

# **G**AUDIO WORKS

USER MANUAL V2.0.2

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# 1. INTRODUCTION

## 1.1. Works

Works is the most innovative VR audio post-production tool for cinematic VR & 360 video. Content producers are able to easily create interactive spatial audio for any media platform.

Below are some of Works' key features, with more updated features to come:

- **Easy integration**

Works is available as an AAX plug-in for Pro Tools. There is no need to buy or learn a new system. You can keep existing workflow and spatialize audio as the final step.

- **Multiple formats**

Works is compatible with multiple channel formats including sound objects in mono, recordings in stereo, and Ambisonics. For Ambisonics, Works supports different component orderings, Furuse-Malham (FuMa) and Ambisonics data eXchange format (AmbiX).

- **Intuitive interface**

Works provides an intuitive graphical user interface (GUI) allowing producers to easily position audio sources. Producers can use digital audio workstations' existing automation features to automate movements of multiple source positions in a 3D space.

- **Guaranteed sound quality**

G'Audio Core, the best audio rendering toolbox available, is integrated within Works. This end-to-end solution provides accurate sound reproduction from the producer to the consumer, allowing the listener to hear sounds as the producer intended.

## 1.2. Sol SDK and .ga5 format

Sol is the quality 3D audio player SDK available for custom integration into Android, Windows, MacOS and iOS apps, as well as web players and mobile devices. Sol supports Ambisonics and is the only player that supports G'Audio's proprietary .ga5 format, which delivers the industry's highest quality 3D audio. When paired with the Sol SDK, projects created with Works and exported using the .ga5 format get the quality they deserve.

## 2. GETTING STARTED

### 2.1. System requirements

For the installation of the G'Audio Works, the following systems are required:

- MacOS 10.10 (Yosemite), MacOS 10.11 (El Capitan), MacOS 10.12 (Sierra)
- Pro Tools 11.2.0 or later (Pro Tools HD is required for 5.1 and ambisonic channel configurations)

### 2.2. Installation

1. Visit the G'Audio Lab website (<https://www.gaudiolab.com>) and create your account.
2. Download and run the Works Installer `GAudio_Works_2.0.2.pkg`. You can find it on our site: Products > G'Audio Works (<https://www.gaudiolab.com/product/works>)
3. If you wish to verify successful installation, please check that the `GWorksMaster.aaxplugin` and the `GWorksSlave.aaxplugin` are located in your AAX plug-in folder: `/Library/Application Support/Avid/Audio/Plug-Ins/`
4. When you insert the *Master* plug-in for the first time, a pop-up window requiring you to sign in will appear. Login with the account information you previously created on our site.

### 2.3. Session structure

Works consists of two plug-ins, the *Slave* and *Master*. They can be found in the `Sound Field` section of the insert list. The *Slave* plug-in should be added to each audio track in order to enable G'Audio Core, our binaural rendering toolbox for VR & 360 video. The *Slave* supports multiple channel configurations (mono, stereo, 5.1, and Ambisonics) and binaurally renders the audio in each track. The *Slave* plug-in can be individually inserted to the tracks you wish to spatialize, or can be simultaneously inserted on all tracks of the same type. The *Slave* is compatible with any other plug-in effects as long as they are added **before** the *Slave*. The *Slave* must be last in the track's processing chain.



Figure 1. Slave should be the last plug-in on each track

The *Master* provides an intuitive graphical user interface for spatializing audio signals. It generates geometrical metadata for each audio source, and in real-time, dynamically alters the output audio according to the head orientation controller interaction. The *Master* plug-in then delivers the metadata to each *Slave* plug-in. The *Master* plug-in is simply an interface used to position sound sources within your scene. For the sake of simplicity, we recommend that you insert the *Master* plug-in onto a master track. Just be sure **NOT** to insert any plug-ins on the master track except for the *Works Master*, as they will not be reflected in your exported mix.

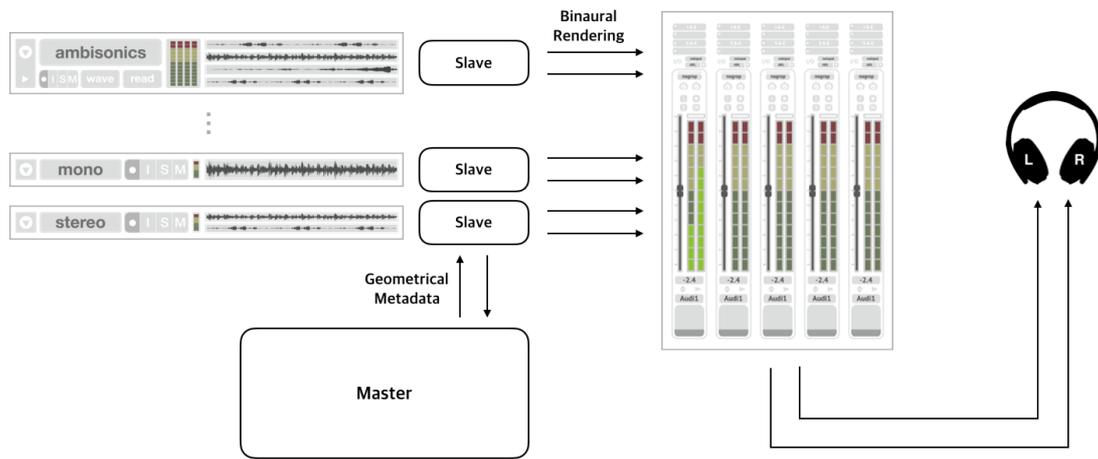


Figure 2. Flow map of Slave and Master

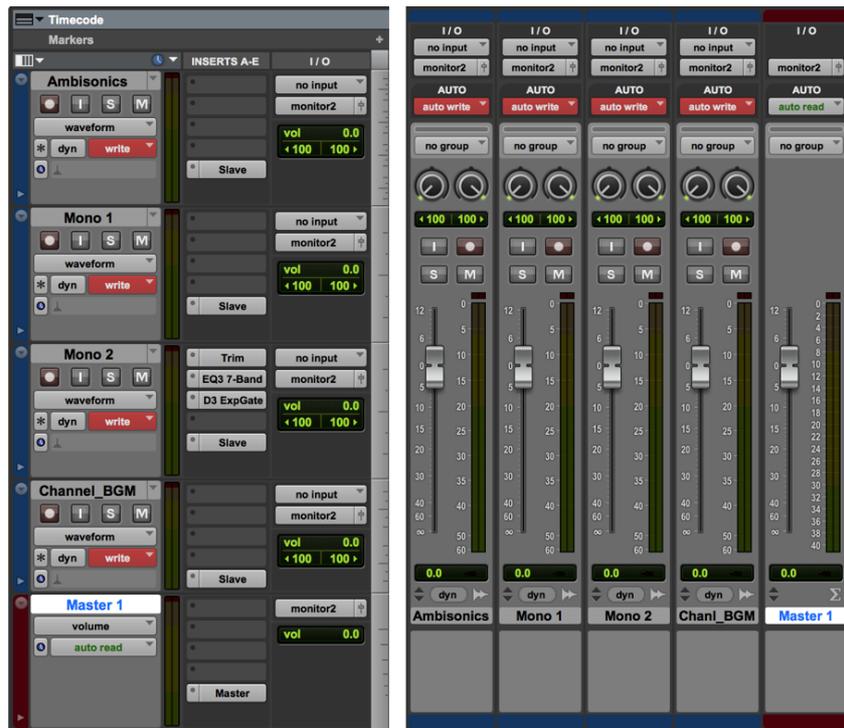


Figure 3. Session structure of sample session

As demonstrated in the picture, your session may include multiple *Slave* plug-ins, and one *Master* plug-in on the master track. You can download a sample session from our website (<https://www.gaudiolab.com/product/works>) in order to better understand this structure.

## 2.4. Compatibility Issues with Previous Versions

### Works 1.x.x

#### *Distance for mono sources*

Since the maximum value of distance for mono source is now extended to 25 (m), the sources saved in the previous versions where maximum value was only 10 (m) would be automatically adjusted to 2.5 times the original distance. This makes the sound smaller, so use the *Trim Tool* in Pro Tools to lower the overall automation line if you wish to use previously saved session files.



Figure 4. Pro Tools's Trim Tool

### 3. OVERVIEW OF WORKS

Works provides two different plug-ins, the *Slave* and *Master*. The *Slave* plug-in binaurally renders audio sources within the track, while the *Master* plug-in is an advanced spatial panner that communicates geometrical metadata to the audio sources. Applying a *Slave* on a track indicates that you will be including the audio sources within that track in your final export. The spatialization of audio sources is controlled through the *Master*.

The G'Player and Works Encoder utility applications will be useful after the export stage. G'Player is the reference player used to monitor the final output on a mobile device. We currently support G'Player on the Oculus GearVR, support for other platforms including the Oculus Rift and HTC Vive are in development. The Works Encoder is a standalone application used to mux your final audio and video in a single file output. Muxing is also possible when exporting using the Works spatializer.



Figure 5. Works Master plug-in

Since audio source spatialization is controlled via the *Master*, each of its six different sections are explained below.

### 3.1. Video Section

This section lets you display the audio sources over the reference video. The reference video is not necessarily the same video you will be using during the muxing or export stage.



Figure 6. Video Section

Click on the  button to select the video file you will be using as a reference video during spatialization. You can easily remove or change the reference video from the *Settings* tab at anytime.

When the reference video is loaded, simply click and drag the audio source markers over the video to set their positions. The left mouse click is used for positioning audio sources, while the right mouse click is used for changing the video viewpoint or the listener's head orientation.

There are various useful features attainable through mouse control, such as multi-selecting audio sources and positioning them straight along the axis. Refer to section [4.2 Working with the Video or 3D Map](#) for more details.

**Note** You can only modify the Yaw (left-right) view from the *Video* section. Use the *3D Map* or the *Head Orientation Controller* if you wish to control both the Yaw(left-right) and Pitch(above-below) field of view.

#### Video toolbar

The toolbar at the bottom of the *Video* section is designed for more elaborate control. There is a mouse cursor selector on the left, and multiple display options on the right. The  option is used

to switch between HMD mode and Panoramic mode. The  GRID and  LABEL options let you display or hide the grid or label respectively.

### 3.2. 3D Map

The 3D Map section allows you to accurately visualize source positions within a three-dimensional space. This section provides a bird's eye view of your entire scene.

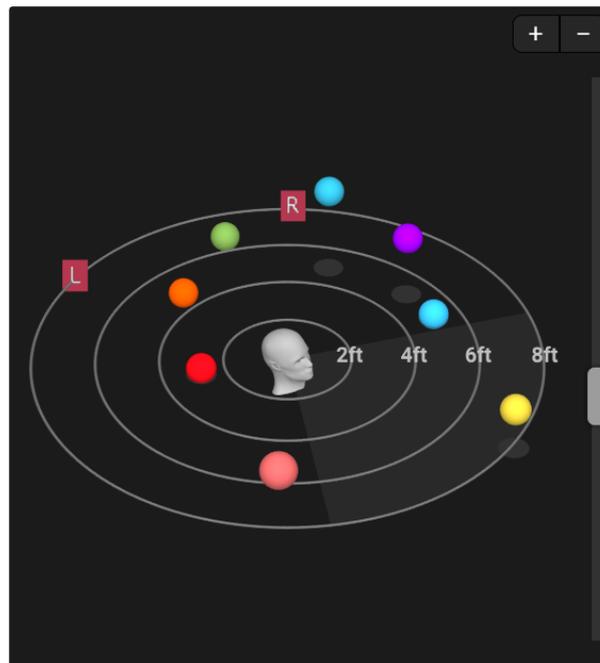


Figure 7. 3D Map

By default, it displays the vertical top-down view. This view can be modified freely if you wish to view objects from a specific angle. The viewpoint angles range from 90° (vertical) to 0° (horizontal) and can be adjusted by moving the scroll bar on the right.

If you wish to adjust zoom scales to get a better view of a source location, use the   buttons on the right side. You may also change the scale to your preferred units of measure (ft, m) in the *Settings* tab.

If you wish to learn how to control audio sources and modify head orientation with the mouse, refer to section [4.2 Working with the Video or 3D Map](#).

### 3.3. Head Orientation Controller



Figure 8. Head Orientation Controller

You can control head orientation using this controller. Each of the two knobs represents the listener's yaw and pitch (lateral and vertical views). Rather than turning knobs, you may also input numerical value directly in the field.

### 3.4. Spatial Positioning Section

The Spatial Positioning section is where you set or modify positional parameters for each audio source. It is divided into three different subsections: 1) Track Configurations, 2) Positioning Knobs, and a 3) Track Gain.



Figure 9. Spatial Positioning Section

#### 1) Track Configurations

This section shows the selected track's name, type, and color. Track **TYPE** represents the type of input track, and **COLOR** displays the unique color representation of the track on the *Video* and *3D Map*. You can change the color by clicking on the **COLOR** button. Additionally, there are three different toggle selections described below:

- **Bypass Spatial Rendering (Background)**

Bypasses the binaural rendering process. This option is typically used to preserve the clarity of voice over track or background music.

- **Timbre Preservation**

This mode preserves the timbre of a track by limiting the binaural rendering effect. Note that spatialization effects are limited in this mode.

- **Lock Positioning**

This option locks the position of an audio source to the set point. In this mode, previously saved automation data is preserved, and the mouse control for that source is disabled; regardless of the automation mode selected in Pro Tools. Use this feature if you no longer need to make any adjustments and wish to keep the automation data as is. You can always turn this option off if you decide to make changes in the future.

**Tip** *Lock Positioning* is especially useful for Ambisonics tracks. By nature, Ambisonics tracks may need additional position modification if the original Ambisonics source does not align properly with the 360 video. This is caused by the physical mismatch between the camera and microphone during the recording stage. If you have shifted the position of an Ambisonics track, use this *Lock Positioning* feature to keep the orientation as is.

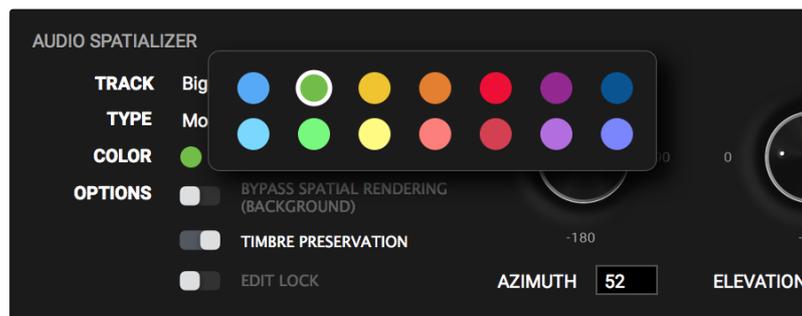


Figure 10. Changing representative color of the source

## 2) Positioning Knobs

Positioning Knobs control the positioning of audio sources — Azimuth, Elevation, and Distance. Each knob has an input field where you can directly type in a numerical value. You may also use the key commands supported by Pro Tools like resetting the value (**Option** + Click), or (**Command** + Drag) for fine adjustments.

## 3) Track Gain

The Gain lets you adjust the gain of the selected audio track. The volume fader information within Pro Tools will **NOT** be reflected in your final export. Use this gain meter, a trim plug-in (found in multi-mono

plug-ins> other), or clip gain, to adjust the output levels of a track. If you have gain automation already recorded, simply copy and paste that automation data to the Works gain automation lane, or to that of a trim plug-in.

### 3.5. Monitoring Format Section

This section allows you to monitor in the audio output format desired. FOA (First-order-Ambisonics) can be used on platforms like YouTube and Facebook. FOA downmixes the original tracks to a limited number of channels. On the other hand, GA5 format delivers the same number of channels that were present in the production stage, with a potentially unlimited number of virtual speakers. GA5 delivers a superior sense of localization and sound quality when compared to the FOA format.



Figure 11. Monitoring Format section

Monitoring Format option is merely for monitoring in the selected format during playback, and will **NOT** affect the final output. Use the *Audio Format* field in the *Export Settings* tab to choose your final output format.

### 3.6. Settings Tab

The Settings menu can be accessed by clicking on the [Settings](#) button on the bottom left portion of the *Master*. There are two tabs titled 1) *Global Preferences* and 2) *Export Settings*. The *Global Preferences* tab is where you can modify the preferences of your working environment. The *Export Settings* tab is where you can select export parameters, like the bounce destination or format selection.

## 1) Global Preferences

This tab displays the current user preferences. It's comprised of three different sections.

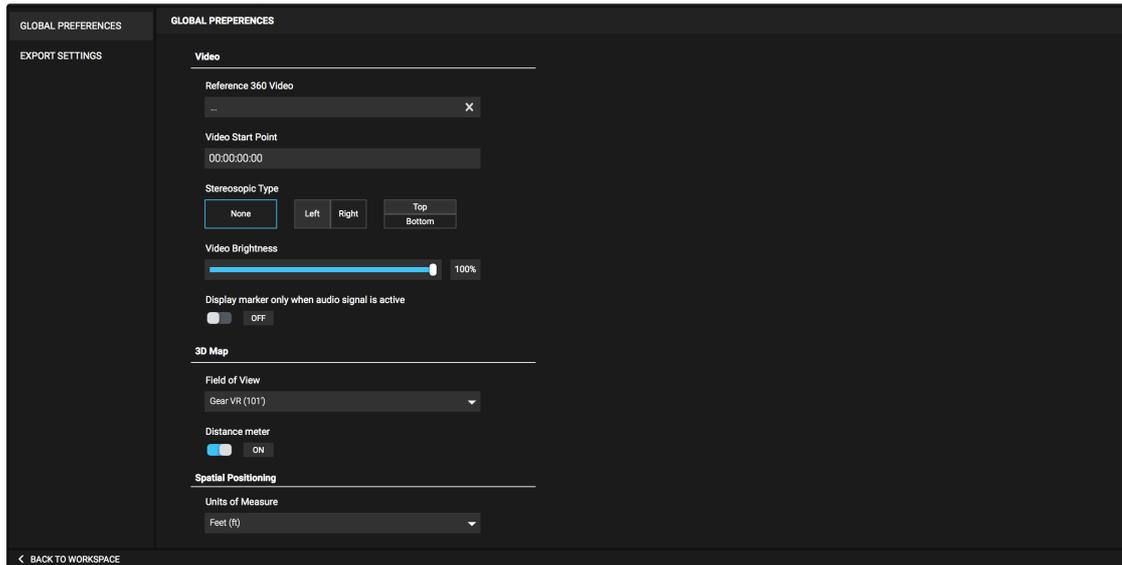


Figure 12. Global Preferences

### Video

- *Reference 360 video*

By clicking this input field, you can select or switch the video file that you will be using as a reference video in the *Master* window. If you wish to spatially mix without a video, click the  button on the right, and the reference video will be removed from the video screen.

**Note** This option only pertains to the reference video in the *Video* section, not the final exported video.

- *Video Start Point*

Adjusting the start point is useful in case that the audio and video are not synchronized. You can set the exact start time, by changing the value in the input field.

- *Stereoscopic Type*

This parameter represents the stereoscopic type of the input video. If your video is a non-stereoscopic 360 video, then set this field to .

- *Video brightness*

This parameter has a value of 0 to 100 representing the brightness of the video in the *Video* section.

- *Display Marker only when audio signal is active*

This option enables source markers to only be visible when the audio source is being played. By turning this option off, source markers will remain visible regardless of the input signal.

### 3D Map

- *Field of View*

This parameter lets you choose the angle of the listener's field of view on *3D Map* and HMD mode of the *Video* section.

Options	Field of view
Disable	None
GearVR (101°)	101°
HTC Vive (110°)	110°
Oculus Rift (110°)	110°

- *Distance Meter*

Hides or displays the distance meter within the *3D Map*.

### Spatial Positioning

- *Units of Measure*

This parameter has two options — feet(ft) and meters(m). This parameter lets you change the units of measure within the *3D Map* and *Spatial Positioning* section. This has no effect on automation data.

## 2) Export Settings

Export Settings is where your exporting options are selected. This tab contains *Output Settings* and *Video Configurations*. The *Video Configurations* section is enabled when you select

360 video file(with spatial audio) as the output file type.

**Note** Configure these settings prior to bouncing with Pro Tools. Once this is done, proceed to bounce the project using the Pro Tools **Bounce to Disk** feature.

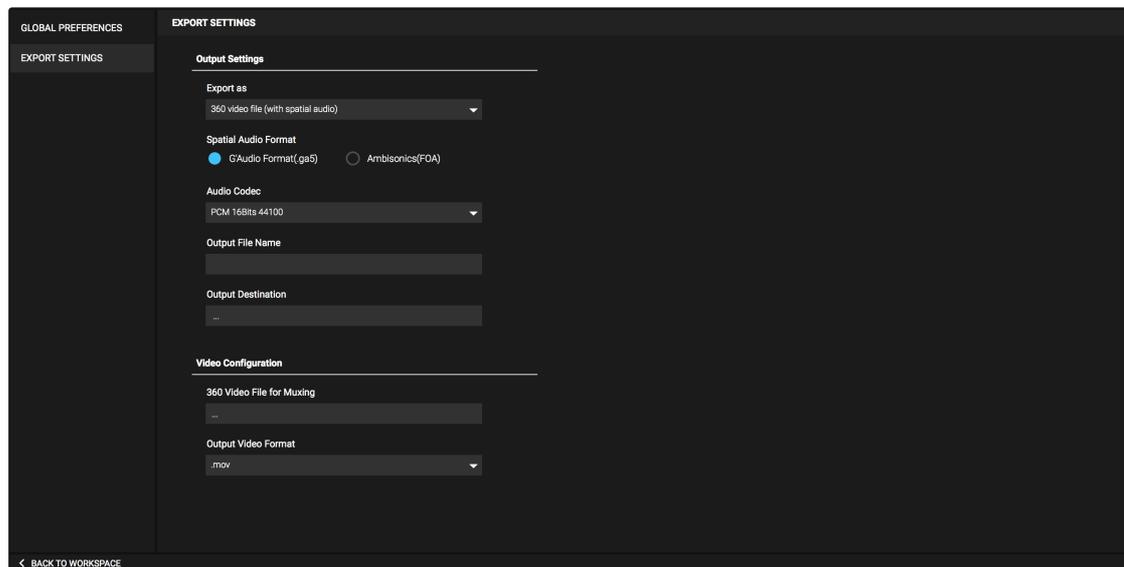


Figure 13. Export Settings

### Output Settings

- *Export as*

This parameter provides two options for export: just a spatial audio file, or a video file with spatial audio embedded. You will get a single audio file (.wav, .mp4 or .ga5) from the **Spatial audio file** option. You will get a single video file (.mp4, .mov) with spatial audio from the **360 video file(with spatial audio)** option.

- *Spatial Audio Format*

This parameter lets you select between two output format options, so choose the format depending on the playback destination. **Ambisonics(FOA)** is supported on YouTube and Facebook, but it downmixes the original tracks to a limited number of channels, and tends to somewhat blur the audio image, impacting object localization. **G'Audio Format(.ga5)** can be used on players that are integrated with the Sol SDK. If you wish to deliver a superior sense of object localization and sound quality, use **G'Audio Format(.ga5)**. GA5 format accomplishes this feat by not downmixing audio sources and providing an unlimited amount of virtual speakers.

**Note** When you select  as an audio format, your non-spatialized(Bypassing Spatial Rendering) audio will be exported as a separate stereo wav file due to the limitations of the FOA format by itself.

- *Audio Codec*

This parameter has multiple options for selecting the audio codec and bitrate. Please note that the codec and bitrate options selected in Pro Tools are different from the ones selected within Works.

- *Output File Name*

This field lets you enter the output file name.

- *Output Destination*

This field designates the final output file's destination.

## **Video Configurations**

- *360 Video File for Muxing*

In this field you can select the location of the video you wish to mux with your spatial audio mix.

- *Output Video Format*

Also referred to as a video container, this will be the resulting video file type. Please note that muxing MP4 with GA5 files is not currently supported. If you wish to use an .mp4 video, you must export using Ambisonics(FOA). If you wish to export using GA5, select MOV as the video container. Support for GA5 audio in an .mp4 container is in development.

## 4. SPATIALIZING AUDIO SOURCES

### 4.1. Loading video and audio sources

A reference video can be imported to the *Master* interface by selecting a video in the *Global Preferences* tab, or by clicking on the [Click to import a video](#) option displayed when you first open the *Master*.

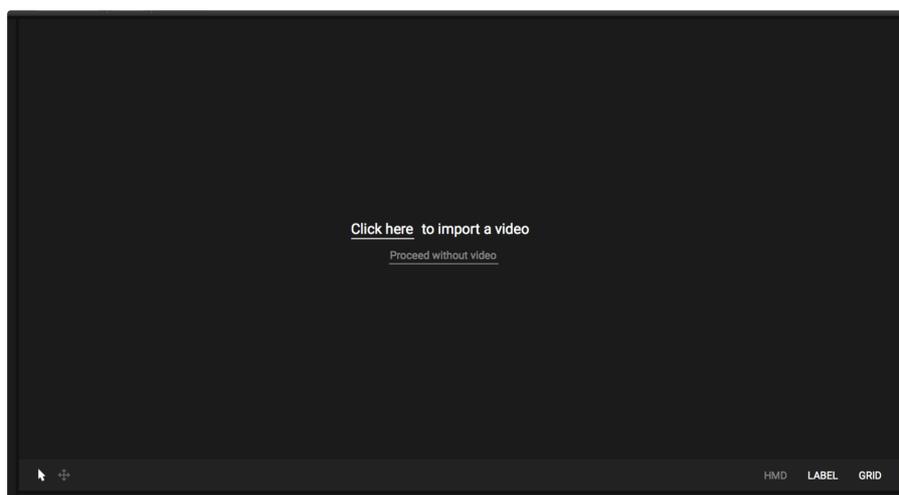


Figure 14. Click to import a video

**Note** Be sure to import a 480p version of the video in order to minimize the processing load on your CPU. In order to convert a video to 480p, right click on the video file, select "Encode Selected Video Files", choose 480p under settings, and Encode for: "Greater compatibility."

Insert a *Slave* plug-in onto each input track, those tracks will then appear on the *Master* interface. The automation data recorded on the *Master* is transferred to the *Slave* in the form of geometrical metadata. Then, the *Slave* binaurally renders the tracks according to their positioning during playback. Multiple channel configuration audio files are supported including: Mono, Stereo, 5.1, and First Order Ambisonics(Quad).

**Note** Ambisonics files have two different types: FuMa and ACN. Be sure to select the proper input type on the *Slave* plug-in before proceeding.



Figure 15. Slave of Ambisonics track

After inserting a *Slave*, you need to enable automation parameters on each track (enabling automation is only necessary if the objects within that track will be moving). Enable the Azimuth, Elevation and Distance parameters for mono tracks, and the Yaw and Pitch parameters for the stereo and Ambisonics tracks. Then, change the status of the track to **Write**, **Touch**, or **Latch**, and it will now be ready for spatialization.

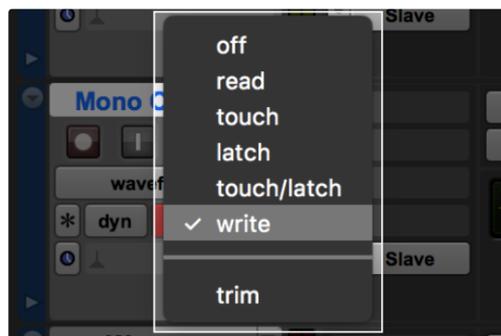


Figure 16. Set status of the track to Write, Touch, or Latch

## 4.2. Working with the Video or 3D Map

After loading your video and audio sources, you may spatialize your audio sources using the *Master* plug-in. You can control the positioning of sound sources via the *Video* section, or via the *3D map*. The *Master* provides two different methods to do this: 1) Tracking the visual movements with by clicking

and dragging on the *Video or 3D Map* 2) Moving the knobs and faders in the *Spatial Positioning* section.

When the sound source track is set to **Write**, **Touch**, or **Latch**, the automation values will be written from the time the user clicks down in the *Video or 3D Map* section, until the mouse click is released. Either click and drag on the source audio, or use point-to-point interpolation in Pro Tools for writing automation.

### **Spatial Positioning by click and drag**

The click and drag method is the most intuitive way to create spatialization. You can easily attach audio to the corresponding objects by following the movements of those object. All this is done over the top of the reference video itself, so you know exactly where to place the audio.



**Figure 17. Spatial Positioning by click and drag**

#### **Move vertically or horizontally**

If you wish to move audio along a constant vertical or horizontal axis, hold **Shift** while clicking and dragging, and your audio objects will move perfectly straight along the desired axis. This option is useful if you are spatializing objects that have a consistent azimuth or elevation.

#### **Move multiple sources at once**

You can spatialize several objects at once simply by clicking and dragging a box around the objects you want to select. You may also use **Command** or **Shift** key.

### **Positioning with the point to point method (Automation interpolation)**

The point-to-point method is another useful way to position audio sources, especially if the object has linear movement. In order to do this, create automation breakpoints at the desired starting and ending

values. The data between these two points will be interpolated. For example, set the position of an audio source over the *Video* section or the *3D Map* at a certain point in time, then, add another break point at the ending position. Automation breakpoints can be created by pressing `Option + /`.

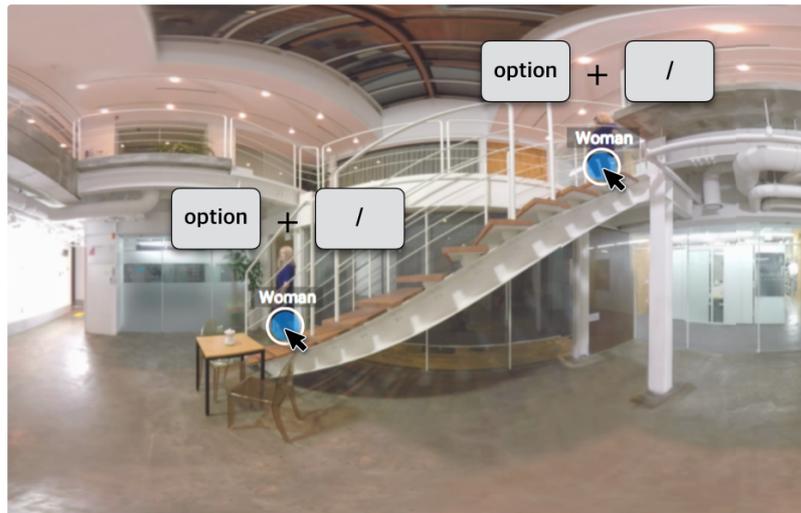


Figure 18. Spatial Positioning with the point to point method

### Spatializing marginal objects : Adjust head orientation / Switch to HMD view

Due to that nature of equirectangular videos, at times, you may not have a clear view of objects if their height is too close to the top or bottom of the screen; as the image may be distorted. In such cases, right-click over the *3D Map* section and point the mouse towards that object or section. Alternatively, you can switch to HMD view and adjust your viewing direction towards that object in that manner. Viewing direction can be moved by right clicking and dragging over the *3D Map* itself, or by using the *Head Orientation* controller knobs. Switching from the default panoramic view to HMD view can be done in the video toolbar.



Figure 19. HMD view mode

### 4.3. Working with the Spatial Positioning

You may also use the knobs in the Spatial Positioning section to position audio sources. Just be sure that the sound source track has the proper automation parameters enabled, and that the status is set to  ,  , or  . Automation data will be written as you turn the Spatial Positioning knobs during playback. The Spatial Positioning knobs also support some additional useful features:

#### Fine tuning

By holding  and turning the Spatial Positioning knobs, you are able to move in finer increments for precision movement. You may also type in a precise location value.

#### Reset to default

+ clicking a knob sets that knob's value back to default. If you wish to clear all positional values, delete the automation lines from the automation lane, or remove the automation lane and add it again.

### 4.4. Adding Ambience/Reverb to a Scene

Sending all or some of your sounds to a reverb can be a great way to add to the immersiveness and realism of a scene. You can add room ambience and reverb by sending your desired audio sources to a stereo or mono aux input track and inserting a reverb plug-in on that aux input, as well as a Slave. Then, simply place the reverb slave anywhere in the scene you wish to place it, like in the middle of a room for example.

If you wish for the reverb to have movement, then simply write the automation using the reverb slave, or copy and paste automation data from previously automated sound sources.

### 4.5. Adding Limiter

Since there is no built-in limiter in this version of Works, you can prevent clipping by adding a limiter with an out ceiling on some of your loudest tracks. Be sure to also check for clipping when looking in different directions, and adjust the limiter accordingly. Sometimes you may not be clipping when the viewer is looking straight ahead, but when they turn to a particular object, then that certain track has the potential of clipping. To prevent this issue, lower the out ceiling of the limiter on that channel, you can also use a compressor. A built-in limiter is currently in development.

## 5. Exporting Output Content

### 5.1. Exporting spatialized audio with the Pro Tools

Works exports the final project using the Pro Tools bounce feature. It supports G'Audio format(.ga5) and FOA format in the WAV codec for export. You can also export a video file with audio embedded within it.

Before bouncing, you must choose your export settings including the audio codec and video format. You can access these options from the *Export Settings* menu in the *Master*. After your settings are selected, use the Pro Tools **Bounce to Disk** feature to bounce and export your project. If you select bounce Spatial audio only, you will get a single .ga5 or .wav file. If you select export with video, you will get single a .mov or .mp4 file.

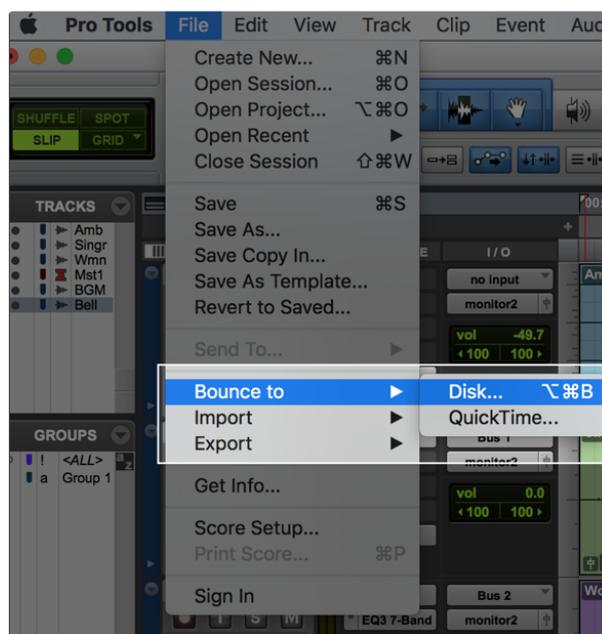


Figure 20. Use 'Bounce to Disk' feature to export your project

**Note** You must always bounce the session using the Pro Tools Built-In Output: Setup>Playback Engine>Built-in Output

**Note** Although the output file created by Works is exported using the Pro Tools Bounce to Disk feature, the audio file bounced by Pro Tools itself is different from the one bounced by Works. Thusly, spatial data will not be reflected in the file bounced by Pro Tools itself. The file bounced by Pro Tools will not be necessary, and can be deleted.

## 5.2. Muxing spatialized audio and video using Works Encoder

The G'Audio Works Encoder is a stand-alone software that lets you mux video with audio. The Encoder is a publishing tool that converts your final output to fit a specific platform, like YouTube for instance. It's useful when you need to mux audio and video without having to go through a DAW like Pro Tools. The Encoder is universally compatible and can run on multiple operating systems including Windows. You can download the Works Encoder from our website (<https://www.gaudiolab.com/product/works>)

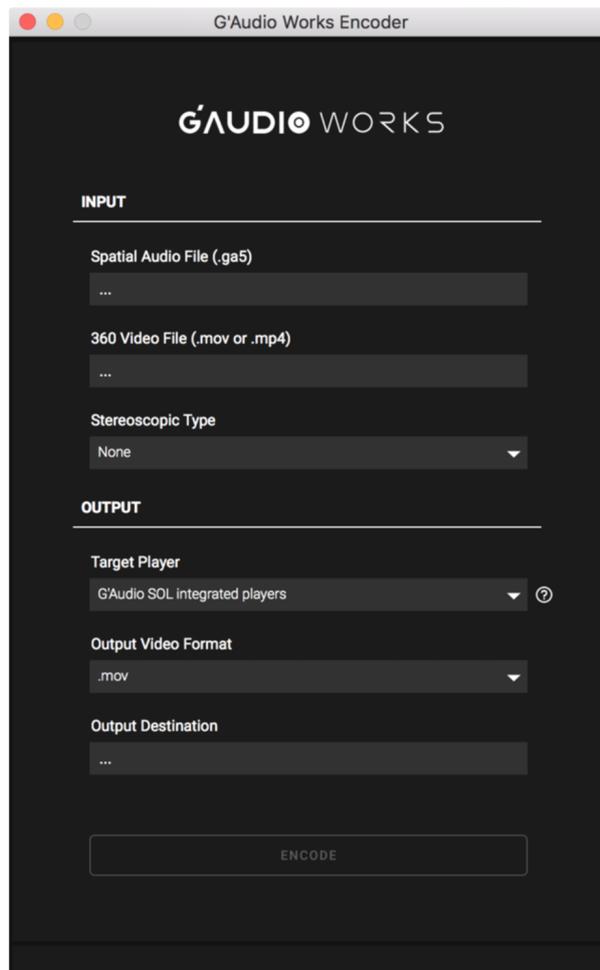


Figure 21. G'Audio Works Encoder

The Works Encoder requires FFmpeg and Python 2.7 installed on your computer. When you first open the app, a popup window will appear to guiding you to the download. Please make sure that your computer is connected to the internet before running the app.

## Input

- *Spatial Audio File (.ga5)*

You may load your GA5 spatial audio file into this field. The G'Audio Works Encoder only accepts .ga5 format as the input audio file.

- *360 Video File (.mov or .mp4)*

You may load your video file in this field.

- *Stereoscopic Type*

You may set stereoscopic type of your input video. If your video is a non-stereoscopic 360 video, then set this field to .

## Output

- *Target Player*

There are multiple target player options available for export. The encoder converts the audio and video for compatibility within the target player. For example, if YouTube is selected as the target player, you will get a final output that has YouTube's metadata embedded within it. Thus, no additional processing will be required in order for your export to be uploaded to YouTube.

**Note** Many platforms, including YouTube and Facebook, currently only support Ambisonics, which will reduce object localization and the general audio quality of the spatial mix. Higher quality audio and more detailed object localization can be achieved using the GA5 format. The GA5 format can be played back in any player that has the Sol SDK embedded within it.

- *Output Video Format*

You may choose between the MOV and MP4 file types. Currently, we do not support GA5 audio in with an MP4 video container. Support for other formats, including MP4, are in development.

- *Output Destination*

This is where you locate the destination where you want your final output file to go.

### 5.3. Playing output content with G'Player

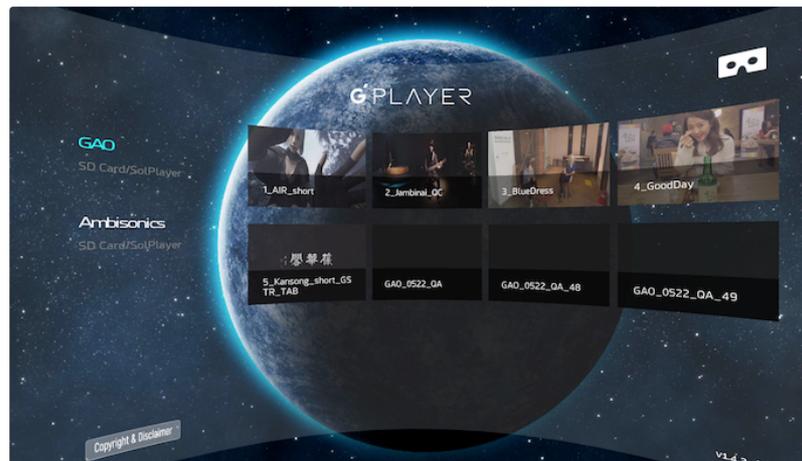


Figure 22. G'Player navigator

The G'Player is a reference player that has the G'Audio Sol SDK integrated within it. As previously stated, the combination of the Ga5 format and the Sol SDK make for better sound object localization and superior audio quality when compared to Ambisonics. There is also a more accurate translation of the spatial mix in production, to the spatial mix in consumption. This is due to the infinite number of virtual speakers, as well as the use of our quality audio engine in both production and playback.

We currently support the G'Player on the GearVR. You can read the detailed instructions for downloading G'Player for the GearVR on our website (<https://www.gaudiolab.com/resources/download/gplayer>). After completion of the installation process, connect your device to the Head Mounted Display, and find the G'Player app in the Oculus Library tab.

**Note** The G'Player is intended only as a reference player used to check your final spatial mix, and to showcase the quality of our Sol renderer. You can obtain a redemption code from the G'Audio website.

#### Side-loading

In order to play back your exported spatial audio video, you must first load it onto the device. You can do this by connecting your device to a computer, and using an app called *Android File Transfer*, or using the built in *File Manager*. Once the G'Player app is installed on your device, place your exported spatial audio video into the *GPlayer* folder, and you're ready for playback.

## 6. Important Things to Note

### Pro Tools Built-In Output

You must always bounce the session using the Pro Tools Built-In Output: Setup>Playback Engine>Built-in Output.

### Plug-ins on the Master Channel

Do not add any plugins on the master track as they will not be reflected in the final export. Thus, you must mix and master each track individually, as the master track and Master Window are only used as an interface for spatializing sound sources.

### Pro Tools Volume Faders

Volume fader information from the Pro Tools faders will not be reflected in the final export. Thus, you must use the track gain within the Works Master, a trim/gain plug-in inserted on the channel, clip-gain, or clip-gain automation for volume control.

### Adjust Clip Gain for All Clips

There are times when you may be content with the overall mix, but you need all of your tracks raised or lowered by a few decibels. To do this, consolidate all of your clips, select all of your clips, press `command + control + shift` and move your scroll wheel up or down. This Pro Tools key command will adjust the clip gain for all of your clips at once.

### Prevent Clipping

Since there is no built-in limiter in this version of Works, you can prevent clipping by adding a limiter with an out ceiling on some of your loudest tracks. Be sure to also check for clipping when looking in different directions, and adjust the limiter accordingly. Sometimes you may not be clipping when the viewer is looking straight ahead, but when they turn to a particular object, then that certain track has the potential of clipping. To prevent this issue, lower the out ceiling of the limiter on that channel.

## 7. Troubleshooting

If you have any questions or need some clarification, please contact us at [support@gaudiolab.com](mailto:support@gaudiolab.com)

## 8. Shortcuts

Action	Shortcut Key
Fine tune the movement of the Spatial Positioning knobs	<code>command</code> + Drag
Reset parameter to default value	<code>option</code> + Drag
Select multiple audio sources at once	<code>Shift</code> + Click or <code>Command</code> + Click
Hide all marker of sources except the clicked one	<code>Alt</code> + Click (over marker on the source list)
Show all marker of sources except the clicked one	<code>Alt</code> + <code>Shift</code> + Click (over marker on the source list)