Dolby

Dolby Atmos Conversion Tool

Guide

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Software v2.1.2

Notices

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Introduction to the Dolby Atmos Conversion Tool documentation

This documentation is for engineers, and others who work with Dolby Atmos content. Use the conversion tool to convert one Dolby Atmos master file format to another, edit or join masters as a composition, or perform other tool operations (such as applying frame rate conversion to a Dolby Atmos master file).

- Contacting Dolby

1.1 Contacting Dolby

You can contact Dolby regarding this product and its supporting documentation.

If you have technical questions about this product, consult the knowledge base at https://professionalsupport.dolby.com.

If you have questions or comments about this documentation, please send an email to documentation@dolby.com.

2

Installing the Dolby Atmos Conversion Tool package

You can install the Dolby Atmos Conversion Tool package on Linux, Mac, and Windows systems qualified by Dolby.

2.1 Dolby Atmos Conversion Tool package components

The Dolby Atmos Conversion Tool package can include the Conversion Tool application (with a dedicated graphical user interface (GUI)) and command-line interface (CLI), depending on the operating system.

Operating system	Dolby Atmos Conversion Tool application (with a dedicated user interface (UI) window)	Dolby Atmos Conversion Tool command-line application
Linux	No	Yes
Mac	Yes	Yes
Windows	Yes	Yes

2.2 System requirements

Before installing the Dolby Atmos Conversion Tool package, you should review system requirements and compatibility information to verify that your system supports the release and that you are ready to begin installation.

The Dolby Atmos Conversion Tool package applications have been qualified for use on these operating systems only:

- Linux (Dolby Atmos Conversion Tool command-line application only):
  - RedHat 7.3
  - Ubuntu 16.04 LTS, 18.04 LTS, and 20.04 LTS
- Mac: macOS 10.13 to 13.2.1
- Windows
  - Windows 10 (64-bit)
  - Windows 11 (64-bit)

2.3 Update considerations

Installing the Dolby Atmos Conversion Tool package overwrites a previously installed version. Additionally, example `.xml` (pmstitch) files and supporting media that were included with Conversion Tool v1.9 and earlier are also overwritten.

Existing logs (on Mac and Windows systems) and the preference file (on Mac only) are not overwritten. You can navigate to these files and delete them, if desired.

- Logs are located here:
  - Mac: `~/Library/Logs/Dolby Laboratories/Atmos Conversion Tool`
  - Windows: `C:\ProgramData\Dolby Laboratories\Atmos Conversion Tool\logs`
- For Mac only, the preference file (`~/Library/Preferences/com.dolby-laboratories.Dolby Atmos Conversion Tool.plist`) is located in the `~/Library/Preferences/` folder.

2.4 Installing the Dolby Atmos Conversion Tool package

Install the Dolby Atmos Conversion Tool package on a Linux, Mac, or Windows system qualified by Dolby.

2.4.1 Installing the Dolby Atmos Conversion Tool Debian package on a Linux system

You can install the Dolby Atmos Conversion Tool Debian package on a Linux system that is qualified by Dolby.

About this task

The Dolby Atmos Conversion Tool Debian package for Linux installs the Dolby Atmos Conversion Tool command-line application. The package does not include the Dolby Atmos Conversion Tool application (which has a dedicated UI window).

Procedure

1. Ensure that the Dolby Atmos Conversion Tool Debian package (`.deb` file) is on your Linux machine.
2. Open the terminal window.
3. Install the Dolby Atmos Conversion Tool package:
   a. Execute one of these command lines:

      `sudo dpkg -i dolby-atmos-conversion-tool-X.X.X.xxxxxxx-Linux.deb` (where xxxxxxx is the build number)

      `sudo dpkg --install dolby-atmos-conversion-tool-X.X.X.xxxxxxx-Linux.deb` (where xxxxxxx is the build number)

      Note: There are two dashes before the word `install`.

   b. If prompted with a warning that the package cannot be authenticated unless you accept the install without verification, execute `y` for yes.

Results

Each Dolby Atmos Conversion Tool package component is installed on your computer, at the noted location:

- Dolby Atmos Conversion Tool command-line application (`cmdline_atmos_conversion_tool`): `/usr/bin`
- Dolby Atmos Conversion Tool documentation: `/usr/share/doc/dolby-atmos-conversion-tool`

2.4.2 Uninstalling the Dolby Atmos Conversion Tool Debian package

You can uninstall the Dolby Atmos Conversion Tool Debian package that was previously installed on a Linux system.

Procedure

Execute this command line:

```
sudo dpkg -r dolby-atmos-conversion-tool
```

2.4.3 Installing the Dolby Atmos Conversion Tool package on Mac

You can install the Dolby Atmos Conversion Tool package on a Mac system qualified by Dolby.

About this task

During installation, previous versions of the Dolby Atmos Conversion Tool are uninstalled.

Procedure

1. Start the installer by double-clicking the Dolby Atmos Conversion Tool installer package `DolbyAtmosConversionTool_X.X.X_xxxxxxx_Mac.pkg` (where `xxxxxxx` is the build number).
2. Follow the on-screen instructions.

Results
Each supported Dolby Atmos Conversion Tool package component is installed on your computer at the locations listed here:

- Dolby Atmos Conversion Tool: `/Applications/Dolby/Dolby Atmos Conversion Tool`
- Dolby Atmos Conversion Tool command-line application (`cmdline_atmos_conversion_tool`): `/Applications/Dolby/Dolby Atmos Conversion Tool`
- Dolby Atmos Conversion Tool documentation: `/Applications/Dolby/Dolby Atmos Conversion Tool`

2.4.4 Uninstalling the Conversion Tool package on Mac

If necessary, you can uninstall the Dolby Atmos Conversion Tool package on Mac by deleting the folder that contains the application and other package contents. Alternatively, you can delete just the tool application or `cmdline_atmos_conversion_tool` Unix executable.

About this task
Uninstalling the Dolby Atmos Conversion Tool folder deletes these items:

- `Dolby Atmos Conversion Tool` application file
- `cmdline_atmos_conversion_tool` Unix executable
- All Conversion Tool documentation

Procedure

1. To uninstall the package:
   a. Navigate to `/Applications/Dolby`.
   b. Perform one of these steps:
      - Right-click on the **Dolby Atmos Conversion Tool** folder and choose **Move to Trash**.
      - Drag the **Dolby Atmos Conversion Tool** folder to the trash.
2. To uninstall the tool application or command-line executable:
   a. Navigate to `/Applications/Dolby/Dolby Atmos Conversion Tool`.
   b. Perform one of these steps:
      - Right-click on the `Dolby Atmos Conversion Tool` application file (or `cmdline_atmos_conversion_tool` Unix executable file) folder and choose **Move to Trash**.
      - Drag the file to the trash.

2.4.5 Installing the Dolby Atmos Conversion Tool package on Windows

You can install the Dolby Atmos Conversion Tool package on a Windows system qualified by Dolby.

Procedure

1. Start the installer by double-clicking the Dolby Atmos Conversion Tool installer package `DolbyAtmosConversionTool_X.X.X_xxxxxxx_Win64.msi` (where `xxxxxxx` is the build number).

   Note: If prompted to uninstall an earlier version, close the message window, uninstall the older version, and then start the installer again.

2. Follow the on-screen instructions.

Results
Each supported Dolby Atmos Conversion Tool package component is installed on your computer at the locations listed here:

- Dolby Atmos Conversion Tool: `C:\Program Files\Dolby\Dolby Atmos Conversion Tool`

- Dolby Atmos Conversion Tool command-line application (`cmdline_atmos_conversion_tool`): `C:\Program Files\Dolby\Dolby Atmos Conversion Tool`
- Dolby Atmos Conversion Tool documentation: `C:\Program Files\Dolby\Dolby Atmos Conversion Tool`

2.4.6 Uninstalling the Conversion Tool on Windows

If needed, you can uninstall the Conversion Tool from your Windows computer.

Procedure

1. Navigate to **Control Panel** > **Programs** > **Programs and Features**.
2. Highlight **Dolby Atmos Conversion Tool**.
3. Click the **Uninstall** button.
4. Follow the on-screen instructions.

2.5 Launching the Dolby Atmos Conversion Tool

After the Dolby Atmos Conversion Tool software is installed, you can launch the tool.

Procedure

1. Locate the Dolby Atmos Conversion Tool application name or icon:

   Figure 1: Dolby Atmos Conversion Tool icon

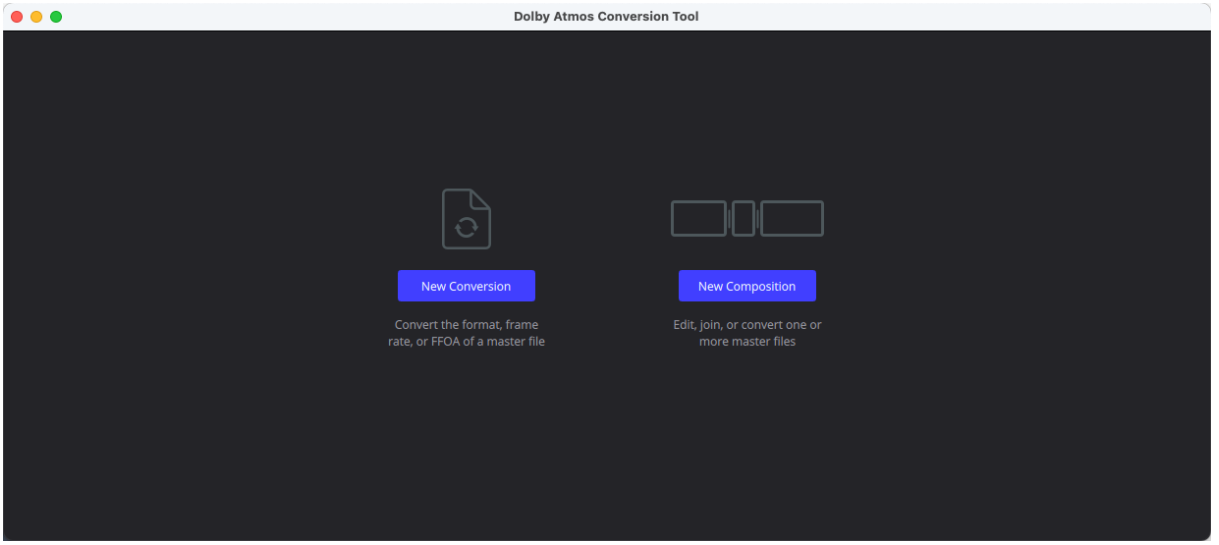
   

   - Mac: The Dolby Atmos Conversion Tool application is in the `Applications/Dolby/Dolby Atmos Conversion Tool` folder.
   - Windows: The Dolby Atmos Conversion Tool application is in the `C:\Program Files\Dolby\Dolby Atmos Conversion Tool` folder.
2. Double-click the Dolby Atmos Conversion Tool application name or click the icon in the dock (Mac only).

Results

The Dolby Atmos Conversion Tool home window displays.

Figure 2: Dolby Atmos Conversion Tool home window



2.6 Quitting the Dolby Atmos Conversion Tool application

When the Dolby Atmos Conversion Tool application is open, you can quit the application from the home, **Conversion**, or **Composition** window.

About this task

The commands and icons for quitting the application are not available when a dialog is open.

How the tool responds to the quit command is dependent on the current window, or window status:

- When quitting from the home window or **Conversion** window, or from the **Composition** window when there are no clips on the timeline, the application closes immediately.
- When quitting from the **Composition** window and there are clips on the timeline, you are prompted with a message noting that all information on the timeline will be lost. You can choose to proceed and close the application or cancel to return to the **Composition** window.

Procedure

- On Mac, perform one of these steps:
  - Choose **Dolby Atmos Conversion Tool** > **Quit**.
  - Click the quit application circle in the application window.
  - Press Command + Q.
- On Windows, perform one of these steps:
  - Choose **Dolby Atmos Conversion Tool** > **Quit**.
  - Click the quit application circle in the application window.
  - Press Control + Q.

2.7 Accessing operation log information

You can access log information that can be of value when debugging or reporting issues.

About this task

With v2.0 and later, the location of the folder that contains the log files has changed:

- v2.0 and later folder:
  - Mac: `~/Library/Logs/Dolby/Atmos Conversion Tool`
  - Windows: `C:\ProgramData\Dolby\Atmos Conversion Tool\logs`
- v1.9 folder:
  - Mac: `~/Library/Logs/Dolby Laboratories/Atmos Conversion Tool/`
  - Windows: `C:\ProgramData\Dolby Laboratories\Atmos Conversion Tool\logs`

Procedure

Perform one of these steps:

- On systems with the Dolby Atmos Conversion Tool, access an `atmos_conversion_tool.log` file that is automatically archived to your drive:

  Note: Each log file name includes the date the file was created (for example, `atmos_conversion_tool.2018-11-05.log`).

  - On Mac:
    a. Press Command + Shift + G.
    b. In the **Go to the folder:** field, enter the path `~/Library/Logs/Dolby/Atmos Conversion Tool`, and then click **Go**.
    c. Double-click the `Atmos Conversion Tool` folder.

    - On Windows: Navigate to the `C:\ProgramData\Dolby\Atmos Conversion Tool\logs` folder.
- When using a command-line program, copy the relevant lines of information in the command-line program window.

  All informational log messages are written directly to standard output, and all error log messages are written directly to standard error. Both streams will appear in the shell terminal as console output.

3

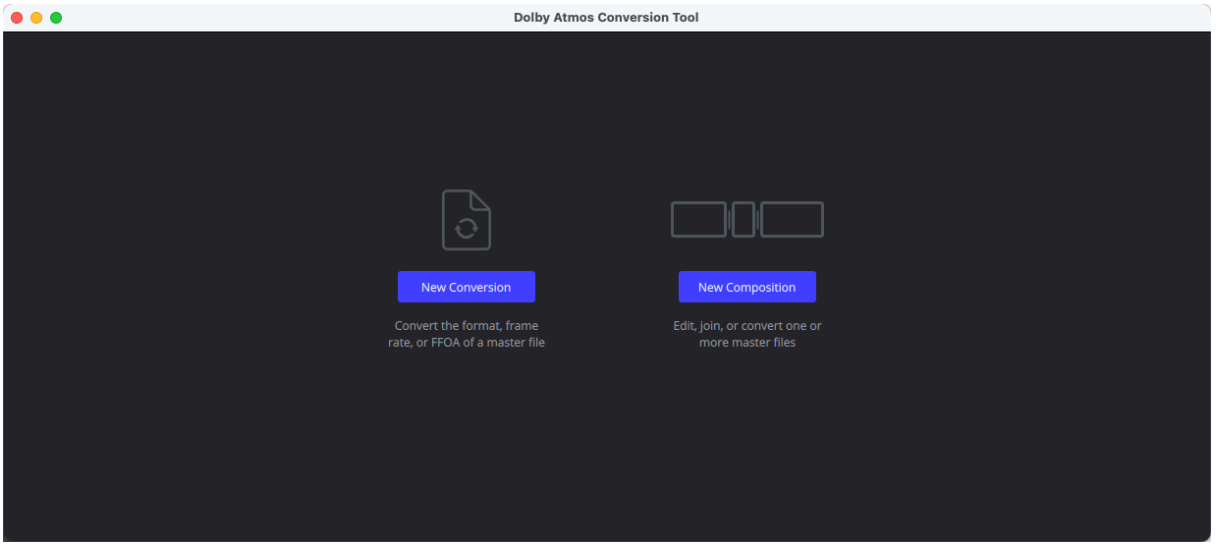
Dolby Atmos Conversion Tool UI

The Dolby Atmos Conversion Tool UI provides windows for performing conversion and composition tasks.

3.1 Home window UI

The home window includes buttons for starting a new conversion or composition.

Figure 3: Dolby Atmos Conversion Tool home window



New conversion button

Click this button to start a new conversion. This action opens the default **Conversion** window, where you can import a master file, and then convert the format, frame rate, first frame of action (FFOA), sample rate, or primary language (IMF IAB only) of a master file. Additionally, when changing the frame rate, you can choose to maintain the pitch and length of the source master.

New composition button

Click this button to start a new composition. This action opens the default **Composition** window. In the new composition, you can edit, join, or convert one or more master files.

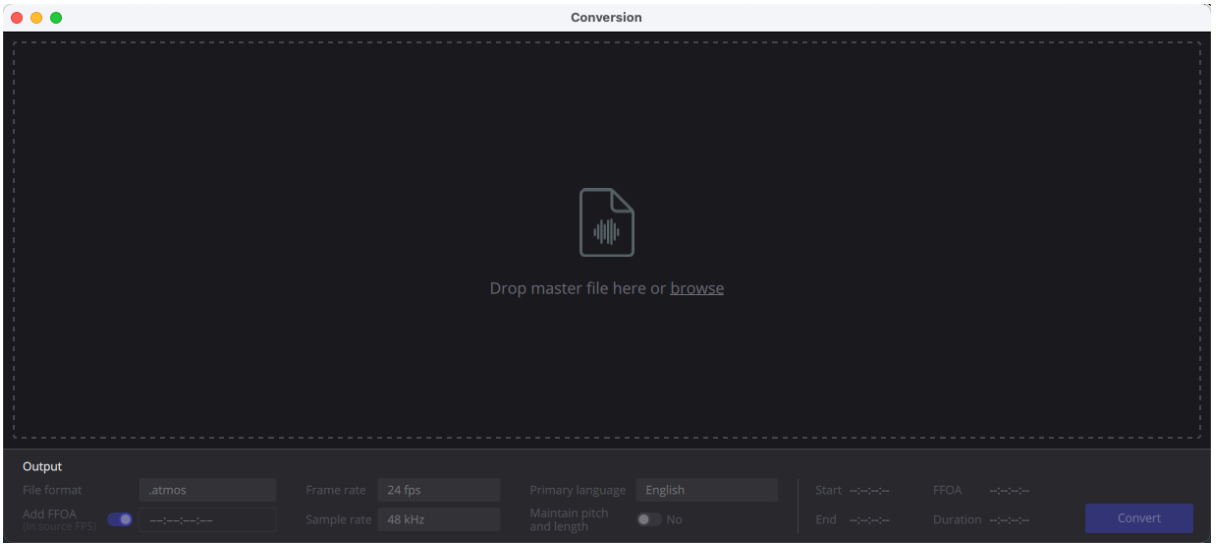
3.2 Conversion window UI

The **Conversion** window provides a work area to import a master and then convert the format, frame rate, FFOA, sample rate, or primary language (IMF IAB only) of the master.

3.2.1 Default Conversion window

The **Conversion** window is empty by default. After you import a master, it provides the controls and displays for performing a conversion.

Figure 4: Default Conversion window, with no master file loaded



Drop master file here or browse area

In the default **Conversion** window, this is the large, empty area that has a dotted outline. You can import a Dolby Atmos master by dropping it into this area or by clicking in this area to browse to the master and open it. Optionally, you can use the **File** > **Import Master File** menu command, which is available when the **Conversion** window is open, to browse to a master and open it.

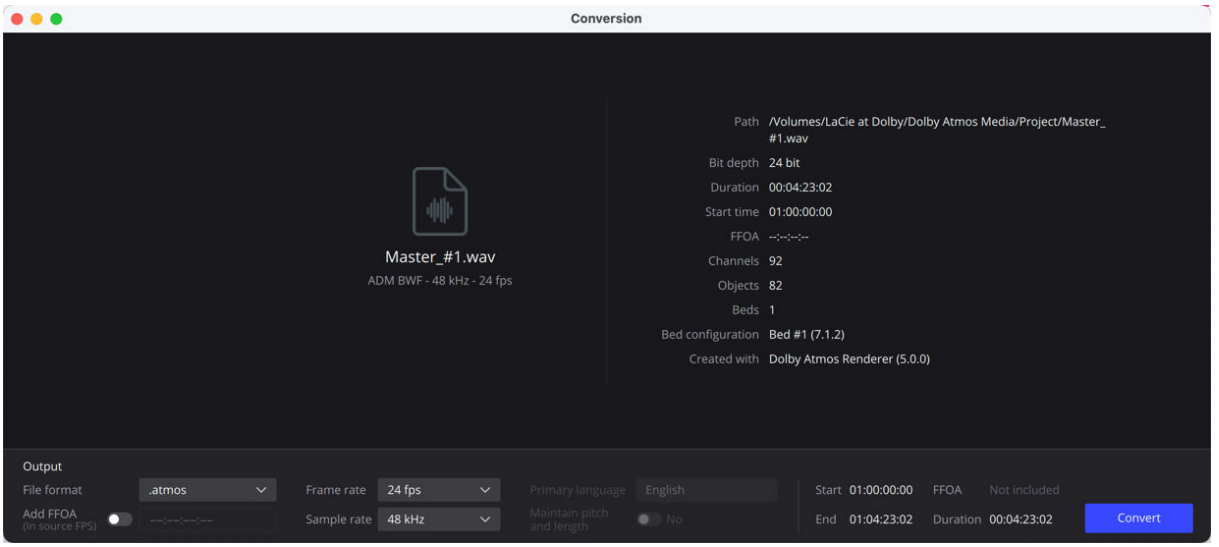
Output section

In the default **Conversion** window, the controls and displays in this section are grayed out and unavailable. The controls and displays become available when a master is imported.

3.2.2 Conversion window with an imported master

After a master has been imported into the **Conversion** window, the window provides controls and displays for converting the master or performing other conversion tasks.

Figure 5: Example of a conversion window with an imported master



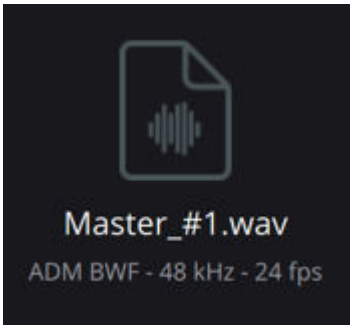
Source master file section

After a master has been imported, the window provides information about the master.

The left side of the window displays the source master name, along with the format, sample rate, and frame rate. The display of the frame rate is dependent on the source master format:

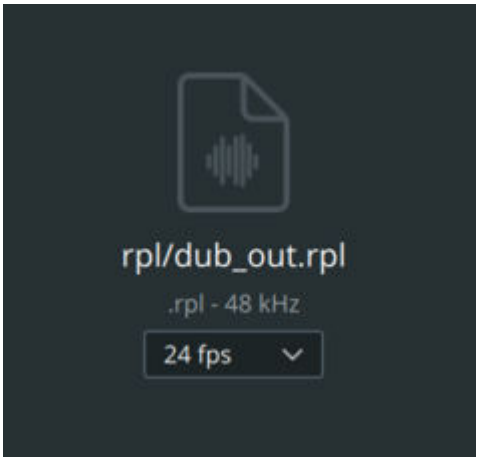
- `.atmos` (or `.damf`), `.wav` (ADM BWF), `.mxf` (Cinema MXF), or `.mxf` (IMF IAB)

  Figure 6: Source master file section for master files other than .rpl

  The frame rate is included in the window. Valid frame rate values are all frame rates supported by the source master. If the input `.atmos` (or `.damf`), `.wav` (ADM BWF), `.mxf` (IMF IAB), or Cinema MXF file has a supported fps value, it will be automatically loaded. If the `.damf` does not have a specified frame rate, the field defaults to 23.976 fps.
- `.rpl`

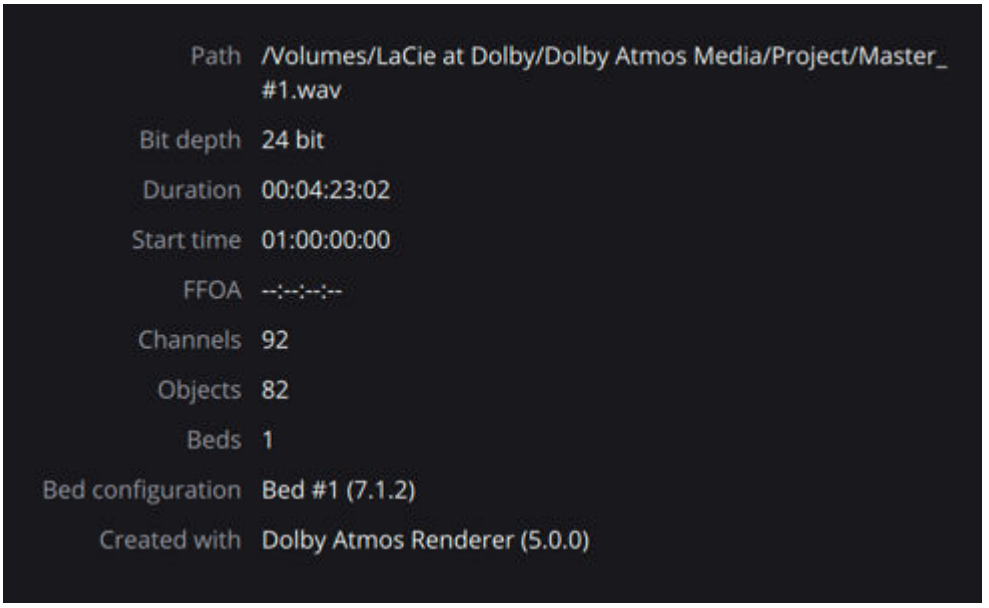
Figure 7: Source master file section for an .rpl master file



After importing an `.rpl` into the **Conversion** window, the source drop-down menu displays under the file name. By default, this menu sets the source frame rate. Changing this value also changes these timecode values in the **Output** section: target frame rate, and output start, end, and duration.

The right side provides detailed information about the source master:

Figure 8: Source master file, example of detailed information



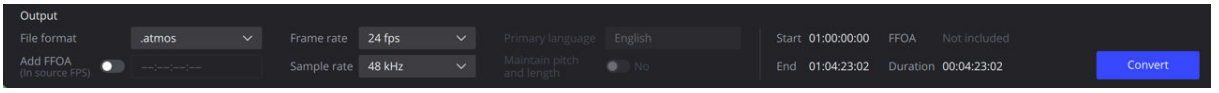
- Path: This is the location of the master.
- Bit depth: This is the bit depth of the master.
- Duration: This is the duration of the master (from start to end), in timecode.
- Start time: This is the start time of the master, in timecode.
- FFOA (First frame of action): This is the FFOA for the master (if included), in timecode, or the not included status. For timecode, this value is rounded, if it was on a non-frame boundary.
- Language: For a source `.mxf` (IMF IAB), this is the primary language for the master (if included).
- Channels: This is the number of mono channels that were defined when the master was originally created or joined together. This includes the total number of mono channels for beds and objects.
- Objects: This is the number of mono objects that were defined in the Dolby Atmos Renderer input configuration before the master was created.
- Beds: This is the number of beds that were defined when the master was originally created or joined together.

- Bed configuration: For each bed that was defined when the master was originally created or joined together, this assigns a number to the bed in sequential order and provides the bed number and respective width.
- Created with: This provides the name and version of the application that was used to create the master (such as Dolby Atmos Renderer, Dolby Atmos Conversion Tool, or a third-party application).

Output section

This section provides settings for the conversion target master, dependent on the source master and selected target format.

Figure 9: Output section example (Conversion window)



File format drop-down menu

Use this drop-down menu to choose whether to convert the input source master to a Dolby Atmos (`.atmos`) master set of files, `.rpl` cinema print master, `.wav` (ADM BWF) file, or `.mxf` (IMF IAB) file.

`.atmos`, ADM BWF `.wav`, and IMF IAB `.mxf` files can be ingested into supported Dolby Atmos encoding tools.

Add FFOA (in source FPS) switch and field

This field displays the FFOA in timecode, in the source frame rate, and lets you keep the value, change it, or not include any FFOA in the target master. Enable the switch to keep or change the source value. Disable the switch to not include an FFOA with the converted master.

When including an FFOA, the value must be the same as or later than the start of the master file, and before the last frame of the file. When an invalid value is entered, the **FFOA** display in the **Output** section turns red and reads **Invalid FFOA**.

If the source `.atmos` or `.wav` file has an FFOA value, it will be automatically loaded. Otherwise, the default is the start time, in timecode, rounded to a valid frame.

Frame rate drop-down menu

Valid values for this drop-down menu are all frame rates supported by the target master, in fps:

- If the input `.atmos` (or `.damf`), `.wav` (ADM BWF), IMF IAB `.mxf`, or Cinema MXF file has a supported frame rate value, it will be automatically loaded.
- If the `.damf` does not have a specified frame rate, the field defaults to 23.976 fps.
- Cinema `.rpl` files use the last used frame rate, as long as it is supported by the Conversion Tool. The target frame rate can then be changed with this drop-down menu (or the source **Frame rate** drop-down menu). Valid values are 24, 25, or 30 fps.

Sample rate drop-down menu

For a conversion or composition, this menu sets the target sample rate. Valid values for this drop-down menu are 48 kHz and 96 kHz, dependent on the target master.

- By default, the sample rate of the source master is used.
- These 96 kHz conversions are supported:
  - 96 kHz ADM BWF `.wav` to 48 kHz ADM BWF `.wav`, IMF IAB `.mxf`, or `.atmos` master
  - 96 kHz ADM BWF `.wav` to 96 kHz ADM BWF `.wav` (for example, for a frame rate conversion)
  - 96 kHz `.atmos` to 96 kHz ADM BWF `.wav`

Primary language drop-down menu

When converting to `.mxf` (IMF IAB) files, use this drop-down menu and field to choose a primary language. The Conversion Tool supports setting the primary language to a common language. For a full list, see *Primary languages supported by the Conversion Tool*.

There are two ways to change the language:

- Click on the **Primary language** drop-down menu, scroll to the desired language, and click (highlight) a language.
- Click in the **Primary language** field, highlight the existing text (if any), type the first letters of the desired language, scroll to the language, and then click (highlight) the language:
  - The field is not character sensitive.
  - You can enter uppercase or lowercase characters to discover a language. Pressing Escape returns the last selected language.

Note:

The tool remembers the last primary language that was selected. For example, when you change the output format from `.mxf` (IMF IAB) to another output format, or close the tool, the primary language that was selected last will be displayed in the **Output** section, in the **Primary language** field.

Maintain pitch and length switch

When doing a conversion or composition and changing the target frame rate, click this option to **On** to maintain pitch and length in the target master. This option is grayed out when outputting to the same frame rate.

Start

This display shows the start of the target master in timecode, based on the target frame rate.

End

This display shows the end of the target master, in timecode, based on the target frame rate.

FFOA

This display shows the FFOA value or status, based on the **Add FFOA** setting and target format. If the **Add FFOA** switch is off, the status displays **Not included**, grayed out.

Duration

This display shows the duration of the target master in timecode, based on the target rate.

Convert button

Press this button to begin the conversion process. This button is grayed out when a source file is loading or a conversion is underway.

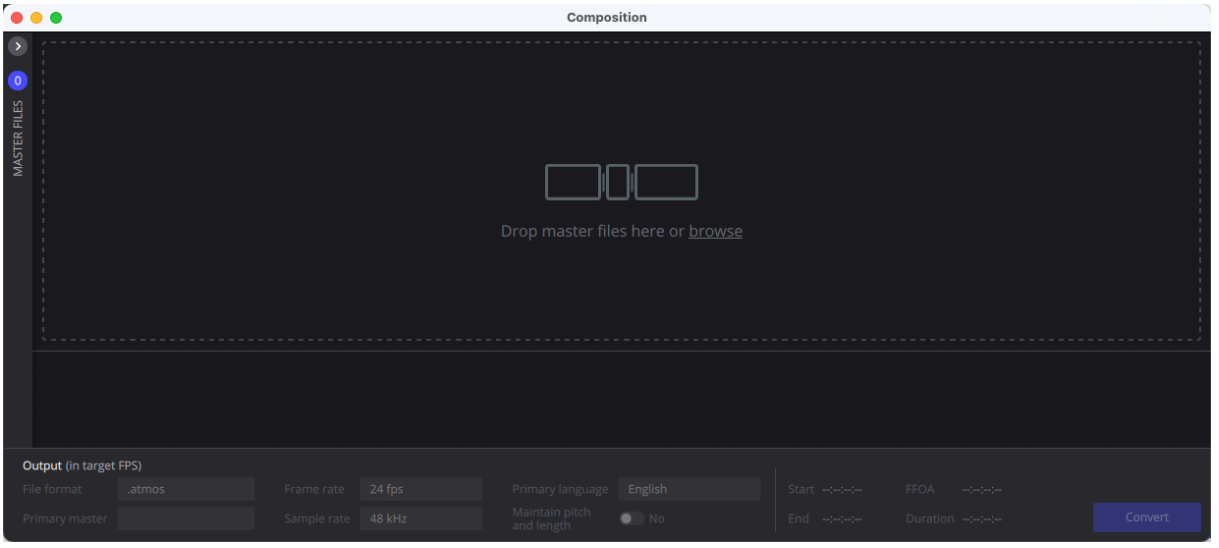
3.3 Composition window UI

The **Composition** window provides the UI for importing one or more masters as a clip, and then performing composition tasks (such as editing a clip, joining clips, or converting a clip to another Dolby Atmos master file format).

3.3.1 Default Composition window

The **Composition** window is empty by default. After you import a master file to the timeline, the window provides the controls and displays for editing and converting that master, and any additional masters that you import to the timeline.

Figure 10: Default Composition window, with MASTER FILES list hidden



MASTER FILES list

In the default **Composition** window, this list is closed and contains no master files.

You can click the **MASTER FILES** list reveal button to open the list, where you can then drop a master file to later add to the timeline. Optionally, you can import a master file into the timeline, which automatically adds it to the list.

Drop master files here or browse area

In the default **Composition** window, this is the large, empty area that has a dotted outline. It represents the composition timeline.

You can import one or more Dolby Atmos master files by dropping the files from a drive into this area or by clicking in the window to browse to the files. Each master is imported into the **MASTER FILES** list and composition timeline (as a clip). Optionally, you can drop a file from the **MASTER FILES** list.

Note: To import an `.xml` (`pmstitch`) file into a composition, you must use the **File** > **Open .xml (pmstitch)** command.

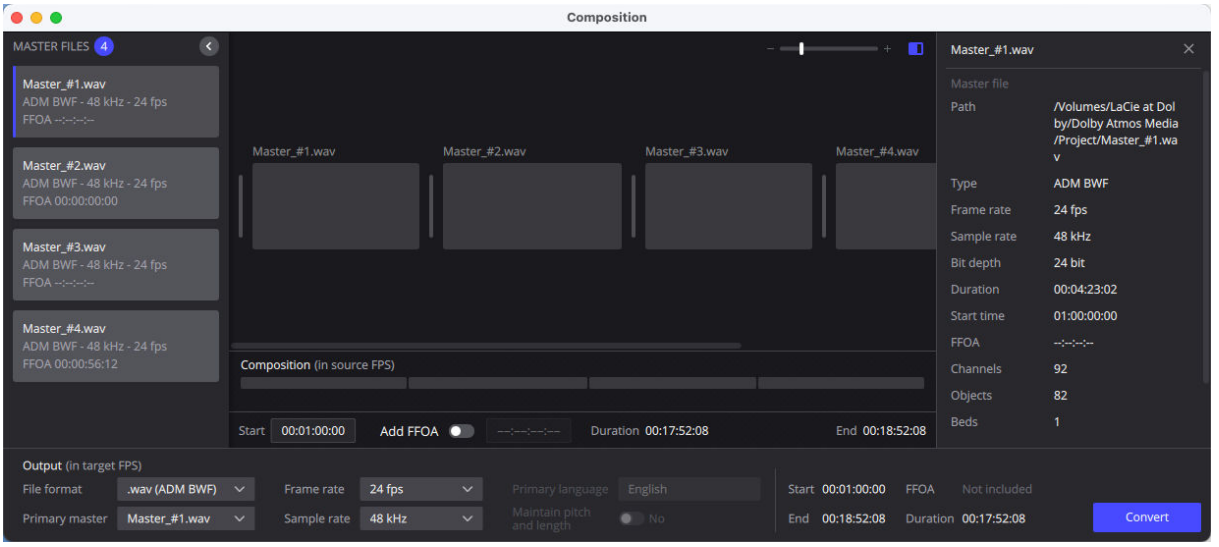
Output section

In the default **Composition** window, the controls and displays in this section are grayed out and unavailable. The controls and displays become available when a clip is imported into the timeline.

3.3.2 Composition window with imported masters

The **Composition** window provides GUI controls for managing master files, displays, and conversion settings for a composition. The window includes the **MASTER FILES** list, composition timeline, advanced metadata section, composition section, and output section.

Figure 11: Composition window example, with multiple master files in the MASTER FILES list and timeline

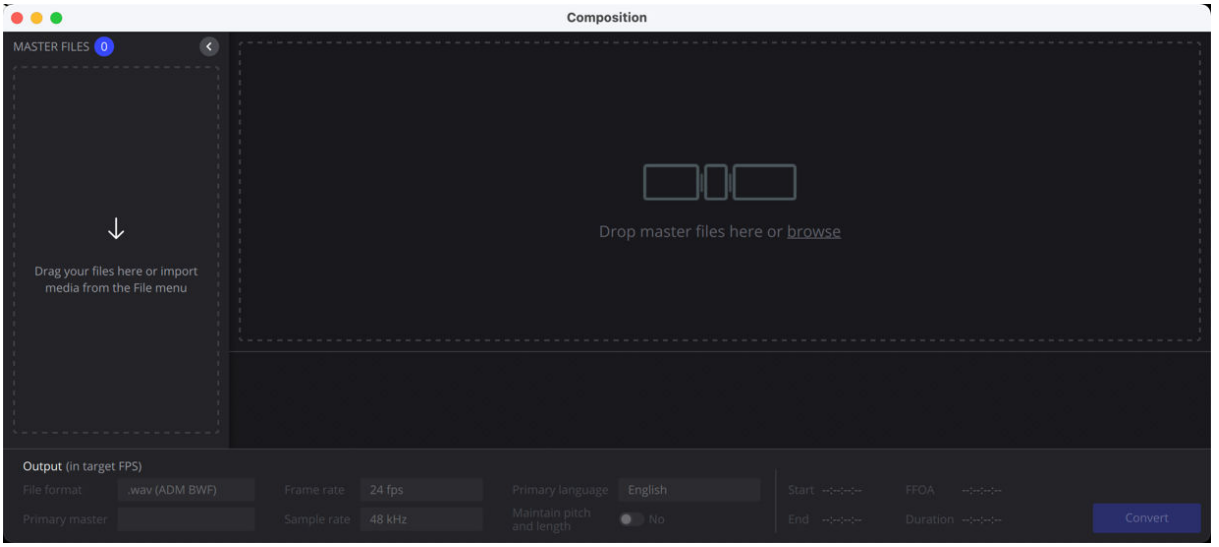


3.3.3 MASTER FILES list

The **MASTER FILES** list provides a bin where you can import master files into the list and composition timeline simultaneously, or the list only (to later add to the timeline).

In the default **Composition** window, the list is hidden. When revealed in a new composition, the list is empty.

Figure 12: Composition window, with MASTER FILES list revealed and no master files



The **MASTER FILES** list provides these items to manage master files for a composition:

MASTER FILES list counter

This blue circle with white text provides the number of master files that have been imported into the list. In the default window, the count is **0**.

Reveal button

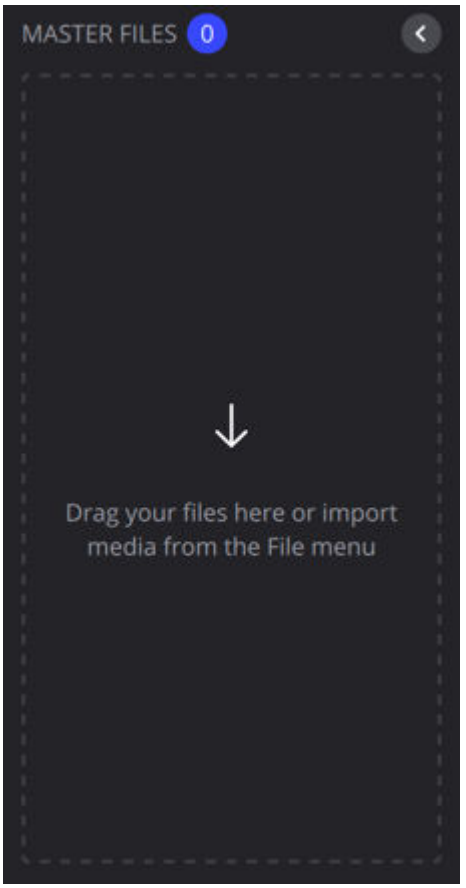
This button reveals and hides the list. In the default window, the list is empty.

List

This is the area in the **MASTER FILES** section that has a dotted outline. You can import a master file into the list by dragging the file into this area or by using the **File** menu. Alternatively, you can import a Dolby Atmos master file into the timeline, which also adds it to the **MASTER FILES** list.

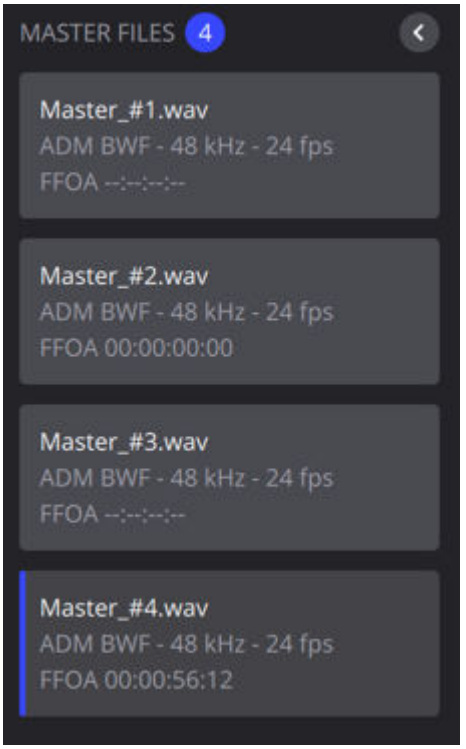
For a new composition, the list is empty.

Figure 13: Empty MASTER list, when revealed



After a file is imported, it displays in the list with the file name, format, frame rate, sample rate, and FFOA. Each file in the list is available for adding to the composition timeline as a clip.

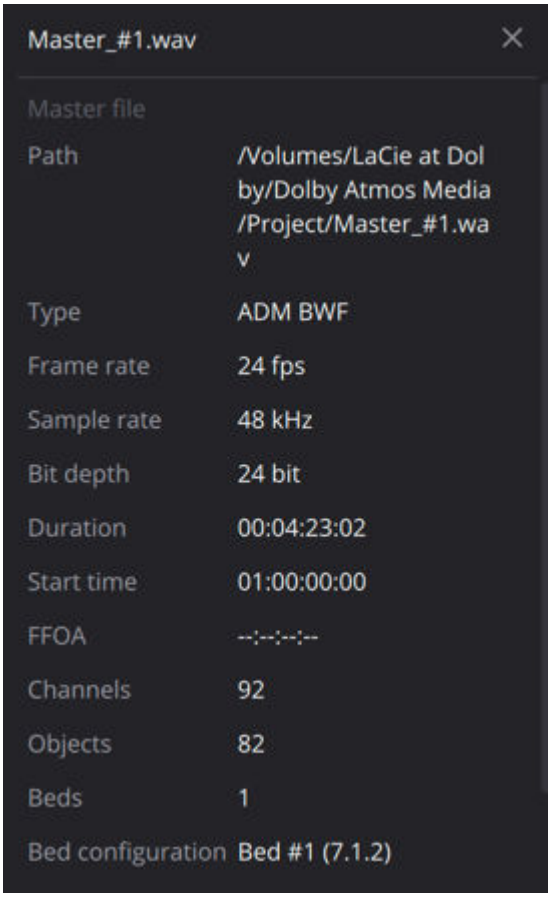
Figure 14: Example of the MASTER FILES list with multiple masters imported



You can click (select) a file in the list to see detailed information about the file, or to remove the file from the list. When you click on a master file in the list, the file displays with an outline to show that is has been selected.

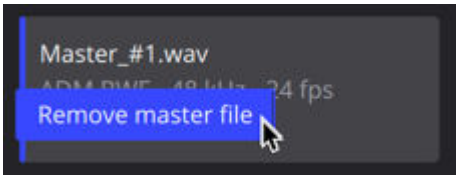
- If the advanced metadata section is open, it displays detailed information about the selected master.

Figure 15: Advanced metadata section, with a master selected



- When a file is selected, you can right-click on the file, and select **Remove master file** to remove the master from the list. Alternatively, you can choose `Edit` > `Remove Master File`.

Figure 16: Removing a master file from the list



3.3.4 Timeline

The timeline provides the area where you import one or more masters as clips for performing composition tasks.

Clips in the timeline

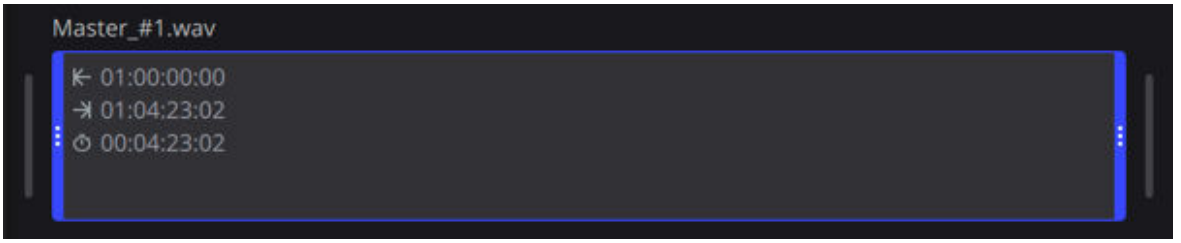
Each clip imported into the timeline includes these elements:

- Clip master name: The name of the master associated with the clip always displays above the clip.

Figure 17: Clip in the timeline, unselected

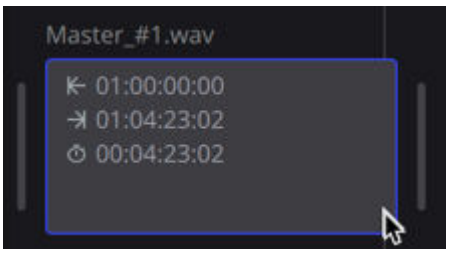
- Selected clip: When you click on a clip, it updates with a blue outline.

  Figure 18: Clip in the timeline, selected

  You can then use menu commands or right-click commands to perform composition tasks (such as **Trim**, **Split**, or **Remove timeline**). If you have edited the clip, you can also use the **Reset to original** right-click command to return the clip to its original state.

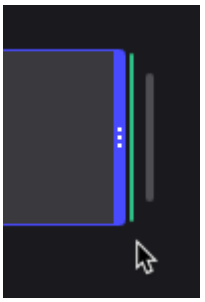
  The outline also includes handles for trimming the clip.

- Clip with subframe boundaries

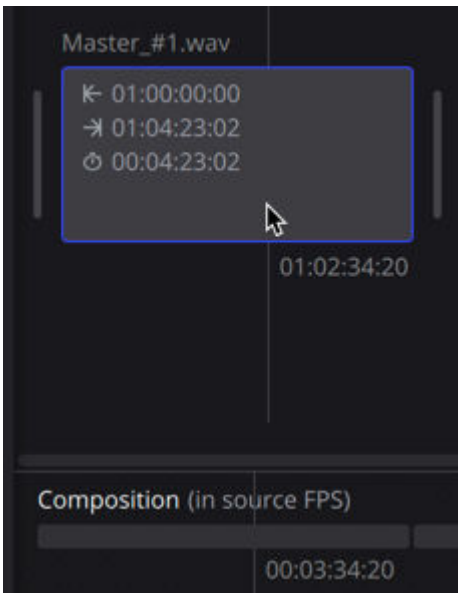
  When a file that starts or ends on subframe boundaries is imported into the **Composition** window, it is extended with silence to the next frame boundary in either direction, so that no underlying content is trimmed. The clip displays a vertical green line to denote the extension.

  Figure 19: Clip with extended silence to the next frame boundary

- Start, end, and duration of a clip (the master associated with the clip), relative to the start of the clip: This metadata displays when you hover over the clip in the timeline (or click on the clip in the **Composition** section).

Figure 20: Timecode locations, relative to a clip (shown in the timeline) and composition (shown in the Composition section)



Concurrently, the **Output** section includes the timecode location relative to the composition in the **Composition** section. The two timecodes and respective timecode lines, along with a cursor, display when you hover over the timeline. You can move the cursor to the left or right to display other timecode locations.

Note: The timecode in the timeline is in the source frame rate; the timecode in the **Output** section is in the target frame rate.

Bars for inserting silence

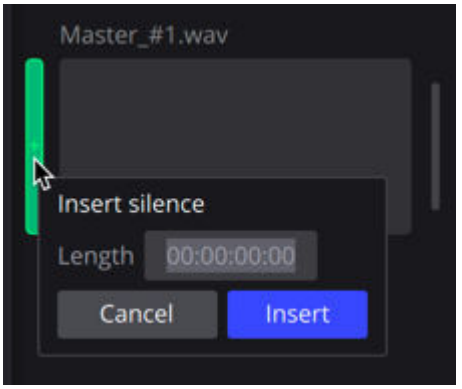
Before and after each clip, there are empty bars for inserting silence to create a silence clip. You can edit silence clips.

Empty silence bar

There is no silence at this location.

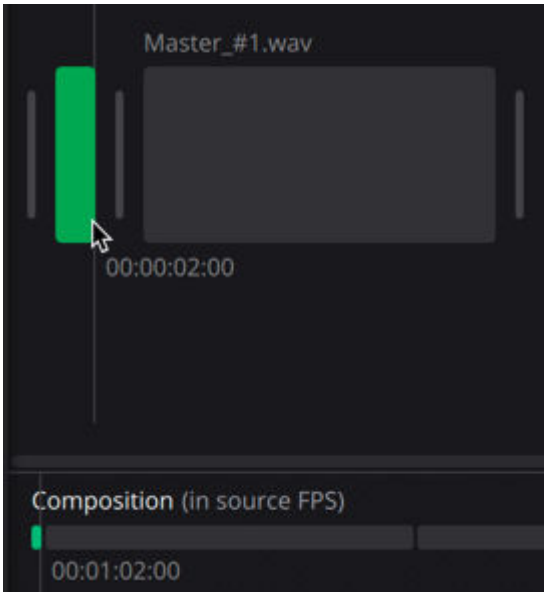
Ready to edit silence bar

When you hover over the empty silence bar, the bar turns green and displays a **+** symbol. You can click on the bar and then set the amount of silence.



Silence clip

A silence clip displays in green. When you hover over a silence clip, it displays the timecode location of the silence, relative to the silence clip (shown in the timeline) and composition (shown in the **Composition** section).



Note: An inserted silence clip also displays in the composition bar.

You can right-click on a silence clip to edit the length or remove the silence from the timeline.

When a silence clip is selected and the advanced metadata section is shown, the advanced metadata section shows the length of the clip.

View controls

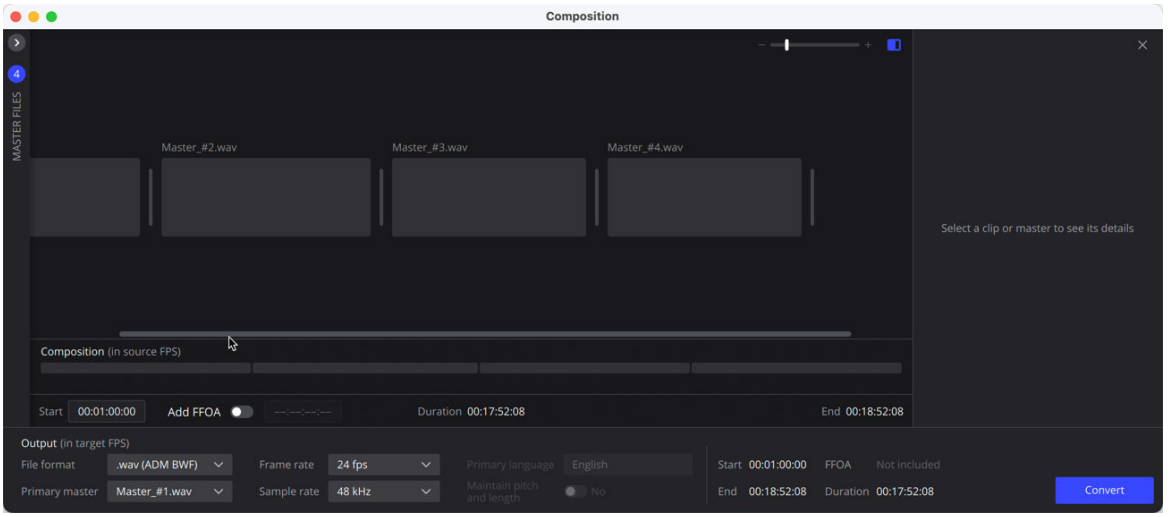
Zoom slider

Use this slider to change how clips display in the timeline.

- To zoom in on the clips in the timeline, click on the zoom slidebar and drag it to the right (toward the **+** symbol).
- To zoom out on the clips in the timeline, click on the zoom slidebar and drag it to left (toward the **-** symbol).
- To zoom so that all the clips fit in the visible timeline, click on the zoom slidebar and drag it all the way to the left.

Clips scroll bar

Use this scroll bar to scroll left or right through the clips in the timeline. This scroll bar displays when you have one or more clips that do not fit in the timeline viewable area (for example, after zooming in on a clip, or after importing multiple masters as clips).



Alternatively, you can click anywhere in the timeline above or below the clips, and scroll to the left or right.

3.3.5 Advanced metadata section

This section of the **Composition** window displays detailed information (advanced metadata) of a master or clip, or the length of a silence clip.

The advanced metadata section provides this information, dependent on the current selection:

- When a master is selected in the **MASTER FILES** list, this section displays detailed master file information.
- When a clip associated with a master is selected in the timeline, or in the **Composition** section, this section displays information for the clip and the associated master file.
- When a silence clip is selected, this section displays the length of the silence.

Show/hide advanced metadata icon

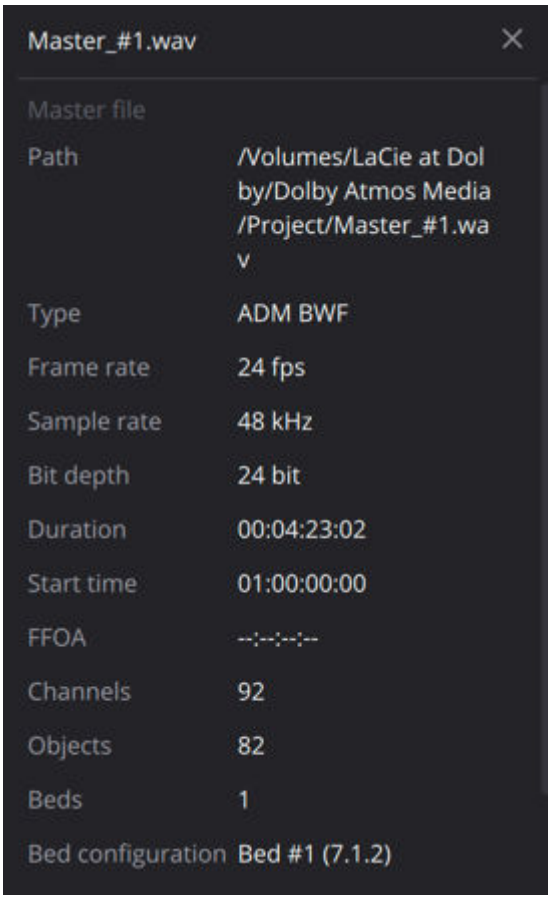
Click on the advanced metadata icon to show (or hide) the advanced metadata section, or click the **X** icon to close the section. When the metadata section is open, the icon is blue.

When no master or clip is selected, the section contains no metadata, and provides a tip to select a clip or master to see its details. When a clip or master is selected, the section displays the relevant metadata.

Master file information

When a master is selected in the **MASTER FILES** list, or a clip is selected in the timeline or **Composition** section, the display provides the master file name and this master file information:

Figure 21: Advanced metadata section, with a master selected in the MASTER FILES list

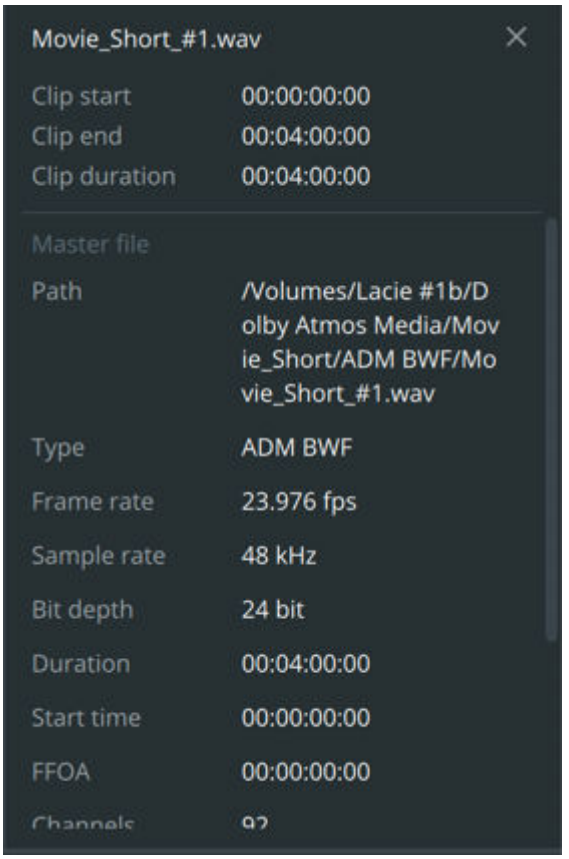


- Path: This is the location of the master.
- Type: This is the format of the Dolby Atmos master.
- Frame rate: This is the frame rate of the master, in fps.
- Sample rate: This is the sample rate of the master, in kHz.
- Bit depth: This is the bit depth of the master.
- Duration: This is the duration of the master (from start to end), in timecode.
- Start time: This is the start time of the master, in timecode.
- FFOA. This is the FFOA for the master (if included), in timecode, or the not included status. For timecode, this value is rounded, if it was on a non-frame boundary.
- Language: For a source `.mxf` (Interoperable Master Format (IMF) immersive audio bitstream (IAB)) file, this is the primary language for the master (if included).
- Channels: This is the number of mono channels that were defined when the master was originally created or joined together. This includes the total number of mono channels for beds and objects.
- Objects: This is the number of mono objects that were defined in the Dolby Atmos Renderer input configuration before the master was created.
- Beds: This is the number of beds that were defined when the master was originally created or joined together.
- Bed configuration: For each bed that was defined when the master was originally created or joined together, this assigns a number to the bed in sequential order, and provides the bed number and respective width.
- Created with: This provides the name and version of the application that was used to create the master (such as Dolby Atmos Renderer, Dolby Atmos Conversion Tool, or a third-party application).

Clip only information

When a clip associated with a master is selected in the timeline, or in the **Composition** section, the display provides clip information. When a clip is trimmed, the timecode updates.

Figure 22: Advanced metadata section, with a clip selected in the composition timeline

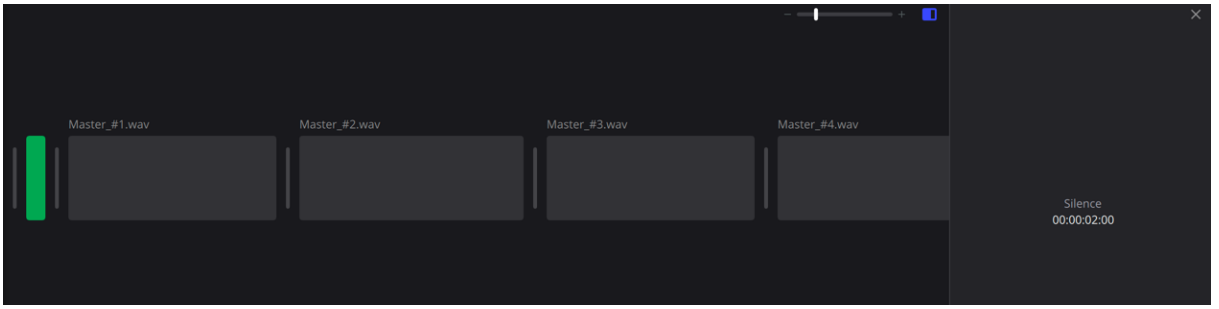


- Clip start: This is the start time of the clip, in timecode.
- Clip end: This is the end time of the clip, in timecode.
- Clip duration: This is the length of the clip, in timecode.

Silence clip length

When a silence clip is selected in the timeline, the display provides the length of the silence, in timecode. When a length of the silence clip is changed, the timecode updates.

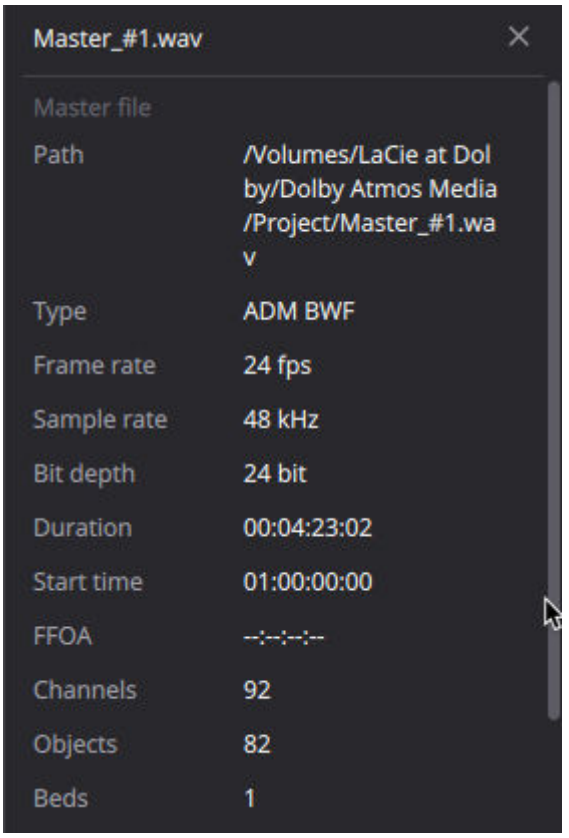
Figure 23: Advanced metadata section, with a silence clip selected



Advanced metadata scroll bar

This scroll bar displays when any advanced metadata is not visible in the section (for example, when a master has numerous beds, or you have a clip selected). Use this scroll bar to scroll down (or up) to see information.

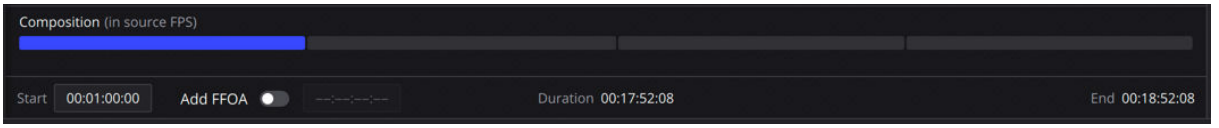
Figure 24: Scroll bar in the advanced metadata section



3.3.6 Composition section

The **Composition** section provides controls for setting the composition start time and FFOA. Additionally, the section provides a bar for selecting a clip and displaying clip metadata.

Figure 25: Composition section in the Composition window



All timecode values in the **Composition** section are in the source frame rate, in fps.

Composition bar and clips

The **Composition** bar lets you view the entire composition regardless of the zoom level in the timeline. The bar provides a representation of each clip.

Figure 26: Example of composition bar with four clips

Click a clip in the bar to select the clip and bring the clip into view in the timeline. If the advanced metadata section is open, it will display metadata for the clip and the associated master.

Additionally, you can click (or hover over) a clip to display the clip start, end, and duration timecode, relative to the composition.

Start field

This field displays the start time that will be used for the composition when it is converted into a new master. The start time is in timecode, in the source frame rate. You can keep the value as is, or update it. By default, the value is at zero.

When this value is changed, the **Duration** and **End** displays in the **Composition** section update accordingly. Additionally, related displays in the **Output** sections update.

If the start value results in an invalid FFOA (as entered in the **Add FFOA** field), the **FFOA** in the **Output** reads **FFOA invalid**, the start, end, and duration times in the **Output** section are not calculated, and the composition cannot be converted. If the start value results in an invalid start, end, or duration value (for example, when crossing the midnight boundary), these values display in the **Output** section in red.

Note: The start, end, FFOA, and duration may be different than what is shown in the **Composition** section if you are converting to a different frame rate.

Add FFOA switch and field

This field displays the FFOA that will be used for the composition when it is converted into a new master. The FFOA is in timecode, in the source frame rate. You can keep the value, change it, or not include an FFOA in the target master. By default, the value is at zero.

Enable the switch to keep or change the source value. Disable the switch to not include an FFOA with the converted master.

When including an FFOA, the value must be the same as or later than the composition start time, and before the last frame of the file. When an invalid value is entered, the **FFOA** display in the **Output** section turns red and reads **Invalid FFOA**.

End

This display shows the end of the target master, in timecode, in the source frame rate, and is based on the source start time.

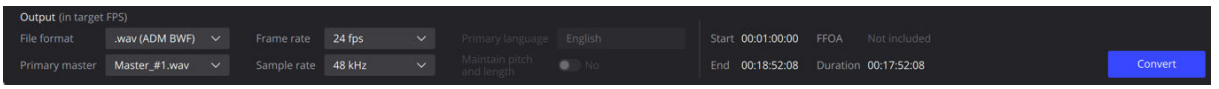
Duration

This display shows the duration of the target master in timecode, in the source frame rate, and is based on the source start time.

3.3.7 Output section

The **Composition** section provides controls for setting the format, frame rate, primary master, and primary language (IMF IAB only) of the target master. Additionally, the section displays the start, end, FFOA, and duration of the target master, in timecode, in the target fps.

Figure 27: Output section (Composition window)



Output drop-down menus

File format

Use this menu to choose whether to convert the composition to a Dolby Atmos (`.atmos`) master set of files, `.rpl` cinema print master, `.wav` (ADM BWF) file, or `.mxf` (IMF IAB) file.

Primary master

In this menu, choose which master associated with a clip should be considered the primary master for the converted master.

The primary master specifies the program-level metadata that is used for the target master. This includes trim and downmix metadata (as written by the Dolby Atmos Renderer) and additional Dolby Atmos and Dolby Digital Plus parameters. The Dolby Atmos and Dolby Digital Plus parameters

typically have default values, unless they have been manually edited within the `.dbmd` file within an `.atmos` or `.rpl` package.

Program-level metadata specified by the primary master is applied for all supported target master formats: `.atmos`, `.mxf` (IMF IAB), `.rpl`, and `.wav` (ADM BWF).

Frame rate

Valid values for this menu are all frame rates supported by the target master, in fps.

Sample rate

This menu sets the target sample rate. Valid values for this drop-down menu are 48 kHz and 96 kHz, dependent on the target master.

- By default, the sample rate of the source master is used.
- These 96 kHz conversions are supported:
  - 96 kHz ADM BWF `.wav` to 48 kHz ADM BWF `.wav`, IMF IAB `.mxf`, or `.atmos` master
  - 96 kHz ADM BWF `.wav` to 96 kHz ADM BWF `.wav` (for example, for a frame rate conversion)
  - 96 kHz `.atmos` to 96 kHz ADM BWF `.wav`

Primary language

When converting to `.mxf` (IMF IAB), use this drop-down menu and field to choose a primary language. The Conversion Tool supports setting the primary language to a common language. For a full list, see *Primary languages supported by the Conversion Tool*.

There are two ways to change the language:

- Click on the **Primary language** drop-down menu, scroll to the desired language, and click (highlight) a language.
- Click in the **Primary language** field, highlight the existing text (if any), type the first letters of the desired language, scroll to the language, and then click (highlight) the language:
  - The field is not character sensitive.
  - You can enter uppercase or lowercase characters to discover a language. Pressing Escape returns the last selected language.

Note: The tool remembers the last primary language that was selected. For example, when you change the output format from `.mxf` (IMF IAB) to another output format, or close the tool, the primary language that was selected last will be displayed in the **Output** section, in the **Primary language** field.

Output displays

This section provides the start, end, FFOA, and duration of the converted target master, in timecode, in the target frame rate.

Note: The start, end, FFOA, and duration of the converted files may be different than what is shown in the **Composition** section if you are converting to a different frame rate. You can import your converted file after the conversion to verify these values in the advanced metadata window in the **Composition** window, or information section of the **Conversion** window.

Start

This display shows the start of the target master, as set in the **Composition** section, and based on the target frame rate.

End

This display shows the end of the target master, relative to the start time set in the **Composition** section, and based on the target frame rate.

FFOA

This display shows the first frame of action value or status, in the target frame rate.

It is based on the **Add FFOA** switch and setting in the **Composition** section. If the **Add FFOA** switch is off, the status displays **Not included**, grayed out. If the switch is on, and the set value is invalid, this display reads **Invalid FFOA**, in red.

Duration
This display shows the duration of the target master, relative to the start time set in the **Composition** section, and based on the target frame rate.

Convert button

Press this button to begin the conversion process.

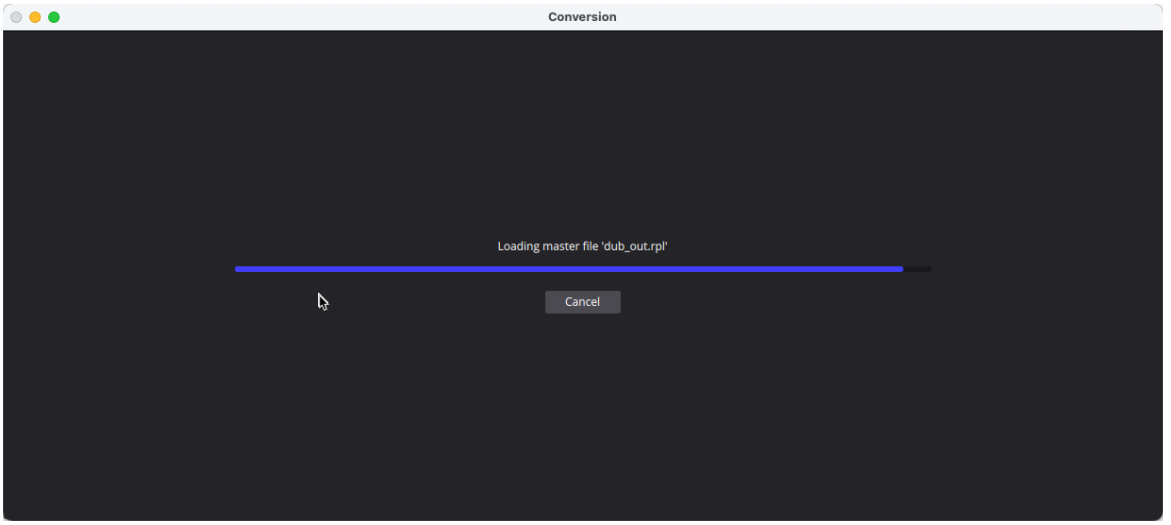
3.4 Progress windows

When importing a master file, or after pressing the **Convert** button to perform a conversion, a progress window displays.

Progress window when importing a master file to the Conversion window or Composition window timeline

Loading message and progress bar
This message and display bar, located in the middle of the window, show the progress of the import.

Figure 28: Importing a master example



Cancel button (Conversion window and composition timeline)
Click this button to stop the import.

Progress bar for importing a master file into the master files list

File being loaded message and progress bar
The file name being loaded and display bar, located at the top of the **MASTER FILES** list, show the progress of the import.

X button
Click this button to stop the import.

Progress window for a conversion

Converting message and progress bar
This message and display bar, located in the middle of the window, show the progress of the conversion.

Cancel button

Click this button to stop the conversion.

File exported successfully message and button

When the conversion completes, the **File exported successfully** message displays. The available button and result of pressing the button is dependent on the current workflow window:

- If performing a conversion in the **Conversion** window, click **OK**. This returns you to the **Conversion** window and the most recent master and conversion settings.
- If performing a conversion in the **Composition** window, click **Return to timeline**. This returns you to the **Composition** window, and the most recent clip and composition settings (as well as the most recent **MASTER FILES** list).

4

Dolby Atmos Conversion Tool application menus

The Conversion Tool provides a menu and submenu structure for access to commands for common conversion and composition workflows.

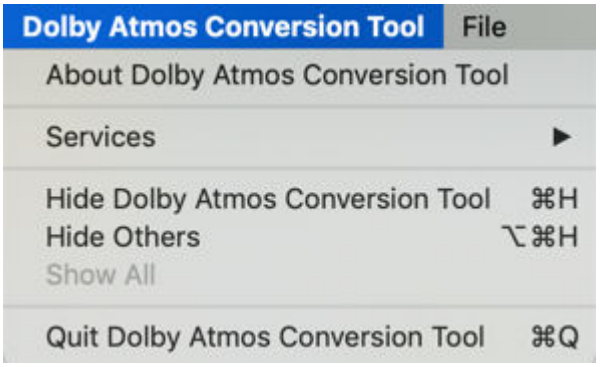
4.1 Dolby Atmos Conversion Tool menu (Mac only)

On Mac, the Conversion Tool provides standard application menus for checking the version number and performing basic window and application management. This menu is available in the home window, **Conversion** window, and **Composition** window.

Dolby Atmos Conversion Tools menu

Most of the menus are common to other application name menus for Mac.

Figure 29: Dolby Atmos Conversion Tool menu



About <application name>

This menu provides this information:

- Application name: Dolby Atmos Conversion Tool
- Software version
- Dolby copyright and trademark information

Hide <application name>

Use this command to hide the current application.

Keyboard shortcut: Command + H (Mac) or Control + H (Windows).

Hide others and show all

Use these commands to show or hide all applications, excluding the current application.

Keyboard shortcut: Command + Option + H (Mac) or Control + Alt + H (Windows).

Quit <application name>

Use this command to close the current Conversion Tool window and quit the application.

Keyboard shortcut: Command + Q (Mac) or Control + Q (Windows).

4.2 Home window menus

The home window provides the menus for creating a new conversion or composition.

4.2.1 File menus (home window)

The **File** menu in the home window provides the menus for creating a new conversion or composition.

Figure 30: Home window file menu

New conversion

The **New Conversion** menu command opens the default **Conversion** window, where you can import a master for converting. Optionally, you can click the **New Conversion** button in the home window.

Keyboard shortcut: Command + N (Mac) or Control + N (Windows).

New composition

The **New Composition** menu command opens the default **Composition** window, where you can import one or more masters for editing or joining, or one master for converting. Optionally, you can click the **New Composition** button in the main window.

Keyboard shortcut: Command + Shift + N (Mac) or Control + Shift + N (Windows).

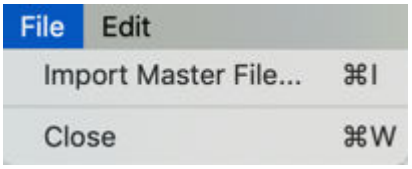
Note: To import an `.xml` (`pmstitch`) file into a composition, you must use the **File** > **Open .xml (pmstitch)** command.

4.3 Conversion window menus

When working on a conversion in the **Conversion** window, the Conversion Tool provides a menu and submenu structure for access to commands for importing a master and performing other common conversion tasks.

4.3.1 File menus (Conversion window)

The **Conversion** window provides menu commands to import a Dolby Atmos master to perform a conversion, or close the **Conversion** window and return to the home window.



Import master file

This menu command lets you browse to a supported master file and open it in the **Conversion** window, where you can perform a conversion. Optionally, you can drop a master in the **Conversion** window timeline, or click in the work area to browse to a master.

Keyboard shortcut: Command + I (Mac) or Control + I (Windows).

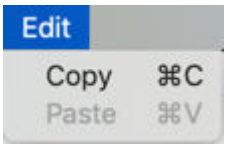
Close (Conversion window)

This menu command immediately closes the **Conversion** window and returns the application to the home window.

Keyboard shortcut: Command + W (Mac) or Control + W (Windows).

4.3.2 Edit menus (Conversion window)

This menu provides commands for copying and pasting timecode to or from the FFOA field of a master loaded in the **Conversion** window.



Copy

Use this command to copy the FFOA of a master so that you can use the value with another conversion or for your records.

To copy the FFOA from a master, the master must be loaded in the tool and have a defined FFOA, the **Add FFOA** switch is enabled, and you have highlighted the value.

Alternatively, press Command + C (Mac) or Control + C (Windows).

Paste

Use this command to paste a new FFOA value into a master before running a conversion.

To paste the FFOA into a master, the master must be loaded in the tool, the **Add FFOA** switch is enabled, and you have highlighted the existing value. Additionally, the FFOA must be the same as or later than the offset in the file, and before the last frame of the file.

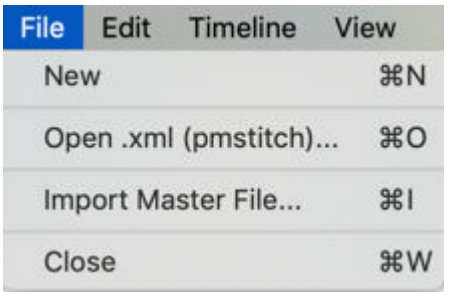
Alternatively, press Command + V (Mac) or Control + V (Windows).

4.4 Composition window menus

When working on a composition in the **Composition** window, the Conversion Tool provides a menu and submenu structure for access to commands for importing one or more masters, and performing other common composition tasks.

4.4.1 File menus (Composition window)

The **Composition** window provides menu commands to import one or more Dolby Atmos master files, or close the **Composition** window and return to the home window.



New (Composition window)

This menu command closes the current composition and returns you the default **Composition** window, with an empty **MASTER FILES** list and timeline.

Keyboard shortcut: Command + N (Mac) or Control + N (Windows).

When you choose this command and there are one or more clips in the timeline, you will be prompted with a message that all information on the timeline will be lost, and asking if you are sure you want to proceed. Click **Proceed** to close the window. Click **Cancel** to remain in the **Composition** window.

Open .xml (pmstitch)

This menu command imports an `.xml` (`pmstitch`) file into the **MASTER FILES** list and the timeline. Each master and silence clip in the file is added to the timeline as an individual clip. Existing masters in the **Composition** window are removed.

Keyboard shortcut: Command + O (Mac) or Control + O (Windows).

Import Master File (Composition window)

This menu command lets you browse to a supported master file and add to the **MASTER FILES** list in the **Composition** window, where it can subsequently be added to the composition timeline as a clip.

Keyboard shortcut: Command + I (Mac) or Control + I (Windows).

Close (Composition window)

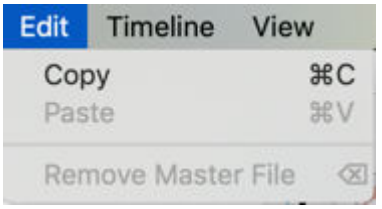
This menu command closes the **Composition** window and returns the application to the home window.

Keyboard shortcut: Command + W (Mac) or Control + W (Windows).

When you choose this command and there are one or more clips on the timeline, you will be prompted with a message that all information on the timeline will be lost and asking if you are sure you want to proceed. Click **Proceed** to close the window. Click **Cancel** to remain in the **Composition** window.

4.4.2 Edit menus (Composition window)

This menu provides commands for copying and pasting timecode to or from the FFOA field or start time of a composition, plus a command to remove a master or clip.



Copy

Use this command to copy the FFOA or start time of a composition so that you can use the value with another entry or for your records.

To copy the FFOA or start time, there must be at least one master clip in the timeline and you have highlighted the timecode value you want to copy. Additionally, for the FFOA, the primary master in the timeline must have a defined FFOA, and the **Add FFOA** switch is enabled.

Alternatively, press Command + C (Mac) or Control + C (Windows).

Paste

Use this command to paste a new FFOA or start value into a composition before running a composition conversion.

To paste the FFOA or start time into a composition, there must be at least one master clip in the timeline, and you must have highlighted the target timecode. Additionally, for an FFOA, the **Add FFOA** switch is enabled, and the FFOA must be the same as or later than the offset in the composition.

The FFOA must be the same as or later than the offset in the `.atmos` or `.wav` file, and before the last frame of the file.

Alternatively, press Command + V (Mac) or Control + V (Windows).

Remove, remove master file, or remove from timeline

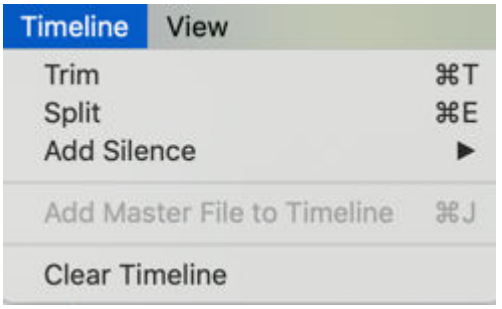
Use this command to remove the currently selected master in the **MASTER FILES** list or clip in the timeline, respectively. When no master or clip is selected, this command is grayed out and displays as **Remove**.

When attempting to remove a master from the list that has any associated clips in the timeline, you will be prompted with a message that removing the master will also remove the clips. Click **Remove master** to remove the master, or click **Cancel** to return to the composition with no changes.

Alternatively, press Delete (Mac US QWERTY) or Backspace (Mac International QWERTY, or Windows).

4.4.3 Timeline menu

The timeline in the **Composition** window provides controls for editing a clip.



Trim

Use this command to trim the start and end of a selected clip in the timeline. The command opens the **Trim** window, where you can set the start and end times.

Alternatively, press Command + T (Mac) or Control + T (Windows).

The **Trim** command is available when a clip is selected.

Split

Use this command to split a selected clip into two clips. The command opens the **Split** window, where you can set the location of the split.

Alternatively, press Command + E (Mac) or Control + E (Windows).

The **Split** command is available when a clip is selected.

Add Silence

This menu provides access to the commands for inserting silence before or after a selected clip in the timeline:

- **Before Selected Clip**: This command opens the **Insert silence** window, where you can set the amount of silence to add before the selected clip.
- **After Selected Clip**: This command opens the **Insert silence** window, where you can set the amount of silence to add after the selected clip.

The **Add Silence** command is available when a clip is selected.

Add Master File to Timeline

Use this command to add a master selected in the **MASTER FILES** list to the timeline as a clip, so that you can work on it. If the timeline has one or more clips in it, this operation places the master after the last master in the timeline.

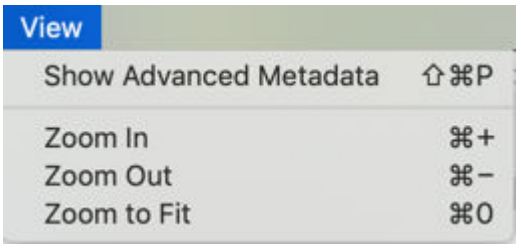
Alternatively, press Command + J (Mac) or Control + J (Windows).

Clear Timeline

Use this command to clear all of the clips in the composition timeline. This command opens the **Clear Timeline** window, where you can choose to proceed with the operation, or cancel it.

4.4.4 View menu

The **View** menu provides commands for setting how clips and clip metadata display in the composition timeline and **Composition (in source FPS)** section. Additionally, you can display detailed (advanced) metadata for a clip or master, or the length of a silence clip.



Show Advanced Metadata

Use this command to display the advanced metadata of a master or clip, or the length of a silence clip. This command opens the advanced metadata section (to the right of the composition timeline).

Alternatively, press Command + Shift + P (Mac) or Control + Shift + P (Windows).

Zoom In

This command makes the size of the clips in the timeline larger, by zooming in on the clips.

Alternatively, you can press Command + the plus symbol (Mac) or Control + the plus symbol (Windows).

Zoom Out

This command makes the size of the clips in the timeline smaller, by zooming out on the clips.

Alternatively, you can press Command + the minus symbol (Mac) or Control + the minus symbol (Windows).

Zoom to Fit

This command zooms in on the clips in the timeline, so that all of the clips display in the visible timeline.

Alternatively, you can press Command + 0 (Mac) or Control + 0 (Windows).

4.5 Keyboard shortcuts

The Dolby Atmos Conversion Tool UI includes keyboard shortcuts to choose various Conversion Tool menus, as well as shortcuts to navigate through pages for preferences.

Common menu shortcuts

The Dolby Atmos Conversion Tool menu is available in the home window, **Conversion** window, and **Composition** window.

Table 1: Dolby Atmos Conversion Tool menu shortcuts

Menu	Mac keyboard shortcut	Windows keyboard shortcut
Hide <application>	Command + H	Control + H
Hide others	Command + Option + H	Control + Alt + H
Quit <application>	Command + Q	Control + Q

Home window shortcuts

Table 2: File menu shortcuts in the home window

Menu	Mac keyboard shortcut	Windows keyboard shortcut
New conversion	Command + N	Control + N
New composition	Command + Option + N	Control + Alt + N

Conversion window shortcuts

Table 3: File menu shortcuts in the Conversion window

Menu	Mac keyboard shortcut	Windows keyboard shortcut
Import master file	Command + I	Control + I
Close	Command + W	Control + W

Table 4: Edit menu shortcuts in the Conversion window

Menu	Mac keyboard shortcut	Windows keyboard shortcut
Copy	Command + C	Control + C
Paste	Command + V	Control + V

Composition window menu shortcuts

Table 5: File menu shortcuts in the Composition window

Menu	Mac keyboard shortcut	Windows keyboard shortcut
New	Command + N	Control + N
Open .xml (pmstitch)	Command + O	Control + O
Import master file	Command + I	Control + I
Close	Command + W	Control + W

Table 6: Edit menu shortcuts in the Composition window

Menu	Mac keyboard shortcut	Windows keyboard shortcut
Copy	Command + C	Control + C
Paste	Command + V	Control + V
Remove	Not applicable	Not applicable
Remove master file (when a master is selected in the **MASTER FILES** list)	Delete (US QWERTY), Backspace (International QWERTY)	Delete
Remove from timeline (when a clip is selected in the timeline)	Delete (US QWERTY), Backspace (International QWERTY)	Delete

Table 7: Timeline menu shortcuts in the Composition window

Menu	Mac keyboard shortcut	Windows keyboard shortcut
Trim	Command + T	Control + T
Split	Command + E	Control + E
Add master file to yimeline	Command + J	Control + J

Table 8: View menu shortcuts in the Composition window

Menu	Mac keyboard shortcut	Windows keyboard shortcut
Show advanced metadata	Command + Shift + P	Control + Shift + P
Zoom in	Command + plus sign	Control + plus sign
Zoom out	Command + minus sign	Control + minus sign
Zoom to fit	Command + 0	Control + 0

5

Dolby Atmos Conversion Tool overview of workflows and considerations

The Dolby Atmos Conversion Tool lets you convert one Dolby Atmos master file format to another, edit or join masters as a composition, or perform other tool operations (like applying frame rate conversion to a Dolby Atmos master file).

5.1 New conversion and new composition workflows

The Conversion Tool application supports two primary types of workflows (or modes) when using the Conversion Tool application on supported Mac and Windows systems.

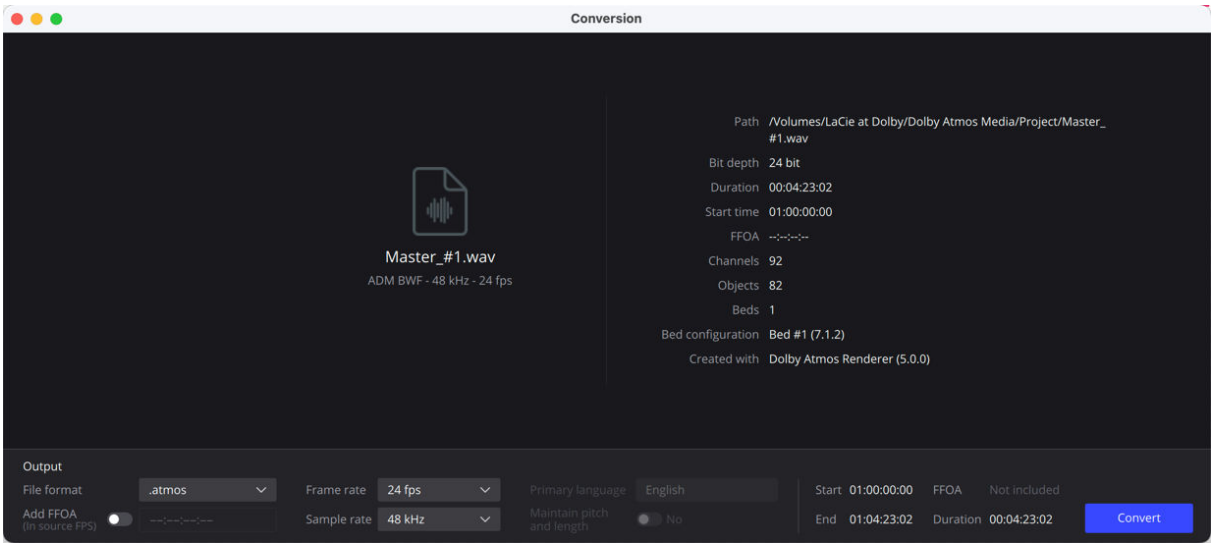
Note: The Conversion Tool command-line application and options let you perform tool operations from a dedicated command-line program on Linux, Mac, and Windows operating systems.

New conversion

Create a new conversion to convert the format, frame rate, sample rate, FFOA, or primary language (IMF IAB only) of a master.

You perform conversion work in the **Conversion** window.

Figure 31: Example of Conversion window, with an imported master file



You can perform changes to the format, frame rate, sample rate, FFOA, or primary language (IMF IAB only) simultaneously or separately.

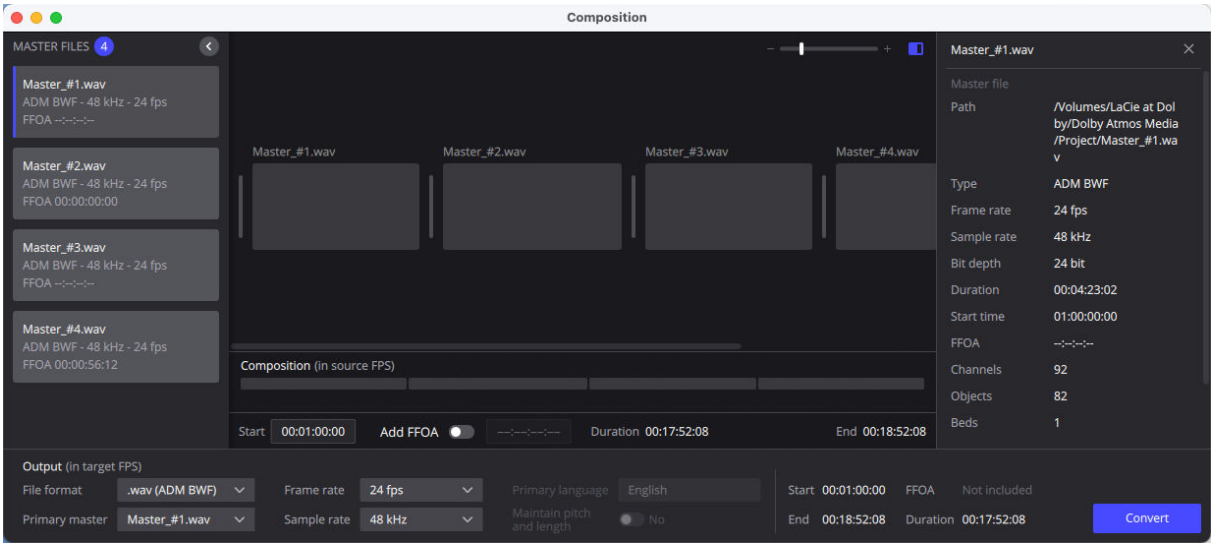
The length of a master file opened in the **Conversion** window is not altered if the master file starts and ends on non-frame boundaries.

New composition

Create a new composition to edit one or more masters (for example, to trim a master or insert silence), join multiple masters (with or without making edits), or convert the format, frame rate, sample rate, FFOA, or primary language (IMF IAB only) of a master.

You perform composition work in the **Composition** window.

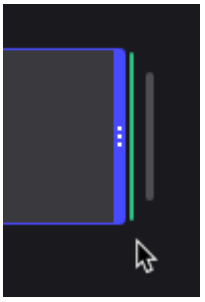
Figure 32: Example of a composition, with multiple master files in the master files list and composition timeline



You can perform changes to the format, start time, frame rate, sample rate, FFOA, or primary language (IMF IAB only) simultaneously or separately.

When a file that starts or ends on subframe boundaries is imported into the **Composition** window, it is extended with silence to the next frame boundary in either direction, so that no underlying content is trimmed. The clip displays a horizontal green line to denote the extension.

Figure 33: Clip with extended silence to the next frame boundary



Single master conversions

You can convert a single master from one Dolby Atmos format to another (or do other tool operations) using either a new conversion or new composition.

Perform a new conversion (in the **Conversion** window):

- When you do not need to change the length of the master, or change the start time
- When you want to preserve source start and end timecodes that are on non-frame boundaries

Perform a new composition (in the **Composition** window):

- When you want to change the length of the master (for example, by trimming or inserting silence at the start of the master)
- When you want to change the start time of the master
- When it is acceptable for the source start and end times to extend to the nearest frame boundaries, if on a subframe

Related information

Performing conversions in the Conversion window on page 57

Editing, joining, or converting Dolby Atmos clips in a composition on page 63

5.2 Supported Dolby Atmos master file formats

The Conversion Tool supports working with various Dolby Atmos file formats as input source files and output target files. This includes performing the conversion with a new conversion or new composition in the tool application, or using command-line options.

Table 9: Conversion Tool source input and target output files

Input format	Output format			
	.atmos	**.mxf (IMF IAB)**	**.rpl**	**.wav (ADM BWF)**
.atmos (or .damf) [a] [b]	Yes	Yes	Yes	Yes
.mxf (Cinema MXF)	Yes	Yes	Yes	Yes
.mxf (IMF IAB)	Yes [c]	Yes	Yes [c]	Yes [c]
.rpl [a]	Yes	Yes	Yes	Yes
.wav (ADM BWF)	Yes	Yes	Yes	Yes
.xml (pmstitch) [d]	Yes	Yes	Yes	Yes

[a] .atmos, .damf, and .rpl file formats can include a .dbmd metadata file when converting to .atmos, .mxf (IMF IAB), .wav (ADM BWF). However, the output file does not include a .dbmd file.

[b] An .atmos file created with Renderer v3.2.x, 3.3.x, or 3.4.x automatically includes a .dbmd file.

[c] Because IMF IAB positional metadata is quantized to eight events per frame, an IMF IAB .mxf is considered a mezzanine rather than a master. Converting from IMF IAB to another format will keep metadata events quantized. Therefore, it may be desirable to convert from the original master file rather than from the IMF IAB mezzanine.

[d] .xml (pmstitch) files can include .atmos, .mxf, .rpl, and .wav (ADM BWF) files. Imports are supported with new compositions and command-line options.

The Conversion Tool is not intended for use with Dolby Atmos VR masters. The tool does not support VR metadata.

Related information

Converting the format and other metadata of a master file (Conversion window) on page 59
Performing tool operations with an .xml (pmstitch) file on page 89
Performing tool operations with command-line options on page 95

5.2.1 Conversions to IMF IAB and group labels

When doing a conversion to an IMF IAB .mxf, the output file can include IAB AudioDescription and IAB AudioDescriptionText metadata fields (which are derived from standard group names). These fields align with *SMPTE ST 377-41:2021, MXF Multichannel Audio Controlled Vocabulary*.

Note: These metadata fields are always included with a conversion in the **Conversion** window. In a composition containing masters with the same channel layout and the same group description strings, the group labels will also be written.

When an entry matches any of the listed group labels, the corresponding IAB AudioDescriptionText will be written. When there is no match, the custom string will persist. This mapping is performed automatically.

Table 10: IMF IAB group labels

ADM audioContentName	IAB AudioDescription	IAB AudioDescriptionText
Dialogue, Dialog, DX, DIA, DX Group or ST37741DX	0x80	ST37741DX
Music, MX, Mus, MUS, MX Group or ST37741MX	0x80	ST37741MX
Effects, FX, FX Group, SFX, BGFXFOL or ST37741FX	0x80	ST37741FX
Narration, NARR, Narr, Voice Over or ST37741NAR	0x80	ST37741NAR
Primary, Composite, Full Mix, or ST37741PRM	0x80	ST37741PRM
Secondary Audio Program, Alternate Language Audio, Dub Mix or ST37741SAP	0x80	ST37741SAP
Descriptive Video, Audio Description or ST37741DV	0x80	ST37741DV
Filled FX, FFFX, FFX or ST37741FFX	0x80	ST37741FFX
Group ADR, Group or ST37741GRP	0x80	ST37741GRP
Walla or ST37741WLA	0x80	ST37741WLA
Crowd, Crowds or ST37741CRD	0x80	ST37741CRD
Vocals or ST37741VOC	0x80	ST37741VOC
Foley, FO, FL, Fol, FOL, FOL GROUP or ST37741FOL	0x80	ST37741FOL
Backgrounds, BG, BG GROUP, Ambiences, AMB, Nat, Nat Sound or ST37741BG	0x80	ST37741BG
custom_string	0x80	custom_string
empty	0x01	n/a

5.3 Supported sample rates and considerations

All Conversion Tools workflows support converting from a source 48 kHz master file format to a target 48 kHz master file format. Additionally, the tool supports various conversions from or to a 96 kHz master file.

Table 11: Supported source and target sample rates

Input format and sample rate	Version	Input sample rate	Output format and sample rate				
			`.atmos`, 48 kHz	`.mxf` (IMF IAB), 48 kHz	`.rpl`, 48 kHz	`.wav` (ADM BWF), 48 kHz	`.wav` (ADM BWF), 96 kHz
`.atmos`	v0.4 or v0.5	48 kHz	Yes	Yes	Yes	Yes	No
`.atmos` or `.damf`	v0.3						
`.atmos`	v0.4 or v0.5	96 kHz	Yes	Yes	No	Yes	Yes

Table 11: Supported source and target sample rates (continued)

Input format and sample rate	Version	Input sample rate	Output format and sample rate				
			.atmos, 48 kHz	**.mxf (IMF IAB), 48 kHz**	**.rpl, 48 kHz**	**.wav (ADM BWF), 48 kHz**	**.wav (ADM BWF), 96 kHz**
.atmos or .damf	v0.3						
.mxf (IMF IAB)	All	48 kHz	Yes	Yes	Yes	Yes	No
.rpl	All	48 kHz	Yes	Yes	Yes	Yes	No
.wav (ADM BWF) .wav (ADM BWF)	All	48 kHz	Yes	Yes	Yes	Yes	No
		96 kHz	Yes	Yes	No	Yes	Yes

Note: The .mxf and .rpl formats do not support sample rates of 96 kHz, and therefore do not support sample rate conversion.

96 kHz to 48 kHz conversions and input with odd sample numbers

When converting a master from 96 kHz to 48 kHz, and the input contains an odd number of samples, the last sample of the output will be rounded, and will contain one more sample.

If the input is an IMF IAB, it is possible that the rounded sample occurs in a video frame boundary. In this case, the output will contain a whole additional frame of padded samples. This is because the IMF IAB format can only contain whole video frames.

5.4 Considerations when setting the frame rate

The source and target frame rates are important parameters in Dolby Atmos mastering and encoding, and must be set appropriately. Additionally, supported frame rates are dependent on the master file format.

5.4.1 Source frame rates

When a Dolby Atmos master file is loaded into the Conversion Tool, the tool interprets the frame rate (and whether it can be edited) based on the source file format, version, and frame rate.

When working on a composition, the frame rate of each master must match. Attempting to import a master with a different frame rate than the current masters in the **MASTER FILES** list results in an error message.

When importing an .rpl master file, how you set the frame rate is based on the workflow:

- After importing an .rpl into the **Conversion** window, the source frame rate drop-down menu displays under the file name. By default, this menu sets the source frame rate. Depending on the frame rate and length of the master, changing this value may also change these timecode values in the **Output** section: target frame rate, and output start, end, and duration.
- When importing an .rpl into the **Composition** window, you will be prompted to set a frame rate, which also is used to set the composition frame rate.

Table 12: Source frame rates for Dolby Atmos master file formats

Dolby Atmos master file format	Versions [a]	Frame rate, as specified in the source file program-level metadata	Source frame rate [b]
`.atmos`	v0.4 or v0.5	23.976, 24, 25, 29.97, 29.97 drop frame (DF), or 30 frames per second (fps)	As specified
`.atmos` or `.damf`	v0.3 and earlier	Not specified	23.976 fps
`.mxf` (Cinema MXF)	v1.0.0.6	24, 25, or 30 fps [c]	As specified
`.mxf` (IMF IAB)	All	23.976, 24, 25, or 30 fps	As specified
`.rpl`	All	Not specified	24, 25, or 30 fps (as set)
`.wav` (ADM BWF)	All	23.976, 24, 25, 29.97, 29.97 DF, or 30 fps	As specified
`.xml` (pmstitch)	All	23.976, 24, 25, 29.97, 29.97 DF, or 30 fps	As specified

[a] The versions column refers to the release number of the specification for the format. To see the version for a home theater master, open the `.atmos` or `.damf` file of the master with a plain text editor, and look at the first line of code.

[b] This is the frame rate interpreted by the tool. It is shown below the file name (in the **Conversion** window) and in the advanced metadata section (in the Composition window). While the target frame rate defaults to the source in Conversion mode, it can be changed.

[c] Higher cinema frame rates (such as 48, 50, 60, 96, 100, and 120 fps) are not supported.

5.4.2 Target frame rates

The Conversion Tool supports frame rate conversions. The tool allows setting a target frame rate that is different from the source frame rate. All Dolby Atmos master file formats support editing the target frame rate.

After importing a master file, the tool sets both the source and target frame rate to the source frame rate.

When doing a conversion or composition and changing the target frame rate, the **Maintain pitch and length** option is available. Click (enable) the switch so that it displays **Yes** to maintain pitch and length in the target master.

When the target format does not support the source frame rate, the tool GUI and command-line app provide feedback.

- When using the tool GUI: The unsupported frame rate is not included in the target **Frame rate** drop-down menu (in the **Output** section).
- When using the command-line application: A message informs you that the target frame rate value is not supported by the target format.

Table 13: Supported target frame rates

Dolby Atmos master file format	Supported target frame rates
`.atmos` (or `.damf`)	23.976, 24, 25, 29.97, 29.97 drop frame (DF), or 30 fps
`.mxf` (IMF IAB)	23.976, 24, 25, or 30 fps
`.rpl`	24, 25, or 30 fps
`.wav` (ADM BWF)	23.976, 24, 25, 29.97, 29.97 DF, or 30 fps

5.4.3 Prerequisites for frame rate conversions

Before converting, there are specific prerequisites that you should always perform.

- When converting to a Dolby Atmos master, note the selected target frame rate (or include it in the name of the directory) to ensure that you know what frame rate was applied during the conversion process.
- When converting from an `.rpl` file, set the source frame rate to the frame rate used during print master recording (typically 24 fps, but can also be 25 or 30).

5.4.4 Frame rate conversion ratios

When converting to a different frame rate, and the **Maintain pitch and length** switch is set to **No**, the Conversion Tool performs a scaling of the playback speed by a specific ratio. The audio duration and pitch will also change by the same ratio as the different source and target frame rates.

A faster playback speed results in a shorter duration and a higher pitch. In some cases, if the difference between the selected input and output frame rates is large, the change in playback speed or pitch may be greater than desired for the program.

In this table, the ratio of input playback speed (the source frame rate) to output speed (the target frame rate) is shown for all the possible combinations of frame rates in the drop-down menus. The conversion ratio is represented in a percentage (for example, converting from 24 fps to 25 fps is -4%).

Note:

The IMF IAB format does not support 29.97 or 29.97 DF as a source or target frame rate.

Note: The `.rpl` format supports 24, 25, and 30 fps only as a source or target frame rate.

Table 14: Frame rate conversion ratios (playback speed for source and target files)

Source frame rate (fps)	23.976 fps target	24 fps target	25 fps target	29.97 fps target	29.97 DF target	30 fps target
23.976	0	-0.1%	-4.1%	0%	0%	-0.1%
24	+0.1%	0	-4%	+0.1%	+0.1%	0%
25	+4.27%	+4.17	0%	+4.27%	+4.27%	+4.17%
29.97	0%	-0.1%	-4.1%	0%	0%	-0.1%
29.97 DF	0%	-0.1%	-4.1%	0%	0%	-0.1%
30	+0.1%	0%	-4%	+0.1%	+0.1%	0%

5.5 Considerations when setting the FFOA

The FFOA is an important parameter in Dolby Atmos mastering and encoding, and must be set appropriately.

The FFOA indicates the first frame of video and is generally used for encoding to match the video start for synchronization. For example, a master file may have been recorded with a starting offset time of 0:59:52:00 (3,592 seconds), and the bitstream encode needs to start later, at 1:00:00:00, to be in sync with the start of active video. In this case, set the **FFOA** to 1:00:00:00. The tool automatically interprets it as real time or as Society of Motion Picture and Television Engineers (SMPTE) NTSC time for pull-down frame rates such as 23.976 or 29.97.

With Dolby Atmos Conversion Tool v2.0 and later, you can choose not to include the FFOA, using either the Dolby Atmos Conversion Tool GUI or CLI. Additionally, files with FFOA on subframe boundaries are rounded to the nearest frame on import.

The FFOA is also used during frame rate conversion to anchor any time-scale expansion or contraction required. This means that the first audio samples at the source FFOA time will still be heard at that same

FFOA time after frame rate (fps) modification. A wrong FFOA can lead to the desired start of program occurring at the wrong timecode value on the timeline.

You typically set the FFOA in `.atmos` master file sets created with the Home Theater Renderer software during master recording. Version 0.4 and 0.5 `.atmos` files can carry the FFOA, but it is optional. Version 0.3 `.atmos` files did not carry the FFOA. You can open the file in the Dolby Atmos Renderer to see the FFOA value (if present).

Note:

The IMF IAB file format does not support FFOA. Instead, all files start at 00:00:00:00.

Note: The Cinema MXF `.mxf` file format has an offset of 00:00:00:00. It does support FFOA.

If the FFOA is not present in a file format that supports FFOA, be sure to check any mastering notes and enter a value in the Dolby Atmos Conversion Tool accurately before starting conversion to another Dolby Atmos master file type, or before frame rate (fps) or FFOA conversion operations. If it was included, but is wrong, you can override the value in the field provided in the tool. As noted, the FFOA can be used in Dolby bitstream encoders to set the start point of the encode, trimming off the beginning audio samples. If the master file was created with no leading silent portion, and encoding should start from the very first audio samples of the master file, the FFOA must correspond to the starting offset time of the source master file.

5.6 Hard disk space requirements

Before using the Conversion Tool, verify hard drive space.

Conversion Tool conversions and operations create masters that can be more than 100 GB in size. For example, if stitching source content that adds up to approximately 100 GB in size, verify that there is approximately 150 GB free storage space on the destination drive (the location where the new master will be created). The operation will fail if there is not enough space to successfully stitch the new content.

5.7 Persistent application data

When you quit the Dolby Atmos Conversion Tool application (or close the **Conversion** or **Composition** window), certain data is retained for the next time you start a new conversion or composition.

To clear persistent data and reset the application to use default data, delete the Conversion Tool preference files.

Persistent data when working in the Conversion window

- Source path for importing a master or `.xml` (`pmstitch`) file
- Destination path for the target master

Note: The frame rate and sample rate are taken from the source master.

Persistent data when working in the Composition window

- Source path for importing a master or `.xml` (`pmstitch`) file
- Destination path for the target master
- **Composition** section values:
  - Start time
  - FFOA (**Add FFOA** switch setting and timecode value)
- **Output** section values:
  - File format
  - Primary language (IMF IAB .Material Exchange Format (MXF) master only)

Note: The frame rate and sample rate are taken from the source master.

5.7.1 Deleting the Conversion Tool application preference files

You can clear persistent data in the Conversion Tool application and reset the tool to use default data, by deleting the preference files for your operating system.

Procedure

1. On Mac, perform these steps:
   a. Open the **Finder**
   b. Choose **Go** > **Go to Folder**.
   c. Enter the path:
      `~/Library/Preferences`
   d. Click **Go**.
   e. Command-click on the two preference files:
      `com.dolby.AtmosConversionTool.ini`
      `com.dolby.AtmosConversionTool.plist`
   f. Perform one of these steps:
      - Right-click on the preference files, and choose **Move to Trash**.
      - Drag the preference files to the trash.
2. On Windows, perform these steps:
   a. Navigate to the `C:\ProgramData\Dolby\Atmos Conversion Tool\` folder.
   b. Delete this file:
      `AtmosConversionTool.ini`

6

Performing conversions in the Conversion window

In the **Conversion** window, you can convert the format, frame rate, sample rate, FFOA, or primary language (IMF IAB only) of a Dolby Atmos master.

6.1 Creating a new conversion

Before you convert a master file in the **Conversion** window, you create a new conversion. This opens the **Conversion** window, which provides the UI for importing a master, configuring the target master, and then starting your conversion.

Procedure

1. Launch the Dolby Atmos Conversion Tool.
2. Start a new conversion by performing one of these steps:
   - Click **New Conversion** in the home window.
   - Choose **File** > **New Conversion**.

     Alternatively, you can press Command + N (Mac) or Control + N (Windows).

   The **Conversion** window displays.

What to do next

Import a master file.

Note: You can return to the home window at any time by choosing **File** > **Close**. Alternatively, you can press Command + W (Mac) or Control + W (Windows).

6.2 Importing a master file for a new conversion

After creating a new conversion, you are ready to import a master file.

Prerequisites

Create a new conversion in the Conversion Tool.

About this task

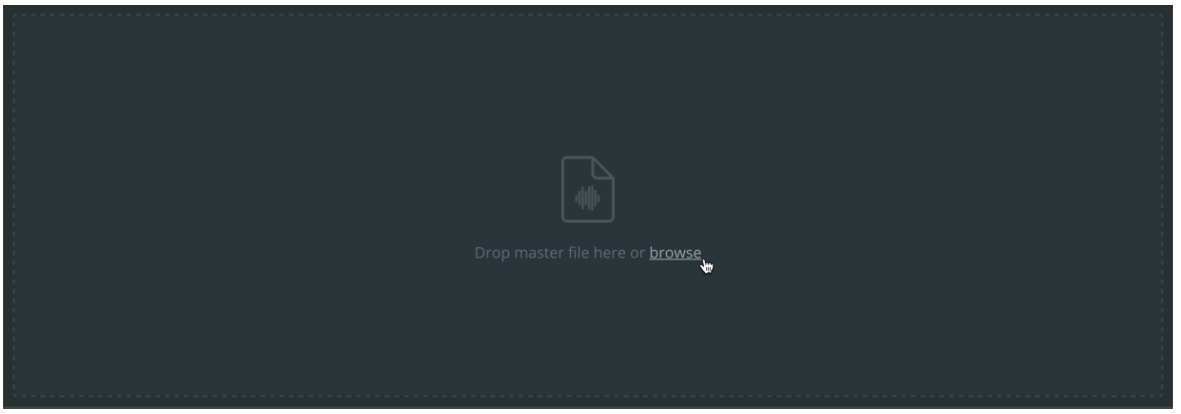
Alternatively, you can create a new composition, and then import and convert a file using the Conversion Tool composition controls. When performing a new composition, the tool also supports importing an `.xml` (`pmstitch`) file.

Note: On macOS, a master file containing a forward slash (/) in the file name displays in the Conversion Tool with the forward slash changed to a colon (:).

Procedure

Add a master to the **Conversion** window by performing one of these steps:

- Drop a master file into the **Conversion** window.
- Click in the **Conversion** window, and then use your browser to locate and choose a master file.



- Choose **File** > **Import Master File**.

  Alternatively, you can press Command + I (Mac) or Control + I (Windows).

A loading message and progress bar display in the middle of the window to show the progress of the import.

What to do next
You are now ready to perform a conversion.

6.3 Converting the format and other metadata of a master file (Conversion window)

In the **Conversion** window, you can convert the format, frame rate, sample rate, FFOA, or primary language (IMF IAB only) of a Dolby Atmos master.

Prerequisites

- Create a new conversion, and then import a master file.

About this task

Perform a new conversion (in the **Conversion** window):

- When you do not need to change the length of the master, or change the start time
- When you want to preserve source start and end timecodes that are on non–frame boundaries.

Alternatively, you can perform a new composition (in the **Composition** window, in the timeline).

Before performing a conversion, review these considerations:

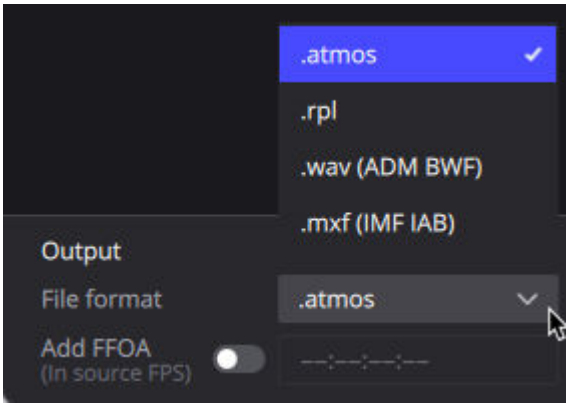
- During conversion, the frame rate can also be converted. For example, you can change from the common cinema rate of 24 fps to a common home theater rate (such as 23.976 or 25 fps).
  - When changing the frame rate, you can choose to maintain the pitch and length of the source master (**Maintain pitch and length** switch set to **Yes**). Otherwise, the Conversion Tool performs a scaling of the playback speed by a specific ratio (see *Frame rate conversion ratios*).
  - When converting to a format that does not support the target frame rate, you will receive an **Unsupported frame rate** message that informs you that the frame rate has been changed.
  - After importing an `.rpl` into the **Conversion** window, the source frame rate drop-down menu displays on the top-left side of the window. By default, this menu sets the target frame rate. It can also be used to change the target frame rate value, and to see the output start, end, and duration timecode for different frame rates.
- When converting to an `.mxf` (IMF IAB) master file:
  - If converting from a file that starts or ends between frames, the Conversion Tool will pad the start or end to the next frame and warn you. This is because the IMF IAB format requires all IMF IAB files to start and end on a frame boundary.
  - If converting from another format, the frame size is compressed in sections where the audio signal is silent (-120 dB or below). This may result in significant file size reduction.
  - The FFOA is not included.
  - You have the option to set the primary language.
- When doing a conversion to an IMF IAB `.mxf` in the **Conversion** window, the output file includes IAB AudioDescription and IAB AudioDescriptionText metadata fields (which are derived from standard group names).
- When converting to the `.atmos`, `.mxf` (IMF IAB), or `.wav` (ADM BWF) file format from an input `.atmos` (or `.damf`) or `.rpl` file, you can include a `.dbmd` metadata file with customized Dolby encoding parameters.

  Note: An `.atmos` master file set created with Renderer v3.2.x, 3.3.x, or 3.4.x automatically includes a `.dbmd` file. Before converting, you can manually update (or replace) the `.dbmd` file. Be sure to use the same file name so that it remains associated with the top-level `.atmos` file.

Procedure

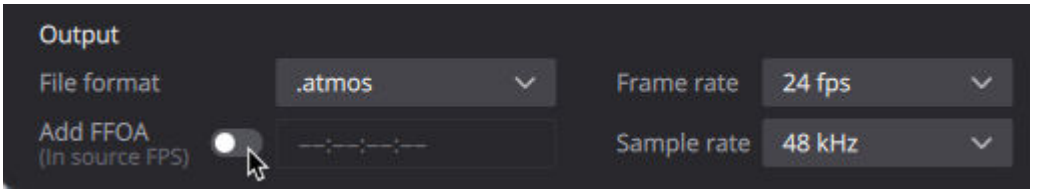
1. In the **Output** section, click the **File format** drop-down menu, and select the master file format that you want to convert to.

   Figure 34: Selecting the target file format

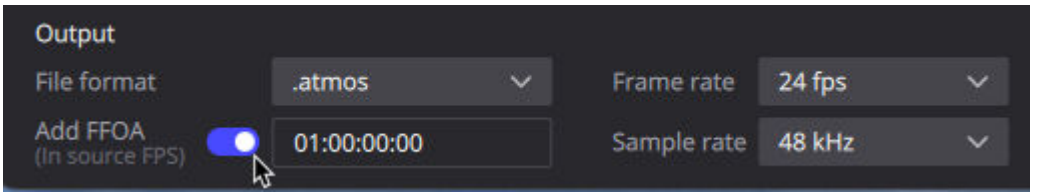
   

2. (Optional) Set the FFOA by performing one of these steps:

   - If you want to not include the FFOA for master formats that support changing the FFOA, disable the **Add FFOA** switch.

   - If you want to set the FFOA for master formats that support changing the FFOA, enable the **Add FFOA** switch, and then set the FFOA.

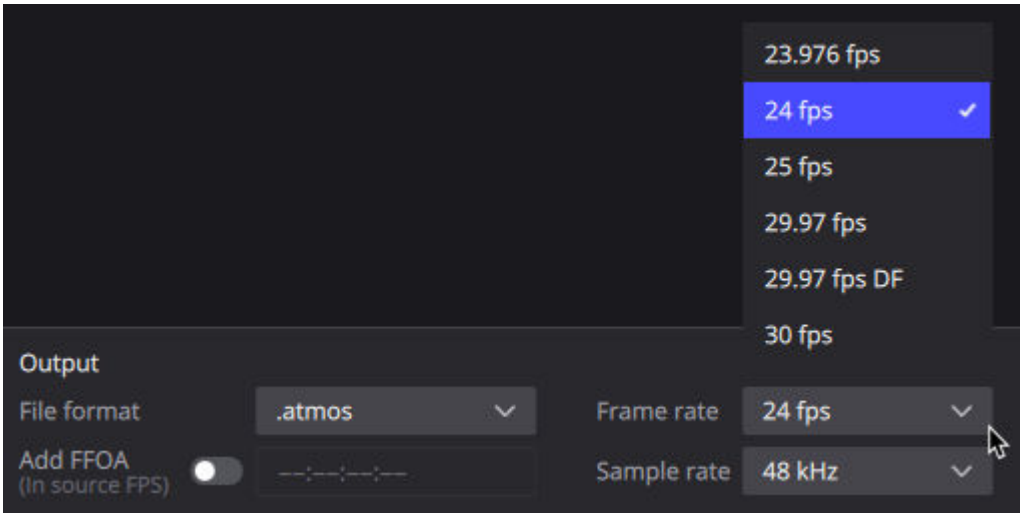
     The FFOA must be the same as or later than the offset in the `.atmos` or `.wav` file, and before the last frame of the file.

     Note: Offset is the timecode value of the start of the master.

     The FFOA is the reference point for the start of picture that the audio needs to sync with, and is typically the starting point when encoding the audio. The FFOA is used as a reference point during frame rate conversion, so the audio will start at the same frame before and after conversion.

3. (Optional) If you want to apply frame rate conversion, perform these steps:
   a. Click the **Frame rate** drop-down menu, and select a target frame rate.

Figure 35: Selecting the target frame rate



b. Select whether you want to maintain the pitch and length of the source master.

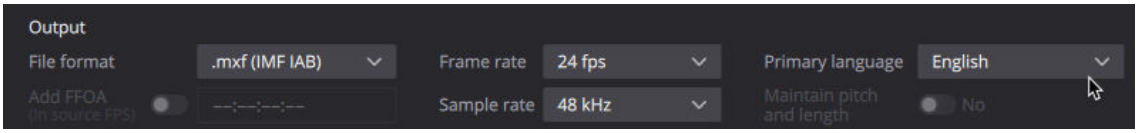
- Set **Maintain pitch and length** to **Yes** to maintain the pitch and length of the source master.

- Set **Maintain pitch and length** to **No** to scale the playback speed by a specific ratio (see *Frame rate conversion ratios*). The audio duration and pitch will also change by the same ratio as the different source and target frame rates.

4. (Optional) If you want to convert the sample rate, click the **Sample rate** drop-down menu, and select a target sample rate.
5. (Optional) If converting to `.mxf` (IMF IAB), set the primary language by performing one of these steps:

- Click the **Primary language** drop-down menu, scroll to the desired language, and then click (highlight) a language.

Figure 36: Selecting the target primary language (IMF IAB only)



- Click in the **Primary language** field, highlight the existing text (if any), type the first letters of the desired language, scroll to the language, and then click (highlight) the language:
  - Pressing Escape returns the last selected language.
  - The field is not character sensitive. You can enter uppercase or lowercase characters to discover a language.

6. Click the **Convert** button.
7. Select a file name and destination for the target file, and then click **Save** to begin the conversion process.

   When the target format is `.atmos`, `.wav` (ADM BWF), or `.mxf` (IMF IAB), the output file name for a conversion uses the source file name by default (Mac only).

   The file name for an `.rpl` master must be `dub_out.rpl`.
8. When the conversion completes and the **File exported successfully** message appears, click **OK**.

   This returns you to the **Conversion** window and the most recent master and conversion settings.
9. (Recommended) Perform a quality control (QC) listening pass on the result.

   Use the Dolby Atmos Renderer, or another application that supports playback of a Dolby Atmos master file.

10. Redo the conversion with new settings, as needed, and then choose **File** > **Close** to return to the Conversion Tool home window.

7

Editing, joining, or converting Dolby Atmos clips in a composition

The Dolby Atmos Conversion Tool lets you create a Dolby Atmos composition, where you can import one or more masters as individual clips, and then edit clips, join clips, or convert a clip to another Dolby Atmos master file format.

7.1 Creating a new composition

Before you can work with one or more clips in a composition, you create a new composition. This opens the **Composition** window, which provides the UI for importing one or more masters as a clip, and then performing composition tasks.

Procedure

1. Launch the Dolby Atmos Conversion Tool.
2. Start a new composition by performing one of these steps:
   - Click **New Composition** in the home window.
   - Choose **File** > **New Composition**.

     Alternatively, you can press Command + Shift + N (Mac) or Control + Shift + N (Windows).

   The **Composition** window displays.

What to do next
Import one or more master files.

Note: You can return to the home window at any time by choosing `File` > `Close`. Alternatively, you can press Command + W (Mac) or Control + W (Windows).

7.2 Importing master files for a composition

After creating a new composition, you are ready to import one or more supported master files.

You can import files into the **MASTER FILES** list first, to later drop them into the **Composition** window timeline as a clip. Alternatively, you can import files directly to the timeline. Files imported directly into the timeline will also be placed in the **MASTER FILES** list.

A master added to the timeline is considered an editable clip.

Note: On macOS, a master file containing a forward slash (/) in the file name displays in the Conversion Tool with the forward slash changed to a colon (:).

7.2.1 Importing a master file to the timeline

After creating a new composition, you can import one or more master files to the timeline. Files imported directly into the timeline will also be placed in the **MASTER FILES** list.

Prerequisites
Create a new composition in the Conversion Tool.

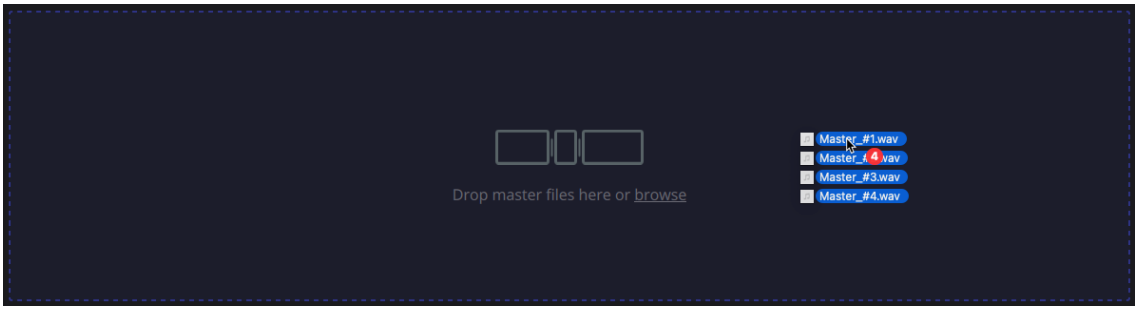
About this task

- Each master is imported into the timeline as an editable clip, as well as the **MASTER FILES** list.
- Each master for a composition must have the same frame rate and same sample rate.
- When importing an `.rpl` master file, you will be prompted to set a frame rate, which also is used to set the composition frame rate.

Procedure

1. If the timeline is empty, perform one of these steps:
   - Select one or more masters (for example, on a hard drive), and then drag and drop them into the timeline.

Figure 37: Example of dropping four files into the timeline



- Click in the empty timeline, browse to the location of your masters (for example, on a hard drive), select one or more of them, and complete the import.

2. If the timeline already has one or more clips, select one or more master files (for example, on a hard drive), and drag and drop them to the timeline.

   You can drag and drop masters before, after, or in between clips in the timeline.

Results

A loading message and progress bar display in the middle of the window, to show the progress of the import.

What to do next

You are now ready to work with the clips in the timeline.

7.2.2 Importing a master to the master files list

If you want to create a list of masters for editing, joining, or converting at a later time, you can import one or more masters directly into the **MASTER FILES** list only. This is also useful for working with like compositions (such as ones that share one or more masters).

Prerequisites

Create a new composition in the Conversion Tool.

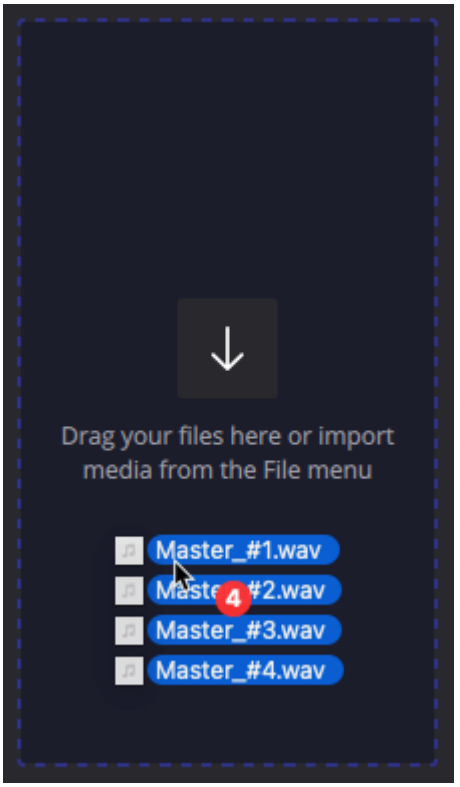
About this task

- Each master is imported into the **MASTER FILES** list.
- Each master in the list must have the same frame rate and same sample rate.

Procedure

- Reveal the **MASTER FILES** list, select one or more masters (for example, on a hard drive), and drag and drop them into the list.

Figure 38: Example of dropping four master files into the master files list



- Choose **File** > **Import Master File**, navigate to your masters, select one or more of the masters, and complete the import.

  Alternatively, you can press Command + I (Mac) or Control + I (Windows).

Results

A loading message and progress bar display at the top of the **MASTER FILES** list to show the progress of the import.

What to do next

You can add a master from the list to the composition timeline as an editable clip.

7.2.3 Opening an .xml (pmstitch) file

After creating a new composition, you can open an `.xml` `pmstitch` file so that it imports the associated stitched master into the master file list and timeline simultaneously.

Prerequisites

- Create a new composition in the Conversion Tool.
- Verify that each Dolby Atmos master file associated with the `.xml` (`pmstitch`) file is at the path specified in the `.xml` file.

About this task

When you import an `.xml` (`pmstitch`) file, existing masters in the **MASTER FILES** list and timeline are cleared. If you have masters in the timeline, you will be prompted with a message that the composition will be replaced and changes will be lost. Choose **OK** to import the file, or **Cancel** to stop the operation.

Procedure

- Choose **File** > **Open .xml (pmstitch)**, navigate to the file, select it, and complete the import.

  Alternatively, you can press Command + O (Mac) or Control + O (Windows).

Results
A loading message and progress bar display in the middle of the window, to show the progress of the import.

What to do next
You are now ready to work with the clip in the timeline.

7.2.4 Adding a master from the master files list to the timeline

You can add a master from the **MASTER FILES** list to the timeline as a clip, so that you can work on it. When there are existing clips in the timeline, you can choose to drop the master before or after any of the clips in the timeline.

Prerequisites
Create a new composition in the Conversion Tool.

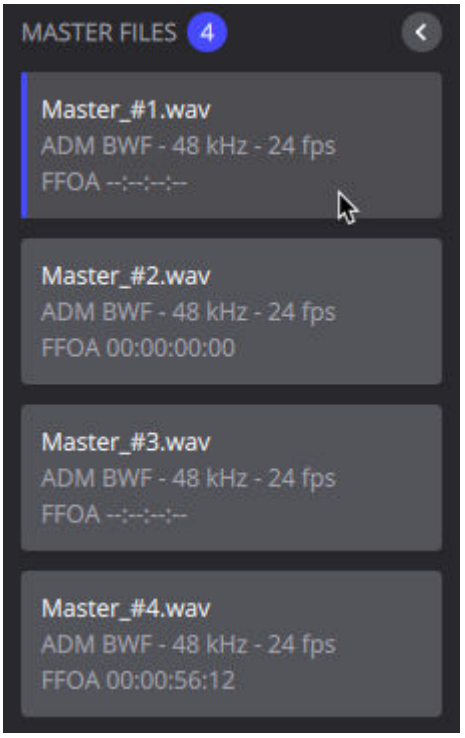
About this task
Each master is added to the timeline as an editable clip.

Each master for a composition must have the same frame rate and same sample rate.

When importing an `.rpl` master file, you will be prompted to set a frame rate, which also is used to set the composition frame rate.

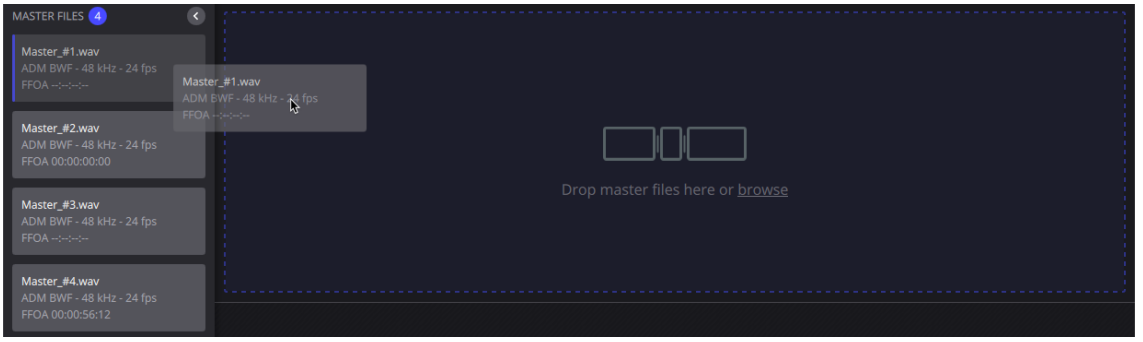
Procedure

1. Click (highlight) a master in the **MASTER FILES** list.



2. If the timeline is empty, perform one of these steps:
   - Drag the file from the list, and drop it in the empty timeline.

Figure 39: Dragging a master from the list



- Choose **Timeline** > **Add Master File to Timeline**.

  Alternatively, press Command + J (Mac) or Control + J (Windows).

3. If the timeline has one or more clips, perform one of these steps:
   - Drag the file from the list, and drop it before or after a clip in the timeline.

     Note: When dragging before or after a clip, the silence bar display turns blue to show where you are dropping the file.

Figure 40: Dropping a file before a clip

Figure 41: Dropping a file after a clip

- Choose **Timeline** > **Add Master File to Timeline**.

  This places the master after the last master in the timeline.

  Alternatively, press Command + J (Mac) or Control + J (Windows).

4. (Optional) Add more masters to the timeline.

What to do next

You are now ready to work with the clips in the timeline.

7.3 Removing a master or clip in the Composition window

When working on a composition, you can remove a master from the master file list, or a clip from the timeline. You can also clear all clips from the timeline.

7.3.1 Removing a file from the master files list

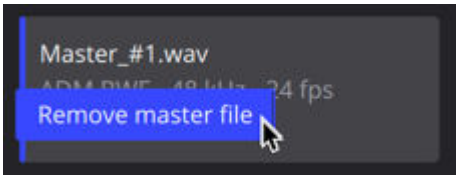
When working on a composition, you can remove a master from the **MASTER FILES** list.

Prerequisites
There are one or more masters in the **MASTER FILES** list.

About this task
Removing a file from the list also removes any instance of the file (as a clip) from the timeline. You will be prompted with a warning if the master exists as a clip on the timeline.

Procedure

1. In the **MASTER FILES** list, click (highlight) the master that you want to remove.
2. Perform one of these steps:
   - Click Delete (Mac US QWERTY) or Backspace (Mac International QWERTY, or Windows).
   - Right-click on the master, and select **Remove master file**.



   - Choose **Edit** > **Remove Master File**.
3. If the master exists as a clip on the timeline, click **Remove master** when prompted.

7.3.2 Removing a clip from the composition timeline

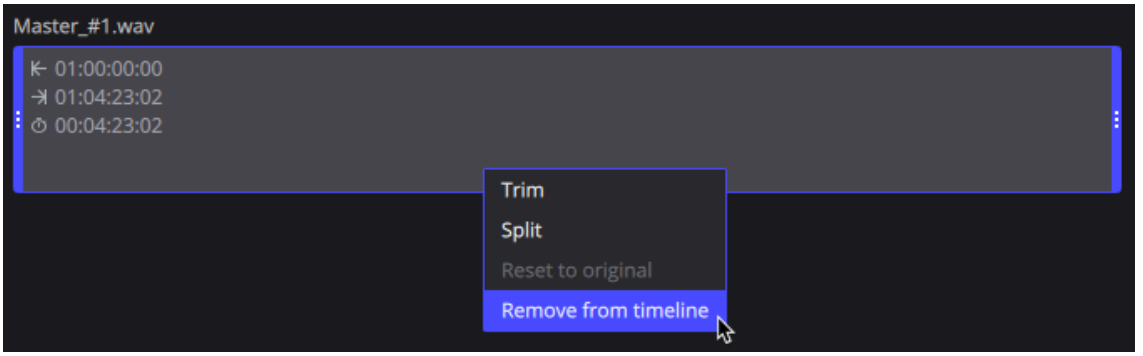
When working on a composition, you can remove a clip from the timeline.

Prerequisites
There are one or more clips in the composition timeline.

About this task
Removing a clip from the timeline keeps the associated master in the **MASTER FILES** list.

Procedure

1. In the composition timeline, click (highlight) the clip that you want to remove.
2. Perform one of these steps:
   - Click Delete (Mac US QWERTY) or Backspace (Mac International QWERTY, or Windows).
   - Right-click on the clip, and select **Remove from timeline**.



- Choose **Edit** > **Remove from timeline**.

7.3.3 Clearing clips in the timeline

When working on a composition that has one or more clips in the timeline, you can clear all of the clips in the timeline.

Prerequisites

There are one or more clips in the composition timeline.

Procedure

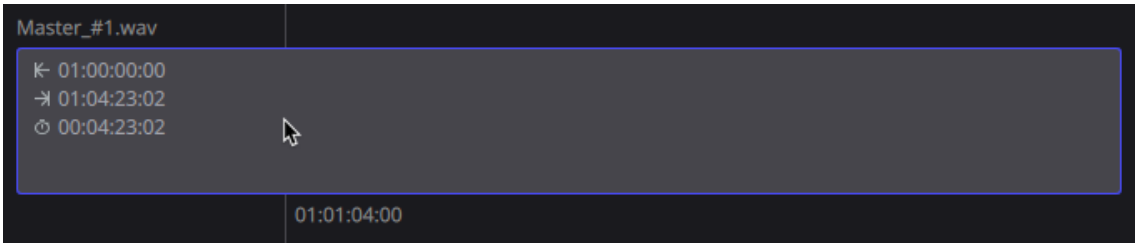
1. Choose **Timeline** > **Clear Timeline**.
2. In the **Clear timeline** dialog, click **Clear timeline**.

7.4 Viewing master file and clip metadata

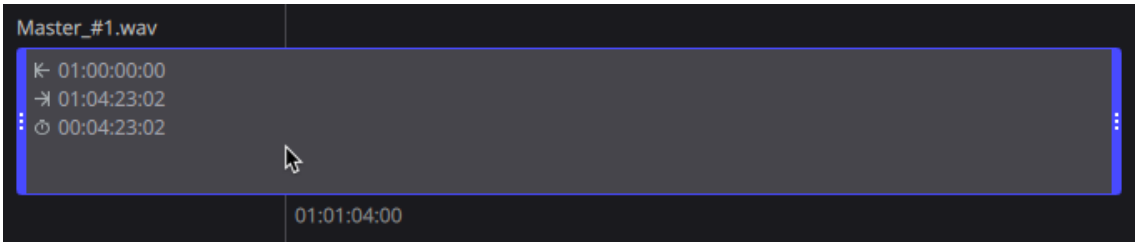
When working on a composition, you change how clips and clip metadata display in the composition timeline and **Composition** section. Additionally, you can display detailed (advanced) metadata for clips or masters, or the length of a silence clip.

Procedure

- To view the start, end, and duration of a clip, relative to the start of the master file associated with the clip, perform one of these tasks:
  - Hover over the clip in the timeline.

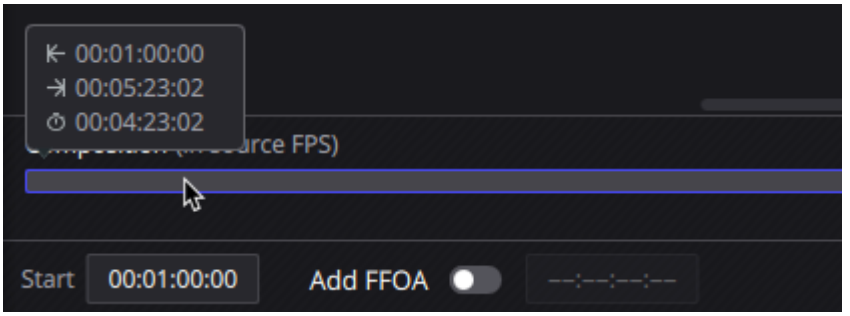


  - Select the clip in the timeline.

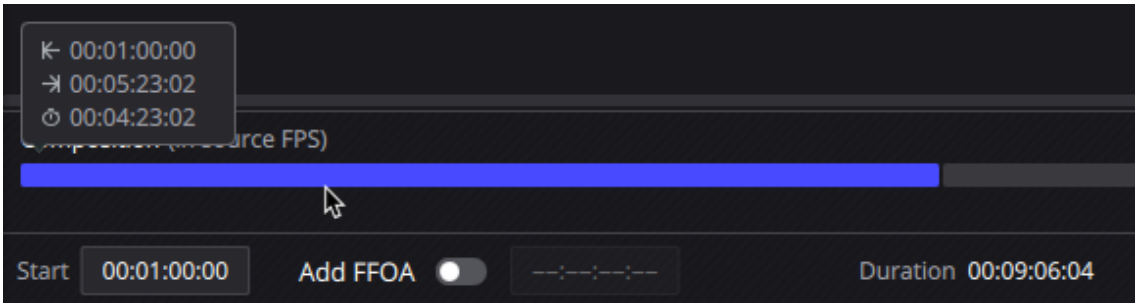


- To view the start, end, and duration of a clip, relative to the composition start time, perform one of the tasks:

- Hover over the composition bar for the clip in the **Composition** section.



- Click on the composition bar for the clip in the **Composition** section.



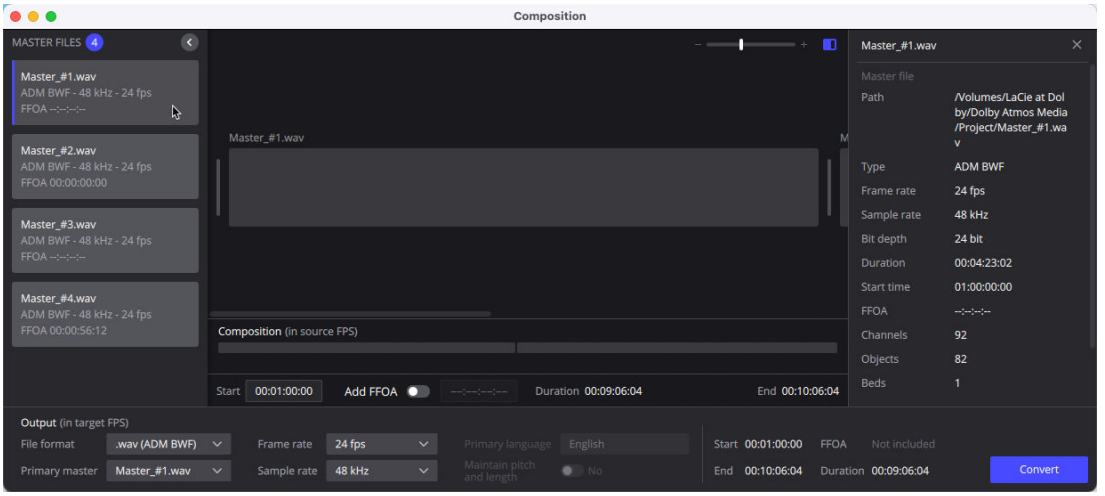
- To display advanced metadata of a master or clip, or the length of a silence clip, perform these steps:
  1. Choose **View** > **Show Advanced Metadata**, or click the advanced metadata icon

.

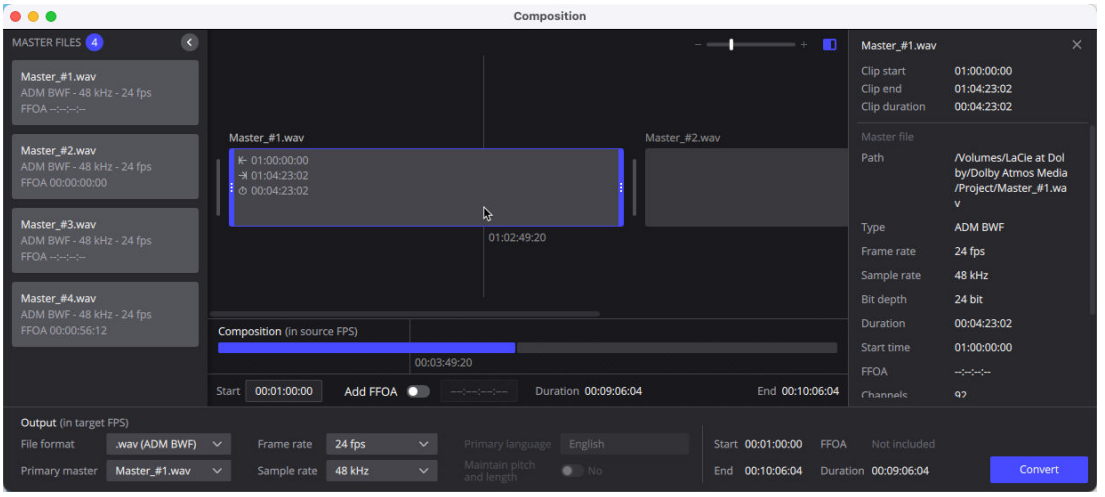
Note: The advanced metadata icon is located at the top-right corner of the **Composition** window.

Alternatively, you can press Command + Shift + P (Mac) or Control + Shift + P (Windows).

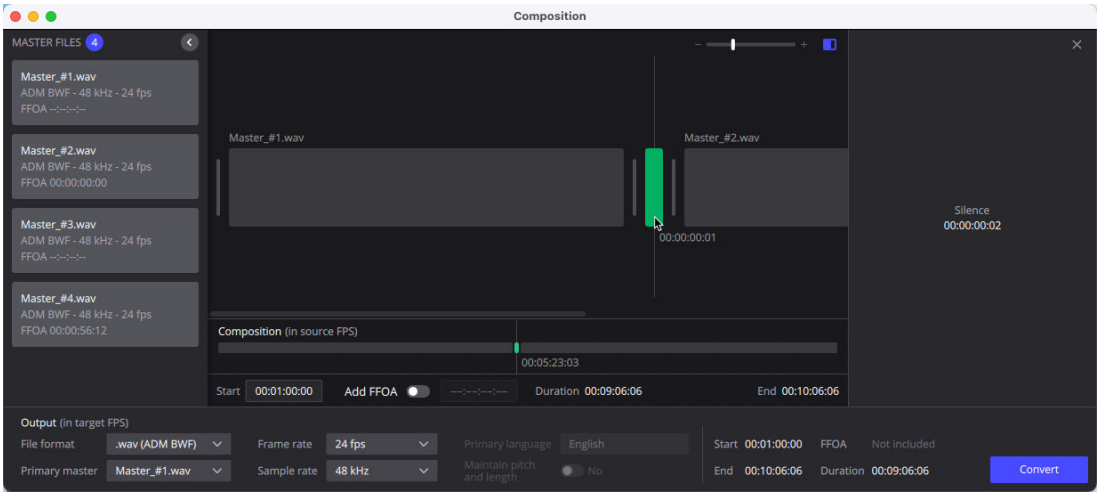
  2. Perform the task for the desired advanced metadata:
     - To display the advanced metadata of a master, click the master in the **MASTER FILES** list.



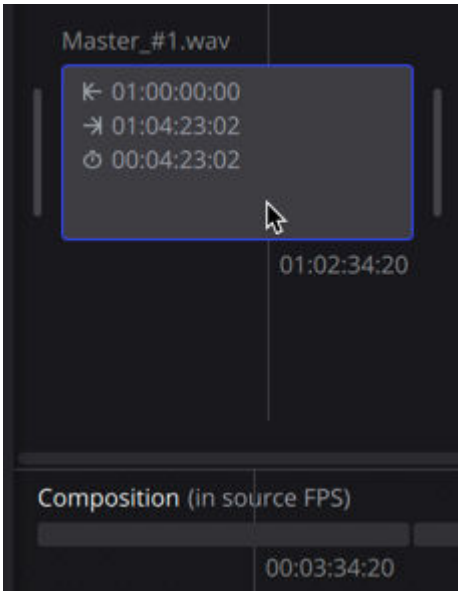
     - To display advanced metadata of a clip, click the clip in the timeline, or click on the bar for the clip in the **Composition** section.



- To display the length of a silence clip, click the silence clip in the timeline.



- To hide advanced metadata, perform one of these steps:
  - Click the blue advanced metadata icon in the **Composition** window.
  - Click the **X** at the top-right corner of the **Composition** window.
  - Press Command + Shift + P (Mac) or Control + Shift + P (Windows)
- To display the timecode location relative to the clip (in the timeline) and relative to the composition (in the **Composition section**, hover over the timeline so that the cursor appears. Move the mouse to the left or right to display other timecode locations.



- To scroll through the clips in the timeline, click on the scroll bar (located at the bottom of the timeline), or anywhere in the timeline above or below the clips, and scroll to the left or right.
- To zoom in, zoom out, or zoom to fit, perform the respective steps using the menu zoom slidebar, menu command, or keyboard shortcut:

  Figure 42: Zoom slide bar

  Note: On Mac, you can also use standard macOS trackpad and mouse shortcuts for zooming.

  - To zoom in on the clips in the timeline, click on the zoom slide bar and drag it to the right (toward the plus symbol), or choose **View** > **Zoom In**.

    Alternatively, you can press Command + the plus symbol (Mac) or Control + the plus symbol (Windows).
  - To zoom out on the clips in the timeline, click on the zoom slide bar and drag it to left (toward the minus symbol), or choose **View** > **Zoom Out**.

    Alternatively, you can press Command + the minus symbol (Mac) or Control + the minus symbol (Windows).
  - To zoom so that all the clips display in the visible timeline, click on the zoom slide bar and drag it all the way to the left, or choose **View** > **Zoom to Fit**.

    Alternatively, you can press Command + 0 (Mac) or Control + 0 (Windows).

7.5 Setting timecode fields

When working on a composition, you can set timecode values for various tasks.

About this task

Depending on the source and target format, these tasks can include timecode values that can be set before a conversion:

- Setting the start time of a composition (the start of the target master)
- Setting the FFOA
- Inserting silence before or after a master
- Trimming a master
- Splitting a master

Procedure

- Use the up and down arrow keys to change a value, or type in a valid value.
- Use the left and right arrow keys to toggle through the timecode unit (such as hours, seconds, minutes, samples), or click on a different time.
- Copy and paste timecode values.

7.6 Inserting silence before or after a clip

In the composition timeline, you can insert silence (add padding) before or after a clip. You can also add silence before or after an existing silence clip, or edit the length of existing silence clip.

Prerequisites

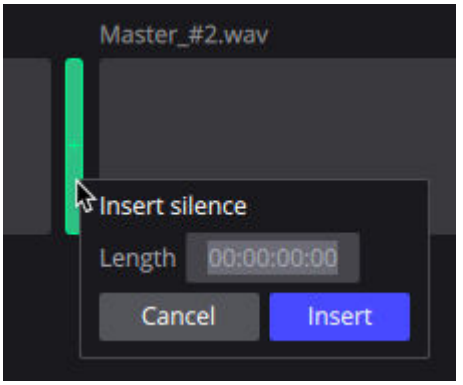
Ensure that one or most masters have been added as clips to the timeline.

About this task

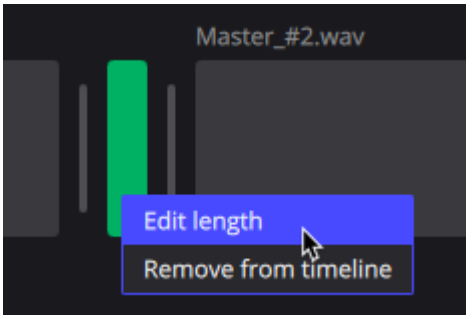
Alternatively, you can use the Conversion Tool command-line application to implement the operation.

Procedure

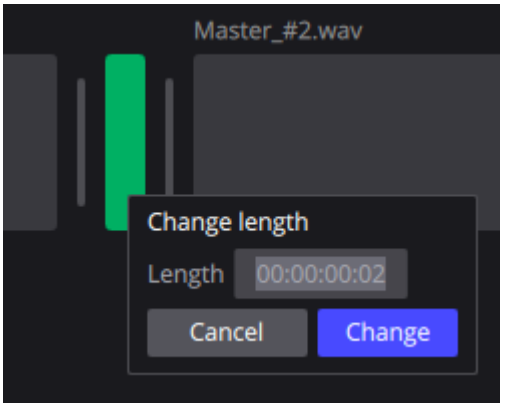
1. If desired, insert silence before (or after) a clip:
   a. In the timeline, perform one of these steps.
      - Hover over the empty silence bar located to the left (or right) of the clip, so that it changes to green with a **+** sign in the middle of it, and then click on it.



      - Click (highlight) the clip, and then choose **Timeline** > **Add Silence** > **Before Selected Clip** (or **After Selected Clip**).
   b. In the **Insert silence** window, in the **Length** field, add the amount of desired silence.
   c. Click the **Insert** button.
2. If changing the length of a silence clip, perform these steps:
   a. Right-click on the silence clip, which is displayed in green, and then choose **Edit length**.



   b. In the **Change length** window, in the **Length** field, add the amount of desired silence.



c. Click the **Change** button.

Results
The silence is inserted.

What to do next
Perform other composition edits, as needed, until you are ready to convert the composition.

7.7 Trimming a clip

In the composition timeline, you can trim a clip at both ends, or at the start or end.

Prerequisites
In a composition, ensure that the clip is in the timeline.

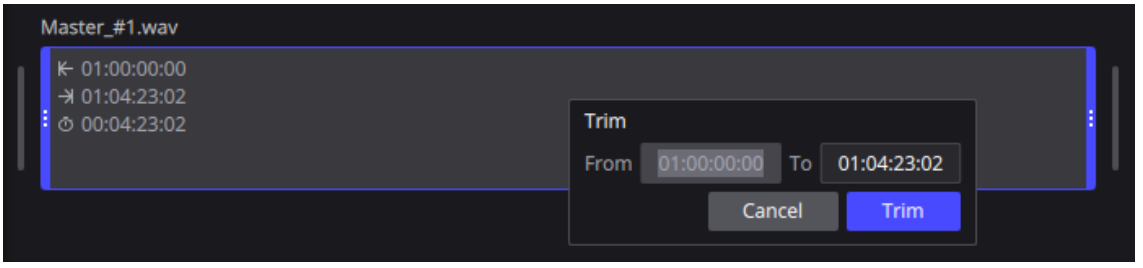
About this task

Alternatively, you can use the Conversion Tool command-line application to implement the operation.

To undo your edits prior to starting the conversion, right-click on the clip and select **Reset to original**.

Procedure

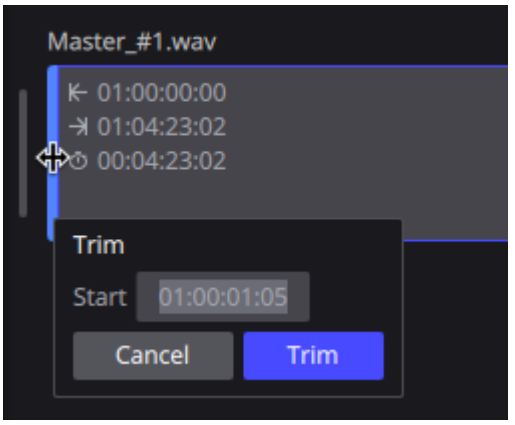
1. If you want to trim the start and end of the clip, perform these steps:
   a. Click (highlight) the clip in the timeline to select it.
   b. Perform one of these steps:
      - Right-click on the clip, and choose **Trim**.
      - Choose **Timeline** > **Trim**.
   c. In the **Trim** window, set the **From** and **To** values to the new start and end times, respectively.



   d. Click the **Trim** button.
2. If you want to trim the start of the clip only, perform these steps:
   a. Click (highlight) the clip in the timeline to select it.
   b. Hover over the left edge of the clip so that the

cursor displays, and then click and drag the cursor to the right, or click on it.

c. In the **Trim** window, set the **Start** of the clip.



d. Click the **Trim** button.

3. If you want to trim the end of the clip only, perform these steps:

a. Click (highlight) the clip in the timeline to select it.

b. Hover over the left edge of the clip so that the

cursor displays, and then click and drag the cursor to the left, or click on it.

c. In the **Trim** window, set the **End** of the clip.

d. Click the **Trim** button.

Results

The clip is trimmed.

What to do next

Perform other composition edits, as needed, until you are ready to convert the composition.

7.8 Splitting a clip

In the composition timeline, you can split a clip into two clips, and then edit the two clips as desired.

Prerequisites

In a composition, ensure that the clip is in the timeline.

About this task

To undo your edits prior to starting the conversion, right-click on the clip and select **Reset to original**.

Procedure

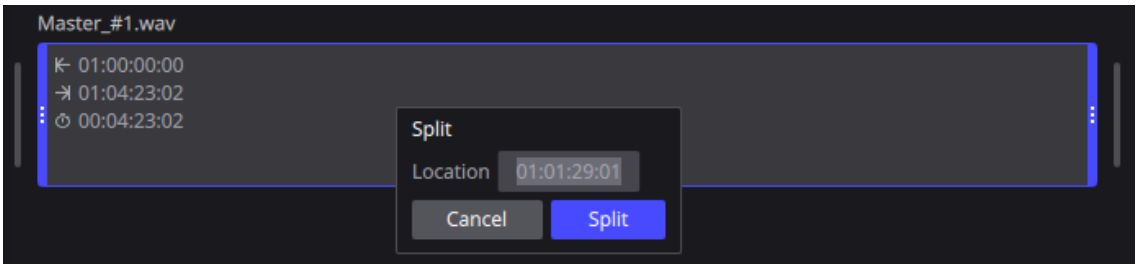
1. If using the cursor (to split at a specific location), perform these steps:

a. In the timeline, move the cursor over the clip until you see the time where you want to perform the split.

   This is the location relative to the start of the clip. Alternatively, you can view the cursor in the **Composition (in source fps)** section relative to the start time, and then move the mouse vertically upward until the cursor is in the clip.

b. Right-click at the location, and choose **Split**.

c. In the **Split** window, verify the **Location**, and then click **Split**.



2. If using the **Timeline** > **Split** command, perform these steps:

   a. Click (highlight) the clip in the timeline.

   b. Choose **Timeline** > **Split**.

      Alternatively, press Command + E (Mac) or Control + E (Windows).

   c. In the **Split** window, in the **Location** field, set the split location.

   d. Click the **Split** button.

Results

The clip is split.

What to do next

Perform other composition edits, as needed, until you are ready to convert the composition.

7.9 Joining masters

In the **Composition** window, you can sequentially order multiple clips, and then join them together.

About this task

- Alternatively, you can use the Conversion Tool command-line application to implement the operation.
- All masters in the composition must have the same sample rate.
- During a join operation, you can do other tool operations. For example, you can convert the frame rate.
- When joining together masters that have different bed widths or a different number of beds or objects, the beds are flattened into a single 9.1 bed. For example, this occurs when joining a master that contains a single 9.1 bed with a master that contains three 5.1 beds. If you wish to preserve access to the individual beds (when importing the master into a digital audio workstation (DAW)), we recommend that you archive the original source masters in addition to the new joined master. When joining together masters that have the same bed widths, the bed layout is preserved.

  When beds are flattened, the objects are organized sequentially after the 9.1 bed. If the number of objects is different between masters, the output master will have the largest number of objects in any one master.
- You can join 48 kHz masters (all Dolby Atmos master formats) or 96 kHz ADM BWF `.wav` or `.atmos` master files only.
- To join an `.xml` (`pmstitch`) file to other master files, you must import the `.xml` (`pmstitch`) first into a new composition.

Procedure

1. Start a new composition.

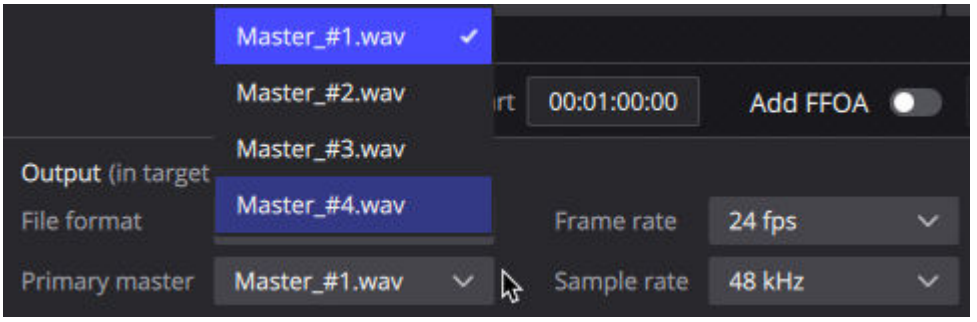
2. In the **Composition** window, import masters to the composition timeline as clips, or add masters from the **MASTER FILES** list to the timeline as clips.
3. Order the clips as desired.

   You can click on a master in the **MASTER FILES** list and drag and drop it into the timeline as a clip, before or after other clips.

   You can click on a clip in the timeline and drag it to a new location (for example, before or after other clips).
4. Choose which master associated with a clip should be considered the primary master for the converted master.

   The primary master defines the metadata values to be used.

   Figure 43: Selecting the primary master

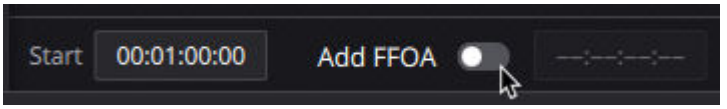


5. (Optional) Insert silence before or after any clips.
6. Set the composition start time.

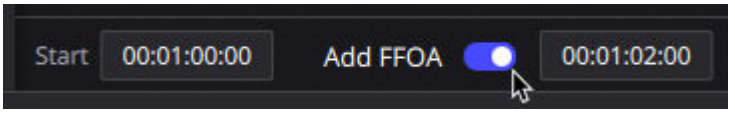
   In the **Composition** section, click in the **Start** field, and then set a valid composition start time.

   The start value must not result in the composition duration crossing the midnight (24 hour) boundary. Adjust the start time (or shorten the duration of the timeline), as needed.
7. (Optional) Set the FFOA in the **Composition** section by performing one of these steps:

   - If you want to not include the FFOA for master formats that support changing the FFOA, disable the **Add FFOA** switch.



   - If you want to set the FFOA for master formats that support changing the FFOA, enable the **Add FFOA** switch, and then set the FFOA.



     The FFOA must be the same as or later than the offset in the `.atmos` or `.wav` file, and before the last frame of the file.

     Note: Offset is the timecode value of the start of the master.

     The FFOA is the reference point for the start of picture that the audio needs to sync with, and is typically the starting point when encoding the audio. The FFOA is used as a reference point during frame rate conversion, so the audio will start at the same frame before and after conversion.

What to do next

Perform other composition edits, as needed, until you are ready to convert the composition into a single master.

7.10 Converting the format of a master file (Composition window)

Use the Conversion Tool application to convert one Dolby Atmos master file format to another.

Prerequisites

- Create a new conversion or new composition, and then import a master file.
- If converting with a composition, make sure that the master has been imported to the timeline (as a clip) in the **Composition** window.

About this task

You can convert the format of a master in the **Conversion** window or **Composition** window.

- Perform a new conversion (in the **Conversion** window):
  - When you do not need to change the length of the master, or change the start time
  - When you want to preserve source start and end timecodes that are on non–frame boundaries.
- Perform the conversion as a new composition (in the **Composition** window, in the timeline):
  - When you want to change the length of the master (for example, by trimming or inserting silence at the start of the master)
  - When you want to change the start time of the master
  - When it is acceptable for the source start and end times to extend to the nearest frame boundary, if on a subframe

Before performing a conversion, review these considerations:

- During conversion, the frame rate can also be converted. For example, you can change from the common cinema rate of 24 fps to a common home theater rate (such as 23.976 or 25 fps).
  - When changing the frame rate, you can choose to maintain the pitch and length of the source master (**Maintain pitch and length** switch set to **Yes**). Otherwise, the Conversion Tool performs a scaling of the playback speed by a specific ratio (see *Frame rate conversion ratios*).
  - When converting to a format that does not support the target frame rate, you will receive an **Unsupported frame rate** message that informs you that the frame rate has been changed.
  - After importing an `.rpl` into the composition, the source frame rate drop-down menu displays on the top-left side of the window. By default, this menu sets the target frame rate. It can also be used to change the target frame rate value, and to see the output start, end, and duration timecode for different frame rates.
- When converting to an `.mxf` (IMF IAB) master file:
  - If converting from a file that starts or ends between frames, the Conversion Tool will pad the start or end to the next frame and warn you. This is because the IMF IAB format requires all IMF IAB files to start and end on a frame boundary.
  - If converting from another format, the frame size is compressed in sections where the audio signal is silent (-120 dB or below). This may result in significant file size reduction.
  - The FFOA is not included.
  - You have the option to set the primary language.
- When converting to the `.atmos`, `.mxf` (IMF IAB), or `.wav` (ADM BWF) file format from an input `.atmos` (or `.damf`) or `.rpl` file, you can include a `.dbmd` metadata file with customized Dolby encoding parameters.

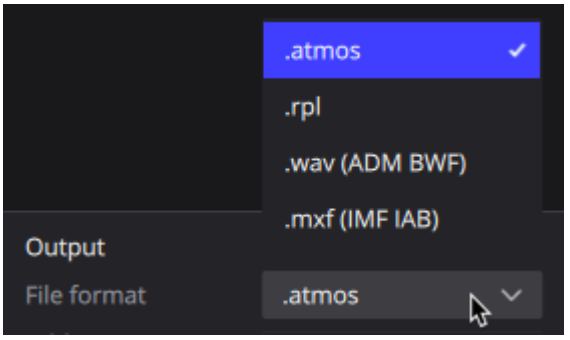
  Note: An `.atmos` master file set created with Renderer v3.2.x, 3.3.x, or 3.4.x automatically includes a `.dbmd` file. Before converting, you can manually update (or replace) the `.dbmd` file. Be sure to use the same file name so that it remains associated with the top-level `.atmos` file.

- If an invalid `.xml` (`pmstitch`) or other Dolby Atmos master file is imported, an error message is displayed. The error message indicates if the issue is with the `.xml` syntax or file path.
- The error message will indicate if the issue is with the .xml syntax or file path(s).

Procedure

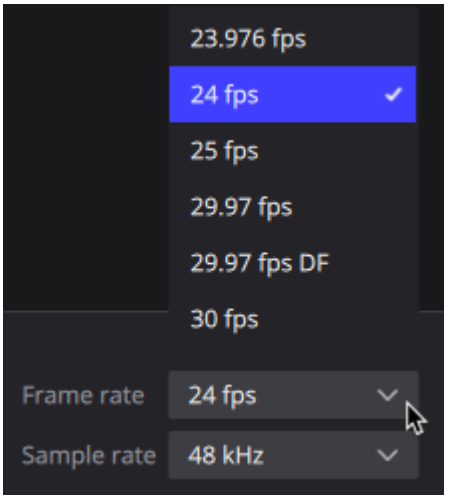
1. In the **Output** section, click the **File format** drop-down menu, and select the master file format that you want to convert to.

   Figure 44: Selecting the target file format

2. (Optional) If you want to apply frame rate conversion, perform these steps:
   a. Click the **Frame rate** drop-down menu, and select a target frame rate.

      Figure 45: Selecting the target frame rate

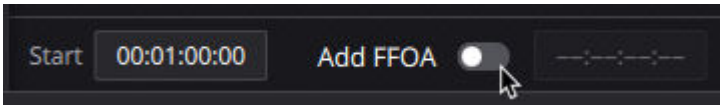
      

   b. Select whether you want to maintain the pitch and length of the source master.
      - Set **Maintain pitch and length** to **Yes** to maintain the pitch and length of the source master.

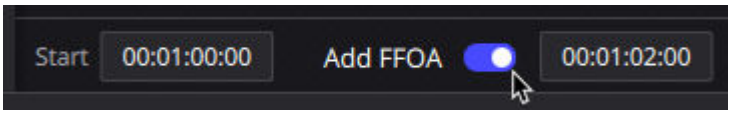
      - Set **Maintain pitch and length** to **No** to scale the playback speed by a specific ratio (see *Frame rate conversion ratios*). The audio duration and pitch will also change by the same ratio as the different source and target frame rates.
3. (Optional) If you want to convert the sample rate, click the **Sample rate** drop-down menu, and select a target sample rate.
4. (Optional) Set the FFOA by performing one of these steps:
   - If you want to not include the FFOA for master formats that support changing the FFOA, disable the **Add FFOA** switch.

     Figure 46: Disabling the Add FFOA switch

- If you want to set the FFOA for master formats that support changing the FFOA, enable the **Add FFOA** switch, and then set the FFOA.

  Figure 47: Enabling the Add FFOA switch

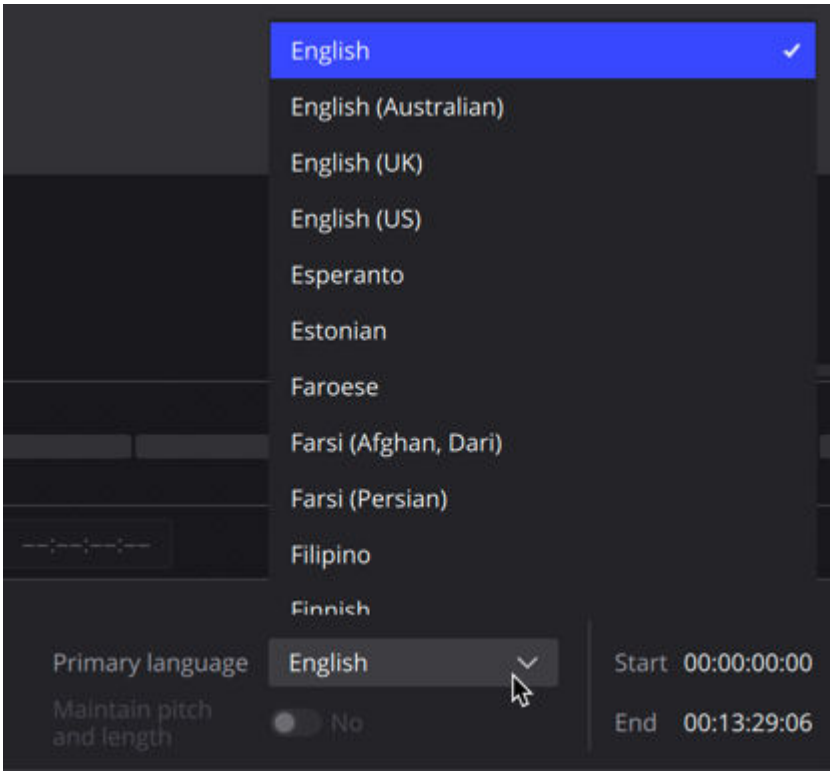
  The FFOA must be the same as or later than the offset in the `.atmos` or `.wav` file, and before the last frame of the file.

  Note: Offset is the timecode value of the start of the master.

  The FFOA is the reference point for the start of picture that the audio needs to sync with, and is typically the starting point when encoding the audio. The FFOA is used as a reference point during frame rate conversion, so the audio will start at the same frame before and after conversion.

5. (Optional) If converting to `.mxf` (IMF IAB), set the primary language by performing one of these steps.

   Figure 48: Selecting the target primary language (IMF IAB only)

   - Click the **Primary language** drop-down menu, scroll to the desired language, and then click (highlight) a language.
   - Click in the **Primary language** field, highlight the existing text (if any), type the first letters of the desired language, scroll to the language, and then click (highlight) the language:
     - Pressing Escape returns the last selected language.
     - The field is not character sensitive. You can enter uppercase or lowercase characters to discover a language.

6. (Optional) If you want to set a new start time, change the value in the **Start** field.

   The start value must not result in the composition duration crossing the midnight (24 hour) boundary. Adjust the start time (or shorten the duration of the timeline), as needed.

What to do next
Perform other composition edits, as needed, until you are ready to convert the composition into a single master.

7.11 Converting a composition

After editing a composition, you can convert the composition to create a new Dolby Atmos master.

Prerequisites
You have created a new composition, imported one or more masters into the timeline, and have performed composition edits.

Procedure

1. Click the **Convert** button.
2. Select a file name and destination for the target file, and then click **Save** to begin the conversion process.
3. After the conversion completes and the **File exported successfully** message appears, click **Return to timeline**.
   This returns you to the **Composition** window, and the most recent clip and composition settings (as well as the most recent **MASTER FILES** list).

What to do next
You can continue to work in the **Composition** window, close the window, and create a new composition or conversion, or quit the tool.

8

Dolby Atmos master file formats

Dolby Atmos master file formats (or media files) include master files or file sets created in a home theater workflow, cinema print masters, and other related Dolby Atmos files.

The Dolby Atmos Conversion Tool supports the files noted in this documentation.

Dolby Atmos master file formats include:

- `.atmos`: Home theater master file set.
- `.damf`: Older (original) home theater master file set.
- `.mxf` (Cinema MXF): Encoded `.mxf` created with Dolby Atmos Renderer for Cinema software v4.0 or later, or Cinema Renderer (Cinema RMU) v1.6.x software. This file format is considered a mezzanine file format due to metadata quantization.
- `.mxf` (IMF IAB): Dolby Atmos IAB track file for IMF in a MXF container. This file format is considered a mezzanine file format due to metadata quantization.
- `.rpl`: Cinema print master and supporting files.
- `.wav` (ADM BWF): BWF file containing ADM metadata.

Special files used with Dolby Atmos master files

- `.dbmd`: Dolby Audio Metadata file that can contain customized Dolby encoding parameters supported when converting to the `.atmos`, `.mxf` (IMF IAB), or `.wav` (ADM BWF) file format from an input `.atmos` (or `.damf`), or `.rpl` file.
- `.xml` (pmstitch): `.xml` configuration file that was required for editing a master prior to Conversion Tool v2.x and the introduction of the composition feature. With v2.0 and later, the file can be imported when doing a new composition, and can be converted to the `.atmos`, `.mxf` (IMF IAB), `.rpl`, or `.wav` (ADM BWF) file format.

9

Primary languages supported by the Dolby Atmos Conversion Tool (IMF IAB only)

When converting to `.mxf` (IMF IAB) with the Dolby Atmos Conversion Tool application or command-line options, you can set the primary language.

This tables lists the languages provided with the UI **Choose primary language** drop-down menu and the respective codes for setting the primary language with command-line options. The default primary language is English.

Table 15: Languages and command-line codes for the primary language option

Language	Command-line code
Acoli	ach
Afrikaans	af
Albanian	sq
Arabic	ar
Arabic (Egypt)	ar-EG
Arabic (Lebanon)	ar-LB
Arabic (UAE)	ar-AE
Aramaic	arc
Armenian	hy
Azerbaijani	az
Bambara	bm
Bashkir	ba
Belarusian	be
Bengali	bn
Bosnian	bs
Bulgarian	bg
Burmese	my
Catalan	ca
Chechen	ce
Cheyenne	chy
Chinese (Cantonese)	yue
Chinese (Mandarin)	cmn
Chinese (Taiwanese Mandarin)	cmn-TW
Croatian	hr
Czech	cs

Table 15: Languages and command-line codes for the primary language option (continued)

Language	Command-line code
Danish	da
Dinka	din
Dutch	nl
Dzongkha	dz
Efik	efi
Elamite	elx
English [a]	en
English (Australian)	en-AU
English (UK)	en-GB
English (US)	en-US
Esperanto	eo
Estonian	et
Faroese	fo
Farsi (Afghan, Dari)	fa-AF
Farsi (Persian)	fa
Filipino	fil
Finnish	fi
Flemish	vls
French	fr
French-Canadian	fr-CA
Gaelic	ga
Georgian	ka
German	de
German (Austrian)	de-AT
Greek	el
Gujarati	gu
Hawaiian	haw
Hebrew	he
Hindi	hi
Hungarian	hu
Icelandic	is
Indonesian	id
Inuktitut	iu
Italian	it
Jamaican Patois	jam

Table 15: Languages and command-line codes for the primary language option (continued)

Language	Command-line code
Japanese	ja
Javanese	jv
Kannada	kn
Kazakh	kk
Khmer (Cambodian)	km
Kikuyu	ki
Kinyarwanda	rw
Kirghiz	ky
Korean	ko
Kurdish	ku
Lango (Uganda)	laj
Latin	la
Latvian	lv
Lingala	ln
Lithuanian	lt
Luxembourgish	lb
Maasai (Masai)	mas
Macedonian	mk
Malagasy	mg
Malay	ms
Malayalam	ml
Maltese	mt
Marathi	mr
Maya	myn
Mende	men
Mongolian	mn
Nepali	ne
Newari	new
Norwegian	no
Norwegian (Bokm ├Ñl)	nb
Norwegian (Nynorsk)	nn
Pashtu (Pashto, Pushto)	ps
Polish	pl
Portuguese	pt
Portuguese (Brazilian)	pt-BR

Table 15: Languages and command-line codes for the primary language option (continued)

Language	Command-line code
Punjabi	pa
Romanian	ro
Romansh	rm
Romany	rom
Russian	ru
Sami	smi
Scottish Gaelic	gd
Sanskrit	sa
Serbian	sr
Sinhala	si
Slovak	sk
Slovenian	sl
Somali	so
Songhai	son
Spanish	es
Spanish (Argentinian)	es-AR
Spanish (Castilian)	es-ES
Spanish (Chilean)	es-CL
Spanish (Latin American)	es-419
Spanish (Mexican)	es-MX
Swahili	sw
Swedish	sv
Swiss-German	gsw
Tagalog	tl
Taiwanese (Hokkien, Min Nan)	nan
Tamashek	tmh
Tamil	ta
Telugu	te
Thai	th
Tibetan	bo
Tonga	to
Turkish	tr
Tuvan	tyv
Ugaritic	uga
Ukranian	uk

Table 15: Languages and command-line codes for the primary language option (continued)

Language	Command-line code
Urdu	ur
Vietnamese	vi
Welsh	cy
Wolof	wo
Xhosa	xh
Yiddish	yi
Zapotec	zap
Zulu	zu

[a] Default

10

Performing tool operations with an .xml (pmstitch) file

On Mac and Windows systems, you can perform Dolby Atmos Conversion Tool operations (including trimming a master, inserting silence, and joining masters) by using an .xml (pmstitch) file that you import into a composition.

10.1 .xml (pmstitch) file considerations

The .xml (pmstitch) interface was originally designed to join (or stitch) multiple reels of a soundtrack for cinema release into a full-length print master. The same format is used in the Conversion Tool with additional capabilities as described in this documentation.

You can load an .xml (pmstitch) file directly into the Conversion Tool UI **Composition** window (Mac and Windows), or load the file into the Conversion Tool command-line application (Linux, Mac, and Windows).

Note: An .xml (pmstitch) file can include 48 kHz source masters only.

When joining masters that have different encoding metadata (either within a .dbmd metadata file or the master), you can specify which source master defines the metadata values to be used for the resulting master by setting the master as the primary master.

In the application, click on the **Primary** drop-down menu and select which master is the primary one. When using the command-line option, add primary="true" to the <source> element. For example:

```
<source primary="true">
```

10.2 .xml (pmstitch) elements and attributes

An .xml (pmstitch) file loaded into the Conversion Tool UI window (Mac and Windows), or passed into the Conversion Tool command-line application (Linux, Mac, and Windows), uses XML elements and attributes to define padding, joining, trimming, and other operations.

In an .xml (pmstitch) file, an element is a container that can hold text, elements, and attributes. Each element has a start and end entry (such as <config> and </config>). An attribute is a part of an element that defines properties of the element. An .xml attribute is always presented as a name=value pair (such as primary="true”).

<stitch>
Root element of the .xml (pmstitch) file. All .xml (pmstitch) files must start with <stitch> and end with </stitch>.

<config>
Contains the frame rate element.

<framerate>
Defines the frame rate of the source included in the operation. Valid values are all frame rates supported by the source master.

<sources>
Contains the elements and attributes for a list of source masters, including source and output settings.

<source>
Contains the elements and attributes for a source master, including source and output settings. When joining masters, the primary <source> element contains the primary="true” attribute.

<sources primary="true”>
Specifies which source master defines the metadata values to be used for the resulting master when joining masters that have different program-level metadata (such as .dbmd parameters).

<path>
Defines the absolute or relative path to the master file. The absolute path is the full location of the file starting with /volumes (Mac) or with the drive letter:\\ (Windows). If no full path is given, the Conversion Tool will interpret the path relative to the location of the .xml file and use the location of the .xml (pmstitch) file as a starting point.

<sourceStart>

Defines the start time of the source master in relation to the value of the start offset of the source master. For example, if the source master starts at 1:00:00:00, this value can be set to 1:00:08:00 to skip the first eight seconds of the content or 00:59:58:00 to add two seconds of silence to the start.

This element is required, unless joining two adjacent masters with no trimming and no gap, in which case the <sourceStart>, <outputStart>, and <outputEnd> should not be included for all masters.

Note: The timecode is interpreted in the context of the <framerate> value.

<outputStart> (or <start>)

Defines the timecode value of the start offset of the target master.

This element is required, unless joining two adjacent masters with no trimming and no gap, in which case the <sourceStart>, <outputStart>, and <outputEnd> should not be included for all masters.

- If <outputEnd> is specified to be after the <outputStart> of the next source, it will be disregarded and the next source <outputStart> field will be used instead.
- If the <count> number of repetitions extends beyond the start of the next source, the repetitions will be truncated by the next source <outputStart> value.

Note: The timecode is interpreted in the context of the specified frame rate.

Note: With Dolby Atmos Conversion Tool v1.8, <start> and </start> were renamed to <outputStart> and </outputStart>, respectively, to better describe their function.

<outputEnd> (or <end>)

Defines the timecode value of the last frame of this section of the target master, exclusively. For example, if the start timecode is set to 1:00:00:00 and end timecode is set to 1:00:08:01, the target master will be 00:00:08:01 at 24 fps.

This element is required, unless joining two adjacent masters with no trimming and no gap, in which case the <sourceStart>, <outputStart>, and <outputEnd> should not be included for all masters.

When joining adjacent masters with no trimming and no gap, the absence of an <outputEnd> value means that the start of the second master determines the length of the previous master. If this is the last master being joined, then the file will go until the end of its duration.

Note: The timecode is interpreted in the context of the specified frame rate.

Note: With Dolby Atmos Conversion Tool v1.8, <end> and </end> were renamed to <outputEnd> and</outputEnd>, respectively, to better describe their function.

<count>

Defines the number of times the current print master is repeated in the target master. For example, if the source master is one second of silence, to get five seconds of silence in the target master, the source print master may be repeated five times by specifying a count of five.

10.3 .xml (pmstitch) file examples for Dolby Atmos Conversion Tool operations

Dolby provides .xml (pmstitch) file examples for use when creating a new .xml configuration file for padding a master, joining together masters, or trimming a master. The examples can also be used to create .xml files for other tool operations (such as converting the master file format).

You can find examples and supporting media files online, at https://professionalsupport.dolby.com/s/article/Where-can-I-find-more-examples-of-pmstitch-xml-files.

An .xml (pmstitch) file configured for a tool operation can be imported into the Dolby Atmos Conversion Tool user interface composition (Mac and Windows), or can be used with the Conversion Tool command-line application (Linux, Mac, and Windows).

10.4 Preparing an .xml (pmstitch) file for a supported Dolby Atmos Conversion Tool operation

Prior to using an .xml (pmstitch) file to perform a tool operation, you need to create and edit the file.

Prerequisites

XML or plain text editor such as TextEdit (on Mac) or Microsoft Notepad (on Windows). If creating the file for use in Linux (with the Dolby Atmos Conversion Tool command-line option), use a Linux text editor (such as gedit).

About this task

This task creates an .xml (pmstitch) file for use when performing a tool operation with either the Dolby Atmos Conversion Tool GUI application (on Mac or Windows), or with the Dolby Atmos Conversion Tool command-line application (Linux, Mac, or Windows).

Note: An .xml (pmstitch) file can include 48 kHz source masters only.

Procedure

1. Create an .xml (pmstitch) file, or open one of the .xml (pmstitch) example files supplied by Dolby.
2. Include the lines shown in the example file, as needed.

Figure 49: Example: Trimming a master file

```
<stitch>
    <config>
        <framerate>24</framerate>
    </config>
    <sources>
        <source>
        <!--original start 00:59:58:00
            original end 01:20:00:00
            original duration 00:20:02:00
            operation:
                trims 2 seconds from head (removes 2pop)-->
            <path>/Volumes/Media/DACT_Sample_Media/Reel1_w2pop/Reel1_w2pop.atmos</
path>
            <sourceStart>01:00:00:00</sourceStart>
            <outputStart>01:00:00:00</outputStart>
            <outputEnd>01:00:20:00</outputEnd>
        </source>
    </sources>
    <!--Finished file duration is 00:20:00:00-->
</stitch>
```

Note: If joining masters, repeat the layout text between the <source> and </source> lines for each additional source master (clip). Additionally, make sure that all clips to be joined were created using the same frame rate to ensure proper audio/video (A/V) sync in the output master. If the frame rates do not match, the conversion will result in an error message.

Figure 50: Example: Joining multiple masters

```
<stitch
    <config>
```

```
        <framerate>24</framerate>
    </config>
    <sources>
        <!--This example illustrates joining together film reels-->
              <source primary="true">
            <path>/Volumes/Media/DACT_Sample_Media/Reel1/Reel1.atmos</path>
            <sourceStart>01:00:00:00</sourceStart>
            <outputStart>01:00:00:00</outputStart>
            <outputEnd>01:20:00:00</outputEnd>
        </source>
        <source>
            <path>/Volumes/Media/DACT_Sample_Media/Reel2/Reel2.atmos</path>
            <sourceStart>02:00:00:00</sourceStart>
            <outputStart>01:20:00:00</outputStart>
            <outputEnd>01:40:00:00</outputEnd>
        </source>
        <source>
            <path>/Volumes/Media/DACT_Sample_Media/Reel3/Reel3.atmos</path>
            <sourceStart>03:00:00:00</sourceStart>
            <outputStart>01:40:00:00</outputStart>
            <outputEnd>02:00:00:00</outputEnd>
        </source>
        <source>
            <path>/Volumes/Media/DACT_Sample_Media/Reel4/Reel4.atmos</path>
            <sourceStart>04:00:00:00</sourceStart>
            <outputStart>02:00:00:00</outputStart>
            <outputEnd>02:20:00:00</outputEnd>
        </source>
    </sources>
</stitch>
```

3. In the <config> section, verify the frame rate matches the frame rate of the master (if available), or change it if desired.

   If working with an .atmos master, and you do not know the frame rate of the master, open the .atmos file with a text editor, and look at the fps value.
4. In the <sources> section, update the <path> for the master folder and file, and then the <sourceStart>, <outputStart>, and <outputEnd> parameters, based on whether you are trimming or padding the master, joining masters, or doing another operation.

   Note: If joining masters, edit the <sources> section parameters for each source master.

   - <path>: Enter the location of the master folder and file (.atmos, .rpl, or .wav). Use the absolute path to the file.

     If you do not use the absolute path, ensure that the .xml (pmstitch) file is in the source directory of the master that will be converted.
   - <sourceStart>: This timecode represents the offset value into the source content. Use this timecode to set the amount of trim or padding at the front of a single master, or any master when joining multiple masters.

     Source master offset is the value of the offset field in .atmos files, offset field in .rpl files, and audioProgramme start value for .wav (ADM BWF) files.

     - To trim the front of a master, set the <sourceStart> to a value larger than the source master offset (but less than 24 hours, such as 23:59:59:23 for 24 fps and 23:59:59:29 for 30 fps).
     - To add padding (silence) to the front of a master, set the <sourceStart> to a value less than the source master offset (but not less than 0).
     - To add no trimming or padding, set the <sourceStart> to the same value as the source master offset.

     Note: When joining masters, the <sourceStart> for each master should correspond to the first videoFrame. The master will be trimmed by the difference between the source offset and the FFOA.

   - <outputStart> and <outputEnd>: These timecode values define the range of the output file. Use this range to set the amount of trim or padding at the end of a master, or to define the start and end of each master to be joined.

When joining adjacent masters, if the end of the first clip comes after the start of the next clip, the start of the second clip is used to determine the length of the first clip.

- To trim the end of a single master, set the <outputStart> and <outputEnd> to define a range that is less than the length of the file, based on the <sourceStart> timecode.
- To add padding to the end of a single master, set the <outputStart> and <outputEnd> to define a range that is greater than the length of the file, based on the <sourceStart> timecode.
- To join two adjacent masters with a gap of silence, set the <outputEnd> of the first master to a value less than the start of the next master by a value greater than one frame.
- To join two adjacent masters with a data overlap, set the <outputStart> of the second master to a value less than the end of the first master. This trims the length of the first master by the amount of the overlap.
- To join two adjacent masters with no trimming and no gap, do not include the <sourceStart>, <outputStart>, and <outputEnd> for all masters.

5. (Optional) Add <count>.

   The <count> field sets the number of times the source will be added to the target master (output file) back-to-back. If you include this field, always set it to a value greater than 1. Setting the field to 1 has no effect. When <count> is not included in the file, the parameter defaults to 1.

6. Save the file as an .xml (pmstitch) file.

11

Performing tool operations with command-line options

The Dolby Atmos Conversion Tool command-line application and options let you perform tool operations from a dedicated command-line program on Linux, Mac, and Windows operating systems.

11.1 Command-line application capabilities

The Dolby Atmos Conversion Tool command-line application supports using a command-line program to perform conversion tool operations, including stitching together Dolby Atmos master files.

The Dolby Atmos Conversion Tool command-line application supports these tool operations:

- Converting from one Dolby Atmos master file format to another

  Note: The command-line application supports converting to or from a 48 kHz master file format. Additionally, the tool supports various conversions from or to a 96 kHz (see *Sample rate considerations*).

- Changing the frame rate of a Dolby Atmos master file
- Changing the sample rate of a Dolby Atmos master file, and selecting whether to maintain pitch and length.
- Changing the FFOA of a Dolby Atmos master file
- Changing the primary language of a Dolby Atmos IMF IAB master
- Converting to `.atmos`, `.mxf` (IMF IAB), or `.wav` (ADM BWF) with a modified `.dbmd` metadata file, from an `.atmos` (or `.damf`) or `.rpl` file.
- Trimming or padding a single master (without adding any other segments)
- Stitching multiple masters together

  When stitching, you can mix together these Dolby Atmos master formats:

  - `.atmos` files
  - Cinema MXF `.mxf` files
  - `.mxf` (IMF IAB) files
  - `.rpl` files
  - `.wav` files

11.2 Command-line options

You can modify operations with command-line options. An additional option displays help.

Table 16: Dolby Atmos Conversion Tool command-line options

Options	Shortcut	Description
`--help`	-h	Displays help (full list of Dolby Atmos Conversion Tool command-line options).
`--version`	-v	Displays the application version, and exits the application.
`--verbose`	-V	Enables verbose information for debugging.
`--pm_in arg`	-i	Specifies the path to the input Dolby Atmos master file.
`--output_path arg (=.)`	-o	Specifies the output path for the audio and metadata files. The default is the current working directory.
`--output_format arg (=atmos)`	-f	Specifies the output file format: `.atmos`, `.mxf`, `.rpl`, or `Waveform Audio Format`.
`--source_fps arg`		Specifies the frame rate of the source master file, in frames per second (fps). This option will set the frame rate of the source master file that does not specify one. Valid values are dependent on the frame rate supported by the source master. They can include 23.976, 24, 25, 29.97, 29.97df, and 30 fps.

Table 16: Dolby Atmos Conversion Tool command-line options (continued)

Options	Shortcut	Description
`--target_fps arg`		Specifies the frame rate of the target master file. Valid values are dependent on the frame rate supported by the target master. They can include 23.976, 24, 25, 29.97, 29.97df, and 30 fps. Numbers near 23.976 and 29.97 will be rounded to (24 × 1,000) ÷ 1001 and (30 × 1000) ÷ 1001. If this value is equal to the frame rate in the source file, frame rate conversion is bypassed and the tool does a format conversion only.
`--no_ffoa arg`		Specifies to not include FFOA when creating the new master.
`--ffoa arg (=-1)`		Specifies FFOA. If none is specified, the source master FFOA will be used.
`-l [ --primary_ lang ] arg`		Specifies IMF IAB sound field primary spoken language as RFC 5646 code value. Applicable only for MXF output format. If none is specified for an input MXF master, its primary language is passed through to the output. If none is specified for all other master types, "en" will be used. See *Primary languages supported by the Dolby Atmos Conversion Tool (IMF IAB only)*.
`--list_languages`		Displays full list of supported RFC 5646 primary spoken language codes.
`--quality arg (=0)`		Specifies the quality of sample rate conversion [0=best_quality - 4=linear] during frame rate/sample rate conversion.
`--disable_ multithreading`		Disables multithreading and uses a single thread for the resampling during frame rate/sample rate conversion.
`--bypass_resampling`		Disables resampling of the audio content during a frame rate conversion (resampling only happens for sample rate conversions if needed).
`--target_sample_rate arg (=48000)`		Specifies the sample rate in Hz of the target master, valid options are: 48000 or 96000. Valid sample rate conversions: • 48000 All formats -> 48000 All formats • 96000 `.atmos`, ADM BWF -> 48000 .atmos, ADM BWF, IMF IAB • 96000 `.atmos`, ADM BWF -> 96000 ADM BWF
`--set_warp_mode arg`		Specifies the warp mode for the target master. Valid options: • downmix_loro, Standard (Lo/Ro) • downmix_pliix, Dolby Pro Logix IIx • warping, Direct render with room balance • normal, Direct render
`--trim_start arg (=0)`		Trims n seconds from the beginning of the input master. Applied before prepending or appending silence.
`--trim_duration arg (=0)`		Trims input master to n seconds after the defined start. Applied before prepending or appending silence.
`--prepend_silence arg (=0)`		Prepends n seconds of audio silence to the beginning of the input master.
`--append_silence arg (=0)`		Appends n seconds of audio silence to the end of the input master.

11.3 General steps for command-line tasks

The procedures for using command-line options include two general steps, both of which are system dependent: opening the command-line program and navigating to the Dolby Atmos Conversion Tool command-line application.

11.3.1 Opening the CLI

When working with Linux (desktop), Mac, or Windows, you will need to open a CLI before you use the Dolby Atmos Conversion Tool command-line application. When working with the server version of Linux, there is no program to open.

Procedure

Perform the step for your operating system:

- Linux (desktop version): Open the terminal window by pressing Ctrl + Alt + T.
- Mac: Open the Terminal application (located in the `/Applications/Utilities` folder).
- Windows: Open the **Command Prompt** from the **Run Window**.

11.3.2 Navigating to the Dolby Atmos Conversion Tool command-line application

The step for navigating to the Dolby Atmos Conversion Tool command-line application is dependent on your operating system.

Procedure

Perform the step for your operating system:

- Linux: Type `cd` followed by the path where the `cmdline_atmos_conversion_tool` binary is located. For example: `cd /usr/bin/cmdline_atmos_conversion_tool`.
- Mac: Type `cd "/Applications/Dolby/Dolby Atmos Conversion Tool/"`.
- Windows: Type `cd "Program Files\Dolby\Dolby Atmos Conversion Tool"`

11.4 Using an .xml pmstitch file with command-line options

You can use an `.xml` (`pmstitch`) with the command line interface to perform a Dolby Atmos conversion workflow.

About this task

This operation requires using an `.xml` (`pmstitch`) file and running the Dolby Atmos Conversion Tool command-line application to create the new master.

Procedure

1. Open the command-line program if working with Linux (desktop version), Mac, or Windows.

   Skip this step if you are working with the server version of Linux.
2. On a command-line, navigate to the Dolby Atmos Conversion Tool command-line application (`cmdline_atmos_conversion_tool`).
3. Enter the commands for creating a new master:

   On a command line, type the commands to start the Dolby Atmos Conversion Tool command-line executable (`cmdline_atmos_conversion_tool`), add `--pm`, and then specify the location name of the source `.xml` file, followed by the `--output path` and the master file path. Provide additional commands, as desired.

   Example:

In this example, the source file path is defined in the `.xml` file, and the output path will be the current working directory (which in this case, is the same folder as the `.xml` file). The master will be a home theater .atmos master file set:

- Linux or Mac: `./cmdline_atmos_conversion_tool --pm_in example.xml --output_pathexample.atmos`
- Windows: `cmdline_atmos_conversion_tool.exe --pm_in example.xml --output_pathexample.atmos`

Example:

In this example, the source file path is defined in the `.xml` file, and the output path will be the current working directory (which in this case, is the same folder as the `.xml` file). The master will be a `.wav` (ADM BWF) master, with a first frame of action at 3600 seconds (01:00:00:00):

- Linux or Mac: `./cmdline_atmos_conversion_tool --pm_in example.xml --output_pathexample.wav --output_format wav --ffoa 3600`
- Windows: `cmdline_atmos_conversion_tool --pm_in example.xml --output_pathexample.wav --output_format wav --ffoa 3600`

4. Verify that the destination path directories you are using are not the directories where the source files are located.

   ⚠ **Caution:** Double-check the destination path before pressing Enter in the next step. Using the same path as your source files is destructive. (It will overwrite the existing files.)

5. Press <Enter> to begin the operation.

   Successful completion is indicated with an information message.

6. When the path to the Dolby Atmos Conversion Tool command-line application directory returns to the screen, you can perform more operations or close the command-line program.

Glossary

A/V
Audio/video.

ADM BWF
Audio Definition Model Broadcast Wave Format.

audio definition model
A metadata model specified in ITU-R BS.2076 that describes the content and format of audio files.

BWF
Broadcast Wave Format. An extension of the Microsoft Waveform Audio File Format (.wav) that includes metadata important to broadcast applications. This format is specified in EBU Tech 3285.

CLI
Command-line interface.

container
A formatted file (such as an MP4 file) comprising one or more multiplexed elementary streams and including format-specific metadata.

DAW
Digital audio workstation. An electronic device or computer software application used to record, edit, and produce audio files.

DCP
Digital Cinema Package. A packing list (PKL) file and all of the files that it references.

Dolby RMU
Dolby Rendering and Mastering Unit.

FFOA
First frame of action. The point on a film reel or corresponding file at which the program content begins.

fps
Frames per second. Measurement unit of frame rate.

frame rate
The number of frames decoded per second in real-time operation.

GUI
Graphical user interface.

IAB
Immersive audio bitstream. A frame-based audio bitstream that includes audio channels and/or audio objects, plus metadata.

IMF
Interoperable Master Format. A SMPTE standard that defines an interoperable, file-based framework designed to facilitate the management and processing of multiple versions of the same high-quality finished work. See SMPTE ST 2067-2 and related documentation.

immersive stereo
A technology that delivers a virtualized immersive experience to headphones or stereo speakers through a Dolby AC-4 bitstream with appropriate stereo content and metadata that converts the stereo signal into the virtualized experience.

ITU
International Telecommunication Union.

Line mode
A dynamic range control (DRC) mode that applies metadata with a target dialogue level of -31 dBFS.

Lo/Ro
Left only/Right only. A stereo representation that preserves separation of Left Surround and Right Surround channels in conversion from a surround format, and is also mono compatible.

Lt/Rt
Left total/Right total. A stereo representation that can be converted to the Left, Center, Right, and Surround channels of a surround format.

mezzanine
Audio or video signals with an intermediate amount of compression for transport and distribution. These lightly compressed signals are smaller in size but have enough quality for multiple compression and decompression cycles in a postproduction chain without producing obvious artifacts. In video, the signal is converted from the source during the color grading and mastering process. In audio, the signal is converted during the ingestion process. Ingestion and conversion of audio and video may occur simultaneously or separately, depending on the situation and workflow.

MXF
Material Exchange Format. A file format used to transfer and store different types of content (for example, audio, video, data, or metadata). MXF currently supports various compression and encoding formats, and its specification can be extended to new essence formats, if needed.

object
An audio signal plus associated object audio metadata.

rendering
Processing of audio content to adapt it to specific speaker layouts, such as 5.1- and 7.1-speaker feeds, or headphones and sound bars.

SMPTE
Society of Motion Picture and Television Engineers.

substream
A decodable unit that represents a specific channel configuration (mono, stereo, or 5.1) and contains audio data and corresponding metadata.

UI
User interface.

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