro-Settings application (see page 28).*

---

## Mute

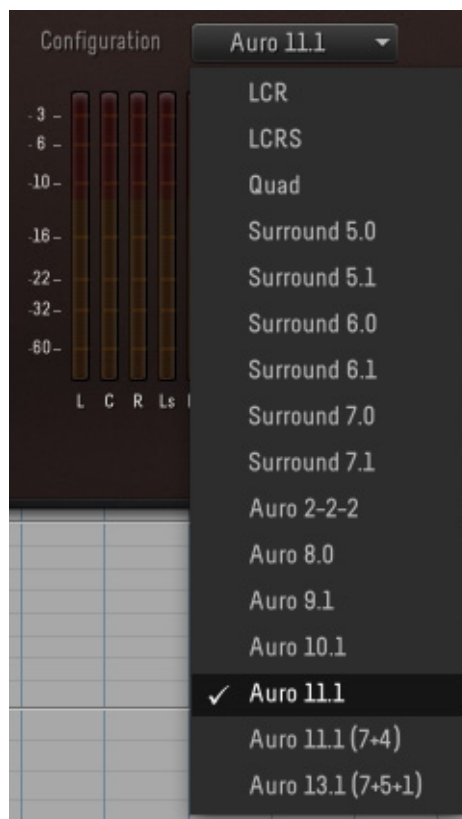
The M LED lights red to indicate this Auro-Mixing Engine instance is muted. Multiple instances can be muted at the same time.

- Click the M to toggle the mute status for this Auro-Mixing Engine instance only.
- Alt + click an M LED to unmute all 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.

Select a format from the Configuration menu:



**Figure 3-6** Configuration menu

## Buses

The Buses area lists the Main Bus and the names of all active Auro-Bus plug-ins 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 their 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 3-7** Meters and Pan Graph in Auro-Mixing Engine

## 3.4 Auro-Return

The Auro-Return plug-in routes channels from an Auro-Mixing Engine or Auro-Matic Pro to the DAW track it is inserted on.



**Figure 3-8** Auro-Return plug-in

### 3.4.1 Connection

The Connection LED indicates the connection state of this Auro-Return instance. If the LED lights red or blinks red, there is a connectivity problem (see page 29 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 channel layer it routes back to the DAW.

To rename an Auro-Return instance, click the name field and type a new name. Note that this does not change the name of the respective DAW track.

### 3.4.3 Bus

This menu lets you select the Auro-Mixing Engine or Auro-Matic Pro 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 the 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 Mixing Engine connected to this Auro-Return plug-in (see page 23).
- and -
- Whether Mix or Downmix is selected in the Output menu.

### 3.4.7 1...N

The 1...N channel menus 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 Mixing Engine channels routed to this Auro-Return plug-in's output channels.

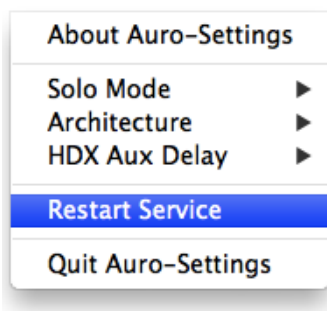
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*NOTE: To assign an incremental range of channels, hold down Alt and select an output.*

---

## 3.5 Auro-Settings App

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



**Figure 3-9** Auro-Settings options in the Finder menu bar

### 3.5.1 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:* All Auro-Matic Pro and Auro-Panner 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.

---

### 3.5.2 Architecture

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 Pro Tools 10.
- 64-bit: Choose this option to use Auro-Matic Pro in Pro Tools 11.

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*NOTE:* An incorrect Architecture setting causes the Connection LED to blink red, indicating that the plug-in will not function correctly (see page 29 for help).

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### 3.5.3 HDX Aux Delay

On Pro Tools|HDX Systems, Auro-Matic Pro and 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 the HDX Aux section on page 13.

### 3.5.4 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 automatically restart.

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.

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

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## Chapter 4: Using Auro-Matic Pro

This is a step by step guide on setting up a DAW session with Auro-Matic Pro 2D and Auro-Matic Pro 3D. It covers up-mixing mono, stereo, 5.1 surround and 7.1 surround sound sources to a sound field of a higher dimension. The DAW used here is Pro Tools, but the workflow is the same in any DAW.

Before using the Auro-Matic Pro 2D or 3D, you need to set the correct Architecture and HDX Aux Delay in the Auro-Settings menu bar application (See 3.5 *Auro-Settings App* for more information about Auro-Settings).

### 4.1 Auro-Matic Pro 2D

Auro-Matic Pro 2D can function as a stand-alone plug-in that up-mixes mono and stereo sound sources to a 5.1 surround sound field. If the Auro-3D Authoring Tools are installed, Auro-Matic Pro 2D can also connect to the Auro-Mixing Engine to use the up-mixed sound source directly in an Auro-3D mix.

#### 4.1.1 Stand-alone Mode

To up-mix a stereo song to a 5.1 surround configuration:

1. Create a stereo audio track in Pro Tools and import the song to that track.
2. Rename the audio track to an appropriate name, e.g. Sugar Plum Fairy.
3. On the stereo track, insert an instance of Auro-Matic Pro 2D (stereo/5.1).

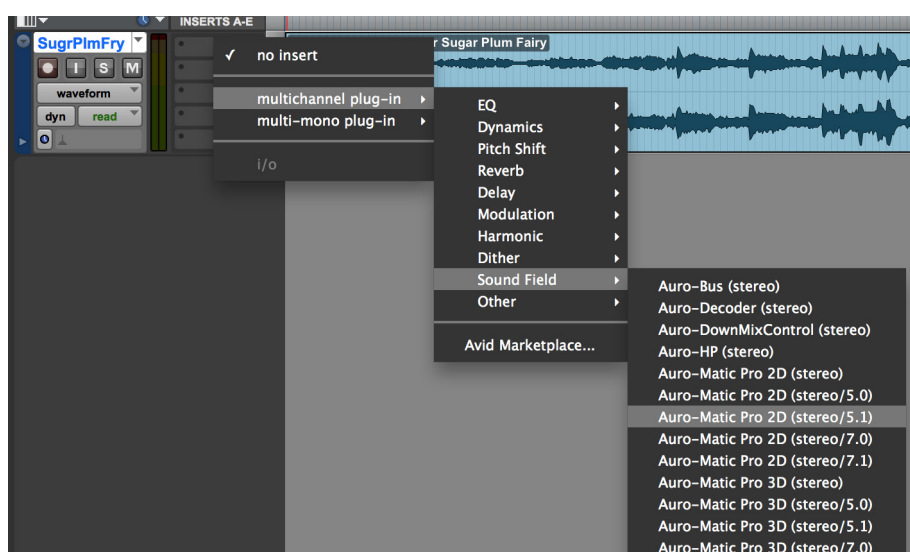
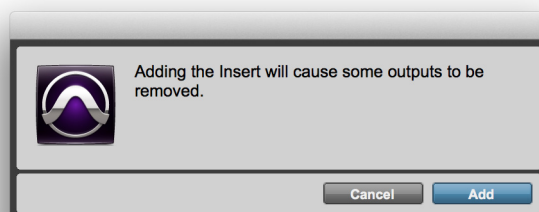


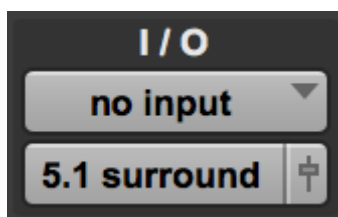
Figure 4-1 Inserting Auro-Matic Pro 2D (stereo/5.1)

4. Pro Tools automatically changes the track output configuration to 5.1 surround. If the audio track already had an output assigned, you will be prompted with the following message:



**Figure 4-2** Changing the track output configuration removes the outputs.

5. Click OK.
6. Still on the audio track, select a 5.1 output to monitor the up-mixed sound source through.



**Figure 4-3** Selecting a 5.1 surround output bus

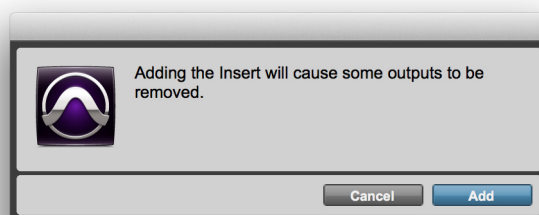
7. Open the plug-in user interface.
8. Change the name of the Auro-Matic Pro 2D instance to something more recognizable, like Sugar Plum Fairy.
9. Start playback and adjust the controls to your liking.

Following these steps, you should now hear the stereo song up-mixed to 5.1 surround.

## 4.1.2 With the Auro-3D Authoring Tools

To up-mix a mono sound effect to 5.1 surround and use the output in an Auro-3D mix:

1. Create a mono audio track in Pro Tools and import the sound effect to that track.
2. Rename the audio track to an appropriate name, e.g. Lightsaber.
3. On the audio track, insert Auro-Matic Pro 2D (mono/5.1). Pro Tools automatically changes the track output configuration to 5.1 surround. If the audio track already had an output assigned, you will be prompted with the following message:



**Figure 4-4** Changing the track output configuration removes the outputs.

4. Click OK.
5. Open the plug-in user interface.
6. Change the name of the Auro-Matic Pro 2D instance to something more recognizable, like Lightsaber.

Instead of directly listening to the 5.1 track output, we will connect this instance of Auro-Matic Pro 2D to an Auro-Mixing Engine via an Auro-Bus plug-in, while the audio track output will be routed to a dummy output:

7. On the audio track, select a 5.1 dummy bus as output (i.e. a bus that is not sent to the monitoring system).

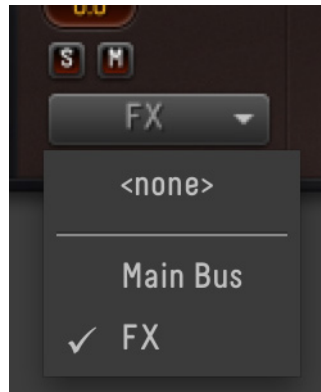


**Figure 4-5** Selecting a dummy output

8. Create a mono audio track in Pro Tools, and name it FX.
9. On the FX track, insert an Auro-Bus plug-in and name it FX as well.
10. Open the plug-in user interface of the Auro-Matic Pro 2D plug-in previously created.

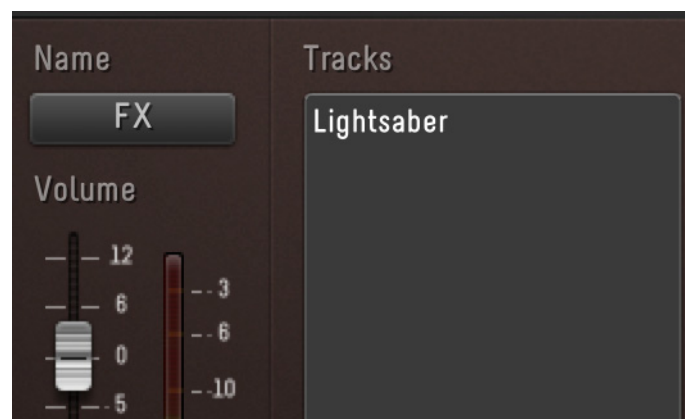


11. Below the Volume fader, select FX from the bus assignment menu.



**Figure 4-6** Assigning Auro-Matic Pro to an Auro-Bus

12. In the FX bus, Lightsaber should now appear in the Tracks field.



**Figure 4-7** The Tracks field in the FX bus

The output of this Auro-Matic Pro 2D instance gets sent to the FX bus now. Next you need to create an Auro-Mixing Engine that receives the FX bus:

13. Create a 5.1 audio track in Pro Tools, and name it Mix.
14. On the audio track, insert an Auro-Mixing Engine plug-in and name it Mix as well.
15. In the plug-in user interface, select a compatible channel-based configuration, e.g. Auro 11.1. It is one of the compatible configurations because it has a 5.1 surround channel-layer in the bottom, just like the output configuration of the Auro-Matic Pro 2D instance.
16. Select FX from the Buses field.



**Figure 4-8** Selecting the FX bus in Auro-Mixing Engine

In the Auro-Mixing Engine, the output of the Auro-Matic Pro 2D instance is mixed together with the output of other Auro-Matic Pro and Auro-Panner plug-ins that connect to it through their respective Auro-Buses.

To be able to monitor the output of the Auro-Mixing Engine, the channels need to be delivered back to the DAW:

17. Create one 5.1 track for the lower channels and one 5.1 track for the height channels.
18. Rename the tracks to Lower and Height, respectively.
19. On the audio tracks, insert an Auro-Return plug-in and rename the plug-ins corresponding to the respective track names.
20. In both Auro-Return instances, select Mix from the Bus menu so that the Auro-Return plug-ins receive the output channels of the Auro-Mixing Engine called Mix.

---

**NOTE:**     *The Auro-Mixing Engine outputs a Mix and a Downmix at the same time. To monitor the Downmix, select it from the Auro-Return Output menu.*

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21. 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.
22. On each audio track, select a 5.1 output to monitor through.
23. Open the Auro-Matic Pro 2D instance.
24. Start playback and adjust the controls to your liking.

Following these steps, you should now hear the mono sound effect up-mixed to 5.1 surround, along with other sources you connect to the Auro-Mixing Engine.

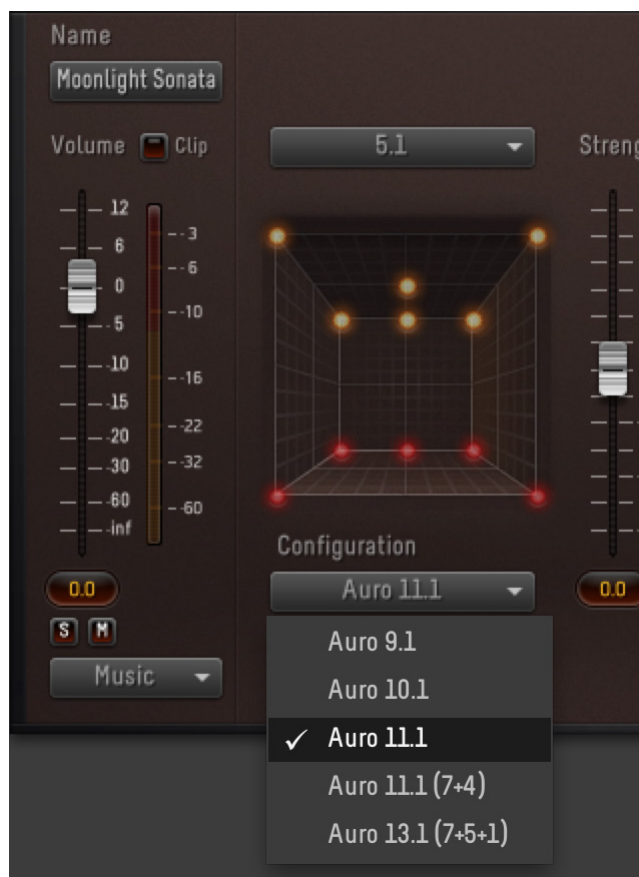
## 4.2 Auro-Matic Pro 3D

Auro-Matic Pro 3D can function as a stand-alone plug-in (without an Auro-Mixing Engine) that up-mixes mono, stereo, 5.1 surround and 7.1 surround sound sources to a three-dimensional sound field. If the Auro-3D Authoring Tools are installed, Auro-Matic Pro 3D can also be connected to the Auro-Mixing Engine to use the up-mixed sound source directly in an Auro-3D mix.

### 4.2.1 Stand-alone Mode

To up-mix a 5.1 soundtrack to an Auro 11.1 configuration:

1. Create a 5.1 audio track in Pro Tools and import the soundtrack to that track.
2. Rename the audio track to an appropriate name, e.g. Moonlight Sonata.
3. On the 5.1 track, insert an instance of Auro-Matic Pro 3D (5.1).
4. Change the name of the Auro-Matic Pro 3D instance to something more recognizable, like Moonlight Sonata.
5. Set the Configuration to Auro 11.1.



**Figure 4-9** Selecting the Configuration

The Auro 11.1 configuration has more channels than a single audio track can handle in most DAWs. Therefore, we will deliver the output channels of the Auro-Matic Pro 3D instance back to the DAW with two Auro-Return plug-ins, each on a separate track:

6. Create two 5.1 audio tracks, one for the lower channels and one for the height channels.
7. Rename the tracks to Lower and Height, respectively.
8. On the audio tracks, insert an Auro-Return plug-in and rename the plug-ins corresponding to the respective track names.
9. In both Auro-Return instances, select Moonlight Sonata from the Bus menu so that the Auro-Return plug-ins receive the output channels of the Auro-Matic Pro 3D instance called Moonlight Sonata.
10. 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.



**Figure 4-10** Two Auro>Returns deliver the output channels from Auro-Matic Pro 3D to the DAW.

11. On both audio tracks, select a 5.1 output bus to monitor through.

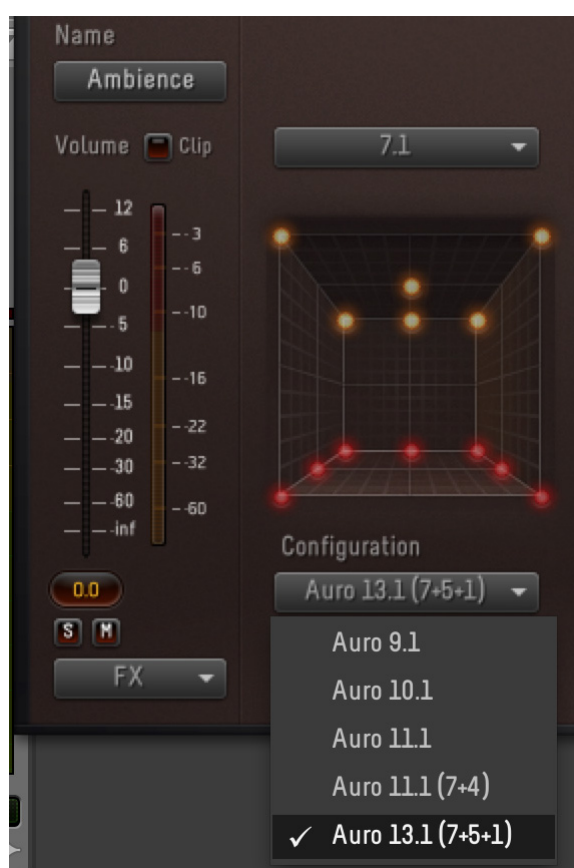
12. Open the Auro-Matic Pro 3D instance.
13. Start playback and adjust the controls to your liking.

Following these steps, you should now hear the 5.1 soundtrack up-mixed to Auro 11.1.

## 4.2.2 With the Auro-3D Authoring Tools

To up-mix a 7.1 ambience sound source to Auro 13.1 and use the output in an Auro-3D mix:

1. Create a 7.1 audio track in Pro Tools and import the ambience source file to that track.
2. Rename the audio track to an appropriate name, e.g. Ambience.
3. On the audio track, insert Auro-Matic Pro 3D (7.1).
4. Open the plug-in user interface.
5. Change the name of the Auro-Matic Pro 3D instance to something more recognizable, like Ambience.
6. Change the Configuration to Auro 13.1



**Figure 4-11** Selecting the Configuration

Next you will connect this instance of Auro-Matic Pro 3D to an Auro-Mixing Engine via an Auro-

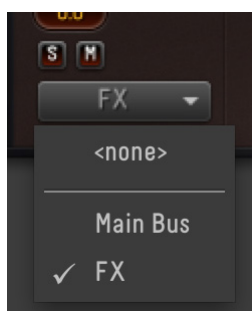
Bus plug-in, while the audio track output will be routed to a dummy output:

7. On the audio track, select a 7.1 dummy bus as output (i.e. a bus that is not sent to the monitoring system).



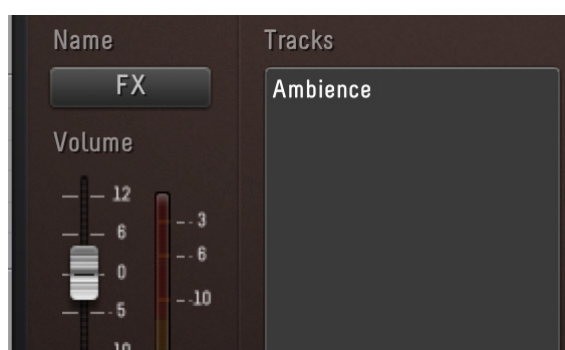
**Figure 4-12** Selecting a dummy output.

8. Create a mono audio track in Pro Tools, and name it FX.
9. On the FX track, insert an Auro-Bus plug-in and name it FX as well.
10. Open the plug-in user interface of the Auro-Matic Pro 3D plug-in previously created.
11. Below the Volume fader, select FX from the bus assignment menu.



**Figure 4-13** Assigning Auro-Matic Pro to an Auro-Bus

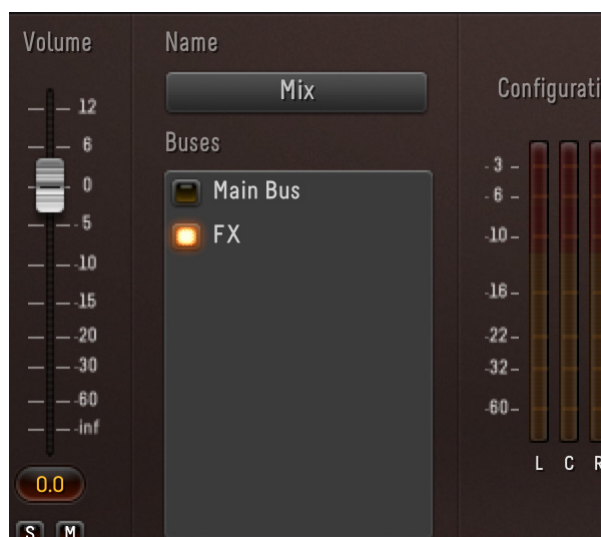
12. In the FX bus, Ambience should now appear in the Tracks field.



**Figure 4-14** The Tracks field in the FX bus

The output of this Auro-Matic Pro 3D instance gets sent to the FX bus now. Next you need to create an Auro-Mixing Engine that receives the FX bus:

13. Create a 7.1 audio track in Pro Tools, and name it Mix.
14. On the audio track, insert an Auro-Mixing Engine plug-in and name it Mix as well.
15. In the plug-in user interface, select a compatible channel-based configuration, e.g. Auro 13.1. It is the only real compatible configuration because we are up-mixing to Auro 13.1 with the Auro-Matic Pro 3D instance.
16. Select FX from the Buses field.



**Figure 4-15** Selecting the FX bus in Auro-Mixing Engine

In the Auro-Mixing Engine, the output of the Auro-Matic Pro 3D instance is mixed together with the output of other Auro-Matic Pro and Auro-Panner plug-ins that connect to it through their respective Auro-Buses.

To be able to monitor the output of the Auro-Mixing Engine, the channels need to be delivered back to the DAW:

17. Create one 7.1 audio track for the lower channels and one 5.1 audio track for the height channels.
18. Rename the tracks to Lower and Height, respectively.
19. On the audio tracks, insert an Auro-Return plug-in and rename the plug-ins corresponding to the respective track names.
20. In both Auro-Return instances, select Mix from the Bus menu so that the Auro-Return plug-ins receive the output channels of the Auro-Mixing Engine instance called Mix.

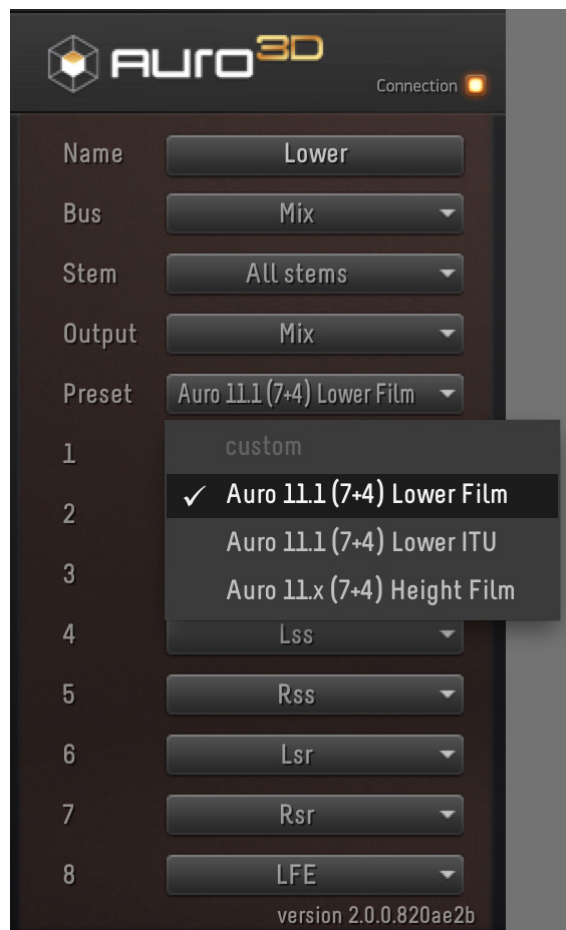
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*NOTE:* The Auro-Mixing Engine outputs a Mix and a Downmix at the same time. To monitor the Downmix, select it from the Auro-Return Output menu.

---

21. 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.



**Figure 4-16** Selecting which channels Auro-Return delivers to the DAW

22. On the audio tracks, select a 7.1 and 5.1 output to monitor through.
23. Open the Auro-Matic Pro 3D instance.
24. Start playback and adjust the controls to your liking.

Following these steps, you should now hear the 7.1 ambience sound source, up-mixed to Auro 13.1, along with other sources you send to the Auro-Mixing Engine.



