



Working With Audio



## Working With Audio

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DaVinci Resolve has simple, but effective, features for working with audio in your timelines. Whether you're adjusting synced audio for dailies, finessing the levels of an edited project you're assembling, or importing and laying in audio mix files from the sound designer to output for mastering, DaVinci Resolve has Level, Pan, and Channel Assignment controls that let you control your audio output for both monitoring and delivery.

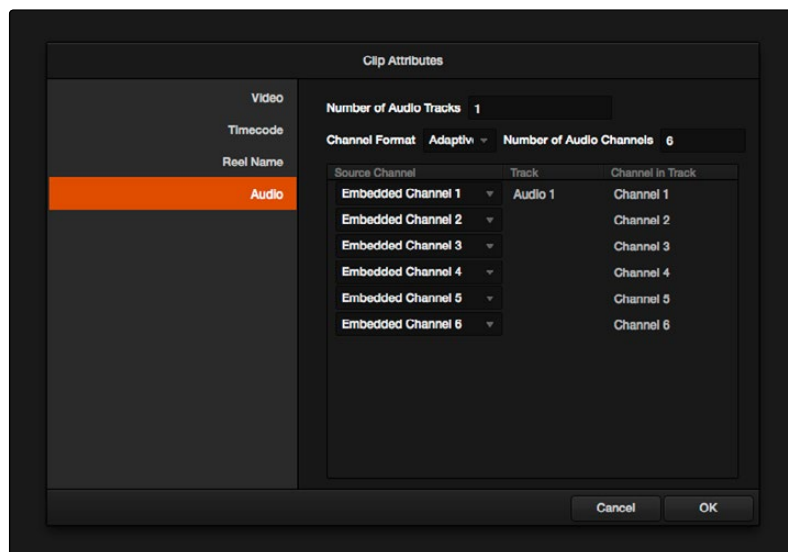
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## Assigning Audio Channels in the Media Pool

When you first import audio into the Media Pool, it's a good idea to make sure that whatever channels those files contain are assigned correctly before you start editing clips into the Timeline. In other words, you want to make sure that stereo files are set to be stereo clips, that 5.1 files are set to be surround clips, and that multi-channel files are set to expose however many channels you want to actually use in your program.

This is particularly important when clips have more than two channels of audio. For example, production sound recordists might record six or more audio channels, corresponding to a variety of microphones on set along with a pair of mixdown tracks. In this case, you need to define how many of these channels you want to actually play back in the Timeline. In this case, you might choose to only work with the two mixdown channels.

Clip channel assignments are made in the Audio panel of the Clip Attributes window, in the Media page.



The Channels controls in the Audio panel of the Clip Attributes window

Mono, stereo, and 5.1 clips are handled automatically, but multi-channel clips needing custom assignments in the Media Pool should be taken care of immediately, so that DaVinci Resolve can more easily place incoming audio clips into the correct track of the Timeline.

Each clip has the following options:

- **Number of Audio Tracks:** The number of source clip channels is given here; you can also change this value to redefine how many audio channels are mapped to the Edit timeline, excluding channels you don't want to use.

- **Channel Format:** Select Stereo, Mono or 5.1 as appropriate for your clip. The selected channel format determines how many channels appear in the Source Channel list below.
- **Source Channel list:** Each channel defined by the Channel Format setting presents an item on this list; a pop-up menu lets you select which source clip channel is routed to each of the tracks presented in the Timeline, and will determine how audio is output via the Audio Mixer.

You can alter the clip attributes for clips one at a time, or for multiple selected clips at once. For more information on these settings, see “Changing Clip Attributes” in Chapter 4, “Media.”

## Working With Audio Clips in the Timeline

A separate set of audio tracks contains the audio portion of video clips, as well as any stand-alone audio files that might be imported along with an AAF or XML file, or that you edit into the Timeline yourself.

### Editing Audio Into the Timeline

In the Edit page, opening an audio-only clip into the Source Viewer results in a split view of the waveform, with the complete waveform shown in the bottom half, and a zoomed in view of the waveform in the top half. This makes it easy to find the section of audio you need relative to the entire clip, and yet still place In and Out points with great precision.

You can set In and Out points for audio clips just like any other clip, in preparation for editing. However, the audio of clips with a particular number of audio channels must be edited into a Timeline track that is compatible with the number of audio channels you're editing.



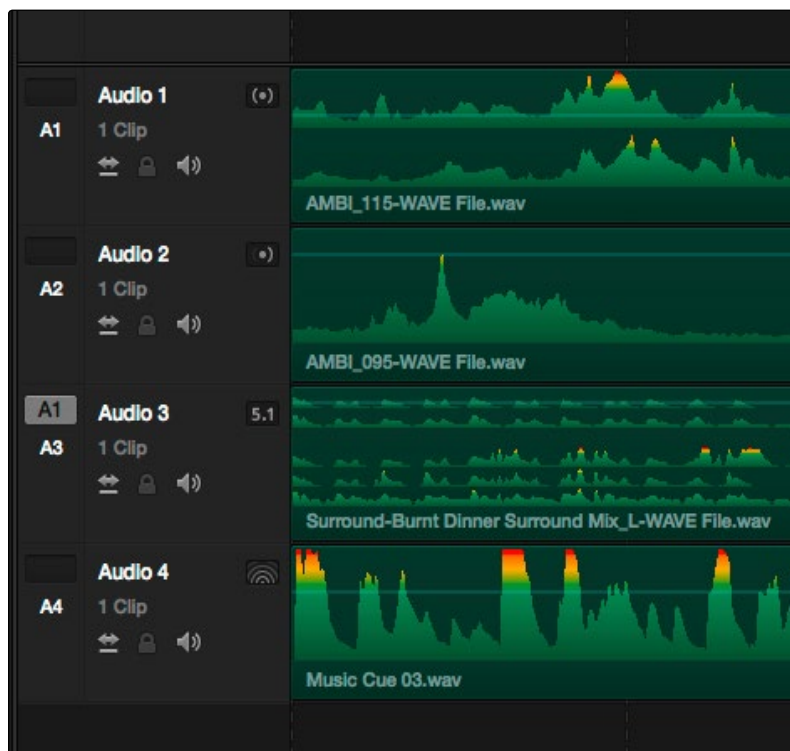
An audio clip opened into the Source Viewer

### Understanding Multi-Channel Timeline Tracks

All multi-channel audio clips are fit into a single audio track that's set to accommodate the number of channels within that clip. This means that whether an audio clip is stereo, 5.1, or has an arbitrary number of channels that were recorded in the field, it will fit into the Timeline as a single clip on a single track.

When you first create a new audio track, you have to choose what kind of audio track it will be. Right-clicking in the bottom audio portion of the Timeline track header reveals a contextual sub-menu that lets you create one of three different kinds of audio tracks.

- **Adaptive:** Capable of holding up to 16 audio channels. An adaptive audio track can hold many different clips with different combinations of channels, up to the maximum number of channels allowed to that track. The number of channels allowable on a particular Adaptive track is user-definable (1–16) at the time that track is created. If you edit a clip with more channels into an Adaptive track that was created to hold fewer channels, the extra channels are ignored.
- **Mono:** Holds a single channel.
- **Stereo:** Holds stereo left and right channels. Stereo tracks can be panned.
- **5.1:** Holds the six channels corresponding to a 5.1 surround mix: left, center, right, surround left, surround right, and LFE.



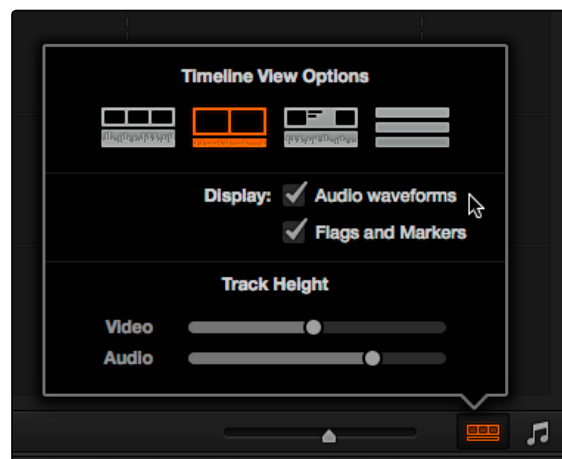
Four audio tracks with each type of audio track shown. From the top down, Stereo, Mono, 5.1, Adaptive

If you edit a multi-channel audio clip into a Timeline that doesn't have the correct type of track, a new audio track will be automatically created with the closest appropriate channel count. However, if you want to exert the most control over the organization of the Timeline, it's best to make the appropriate clip assignments in the Media page first, and then set up your Timeline with audio tracks of the appropriate type.

**Note:** It is not possible to change what type of channels a track is set up for after it's been created.

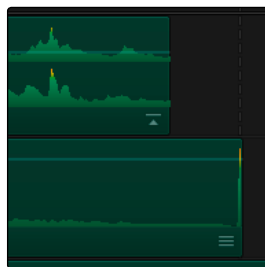
## Displaying Waveforms in the Timeline

The Timeline View options palette lets you turn Audio Waveform display on and off via a checkbox.



The Audio Waveform display option in the Timeline View pop-up

While audio waveforms are displayed, a small button in the lower right-hand corner of multi-channel audio clips lets you toggle between seeing a single averaged waveform that represents that clip's Audio, and seeing each individual waveform in a vertical stack.



Top: Stereo audio drawn as individual waveforms.

Bottom: Audio channels drawn as a single averaged waveform

Whenever you cut an audio clip, you cut all audio channels with it. Audio channels cannot be individually edited, but audio channels can be enabled and disabled individually using the Clip Attributes command in the Media Pool. For more information, see “Changing Clip Attributes” in Chapter 4, “Media.”

## Setting Clip Levels and Pan in the Inspector

Each clip has individual Level and Pan parameters, accessible in the Inspector when an audio clip is selected.



The Volume and Pan parameters available for audio clips in the Inspector

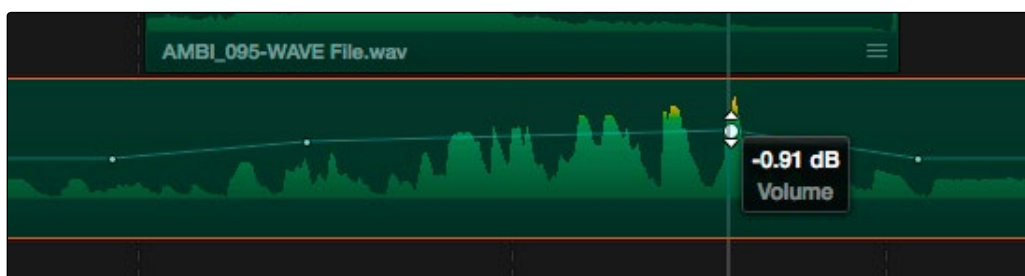
Selecting an audio clip in the Timeline and adjusting its Volume or Pan only alters that clip, which lets you set basic levels for individual clips in your program.

## Keyframing Audio

There are two ways you can keyframe audio in the Edit page. You can use each clip's Level Curve in the Timeline, or you can use the keyframe controls in the Inspector to animate the Volume or Pan of individual clips as you would any other clip attribute, fading the level up or down, or panning from left to right. For more information on keyframing in the Edit page, see Chapter 7, "Edit Page Effects." Any Volume keyframes you create using the Keyframe controls of the Inspector automatically appear on the Volume Curve of that audio clip in the Timeline.

## Using Level Curves

Each audio clip in the Timeline appears with a green curve control overlaid on top of it, that by default starts out completely flat. Similar to such controls found in other applications, the Level Curve lets you alter each clip's volume, either overall, or dynamically using keyframes.



Level curves adjusting the level of a clip's audio in the Timeline



### Methods of adjusting Volume curves

- To adjust any level curve segment, position the pointer on top of the curve segment you want to raise or lower, and when the move cursor is displayed, click and drag up to raise the level, or down to reduce the level.
- To add keyframes to the level curve, hold the Option key down and click the curve to place a keyframe at that frame. You must add at least two keyframes to create an automated change in volume.
- To adjust keyframes on a level curve, move the pointer over a keyframe so that the four-way cursor appears, and then click and drag in the intended direction of adjustment, either vertically to change the volume of the clip at that frame, or horizontally to move the keyframe to a different point in time. Once you start dragging a keyframe into a particular direction, keyframe movement is constrained in that direction until you release that keyframe.
- To delete keyframes from a level curve, open the Inspector, move the playhead to the frame of the keyframe you want to delete, and click the orange Keyframe button to make it disappear.

### Audio Fade Handles

When you position the pointer directly over an audio clip, a pair of Audio Fade handles appear at the In and Out points. Dragging each of these handles towards the center of the clip lets you fade in the clip volume at the beginning of the clip, and fade out the clip volume at the end of the clip.

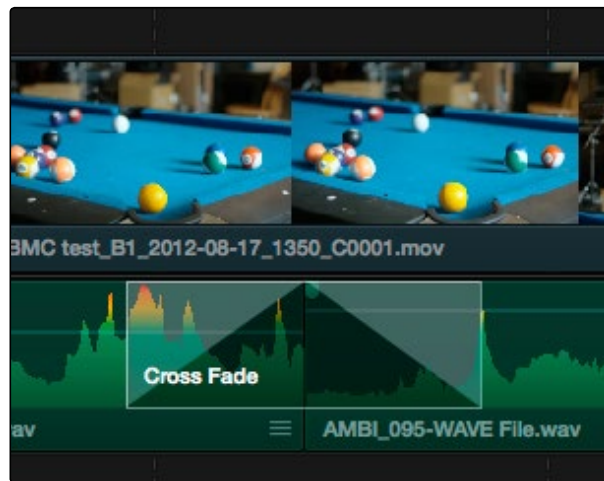


Audio Fade handles at either end of an audio clip

**Note:** When you import a Final Cut Pro X project, the fade handles for each clip automatically import as well.

## Audio Crossfades

You can also add Cross Fade transitions to any edit point between two overlapping audio clips. Cross Fade transitions fade the volume of the outgoing clip down while simultaneously fading the volume of the incoming clip up, letting you create a smooth aural transition between two audio clips.



An audio Cross Fade transition applied between two clips

You can double-click a Cross Fade transition to open it into the Inspector, revealing the following parameters:

- **Duration:** The duration of the transition, shown in both seconds and frames.
- **Alignment:** A pop-up that lets you choose the transition's position relative to the edit point it's applied to. Your choices are "End on Edit," "Center on Edit," and "Begin on Edit."
- **Transition style:** For Cross Fade transitions, there is only one style available.
- **Fade In/Fade Out levels:** There are three options that affect the incoming and outgoing halves of the Cross Fade effect independently. 0dB applies a linear fade. +3dB applies a boosted curve; when applied to both Fade In and Fade Out, this can compensate for diminished levels in the middle of a Cross Fade. -3dB applies an attenuating curve, which deliberately lowers the level of the Cross Fade.

## The Audio Mixer

The Audio Mixer provides a set of graphical controls you can use to set levels, pan stereo audio, and mute and solo tracks, while you work. The Audio Mixer can only be opened from the Edit page.

To open the Audio Mixer:

Choose View > Audio Mixer.

The Audio Mixer exposes channel strips with controls for the tracks in the Timeline, one for each track, plus an Output strip that adjusts the overall level of the mix.



The Audio Mixer, with three channel strips corresponding to the three tracks in the Timeline

### Track Mixing vs. Clip Mixing

How the Audio Mixer functions depends on the mode pop-up menu at the upper right-hand corner. There are two modes, Track and Clip:

- **Track Mode:** While in Track mode, each channel strip's controls affect the audio of every single clip on a particular track. Furthermore, the Channels pop-up menu corresponding to the Output controls lets you define how many channel outputs you're sending to your A/V output device for monitoring, and Channels pop-up menus for each audio track let you assign which output channels that track is mapped to.

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- **Clip Mode:** While in Clip mode, each fader's controls affect only the clip in each track that intersects the playhead at that time. Using the Audio Mixer in this mode when a clip is keyframed results in additional keyframes added to whichever clip intersects the playhead on the track being adjusted.

There are entirely separate controls for making track-based audio adjustments. These can be accessed via the pop-up at the upper right-hand corner of the Audio Mixer.

## Audio Mixer Controls

Each track's channel strip has the following controls:

- **Name:** The name of the audio track that channel strip corresponds to.
- **Mute:** Mutes that track. Orange when enabled.
- **Solo:** Mutes all tracks other than ones that are soloed. Blue when enabled.
- **Stereo/Mono toggle:** This button toggles that track between Stereo mode (the button is highlighted orange, channels are shown as "1 + 2") or Mono mode (the button is gray, channels are shown as "1, 2"). In Stereo mode, stereo panning is enabled. In Mono mode, stereo panning is disabled.
- **Send pop-up:** Reveals a set of checkboxes that lets you send that track's audio to multiple outputs. 5.1 tracks have a button that opens a Channel Output Mapping window with pop-ups to map each of the six 5.1 audio channels. The settings you choose here determine how audio is output when rendered or output to tape in the Deliver page.
- **Pan knob:** Lets you pan a Mono channel's audio from left to right, or invert a Stereo channel's left and right audio channels. The pan knob is disabled for 5.1 tracks.
- **Fader:** A vertical slider that lets you adjust the volume of the channels on that track.
- **Weighted dBFS audio meters:** Audio meters to the right of each fader display the audio volume of all channels on that track during playback. Each channel strip has individual meters corresponding to the number of channels that track has been set to accommodate.

The Output strip has the following controls:

- **Mute:** Mutes all audio playback from all tracks.
- **Output pop-up:** (Only enabled in Track mode) Lets you set how many channel outputs of the available A/V interface are available for audio assignments.
- **Fader:** A vertical slider that lets you adjust the volume of the entire mix.
- **Weighted dBFS audio meters:** Audio meters display the audio volume of the entire mix during playback. The number of individual meters corresponds to the number of outputs that have been selected.

The controls of the Audio Mixer cannot currently be automated.

## Disabling Track Audio vs. Muting Tracks

When you use the mute or solo controls of the Audio Mixer, track audio is disabled during playback. However all muted (or non-soloed) tracks are re-enabled for output to tape or rendering as file-based output when you use the controls in the Deliver page. If you want to disable tracks for output, you can use the Enable Track button, in the track header of the Timeline in the Edit page or the Deliver page, to turn any tracks off that you don't want to output.

## Timecode Synced Audio Playback

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DaVinci Resolve lets you synchronize a timeline to a timecode-controllable audio playback device connected externally, such as a DAT deck, so you can grade it within context to the program's soundtrack, and host client review timelines with synced audio.

**To synchronize a timeline to audio from a timecode-controllable playback device:**

1. Right-click the Timeline you want to link audio to, and choose Chase Audio Settings.
2. Turn on the "Enable External LTC" checkbox to sync that Timeline to a timecode controllable device connected to your workstation.
3. If necessary, enter a Synchronization Delay to account for any latency between DaVinci Resolve and the audio playback device you're using, using the pop-up menu to the right to choose either seconds or frames for the delay.
4. When you're finished, turn on the Enable checkbox and click Apply.

Once synchronized, LTC timecode output from your Resolve workstation's video I/O card (audio channel 16 of a DeckLink or UltraStudio interface) will lock and synchronize the external audio device whenever you play the Timeline.